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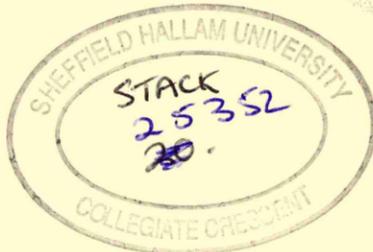
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TELEPHONE APPREHENSION:

A study of

Individual Differences in Attitudes to,

and Usage of the Telephone

by

Richard Guy Fielding Bsc

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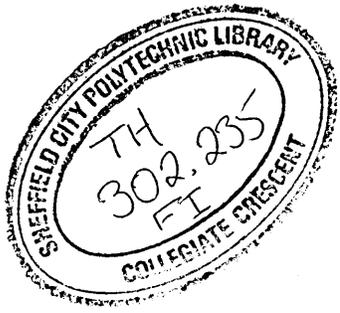   Birmingham

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TELEPHONE APPREHENSION:
A Study of Individual Differences in Attitudes to, and Usage of the Telephone

Richard Guy Fielding BSc

ABSTRACT

This thesis explored one form of communication apprehension, namely telephone apprehension, defined as "anxiety or fear associated with the anticipated or actual use of the telephone". Using a self-report questionnaire, data from UK and Australian student and non-student samples indicated significant sex (male>female), non-significant age, but significant age by sex interactions (older men>older women, younger nsd). Culture and sample differences were significant (UK>Australian>USA; students>non-students). Correlations between apprehension and use were small.

Factor analyses suggested that telephone apprehension comprised three independent factors. "Problematic Communication" focuses upon apprehension, whilst "Approach-Avoidance" involves overall like-dislike and use-avoidance. "Confidence" concerns self-perceived competence. This analysis implied that there was no necessary relation between telephone apprehension and use-avoidance.

A validity study concluded that a revised self-report questionnaire incorporating distinctions between using, communicating, speaking and listening by telephone was an appropriately specified, valid and reliable measure of telephone apprehension.

An investigation of the correlations of telephone apprehension with generalised anxiety, communication apprehension, social desirability and self-esteem showed that these were non-significant, and accounted for only 6.4% of the overall variance in telephone apprehension. It was concluded that differences in telephone apprehension do not result merely from differences in other, more generalised personality or communication variables.

A critical review of the concept of telephone apprehension, and of communication apprehension in general, lead to the redefinition of telephone apprehension within an expectancy-value framework, as the summed product of the evaluative components of beliefs about the negative affective outcomes of telephone use, and their associated outcome expectancies. In addition to apprehension, other variables should be incorporated in predictive models of telephone use, such as non-affective outcome expectancies and evaluations, and self-efficacy expectancies. A combined expectancy-value and self-efficacy model was proposed which incorporated telephone apprehension as one of the predictor variables.

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Guy Fielding
24th July 1990

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CONTENTS

TELEPHONE APPREHENSION

A Study of Individual Differences in Attitudes to, and Usage of the Telephone

PREFACE

"In the United States more households now have telephones than running water."

The telephone is one of the most common communication technologies, and for many people everyday life without the telephone is almost unimaginable. However, unlike television and the press, the telephone has been largely ignored by communication researchers. This thesis began when I became intrigued by this neglect, and wrote a chapter for an edited volume of readings intended for undergraduate students of communication, reviewing what was then known about the telephone. One of the most general conclusions that emerged from that review was the paradoxical nature of much of our knowledge of the telephone. The facts are often at odds with both popular conceptualisations and theoretical predictions.

When discussing this chapter with colleagues, I was struck by the frequency with which they admitted to disliking and avoiding the telephone (and if not themselves, then their partner or a friend or relative). Yet the published literature suggested that the telephone should be a source of reassurance and psychological security. This was a paradox which seemed to have considerable individual and social consequences. If the telephone was, and was becoming more important to the way people conducted both their private lives and their careers, then the person who was fearful of the telephone would be disadvantaged in many ways. Further, many of the new technologies, such as e-mail, fax, computer conferencing and such like also involved use of the telephone. The problem of telephone anxiety therefore seemed to have considerable practical significance. Chapter One of this thesis outlines this initial view of the telephone.

Within the American tradition of communication, with its roots in the study of rhetoric and training for public speaking, there had long been an interest in the problem of "public speaking anxiety". Since the early 1970's this work had been dominated by the work of McCroskey and his colleagues. Published studies of "communication apprehension" now exceed a thousand, and this work appeared to offer an empirical and theoretical starting point on which a study of "telephone apprehension" could be based. As the material reviewed in Chapters Two and Three demonstrates, my initial enthusiasm for this research is now tempered by substantial reservations. Whilst much of this work is empirically impressive, it is not matched by comparable theoretical development. The most obvious problems are the absence of an explicit model relating apprehension to behaviour, and the absence of attempts to answer questions of cause. Why should someone be apprehensive about communicating, and how does this affect their subsequent communicative behaviour?

Within the tradition of communication apprehension research, however, I discovered the work of Reinsch. He had also noticed the problem of telephone apprehension, principally because he himself disliked the telephone. He and colleagues had developed the initial version of a scale to measure telephone apprehension, and the first empirical work I undertook was to examine the utility of this scale when used with subject populations other than American undergraduate communication sophomores ("the communication rat"). A review of the research that is available on the topic of telephone apprehension forms Chapter Four of this thesis, with the initial empirical work reported in Chapters Five to Eight.

This intial work includes data not only from UK samples, but also from Australian subjects. This was made possible by a four month secondment to an Australian CAE to assist with the development of their Communication Studies programme. During this visit I was struck by the

differences between Australian and British attitudes to, and use of, the telephone, and took the opportunity to collect data for two of the studies reported in this thesis.

This initial work raised three problems. The first concerned the validity of the scale, and in particular the conceptual integrity of the scale. I was concerned with the apprehension people experienced when communicating by telephone, and the scale appeared to share this concern. However, none of the items which constitute the scale mention communicating. Instead, they are concerned with speaking or talking on the telephone. Listening to another person on the telephone appeared to be ignored. An account of the investigation of this and other aspects of the problem of validity appears as Chapter Nine. The second problem concerned the dimensionality of the scale, and of telephone apprehension. Was it a single problem, or was it a number of different problems? Analyses reported in Chapter Seven suggested that it was not a single problem, and in Chapter Eleven a model is proposed which attempts to identify the various components of telephone apprehension, to spell out their relations one with the other, and to relate them to telephone behaviour. The third problem concerned the correlates of telephone apprehension, and plausible alternative explanations for the observed results. The research reported in Chapter Ten attempted to examine the most plausible alternative explanations, and shows that telephone apprehension cannot simply be explained away as a specific manifestation of a more general characteristic of particular individuals. Telephone apprehension is a real problem, and is not simply reducible to other communication or psychological problems. It is also, as Chapters Seven to Nine demonstrate, a more complex problem than originally envisaged.

Before any further research based within the
communication apprehension tradition was undertaken, it
seemed necessary to locate this research within, or at
least relate it to, the extensive research which exists
within psychology which could provide answers, or at
least a framework within which answers could be sought,
to the two fundamental questions of "why should be people
be anxious when communicating by telephone?" and "how is
such anxiety likely to affect the way a person uses the
telephone?". These questions are tackled in Chapters
Twelve and Thirteen. A summary and the overall
conclusions are presented in Chapter Fourteen.

As with many, if not most, research projects, the
conclusions are rather less definite than the researcher
originally hoped. Many issues have not been explored,
those which have have perhaps not been tackled as
effectively as they could, or should have been, and the
results which have been obtained, and the analyses that
are offered are necessarily more tentative than
conclusive. However, the data presented here does suggest
that telephone apprehension is an important problem for
many people, that it has practical significance, and that
its investigation is theoretically and empirically
demanding.

One last point should be noted. This thesis is located
within the discipline of communication, rather than
psychology or sociology. The study of communication is,
within the UK, a comparatively recent development. Many
of those teaching and researching within the discipline
are not originally trained within that discipline, and
the research literature and practice that informs the
discipline elsewhere, such as in the United States, is
only gradually being discovered. The problem of telephone
apprehension is in many ways an excellent problem to
research when pursuing a doctorate in this new
discipline, for although such research can be informed by
the data, theories and practices of more developed

disciplines such as psychology and sociology, the problem itself is centrally and unambiguously a problem of communication, and is most properly studied within, and evaluated with respect to the data, theories and practices of the newly emerging discipline of Communication Studies.

CHAPTER ONE

THE TELEPHONE SYSTEM AND TELEPHONE USAGE

AN INTRODUCTION

SYNOPSIS

In this introductory chapter a definition of
telecommunications is offered, and its multiple meanings
and connotations noted. The telephone and telephone
system is differentiated from other forms of
telecommunications, in particular, it is distinguished
from the mass telecommunications media and the "new"
communications media. The enormous scale of the telephone
system, and the extent of human communication conducted
by telephone is noted.

The absence of extensive communication-orientated
research about telephone use and telephone users is
explored, with surveys of general communication research,
and specialist areas such as organisational and inter-
cultural research demonstrating an almost complete
neglect of the topic. The problems associated with this
neglect are noted.

The importance of a two-way relationship between
telephone research and general communication research is
stressed, and the lack of such a relationship in existing
research is noted. Some of the research which is
available is briefly reviewed. As an example of the
importance of the two-way relationship between
specialised telephone research and broader communication
theory, the problem of the "missing non-verbals" is
explored in some detail, and the implications of the
developing understanding of telephone behaviour for
theories of communication in general are discussed. The
inhibiting effects are discussed of the institutional
structure of the discipline of communication for
telephone research in particular, but also for
communication research itself.

The limited research which is available about telephone
usage and users is reviewed, and the surprising nature of
much of this data is noted. The overwhelmingly local and
familiar pattern of telephone use, and its complementary
and enhancing, rather than substitutional, relationship
to face-to-face communication is documented. The
characteristics of users with differential patterns of
usage are explored in terms of demographic and social
characteristics. Finally, the individual differences
approach to understanding variation in telephone usage is
introduced, and the limited research available is
reviewed.

CHAPTER ONE

THE TELEPHONE SYSTEM AND TELEPHONE USAGE

AN INTRODUCTION

"Telecommunications" is defined as:

"Any transmission, emission or reception of signs, signals, writings, images and sounds, or intelligence of any nature by wire, radio, visual or other electromagnetic systems." (International Telecommunication Union)

Underlying this simple definition are a range of meanings of enormous scope and scale. The term represents a group of technologies, the operations of massive national and international organisations, and the messages that are carried by that system and those organisations. Telecommunications also represents an orientation to interaction and communication which has consequences for, and influence upon the way in which human communication is studied and understood.

Although there is good reason for the attention which communication researchers have given to mass communications (see Delia, 1987), and to the new information and communication technologies (eg Forester, 1987; Fulk and Steinfield, 1990; Rice, 1984; Schement and Lievrouw, 1987; Williams, 1984), this research effort has not been paralleled by work on the most basic, and also the most common, and arguably, the most powerful telecommunications device, namely, the telephone. This thesis is a contribution to the research which has examined the use of the telephone, and in particular to research which examines users' orientations to, and anxieties about using the telephone.

The Absence of Communications-Orientated Research which Examines the "Plain Old Telephone"

Most of the limited scholarly writings on the telephone claim that, compared with other aspects of human

communication, the telephone is peculiar in being given relatively little or no attention, and that this is at odds with its actual distribution and impacts. This argument contrasts the scale of the world-wide telephone system with the absence of research and writing about the telephone within the study of communication.

For instance, in 1987 the Government commissioned a wide-ranging study of the electronic communication infrastructure of the UK, which explored the ways in which the communications infrastructure might develop to the year 2010 (PA Consulting Group, 1988). The report explored the different policy orientations available, ranging from a "Laissez-Faire" scenario to an interventionist "Broadband National Grid" approach. The study concluded that the differences between even the most radically different scenarios were relatively insignificant, since in all scenarios the single most significant element was "basic voice telephony", and that the existing dominance of this element, and the predicted increase in demand for basic voice telephone services in all scenarios, made all other differences relatively insignificant. The dominance of the telephone is illustrated by total distribution of investment in the communications infrastructure.

See Figures C01F01 and C01F02

Voice and voice messaging systems, together with associated equipment, form by far the largest portion of output and revenues in the communications industries. (PA Consulting Group, 1988, p.22). Based on historic trends, commercial use of basic telephone services is likely to grow at approximately 5% per annum, and residential use would grow at some 2.5% per year over the next twenty years. Telephone investment and revenues are significantly higher than those for any other communications service, and are predicted to form approximately 60-75% of the total communication investment/costs in 2010, in all of the different

UK   TELECOMMUNICATIONS   INFRASTRUCTURE
EXISTING   NETWORK   ASSETS   MARCH   1987

Total   Investment=£16,250   Million

BT   Telephone

Cable   Companies
Terrestial   Broadcasters
Cellular   Telephone
Mercury   Telephone

Estimates   from
PA   Consulting   Group
based   on   published   accounts
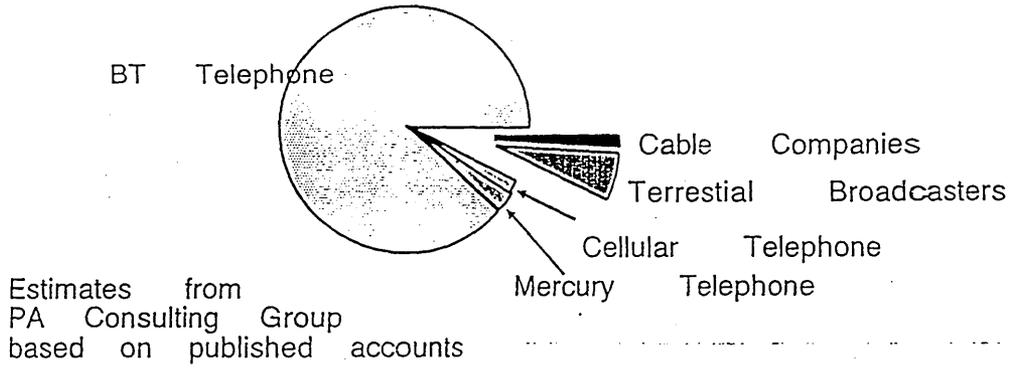
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UK   TELECOMMUNICATIONS   INFRASTRUCTURE
ANNUAL   INVESTMENT   1987

Total=£1750Million

BT   Telephone

Satelitte   Companies
Cable   Companies
Terrestial   Broadcasters
Cellular   Telephone
Mercury   Telephone

Estimates   from
PA   Consulting   Group,
based   on   published   accounts

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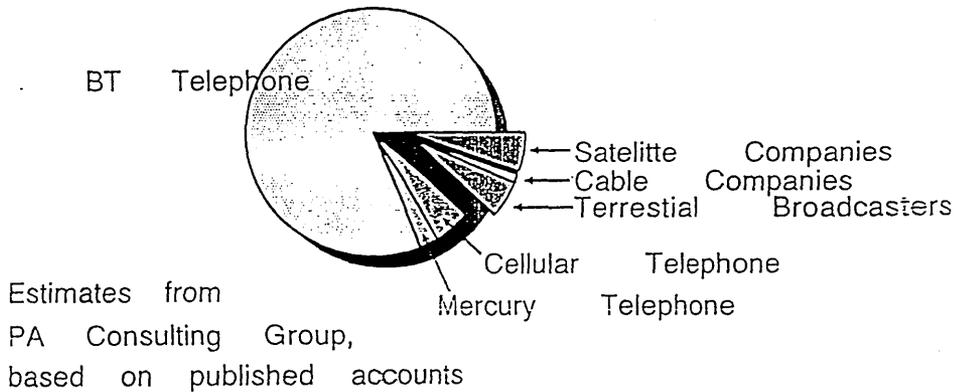
scenarios investigated. A series of reports by the Telecommunications Research Centre has reported similar patterns of investment and revenues in most of the major world economies (eg Telecommunications Research Centre, 1990).

Given that the telephone is a major communications medium, and is likely to have had, and will continue to have an impact upon the way people communicate and live, it could be assumed that it would have been given serious attention by communication researchers. However, surveys of published communication research reveal that this is not the case. Research concerned with the telephone which adopts a communication (or more broadly, social science) perspective (as opposed to a technological or economic perspective) is in fact relatively scarce. For instance, a review of seven recently published "Communication Handbooks" offering contemporary overviews of communication studies and related areas shows that in the several thousand pages and approximately one hundred chapters in these Handbooks, the telephone is mentioned only three times.

A similar picture is presented by a survey of communication reference materials. In the 1913 pages of the International Encyclopaedia of Communication (Vols 1-4), only four 4 pages (Vol 4:212-216) mention the telephone, and these present a history of the development of the telephone system. No account of the communicational, psychological or sociological significance of the telephone is presented. This neglect continues when more specialised areas are examined, even when those areas might be expected to be more aware of the importance of the telephone. For instance, in the area of organisational and managerial communication, the telephone appears to be crucial (Pool, Decker, Dizard, Israel, Rubin and Weinstein, 1977). However, a survey of the major current texts shows only three brief references in over 4000 pages.

In the study of cross-cultural, inter-cultural and international communication, interest might focus on the relationship between differences in cultural patterns and patterns of communication, and the important role that cultural differences might be expected to play in determining attitudes to, and use of the telephone. Similarly, the telephone might be expected to be a major channel of international communication. For instance, Thorngren (1977) reported studies of face-to-face and telephone communication both within and between organisations operating internationally within Western Europe, and found that telephone was used for approximately 80% of all such contacts. Badami (cited in Condon and Yousef (1975)), noted cultural differences in the use of the telephone, such as the German tendency to follow an unwritten but elaborate etiquette of telephone use. However, a survey of nearly two dozen texts, including the major summative handbooks, as well as the major edited collections, reveals only two limited references to the telephone. The telephone is clearly seen as of little or no importance.

Taken together, these surveys suggests that, at a time when the telephone increasingly interpenetrates daily life, this area of human communication is virtually ignored by communications researchers. There is a need for systematic communications research looking at the telephone and the use of the telephone. The current lack of research leads to a number of concerns:

1: Currently, the telephone is an "unknown" medium. Available research is largely unable to specify how the telephone is used, why it is used, nor how it could be used better.

2: The telephone is falsely regarded as an unproblematic medium, with consequent problems of inappropriate implementation and use.

3: The lack of satisfactory theoretical models of telephone use means that telephone communication cannot be related to other forms of human communication. Such theoretical models are needed, for instance, in order to produce more useful analyses of the likely effects of new developments in telecommunications.

4: Many of the theoretical issues in the mainstream of communication research are biased and impoverished by their failure to recognise the existence and importance of this area of human communication activity.

This state of affairs may be summarised, with respect to both communications researchers and the general public, by describing the telephone as the "unseen and the unknown" communications medium. This neglect may be inherent in the nature of the telephone system itself. That is, just as the need and means to research the telephone have appeared, so, perversely, the medium itself has become progressively more <u>transparent</u> to its users, and the ability to see it as a problem worthy of research has been minimised.

A number of findings are supportive of this highly speculative hypothesis. The introduction of automatic direct dialling between 1958 and 1979, replacing the need to go through an operator, and the associated elimination of open party lines, created an apparently user-transparent medium which is seen as providing simple, direct and private contact between individuals. Before this, the presence of an operator created a medium which was complex, indirect and anything but private. Pool (1983) notes the early perceptions of the telephone as a public medium, with the operator as an active participant in the system. That the operator could, and would, listen-in was taken for granted. The effect of the introduction of direct dialling, and the shift in the public's perceptions of the medium, can be seen in a number of ways. One example is the changing pattern of

international telephone traffic. The introduction of
direct dialling between any two countries is predictably
followed by a massive growth in telephone traffic.
Although also related to such factors as reduced costs
and increased convenience, this growth is likely to be
tied to the users' perceptions of the medium as being
more direct and transparent.

Other research findings also suggest that the system is
user-transparent. For instance, when diary procedures are
used to examine studies of residential telephone usage,
it is found that users overestimate the number of calls
made. One reason for this is that outgoing and incoming
calls are not distinguished. What seems to be important
is the call, not who initiated it. When reminded to count
only outgoing calls, people's estimates of the calls made
then drops below the number actually made, apparently
because they do not count calls which were not completed
to the person intended (Mayer, 1977). This pattern of
discrepancy can best be described by suggesting that the
telephone call per se is unnoticed, it is the person-to-
person contact and conversation that is seen as
significant.

People's preference for a transparent communications
medium is indicated by studies of telephone pricing
structures. In the United States, where a choice of
pricing mechanisms can be offered to customers, so-called
'flat-rate' schemes provide, once a high initial charge
has been paid, unlimited calls at no extra cost, and
these schemes are offered as alternatives to schemes
where payment is made in terms of a simple charge per
call. Over 40% of subscribers do not use the payment
scheme that would be most economical for them (Mayer,
1977). The direction of this 'false economy' is for low-
usage customers to prefer the flat-rate charge, which is
only of benefit if large numbers of calls are being made.
It can be concluded that subscribers wish to minimise
awareness of the telephone system, even at the expense of

greater overall cost.

Telephone Research and General Communication Research

Even the most superficial consideration of the telephone
and telephone use indicates numerous problems worthy of
investigation by communications researchers. However, as
noted, these problems seem to be recognised by only a
small group of researchers. Although the relationship
between telephone research and mainstream communication
research could be potentially productive for both
parties, it seems that this productive relationship has
not yet been realised. For instance, the relative neglect
by researchers and invisibility for users is seen in the
advice which practical communication skills texts give to
telephone users. If these texts mention the telephone,
then telephone communication is presented in terms of
simple problems of articulation and courtesy (Eyre,
1979), or as a very straightforward and unproblematic
process of two parties making contact, identifying
themselves and the subject matter, discussing it, and
then making some decision before closing the call
(Bergin, 1981).

Existing research suggests that face-to-face and
telephone mediated conversations are not equivalent, but
that the differences are sometimes surprising. For
instance, empirical evidence shows that complex task-
oriented problems can be solved, and information
processed just as efficiently, via the telephone as face-
to-face, and that for non-socio-emotional problem the
telephone may even have advantages over face-to-face
conversation (Williams, 1977).

Morley and Stephenson (1969, 1970) conducted a series of
studies of industrial bargaining, comparing face-to-face
negotiations with those conducted by telephone. They
showed that the side with the stronger case was more

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successful when negotiating by telephone than when
negotiating face-to-face, that is, the outcomes they
achieved more closely represented their objective
advantage and optimal outcome. When negotiating face-to-
face the relative advantage gained was attenuated.
However, there were also significantly more breakdowns in
negotiation (ie a failure to reach any agreement) on the
telephone than face-to-face. It was argued that when
subjects were negotiating via the telephone they
concentrated on the objective, task-related aspects of
the problem, and ignored the interpersonal, socio-
emotional aspects of the encounter. It seemed easier to
ignore the feelings of the loser when negotiating by
telephone. When negotiating face-to-face the socio-
emotional costs of winning acted as a limitation on the
extent to which objective advantages were exploited.

These results suggested that the greater the bandwidth of
the medium, the greater the emphasis on the affective
content of the messages. Users may, at some level, be
aware of these differences. Wilson and Williams (1977)
studied the (in)famous Watergate tapes which recorded
discussions between President Nixon and his staff. They
compared telephone and face-to-face conversations, and
found proportionately more disagreements on the telephone
than in face-to-face meetings. There are a number of
possible explanations for this. One is that the telephone
encourages people to disagree, by setting up conditions
for conflict. Another is that something about face-to-
face encounters actively prevents people from
disagreeing. Another possibility is that people choose to
telephone precisely when they want to disagree.

The Role of Non-Verbal Channels in Telephone and Face-to-
Face Communication

The potentially productive relationship between telephone
research and mainstream communication research can be

illustrated by the problem of the 'missing nonverbals'.
Analysis of face-to-face interaction shows that
interaction is regulated by use of a wide variety of
visual signals: face, eyes, body, hands, orientation, etc
(Kendon, 1967). The telephone has no visual channel. How
then is this visual information compensated for or
replaced?

There has been general agreement that visual signals
fulfil a number of different functions in conversation:

    1: to get feedback
    2: to signal attention
    3: to signal attitudes
    4: to support the verbal channel
    5: to regulate the encounter, e.g. turn taking

There has also been agreement about the power and
importance of non-verbal signals, particularly with
respect to the interpersonal and encounter regulation
aspects of interaction (eg Argyle, Alkema and Gilmour,
1971; Argyle, Salter, Nicholson, Williams, and Burgess,
1970). Given this view of non-verbal signals, it would be
pedicted that there would be great difficulty when using
the telephone. Given that this difficulty is not
apparent, more precise hypotheses must be considered. One
hypothesis is that there would be inter-speaker chaos.
That is, the smoothness of speaker switching would
deteriorate in telephone conversations; there would be
more interruptions, and longer silent pauses (Kendon,
1967). There would also be attempts to compensate for the
absence of visual cues; such as an increase in the use of
filled pauses as floor-holding devices, and of attention-
signalling accompaniments such as "yeah", "mmhm", etc. It
is also likely that anxiety would increase, and therefore
markers of anxiety in speech, such as speech errors,
would increase. Finally, conversational styles might
change, with people trying to minimise speaker switches,
and trying to say less overall.

Empirical evidence does not support any of these hypotheses, and in some cases, demonstrates that exactly the opposite occurs (eg Beattie and Barnard, 1979). There are at least three possible explanations for this. The first is that normal conversation is much more redundant and robust than was thought, and can sustain considerable degradation before normal procedures and patterns are abandoned. A second explanation is that individuals adapt by adopting a 'short and sharp' style of conversation, which uses rapid changes of speaker to maximise feedback, in which feedback is switched into the verbal and vocal channels, and in which a more formal, rule-following style is adopted. The third explanation is that perhaps the researchers' unexamined model of everyday conversation which is at fault. Good conversation may in fact be characterised by interruptions, periods of silence, unfinished words and sentences, and so on. These "messy" conversations are characteristic of everyday life, but have not generally been studied by interpersonal communication researchers.

The fact that individuals can conduct telephone conversations, and that they choose to conduct so many, also suggests that visual feedback is not as important as most basic texts on communication imply (eg Dimbleby and Burton, 1986). This issue has recently been explored in greater detail by Derek Rutter and his colleagues. Rutter's theory of 'Cuelessness' (Rutter 1984) is a good example of the potential contribution of telecommunications research to the more general understanding of human communication. Rutter argues that a widespread misconception exists which suggests that in human interaction, eye-contact (mutual gaze) is crucial and that looking (gaze at the other person's eyes) is vital. Whilst the evidence that should have led to the rejection of both of these propositions has been available for some time, it has been ignored in favour of, and perhaps because of, the early-established orthodoxy that both are central to skilled interpersonal

interaction.

Rutter suggests that what is important is not looking, but visual access to the whole person, that is "seeing". Two kind of evidence lead to this conclusion. Firstly, eye-contact, that is, the mutual and simultaneous looking at/into each other's eyes, turns out to be nothing more than a chance event. That is, when two individuals are holding a conversation and both of them are looking (ie gaze directed at the other's eyes), by chance their eyes will meet. A range of studies show that the duration of eye-contact in a variety of encounters is almost exactly what would be predicted on the basis of chance. That is, in normal interaction, eye-contact is a random by-product, not an independent process in its own right. The second line of evidence concerns the relative lack of importance of looking, that is, of gaze directed at the other person's eyes. Studies of encounter regulation and feedback showed that looking plays little part in either.

According to Rutter, when conversations in which seeing is possible are compared with those in which it is impossible, regular differences are found. In non-seeing conversations:

* individuals are depersonalised
* they are task-oriented in what they say
* they are stilted and unspontaneous in their style, and
* they are extremist and uncompromising in the outcomes reached.

Rutter (1984) suggests that variations in 'Cuelessness' underlie this pattern of results. The theory of 'Cuelessness' proposes that the important variable in determining the content, style and outcome of an interaction is the aggregate number of usable cues, of all kinds, that are available to the participants in an interaction. Situations vary in the number of cues

(conversely, their cuelessness) that they offer. This, via its influence upon the interactants' impressions of the 'psychological distance' between them and their partner, determines the content of the interaction, which in turn determines the style and the outcome of the interaction. This research illustrates the way in which investigation of telephone communication increases the understanding of communication in general.

Institutional Limits on Telephone Research

Data describing who uses the telephone, when, and for what purposes, is, considering the pervasiveness of the medium, surprisingly limited. There are several possible reasons for this:

1: Much of the information is proprietary.
2: The public telephone companies have been described as "among the slowest of modern institutions to adopt a consumer-oriented marketing strategy" (Williams, 1982). As a result they have simply not developed appropriate research strategies.
3: The accurate and reliable collection of data has become increasingly efficient as the result of automatic call-logging technology. However, this technology is incompatible with or irrelevant to the needs of psychologically or sociologically oriented research, and may actually have discouraged such research by suggesting that it was comparatively difficult, expensive and professionally unrewarding compared to non-socio-psychological approaches.

In addition to the effects of transparency noted previously, these three reasons have undoubtedly contributed to the lack of available research on the telephone. However, they do not provide a totally convincing explanation for the "ninety-odd years of scholarly neglect, not to say disdain" which Aronson

(1971) notes in one of the few published reviews of the
social consequences of the telephone. This neglect has
not (with some notable exceptions) diminished since
Aronson's review (Lievrouw and Finn, 1987). This neglect
seems to relate to the institutional and social structure
of the discipline of communication. Sociology, and
sociologically-orientated communication scholars, have
dominated the study of the mass media, whilst social
psychology, and psychologically-orientated communication
researchers, have focused upon face-to-face interactions
in dyads and small groups. The study of the telephone
seems to have slipped between this institutionalised gap
in the structure of scholarly activity: it is not of
interest to mass media researchers because it is not
"mass", and it is not of interest to researchers of
interpersonal communication because it is "mediated".
When the "new communication media" began to be
researched, the "plain old telephone" was not of interest
because it was old. The neglect of the telephone should
perhaps sound a general warning concerning the inhibiting
effects of boundaries between (and within) academic
disciplines.

Existing Research on the Use of the Telephone

Although, relative to its importance, comparatively
little research is available, the research that is
available does provide some useful information about
telephone usage.

Data describing telephone usage is often counter-
intuitive. In the USA, the average household makes
approximately 120 calls per month, about 4 per day. There
is a tendency for usage (both in terms of numbers of
calls made and received, and in terms of duration of
calls) to decrease with increasing income levels (Mayer,
1977). Approximately half of the calls from the average
urban household are made to only five different numbers;

in a typical month the average household will dial only twenty-five different numbers. As in face-to-face relationships (Emler and Fisher, 1984) most people in fact have only a very limited number of telephone contacts, and do not seem to widen their circle of telephone acquaintances very quickly. Thorngren (1977), in reviewing four large-scale studies of patterns of organisational communication conducted in the UK and Sweden, noted that telephone contacts are rarely used to establish new relationships. Even in the work context, the proportion of new relationships established face-to-face is much higher than via the telephone, with telephone communication being used to maintain regular contact within established relationships.

One of the most consistent findings about telephone usage is that it is largely local. Data from the USA shows that, within a given telephone area, between 40% and 50% of calls from a household are made to people living within a two-mile radius of that house, and about 70% of the calls from residences are made to places within a five-mile radius. (Garfinkle 1976, Mayer 1977). Noble (1987) in a study of residential phone use in Eastern Australia, found that there was a positive correlation between the use of the telephone and the number of relatives the respondent had living locally. Perhaps most surprisingly, Harbilas (1989), in a study of migrants to Australia, found that whilst the telephone was used to keep in touch with proximate relatives, it was not used to keep in touch with overseas relatives.

The common belief in the "travel substitution hypothesis" as descriptive of telephone usage in business contexts has also been challenged (Salomon, 1986). Whilst widely asserted, there is little evidence to demonstrate the substitution of telecommunications for physical travel, and what evidence is available suggests that the processes of complementarity and enhancement are more important. Downs (1985) argues that the communications

media are only one factor amongst many determining decisions about location and travel, that such technologies are enabling rather than determining, and that the impact of new technologies is not, and will not be, as dramatic as the impact of the telephone already has been.

One way of summarising all of these findings about usage is that the telephone is an extension of, and an intrinsic part of the user's other social activities. It is not used primarily as a compensation for, or as a replacement of them. The telephone is a particular means of keeping in touch, of doing business, and of conducting relationships and activities which is used in conjunction with face-to-face and other forms of communication contact. The more socially and occupationally active a person is, the greater their use of the telephone. The telephone is different from, but is not necessarily deficient as compared to face-to-face conversation. Rather, it seems to have its own special characteristics and role to play.

One straightforward way of assessing the impact of the telephone is to ask how much interpersonal communication is conducted face-to-face, and how much of it is conducted via the telephone. Using diary and observational procedures a number of studies have looked at the way people spend their time during a typical day. The majority of these studies have looked at the communication activities of managers during the working day. Stewart (1967) found that most of a manager's working day was spent in communication of one kind or another, with 60% of the total spent in conversation. 10% of all of these conversations were via the telephone. Conrath (1973) found that 12.9% of all communication episodes were conducted by telephone, rather than in writing or face-to-face. Other studies have estimated that managers spend between 6% (Volard and Davies, 1982) and 16% (Klemmer and Snyder, 1972; Plotzke, 1982) of

their working day using the telephone. Clearly a substantial part of the manager's working day is directly involved with the telephone, without any assessment of the impact those telephone calls may have on the manager's other activities during the day. Interestingly, Klemmer and Snyder (1972) found that telephone use was the most accurate estimated of all communication activities.

Goddard (1973) noted some of the differences between telephone conversations and face-to-face meetings. Telephone calls are shorter, with 87% lasting between 2 and 8 minutes. Face-to-face meetings are longer, with 80% of them lasting more than 10 minutes, and 15% lasting more than 2 hours. Most telephone calls (83%) are not pre-arranged, whereas most face-to-face meetings (83%) are. (Informal observation suggests that one of the most common uses of the telephone is to pre-arrange face-to-face meetings.) Telephone calls tend to be about one specific subject (84% of all calls made), whereas face-to-face meetings tend to deal with more than one topic. Most telephone calls have a single purpose, usually giving or receiving orders and instructions, or giving or receiving information. In contrast, face-to-face conversations cover a much wider range of purposes, with a much more equitable distribution of roles within the conversation.

Models of telephone use have tended to focus on the demographic characteristics of households. In the USA, households which contain an adult woman over the age of 19, and younger than 64, tend to have higher than average telephone usage (Mayer, 1977). If, in addition, the household contains a man over 65 who is not the head of that household, then telephone usage will be higher. On the other hand, when the head of the household is over 55 the number of calls made diminishes fairly rapidly. If there are girls between the ages of 13 and 18 in the household then telephone usage will also be higher.

Households with teenage children, and who have recently moved from one part of a city to another part of the same city, tend to be the heaviest of all telephone users. (In these cases the telephone is used to maintain contact with friends who are still seen face-to-face, but less frequently than before.)

An extension of this approach has examined the social and demographic characteristics of people with and without telephones, and those who make relatively heavy and relatively little use of the telephone. Analyses of survey and census data by Kildegaard (1966) and by Tull and Albaum (1977), show that, in the USA, there are systematic differences between people with and without home telephones. Households with telephones are more likely to have white, male heads of household, with above average income, education and age. Wolfle (1979) found that people without a home telephone are more likely to be male, young and black, and to be employed in occupations of lower prestige. They have fewer educational attainments and lower income, and are more likely to be single, divorced or separated. However, Wolfle (1979) notes that most of these differences are small, representing a difference between the two samples (home telephone vs no home telephone) of less than 2%. Only three discriminators, occupation, income and education, exceed 2%, with the largest of these being income (4.10%).

One interpretation of these results is that, in a situation where over 90% of households have telephones, although demographic and economic factors may be one of the determinants of the decision not to have a domestic telephone, this is unlikely to be the primary, or even a major factor in the decision. If that is the case, then other factors, including individual attitudes to the telephone, are likely to play a part, and possibly a major part, in this decision. However, little or no research has adopted a traditional individual differences

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approach to this question.

Until recently, although the telephone has been thought of as a peculiarly female means of communication, there has been an absence of studies which compare male and female telephone use. Published reviews (eg Singer, 1981; Claisse and Rowe, 1987) offer no analysis by sex. Some incidental data is available. Maddox (1977) reported that women use the telephone most frequently for intrinsic reasons and use it more often because they are more likely to be at home. Noble (1987) found that women use the telephone more frequently than men for intrinsic reasons, whereas there were no sex differences for instrumental use of the domestic telephone. Interestingly, few of the women in Noble's (1987) study were housewives, suggesting that greater intrinsic use of the telephone by women is not necessarily related to being at home.

The absence of studies examining the relation of gender to telephone use has been rectified by recent studies by Rakow (1988) and Moyal (1989). Both of these studies use qualitative methodologies, but do offer some quantitative data. Moyal (1989) found that 95% of her national sample of 200 Australian women made an average of 17-30 calls per week, occupying on average 5-15 minutes in length, but sometimes extending to 45 minutes and occasionally to over an hour. These calls were primarily intrinsic (ie socio-emotionally focussed), and furnished a 'psychological neighbourhood' that the women saw as essential to their personal well-being, sense of community and autonomy. Moyal notes that the great majority of calls were made locally, and the majority of calls were between mothers and daughters. Rakow (1988) argued that the telephone is "both gender work and gendered work". Women's use of the telephone is directly related to their restricted mobility and limitations about where they live and the opportunities available to them. The telephone serves as a compensation for these

restrictions and for separation from family and friends, and is used creatively to transcend the physical and social boundaries of women's domestic and economic lives.

As noted above, little or no research has adopted the psychological approach of examining differences in an individual's personal characteristics as predictive of differences in telephone usage. Short, Williams and Christie (1976) studied users' reactions to two different telecommunications media, a videophone system and the same system with the vision turned off (audio-only system). Results of an initial study suggested that the videophone could be treated as the more face-to-face-like medium, and the audio-only medium as the more telephone-like medium. In another study, 96 subjects completed Little's (1971) Thing-Person questionnaire, which consists of a series of questions relating to the respondents' interest in interacting with people as compared with things. Other independent variables were the interactant (stranger or friend) and task (three different tasks were used). All subjects held conversations using both media, and after both conversations, completed questionnaires indicating their feelings about the media, the conversations and their interactants. Factor analyses were used to simplify the 24 scales. Two factors were extracted for the media: "medium efficiency" (efficient, useful, reliable) and "medium simplicity" (simple, private, easy to use). There were also two conversational factors: "conversation interest" and "conversation cooperativeness"; and three person factors: "person evaluation", "person formality", and "person confidence".

Thing-Person Orientation scores (Person Orientation score minus Thing Orientation score) correlated significantly ($p < 0.05$) with five of the seven factor scores:

medium simplicity	r=0.34
conversation interest	r=0.19

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conversation cooperativeness  r=0.19
person evaluation             r=0.17
person confidence             r=0.26
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That is, users who were more oriented to people than things saw both media as more simple, the conversations as more interesting and cooperative, and evaluated their conversational partners more positively and as having greater confidence. However, there were no relations between medium efficiency and Thing-Person orientation, nor between person formality and Thing-Person orientation.

In addition, all factor scores except "person confidence" were significantly different as a function of media differences, with the videophone being rated as the more efficient medium, as associated with the more interesting conversations, and the more positively evaluated people. Taking these two sets of results together, Short, Williams and Christie (1976) concluded that users who were more oriented to people than things saw the videophone (the more face-to-face-like medium) as more simple than the audio-only (telephone-like) medium, the conversations held via this medium as more interesting and cooperative, and evaluated the people they talked with more positively when talking to them via the face-to-face-like medium (the videophone) than when talking via the telephone-like medium (audio-only). There were no differences in terms of medium efficiency, person confidence and person formality.

Noble (1987) reported a study of 100 Australian residential telephone users and the relation of individual differences in sociability, introversion-extroversion and verbaliser-visualiser scores. He reported significant correlations between sociability and telephone use, with more sociable individuals on average making and receiving more intrinsic calls, and receiving, but not making, more instrumental calls. When asked about

the number of calls made the previous day, extroverts reported receiving, but not making, more calls. Support was found for the notion that verbalisers would have a more positive orientation to the telephone than visualisers. Significant correlations were found between verbaliser-visualiser scores and four of six possible measures of telephone use. There were significant correlations between verbaliser-visualiser scores and the number of intrinsic calls received, intrinsic calls made, instrumental calls received, and calls received yesterday. These results indicate that, overall, visualisers receive more calls than verbalisers. However, surprisingly, the results for calls made were <u>less</u> clear-cut, with the correlations between verbaliser-visualiser scores and the number of instrumental calls made, and calls made yesterday being non-significant. Noble (1987) also noted that people who in general were more anxious reported themselves as "making fewer phone calls yesterday", but there were no significant correlations with the other five measures of telephone use.

The most obvious dimensions of individual differences which would be expected to be related to telephone use are those relating to attitudes to, and anxieties about, the telephone. Surprisingly, almost no research has tackled this issue. The most extensive research relating individual differences in orientations to communication to differences in communication behaviour is that conducted within the tradition of "communication apprehension" (eg McCroskey, 1970, 1977a, 1982a) but this has not, until recently, been extended to understanding differences in telephone usage. This is the enterprise which this thesis is concerned with. Reviews of the literature dealing with communication apprehension, and its application to the telephone, form the next three chapters of this thesis.

CHAPTER TWO

COMMUNICATION APPREHENSION

SYNOPSIS

In this chapter the concept of communication apprehension is defined and described, and the research employing this concept is critically reviewed.

The changing claims made for the predictive utility of the concept are noted, from an initial prediction of clear behavioural correlates of avoidance, withdrawal and disruption to the later, more limited claim of negative affect associated with communication. A taxonomy is proposed of differing associated characteristics (uncommunicative, dislike present ways of communicating, want to be more communicative, self-perceived below average communicative competence) and the different kinds of evidence (self-report, other-report, indirect objective, and direct object data) relevant to testing the relationship of communication apprehension to these characteristics. The evidence relevant to each characteristic is then examined.

It is shown that in each case, most of the available evidence is of the weakest kind (self-report), and that evidence of the strongest kind (direct objective) shows the least powerful and most inconsistent relationships. The evidence also shows that the strongest relationships are with public speaking apprehension, rather than with general communication apprehension.

High communication apprehension is associated with high general anxiety, introversion, low self-esteem, and lack of assertiveness. Reported cross-cultural studies of communication apprehension are few, and demonstrate little cross-cultural variation. The proposed causes of communication apprehension (genetic predisposition, reinforcement history, skill acquisition, and modelling) are noted.

The major reconceptualisation of the communication apprehension concept proposed by McCroskey (1982a) is outlined. This proposes a continuum from traitlike to statelike communication apprehension, and is claimed to be consistent with general models of state-trait relationships. Each level of the proposed conceptualisation is examined, and tests of the reconceptualisation are noted. Problems with this conceptualisation of communication apprehension are then discussed. They include the proposition that anxiety is necessarily problematic and pathological, and confusion concerning the interpretation of pathological scores. The limited range of communication modes referenced by operationalisations of the concept are noted. These limitations call into question the claim that a trait measure is being used, and suggest that in practice a specific generalised-context measure is being employed. The confused nature of the proposed conceptual continuum is noted, and various measurement problems are identified. Finally, the tests of the conceptualisation noted earlier are shown to be inappropriate to the testing of the validity of the model.

The available measures of communication apprehension are then reviewed. The development of the most recent version of the instrument is described, and earlier and current difficulties are identified. Measures of context-based, audience-based and state communication apprehension are also examined, and the mismatch between the claimed and actual operationalisation of all measures is noted.

It is concluded that whilst existing communication apprehension research should clearly be relevant to telephone apprehension research, the available research is of limited value because of conceptual or empirical problems. Its primary value is to identify issues, and to emphasise the need for the careful conceptualisation and operationalisation of the telephone apprehension concept.

CHAPTER TWO

COMMUNICATION APPREHENSION

INTRODUCTION

In this chapter, the problem of telephone apprehension is located within the existing extensive research dealing with communication apprehension. Research detailing the correlates of communication apprehension is reviewed. A critical review of the conceptualisation and operationalisation of communication apprehension, before the chapter concludes by reviewing the measures used to study communication apprehension.

COMMUNICATION APPREHENSION

Communication Apprehension (CA) is one of the most frequently investigated variables in the field of human communication research. Payne and Richmond (1984), for instance, found nearly a thousand studies, and interest has, if anything, increased subsequently. McCroskey (eg 1970, 1977a, 1978, 1984) and colleagues have been central to this work.

The original definition of CA was "a broadly based anxiety related to oral communication" (McCroskey, 1970). Later, McCroskey defined CA as "an individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons" (McCroskey, 1978, p. 200). McCroskey (1970) published the Personal Report of Communication Apprehension (PRCA), a 20-item scale designed to measure individual differences in CA. Richmond and McCroskey (1985) described people with high PRCA scores as afraid to communicate and, because it is natural for people to avoid things they fear, quiet. They may not feel restricted by their feelings about communicating, and the social problems

they experience stem from how they are perceived by others and how others respond to them.

People with low PRCA scores were described as high talkers who actively seek out opportunities to interact with others. They are fearful or anxious in very few communication situations. People with moderate PRCA scores were described as likely to feel some fear or anxiety in a few situations, but in most others they would feel quite comfortable.

Three features of these definitions and associated descriptions are noteworthy. The first is that communication includes talking, both in dyads, small groups, classrooms and public speaking settings, but it also allows the inclusion of other modes of communication, such as listening (Wheeless, 1975) and other channels of communication, such as writing (Daly and Miller, 1975) and singing (Andersen, Andersen, and Garrison 1978). CA should therefore include the telephone as a channel of communication, and would subsume telephone apprehension within it. However, in practice "communication" refers only to face-to-face talk. Despite this, a review of CA raises issues with profound implications for the study of telephone apprehension, and CA provides the conceptual basis for the majority of work so far conducted.

A second feature is that CA is defined as an affective response, that of fear or anxiety, and does not specify behavioural characteristics. According to McCroskey (1982a), relations between affective responses and behaviour are to be determined empirically, either as causes, correlates or consequences. Richmond and McCroskey (1985) also suggest that the distinction between CA and shyness is centred upon the difference between definitions specified in terms of affective (CA) and behavioural (shyness) features.

A third feature is that both anxiety and fear are
specified in the definition. McCroskey and Richmond
(1987) argue that social confidence results when
behaviour and outcomes are predicted and these
predictions are verified. When expectations are not met,
the person will adjust not only their behaviour, but also
their expectations. However, when expectations are
repeatedly not met, people will lose confidence in their
ability to make accurate predictions. This inability to
predict outcomes results in anxiety. On the other hand,
if expectations are formed, but those expectations are
negative, and the expected negative outcomes cannot be
avoided, then fear results. That is, anxiety is
associated with situations where the outcome is unknown,
whereas fear is associated with situations where the
outcome is (believed to be) known, and is negative.
According to McCroskey and Richmond (1987), CA may result
from both unknown outcomes and known negative outcomes.

A Review of Research on Communication Apprehension

Porter (1981) noted that over 80% of the published
research on CA used McCroskey's (1970) PRCA-20. Since its
publication, a number of different versions have been
developed. These correlate highly with one another, and
all are normally distributed with high intra- and inter-
test reliability. Reviews of CA normally pool results
from studies using different versions of the PRCA.

Age, Sex, and Gender

In most studies of CA, biological sex differences,
although sometimes controlled for, have only occasionally

been reported. Those which have have reported minimal sex differences. Hansford and Hattie (1979) found no significant differences as a function of either age or sex in five American samples (N=4542), and an Australian sample (N=1784). Talley (1979) found that females had higher CA scores than males, but that this difference accounted for only 2% of the variance.

To the extent that sex differences do exist, they reflect greater female anxiety about public speaking, and a bias in the PRCA-20 toward public speaking items, rather than representing differences in overall CA. McCroskey, Simpson, and Richmond (1982), using the PRCA-24 with 778 undergraduates and 106 teachers, found no significant differences in overall CA, but females were more apprehensive of the public speaking context, whilst males were more apprehensive of interpersonal conversations. In both cases the variance accounted for was small, approximately 1% in the interpersonal context and 2-4% in the public speaking situation. There were no significant differences in the meetings and small group contexts.

Talley and Richmond (1980), Greenblatt, Hasenauer and Freimuth (1980) and McDowell, McDowell, Hyerdahl and Steil (1978) have investigated the relationship between gender orientation and CA. In general, psychologically masculine individuals experience less CA than psychologically feminine individuals, whilst androgynous individuals experience less CA than either. The highest levels of CA are experienced by undifferentiated individuals. Talley (1979) noted that gender orientation accounted for 18% of the variance in CA, a result similar to those reported by Greenblatt et al (1980) and McDowell et al (1978). Strohkirch and Parks (1986) found that biological sex failed to predict CA, whilst measures of gender role orientation were significant predictors. CA was greater for feminine than for masculine subjects. Androgynous subjects experienced the lowest CA, and undifferentiated subjects had CA levels equivalent to

feminine subjects.

Thus, psychological sex seems to be a more important predictor of CA than biological sex, and the relation of both to CA is context specific. Males tend to be more apprehensive in interpersonal contexts, and females tend to be more apprehensive in public speaking contexts. As noted in Chapter Four, the relation of telephone apprehension to age and to both sex and gender is unknown, and these will be among the variables investigated in this thesis.

Relation of Communication Apprehension to other Communication Characteristics

It is usually suggested that the high CA will exhibit a number of associated communication-related characteristics. Indeed, as Beatty (1987) notes, these associated characteristics are so central to CA that failure to find evidence of strong relationships would call into question the construct validity of the CA trait. Before considering the evidence for each of these relationships, the characteristics which are assumed to co-exist with high CA will be outlined.

The first is being "uncommunicative", which consists of two sub-characteristics, avoidance of and restricted activity within communication situations. The second, and often implicit, characteristic is the person's dislike of their present way of communicating. The third is the person's self-reported desire to be more communicative. The fourth is the person's self-reported perception of themselves as having below average communication competence. There is no necessary logical inter-dependence between these characteristics, and this relationship must be established empirically.

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McCroskey (1982c) suggests three patterns of behaviour are typical of high CA's. These are:

> communication avoidance
> communication withdrawal
> communication disruption

According to McCroskey (1982c), high CA's, to minimise experienced discomfort, will avoid situations which they anticipate will require them to communicate. He claims that high CA's "select occupations that involve low communication responsibilities, pick housing units that reduce incidental contact with other people, choose seats in classrooms or in meetings that are less conspicuous, and avoid social settings" (McCroskey, 1982c, p.164). He summarises: "Avoidance, then, is a common behavioural response to high communication apprehension." (McCroskey, 1982c, p.164)

If it is not possible to avoid a communication situation, McCroskey claims that high CA's will withdraw. They will be silent or participate little. They will not initiate communication, will only contribute when called upon to do so, and when called upon, will minimise their contribution. McCroskey (1982c), however, does not cite specific supporting studies.

When the high CA is unable to either avoid or withdraw from communication, then disrupted behaviour is predicted. The person may exhibit disfluent speech, disrupted non-verbal behaviours, selection of inappropriate communicative strategies and content, and so on. These predictions are stated as if they had been documented, but McCroskey (1982c) does not cite supporting data or studies.

McCroskey (1982a) notes a fourth possible consequence of high CA, namely overcommunication. Although uncommon, this may be exhibited by some high CA's as an "overcompensatory" reaction. Rather than "flight", the option of "fight" is chosen. According to McCroskey (1982c), overcommunication may be seen to be the result of low CA combined with low communication competence, rather than due to high CA.

It would be expected that, if these patterns do in fact hold for CA, similar patterns of behaviour would apply to telephone apprehensives with respect to telephone behaviour.

Published reviews of CA have not given sufficient attention to the nature of the evidence on which the claimed relationships between high CA and various communication-related characteristics are based. Several different kinds of evidence exist:

> Evidence may be self-report, for instance, self-report of avoidance of communication (eg Lederman, 1983).

> Evidence may be observer-judgments, for instance, observer-judgments of another person's avoidance of communication situations (eg McCroskey, Hamilton and Weiner, 1974).

> Evidence may be indirect (macro) objective measures. For instance, avoidance of communication situations may be assessed by examining the person's choice of living accommodation (eg McCroskey and Leppard, 1975).

> Evidence may be direct objective measures (eg Ayres and Suek, 1987).

This generates a 4x4 matrix of assumed correlates and types of evidence, as follows:

CHARACTERISTIC   TYPE OF EVIDENCE

	SELF REPORTS	IMPRESSIONS OF OTHERS	INDIRECT OBJECTIVE MEASURES	DIRECT OBJECTIVE MEASURES
UNCOMM- UNICATIVE	1	2	3	4
DON'T ENJOY COMMUNICATION	5	6	7	8
WANT TO COMM' DIFFERENTLY	9	10	11	12
PERCEIVED INCOMPETENCE	13	14	15	16

Beatty (1987) notes that to maximise confidence in any claimed relationship, relationships should be established by means of direct objective measures. Whilst self-reports of behaviours, behavioural intentions or behavioural preferences expressed via questionnaires of interviews provide indirect support, and failure to find such support would be disappointing, they do not provide conclusive evidence. Similarly, whilst the perceptions of others provide indirect support, such impressions may be influenced by other factors and do not provide direct, conclusive evidence. The use of macro-objective measures relies on considerable speculation, and extended causal chains, to link CA with specific behaviours. However, the problem is that the majority of evidence linking CA with behaviour is in fact based on self-reports, other-reports or indirect linkages, whilst studies providing direct objective evidence are very few. In the following review these limitations should be borne in mind.

Uncommunicative Behaviour:
Self-reports of behaviour (Cell 1)

Several studies have linked CA to self-reports of communication behaviours. Davis and Scott (1978) found that high and low apprehensives differed significantly in the amount of self-reported verbal activity. Daly (1978a) reported a correlation of $r=0.71$ between self-reports of avoidance of communication and CA, and Lederman (1983) showed that students with high CA scores reported a preference for avoiding communication. Soares (1984) noted that high CA's reported themselves as unlikely to initiate conversions. Rubin and Graham (1988) found a strong negative correlation between self-reported interaction involvement and CA. High CA's perceive themselves as disclosing less, disclosing more negative things, as being less honest, and as being more superficial (McCroskey and Richmond, 1977; Stacks and Stone, 1982).

Uncommunicative Behaviour:
Other-reports of behaviour (Cell 2)

Several studies report that CA is related to the impressions formed by others. The high CA is seen as less socially and interpersonally attractive (McCroskey, Hamilton, and Weiner, 1974; McCroskey and Richmond, 1976; McCroskey, Richmond, Daly and Cox, 1975; Richmond, 1977). Porter (1982) reported that low CA's were seen as more dominant, and McCroskey and Richmond (1976) reported that they were more likely to be seen as opinion leaders. Daly and Stafford (1984) suggest that these relationships exist because vocal activity (the amount and the way a person talks) is related to a variety of positive person perceptions, and that CA is related to variations in vocal activity.

Uncommunicative Behaviour:
Indirect Objective Measures of Behaviour (Cell 3)

Various studies report that educational success is
related to CA. High CA's select courses having
significantly fewer perceived communication demands than
those selected by low apprehensive people (Daly and
Shamo, 1977; McCroskey and Andersen, 1976) and are more
likely to dropout of courses with high communication
demands (McCroskey, Ralph and Barrick, 1970). CA is
inversely related to positive attitudes toward higher
education, and towards teaching based on oral
communication skills (McCroskey and Sheahan, 1978; Scott
and Wheeless, 1977).

Occupational success and satisfaction are also related to
CA scores (Daly and McCroskey, 1975; Scott, McCroskey and
Sheahan, 1978), with high CA's preferring jobs requiring
little communication, whilst low apprehensives seek and
obtain desirable jobs that demand frequent communication.
However, in a study of mentoring, linking education and
occupational success, Hill, Bahniuk and Dobos (1989)
found CA was not correlated with any of the ten indices
of academic success they studied.

Uncommunicative Behaviour:
Direct Objective Measures of Behaviour (Cell 4)

As Capella (1987) notes, very little CA research has been
concerned with overt verbal and non-verbal behaviour.
Some recent studies have attempted to address this
problem. Beatty (1987) showed that high CA's tended to
avoid public speaking situations when given the choice,
whilst low CA's showed the opposite tendency. When no
choice was given, high CA's gave shorter speeches and
reported greater anxiety whilst doing so. Both Sorenson
and McCroskey (1977) and Beatty, Forst and Stewart (1986)
found low but significant correlations between amount of

verbal behaviour and CA. Remland and Jones (1985) reported that high CA's talked significantly less than low CA's. High CA's used shorter words, were more repetitious, and used a higher proportion of adjectives and adverbs (Jordan and Powers, 1978). They used more rhetorical interrogatives (Powers, 1977) and had higher rates of disfluencies (Booth-Butterfield and Booth-Butterfield, 1986). Burgoon and Koper (1984) found that high CA's nodded less, were less facially animated, and tended to lean away from their conversational partner.

Ayres and Suek (1987) studied the impact of CA on behaviour in initial interactions. They found that high CA's had fewer disfluencies than did low communication apprehensives, a finding at odds with that of Booth-Butterfield and Booth-Butterfield (1986). In his 1982 review, McCroskey (1982a) had claimed that, whilst the behaviour of high and low CA's would differ with respect to avoidance and withdrawal, it would not differ with respect to disrupted communication and overcommunication. People with low CA would display similar levels of communication disruption and overcommunication to high apprehensives, but for different reasons. For instance, communication disruptions may arise from "pushing too hard" (McCroskey, 1982a, p.165) rather than from anxiety. Whilst this may be correct, acceptance of this proposition would at best lead to the prediction of inconsistent findings, such as those of Ayers and Suek (1987) and Booth-Butterfield and Booth-Butterfield (1986), and at worst would render this aspect of the theory of CA untestable and unfalsifiable.

Enjoyment of Communication:
Self-reports of behaviour (Cell 5)

Several studies document CA as a predictor of state anxiety during communication. For instance, Beatty and Andriate (1985), Beatty and Behnke (1980), Behnke and

Beatty (1981), Booth-Butterfield (1986), and McCroskey
and Beatty (1984) all showed relationships between CA and
anxiety experienced during public speaking. McCroskey and
Beatty (1984) and Richmond (1978) showed relationships
between CA and anxiety experienced during interpersonal
encounters. Biggers and Masterson (1984) found that high
apprehensives reported less pleasure in communication
situations than did low apprehensives. Rubin and Rubin
(1989) found that CA was negatively related to scores on
a measure of communication satisfaction.

Enjoyment of Communication: Cells 6, 7 and 8

There are very few studies which explore enjoyment of
communication other than those using self-report
measures.

Desire to change Communication: Cells 9, 10, 11 & 12

There appear to be no studies appear which have asked
high communication apprehensive if they wish to change
their communicative style, and if so, in what ways, and
which have compared the replies of high and low
apprehensives. Nor are there any studies which use other
kinds of evidence to explore this question.

Communicative Competence: Cells 13, 14, 15 and 16

McCroskey (1982a) distinguished between communication
competence and communication skill. Communication
competence is within the cognitive domain, whilst
communication skill lies within the psychomotor
(performance) domain. Communication competence, following
Larson, Backlund, Redmond and Barbour (1978), is defined
as "the ability of an individual to demonstrate knowledge
of the appropriate communicative behaviour in a given
situation". Communication skill, on the other hand, is

the ability of the individual to perform those
appropriate communicative behaviours in a given
situation.

Most of the work investigating the relation of CA to
communication competence relies upon either self-report
or other-reports. For instance, Cegala (1981) suggested
that high apprehensives are likely to exhibit low
interaction involvement and that others would therefore
see them as being less competent. Wheeless and Duran
(1982) found that communicative adaptability was related
to low CA. A number of studies show that high
apprehensives, when compared with their low apprehensive
counterparts, consider themselves to be less competent,
less confident and less well understood in communication
settings (Freimuth, 1976; Prisbell, 1982).

Downs (1986) examined the relationship between PRCA-24
scores and scores on the Interaction Involvement Scale
(Cegala, Savage, Brunner and Conrad, 1982). The IIS
assesses three cognitive dimensions of communicative
competence (Attention, Responsiveness and Perception),
and is best considered as a measure of self-reported
cognitive communicative competence (Spitzberg and Cupach,
1989). CA correlated significantly with all three
dimensions, and a canonical correlation of -0.73 between
PRCA-24 scores and the IIS dimensions. Downs (1986)
suggested that these results were consistent with a model
in which self-perceived competence impacts, but is not
the only determinant, of CA. In turn, anxiety about
communication impacts willingness to communicate, but is
not the only determinant of this predisposition. It
should be noted that the relationships may also operate
transitively, that is, anxiety may impact self-perceived
communicative competence ("If I were competent, I
wouldn't be feeling this anxious, therefore I must be
incompetent..").

Personality correlates of traitlike Communication Apprehension

In addition to communication-related characteristics, other correlates of CA have also been researched. Several studies have used multidimensional inventories of personality, seeking to describe the overall personality of high CA's. McCroskey, Daly and Sorenson (1976) compared CA scores with scores on Cattell's Sixteen Personality Factor Questionnaire (16PF). They found that CA was inversely related to self-control, adventurousness, surgency, emotional maturity, cyclothmia, dominance, and confidence. There was no relationship with sophistication, self-sufficiency, sensitivity, eccentricity or radicalism. Butler (1986) extended this research, and found that highly apprehensive subjects, when compared to their low apprehensive counterparts, were characterised by emotional instability, restraint, submissiveness, timidity, low self-assurance, and tension.

Other studies have focussed on the relationship between CA and specific aspects of personality.

General Anxiety: Moderate positive correlations have been reported between CA and general anxiety (Beatty, 1986; Beatty and Andriate, 1985; McCroskey, Daly and Sorenson, 1976; Porter, 1979) ranging from 0.39 to 0.66. McCroskey and Beatty (1984) found significant correlations between CA and Spielberger's State-Trait Anxiety measure (Speilberger, Gorsuch and Lushene, 1970), supporting the notion that trait CA is an accumulation of state anxiety experiences, and that anxiety about communication is a contributor to general anxiety.

Beatty (1986) examined the causal relation between CA and general anxiety using a cross-lagged panel design. Variations in CA scores had a significant effect on subsequent levels of general anxiety ($r=0.32$, $p<0.05$),

but general anxiety had no such effect on CA (r=0.07, nsd). These results are consistent with the inductive view of general and specific anxiety, that is, that general anxiety is a summary of specific trait anxieties (Zuckerman, 1976), and that specific traits are in turn a summary of specific experiences (Mischel, 1973). In this model, general anxiety is an operationalisation of, and a consequence of, variations in specific trait anxieties. That is, variations in specific trait anxieties will cause variations in measured generalised anxiety, but variations in generalised anxiety have no implications for variations in any specific trait anxiety. In the earlier, deductive view of anxiety (eg Taylor, 1953), anxiety was seen to function as an intra-psychic cause of negative reactions to threat across all situations, and hence fluctuations in generalised anxiety would have been seen as a cause of fluctuations in more specific anxieties, such as CA. Biggers and Masterson (1984) suggested that CA is centrally related to specific emotional responses to oral communication situations. Rubin and Rubin (1989) note that CA may influence the ability to effect positive outcomes when communicating, and the most important outcome is taken to be communication satisfaction . Indeed, internal comfort/discomfort is now the only outcome of CA expected to be universal across persons and situations (McCroskey, 1982a). This issue is explored in greater depth later in this chapter.

Introversion-Extroversion: The definition of extroversion-introversion (Eysenck, 1970; 1971) is communication oriented. Introverts tend to be introspective and inner-directed. They are less dependent on other people's evaluations, and tend to be less sociable than extroverts, with the introverted individual feeling little or no need to communicate, and placing little value upon communication. Introverts are often characterised as quiet and withdrawn. Whilst verbal activity and extroversion-introversion should therefore

be related, this relationship would be because of lack of need rather than anxiety. Thus, no significant correlation would be predicted between CA and introversion-extroversion. However, both Huntley (1969) and McCroskey and McCroskey (1986a) found significant correlations (r=0.33) between introversion and CA.

Self-esteem: A person's self-esteem is that person's evaluation of their own worth. One component of this evaluation is likely to be their opinion of their ability as a communicator. A person with low self-esteem may be expected to hold a low opinion of their ability as a communicator, and may therefore expect other people to react negatively to them as interlocutors. They may therefore be expected to be anxious about communication. Daly and Stafford (1984) note that an inverse relationship is found between both global and specific aspects of self-esteem and social-communicative anxiety. This relationship is quite strong. McCroskey, Daly, Richmond and Falcione (1977) found significant correlations between self-esteem and CA, and Duran (1983) found links amongst social composure, self-esteem and CA. McCroskey and McCroskey (1986a) reported a correlation of r=-0.45 between CA and self esteem. (It should be noted that many of the commonly used measures of self-esteem include items which appear to index anxiety about communication, and therefore there is some overlap of the measuring instruments used to test this relationship.)

Assertiveness: Kearney and McCroskey (1980) found that high apprehensives considered themselves to be less assertive than other people. Deffenbacher and Payne (1978) found that CA was associated with low ability to be assertive in social situations, as well as fear of negative evaluation by others. Soares (1984) argued that the relationship between high CA and low assertiveness was such that they could best be considered as part of a larger construct he termed "communication confidence".

Significance of Personality Profiles

McCroskey (1982c) summarised this research by suggesting that the high CA tends to experience high levels of general anxiety, to be introverted, to lack emotional maturity and self-control, and to have low self-esteem and to be unassertive.

McCroskey (1982a) argued that much of the research concerning the correlates of CA has been subject to over, if not actual mis-interpretation. He noted that relationships observed in aggregate data should be extrapolated with considerable caution to individual cases. He also argued that the "the only effect of CA that is predicted to be universal across both individuals and types of CA is an internally experienced feeling of discomfort" (McCroskey, 1982a, p.163) According to McCroskey, CA should be viewed from a cognitive rather than a behavioural perspective, and whilst CA may have some behavioural implications, its most important impact is internal. Thus, according to McCroskey (1982a), the only potentially valid indicator of CA is an individual's self-report of their experience. (Note that McCroskey uses the term "cognitive" to refer to the distinction between behaviourist and non-behaviourist (ie cognitivist) approaches to psychology, and is not using "cognitive" as simply referring to learning or information processing. That is, "cognitive" is not used in contrast to "affective", and in fact includes affective responses.)

Cross-Cultural studies of communication apprehension

The CA concept was developed within the US context, and the vast majority of empirical research has been conducted within the US. It is therefore important to examine the extent to which the construct is generalisable to other cultures, both in terms of

specific comparisons, for instance, of the distribution
of CA as a function of, say, age and sex, and also in
terms of the underlying dynamics, as indexed, for
instance, by an examination of the correlates of high CA
scores.

McCroskey (1982a) suggests that the American culture
places a relatively high value upon communication, and
upon the skilled communicator. However, whilst some
cultures place a lower value on communication (eg some
Asian and African cultures), in general, all cultures
place a relatively high value upon communication. Within
the American culture, high levels of communication
activity, and communication competence, are associated
with a variety of positive perceptions of the speaker,
whilst reduced communication activity is associated with
less positive perceptions (Hayes and Meltzer, 1972;
McCroskey and Richmond, 1976). This relationship holds
across a wide variety of cultures. For instance, Hayes
and Meltzer (1972) showed that this relationship held
within the Mexican, Chilean and British cultures.

A limited number of empirical studies have reported
cross-cultural comparisons of the distribution of CA
scores. Hansford and Hattie (1979) found no significant
differences between US and Australian samples in CA
levels, and confirmatory factor analysis indicated that
the structure of the CA measure was the same in both
cultures. Klopf and Cambra (1979) reported little or no
difference between Australian and US norms, but higher
norms amongst Hawaiian Americans and a Japanese sample,
and lower norms amongst Koreans. In later reports, no
significant differences were found between US and
mainland Chinese norms (Klopf and Cambra, 1980).

McCroskey (1982a) notes that CA research has been
reported from Australia, Canada, China, Guam, Korea and
Japan. He also noted that research was underway in
Finland, West Germany, India, Puerto Rico, the Soviet

Union and South Africa. In general, however, there has been a lack of empirical cross-cultural data. In particular, it should be noted that no published studies have reported normative data for UK samples, although an unpublished study of 147 UK undergraduates by Harris (personal communication, 1990) gave a mean of 62.10 (sd=14.54) for the PRCA-24.

Causes of Communication Apprehension

Whilst there is no definitive list of causative factors and/or developmental correlates, and a surprising absence of empirical research, a number of mechanisms have repeatedly been suggested as related to the development of differing levels of CA. According to Daly and Stafford (1984) they are:

> 1: genetic predispositions
> 2: reinforcement
> 3: skill acquisition
> and 4: modelling.

Most writers on CA suggest that, whilst susceptibility to anxiety has an inherited component, the role of this in the overall development of an individual's level of CA is probably minimal. The other three factors are probably much more important.

The most common explanation for differences in levels of CA is the history of reinforcement an individual has received for the communication attempts they have made. Based on general learning models, it is predicted that a history of unsuccessful (but not necessarily traumatic) experiences will lead both to the internalisation of these negative expectancies and to the avoidance of the situations which have brought them about. A history of unsuccessful experiences can arise from a number of causes, such as an inadequate knowledge of social rules,

a lack of necessary skills, and a mismatch between the individual's skills and the characteristics of the medium of communication. McCroskey (1982a) suggested that, in addition to people holding negative expectancies due to a history of negative experiences (a strict reinforcement model), they may have experienced apparently random responses to their communication attempts, resulting, over time in a sense of helplessness (Seligman, 1975), and this will lead them to avoid communication.

A third explanation is the failure to develop adequate communication skills. This explanation points to the relation between social anxiety and poorer social and communicative skills, and between popularity and enhanced skills (Van Kleeck and Daly, 1982). Inadequate skills then lead to negative experiences and expectations.

A final explanation emphasises the importance of imitation of role models for the direct learning of anxiety. That is, children not only imitate their parents' communicative styles, and thereby learn inadequate communication skills, but they may also adopt their parents' low expectations vis-a-vis communication outcomes, and their parents' anxiety concerning communication.

No single explanation provides a complete account of the development of CA, and each explanation overlaps the others. However, these mechanisms have important implications, for instance, for the planning of intervention programmes designed to alleviate high CA. The lack of an adequate developmental explanation of CA obviously applies to the sub-category of CA central to this thesis, namely telephone apprehension. It should also be noted that this lack of explanation also applies more generally, in that no adequate model of the mechanisms underlying CA has been proposed by McCroskey or his colleagues.

The Reconceptualisation of Communication Apprehension

In two recent and important reviews, McCroskey (1982a, 1984) proposed a reconceptualisation of CA in terms of a continuum of more-or-less traitlike versus more-or-less statelike conditions. This reconceptualisation has important implications for the conceptualisation of telephone apprehension vis-a-vis CA. McCroskey has proposed a four-point continuum:

    1: CA as a trait
    2: CA in a generalised context
    3: CA with a given audience across situations
    4: CA with a given individual or group in a given situation

McCroskey (1984) states that "this continuum can be viewed as ranging from the extreme trait pole to the extreme state pole, although neither the pure trait nor pure state probably exists as a meaningful consideration" (p15-16).

Traitlike Communication Apprehension

McCroskey defines traitlike CA as "a relatively enduring, personality-type orientation toward a given mode of communication across a wide variety of contexts" (McCroskey, 1984, p16). (As noted, in practice discussions of CA tend to limit themselves to consideration of people talking in face-to-face situations.) Richmond and McCroskey (1985) suggest that some 20 percent of the population (of the USA) experience high traitlike CA.

Implicit in this definition is the proposition that traitlike CA is consistent over time, that is, across occasions. McCroskey explicitly notes that traitlike CA "cuts across context, receiver and time" (McCroskey,

1982a, p.150). Traitlike CA implies that, in cases of very high or very low CA, the level of CA experienced will be independent of the specifics of the situation. In the case of individuals with moderate CA, their response will vary, and will be dependent on the specific features of any given situation.

According to McCroskey (1982a) the most common measures of CA, such as the original PRCA-20, are measures of a general predisposition or trait. The vast majority of research, and particularly the earlier research conducted during the 1970's and early 1980's, studied traitlike CA,

Generalised-Context Communication Apprehension

Generalised-context CA, or Context-based CA is seen as "a relatively enduring, personality-type orientation toward communication in a given type of context" (McCroskey, 1984, p16). McCroskey notes that this type of CA "relates to generalised types of situations" (Richmond and McCroskey, 1985). Context-based CA is that which is associated with "a single type of communication context cutting across receiver and time (McCroskey, 1984, p19). Within this conceptualisation, telephone apprehension can be seen as one kind of generalised-context CA, with variations in telephone apprehension contributing to variations in overall traitlike CA.

The forms of context-based CA most commonly discussed in the literature are stage fright and public speaking anxiety. McCroskey suggests that "... while only (sic) 20% of the population experience high traitlike communication apprehension, estimates run as high as 80% of the population for generalised-context communication apprehension - over 70% for the public speaking context alone" (Richmond and McCroskey, 1985). Thus, the vast majority of the population will experience high levels of CA in at least one generalised communication context. A

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report by Bruskin and Associates (1973), cited in Lewis and Reinsch (1982), indicated that the most common fear of Americans was the generalised-context apprehension of speaking before a group. Similarly, as will be noted in Chapter Four, fear of the telephone appears to be widespread.

In the original statement of the revised formulation of CA, it is not clearly specified what the expected relationship between degrees of CA of different kinds within a level, such as generalised-context, is thought to be. A number of different models exist; essentially uncorrelated (second-order factors), ordered in some fashion, or essentially uni-factorial, displaying moderate to high levels of correlation. Similarly, it is not clear what the exact relationship is expected to be between lower and higher levels, such as between lower-order generalised-context apprehension and higher-order traitlike apprehension. In his original presentation of this revised formulation, McCroskey suggests that, "It should not be surprising, ... to find moderate to moderately high correlations between the two types of measures. To the extent that a traitlike orientation towards communication actually exists, an appropriate measure of that orientation should be at least somewhat predictive of orientations within generalised contexts." (McCroskey, 1982a, p148). This statement suggests that McCroskey misunderstood the inductive conceptual relationship between different types of CA. Simply as a function of subsuming generalised-context CA within traitlike CA, and the dependence of the latter on the former in measurement schemes, it would be expected that the two would be correlated. The correlation exists because of the measurement dependence between the two types of CA, with traitlike CA being a summary of a series of generalised-context CAs. Another way of expressing this relationship is that it would be expected that generalised-context CA would be somewhat predictive of traitlike CA, but not the other way around.

Levine and McCroskey (1990) examined each of the models specified above, and found that the second-order factor model gave the best fit to the data available.

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see figure C02F01
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This second-order factor model is consistent with the inductive conceptualisation of state-trait relationships outlined by Zuckerman (1976). According to this model a personality construct can be considered a trait to the extent that the stimuli evoking the response are clearly specified, and that the person refers to several previous experiences when describing their response. The model predicts that any specific trait measure should correlate, at least moderately, with other trait measures of the same construct, and correlate to a low degree with individual state responses to the same referent stimulus. The trait measure should, however, correlate moderately with the mean of individual state responses. Trait measures should also have high internal and test-retest reliabilities.

Audience-based Communication Apprehension

Audience-based, or Person-Group, CA refers to a person's reactions to communicating with a given individual or group of individuals across time (on a number of occasions). McCroskey defines audience-based CA as "a relatively enduring orientation toward communication with a given person or group of people" (McCroskey, 1984, p.17). It is associated with "a single receiver or group of receivers cutting across context and time" (McCroskey, 1984, p.19). Richmond and McCroskey (1985) suggest that almost 95% of people will report having high CA with respect to some person or group.

SECOND   ORDER
FACTOR   MODEL

(After Levine and McCroskey 1990)

COMMUNICATION
APPREHENSION

DYADIC
COMMUNICATION
APPREHENSION
→ Situation D1
....
→ Situation Dn

GROUP
COMMUNICATION
APPREHENSION
→ Situation G1
....
→ Situation Gn

MEETING
COMMUNICATION
APPREHENSION
→ Situation M1
....
→ Situation Mn

PUBLIC   SPEAKING
COMMUNICATION
APPREHENSION
→ Situation P1
....
→ Situation Pn
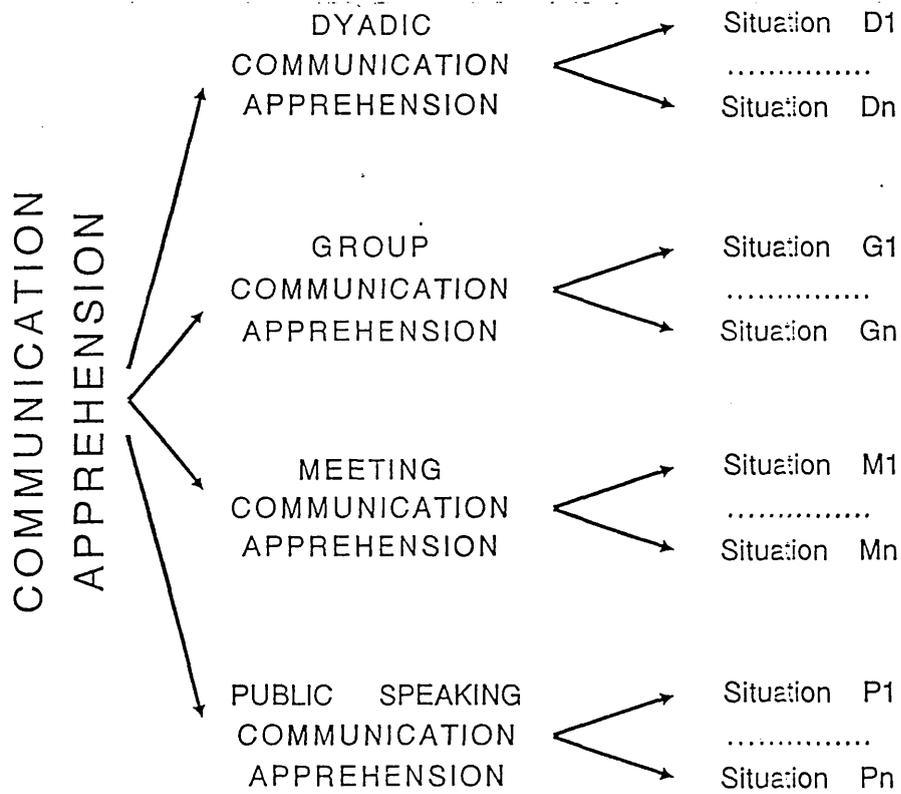
McCroskey proposed that for any given person or group, the relationship between traitlike CA and person-group CA is likely to be a function of the person's familiarity with that person or group. In the early stages of a relationship, the level of apprehension experienced is likely to reflect generalised, traitlike levels of CA. As the relationship develops, the person's response to the other is likely to become more differentiated, and to become more dependent upon the specific situational constraints created by the other person or group. Richmond (1978) demonstrated that, whilst in the early stages of a relationship generalised personality orientations were somewhat predictive of experienced CA, in the later stages of a relationship, situational constraints became more predictive. Presumeably, this pattern of findings should also apply to the use of the telephone, although this has not specifically been studied.

Situational Communication Apprehension

Situational CA is viewed as a transitory orientation toward communication with a given person or group of person on a particular occassion. It is the most statelike of the types of CA identified by McCroskey. It is not seen as personality-based, but as a response to the situational constraints generated by the other person or group. Situational CA is expected to fluctuate widely as a function of the changing constraints introduced by the other person or people. Situational CA has received little research attention (McCroskey, 1982c).

Tests of the Reconceptualisation of Communication Apprehension

In addition to the Levine and McCroskey (1990) study noted above, several empirical tests of this

reconceptualisation have now been reported. McCroskey, Richmond and Davis (1986) tested the proposition that a measure of traitlike CA will be decreasingly predictive of other types of CA as the other type approaches the situational end of the continuum. They tested one of the linkages within the proposed continuum, namely the link between traitlike CA and audience-based CA. The results indicated that traitlike CA was a significant predictor of audience-based CA, but that aspects of the situational context were much more predictive of audience-based CA than were traitlike dispositions.

Booth-Butterfield and Gould (1986) reported a study which focused on the relationship between context-CA and state-CA. In two separate studies they demonstrated that, on average, 50% of the variance in state CA was explained by one, and occasionally two, context CA scores. They argued that the results overall provided strong support for the construct validity of McCroskey's reconceptualisation.

Booth-Butterfield and Booth-Butterfield (1986) investigated the influence of trait CA upon state CA. Other predictors examined were reticence, task structure and evaluation level. Trait CA accounted for 31% of the 49% explained variance in the model, and was by far the greatest single predictor. Reticence was also a significant additional predictor, both alone and in interaction with evaluation level, accounting for some 5% of the variance. Task structure and evaluation levels did not contribute significantly to the prediction of state CA.

A Critique of Communication Apprehension

Whilst the reconceptualisation offered by McCroskey (1982a) represents a significant broadening of the original concept of CA, and introduces a number of useful distinctions, it is both confusing and inconsistent in a

number of respects. It is important to look closely at these inconsistencies because of the implications they have for the conceptualisation of telephone apprehension.

Anxiety as Problematic

Fundamental to the concept of CA is the proposition that anxiety is problematic. Anxiety is seen to be an unpleasant and unwanted emotional response to communication situations, leading to avoidance and withdrawal, and if this is not possible, to interference with, and deterioration of performance. It is unnecessary, and reduction or removal of anxiety will lead to enhanced performance.

A number of qualifications of this view should be considered. The first is to note that anxiety is an intrinsic and perhaps necessary part of human existence. This is recognised by McCroskey and his colleagues in their discussions of CA. However, whilst it is true that, for instance, McCroskey (1982a) explicitly comments on the pathological nature of very low CA scores, this acknowledgement does not appear to be matched by practice. There appear to be no published studies in which low communicative apprehension scores have been treated as abnormal or pathological. It would be expected that studies of CA would include three groups of subjects: high, medium and low communication apprehensives, with both the high and low groups being compared against the "normal" medium CA's. Instead, high apprehensives are usually contrasted with low apprehensives, with low apprehensives being treated as the "normal" and evaluatively positive group. Similarly, treatment programmes are not normally designed and implemented for low communication apprehensives.

The second qualification is that there is little evidence that the removal or reduction of anxiety in and of itself will improve performance. As Stewart (1968) notes, in the

context of public speaking performances, there seems to be no clear relationship between anxiety and performance, except that some arousal or anxiety appears to be necessary for effective performance.

The third qualification is that subjects who have successfully completed programmes designed to deal with high CA do not report reduced anxiety levels (Metzger, 1974; Oerkvitz, 1975). Rather, they report changed perceptions of the significance of the anxiety associated with communication, seeing it as a necessary and non-impairing part of the process.

The fourth qualification is to note the extensive research which shows that avoidance behaviour is not controlled by anticipatory fear (Bandura, 1986a; Bolles, 1975; Betz and Hackett, 1986; Hernstein, 1969; Leland, 1983; McAuley, 1985; Schwartz, 1978, Williams, Dooseman, and Kleifield, 1984; Williams, Kinney, and Falbo, 1989; Williams, Turner, and Peer, 1985). Rather, avoidance is a function of other factors, such as low self-perceived efficacy expectancies (Bandura, 1989).

The Problem of Pathological Scores

The CA literature assumes that both very high and very low CA is pathological, although as just noted, this is not translated into practice. McCroskey equates "pathological" with extremes of response (see McCroskey, 1982a, p.151). However, he discusses extreme responses in terms of the frequency, rather than the magnitude of response. He suggests, for instance, that a person who never experienced CA would be seen as "evidencing pathological behaviour", since "fear is a natural human response to a truly threatening situation". In a later discussion of pathological CA he seems to equate pathological with inappropriate, and suggests that pathologically high CA occurs when "the person won't talk when they should" and low levels when the person "talks

when they shouldn't" (Richmond and McCroskey, 1985, p.40).

Within the CA literature, pathological is defined in both conceptual and in empirical terms. Conceptually, McCroskey views abnormal or pathological levels of CA as those which are "nonadaptive, nonresponsive, or nonfunctional" (McCroskey, 1982a, p.151). He suggests the following formulation:

"Experiencing fear or anxiety in a threatening situation and adapting by withdrawing or avoiding the threatening situation is normal. Experiencing no fear or anxiety in a nonthreatening environment and continuing to function in that environment is normal. The reverse responses are abnormal. Experiencing low communication apprehension in the face of real danger and experiencing high communication apprehension when no real danger is present are both abnormal responses. If such responses become characteristic of the individual, the individual may be regarded as pathological..." (McCroskey, 1982a, p.151)

McCroskey notes the extent to which the judgment "pathological" is one of degree, and suggests that if abnormal responses occur in only one or a small number of circumstances, then this should not generate a judgment that the person experiences pathological levels of CA. "Only when such behaviour is a consistent pattern of the individual would such a judgment seem warranted". (McCroskey, 1982a, p.151)

Thus, McCroskey equates pathological with abnormal, but it is not clear whether abnormal refers to responses which are extreme in magnitude as well as frequency, and he also appears to assume that all such extreme responses are likely to be unusual and inappropriate. It is clear that McCroskey sees withdrawal or avoidance as appropriate responses to fear or anxiety producing situations, and proposes that withdrawal or avoidance are normal responses (in both the "usual" and "appropriate" senses of the term) to such affective states.

McCroskey is also clear that the use of the term "pathological" should not be restricted to just one end of the CA continuum. "Extremely low communication apprehension can be just as abnormal as extremely high communication apprehension" (McCroskey, 1982a, p.151). This seems to imply that the concept is bi-polar rather than uni-polar, with the ability to respond appropriately, e.g. to choose whether or not to talk, being a non-linear function of CA. A truely uni-polar scale would imply that the ability to respond appropriately, e.g. to choose whether or not to talk, would be a linear function of CA, with decreasing levels of CA being associated with increasingly appropriate communicative behaviours. These alternative conceptualisations have quite different implications for the relationship of CA to other variables such as communication competence, willingness to communicate, and communication satisfaction. They also have clear implications for the conceptualisation and operationalisation of telephone apprehension.

When discussing the empirical treatment of pathological levels of CA, McCroskey (1982c) endorses the procedure adopted in most of the CA literature, namely, that scores one standard deviation or more above the mean are identified as "high communication apprehensives", whilst scores one standard deviation or more below the mean are identified as "low communication apprehensives". Most commonly used CA measures approximate to a normal distribution. Thus, some 68% of scores fall within ± 1 standard deviation, with some 16% of the scores being classified as high and 16% being classified as low CA scores. Such a procedure means that comparisons across samples are relatively meaningless, if not impossible. This procedure also implies a very broad use of the term "pathological".

The Problem of Communication Modes

Whilst McCroskey's definition of traitlike CA appears to include a wide variety of contexts, it does so with respect to only a single mode of communication, that being the channel-like one of "oral communication" (which is in fact face-to-face oral communication, and appears to exclude the telephone). Logically, the most general, traitlike definition of CA should include a variety of both contexts and modes of communication. McCroskey (1982a) discusses this issue but does not appear to offer a satisfactory resolution. He notes that the original definition of CA clearly focused upon oral communication, and that the original PRCA-20 was a measure of apprehension in oral communication situations. He also notes that research investigating other modes of communication, such as writing (Daly and Miller, 1975) and singing (Andersen, Andersen and Garrison, 1978) demonstrated only low correlations between oral CA and apprehension in other modes.

The revised conceptualisation of traitlike CA permits apprehension about talking, writing, or singing (and presumeably the telephone) to be encompassed. However, as of 1982, no suitable measure of this enhanced view of traitlike CA existed and McCroskey argues that "While generation of a general communication apprehension instrument would probably be possible, efforts in that direction might not be particularly useful." (McCroskey, 1982a, p138)

Referring to the research instruments used to investigate apprehension in writing and singing, and their low correlations with the measure of oral CA, McCroskey suggests:

"The research .... clearly indicates the multidimensional nature of the general construct. Thus dimension scores of the new instrument would be the product of major concern. Since measures of those dimensions already exist, little would be gained by generating additional ones. If a unidimensional measure could be generated, it would, of

necessity, have to be composed of items so general as to make the likelihood almost certain that the ultimate measure would be nothing more than a new general anxiety measure." (McCroskey, 1982a, p138)

There are several problems with this argument. A generalised measure of traitlike CA can, and should, be constructed by including items which explicitly sample all modes of communication, rather than by creating non-specific (and hence ambiguous) items. Such a measure would not, and should not, be conceptually equivalent to a measure of general anxiety, for it would explicitly limit itself to apprehension related to communication, whereas measures of general anxiety would also include anxiety associated with other, non-communicative situations. The most problematic element in this argument is however, that the revised PRCA-24, which is presented as a measure of traitlike CA, and which is used in this way in a number of studies testing this reconceptualisation, is, in terms of McCroskey's own definition, not a measure of traitlike CA at all. Rather, it is a measure of "generalised-context CA". McCroskey himself notes that "current instruments labelled as CA measures are restricted to oral CA, specifically apprehension about talking to or with others" (McCroskey, 1982a, p138).
A measure of telephone apprehension would be a measure of the generalised-context CA associated with mediated oral communication, and would be one element in a measure of traitlike CA, alongside current measures of CA in oral face-to-face communication (such as the PRCA-24), writing apprehension, etc.

The Problem of the Conceptual Continuum

The treatment of audience-based CA, and its differentiation from context-based CA, is confused and unsystematic. In defining audience-based CA McCroskey appears both to define it in terms of constancy over time, and to suggest that length of acquaintance (ie

time) is a correlate of audience-based CA levels. For instance, in Richmond and McCroskey (1985, p37) he notes that audience-based CA is "produced by the situational constraints more than by the personality of the individual. Hence, length of acquaintance should be considered here." At the beginning of many relationships the nature of the relationship will change rapidly and hence the associated levels of audience-based CA will also change rapidly. Indeed, as already noted, Richmond (1978) found that while stable orientations such as personality characteristics and traitlike CA were predictive of CA levels early in relationships, in later stages of the acquaintance the specific situational constraints were better predictors of the level of CA experienced. It would appear therefore that rather than defining audience-based CA in terms of the identity of a given individual or group, it would be better to define it in terms of the relationship with that identified individual or group.

There is a more general problem with the distinction between audience-based and context-based CA. The distinction, and the specification of the relationship, between audience-based and context-based CA does not appear to draw upon other, more systematic, analyses of communication situations. McCroskey (1982a) proposed that state, audience, context and trait levels of analysis form a continuum. In such a scheme, the progression from state to audience to context to trait would be an orderly progression of increasing generality.

```
State  State  State  State  State  State  State  State
  A1     A2     B1     B2     C1     C2     D1     D2
  └──┬──┘       └──┬──┘       └──┬──┘       └──┬──┘
     │             │             │             │
 Audience-A    Audience-B    Audience-C    Audience-D
     └──────┬──────┘             └──────┬──────┘
            │                           │
        Context-X                   Context-Y
            └─────────────┬─────────────┘
                          │
                        Trait
```

60
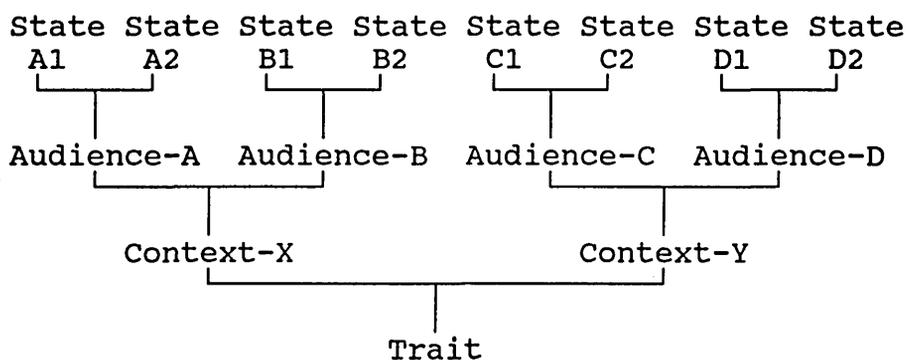
Yet analyses of the components of communicative and interactive situations, such as that suggested by Fraser and Brown (1979), have argued for a multi-level, hierarchical analysis. Such analyses show that the factors on which McCroskey focuses (audience and context) are only two of a larger number of factors which constitute the components of a communication situation, and these are not ordered in the way McCroskey assumes. The analysis suggested by Brown and Fraser (1979) is far more subtle, as illustrated:

```
┌─────────────────────────────────┐
│         See Figure C02F02        │
└─────────────────────────────────┘
```

Even this detailed analysis is incomplete. For instance, with respect to "interpersonal relations", Wish, Deutsch and Kaplan (1976) suggest that the most important dimensions of relationships within an interaction are:

Dimension 1: Co-operative vs. Competitive
Dimension 2: Equal vs. Unequal
Dimension 3: Intense vs. Superficial
Dimension 4: Socio-emotional vs. Task-oriented

However, it can be seen that within the analysis offered by Brown and Fraser (1979), "scene" and "participants" (which are synonymous with "context" and "audience" in McCroskey's scheme) are at equivalent levels of analysis. That is, rather than "context-based" and "audience-based" being points along a continuum, as McCroskey proposes, they are at equivalent points on the continuum, with the progression being not one of monotonically increasing generality as the analysis moves from state to trait, but bifurcated:

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Situation

Scene　　　　　　　　　　Participants

Setting　　　　　Purpose

Locale Time Bystanders

Activity　　Subject
Type　　　　Matter

Goals,　　　Task,
Activated　 Topic
Roles

Individual　　　　Relationships
Participants　　　　between
　　　　　　　　　　Participants

Individual　　　　　Individual
qua　　　　　　　　as member of
Individual　　　　　Social Category

Stable　　　　Temporary　　　　Sex, Age,
Features　　　Features　　　　　Class,
　　　　　　　　　　　　　　　　Ethnicity,
　　　　　　　　　　　　　　　　etc

Personality,　Moods,
Interests,　　 Emotions,
Appearance,　　Attitudes,
etc　　　　　　 etc

Interpersonal　　　　Role and
Relations　　　　　　Category
　　　　　　　　　　　Relations

Liking,　　　　　　　Social power,
Knowledge,　　　　　　Social status,
etc　　　　　　　　　　In-group vs
　　　　　　　　　　　 Out-group,
　　　　　　　　　　　 etc

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As an alternative to McCroskey's conceptualisation, consider three possible variables for describing, and distinguishing between, communication situations:

channel/mode (which would include the telephone)
task/topic
relationship between participants

These variables can be positioned within the analysis of situations offered by Brown and Fraser (1979). Within "scene" they distinguish between "setting" and "purpose". Within "setting" the channel or mode of communication would constitute a sub-category of "locale". Within "purpose" they distinguish between "activity type" and "subject matter", with task or topic constituting the sub-categorisation of "subject matter". The relationship between partners would be positioned within "participants", as a sub-category of "relationships between partners". It can be seen that the Brown and Fraser scheme implies that this variable is not adequately specified, in that a further distinction, between "interpersonal relations" and "role/category relations" needs to be made. The three variables can be respecified as follows:

channel/mode
task/topic
role/category relationship between participants

Further variables could be added to this scheme, such as time, interpersonal relationships, etc. Clearly, a complete specification of any given situation would be highly complex, and the specification of even general variables in terms of which situations might be described would involve an extensive set. Each of these variables would need to be at equivalent levels of analysis, (or "specificity", to use the terminology of Fishbein and Ajzen (1975)) and together either define a specific "state" in terms of specific values for each variable, or

define a general "trait" in terms of the summation of values within and across each variable.

In this approach, Dimensional CA could then be defined as referring to apprehension with respect to a given value of a particular variable, summing across all values of all of the other variables. In such a scheme, the progression from state to dimensional to trait would be an orderly progression of increasing generality.

```
State-A1    State-A2          State-B1    State-B2
  └────┬────┘                   └────┬────┘
   Dimension-A                    Dimension-B
       └───────────┬──────────────┘
                 Trait
```
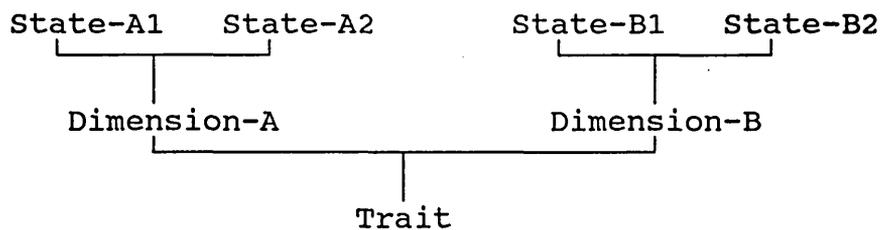
The Problem of Measurement

There are a number of problems created by these confusions for the measurement of CA. Whilst the PRCA-24 samples levels of CA across a number of "generalised contexts" (all of which, however, are oral face-to-face contexts) it does not do so across a number of different audiences/relationships, nor across a number of different topics/tasks. Examination of the PRCA-24 shows that the identity of the audience and the nature of the relationship with them is in general unspecified ("other people"), and where it is specified this is done in terms of "a new acquaintance". In the terms presented above, the PRCA-24 is therefore in reality a measure of dimensional CA, that is, of Stranger CA, with much of the necessary variation across the dimensional matrix being ambiguous and/or poorly specified. A true measure of traitlike CA would specify a number of channels/modes, audiences/relationships, tasks/topics and so on.

COMMUNICATION   APPREHENSION

The Dimensions of
Communication Apprehension

Interactants
/Relationship

Channel
/Mode

Task/Topic

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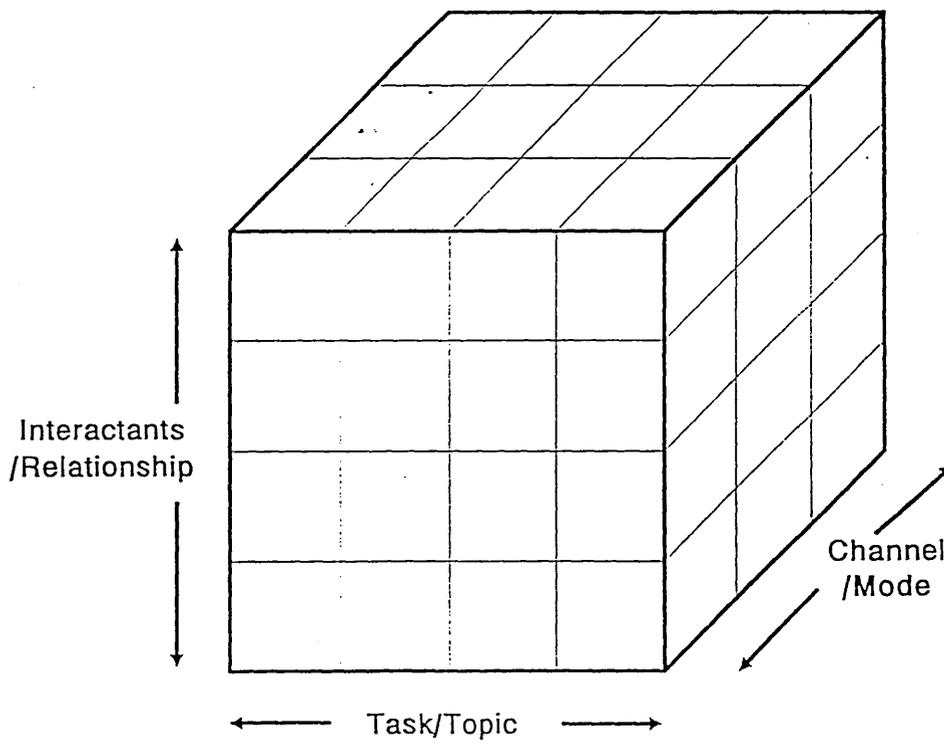
The importance of including other channels/modes in a measure of traitlike CA is indicated by studies of listening apprehension (Wheeless, 1975) and writing apprehension (Daly and Miller, 1975), which show only moderate correlations with oral face-to-face CA. Phillips (1968), in a study of people identified as severely inadequate oral communicators noted that one of their identifying characteristics was that they "preferred to communicate in writing where possible and most had achieved a fairly high level of skill at writing" (Phillips, 1968, p41). A similar point can be made with respect to the difference between speaking and listening, where correlations between measures of CA, which focus on speaking, are shown to have only moderate correlations with measures of listening apprehension (Wheeless, 1975). This point applies in two senses to telephone apprehension. The first is that it may be an alternative channel/mode of communication, bearing the kind of "trade-off" relationship with communication using other channels/modes described by Phillips (1968). Secondly, within telephone apprehension, the difference between speaking and listening may also be presumed to apply, a point explored in Chapter Nine of this thesis.

The Problem of Testing the Reconceptualisation

The empirical tests of the reconceptualisation reported above have a number of conceptual and methodological difficulties. The study by McCroskey, Richmond and Davis (1986) is presented as a test of the proposition that a measure of traitlike CA will be decreasingly predictive of other types of CA as the other type approaches the situational end of the continuum. Such a proposition can only be tested, in a single study, when there is a comparison of the ability of a measure of traitlike CA to predict two different types of CA. If two different types of CA differing in their position with respect to the situational end of the continuum are considered, it is

possible to identify not only a difference in the predictive ability of traitlike CA, but also the direction of difference. If, as in this study, only one other type of CA is included it is not possible to test this prediction.

Booth-Butterfield and Gould (1986) suggest that the construct validity of the reconceptualisation is supported by a study which shows that on average, some 50% of state CA variance can be explained by one <u>and occasionally two</u> context CA scores. It is not clear why combining context CA scores would improve predictions of state CA, and how the proposed reconceptualisation leads to such a procedure. Such a prediction only follows if there are assumed to be conceptually distinct types of context CA, which tap different dimensions of any particular state. This is the conceptualisation proposed here, but is explicitly not offered by McCroskey. Construct validity of McCroskey's (1984) conceptualisation would, instead, be provided by a demonstration that a significant proportion of context CA was explained by a measure of state CA, and that increasing proportions were explained by additional measures of state CA. It seems then, that apart from the Levine and McCroskey (1990) study, no adequate test of the proposed reconceptualisation has yet been published.

<u>Measures of Communication Apprehension</u>

<u>Measures of Traitlike Communication Apprehension</u>

Having examined the conceptual underpinnings of research on CA it is now appropriate to look at measures of CA. Gilkinson (1942) first developed a 104 item measure of Personal Report of Confidence as a (Public) Speaker (PRCS). From this Paul (1966) developed a shorter, 25 item version, which is the version that has been used in almost all subsequent research on public speaking anxiety. The Personal Report of Communication Apprehension (PRCA) published by McCroskey (1970) was

designed to measure apprehension experienced in a wide range of situations, including but not primarily that of public speaking. According to Porter (1981), one or other version of the PRCA has been used in over 80% of the published research on CA.

The original 20-item version of the PRCA (PRCA-20: McCroskey, 1970) was developed to be specifically appropriate for college students. It was claimed to be uni-dimensional, and to possess high inter-item reliability (of the order of 0.90) in most studies. Scott, McCroskey and Sheahan (1978) developed a version of the PRCA specifically for use by adults working in organisations. This was a 20-item scale drawn from a pool of 50 items, and selected on the basis of factor analysis of the items. The PRCA-OF provided greater face validity when researching in organisational settings, and has been widely used with adult samples. It is regarded by the authors as a form of the PRCA rather than as a unique instrument, with results generated from the two scales being considered as interchangeable. (Scott et al, 1978, p109)

Porter (1979, 1981) noted that the PRCA-20 has an over-emphasis on public speaking situations, to the near exclusion of other types of communication settings. For instance, Wheeless and Crouse (1973) used a thirty-item instrument to measure CA. Twenty-two of the items loaded on two separate dimensions of "public speaking" and "interpersonal communication", and they note that their instrument contained more items clearly related to interpersonal contexts of communication than the standard PRCA. Partly in response to this criticism, McCroskey (1976) added five more items to the original PRCA-20, all of which focus on interpersonal contexts (PRCA-25).

Porter (1981) demonstrated that both the original PRCA-20 and the expanded PRCA-25 were primarily measures of anxiety in public speaking situations, and that the

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additional interpersonal items constituted a separate component of the PRCA. He argued that they should not be treated as equivalent items in terms of scale additivity. Porter (1981) therefore proposed a shortened, 13-item form of the PRCA-20 which consisted of just the public speaking focussed items. This scale had high inter-item reliability and greater construct validity than the original PRCA-20, but is a measure of public speaking rather than generalised CA.

In association with the reconceptualisation of the CA concept, McCroskey (1982c) developed a new 24-item measure that includes items assessing CA in four settings: public speaking, dyadic conversation, meetings and classes. This measure provides an overall CA score and four sub-scale scores. McCroskey (1982c) reported the internal validity of the PRCA-24 as 0.94, and total scores on the new form correlated 0.90 or greater with earlier forms. McCroskey (1986) published a (slightly) revised version of the PRCA-24 scale, the PRCA-24B. However, as argued above, whilst the total PRCA-24 score, summed across the four generalised-contexts, is taken by most researchers to be a measure of traitlike CA, it should in fact be considered to be a measure of generalised-context CA, that of oral face-to-face CA.

Measures of Generalised-context Communication Apprehension

The revised conceptualisation of CA requires the operationalisation of all four levels, from trait to state. A number of scales exist to measure generalised-context CA. For instance, with respect to public speaking, Gilkinson's (1942) Personal Report of Confidence as a Speaker (PRCS), and McCroskey's own (1970) Personal Report of Public Speaking Anxiety (PRPSA). Other scales have been developed to measure apprehension in contexts of writing, listening and

singing.

McCroskey and Richmond (1980, 1982) developed a measure
(Communication Apprehension in Generalised Context) of
context-based CA, which provides four separate measures
of CA: in interpersonal conversations, in group
discussions, in meetings, and when speaking in public. As
noted above, it can also be argued that the PRCA measures
should themselves be treated as measures of generalised-
context CA.

However, in neither the Communication Apprehension in
Generalised Contexts measure nor the PRCA-24, is an
adequate definition or description of the contexts given
to the respondent, either in the instructions or within
the scale items. Ambiguity almost certainly exists,
therefore, concerning the specification of the contexts.
For instance, the differences between meetings and group
discussions, between meetings and public speeches, and
between group discussions and conversations are not
specified. These contexts seem to overlap quite
considerably. The overlap exists not only conceptually,
but also in reality. It is difficult to envisage,
assuming that the respondent actively participates in the
situation, a meeting that is not either an interpersonal
conversation or a group discussion or a public speaking
situation. Strohkirch and Parks (1986) noted that the
terms and phrases used to specify the different contexts
within the PRCA-24 are so brief as to be ambiguous and so
broad as to prevent the detection of precise situational
differences. Their results showed that, for instance,
subjects did not generally discriminate between the
discussion and meeting contexts.

McCroskey (1984) suggested that no taxonomy for
generalised-context CA had received consensual acceptance
in the literature, but proposed that the taxonomy based
on types of communication settings, as advanced by
McCroskey and Richmond (1980) and incorporated in the

revised PRCA-24, was adequate. As noted above, widely accepted taxonomies, such as that proposed by Brown and Fraser (1979) are available, and could be applied in the development of measures of CA, although this has not yet happened. It may be that the taxonomy used by McCroskey simply specifies the number of people involved, and simultaneously, specifies increasing formality, from informal conversation through to the formality of a public speech.

```
                                                    Informal
                                                      ││
      conversation      = 2 (one-to-one)              │││
                                                      │││
      group discussion = 3-7                          │││
                                                      │││
      meeting           = 8-12                        │││
                                                      │││
      public speech     = 12+                         │││
                                                      \V/
                                                    Formal
```

However, this continuum is not made explicit, nor is there any explicit mention of channel, such as the use of the telephone or other mediated communication.

Measures of Audience-based Communication Apprehension

Richmond (1978) used a modified version of Spielberger's (1966) measure of state anxiety as a measure of audience-based CA. The most recent measure of audience-based CA is the Situational Communication Apprehension Measure (SCAM) (McCroskey and Richmond 1982). This is 20-item, 7-step scale which allows the specific situation or audience to be specified e.g. "Please complete the following questionnaire about "how you felt the last time you interacted with someone who had a supervisory role over you." (Richmond and McCroskey, 1985, p119). Whilst clearly allowing the audience to be specified, this measure does not appear to conform to the definition of audience-based CA proposed by McCroskey (1982a). That is, it asks subjects to respond in terms of a particular occasion rather than in terms of the same audience across

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a number of different occasions. That is, it is in fact a measure of statelike, and not of audience-based, CA.

Measures of Situational Communication Apprehension

Situational or Statelike CA is a transitory response to the specific demands and constraints of a particular situation. It is "specific to a given context with a given receiver at a given time" (McCroskey, 1984, p.19). McCroskey (1982c) noted that the measurement of situational CA had received little attention, and suggested that the measure of state anxiety (Spielberger, 1966), as modified by Richmond (1978), appeared to be a satisfactory measurement device. Since that date, the SCAM inventory (McCroskey and Richmond, 1982a) has been developed to measure levels of situational CA.

One way of summarising this review of CA measures is to suggest that, despite the 20 years of research in this area, and the enormous number of published studies, at the present time there appears to be no completely satisfactory instrument available for operationalising the concept of communication apprehension, except possibly at the Situational or Statelike level. As Porter (1981) has argued, precisely because of its massive application, the adequacy of the PRCA is of enormous concern. It is clear that the PRCA must be used with caution, and any additional measures, such as those developed for use in the specific context of telephone apprehension must be examined with great care before widespread application.

Areas for Future Examination

This review has demonstrated that at present, and despite an enormous research effort, the study of CA suffers from a number of conceptual and empirical limitations and

confusions. To the extent that telephone apprehension is properly conceptualised as a context-specific, channel-specific sub-category of traitlike CA, an appreciation of both the existing work within CA, and its limitations, must constitute the starting point for research on this topic. In Chapter Four the available research specifically dealing with telephone apprehension will be reviewed. Before this, in Chapter Three, those areas of research such as reticence, shyness and willingness to communicate which are closely related to CA and to telephone apprehension will be examined.

CHAPTER THREE

CONCEPTS RELATED TO COMMUNICATION APPREHENSION

SYNOPSIS

In this chapter concepts related to communication apprehension, and hence to telephone apprehension, were reviewed. These concepts, such as reticence, shyness, and unwillingness to communicate, all involve at least three components: negative affect, behavioural avoidance, and inadequate communication competence. The terms differ conceptually in the emphasis given to these elements. Whilst it has been argued (Kelly, 1982a) that in practice the terms cannot be differentiated, in this chapter, following Leary (1983a), they have been reviewed separately.

Reticence is defined in terms of people who do not, in the opinion of themselves and others, communicate competently. The empirical support for this conceptualisation was reviewed, and problems with this conceptualisation noted. The relation of reticence to telephone apprehension, and the implications of the concept of reticence for the study of telephone apprehension were explored.

The varying definitions of shyness were reviewed, and it was suggested that the distinction between the social anxiety (affective) and social inhibition (behavioural) components of shyness is important, and the proposal that shyness is a psychological syndrome that includes both subjective social anxiety (affect) and inhibited social behaviour, placing equal emphasis on both the internally experienced discomfort and externally observable behaviour, is seen to be the most acceptable definition of shyness. It was noted that men appear to be more shy than women, that the proportion of shy people does not vary greatly across cultures, and that most shy people consider shyness to be a problem.

The unwillingness to communicate concept and scale was an explicit attempt to broaden and integrate the concepts of communication apprehension and reticence. It is concerned simply with the extent to which an individual is unwilling to communicate, without specifying particular causes or affective correlates. The scale was found to consist of two independent factors, measuring affect and behaviour. The willingness to communicate construct, developed as a purely behavioural concept, is derived from the observation that consistent individual differences in behavioural tendencies with regard to frequency and amount of talk have repeatedly been noted in the research literature. The relation of willingness to communicate with communication apprehension, communication behaviour, and self-perceived communication competence were explored, and the implications of research on willingness to communicate for telephone apprehension noted.

CHAPTER THREE

CONCEPTS RELATED TO COMMUNICATION APPREHENSION

INTRODUCTION

In this chapter a number of concepts closely related to CA will be examined, such as reticence, shyness and social anxiety. Concepts which appear to be the converse of the CA concept, such as willingness to communicate are also examined. Finally, the parallel notion of receiver or listening apprehension is examined. The implications of each of these concepts for the study of telephone apprehension are explored.

Constructs related to Communication Apprehension: Same or Different?

In the psychological and communication literatures there are a number of constructs which appear to be very similar to, or are the converse of CA. They include shyness, reticence, unwillingness and willingness to communicate, and predisposition to verbal behaviour. More specific concepts, at the level of generalised context CA, include stage fright and public speaking anxiety, and receiver or listening apprehension. The more general concept of social anxiety is also clearly relevant.

In his 1982 review, McCroskey discusses several constructs related to CA. He notes:

".. the communication apprehension construct is neither the largest nor the smallest of the group. Communication competence, or reticence, seems to be the broadest construct. Unwillingness to Communicate and PVB (Predisposition to Verbal behaviour), seen as parallel but not fully isomorphic constructs, are viewed as constructs purporting to explain parts of what is seen as reticence. Communication apprehension is seen as one of the elements leading to unwillingness to communicate or negative PVB. Stage fright and audience anxiety are seen as representative subconstructs of communication apprehension. Shyness, depending on how the label is employed in a given case, can be employed as an equivalent term for constructs at each of the descending

conceptual levels." (McCroskey, 1982a: p.144)

The most general term appears to be social anxiety.
Whilst social anxiety and CA are distinct concepts, the
two terms are clearly related. In this thesis social
anxiety is taken to be the more general concept,
referring to anxiety associated with all social
situations, including both communicative and non-
communicative social situations. However, given that
social situations typically involve communication, the
degree of overlap is likely to be considerable.

In addition to differences in scope, these terms are also
distinguished in terms of their discipline of use. The
literature on social anxiety is primarily psychological
in origin, whereas the literature on CA is almost
exclusively from communication scholars.

At the same level of specificity (Fishbein and Ajzen,
1975) the terms reticence, shyness and unwillingness to
communicate are used. These concepts all involve at least
three components: negative affect associated with
communication, avoidance of communication and inadequate
communication competence. Each term focuses on one of
these elements as primary, normally by identifying it as
the casual element (Kelly, 1982a). The original
conceptualisation of CA illustrates this; communication
was avoided because of anxiety. Reticence (Phillips,
1968, 1980) is defined in cognitive-affective terms, and
is seen as a characteristic of people who avoid
communication because of inadequate communication skills,
and who also feel anxious because of their inadequacy.
The term shyness is used to refer to a wide range of
behavioural and affective problems, including inadequate
social skills, apprehension about social situations, and
low self-esteem (Zimbardo, Pilkonis and Norwood, 1975),
but is most commonly taken as referring to a combination
of negative affect and behavioural inhibition.
Unwillingness to Communicate (Burgoon, 1976) is defined
in purely behavioural terms, and is characteristic of

people who avoid communication regardless of the cause, and who may or may not feel anxious. In general, definitions in this area are fuzzy and establishing differences and similarities amongst concepts is difficult. Kelly (1982a) noted that the result is confusion over how many distinct problems exist and the extent to which the diversity of labels reflects a real diversity of problems. She argued that in practice the distinctions made do not result in operational differences, and that these concepts should be treated as synonymous. However, Leary (1983a) has argued that the conceptual differences do make a difference, and in the following review of the literature this more conservative approach will be followed. Each of these concepts will be examined separately, and the implications of each for the study of telephone apprehension will be commented upon.

RETICENCE

Originally reticence and CA were virtually the same construct. They both represented an expansion of the earlier concept of stage fright to include other oral communication contexts, and both referred to anxiety about communication or anticipated communication. Phillips defined the reticent person as someone "for whom anxiety about participation in oral communication outweighs his projection of gain from the situation." (Phillips, 1968, p.40)

Phillips (1968) studied a sample of 4500 students and on the basis of this and other questionnaire studies, estimated that at least 5% of the American university population experience a severe and generalised problem with oral communication. Other estimates (Pedersen, 1970) suggest that approximately 25% of the American population can be described in this way.

In addition to the primary definition of reticence noted above, Phillips (1968) elaborated his description of reticence, and confounded self-reported anxiety about communication with the behavioural characteristic of the avoidance of communication, and the cognitive characteristic of communicative incompetence. Phillips suggested that this was a necessary characteristic of the reticence syndrome:

"Mere quietness is not the problem! .. The reticent person .... cannot participate even when he needs to or when he feels strongly enough to want to. He has become a prisoner of his technique of avoidance..". Phillips (1968, p.45)

Sokoloff and Phillips (1976) later acknowledged the problems of definitions using loosely linked multiple criteria. They noted that the original definition of reticence was "an imprecise designation for an aggregate of problems" (Sokoloff and Phillips, 1976, p.331) and that the use of different labels by other investigators had produced considerable confusion.

Phillips (1980) and Sokoloff and Phillips (1976) offered a revised definition of reticence in terms of people who do not communicate competently. That is, reticence is the reverse of communication competence. It involves "ineffective speech performance, normally stemming from incapacity, ineptitude, or ignorance relating to one or more of the rhetorical subprocesses of the speech process and relationship. 'Ineffectiveness' refers to the failure to accomplish common goals for which speech is the normally accepted method of achievement" (Sokoloff and Phillips, 1976, p.332-333). They also distinguish between self and other ratings of incompetence, and insist that an individual's self-perception of incompetence is not sufficient, but it must be confirmed by others (for instance, by an expert judge) that such incompetence exists. Whilst clarifying the centrality of competence to reticence, Sokoloff and Phillips (1976) maintain another

confusion. They equate incompetence with being uncommunicative:

"Reticence ... refers to a choice by an individual to refrain from participation in required or desired communication experiences because he is aware of his own ineptitude." (Sokoloff and Phillips, 1976, p.345)

According to this definition reticence is merely a subset of communication incompetence, and the incompetences of over- and/or inappropriate communication are ignored.

The identification of reticence with interpersonal incompetence is challenged by two studies by Kelly (Kelly, 1982b; Kelly and Copeland, 1983). Kelly (1982b) asked reticent and non-reticent subjects to interact with a confederate, with judges observing these interactions. Judgments were made in terms of fluency, displayed nervousness and speech activity. Judges did not see reticent subjects as less competent than non-reticent participants. Kelly and Copeland (1983) examined the availability and adequacy of the relationships of reticent and non-reticent subjects. Contrary to expectations, reticent subjects reported neither fewer relationships nor less adequate relationships. In fact, reticent subjects identified more close attachment relationships, and reported greater adequacy of these relationships. They also reported more people with whom they had other relationships, and more people who provided relational requirements.

Kelly and Copeland (1983) note that individual differences in reticence may not have a particularly powerful impact on the actual behaviours of those individuals, but may instead have a considerable impact on the individual's perceptions of their behaviours, and on other people's perceptions and judgments of their behaviours and competences, etc. It may be that this is because reticent people do not differ in terms of the formal (ie temporal-structural) characteristics of their communication e.g. how much they talk, hesitations,

interruptions, etc. Instead, they may be different simply
in terms of <u>what</u> they say and <u>how</u> they say it (ie
stylistics), such as using more uncertainty markers, tag
questions, qualifiers, etc. This difference may be
related to the expressed confidence of what they say; in
particular what they say about themselves. Thus, when
judges are asked to focus upon communicative competence
per se, no differences are found. However, when judges
are asked to evaluate the person, then differences do
appear.

Some evidence to support this proposition is available
from the CA research literature. CA's are more negatively
evaluated as job applicants (Daly, Richmond and Leth,
1979; Richmond, 1977) and are less likely to be offered a
job on the basis of an interview (Daly and Leth, 1976).
High CA's are seen as less socially attractive than low
CA's (McCroskey, Daly, Richmond and Cox, 1975; McCroskey
and Richmond, 1976; Richmond, 1978). These negative
judgments may result from speakers using a style
expressing low self-confidence. The impact of such
stylistic devices is documented by studies of persuasive
impact (London, 1973), of powerful-powerless speech
(O'Barr, 1982) and of language intensity (Bradac, Bowers
and Courtwright, 1979)

Thus, reticent individuals may not initially differ in
their formal communication skills, but they may differ in
that they see themselves as unskilled. That is, their
problem is primarily one of unrealistic expectations and
destructive perceptions, and these may then lead to
particular choices and behaviours. This approach to the
understanding of social anxieties and avoidance has been
explored by writers such as Sutton-Simon and Goldfried
(1979), and will be returned to later in this thesis.

Reticent individuals may also differ in their appraisal
of the affective correlates of interaction. Streibel
(1978) noted that both reticents and non-reticents

reported tension when communicating. However, reticents believed that the tension was a significant part of their problem and that they would perform better if they did not feel it. On the other hand, non-reticents, although they found the tension unpleasant, did not feel that it had a significant negative effect on their performance, and did not see its absence as essential to improved performance. Follow-up studies of participants in a programme for reticent students showed that whilst considerable improvements in the ability to communicate was reported, reported levels of communication anxiety had not been reduced. Rather, such tension was no longer seen as an impairment (Metzger, 1974; Oerkvitz, 1975).

Relation of reticence to communication apprehension

McCroskey (1982a) has suggested that reticence represents the broad range of communicative incompetence, with CA representing a subset of that broad construct. CA relates to communicative incompetence stemming from anxiety or fear. (McCroskey, 1982a, p.140). However, it seems more accurate to see the behaviour of avoidance of communication as the most general term, with both reticence and CA being subsets, distinguished in terms of their identification of specific causes for this avoidance. In the case of reticence, avoidance results from self-perceived incompetence, which may then have the additional consequences of both anxiety and incompetence as judged by others. In the case of CA, avoidance is due to anxiety, which then has the additional consequences of both self-perceived and other-perceived incompetence.

Implications of reticence for the study of telephone apprehension

The reticence concept leads to a number of propositions concerning telephone apprehension and use.

1: Self-perceived telephone communication incompetence (telephone reticence) will lead to avoidance of use of the telephone.

2: Self-perceived telephone communication incompetence (telephone reticence) will be associated with high levels of telephone apprehension

3: High telephone reticents will not be perceived as any less competent with respect to telephone communication than people who experience moderate or low levels of telephone reticence.

4: When using the telephone, high and low telephone reticents will not differ significantly in terms of the structural characteristics of communication, such as the amount of time spent communicating, but they will differ in terms of the stylistic characteristics of communication, such as what is said and how it is said.

5: High and low telephone reticents will have different expectations concerning the effectiveness and efficiency of telephone communication. That is, high telephone reticents will see themselves as incompetent because their expectations of what would constitute effective and efficient telephone communication are (unrealistically) high.

SHYNESS

Zimbardo (1977a) acknowledged that shyness "is a fuzzy concept", while McCroskey (1982a) noted that the term does not represent a single construct. Rather, it has been applied to a variety of disparate constructs, and does not seem to have any property that is either

universal, nor that is unique to it and is not referenced by other related constructs. Further, there is a tendency to define shyness in terms of multiple elements. Some definitions emphasise the internal discomfort experienced by the shy person (eg Zimbardo, 1977b), others focus upon the observable behaviours of the shy person (eg avoidance of interaction), others identify shyness as inappropriate interaction (ie inadequate competence), and some see shyness as the combination of some or all of these elements. Many definitions also include, or imply, a specification of one or more possible causes of shyness. The definitions offered demonstrate the varying emphasis on behavioural, affective and a combination of these elements in the definition of shyness.

Zimbardo (1977a) viewed shyness as characterised by apprehension and nervousness in interpersonal encounters. Buss (1980) locates shyness within a more general construct which he terms "social anxiety". This sees the discomfort experienced in the presence of others as primary. Buss (1984) defines shyness as "discomfort, inhibition, and awkwardness in social situations, especially with people who are not familiar" (Buss, 1984, p.39). However, Buss also notes the behavioural correlates of this discomfort. He emphasises the lack rather than the inadequacy of behaviour, and explicitly restricts shyness to interpersonal contexts. Leary (1983b) also uses the "social anxiety" concept, but suggests that this refers only to the affective component of shyness. He defines shyness as a psychological syndrome that includes both subjective social anxiety and inhibited social behaviour, placing equal emphasis on both the internally experienced discomfort and externally observable behaviour (see also Crozier, 1979; Jones and Russell, 1982).

Pilkonis, Heape and Klein (1980) focus upon the behavioural component, in terms of the avoidance of interaction and its inappropriateness. Shyness is

characterised by avoidance of social interaction, and the failure to respond appropriately to other people. McCroskey and Richmond's (1982) definition of shyness focuses exclusively on the behavioural element. Shyness is "the tendency to be timid, reserved, and most specifically, talk less". Their conceptualisation is equivalent to the unwillingness/willingness to communicate constructs discussed later. They note that CA may be one of the causes of shyness, but that there may be other causes.

The problem with these varying definitions is that the same term, shyness, has been used in the literature to refer to radically different psychological phenomena, and that the result has been conceptual and empirical confusion.

All definitions of shyness, as compared to CA, appear to include both a more general and a more specific term. The more general term refers to the discomfort and anxiety that is caused by the actual or anticipated presence of other people, not necessarily just by communication with them. The more specific term is that shyness tends to be, implicitly or explicitly, restricted to interpersonal contexts, and does not include the other social-communicative contexts referred to by CA.

In this thesis the concept of telephone apprehension will initially be defined in terms of the affective element, that is, as the "anxiety or fear associated with the anticipated or actual use of the telephone as a communication channel" (Steele and Reinsch 1983). As such, it will be defined in a manner analogous to CA, and will assume that the behavioural correlates should be determined empirically rather than assumed or incorporated in the definition itself. This approach is analogous Zimbardo's (1977a) definition of shyness, and the definition of social anxiety proposed by Leary (1983a, 1986) and Crozier (1979).

Because of these varying definitions of shyness, caution must be exercised when presenting accumulative reviews of the findings of shyness research. However, three findings are particularly relevant to the telephone research reported later in this thesis. Men appear to be more shy than women (McCroskey, Simpson and Richmond, 1982; Talley, 1979; Zimbardo, 1977a) These findings are unlike those for CA, where no consistent sex differences have been found, and this may be due to the greater emphasis on the behavioural aspects of the shyness syndrome. It suggests, as will be noted later, that, if there are sex differences in telephone apprehension, then telephone apprehension may be expected to be higher amongst men than amongst women.

The majority of research on shyness has been conducted on North American populations (Richmond and McCroskey, 1985). Relatively little research has been conducted in most other cultures, although it might be expected that cultural differences would be found in both the incidence of, and of reactions to shyness. However, the available research suggests that the proportion of shy people is essentially the same across a wide variety of cultures (Richmond and McCroskey, 1985). The implications of this work for telephone apprehension are to suggest that it is unlikely that there will be significant cultural differences in levels of telephone apprehension.

Most shy people consider their shyness to be a problem (Zimbardo, 1977a). Similarly, high CA's consider apprehension to be a problem. It can therefore be predicted that most people describing themselves as experiencing high levels of telephone apprehension will consider this to be a problem.

There is a further implication, which is that, whilst not all high telephone apprehensives may be shy, in that their apprehension may be limited to situations involving communicating by telephone, all shy people would be

expected to experience high levels of telephone
apprehension. That is, shyness concerns anxiety and
avoidance of all interpersonal interactions, including
the telephone.

UNWILLINGNESS TO COMMUNICATE

Burgoon presented the unwillingness to communicate
concept, and an associated measurement scale as an
explicit attempt to broaden the concepts of both CA and
reticence (Burgoon, 1976). The construct is concerned
simply with the extent to which an individual is
unwilling to communicate, without proposing causes, nor
specifying particular affective correlates. Burgoon
described this predisposition as "a chronic tendency to
avoid and/or devalue oral communication". Burgoon (1976)
suggests that possible causes of unwillingness to
communicate may be high CA, low self-esteem,
introversion, anomie and alienation.

The measure of unwillingness to communicate (UCS)
developed by Burgoon (1976) included two separate
factors, one labelled "reward" and the other labelled
"approach-avoidance". Daly (1978b) reported that scores
on the "approach-avoidance" factor were highly correlated
with the PRCA-20 scale (r=0.88), to the extent that the
two measures were virtually interchangeable. Scores on
the approach-avoidance factor correlated significantly
with measures of communication activity such as total
participation in a small group, and amounts of
information-giving and information-seeking in a small
group. On the other hand the "reward" factor was
uncorrelated with the PRCA-20 measure (r=0.01). Scores on
the reward factor were significantly correlated with
satisfaction with the group, attraction to group members,
and perceived integration into the group.

Burgoon (1976) commented that these results were disappointing, in the sense that they do not provide support for a general predisposition of unwillingness to communicate. Subsequent research using this concept and scale is very limited. However, these results are consistent with findings from the study of shyness and social anxiety, and suggest that a conceptual and empirical distinction between the behavioural and affective dimensions should be maintained. That is, positive and negative affect associated with communication (the "reward" factor) is not necessarily correlated with the behavioural characteristics of approach/avoidance. Rather than assuming their association, the relationship must be established empirically. It is also necessary to develop models which predict and explain the relationship between affect (apprehension) and behaviour (avoidance). This general problem has been explored most thoroughly within the field of attitude-behaviour consistency (see, for example, Fishbein and Ajzen, 1975), but has not been pursued within the study of CA.

WILLINGNESS TO COMMUNICATE

The willingness to communicate construct (WTC), and the very similar predisposition towards verbal behaviour (PVB) (Mortensen, Arnston and Lustig, 1977) and verbal activity constructs (McCroskey, Andersen, Richmond, and Wheeless, 1981; McCroskey and Richmond, 1982) appear to be the logical opposites of the unwillingness to communicate construct. The willingness to communicate, predisposition towards verbal behaviour and verbal activity constructs are purely behavioural, that is, they refer to observable communicative behaviour. (Whilst this is the stated intention of their authors, it should be noted that the most widely used measures of these constructs are in fact self-report measures, and hence are likely to be cognitively/affectively mediated.) These

constructs all derive from the observation of consistent
individual differences in behavioural tendencies with
regard to frequency and amount of talk (eg Chapple and
Arensberg, 1940; Goldman-Eisler, 1951; Borgatta and
Bales, 1953; see also Biggers and Masterson, 1984 and
Giles and Street, 1985). Mortensen, Arnston, and Lustig
(1977) argue that "the more global features of speech
tend to be consistent from one class of social situations
to another", and suggest that there is a characteristic
predisposition of an individual to talk a given amount,
and that this predisposition operates within, and across
the constraints of particular situations.

The Willingness to Communicate (WTC) scale was developed
by McCroskey and colleagues (McCroskey and Baer, 1985;
McCroskey and Richmond, 1985) and aims simply to measure
a behavioural tendency. WTC is not viewed as a unique,
independent aspect of personality, but is seen as a
summative dimension substantially related to, and
generated by a variety of other personality variables,
amongst which are introversion, anomie and alienation,
self esteem and CA.

The statement of the WTC construct and the development of
the associated scale derives directly from the trait-
state conceptualisation of CA (McCroskey, 1982a). That
is, the tendency to communicate should be consistent
across a variety of communication contexts and types of
interlocutors. Consequently, the WTC Scale (Trait Form)
includes items referring to four communication contexts
(public speaking, talking in meetings, talking in small
groups, and talking in dyads) and three types of
receivers (strangers, acquaintances, and friends).

A validity study of the WTC Scale (McCroskey and Baer,
1985) reported high internal reliability (Alpha=0.92).
The mean correlation amongst the four communication
context sub-scores was r=0.58, and amongst the three
interlocutor sub-scores, r=0.58, demonstrating the

existence of a high level of consistency across both different contexts and different types of interlocutors. Factor analysis indicated that the scale is essentially unidimensional.

McCroskey and Richmond (1982) presented a measure of verbal activity which they termed the "Shyness Scale", developed from work by McCroskey, Andersen, Richmond, and Wheeless (1981). They derived a scale which was factorially distinct from, yet substantially correlated with a measure of CA. This scale was initially labelled the Verbal Activity Scale (VAS), but was later (McCroskey and Richmond, 1982) renamed the Shyness Scale. It is a self-report scale of the amount of talk in which the individual typically engages, and as such appears to be closely related to both the PVB and WTC constructs described above.

Zakahi and McCroskey (1986) found that subjects classified as high or low on the WTC scale behaved very differently in terms of agreeing to participate in communication. Although they did not measure actual communication behaviour, this provided strong support for the willingness to communicate construct and the WTC measure. Chan and McCroskey (1987) studied students who scored one standard deviation above or below the mean on the WTC measure. Fewer low WTC students participated in classroom discussions than those who scored high on the scale. A higher proportion of all of the participations in each class came from students with high scores on the scale than from those with low scores.

McCroskey and Richmond (1982) looked at the relationship between respondents' self-reported VAS scores and reports of their communication behaviours by observers, in this case, people who were untrained observers, but who were friends of the respondents. VAS scores were significant, but not perfect predictors of observers' reports of communication behaviour (r=0.53). Evidence from diary

studies suggests that self-reports of communicative
behaviour typically underestimate the amount of informal,
and overestimate the amount of formal communication.
These results suggest that respondents are able to report
accurately relative differences in communicative
behaviours, and imply that self-reports of telephone
behaviour can be used to explore relative, if not
absolute, differences in the use of the telephone as a
function of differences in levels of telephone
apprehension.

A number of investigations have examined the relationship
between self-reports of communication behaviours, as
measured by scales such as the WTC, PVB and VAS, and
apprehension associated with communication, as measured
by scales such as the PRCA. Mortensen, Arnston, and
Lustig (1977) report a significant correlation of r=-
0.67, and Daly (1978b) reported a correlation of r=-0.66
between PVB scores and PRCA-20 scores. As noted earlier,
the Verbal Activity Scale is factorially distinct from
the PRCA-20 scale (McCroskey, Andersen, Richmond, and
Wheeless, 1981), but correlates significantly with it
(r=0.55). McCroskey and Baer (1985) report a significant
correlation of r=-0.52 between WTC and PRCA-24 scores for
a sample of 428 college students. Clark (1989) reported
that the WTC scale correlated significantly with the PRCA
scale (PRCA version unspecified, but presumed to be the
PRCA-24) with r=-0.538 (n=101, p<0.0001).

McCroskey and Baer (1985) note that the two constructs
appear to share some 25-30% of the data variance, and
whilst CA may therefore be expected to be reasonably
predictive of willingness to communicate (and vice-
versa), there is still substantial variance which must be
accounted for by other variables. It should also be noted
that both kinds of scales are self-report scales, and the
tendency for the individual to over-estimate the
consistency of their affective and behavioural
predispositions may be at least partially responsible for

the observed correlations.

If this pattern of results generalise to the study of
telephone apprehension, moderate rather than high
correlations may be expected between scales measuring
telephone apprehension and scales measuring willingness
to communicate using the telephone. Similarly, a person's
self-reports of telephone behaviour should be reasonably,
but not perfectly related to objective data describing
that person's telephone usage.

To date, there appears to be no published study of the
relationship between willingness to communicate and
objectively-measured communication competence. It may be
predicted that if a person is not competent to perform a
particular type of behaviour then their experience of
performing that behaviour and its consequences will be
unrewarding or even punishing, and they are therefore
less likely to perform that behaviour in future.
Observation of a range of human activities suggests that
this relationship is not perfect however. People do
engage in activities at which they are not particularly
competent, often whilst believing that they are highly
competent (e.g. car drivers). On the other hand, other
people will refrain from activities because they believe
that they are incompetent even when they possess adequate
or even high levels of competence. The research reported
above concerning the poor relationships between reticence
and both competence and communication behaviours
illustrates this.

The key relationship appears to be that between a
person's actual communication competence and their
perceived communication competence, and there are good
reasons for believing that these may often be only
loosely related (see Ingram, 1989). Whilst there may be
little or no relationship between actual communication
competence and willingness/unwillingness to communicate,
there is likely to be a relationship between self-

perceived communication competence and willingness to communicate. McCroskey and McCroskey (1986d) report a partial test of these relationships. They examined the relationship between WTC and the Self-Perceived Communication Competence measure (SPCC). This used twelve items to ask respondents directly to estimate their own competence as communicators in four situations and with three different types of interlocutors. The correlation between WTC and SPCC scores was r=0.59, indicating a substantial relationship between self-perceived communication competence and willingness to communicate (approximately 35% of variance in common).

Downs (1986) examined the relationship of both PRCA-24 and WTC scores of 323 students to their scores on the Interaction Involvement Scale (IIS: Cegala, Savage, Brunner and Conrad, 1982). The IIS is a measure of self-reported cognitive communicative competence. Canonical correlation analyses, using WTC and PRCA-24 scores as predictors of the three IIS dimensions of attentiveness, responsiveness and perceptiveness, produced a canonical correlation of 0.38 between WTC and the IIS dimensions, and a correlation of -0.73 between PRCA-24 and the IIS dimensions.

According to Downs (1986), these results are consistent with a model which suggests that self-perceived competence impacts on anxiety about communication, but is not the only determinant of such anxiety. In turn, anxiety about communication impacts on the willingness to communicate, but is not the only determinant of this tendency. However, these results also seem to be consistent with a model in which self-perceived competence impacts directly on willingness to communicate, and on anxiety. It should also be noted that as with all correlation analyses, the relationships may also operate transitively, that is, anxiety may impact on self-perceived communicative competence ("If I were competent, I wouldn't be feeling this anxious, therefore

I must be incompetent..") and willingness to communicate
may impact on CA ("I don't want to communicate, perhaps
this is because it makes me anxious?").

Research on willingness to communicate has a number of
implications for the study of telephone apprehension.
Perhaps the most important is to note the distinction
between self-reports of affective reactions to
communication and self-reports of behavioural tendencies.
Whilst affective reactions may be significant
determinants of behavioural tendencies they are unlikely
to be either the perfect or the sole predictor. In turn,
affective responses may be partially (although not
completely) determined by self-perceived competence,
which may also directly influence willingness to use the
telephone. It is also clear that there is a need to
examine any proposed scale of telephone apprehension to
identify separate factors of positive and negative
affective response to the telephone, behavioural
tendencies and consistencies, and self-perceived
telephone competence.

In the following chapter, the available research dealing
directly with telephone apprehension will be reviewed.

CHAPTER FOUR

TELEPHONE APPREHENSION

SYNOPSIS

In this chapter the concept of telephone apprehension is introduced and defined as "anxiety or fear associated with the anticipated or actual use of the telephone as a communication channel" (Steele and Reinsch 1983). There is very little research which explores people's anxieties and fears with respect to the telephone. Most writers concerned with the telephone have stressed the sense of security and reassurance experienced by users of the phone. However, the frequent and widespread anecdotal evidence is noted which suggests that telephone apprehension is often intense and is certainly widely prevalent.

A number of studies are reviewed, including Wurtzel and Turner's (1977) study of New York subscribers whose access to the telephone was eliminated by a telephone exchange fire, and Noble's recent (1989) study of telephone uses. These provide descriptive evidence for negative evaluations of the telephone.

The work of Reinsch and his colleagues (Lewis and Reinsch, 1982; Steele and Reinsch, 1983, 1984; Reinsch and Lewis, 1984a) is reviewed. Their development of the Telephone Apprehension Inventory is outlined, and the preliminary attempts to demonstrate validity are described. Findings are reviewed which show that whilst telephone apprehension may be related in some way to trait-like communication apprehension, it does not appear to be related to other specific aspects of communication apprehension, such as apprehension of public speaking and writing apprehension. Other data is noted which lead to consideration of alternative explanations for variations in reported telephone apprehension, such as generalised evaluation apprehension or anxiety about communication in informal and spontaneous situations.

A second group of studies is reviewed which indicate that the telephone in general is seen as a less pleasant and more anxiety-provoking medium than face-to-face. The telephone is not the preferred medium for the majority of interactional tasks, although there are a limited number of specific situations where the telephone is preferred. However, evidence is also noted that shows the extensive use that is made of the telephone, that shows that most people enjoy using the telephone, and that shows that people claim that the telephone is important to the way they lead their lives.

The relation of telephone apprehension to apprehension about information technology and the new media is outlined, and the interdependence of attitudes to both old and new communication technologies is signalled. The claimed significance of telephone apprehension is outlined, not only in terms of its immediate impact upon patterns of telephone use, but also its more general, and more profound impact upon the way that people lead their lives, and the opportunities available to them and the outcome of those opportunities.

Finally, the chapter considers and outlines the research issues to be dealt with in the remainder of this thesis.

CHAPTER FOUR

TELEPHONE APPREHENSION

INTRODUCTION

In this chapter, existing research examining the specific problem of telephone apprehension is reviewed, and an overview of the issues which will explored in this thesis is presented.

TELEPHONE APPREHENSION

Telephone apprehension refers to the idea that a person may be markedly uncomfortable about communicating when using the telephone. It can be defined as "anxiety or fear associated with the anticipated or actual use of the telephone as a communication channel" (Steele and Reinsch, 1983). It has been hypothesised that telephone apprehension may influence individuals to avoid the use of the telephone, to prefer other modes of communication when they are available, and to hinder, or at least affect, performance the telephone is used.

As noted in the preceding chapters, extensive research effort has been devoted to defining, operationalising, and exploring the precursors and consequences of communication apprehension. Recently, with burgeoning interest in information technology and "The New Media", attention has been given to the concept of "computer-phobia" in particular, and to the concept of "technology-phobia" in general. Within psychology, there has long been an interest in the problem of anxiety, and within clinical psychology, an interest in the problem of phobias. Considerable attention has been given to the problem of social anxieties and shyness. However, with the exception of the work of Steele and Reinsch (1983, 1984) almost no attention has been given to telephone apprehension, which may be seen to be related to, and

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relevant to, the anxieties and apprehensions noted above. Within the generally neglected field of telephone research (see Chapter One), an indication of this specific neglect is given by an examination of recent review volumes by Rutter and by Pool (Pool, 1977, 1983; Rutter, 1987) In none of these volumes is the topic of telephone anxiety (or the related terms telephone apprehension, fear and phobia) either indexed or mentioned. The topic is mentioned in passing in a number of review essays, but only to note its existence rather than to explore the topic more fully (see for example Aronson, 1971; Ball, 1968). Harris (1957) does tackle the subject, but from a psychoanalytic rather than communications perspective.

Rather than apprehension, in most reviews and commentaries on the telephone, the relation of the telephone to feelings of increased security and reassurance are stressed. For instance, Aronson (1971) proposed that, at the psychological level, the telephone reduces anxiety and loneliness, whilst increasing feelings of security as a result of its role in maintaining "psychological neighbourhoods". Maddox (1977) quotes Marilyn Monroe as saying: "Do you know who I've always depended on? Not strangers, not friends. The telephone! That's my best friend."

Despite this tendency to see the telephone as 'friendly' and unproblematic, telephone apprehension is a phenomena frequently referred to in casual conversation, and discussions of this topic generate considerable anecdotal evidence attesting to its prevalence and importance. For instance, in a very early review, Casson (1910) noted that a common early reaction to the telephone was fear: "The very idea of talking at a piece of sheet-iron was so new and extraordinary that the normal mind repulsed it....People who talked for the first time into a telephone box had a sort of stage fright. They felt foolish." (Casson, 1910, p44). Kleinfield (1981) noted

that "therapists have encountered certain personality
types who can't at all cope with the 'phone. They
literally fear making a call." (Kleinfield, 1981, p16).
Goodman (1982) referred to such people as "phono-
phobics", and many anecdotal references exist in the
popular and training literature to this problem. For
instance, descriptions of "tele-sales" have noted that
selling by telephone "is inappropriate for phono-phobics,
people who fear the telephone". (Tulsa World, 1982).
Rakow (1988), in her ethnographic study of telephone use
in a rural American community, noted that individual
dislike of (and also, of a particular liking for) using
the telephone was frequently commented on. Interestingly,
disliking the telephone is most frequently said about
men, and is offered as an explanation of the relatively
greater use of the telephone by women.

Existing Telephone Apprehension Research

Existing research examining telephone apprehension is
limited. Much of the available evidence is incidental,
and is reported as secondary to the major focus of the
original study. For instance, Wurtzel and Turner (1977)
studied an area of New York which had been affected by a
fire in its telephone exchange, putting the local
telephone system out of action for 23 days. As part of
their larger study of the effects of the fire on the
lives of people living in the area, they looked at
anxieties surrounding the use of the telephone. 190
individuals took part in their survey. Each individual
was asked to select one of four statements which most
nearly represented their attitude to the telephone. The
four statements, and the percentage of respondents
selecting each statement, were:

I enjoy using the telephone and use it at every
opportunity: 33.2%

I use the telephone whenever I have to: 51.5%

I dislike using the telephone but use it when
necessary: 11.6%

I avoid using the telephone as much as
possible: 3.7%

Clearly, there are problems with extrapolations from such
a small and unsystematic sample, but they do suggest that
the problem of telephone apprehension is of some
importance. They suggest that nearly 4% of an American
urban population experience significant, and that a
further 12% experience some degree of telephone
apprehension. If similar rates and levels of apprehension
were found throughout the USA, then, with a projected
population of 248.4 million in 1990, some 9.94 million
people would be classified as experiencing significant,
and a further 29.81 million would be classified as
experiencing moderate telephone apprehension. If similar
rates and levels of apprehension were to be found in the
UK, then, in the population of 50.4 million (mid-1988),
some 2.02 million people would experience significant
levels of telephone apprehension, and a further 6.05
million experience moderate levels of telephone
apprehension.

It should be noted that Wurtzel and Turner's (1977)
survey had a number of limitations. It was itself
conducted by telephone, and was therefore likely to have
missed people who were very high in telephone
apprehension, who either do not have telephones, or who
have them but insist that other people answer the
telephone. These factors suggest that the level of
telephone apprehension identified was likely to be an
underestimate of the actual situation. It is also likely
that there were demand characteristics associated with a
telephone survey inquiring about telephone usage, and
these would have affected responses to the questions,
although the direction of bias is uncertain. There may
also have been other factors, such as convenience and
cost, which influenced people's responses to questions
asking about their telephone usage, and therefore not all
negative responses should be attributed to telephone
apprehension per se.

In a study of 100 Australian telephone users, Noble (1987) developed a set of scales to assess "telephone obedience". Nine scales were designed to assess the extent to which people felt compelled to answer a ringing telephone (even when the phone is in a call-box, and is unlikely to be for them). The scale items used were:

1: I always feel that I have to answer the telephone whenever it rings.

2: I would like someone to screen my calls. (R)

3: I can ignore a ringing telephone. (R)

4: I always answer the telephone as soon as possible.

5: I feel guilty if the phone rings and I don't answer it.

6: I often feel like taking the telephone off the hook. (R)

7: I take my time to answer the telephone. (R)

8: If I don't or can't answer the telephone I worry in case I miss out on something.

9: I answer the telephone even when I know the call is not for me.

He found that most people felt that they had to answer a ringing telephone (73%), even when they know that the call is not for them (59%). 55% of people reported feeling 'guilty if the telephone rings and I don't answer it', and 58% worried 'in case I miss out on something if I don't or can't answer the telephone'. Noble (1987) found that telephone obedient people were in general more anxious ($r=0.25$, $p<0.006$).

In a later study, Noble (1989) reported a preliminary analysis of a 'uses and gratifications' approach to understanding telephone use. The study, which involved interviews with nearly 1000 respondents, included four questions:

1: Why I like to use the telephone.

2: Why I sometimes dislike the telephone.

3: Why I like receiving phone calls.

4: How I feel the phone "uses" me.

These questions provide some insight into possible reasons underlying telephone apprehension. Illustrative reasons cited by Noble (1989) include:

Why people sometimes dislike the telephone:

'Because you get wrong numbers and bills.'

'Can't tell who is on the other end.'

'Some people talk too long on the phone.'

'Impersonal, and hard to transmit exact feelings.'

'Allows me to be disturbed when I don't want to be, or by people I don't want to.'

'It is too convenient: it's too tempting to call friends when I should be studying.'

'Inconvenient calls at inconvenient times.'

'Obligation to answer the phone.'

'Business people ring up at home.'

How I feel the phone "uses" me:

'I hate waiting for an important call.'

'I hate it when people hunt me down with a phone.'

'I can't stand getting stuck on the phone for too long.'

'I always feel I should answer the phone for fear of missing out on something.'

'Intrusion of privacy.'

'People ring up and ask favours, and put you on the spot, and often you reply without having properly considered.'

'I feel annoyed when people don't ring, which affects my emotions for the day. It also stops me from doing things and from going out.'

'People ring at inconvenient times.'

As Noble (1989) notes, these comments make it clear that psychologically the telephone is seen as very much a "double-edged sword". The benefits of the phone, such as

convenience, time-saving and the overcoming of problems of distance and dispersion, are accompanied by complementary disadvantages.

Noble (1989) also presented a preliminary classification of uses of the phone. This classification was based on the analysis of a small sample of the total number of interviews conducted (No details are given of the size of the sample, but it appears to have been based on the analysis of approximately 40 interviews). Noble (1989) divided the reasons people gave for disliking the phone into 11 categories:

What people dislike about the telephone

 1: Expense
 2: Interruptions (time inconvenient)
 3: Invasion of privacy (caller inconvenient)
 4: Nuisance calls (topic unwelcome eg obscene calls, sales calls)
 5: Unwanted availability (caller unwelcome)
 6: Failure to connect (wrong number, no reply, engaged, wrong person, answer machine)
 7: Problematic communication (medium creates difficulties for effective/efficient communication)
 8: Over-convenience (user over-uses phone)
 9: Obedience (obligation to answer)
10: Impersonal (difficult to communicate feelings)
11: Brings bad news

Whilst a number of the categories suggested by Noble appear to overlap or duplicate (eg 3 and 5, 7 and 10) this is a useful initial categorisation of the reasons underlying dislike of the telephone.

A preliminary classification of the ways in which people felt the telephone "used" them was also presented, which showed considerable overlap with the classification of reasons for disliking the telephone:

How people feel the phone 'uses' them

1: Obedience (obligation to answer)
2: Time damage (interruptions, time wasted, invasion of
              privacy)
3: Nuisance calls/callers (unwanted calls)
4: Powerful persuasive medium (manipulated via phone in
                           unwanted ways)
5: Cost of convenience (too convenient leads to too
              costly)
6: Too enticing (over-use)
7: Insensitive callers (callers don't take account of
              receiver's situation)
8: Unpleasant anticipation (uncomfortable waiting for
                       important incoming call)
9: Pressure to acquire telephone

Whilst detailing a number of reasons underlying negative
attitudes towards the telephone, these classifications
focus upon "rational" reasons for such negative
evaluations. They do not include anxiety about the
telephone per se, except in their reference to the
problematic nature of telephone communication, either in
creating barriers to effective and efficient
communication (Items 7 and 10 in "What people dislike
about the telephone") or in facilitating particular kinds
of communication (Item 4 in "What people dislike about
the telephone" and Item 4 in "How people feel the phone
'uses' them").

Lewis and Reinsch (1982), working in the USA, collected
data from 58 business communication students, 52 high
school teachers of business communication, and 16 college
professors. Each subject was tested using measures of
communication apprehension (PRCA-OF: Scott, McCroskey and
Sheahan, 1978), speech apprehension (PRCA-13: Porter,
1981), writing apprehension (WAT: Daly and Miller, 1975),
and telephone apprehension. Telephone apprehension was
measured with a set of three Likert-type scales. Lewis
and Reinsch found that telephone apprehension, as

measured by their 3-item scale, was significantly correlated with communication apprehension (PRCA-OF:r=0.383, n=126, p<0.001) but non-significantly correlated with speech apprehension (PRCA-13:r=0.141, n=126, ns) and non-significantly correlated with writing apprehension (r=-0.052, n=126, ns). Lewis and Reinsch also found that responses to the four-part question used by Wurtzel and Turner (1977) were significantly correlated with their 3-item scale of telephone apprehension. (The internal reliability of their 3-item scale was only 0.692.)

This very preliminary research appeared to indicate that telephone apprehension is related to overall communication apprehension, but not to apprehensions associated with specific kinds of communication such as public speaking and writing.

The significant positive correlation of telephone apprehension with communication apprehension could be interpreted in a number of ways. Firstly, telephone apprehension may simply be a component of general communication apprehension in the trivial sense that the Scott, McCroskey and Sheahan (1978) scale could include questions which refer directly or indirectly to telephone use, and to telephone apprehension, and thereby duplicates Lewis and Reinsch's (1982) measure of telephone apprehension. The observed correlation would then derive merely from this duplication of questions. Examination of the Scott et al (1978) scale shows that this is not the case. The scale makes no reference to the use of the telephone (which, in a scale attempting to assess communication apprehension in an organisational setting, might be seen as a significant failing!).

There are in addition two non-trivial senses in which telephone apprehension may be a component of communication apprehension. The first, as argued in Chapter Two, is that communication apprehension as a

generalised measure should tap apprehension associated with a range of communication situations and channels of communication, such as face-to-face conversation, public speaking, and use of the telephone. As such, telephone apprehension is necessarily a component of communication apprehension, and measures of telephone apprehension should correlate to some degree with measures of overall communication apprehension. However, the operationalisation of communication apprehension used by Lewis and Reinsch (1982) did not adopt this approach to communication apprehension. Reinsch and Lewis (1984a) clearly identify telephone apprehension as an example of Generalised-Context apprehension, but they also note that people who are quite comfortable in other contexts may experience heightened apprehension when called upon to communicate by telephone, and vice-versa, implying that they would expect inter-context correlations to be low, and correlations between scores with respect to this context and generalised trait measures to be modest.

The second sense in which telephone apprehension and communication apprehension may be related is that whilst communication apprehension in organisational/interpersonal contexts and telephone apprehension are conceptually and operationally independent, in practice, people who are likely to experience one are also likely to experience the other, and vice-versa. This may be because the same dynamics underlie both telephone apprehension and organisational/interpersonal communication apprehension.

In addition to the significant correlation between telephone apprehension and communication apprehension scores, Lewis and Reinsch (1982) also reported non-significant correlations between telephone apprehension scores and measures of speaking and writing apprehension. Two different explanations of this pattern of correlations are possible. One explanation is that the pattern reflects differences between pre-meditated and

spontaneous communication situations (and possibly,
closely allied to this, between formal and informal
situations), and that telephone apprehension may be
related to the spontaneous nature of telephone
communication. (As noted in Chapter One, Goddard (1973)
found that most telephone calls are not pre-arranged,
whilst most face-to-face meetings are.) A second
explanation is that the pattern reflects differences
between situations where personal evaluation is salient
versus those where it is not. If this were the case, the
possibility that telephone apprehension might merely be a
reflection of more generalised evaluation apprehension
could be rejected.

The first explanation of the pattern of correlates is
that telephone apprehension is related to the spontaneous
nature of telephone communication. Lewis and Reinsch
(1982) assessed communication apprehension using the
Organisational Form of the PRCA developed by Scott,
McCroskey and Sheahan (1978). This measure consists
primarily of items which refer to one-to-one or small
group, face-to-face interactions. These are situations
where conversation is likely to be relatively informal
and spontaneous. On the other hand, the measure of speech
apprehension used Porter's (1981) short form of the
original PRCA (McCroskey, 1970). This scale taps
anxieties about speaking in public, that is, about
situations where one person is called upon to present a
relatively formal, premeditated speech to a multi-person
audience. Similarly, the measure of writing apprehension
(Daly and Miller, 1975) used by Lewis and Reinsch (1982)
taps anxieties about producing text. This is, by
definition, a relatively formal, premeditated activity.
Thus, this first explanation seems to be consistent with
the data available.

The second explanation of the pattern of correlates is
that telephone apprehension reflects a difference between
situations where personal evaluation is salient versus

those where it is not. To the extent that Porter's (1981) short-form of the PRCA taps anxieties about speaking in public, it is also likely to be tapping anxieties about situations where evaluation of the speaker is likely to be highly salient to all participants. (Indeed, Porter (1981) criticised the validity of the PRCA, arguing that it measured evaluation apprehension rather than communication apprehension.) Similarly, measures of writing apprehension are likely to be tapping anxieties not only about producing text, but also about the evaluation of that text by an audience. Thus, evaluation is likely to be a salient aspect of both public speaking and writing situations. On the other hand, evaluation per se is likely to be a less salient aspect of the one-to-one or small group, face-to-face interactions referred to in the PRCA-OF (Scott, McCroskey and Sheahan, 1978). This pattern of results is therefore consistent with the suggestion that telephone apprehension is not merely a specific manifestation of a more generalised evaluation apprehension. Overall, these results suggest that telephone apprehension is apprehension associated with a situation where conversation is relatively informal and spontaneous, and where speaker evaluation is not a salient cause of anxiety.

The Telephone Apprehension Inventory

In a later study, Steele and Reinsch (1983) attempted to develop a reliable measure of telephone apprehension. They produced an initial pool of 92 5-point Likert items. These items were taken from a variety of previous general communication and speech apprehension scales (Beatty, Kruger and Springhorn, 1976; Burgoon, 1976; Gilkinson, 1942; Lewis and Reinsch, 1982; McCroskey, 1970; Mortensen, Arnston and Lustig, 1977; Taylor, 1953; Watson and Friend, 1969; and Wheeless, 1975) as well as being generated by the authors and colleagues. Responses from 81 American undergraduates were used to test for internal

reliability, and 62 items were eliminated on this basis. The wording of the remaining was refined,and in some cases reversed in polarity. The resulting items were presented to a further 371 undergraduates. Responses were obtained from 333 subjects, and analysed for reliability and a factor analysis performed. Correlations between the composite score for the 30 items and the individual scales were examined, and the items with the lowest correlations systematically discarded until only 20 items remained. The overall reliability for these 20 items was high, with an alpha (Cronbach, 1951) of 0.940. An unrotated factor analysis "strongly indicated the presence of a single major factor" (Steele and Reinsch, 1983, p11). Every scale had its primary loading on the first factor, and every primary loading was 0.56 or greater. The item-composite score correlations for each of the items are presented in Table 1, together with similar data from a replication study by Steele and Reinsch (1984).

Table 1: Item-Composite score correlations

ITEM	ITEM-TOTAL CORRELATION	
STEELE & REINSCH	1983	1984
1: I look forward to telephone conversations	.652	.623
2: I feel it is difficult to converse over the phone	.627	.689
3: I avoid speaking on the telephone whenever possible	.602	.657
4: I find speaking on the telephone pleasant	.710	.707
5: I take pride in my speaking ability over the phone	.546	.499
6: It is easy for me to express myself on the telephone	.547	.544

Table 1 (cont'd): Item-Composite score correlations

ITEM	ITEM-TOTAL CORRELATION	
STEELE & REINSCH	1983	1984

7: I thoroughly enjoy speaking on the telephone

| | .661 | .714 |

8: I feel rushed and pushed when I use the phone

| | .675 | .572 |

9: When I have to talk on the phone, I grow nervous and uncomfortable

| | .618 | .585 |

10: I hurry to finish the conversation when talking on the telephone

| | .568 | .650 |

11: I feel misunderstood when I use the phone

| | .677 | .615 |

12: I have problems expressing myself over the telephone

| | .575 | .659 |

13: I do not like to talk on the phone

| | .716 | .783 |

14: I feel inhibited using the phone

| | .563 | .658 |

15: I feel relaxed and comfortable when speaking on the telephone

| | .725 | .667 |

16: I dread speaking on the phone

| | .713 | .652 |

17: I feel calm and comfortable using the telephone

| | .714 | .692 |

18: I do not feel comfortable using the telephone

| | .745 | .684 |

19: I have feelings of frustration after most phone calls

| | .661 | .484 |

20: I avoid using the phone

| | .587 | .653 |

| Alpha | .940 | .938 |
| N | 333 | 434 |

Overall scores on the final 20 item, 5-point scale could range between 20 (minimum apprehension) and 100 (maximum apprehension). For this group of 333 subjects the actual minimum score was 20, and the maximum score was 83. The mean was 40.862, (mode = 42, median = 40) with a standard deviation of 11.636, skewness was 0.884 and kurtosis was 1.304.

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FIGURE 1 ABOUT HERE: C04F01.GEM
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Using the normative conceptualisation of problematic apprehension adopted by McCroskey and other communication apprehension researchers, Steele and Reinsch (1983) suggest that some 22.2 % of this group experience moderate to severe levels of telephone apprehension. They report that 12.3% (41) respondents scored more than one standard deviation above the mean, and 7.8% (26) scored more than 2 standard deviations above the mean. Only 7 respondents (2.1%) scored more than three standard deviations above the mean. In broad terms these figures correspond well with those obtained by Wurtzel and Turner (1977).

In a replication of their 1983 study, Steele and Reinsch (1984) reported a mean of 42.956 and a standard deviation of 11.518 (N=434), with an alpha of 0.938. The range of scores was from 20 to 93. In this replication, 14% of respondents scored one or more standard deviations above the mean.

The relatively high levels of telephone apprehension indicated by these three studies (Steele and Reinsch, 1983, 1984; Wurtzel and Turner, 1977) are to some extent surprising. The telephone is apparently a dyadic, interpersonal medium of communication, and Strohkirch and Parks (1986) have shown that people experience most communication apprehension in public speaking contexts, less apprehension in small-group contexts such as meetings and group discussions, and least apprehension in

TELEPHONE APPREHENSION

USA STUDENT RESPONSES

Distribution of T20 Scores

Data from

Steele & Reinsch

1983

N = 333

T20 SCORE
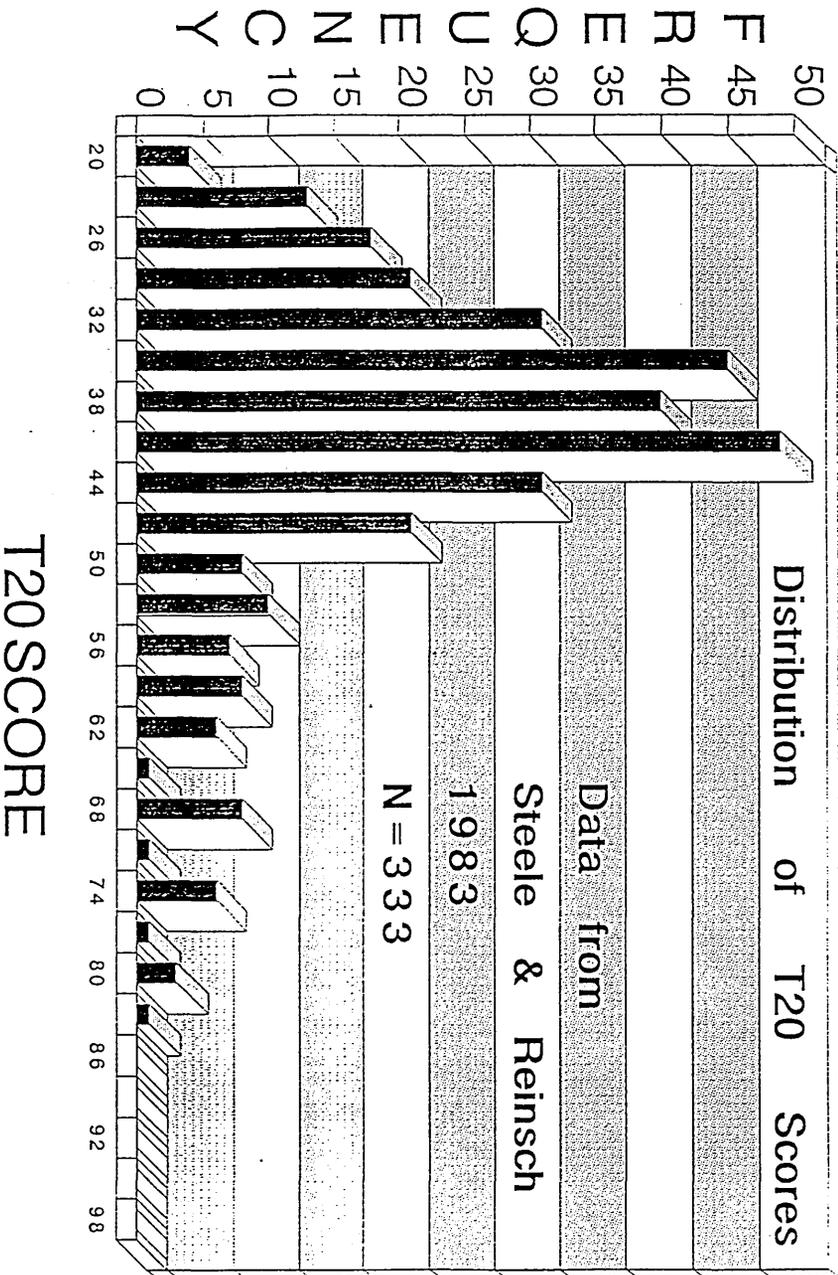
dyadic contexts.

In their 1984 replication, Steele and Reinsch explored various aspects of the validity of the scale. Kerlinger (1973) cites three criteria of validity: content validity, criterion-related validity, and construct validity. Content validity of a scale refers to the judged relevance of the scale items to the property being measured. Criterion-related validity refers to the ability of the scale to predict behaviours or attributes specified by an underlying theory. This type of validity can be established by external verification of the scale, or by the use of already established scales with known properties. Construct validity is concerned with the relationship of concepts to each other i.e. it involves a determination of how variance is shared amongst a group of related constructs. Steele and Reinsch (1984) examined content validity by asking judges to comment on the items comprising the scale; criterion-related validity was examined in terms both of other measures of attitude to the telephone, and of (self-reported) telephone usage; construct validity was examined in terms of the relationship of the scale to measures of other kinds of communication apprehension.

Judges evaluated the content validity of the scale in terms of the apparent relevance of the scale items to a definition of telephone apprehension. Steele and Reinsch (1984) concluded that the scale did possess content validity. Criterion-related validity was evaluated by comparing scale scores with self-reported telephone behaviour. People with higher scores reported initiating and receiving fewer calls than people with lower scale scores. The correlation between telephone apprehension and number of calls initiated was $r=-0.2704$ ($p<0.001$), whilst the correlation with calls received was lower but still significant ($r=-0.1412$, $p<0.002$). It should be noted that the number of calls were self-reported, and it might be expected that this self-report measure might

correlate with self-reported telephone apprehension for reasons other than objective variation in the number of calls, and is likely to correlate more closely than an objective measure of actual behaviour.

Respondents were also asked to choose the single item in the four-part multiple choice question used by Wurtzel and Turner (1977) which best described their use of the telephone. These items are again self-reports of behaviour, rather than objective, independent measures of behaviour, and each item appears to tap a mixture of both self-reported behaviour and attitudes towards the telephone. Results showed a significant negative correlation ($r=-0.6014$, $p<0.001$) between answers to this item and the scale, such that people with higher scale scores were more likely to report avoiding the use of the telephone.

Construct validity was explored by examining the correlations between scores on the scale and measures of communication apprehension, speech apprehension and receiver apprehension. Communication apprehension was measured using the PRCA-OF (Scott, McCroskey and Sheahan, 1978), with two items deleted to give an 18 item scale. Speech apprehension was measured using Porter's (1981) 13-item short form of the PRCA. (The two items omitted from the PRCA-OF were exact duplicates of items in this short form of the PRCA.) Receiver apprehension was measured using the Receiver Apprehension Test (RAT) developed by Wheeless (Scott and Wheeless, 1977, Wheeless, 1975). Results showed that TAI scores were significantly and positively correlated with communication apprehension (PRCA-OF, $r=0.2740$, $p<0.0001$), speech apprehension (PRCA-13, $r=0.1268$, $p<0.004$), and receiver apprehension (RAT, $r=0.4576$, $p<0.0001$).

The significant correlations between communication apprehension (PRCA-OF) is consistent with the Lewis and Reinsch (1982) findings, and the correlation with

receiver apprehension is consistent with the fact that
using the telephone involves both speaking and listening.
(Note, however, that the TAI itself focuses almost
exclusively on speaking on the telephone, and none of the
twenty items included refers specifically to listening.
See Chapter Nine for further discussion of this point.)

The correlation between telephone apprehension and speech
apprehension (PRCA-13) is however inconsistent with the
results reported by Lewis and Reinsch (1982). Given that
the PRCA-13 focuses primarily upon apprehensions
associated with public speaking, the correlation is also
somewhat unexpected. This correlation was explored
further by Steele and Reinsch by means of partial
correlations. The correlation between telephone
apprehension and speech apprehension with communication
and receiver apprehension removed was r=-0.05 (p=0.15), a
negative and non-significant relationship, suggesting
that the apparent correlation between TAI and PRCA-13
scores was an artifact resulting from the high
correlations of the PRCA-13 with both the PRCA-OF and
RAT.

Overall, these results were taken by Steele and Reinsch
as supporting the construct validity of the telephone
apprehension measure. As Steele and Reinsch (1984)
comment: "Persons who are apprehensive about receiving
messages or about oral communication should experience
some telephone apprehension since telephone communication
requires listening and speaking." On the other hand,
there is no reason to expect that telephone apprehension
should be related to fear of public speaking, the primary
focus of the PRCA-13 measure used to tap speech
apprehension. However, Steele and Reinsch (1984) do not
provide data which allows clear conclusions to be drawn
concerning the correlates of telephone apprehension, nor
to eliminate other plausible explanations of variations
in telephone apprehension. In particular, the validation
of the scale is not based upon an appropriate trait-state

model such as that outlined by Zuckerman (1976), and Steele and Reinsch's conclusion that validity has been demonstrated is strictly unwarrented.

Steele and Reinsch (1984) also examined levels of telephone apprehension as a function of differences in subjects' age and sex. They found that younger students reported lower levels of telephone apprehension, and that men reported higher levels of telephone apprehension than women. However, examination of their sample indicates that it consisted largely of 18 and 19 year-olds, and the reported age and sex differences may not be generalisable. It is not clear, therefore, that this measure is appropriate for use with non-student samples with a wider distribution of ages, nor with samples from other cultures.

Steele and Reinsch (1983) suggest that the 20-item TAI constitutes "a reliable and unidimensional scale which can be used to assess telephone apprehension" (p11) and their replication and extension of the 1983 study (Steele and Reinsch 1984) supports this proposition. However, this may not be as clear-cut as Steele and Reinsch maintain. Nor is it clear, if telephone apprehension is multi-dimensional, what the components of telephone apprehension are. Porter (1981), in his highly critical assessment of the psychometric nature of the PRCA noted that "If the PRCA does not measure what it purports to measure, it may be neither a conceptual nor a methodological contribution" (Porter, 1981, p58). Given the troubled history of measurement within the general field of communication apprehension, it would seem necessary to thoroughly investigate the psychometric nature of the Telephone Apprehension Inventory at an early stage of the research process.

Telephone apprehension may stem from a number of different causes. Amongst possible causes which have been suggested by Reinsch and Lewis (1984a) are traumatic experiences, defective learning, and inappropriate communication skills. Heightened anxiety when communicating by telephone may stem from one-trial learning associated with a traumatic call. Inadequate learning of the rules associated with telephone use may result in uncertainty and associated anxiety. Reinsch and Lewis (1984a) reported an attempt to test the third possibility, namely, that a poor fit between the skills needed to conduct successful telephone calls and the skills actually possessed by the person would lead to negative experiences of telephone calls, and consequently, to high levels of telephone apprehension. On the basis that the telephone places a premium on vocal non-verbal skills, whilst visual non-verbal skills would be at a discount, they explored four hypotheses which specified relationships between non-verbal abilities and telephone apprehension. In a study of 84 employed adults they found a significant negative correlation ($r=0.257$, $df=82$, $p<0.01$) between telephone apprehension and vocal leakage (the extent to which the person could not control the encoding of information in the vocal non-verbal channels, such as voice rate, pitch and volume). However, there were no significant correlations with vocal perceptiveness (the extent to which the person could control the decoding of information in the vocal non-verbal channels), visual (facial) leakage (the extent to which the person could not control the encoding of information in the visual non-verbal channels, such as facial expression) and visual (facial) perceptiveness. It must be noted, however, that the measures used in the study were contemporary rather than sequential, and self-report rather than objective behavioural measures were used. Thus, it is possible only to conclude that people who see themselves as high telephone apprehensives also

see themselves as being high on vocal leakage, but do not
see themselves as significantly different to low
telephone apprehensives in terms of vocal perceptiveness,
and visual leakage and perceptiveness. The data do not
support inferences concerning the relationship between
telephone apprehension and objective differences in non-
verbal competences, nor to the direction of the causal
relationship between telephone apprehension and non-
verbal competences.

Apart from this single study, no other research has been
identified which addresses the question of the causes of
telephone apprehension. Hence it is not known what
communicative and psychological processes underlie
telephone apprehension, and how anxiety concerning use of
the telephone is related to other constructs.

It is possible to speculate, based on analyses of the
developmental correlates of communication apprehension.
As noted in Chapter Two, four general and overlapping
causes are generally cited as underlying high levels of
communication apprehension. They are:

> 1: genetic predispositions
> 2: reinforcement
> 3: skill acquisition
> and 4: modelling.

Whilst susceptibility to anxiety in general may have an
inherited component, and this may play a part in the
development of a given individual's level of telephone
apprehension, the significance of any genetic
predisposition specifically to telephone apprehension
must effectively be zero. The other three factors are
likely to be much more important.

It is possible, indeed probable, that the history of
reinforcement and punishment an individual has received
for their attempts to communicate by telephone will

influence the level of telephone apprehension they experience. General learning models would predict that a history of experiences perceived to be unsuccessful would lead both to the internalisation of these negative expectancies and to the avoidance of the situation, use of the telephone, with which they are associated. As in the case of communication apprehension, a history of unsuccessful experiences can arise from a number of causes, such as an inadequate knowledge of the rules of telephone use, a lack of the skills necessary to use the telephone effectively, or a mismatch between the individual's skills and the characteristics of the medium of communication (the possibility explored by Reinsch and Lewis (1984a), above).

McCroskey's proposal (1982) that, in addition to people holding negative expectancies due to a history of negative experiences (a strict reinforcement model), they may experience a sense of helplessness when dealing with the medium as a result of experiencing an apparently random pattern of responses to their communication attempts, may be particularly relevant to a medium where many of the normal cues present in face-to-face communication are absent.

A third explanation for the development of telephone apprehension is the failure to develop adequate communication skills. Given that communication by telephone requires particular skills, for instance, an increased attention to vocal non-verbal cues, people who fail to acquire such skills, or fail to acquire the knowledge that they should be used when communicating by telephone, will experience difficulty when communicating by phone.

A final explanation emphasises the importance of imitation of role models for the direct learning of telephone apprehension. That is, children may not only imitate the way their parents use the telephone, and

thereby may learn inadequate telephone skills, but they may also imitate the anxiety their parents express when communicating by phone.

Reinsch (1985) reviewed possible developmental correlates of the more general problem of techno-phobia. If telephone apprehension is considered to be a special case of techno-phobia, four possible causes of telephone apprehension may be suggested:

1: negative reactions to the (perceived) consequences of the technology
2: negative reactions to the technology itself
3: negative reactions to the task(s) created by the technology
4: negative reactions to the continuing use of the technology

Negative reactions to the (perceived) consequences of the technology

Some people may fear the technology because they fear that their jobs/lives will be changed or eliminated by it. This may be a realistic fear, or it may be because of a misunderstanding of the consequences of the technology. This kind of technology aversion does not appear to be directly relevant to the general problem of telephone apprehension, and for most people does not seem to be a major factor. For most people the telephone is a technology which is in place, which is an integral part of their job and of their personal/social life, and which they find difficult to imagine doing without.

However, a number of academic and journalistic studies have suggested that this is a primary factor in the decision of individuals not to install a domestic phone. Hill (1986) reported interviews with a number of people who had consciously decided not to install a domestic

phone. Typically, they cited negative consequences for themselves, such as being pestered and disturbed, as reasons for this decision.

Negative reactions to the technology itself

Central to an understanding of telephone apprehension must be an understanding of people's fear of the technology itself. Such aversion can result from at least three sources:

    1: novelty
    2: misinformation
    3: traumatic experience (faulty learning)

With most technologies, novelty is both personal and societal, that is, the technology itself is new, and it is new to the individual. In the case of telephone apprehension, novelty is, in most circumstances, a personal unfamiliarity with the technology, rather than the general novelty of the device. Because of a personal unfamiliarity people may not have learnt the skills they need, or feel that they need, and are aware of this lack. (They may in fact believe that they do not have the appropriate skills, due to a lack of familarity, whilst in fact possesing perfectly adequate skills.) Specific aspects of telephone use may generate apprehension based on novelty, such as the fear of encounters with telephone-answering machines, anxiety about participation in teleconferences, nervousness when dealing with "smart" phones, etc.

People may have beliefs about the telephone which are incorrect, and which cause them distress. One general example of this is the mismatch, discussed in Chapter One, between people's beliefs about telephone usage and actual usage. For instance, whilst most calls are within the local area, and to people who are already known,

popular images of the telephone assume that the primary
use is for calls are over long distances and to and from
strangers. Fisher (1989) found that most people
overestimated the cost of calls, and in particular,
overestimated the cost of long-distance and international
calls. Parks (1980) examined communication apprehension
across 35 situations and found communication apprehension
to be greatest in situations where people were less
likely to know one another. Incorrect beliefs of this
kind are likely to increase levels of telephone
apprehension.

As studies of one-trial learning have shown, a single
traumatic experience that is intensley negative can
strongly influence future feelings and behaviours. Such
an experience may be traumatic in terms of process or
outcome failure (eg a totally unsuccessful telephone
call, which ended in anger or misunderstanding), in terms
of self-image, or in terms of message content (eg
receiving an unwelcome message by phone). For instance,
it has been noted earlier that older people associate
phone calls with bad news (Kleinfield 1981).

A third factor contributing to telephone apprehension may
be a more generalised aversion to the kind of activity
associated with the technology. The most general form of
this is that, for people who are high communication
apprehensives, the telephone and the tasks conducted by
telephone are inherently communicative, and will
therefore be aversive. The more specific form of this is
to note that people prefer to use the telephone, as
opposed to face-to-face communication, for tasks which
are negative (such as saying "No" or "giving someone the
brush off" (Noble, 1987)) or which are primarily task
orientated rather than socio-emotional in focus. For some
people these tasks are unpleasant and will be avoided,
and to the extent that they are associated with the
telephone, will lead to telephone apprehension.

Negative reactions to the continuing use of the technology

The suggestion has frequently been made that
"technological" environments are inherently and
particularly stressful to human beings (see Brod (1984)
on "technostress"). Hence, by extension, aversion to the
phone may simply be the result of the continuing use of
the phone. If this was the case, then such aversion would
be most apparent, paradoxically, in people with high
levels of telephone usage, either currently, or at some
point in the past. Some indication that this kind of
reaction may be a factor in some cases is given by people
who do not have a domestic telephone. Frequently they are
people who have work telephones, who experience high
levels of demand via their work telephone, and who are
seeking to reduce or eliminate this source of stress
during their non-working time. A more moderate reaction
to this pressure is the use of an ex-directory number,
which limits total access and in particular access from
"unauthorised" callers. The proportion of subscribers
with ex-directory numbers is estimated to be some 33% of
all subscribers. Other tactics are commonly used to limit
some of the stresses associated with the telephone. For
instance, the use of a secretary to filter calls operates
in this way, and is a clear marker of status within an
organisation. A more recent technological version of this
is the use of telephone answering machines as "call-
buffers", either to take and store calls during
particular periods when the person is present but does
not want to be disturbed, or by simply allowing the
receiver to monitor calls before deciding whether or not
to answer them. The simplest form of this kind of
strategy is to take the phone "off the hook", or, on more
recent exchanges, to "pull the plug out".

EVIDENCE THAT THE TELEPHONE IN GENERAL IS AN ANXIETY-
AROUSING MEDIUM

Whilst the research reviewed above deals with individual
differences in telephone apprehension, it is not clear
what level of apprehension is in general associated with
use of the telephone. A number of studies suggest that,
in general, people perceive interactions mediated via the
telephone as less pleasant and more anxiety provoking
than face-to-face interactions, but that this difference
is not large, and may be dependent on the nature of the
topic, task and interactional partner.

In one of the first systematic programmes investigating
"The New Media" the Communication Studies Group, London,
published a series of reports during the 1970's comparing
the characteristics of video interactions with those of
face-to-face interactions. This research programme was
aimed at promoting video-conferenced meetings as
substitutes for face-to-face meetings, and as superior to
telephone or audio-conferenced meetings. A telephone (or
more commonly, an audio) condition was therefore often
included as a comparison in these investigations. These
studies were reviewed by Short, Williams and Christie
(1976). Although no specific measures of differing levels
of anxiety aroused by the different media were included,
a number of general evaluative scales were included in
most studies. Short et al (1976) found that in general
people saw the telephone or audio-only media as "less
pleasant" than the face-to-face medium.

Wilson and Williams (1977), in a study of the Watergate
transcripts, suggested that telephone conversations are
experienced as less pleasant than face-to-face ones. A
number of measures were extracted from the published
transcripts, such as length of conversation, length of
utterances, number of agreements and disagreements,
number of questions, etc. Significant differences between
face-to-face and telephone conversations were felt by the

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authors to support the "telephone is unpleasant" hypothesis.

A review of studies which have examined speech disturbances (a well-documented measure of state anxiety) and which have included a comparison between face-to-face and audio-only conditions suggests that state anxiety is greater in the audio-only condition (eg Rutter and Stephenson, 1977; Rutter, Stephenson and Dewey, 1981). However, in these experimental situations, real telephones are rarely used to implement the audio-only conditions. Subjects are usually faced with microphone and loudspeakers providing hi-fi audio links. It is therefore possible that the elevated levels of anxiety could be a result of the unfamiliarity of the audio-only medium, relative to both the face-to-face condition and to normal telephone use.

Rutter (1987), in a study of university-level telephone teaching, reported a comparison of telephone-mediated tutorials with face-to-face tutorials. Participants were asked at the end of each session to record their impressions of the tutorial using scales such as "formal", "tiring", "humorous" and "anxiety-provoking". Face-to-face tutorials were seen as more spontaneous, humorous, and light-hearted, and as less formal and tense. Although face-to-face tutorials were seen as slightly less anxiety-provoking, this difference was not significant. No analysis by sex or age of participants was reported. Whilst these results suggest that people find the telephone difficult, it does not appear that the experience of the telephone per se is more anxiety-provoking than face-to-face interactions. The differences that were noted could be a function of unfamiliarity with the medium, or could result from the differences in tutor strategies which occurred in the telephone-mediated sessions.

Champness (1972) asked a sample of 112 civil servants how suitable they thought various media (face-to-face, loudspeaking audio, and two types of video system) were for various activities. Analysis revealed four factors:

1: Interpersonal relations: loading highly on scales such as 'maintaining group morale', 'getting to know others' and 'staff relations'.

2: Factual information: loading highly on scales such as 'exchange of factual information' and 'giving orders'.

3: Interpersonal conflict: loading highly on scales such as 'resolving conflicts', 'settling differences of opinion' and 'persuading people'.

4: Chatting: this was an uninterpretable residual factor.

Both Factors 1 and 3 showed substantial medium effects, with face-to-face communication being considered superior to the audio system. However, there were no medium effects for Factor 2. Westrum (1972) in an American study compared face-to-face communication with the telephone and concluded that people felt that telephone communication was most problematic in situations which involved a high degree of emotional contact, such as conflict resolution, the development of trust, and authority relations.

Noble (1987) reported preferences for performing particular communication tasks either face-to-face or by telephone. Face-to-face communication was the overwhelming preference in the majority of situations. Face-to-face contact was seen as preferable if giving good or bad news, gossiping, persuading, trying to get one's own way, and abusing someone. The only situations in which the telephone was preferred tended to be those situations where the interaction needed to be brief, particularly when the initiator of the interaction needed to enforce brevity, and to involve information transfer. These situations were 'saying no', brushing someone off, making arrangements and issuing invitations. These results were replicated by Skelton (1989, using a sample of teenagers) and Harbilas (1989, in a study of

immigrants' attitudes to the telephone in Australia).

Set against this evidence that the telephone is not in general seen as the medium of choice, it is necessary to note evidence, such as that reported by Skelton (1989), that most respondents report enjoying use of the telephone, and consider it an important part of their lives. One way of summarising these apparently contradictory findings is that the limitations of the telephone are recognised, but its usefulness is also recognised, particularly for specific purposes. Another possibility is that the (slight) anxiety associated with the telephone is in fact pleasantly arousing, as is the sense of accomplishment gained from using a problematic medium effectively. However, there is no firm evidence and support for either of these possibilities or to indicate how telephone apprehension relates to other kinds of social or communicative anxiety.

Relation of Telephone Apprehension to Technology Apprehension

In discussing the potential of the "Information Technology Age" Dillman (1985) notes that in addition to the availability of the technology, the adoption and exploitation of information technology and the new media will also require an adequate human infrastructure. That is, it will require people who will be willing and able to use these technologies and media. An unnoticed, but critical element in many of the newer technologies is the telephone and the telephone system. If this is the case, then adoption of the new technologies will require that people are willing and able to use not only the new technologies, but also the existing technology of the telephone.

An example of this inter-connection is given by the work of LaRose and his colleagues (eg LaRose and Bates, 1989;

LaRose and Mettler, 1989). As part of their investigation
of the adoption of new technologies in rural communities,
LaRose and Bates (1989) developed an index of what they
termed "virtual social distance". This was a seven item
scale which measured the extent to which respondents were
willing to accept information technologies as substitutes
for face-to-face interpersonal interactions.

LaRose and Mettler (1989) reported the following data:

Virtual Social Distance: Percentage of rural and nonrural
respondents expressing willingness to use information
technologies to perform certain tasks

	Rural (n=148)	Nonrural (n=298)
Writing a $20 check by computer	42	47
Getting the news of the day by computer	45	50
Taking a (educational) course for credit by cable TV	54	61
Shopping for clothing by cable TV	20	18
Taking part in a committee meeting by phone	43	51
Seeking medical advice by phone	47	47
Negotiating a contract by phone	25	27

None of the rural-nonrural differences were significant.
Percents are those who scored above the midpoint on each
scale item. Higher numbers indicate stronger agreement
with each statement.

This data suggests that there are substantial numbers of
people, in both rural and nonrural communities, who are
reluctant to use the phone for a number of apparently
routine tasks, such as taking part in a committee
meeting, seeking medical advice, or negotiating a
contract by phone. This reluctance to use the telephone
as a substitute for face-to-face contact is at least as
great, and in some cases is greater, than the reluctance

to use the newer technologies.

LaRose and Mettler (1989) also reported a number of indices of attitudes to, and use of the new information technologies. These included "number of home telecommunications terminals" and "use of information technology". A feature common to all three of these indices is that they were developed using confirmatory factor analyses, demonstrate high internal reliabilities, and they included the telephone alongside computer and radio/television/video technologies.

Number of home telecommunications terminals

"Which of the following do you have in your home?"

Extension telephone
Touch-tone phone
Telephone answering machine
        Video cassette recorder
        Cable Television
        Home Satellite receiver
                Personal computer
                Computer printer
                        Weather radio
(Cronbach's Alpha = 0.66)

Use of information technology

"How frequently do you use the following?:"
        (never, sometimes, monthly, daily)

                Toll-free 800 numbers
                900 number telephone polls
                Conference calling
                Speaker phones
                Touch-tone phones
                Cellular telephones
                Automatic telephone diallers
                Telephone answering machines
                Telephone credit cards
                Automatic pagers
                Facsimile machines

                Personal computers
                Computer modems
                On-line data bases
                Electronic mail systems
                Private computer networks
                Audiotext services
                Automatic bank teller machines

                (Cronbach's Alpha = 0.91)

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These scales suggest that attitudes to, and use of the phone may properly be considered to be a component of more general attitudes to, and use of, the new information technologies and vice-a-versa. However, the precise relationship of telephone apprehension to other kinds of technological anxieties is, as yet, unclear.

Significance of Telephone Apprehension

The review of research outlined in this chapter suggests that high levels of telephone apprehension can cause people to avoid making and receiving telephone calls, may impair their effectiveness as communicators when communicating by phone, and may influence their choice of media such that they select other, less appropriate channels for their communications. These effects are likely to have negative impacts upon the social and task effectiveness of these individuals. Because the telephone has been seen as unproblematic, and its use 'transparent' it seems to have been assumed that merely making the telephone available would lead to its increased and appropriate use. Organisations, and individuals, who base their decisions about communicative and other activities on the assumption that because a telephone is available it will be used effectively and appropriately, ignore the possibility that the high levels of telephone apprehension experienced by a significant proportion of the adult population will lead to the avoidance or inappropriate use of the telephone.

The study of telephone apprehension

As has been seen, relatively little research has investigated the phenomena of telephone apprehension. That which has been done suggests that it is an important phenomenon, which has implications not only for use of the telephone itself, but also for the use of the newer

communication media. The lack of research, and the mismatch between the apparent prevalence and importance of a phenomenon associated with the telephone on the one hand, and the lack of systematic research on the other, is one that has been remarked upon previously. Aronson (1971) noted the "ninety-odd years of scholarly neglect, not to say disdain" which characterises academic interest in the telephone. There exists considerable evidence to document the importance of the telephone in people's everyday social and occupational lives (see, for example Pool, 1977, 1983). The telephone has played a significant part in shaping both the physical and the psychological world, and its importance is, according to most forecasters (eg Pelton, 1981; Williams, 1982), likely to remain or even increase in the future. If, as suggested above, telephone apprehension is an identifiable phenomena, which affects whether or not people use the telephone, and the way in which they use it, then there is likely to be considerable practical benefit to be gained from exploring this phenomenon. In addition, such exploration will also provide theoretical elaboration of the concepts of telephone apprehension, as well as explicating one of the components of communication apprehension.

The research described in this thesis investigates the following questions and issues:

1: Is the Telephone Apprehension Inventory an appropriate measure for use with non-USA samples?

2: How prevalent is telephone apprehension in various UK and Australian samples, and at what levels?

3: In these samples, how does telephone apprehension vary as a function of such variables as the age and sex of the respondent?

4: Is telephone apprehension unidimensional, and if not, what are the components of telephone apprehension?

5: Is it possible to demonstrate the validity and reliability of the Telephone Apprehension Inventory?

6: What are the correlates of telephone apprehension, and do these provide plausible alternative explanations of variations in telephone apprehension?

7: What communicative and psychological processes underlie telephone apprehension, and how are anxieties concerning the telephone related to other anxieties?

8: How is telephone apprehension related to telephone behaviour, and what other determinants of telephone behaviour should be taken into account?

CHAPTER FIVE

THE TELEPHONE APPREHENSION INVENTORY

SYNOPSIS

The Telephone Apprehension Inventory (TAI) originally developed by Steele and Reinsch (1983, 1984) was given to three different samples of student subjects from a UK Polytechnic and an Australian IAE, and 306 adult employees of a UK Institute of Higher Education. A final sample of UK students was used to examine the test-retest reliability of the TAI.

It was predicted that male and female subjects, and older and younger subjects would report significantly different levels of telephone apprehension. In addition, it was predicted that sex differences in telephone apprehension would be greater in younger age groups, and less marked in older age groups. Predictions were also made about culture and sample differences. It was predicted that there would be no significant differences in levels of telephone apprehension reported by UK and Australian subjects, but that both UK and Australian subjects would report higher levels of telephone apprehension than American subjects. Comparable student and non-student samples were predicted to have significantly different levels of telephone apprehension.

Analysis of the different subject groups showed a pattern of highly consistent results. For all of the groups examined, internal reliability was high, with alphas of 0.95 or better. The test-retest reliability study showed a correlation of 0.90 between data collected over several weeks. Significant sex differences were found in all three samples, with males reporting higher telephone apprehension than females. There were no significant main effects of age in any of the three samples. In neither the UK nor the Australian Student samples were there significant age by sex interactions. However, in the UK Non-student sample there was a significant age by sex

interaction, such that sex differences were greater for older subjects. UK students reported significantly higher telephone apprehension than Australian students, and both UK and Australian students reported higher levels than comparable US students. No significant culture by age or sex interactions were found. Comparison of the UK Student and Non-student samples showed that students reported significantly greater levels of telephone apprehension. No significant interaction effects of sample with age or sex were found.

Subjects with high levels of telephone apprehension would reported making and receiving fewer calls at their domestic telephone than subjects with low telephone apprehension. Women tended to report making more calls than men, and older respondents tended to report making more calls than younger respondents. No significant sex differences in estimates of calls received were found, and no strong, systematic patterning of calls received was found.

CHAPTER FIVE

THE TELEPHONE APPREHENSION INVENTORY

INTRODUCTION: HYPOTHESES AND RATIONALE

This chapter reports a series of studies which explored
the characteristics of the Telephone Apprehension
Inventory developed by Steele and Reinsch (1983, 1984).
The studies explored the nature of sex, age, culture and
sample differences, and the relation of telephone
apprehension to reported telephone use.

Sex and Telephone Apprehension

The literature shows that differences in communication as
a function of gender are pervasive (Aries, 1987). Gender
differences in both verbal and nonverbal behaviour are
well established and are of comparable, or greater,
magnitude to most other psychological gender differences
(Aries, 1987; Hall, 1984). It is therefore likely that
there will be significant differences between males and
females in their levels of telephone apprehension.
However, no convincing prediction can be made about the
direction of this difference. The existing literature
suggests that plausible predictions can be made in both
directions. These rationales are outlined below.

Proposition: Females experience higher levels of telephone apprehension than males.

Rationale 1: Research on gender differences in nonverbal
behaviour (Hall, 1984, 1987) shows that consistent
differences between males and females exist across a wide
variety of variables. In particular, females are superior
on measures of various nonverbal skills. Females are more
active nonverbally than males. They smile and gaze more,
have more expressive faces, stand closer to others and
face them more directly, touch and are touched by others

more, and show more involved, more expressive and more self-conscious body movements. To the extent that females are more skilled and more active users of nonverbal behaviours, then it is likely that their habitual conversational patterns will be disrupted to a greater extent than less skilled and less active users when they converse via a medium, such as the telephone, which eliminates these cues. It can therefore be predicted that females will have higher levels of telephone apprehension than males.

Rationale 2: Women are characteristically more oriented towards social-emotional participation, men towards task-instrumental activities (Aries, 1987; Baird, 1976). This differential orientation to conversation is associated with differential attention to both verbal and nonverbal cues, with socio-emotional uses demanding that more attention is given to nonverbal cues. To the extent that the telephone eliminates nonverbal channels, women would see the telephone as less suited, and men would see it as more suited to their particular purposes. If a person is aware that the medium of communication is unsuitable for their purposes, this is likely to generate anxiety concerning its use. It can therefore be predicted that women will be more, and men less anxious about using the telephone.

Rationale 3: Edelsky (1981) found that there were two types of conversational "floor". The first was orderly, with one-at-a-time interaction and monologues. The second involved two or more people talking at once, jointly building an idea, with deep conversational overlaps. Men predominated in the first kind of conversational activity, women in the second. It has been argued that the telephone is primarily suited to, and is used for the first kind of conversation, whereas face-to-face conversation is primarily of the second kind (Morley and Stephenson, 1969, 1970). If this is the case, then women are likely to be more apprehensive about the telephone

than men, because it would appear to demand, or facilitate, the use conversational styles and strategies which they do not habitually favour.

These rationales all suggest that women experience higher levels of telephone apprehension than men.

Proposition: Males experience higher levels of telephone apprehension than females.

Rationale 1: The literature comparing the structure of telephone and face-to-face conversations predicts, because of the role that visual behaviour is claimed to play in turn-taking, that the elimination of visual clues in telephone conversations should lead to the disruption of these turn-taking behaviours. However, empirical investigation (eg Beattie and Barnard, 1979) shows that this is not the case. In practice telephone conversations are as well-organised as, or better organised than, face-to-face conversations. It has been suggested (Fielding and Hartley, 1987) that this could be because conversations and conversationalists exhibit:

        a: redundancy

        b: substitution

        c: strategy shifts.

Redundancy suggests that normal conversations are structurally highly redundant, and are therefore robust when subjected to degradation, such as that experienced during telephone conversations. Substitution suggests that the information normally carried by visual signals is transferred to other channels (eg vocal cues such as filled pauses). Strategy shifts suggest that speakers adopt different models for conducting conversations when using different media. If these switches do occur, then those conversationalists who are less skilled are likely to experience greater anxiety when shifting to relatively unfamiliar media, simply because the required adaptations will be more problematic for them. It may also cause

anxiety because the relatively unfamiliar strategy may require a greater level of competence to implement successfully. Communicating by telephone may be a more skilled activity than communicating face-to-face. It is relatively unusual, it demands that the conversationalists follow restricted rules, and it requires discipline and more active participation on the part of the listener as well as by the speaker. Aries (1987) and Hall (1984, 1987) have shown that on a number of indices of conversational behaviour, women show higher levels of skill and lower levels of anxiety than men. Thus, the generally greater communication skills of women suggests that women would be able to adapt to the requirements of telephone communication more successfully than men. To the extent that men are less competent, then they would find the modified strategies and behaviours required more demanding and less acceptable. If this were the case, then it would be predicted that men would experience higher levels of telephone apprehension than would women.

Rationale 2: Rakow (1988) has noted the early association of the telephone with women's talk, and its importance as a means of communication for women. Pool, for instance, suggested that the telephone is essentially "a female instrument", used to alleviate the boredom and loneliness of women's lives (Pool, 1977, 1983). Popular belief about the telephone sees it as particularly suited to women's talk, and this has been reflected in both scholarly and non-scholarly writings. For instance, Boettinger states: "Few devices are so well matched to the needs and style of women." (Boettinger, 1977, p15). Early surveys of telephone use reported that both men and women agreed that women used the telephone more frequently, and cited greater telephone apprehension as a reason for this: "Many men said they did not like to use the phone, so they had the women call for them" (Robertson and Amstutz, 1949, p.18). In her ethnographic study, Rakow (1986) identified a systematically unequal sex distribution of

telephone use, in terms of frequency of usage, functions, and conversational roles. She noted that male dislike of the telephone was frequently cited as a reason for this unequal distribution of telephone talk. Steele and Reinsch (1984) found that females reported both initiating and receiving more calls than did males. Moyal (1989), in an Australian study, reported high levels of female use of the telephone for "psychological care within the telephone community". Noble (1987) found that women use the phone more frequently than men for intrinsic purposes, but there were no sex differences in instrumental use of the domestic telephone.

Given that this differential pattern of telephone use is widespread, then it could be predicted that, because of greater familiarity with the telephone, women are likely to experience lower levels of telephone apprehension than men.

Proposition: Males and females do not experience
different levels of telephone apprehension.

There may be no systematic sex differences in levels of telephone apprehension. As noted in Chapter Two, existing research on sex differences in CA shows no significant and consistent differences as a function of sex. For instance, Strohkirch and Parks (1986) showed that people experience most communication apprehension in public speaking contexts, and least in dyadic contexts. Situational differences were a strong main effect in their study, but there were main effects of sex, and no sex by situation interaction effects. Thus, because the telephone is a dyadic communication situation, levels of apprehension are likely to be low, and no sex differences would be predicted.

Skelton (1989), in a study of teenagers telephone use, found no sex differences in either number of calls made,

nor in the duration of calls made. Skelton notes that these results may be unique to teenagers, as at this stage the teenage girl has not assumed the role of keeping up with a network of family and friends, and the teenage boy does not have a partner to do this for him.

Whilst all three sets of rationales outlined above are highly speculative, taken together, they suggest that men and women can be expected to experience different levels of telephone apprehension, but the direction of difference is, a priori, unclear. The following hypothesis was therefore formulated:

HYPOTHESIS 1: MALE AND FEMALE SUBJECTS WILL REPORT SIGNIFICANTLY DIFFERENT LEVELS OF TELEPHONE APPREHENSION.

Age and Telephone Apprehension

Despite the important relationships between age and communication, research on this topic has been limited. Whilst there is considerable research on early communicative development, this is concentrated in the very early years (between 0 and approximately 10 years of age), with very little work exploring the continuing development of communication through adolescence and into adulthood. Little or no attention has been paid to variations in communication as a function of age during the very broadly defined period of "adulthood" (approximately 16 to 65 years of age) and only recently has attention been paid to the issue of communication and aging (approximately 65+). The majority of research on the relationship between communication patterns and age has been concerned with adult socialisation (for instance, examining adoption of occupational jargons) or has focussed on patterns of mass media use (Dion, 1985; O'Keefe and Reid-Nash, 1987). Almost no work has been concerned with differences in patterns of interpersonal communication.

Within the adult age band (approximately 16 to 65), and with respect to telephone communication, theorising about relationships between age and telephone apprehension must be speculative. It is possible, however, to predict that there will be a significant difference in normative levels of telephone apprehension as a function of age, although no convincing prediction can be made about the direction of this difference. Plausible rationales can be provided for predictions that younger respondents will be more anxious than older respondents, and for the prediction that older respondents will be more anxious than younger respondents. These alternative rationales are outlined below.

Proposition: Older respondents experience higher levels of telephone apprehension than younger respondents.

Rationale 1: Older people are more likely than younger people to have hearing problems, and they are more likely to be concerned about their competence when using a medium of communication which relies entirely on the auditory channel (Corso, 1977). The telephone also limits the amount and nature of the feedback that can be provided to put the person at ease and make the conversation more personal (Singer, 1981), factors which seem to be particularly important to older people (Botwinick, 1978). To the extent that these decrements are progressive, it can be expected that there will be an overall relationship between increasing age and increasing apprehension concerning telephone use.

The proposition that older respondents will experience higher levels of telephone apprehension than younger respondents is supported by Herzog, Rodgers and Kulka (1983). They compared data from face-to-face and telephone surveys and examined the reaction of older adults (65+) to telephone use. They found that, despite the fact that older people are slightly more likely than

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younger people to have a telephone (Thornberry and
Massey, 1978), older people, but not younger people,
experienced telephone interviews as significantly more
stressful and tiring than face-to-face interviews.
Despite the fact that they were more likely to be at home
to a face-to-face survey interviewer, older people were
significantly more likely to avoid telephone interviews
than were younger people, presumably because they found
them more stressful.

Proposition: Younger respondents experience higher levels
of telephone apprehension than older respondents.

Rationale 1: Younger people, simply because they are
younger, will have less experience of using the telephone
than older people. To the extent that familiarity with an
activity is associated with decreased anxiety, younger
people would therefore report higher levels of telephone
apprehension than older people.

Taken together, these rationales suggest that reported
levels of telephone apprehension are likely to vary as a
function of age, but that the direction of this
relationship is, a priori, unclear. The following
hypothesis was therefore formulated:

HYPOTHESIS 2A: OLDER AND YOUNGER SUBJECTS WILL REPORT
SIGNIFICANTLY DIFFERENT LEVELS OF TELEPHONE APPREHENSION.

Proposition: Age and sex will interact in influencing the
level of telephone apprehension experienced.

Burgoon (1985) suggested that, at least with respect to
nonverbal behaviour, the most generalised relationship
with age is that older people adopt more gender-neutral
styles. If this relationship also applies to verbal
behaviour, and to the use of the telephone in particular,

this would lead to the prediction that there would be an interaction between sex and age effects, such that sex differences would be most marked amongst younger people. The following hypothesis was therefore formulated:

HYPOTHESIS 2B: SEX DIFFERENCES IN TELEPHONE APPREHENSION WILL BE GREATER IN YOUNGER AGE GROUPS, AND LESS MARKED IN OLDER AGE GROUPS.

Cultural Differences and Telephone Apprehension

Despite the important relationships between differences in cultural patterns and patterns of communication, and the important role that cultural differences might be expected to play in determining attitudes to, and use of the telephone, as with other aspects of research on the telephone, research has been limited. Despite this neglect, cultural differences in the use of, and in attitudes to the telephone, are readily apparent. Comparison of different countries in terms of the number of telephones installed, and of telephones per person show wide variation between countries, as data from the following countries illustrates:

Country	Telephones per 100 population
UK	53.3
Australia	53.5
USA	75.9
Denmark	74.0
Irish republic	25.0
Tanzania	0.5
South Africa	11.5
Argentina	10.3
Mexico	8.9
India	0.5
Taiwan	25.8

International Marketing Data and Statistics 1987/88; Euromonitor, 1987: data for 1984

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A number of predictions can be made concerning the variations in levels of telephone apprehension in different countries and cultures.

Proposition: Respondents in different countries will be characterised by significantly different levels of telephone apprehension.

Rationale 1: To the extent that telephone apprehension is related to differing familiarity with, and frequency of usage of the telephone, then it would be expected to reflect the number and proportionate penetration of installed telephones, and of telephone use. Frey (1973) presents data by country, ranked in terms of the number of domestic telephones installed per 1000 head of population, using 1969 data. In these tables, the US is ranked 1, Australia is ranked 8 and the UK ranked 11, in a table listing 100 different nations. The more recent data presented above is consistent with these rankings, but suggests a narrowing of the difference between the UK and Australia. Assuming the association of familiarity and decreased anxiety, these figures suggest that reported telephone apprehension is likely to be similar for UK and Australian subjects, and would be higher in both groups than in comparable groups of American subjects.

Proposition: Respondents in different countries will not experience significantly different levels of telephone apprehension.

Rationale 1: As noted earlier, levels of communication apprehension, and the proportion of shy people in any given population appears to be relatively constant across a wide variety of cultures (Richmond and McCroskey, 1985). These findings suggest that it is unlikely that there will be significant cultural differences in levels

of telephone apprehension.

These speculative rationales suggest that reported levels of telephone apprehension may vary as a function of cultural differences, although these differences may be neither large nor consistent. In order to explore these differences, the following hypothesis was formulated:

HYPOTHESIS 3A: BRITISH AND AUSTRALIAN SUBJECTS WILL DIFFER SIGNIFICANTLY IN THE LEVELS OF TELEPHONE APPREHENSION THAT THEY REPORT, AND BOTH UK AND AUSTRALIAN SUBJECTS WILL REPORT HIGHER LEVELS OF TELEPHONE APPREHENSION THAN COMPARABLE AMERICAN SUBJECTS.

Sample Differences and Telephone Apprehension

In the current study data was collected from both student and non-student subject populations. One rationale suggests that, given the nature of student life (low income, rented accommodation, individualised rather than organisationally directed work, etc) then, relative to their same age peers, students are likely to make less use of the telephone during their working day, and may possibly make less use of the telephone during their non-working day. If this is the case, and if familiarity leads to decreased anxiety, it could be predicted that students would report higher levels of telephone apprehension than comparable non-students. On the other hand, Herzog, Rodgers and Kulka (1983) suggested that telephone use may require a reasonably high level of ability and sophistication, and this is related to overall educational level, such that less educated people avoided the telephone more than better educated people. If this is the case, and it is assumed that students are better educated than their peers, then it may be predicted that students would report lower levels of telephone apprehension than comparable non-students.

It can therefore be predicted that telephone apprehension is likely to vary as a function of sample characteristics (ie Student vs Non-student), but that the direction of difference is unclear. The following hypothesis was therefore formulated:

HYPOTHESIS 3B: STUDENT SUBJECTS AND NON-STUDENT SUBJECTS WILL REPORT SIGNIFICANTLY DIFFERENT LEVELS OF TELEPHONE APPREHENSION.

Many theorists have noted the avoidance of situations associated with anxiety (eg Lazarus and Averill, 1972; Spielberger, 1966, 1972). Lederman (1983) showed that self-reports of avoidance were characteristic of people with high levels of communication apprehension. Steele and Reinsch (1984) found correlations of -0.2704 (n=434, p<0.001) between telephone apprehension and self-reports of calls initiated, and -0.1412 (n=434, p<0.002) between telephone apprehension and self-reports of calls received. Given this general relationship between anxiety and avoidance, it was predicted that high telephone apprehensives would report making and receiving fewer calls per day than low telephone apprehensives. Because of the greater control over the number of calls, it was predicted that the correlation between telephone apprehension and calls made would be significantly higher than that between telephone apprehension and calls received.

HYPOTHESIS 4: SUBJECTS WITH HIGH LEVELS OF TELEPHONE APPREHENSION WILL REPORT MAKING FEWER CALLS FROM THEIR DOMESTIC TELEPHONE THAN WILL SUBJECTS WITH LOW LEVELS OF REPORTED TELEPHONE APPREHENSION.

HYPOTHESIS 5: SUBJECTS WITH HIGH LEVELS OF TELEPHONE APPREHENSION WILL REPORT RECEIVING FEWER CALLS ON THEIR DOMESTIC TELEPHONE THAN WILL SUBJECTS WITH LOW LEVELS OF REPORTED TELEPHONE APPREHENSION.

EXISTING DATA RELEVANT TO THESE HYPOTHESES

Some data relevant to these hypotheses are reported by
Steele and Reinsch (1984). They examined differences in
telephone apprehension as a function of age and sex.
Telephone apprehension was higher among men than among
women. The overall mean was 42.96 (sd=11.52, n=434). For
men the mean was 44.17 (sd=11.01, n=240), whilst for
women the mean was 41.46 (sd=11.98, n=194). Telephone
apprehension was also higher among older than younger
students. However, whilst the ages of subjects ranged
from 17 to 46, 93.5% of their sample were students
between 18 and 23 years old.

Wurtzel and Turner (1977) found no significant
relationships between reported use of the telephone and
the age, sex or occupation of the respondent. The
perceived necessity of the phone was high, with 90% of
respondents seeing it as "necessary to daily living" to
some degree or other. Wurtzel and Turner (1977) reported
that perceived necessity was associated with the
increasing age of the respondent, but did not report
significant relationships for either sex or occupation.
They asked respondents six questions about the
psychological functions of the telephone, asking whether
absence of the phone made them feel "uneasy",
"frustrated", "isolated", "less hectic", "free from
intrusion", and "more in control of things", and noted
that responses to these six questions were unrelated to
the age, sex or occupation of the respondent.

METHOD

In order to explore the hypotheses outlined above, the
Telephone Apprehension Inventory (TAI) originally
developed by Steele and Reinsch (1983, 1984) was given to
four different samples of subjects. Demographic questions
concerning age and sex, and instructions assuring

subjects of anonymity and confidentiality were added to the original TAI.

The first sample of subjects were undergraduate students from all years of a variety of courses in different faculties of Sheffield City Polytechnic. Questionnaires were distributed and then collected by lecturing staff during scheduled teaching sessions.

A second sample of undergraduate Sheffield City Polytechnic students was used to examine the test-retest reliability of the TAI. Respondents completed TAI's on two separate occasions, with the interval between the first and second sessions being from three to six weeks. Both questionnaires were completed during teaching sessions, and collected at that point.

The third sample were Australian undergraduate students from all years of a variety of courses in various faculties at the Darling Downs IAE, Queensland. Questionnaires were distributed by lecturing staff during scheduled teaching sessions. Some were collected during those sessions, others were returned individually via the internal postal system.

In order to explore the hypotheses concerning age outlined above, as noted with respect to Steele and Reinsch (1984), it is necessary to collect data across the entire adult age range, rather than from the limited age range represented by student populations. Exploration of other hypotheses (eg sex differences) would also be more robust with such samples. The fourth sample, therefore, were adult non-students. They werewas all members of the academic (full and part-time) and the non-academic staff (porters, van-drivers, refectory staff, etc) of the Dorset Institute, Poole. They were contacted individually by letter via the internal mail system. They were also asked to estimate the number of calls made and received per day from their domestic telephone. The

questionnaire focused on domestic calls because work
phone usage is likely to be more constrained by
situational demands. The questions also distinguished
between calls made, where considerable choice can be
exercised, and those received, where the exercise of
choice is more limited.

In addition to these four samples, published data were
available for some 300 American undergraduate students
(Steele and Reinsch, 1983).

In addition to internal analyses, these samples allowed a
number of comparisons to be made:

```
┌─────────────────┐              ┌─────────────────┐
│  UK STUDENT     │──────────────│      UK         │
│  SAMPLE         │              │  NON-STUDENT    │
│                 │              │  SAMPLE         │
└─────────────────┘              └─────────────────┘
        │
┌─────────────────┐
│  AUSTRALIAN     │
│  STUDENT        │
│  SAMPLE         │
└─────────────────┘
        │
┌─────────────────┐
│  US STUDENT     │
│  DATA           │
│                 │
└─────────────────┘
```
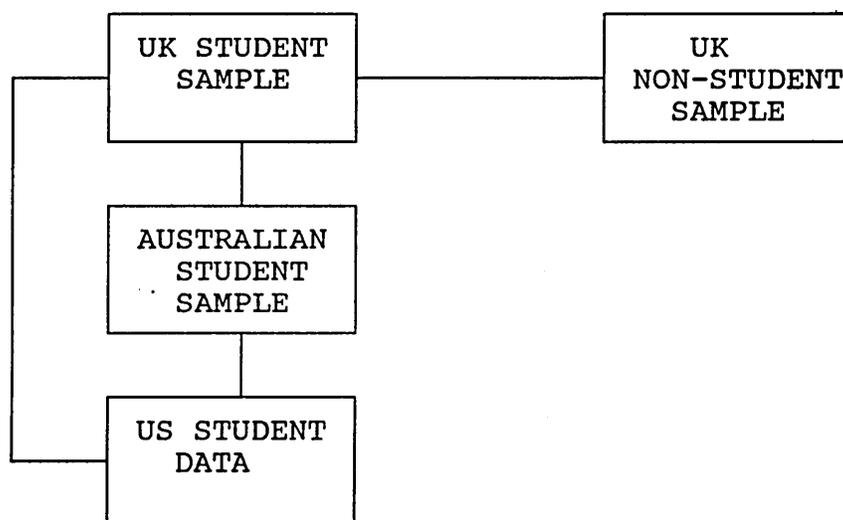
RESULTS: UK STUDENT DATA

A total of 405 usable responses were returned. As there
were no respondents under 16, and over 45, the age
classification was simplified to just two categories:

Age	-25	26+	TOTAL
MALE	216 (53.3%)	26 (6.4%)	242 (59.8%)
FEMALE	146 (36.1%)	17 (4.2%)	163 (40.2%)
TOTAL	362 (89.4%)	43 (10.6%)	405

149

The means and standard deviations for the composite score
of the 20 items of the TAI (with the direction of scoring
of individual items reversed where appropriate) (the T20
score) were as follows:

	T20 SCORES: UK Student Data		
AGE	-25	26+	TOTAL
MALE	m=50.63	m=51.38	m=50.71
	sd=14.13	sd=11.42	sd=13.85
	n=216	n=26	n=242
FEMALE	m=47.15	m=44.00	m=46.82
	sd=14.01	sd=10.97	sd=13.73
	n=146	n=17	n=163
TOTAL	m=49.23	m=48.47	m=49.15
	sd=14.17	sd=11.70	sd=13.92
	n=362	n=43	n=405

(Note: Minimum T20 score is 20, maximum T20 score is 100,
increasing scores indicate increasing apprehension.)

The distribution of TAI T20 scores approximates to a
normal distribution, with some positive skewing, but an
absence of marked kurtosis.

```
Distribution of T20 Scores: UK Student data
            See Figure C05F01
```

An item-by-item examination (see Table 5.01, Appendix 1)
showed that all items correlate highly and significantly
with the overall T20 measure. These correlations are
similar, and are on average slightly higher, than those
reported by Steele & Reinsch (1983, 1984).

Alpha (Cronbach, 1951) was 0.9460, with the following
split-half reliability statistics:

          simple split half reliability = 0.8529
         equal length Spearman-Brown = 0.9206
                Guttman split-half = 0.9200

A separate study of test-retest reliability used an
additional 94 respondents. The age and sex distribution
of respondents was as follows:

DISTRIBUTION OF T20 SCORES

Figure C05F01

UK STUDENT DATA

Mean=49.15   sd=13.915

Min=21,   Max=94

Skewness=0.574

Kurtosis=0.038

N=405
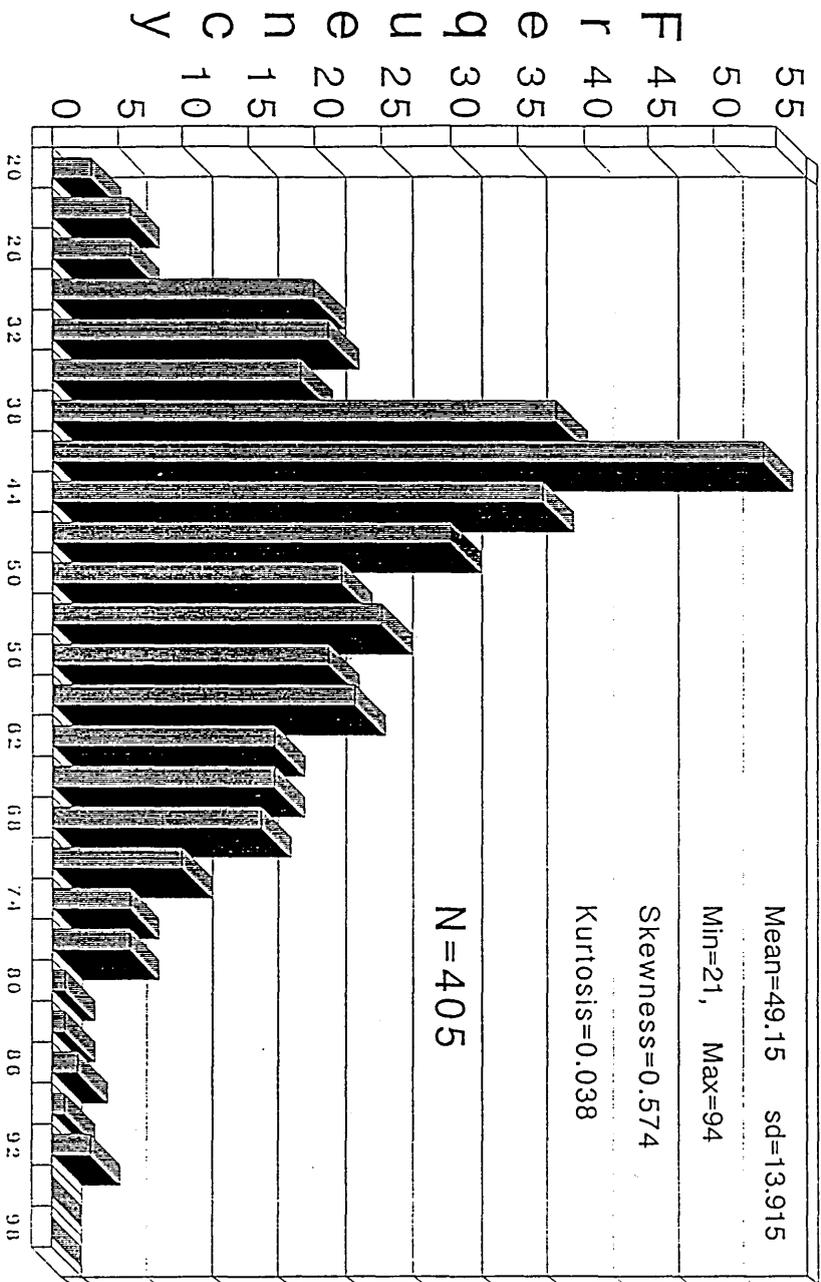
Age	-25	26+	TOTAL
MALE	17 (53.3%)	2 (6.4%)	19 (20.2%)
FEMALE	67 (36.1%)	8 (4.2%)	75 (79.8%)
TOTAL	84 (89.4%)	10 (10.6%)	94

Intervals between test and retest varied between a minimum of three weeks and a maximum of six weeks.

Alpha for the test sample was 0.9538, and for the retest sample 0.9656. The Pearson product-moment correlation between the test and retest forms for the TAI T20 score was 0.9039 (df=92, p<0.0001). The mean test T20 score was 48.734 (sd=14.873), and the mean retest T20 score was 48.394 (sd=15.440). The t-value was 0.49 (df=93, nsd). These measures indicate that the TAI scale and T20 score have acceptable reliability.

COMPARISON WITH A US STUDENT SAMPLE

An initial comparison of the summary descriptive statistics provided by Steele & Reinsch (1983, 1984) and the present data suggests that telephone apprehension is greater in UK students than in a comparable sample of US students.

	UK SAMPLE	UK RELIABILITY TEST SAMPLE	US SAMPLE 1983	1984
MEAN =	49.146	48.734	40.862	42.96
SD =	13.915	14.873	11.636	11.52
ALPHA =	0.946	0.954	0.940	0.938
MODE =	41	47	42	na
MEDIAN =	46	46.5	40	42.02
MIN SCORE =	21	21	20	20
MAX SCORE =	94	92	83	93
RESPONDENTS	405	94	333	434

na = not available

A 2 x 2 analysis of variance was performed to examine the effects of age and sex differences (see Table 5.02, Appendix 1). (The test-retest reliability sample data were not included in these and subsequent analyses). Males have significantly higher T20 scores than females (Male T20=50.71, Female T20=46.82; F=7.721, df=1, 401; p<0.006). A comparison of younger males and females gives t=2.31 (Young Males=50.63, Young Females=47.15, df=360, p<0.022, 2-tailed). A comparison of older males and females gives t=2.11 (Older Males=51.38, Older Females=44.00, df=41, p<0.041, 2-tailed). Thus, Hypothesis 1 is supported, with both younger and older males significantly more anxious about the telephone than comparable females. There are no significant age differences (F=0.126, df=1, 401, nsd), although the relatively small number of older subjects should be noted. The interaction effect of age and sex is non-significant (F=0.734, df=1, 401, nsd). Thus, neither Hypothesis 2A nor 2B is supported.

RESULTS: AUSTRALIAN STUDENT DATA

A total of 389 responses were obtained, distributed as follows:

AGE	-25	26+	TOTAL
MALE	102 (26.2%)	33 (8.5%)	135 (34.7%)
FEMALE	195 (50.1%)	59 (15.2%)	254 (65.3%)
TOTAL	297 (76.3%)	92 (23.7%)	389

The T20 scores for each of these cells were as follows:

AGE	-25	26+	TOTAL
MALE	m=49.13 sd=12.30 n=102	m=48.42 sd=13.04 n=33	m=48.96 sd=12.44 n=135
FEMALE	m=44.87 sd=13.29 n=195	m=43.39 sd=14.72 n=59	m=44.52 sd=13.62 n=254
TOTAL	m=46.33 sd=13.10 n=297	m=45.20 sd=14.28 n=92	m=46.06 sd=13.38 n=389

The distribution of T20 scores for this sample approximates to a normal distribution, with some positive skewing and a small degree of negative kurtosis.

> Distribution of T20 Scores: Australian Student Data
> See Figure C05F02

An item-by-item analysis (see Table 5.03, Appendix 1) showed that all individual items correlated highly and significantly with the overall T20 measure, and these correlations were similar to, and in fact slightly higher than, those reported by Steele and Reinsch (1983, 1984).

Alpha was 0.9576 for the 389 cases analysed, with split-half reliability statistics with high and significant values:

$$
\begin{aligned}
\text{split half reliability} &= 0.8884 \\
\text{equal length Spearman-Brown} &= 0.9409 \\
\text{Guttman split-half} &= 0.9401
\end{aligned}
$$

These statistics all suggest that the TAI has high and adequate reliability.

COMPARISON WITH A US STUDENT SAMPLE

A preliminary comparison between this data and the data provided by Steele and Reinsch (1983, 1984) suggests that telephone apprehension is greater in Australian students than amongst similar US students.

DISTRIBUTION OF T20 SCORES

Figure C05F02

AUSTRALIAN STUDENT DATA

Mean=46.062,   sd=13.375

Min=20,   Max=88

Skewness=0.406

Kurtosis=-0.227

N = 389

155
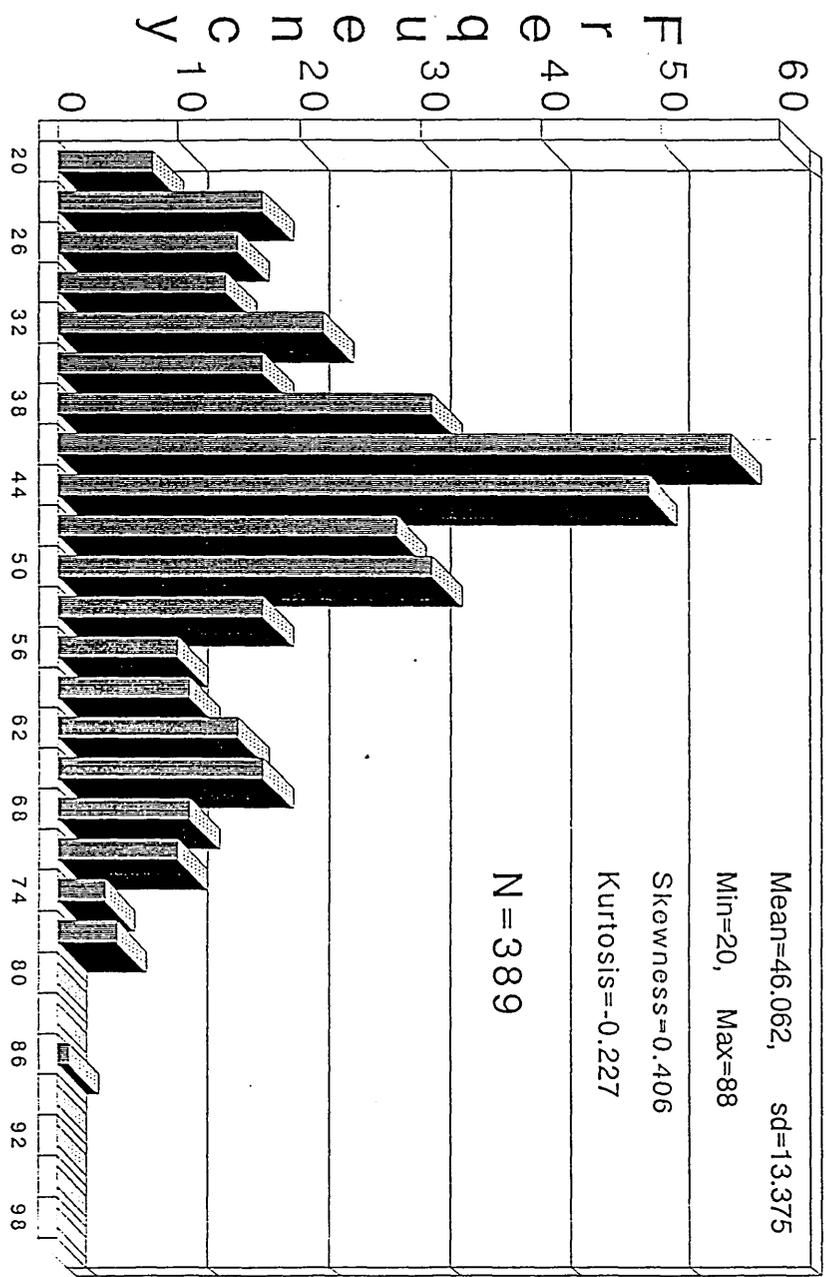
	AUSTRALIAN SAMPLE	US SAMPLE 1983	1984
MEAN =	46.062	40.862	42.96
SD =	13.375	11.636	11.52
ALPHA =	0.906	0.940	0.938
MODE =	43	42	na
MEDIAN =	44	40	42.02
MIN SCORE =	20	20	20
MAX SCORE =	88	83	93
RESPONDENTS	389	333	434

na = not available

AGE AND SEX DIFFERENCES

A 2 x 2 ANOVA examined age and sex differences (see Table 5.04, Appendix 1). Males have significantly higher T20 scores than females (Male T20=48.96, Female T20=44.52; F=9.930, df=1, 385, p<0.002). A comparison of younger males with females gives t=2.69 (Younger Males=49.13, Younger Females=44.87, df=295, p<0.008, 2-tailed). A comparison of older males and females t=1.64 (Older Males=48.42, Older Females=43.39, df=90, p<0.105, 2-tailed). Thus, Hypothesis 1 is again supported, with both younger and older males being more anxious about the telephone than comparable females, but with this difference being clearer (and significant) in younger age groups. There were no significant age differences (Younger T20=46.33, Older T20=45.20; F=0.587, df=1, 385, nsd), and the sex by age interaction effect was not significant (F=0.055, df=1, 385, nsd). Thus, there was no support for either Hypothesis 2A or 2B.

COMPARISON OF UK AND AUSTRALIAN STUDENT SAMPLES

The correlation between the mean ratings of the 20 items of the TAI for the UK and Australian samples was highly significant (r=0.9546, df=18, p<0.0001), indicating that UK and Australian respondents were responding in a similar manner to the different scale items (see Table 5.05, Appendix 1).

A 3-way ANOVA examined culture, sex and age effects (see Table 5.06, Appendix 1).

SAMPLE	SEX	AGE	MEAN T20 SCORES			
UK	MALE	-25	50.63 (n=216)	50.71	49.07	47.06
		26+	51.38 (n= 26)			
	FEMALE	-25	46.95 (n=146)	46.64		
		26+	44.00 (n= 17)			
AUSTRALIAN	MALE	-25	49.13 (n=102)	48.96	46.06	
		26+	48.42 (n= 33)			
	FEMALE	-25	44.87 (n=195)	44.52		
		26+	43.39 (n= 59)			

Summary of comparisons		
Culture: UK =49.07 (n=405)	Australian=46.06 (n=389)	
Sex: Male=50.08 (n=377)	Female=45.35 (n=417)	
Age: -25 =47.88 (n=659)	26+ =46.24 (n=135)	

There is a significant overall difference in the T20 scores of the UK and Australian Student samples (F=3.217, df=1, 786, p<0.073). There is also a highly significant sex difference (males=50.1, females=45.4, F=18.208, df=1, 786, p<0.001). The age difference was not significant, and none of the 2-way or 3-way interactions were significant. Hypothesis 3A, which predicted a significant difference in the level of telephone apprehension reported by UK and Australian subjects, is therefore supported.

COMPARISON OF UK AND AUSTRALIAN DATA WITH US STUDENT DATA

A simple comparison of means shows the following differences:

	UK	AUS	US(1983)	US(1984
MEAN =	49.146	46.062	40.862	42.96
SD =	13.915	13.375	11.636	11.52
MODE =	41	43	42	na
MEDIAN =	46	44	40	42.02
MIN SCORE =	21	20	20	20
MAX SCORE =	94	88	83	93
KURTOSIS =	0.038	-0.227	1.304	na
SKEWNESS =	0.574	0.406	0.884	na
RESPONDENTS	405	389	333	434

na = not available

In addition to the summary descriptive statistics
reported above, Steele and Reinsch (1983) provide a
histogram of the distribution of subjects' responses,
collapsed into intervals of 3. In order to conduct
statistical analyses of the differences between the
samples, the original US data was reconstructed. A total
of 333 T20 scores were generated which replicated the
published distribution of responses, and which gave
summary descriptive statistics approximating as closely
as possible those provided by Steele & Reinsch (1983).

	ORIGINAL US DATA	RECONSTRUCTED US DATA
MEAN =	40.862	40.994
SD =	11.636	12.14
MODE =	42	42
MEDIAN =	40	40
MIN SCORE =	20	20
MAX SCORE =	83	83
KURTOSIS =	1.304	1.300
SKEWNESS =	0.884	1.058
RESPONDENTS =	333	333

A one-way analysis of variance then compared UK,
Australian and US Student samples (see Table 5.07,
Appendix 1). There is a highly significant difference in
T20 scores as a function of sample. Examination of t-test
comparisons between the cells shows that the UK and
Australian samples differ significantly (t=3.10, df=792,
p<0.002), and the Australian and US samples are also

p<0.002), and the Australian and US samples are also significantly different (t=5.29, df=720, p<0.001). Thus, Hypothesis 3A is again supported, with both UK and Australian samples having significantly higher levels of telephone apprehension than comparable US samples.

RESULTS: UK NON-STUDENT SAMPLE

A total of 468 members of the non-academic staff working at the Dorset Institute, Poole were contacted individually, and 316 questionnaires were returned (67.5%), of which 306 (65.4%) were usable (ie complete). The age by sex distribution was:

Age	16-25	26-35	36-45	46-55	56-65	TOTAL
MALE	7	29	55	44	18	153 (50.0%)
FEMALE	10	25	70	35	13	153 (50.0%)
TOTAL	17	54	125	79	31	306
	5.6%	17.6	40.8%	25.8%	10.1%	

The T20 means were:

	T20 SCORES: UK Non-student Data					
Age	16-25	26-35	36-45	46-55	56-65	TOTAL
MALE						
means	37.57	41.55	46.16	44.09	53.44	45.16
sd	9.36	11.66	13.05	12.08	15.58	13.09
n	7	29	55	44	18	153
FEMALE						
means	44.00	48.40	37.09	35.86	33.38	38.79
sd	17.63	18.12	12.94	12.74	10.02	14.61
n	10	25	70	35	13	153
TOTAL						
means	41.35	44.72	41.08	40.44	45.03	41.97
sd	14.77	15.24	13.71	12.97	16.70	14.21
n	17	54	125	79	31	306

The distribution of TAI T20 scores approximated to a normal distribution, but with considerable positive skewing, and moderate kurtosis.

Item-by-item analysis (see Table 5.08, Appendix 1) showed
that all individual items correlated highly and
significantly with the T20 score, and that these
correlations were similar, and on average were slightly
higher than those reported by Steele and Reinsch (1983,
1984).

ANALYSIS OF RELIABILITY: Alpha (Cronbach, 1951) was
0.9540 for the 306 cases analysed, and split-half
reliability statistics were as follows:

> simple split half reliability = 0.8692
> equal length Spearman-Brown = 0.9300
> Guttman split-half = 0.9296

All indices showed acceptably high levels of internal
reliability.

AGE AND SEX DIFFERENCES: UK Non-student Data

A 2(sex) x 5(age) ANOVA showed (see Table 5.09, Appendix
1) that males have significantly higher T20 scores than
females (Male T20=45.16, Female T20=38.79; F=16.615,
df=1, 305; p<0.0001), again providing support for
Hypothesis 1. There is no clear trend in the pattern of
means as a function of age, and the main effect for age
is not significant, again providing no support for
Hypothesis 2A.

However, there is a highly significant age by sex
interaction (F=6.614, df=4, 305, p<0.0001). Examination
of means suggests that for younger respondents, male and
female TAI T20 scores do not differ significantly, but
mean male T20 scores tend to be lower than for females.
However, for older respondents, males have significantly

DISTRIBUTION OF T20 SCORES

Figure C05F03

UK NON-STUDENT DATA

Mean=41.974, sd=14.209
Min=20, Max=98

Skewness=0.727
Kurtosis=0.421

N=306
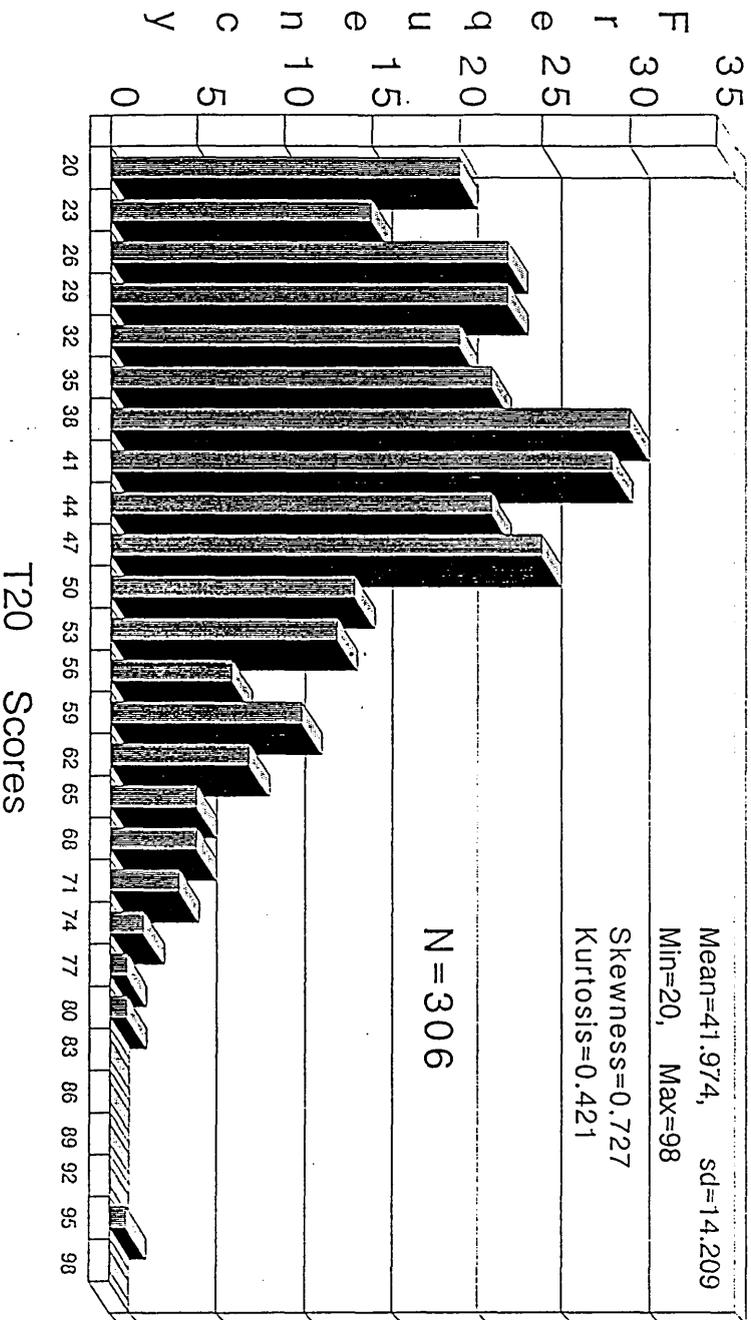
T20 Scores

higher scores than females.

UK Non-student Sample: Mean T20 Scores

Age Group	Combined	Male	Female	t	df	2-tailed probability
16-25	41.35	37.57	44.00	-0.88	15	0.395(nsd)
26-35	44.72	41.55	48.40	-1.67	52	0.100
36-45	41.08	46.16	37.09	3.88	123	0.0001
46-55	40.44	44.09	35.86	2.94	77	0.004
56-65+	45.03	53.44	33.38	4.06	29	0.0001
TOTAL	41.97	45.16	38.79			

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┌─────────────────────────────────────────────────┐
│   T20 scores by age and sex: UK Non-student data │
│              See Figure C05F04                   │
└─────────────────────────────────────────────────┘
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Given the highly significant differences found in the two student samples for the 16-25 age group, with males reporting significantly higher T20 scores, it is probable that the non-significant results for the 16-25 and 26-35 age groups in this sample is due to high within-cell variance and the relatively small cell numbers.

In addition to completing the TAI and demographic data, respondents were also asked about their telephone use. The first question asked them whether they were listed "by name" in the Dorset Institute's Internal Telephone Directory. Overall, 264 (86.3%) of respondents were listed, with only 42 (13.7%) not being listed. Respondents who were not listed were likely to be younger and female, suggesting that listing in the directory is related to occupational status. Comments made by respondents suggest that omission could either be because of the job performed, or because the person was a new member of staff. Comparison of T20 scores as a function of being listed as opposed to not being listed in the directory showed no significant differences (Listed T20=41.89 (sd=14.40, n=264), Not listed T20=42.48 (sd=13.09, n=42), t= -0.25, df=304, p<0.806).

UK Non-Student Sample

T20 Means by Sex and Age

Figure C05F04

163
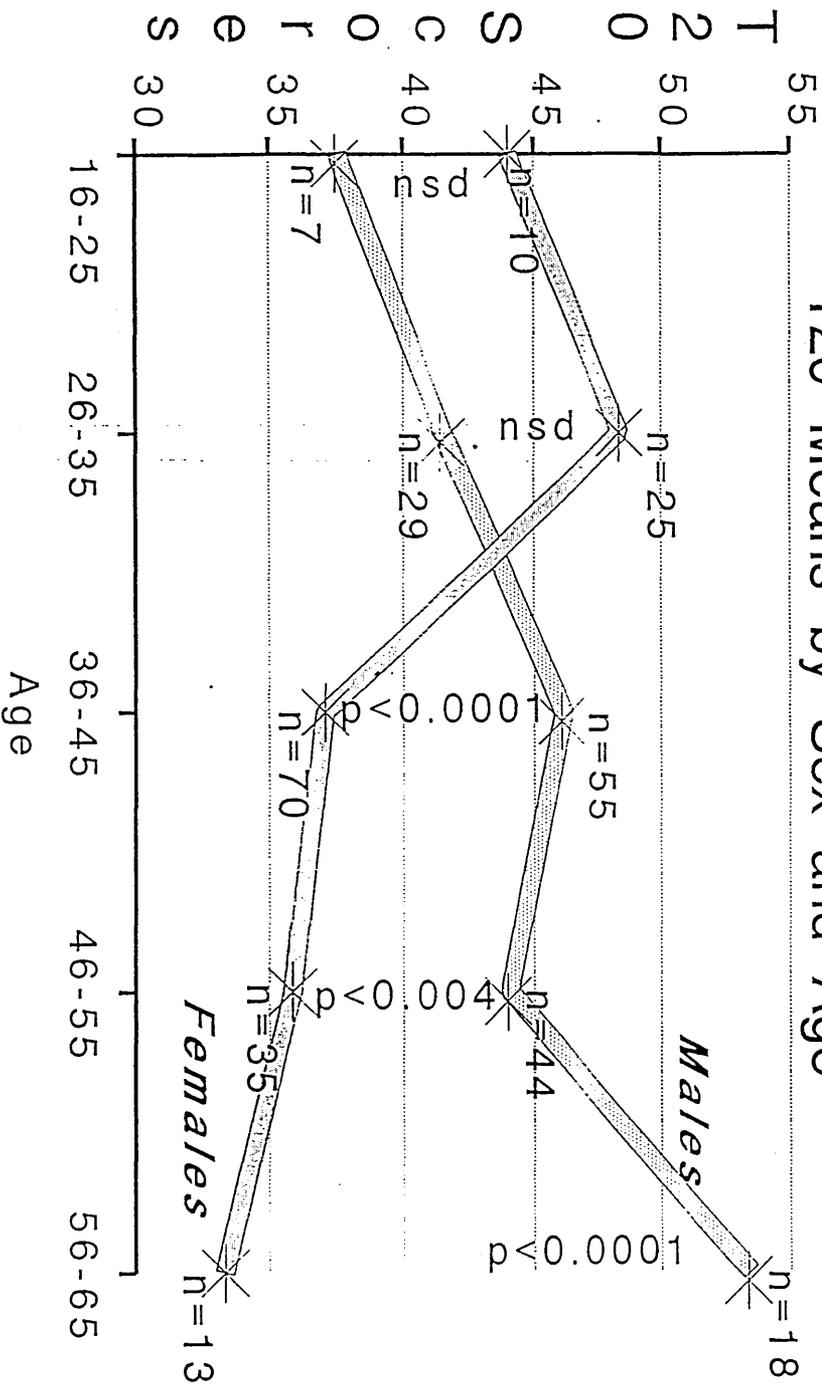
Only 4 respondents (1.3%) reported that they did not have a telephone at home (all were male). Because of the small number of these respondents, no further analysis in terms of related differences in telephone apprehension was undertaken. (Although some relation might have been expected, this was likely to be small for a number of reasons. One reason is that the high level of installed telephones (approximately 85% in UK homes, 98.7% in this sample) means that ceiling effects were likely to attenuate differences. The installation of a telephone, except where the person is living alone, is also likely to be a shared decision, and not solely determined by the person completing the questionnaire.)

Respondents were asked to estimate the number of calls they made using their home telephone in a typical day. (Note that no mention was made in the questionnaire of how to count "failed" calls. Other research (see Chapter One) suggests that people are in practice unlikely to count "failed" calls as calls.) Frequencies of less than one, but greater than zero, were coded as 1 call per day. Frequencies of 8 calls or more were coded as 8 calls. Only two respondents reported making 8 or more calls per day.

CALLS MADE FROM HOME PHONE: UK Non-student Data	
Number of Calls	% Respondents
0	11.4
0-1	42.5
2	26.8
3	11.8
4	3.6
5	2.6
6	0.7
7	0.0
8 or more	0.7

The overall mean of 1.68 compares with figures of 2.6 (sd=2.1) for an Australian sample of 100 members of the general public studied by Noble (1987), and 3.90 for the sample of 434 American undergraduates studied by Steele and Reinsch (1984).

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CALLS MADE FROM HOME PHONE: UK Non-student Data

Age and Sex Differences

Age	16-25	26-35	36-45	46-55	56-65+	TOTAL
MALE						
means	1.29	1.14	1.67	1.36	2.28	1.54
sd	0.76	1.48	1.38	0.84	1.67	1.31
n	7	29	55	44	18	153
FEMALE						
means	1.80	1.60	1.96	1.54	2.31	1.82
sd	0.92	0.96	1.45	0.78	1.38	1.22
n	10	25	70	35	13	153
TOTAL						
means	1.59	1.35	1.83	1.44	2.29	1.68
sd	0.87	1.28	1.42	0.81	1.53	1.27
n	17	54	125	79	31	306

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┌─────────────────────────────────────────────┐
│   Distribution of calls made by age and sex  │
│              UK Non-student data             │
│              See Figure C05F05               │
└─────────────────────────────────────────────┘
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This data suggests that women use the telephone slightly more, but with sex differences attenuating with increasing age (as predicted by Burgoon (1985) with her proposal that older people adopt more gender-neutral communication styles, and as discussed with respect to Hypothesis 2A). In addition, it suggests that men are more likely to report not making any calls from their home telephone.

CALLS MADE FROM HOME PHONE: Age and Sex Differences

	0	0-1	2	3	4	5	6	7	8 or more	
Males	26	67	33	16	5	4	1	0	1	153
Females	9	63	49	20	6	4	1	0	1	153

ANOVA (see Table 5.10, Appendix 1) shows that both age and sex effects are significant, but there is no significant age by sex interaction effect. Women report making more calls (Male=1.54, Female=1.82, F=3.672, p<0.056). Examination of the means, and the significant

UK Non-students: Calls Made
Sex Differences

Figure C05F05

Males

Females

Age
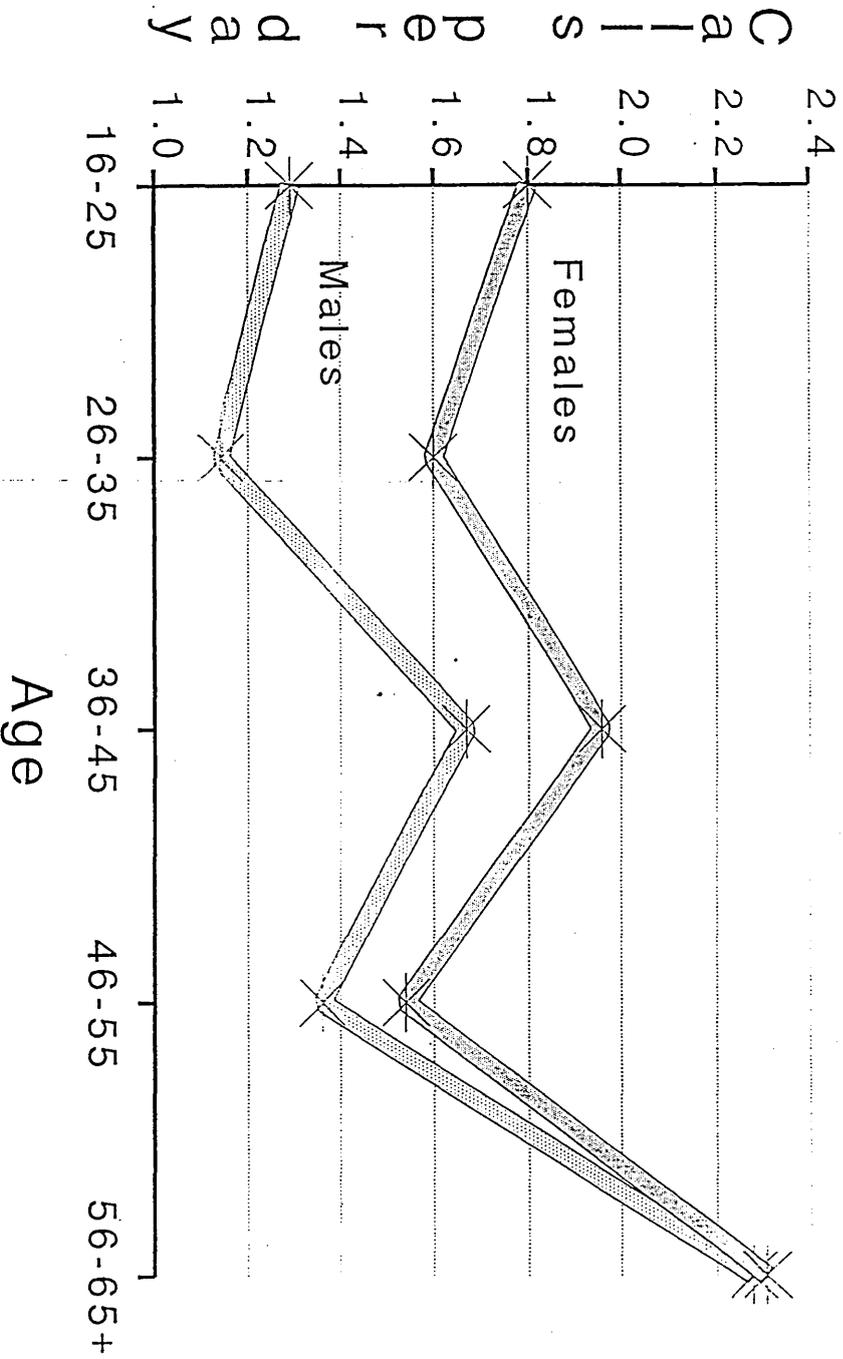
correlation between age and numbers of calls made (r=0.1011, p<0.039), suggests that overall older people tend to make more calls than younger people (F=3.877, p<0.004).

Respondents were also asked to estimate the number of calls they received (as opposed to being for other members of their household) to their home telephone in a typical day. (Again, frequencies of less than one, but greater than zero were coded as 1 call per day, and frequencies of 8 calls or more were coded as 8 calls. Only two of the 306 usable questionnaires reported receiving more than 8 calls per day.)

CALLS RECEIVED ON HOME PHONE: UK Non-student Data

Number of Calls	% Respondents
0	8.8
0-1	38.6
2	24.5
3	12.4
4	7.5
5	3.6
6	2.6
7	1.3
8 or more	0.7

The overall mean of 2.03 compares with Noble's figure of 2.1 (sd=1.6) for an Australian sample (Noble, 1987), and 3.92 for the American sample studied by Steele and Reinsch (1984).

CALLS RECEIVED ON HOME 'PHONE: UK Non-student Data

Age	16-25	26-35	36-45	46-55	56-65+	TOTAL
MALE						
means	1.71	1.14	2.33	1.70	2.67	1.93
sd	1.11	1.46	1.76	1.27	2.03	1.65
n	7	29	55	44	18	153
FEMALE						
means	2.30	2.08	2.19	1.86	2.46	2.12
sd	1.77	1.82	1.53	1.09	1.45	1.49
n	10	25	70	35	13	153
TOTAL						
means	2.06	1.57	2.25	1.77	2.58	2.03
sd	1.52	1.69	1.63	1.19	1.79	1.57
n	17	54	125	79	31	306

Sex differences in the number of calls received tend to be smaller and less consistent than sex differences in calls made. ANOVA (see Table 5.11, Appendix 1) shows that the sex effect is not significant (Male=1.93, Female=2.12, F=0.815, p<0.367), whilst the overall age effect is significant (F=3.243, p<0.013). The correlation between respondent age and calls received was non-significant (r=0.0767, p<0.09). There was no significant age by sex interaction effect.

CALLS RECEIVED ON HOME 'PHONE: UK Non-student Data

	0	0-1	2	3	4	5	6	7	8 or more	
Males	21	58	34	15	11	7	4	2	1	153
Females	6	60	41	23	12	4	4	2	1	153

The distribution of calls by sex suggests that the pattern of calls received is very similar for males and females, except that men are more likely to report not receiving any calls at home.

These results are broadly consistent with those reported by Noble (1987), who reported significant sex differences in numbers of calls made and received for intrinsic purposes, with women using the telephone more than men, but there were no sex differences in calls made or

received for instrumental purposes.

The correlation between T20 scores and self-reported calls made was $r=-0.1994$ ($n=306$, $p<0.0001$), indicating that people with higher T20 scores reported making fewer phone calls from their domestic telephone. The correlation between T20 scores and reported number of calls received was $r=-0.1098$ ($n=306$, $p<0.027$), indicating that people with higher TAI T20 scores report receiving fewer telephone calls. The correlation between T20 scores and calls made is, as predicted, significantly greater than that with calls received ($t=2.418$, $df=303$, $p<0.01$, 1-tailed). (Clearly, the relation between estimates of calls and the actual numbers of calls is unknown, and may itself be expected to be a function of telephone apprehension.)

As noted later, some respondents commented that there was an inverse relationship between their domestic and workplace use of the telephone. One reason cited for this was that, if there is a great deal of telephone use in the workplace then it was avoided in domestic settings. Another possible reason is that access to a work telephone allows private calls to be made. Given this possible inter-relationship between domestic and work telephone usage, and the fact that, if this relationship exists, it might be expected to attenuate the relationship between telephone apprehension and domestic telephone use, correlations between calls made and received and TAI scores were calculated separately for respondents with and without listings in the Institute Directory. If this inverse inter-relationship exists then the relationship between TAI scores and domestic telephone usage should be greater for those not listed in the directory (and who can therefore be presumed to have less ready access to a work telephone) than for those who are listed in the directory. The pattern of results does not support this hypothesis. For listed respondents, the correlation between T20 scores and self-reported calls

made was r=-0.2173 (n=265, p<0.0001), and with calls received r=-0.1154 (n=41, p<0.03). For non-listed respondents, the correlation between T20 scores and self-reported calls made was r=-0.0346 (n=41, p<0.415, ns), and with calls received r=-0.0380 (n=41, p<0.407, ns). Both of these correlations were greater for those listed than for those not listed. Although not a powerful test of the hypothesis, and it is possible that for some individuals an inverse relationship between work and hone telephone use exists, these results suggest that overall the compensation and transfer mechanisms are neither general nor powerful.

The correlation between respondents' estimates of calls made and calls received was r=0.7822 (n=306, p<0.0001). However, the data suggest that people tend to overestimate the number of calls received. That is, estimates of calls made was greater than of calls received, whereas, over a large number of people, it would be expected that the calls made would approximate calls received. In this sample the estimate of calls received was significantly greater than calls made (t=6.23, df=305, p<0.0001, 2-tailed).

> Distribution of calls made and received
> UK Non-student data
> See Figure C05F06

ESTIMATED CALLS ON HOME 'PHONE: UK Non-student Data

Age	16-25	26-35	36-45	46-55	56-65+	TOTAL
MADE						
means	1.59	1.35	1.83	1.44	2.29	1.68
sd	0.87	1.28	1.42	0.81	1.53	1.27
n	17	54	125	79	31	306
RECEIVED						
means	2.06	1.57	2.25	1.77	2.58	2.03
sd	1.52	1.69	1.63	1.19	1.79	1.57
n	17	54	125	79	31	306

UK Non-students

Calls Made versus Calls Received

Figure C05F06

171
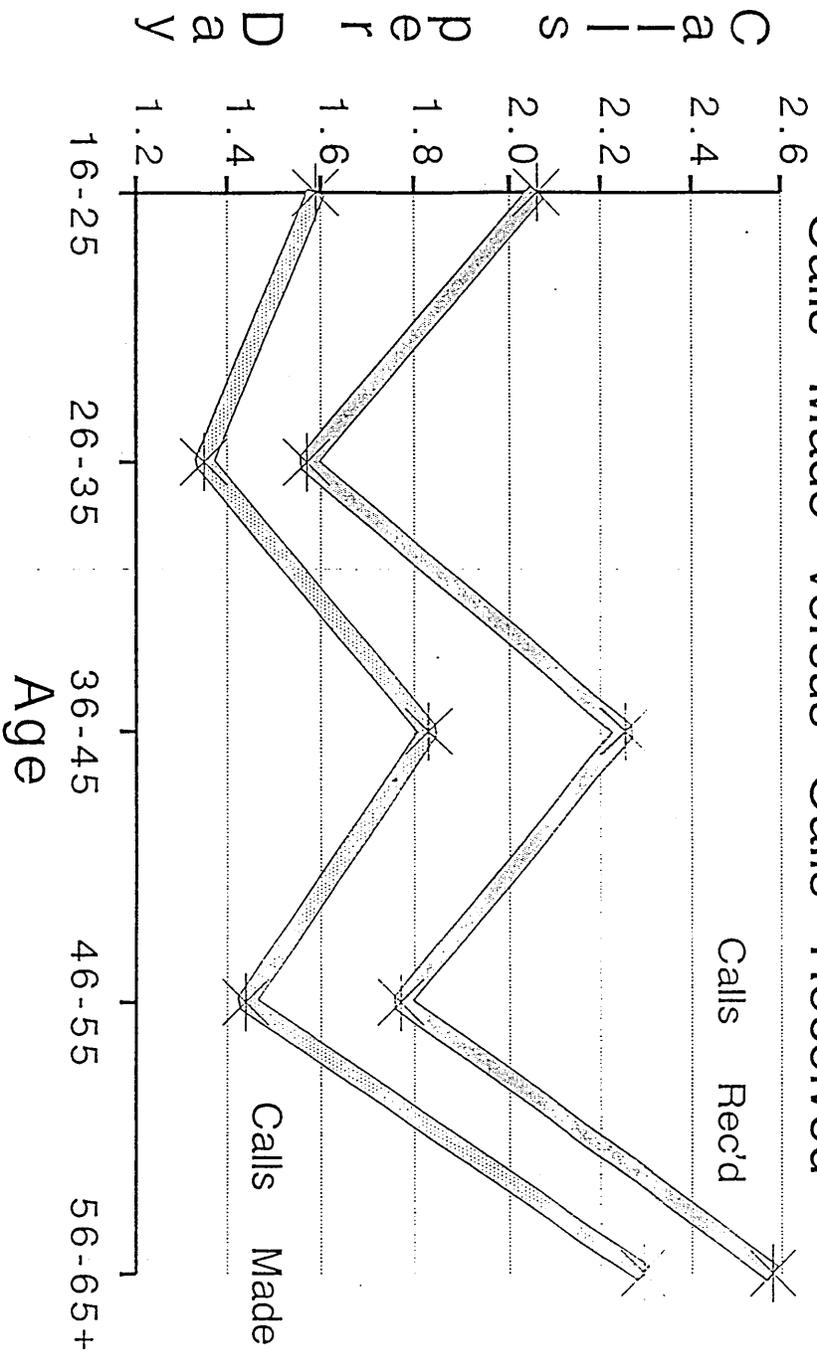
However, the tendency to overestimate calls received was by no means universal, and there may be systematic biases in the ratio of estimates of calls made to calls received as a function of telephone apprehension. Three possibilities exist:

Number of calls made is greater than the number of calls received

Number of calls made is equal to the number of calls received

Number of calls made is less than the number of calls received

33 (10.8%) respondents reported making more calls than they received, 180 (58.8%) reported making the same number of calls as they received, and 93 (30.4%) reported making fewer calls than they received. Respondents were classified as either high, medium or low telephone apprehensives on the basis of their TAI T20 scores (high TA=top third, T20=47-100; medium TA=middle third, T20=35-46; low TA=bottom third, T20=20-34).

	CALLS MADE > CALLS REC'D	CALLS MADE = CALLS REC'D	CALLS MADE < CALLS REC'D	TOTAL n %
HIGH TAI SCORE	5	67	30	102 33.3
MEDIUM TAI SCORE	12	54	37	103 33.7
LOW TAI SCORE	16	59	26	101 33.0
n %	33 10.8	180 58.8	93 30.4	306

This distribution is significantly different from that expected by chance (X^2=9.063, p<0.0595). The key difference appears to be that low telephone apprehensives are more likely to report more calls made than received, whereas high telephone apprehensives are less likely to

report more calls made than received. Significant differences between high and low apprehensives are not apparent in terms of other patterns of reporting.

Comments made by respondents

In addition to simple multiple-choice responses to the questions, respondents were invited to add comments to the questionnaire. Approximately 15% of respondents did so. Comments ranged from 1-2 words to one or more pages of comments. Approximately half of the comments concerned the design of the questionnaire, the other half were concerned with the phenomena of telephone apprehension and telephone use.

The most frequent comments made concerned the difference between work and home telephone use. Comments were also made about differences in responses to the telephone as a function of:

> Topic of conversation (and its content)
> Identity of the other person (eg known vs stranger)
> Whether the call was being made or received
> Whether the call was local, long distance, or international
> The time of day the call was being made ie its cost
> The location of the phone eg how public/private it was

When commenting on the distinction between work and domestic use of the phone, some respondents noted that their reported levels of domestic telephone use was low because of high levels of telephone use in the work context, and that this low domestic usage was not indicative of their total use of (and orientation to) the telephone.

A number of respondents commented that they consciously

adopted different strategies for dealing with work and personal calls, and that these were associated with quite different levels of apprehension. One respondent explicitly commented on the need to prepare very carefully for calls, because without such preparation high levels of apprehension were experienced. Many comments suggested that the cost of calls was a major factor affecting use, and levels of apprehension.

Many respondents commented that the generalised questions used in the TAI did not allow sensible responses to be made. Although the instructions asked people to respond in terms of their "general reaction", and people might, theoretically, be expected to be able to generalise over a number of different contexts, in practice people were unable or unwilling to do this, and suggested that the questionnaire should explicitly recognise these distinctions.

COMPARISON OF UK STUDENT AND NON-STUDENT T20 SCORES

The correlation between the mean ratings of the 20 items of the TAI for the UK Student and the UK Non-student samples was highly significant ($r=0.9352$, $df=18$, $p>0.0001$), suggesting that UK student and non-student respondents were responding in a similar manner to the different items (see Table 5.12, Appendix 1).

A 3-way ANOVA was used to examine sample, sex and age differences (see Table 5.13, Appendix 1). Because of the limited numbers of subjects in the older age classifications in the Student sample, the age classification of respondents in the Non-student sample was reduced to the same two-way classification used in the analysis of the Student samples.

The distribution of responses by sex and age was as follows:

Distribution of Responses				
UK Student and Non-student Samples				
Sample	Age	-25	26+	TOTAL
Students	MALE	216 (30.4%)	26 (3.7%)	242 (34.0%)
	FEMALE	146 (20.5%)	17 (2.4%)	163 (22.9%)
Non-students	MALE	7 (1.0%)	146 (20.5%)	153 (21.5%)
	FEMALE	10 (1.4%)	143 (20.1%)	153 (21.5%)
	TOTAL	379 (53.3%)	332 (46.7%)	711

T20 Scores by Sample, Sex and Age					
SAMPLE	SEX		AGE	T20 SCORE	
STUDENT	MALE	50.71	-25	50.63 (n=216)	50.71
			26+	51.38 (n= 26)	
	FEMALE	46.64	-25	47.15 (n=146)	46.82
			26+	44.00 (n= 17)	
NON STUDENT	MALE	45.16	-25	37.57 (n= 7)	45.16
			26+	45.52 (n=146)	
	FEMALE	38.79	-25	44.00 (n= 10)	38.79
			26+	38.43 (n=143)	

Summary of comparisons	
Sample: Student=49.15 (n=405) Non-student=41.97 (n=306	
Sex: Male=48.56 (n=395) Female=42.93 (n=316	
Age: -25 =47.88 (n=659) 26+ =46.24 (n=135	

There was a significant overall difference in the T20
scores of the UK Student and Non-student samples
(F=10.949, df=1, 703, p<0.001), and males had
significantly higher T20 scores than females
(males=48.56, females=42.93, F=22.592, df=1, 703,
p<0.0001). The age difference was not significant,
although examination of the means shows an apparently
large difference, with older subjects being less anxious
than younger subjects. (Younger=48.87, Older=42.85). None
of the 2-way or 3-way interactions were significant,
although the sex by age interaction approached
significance (F=3.137, df=1, 703, p<0.077). Examination
of the means showed that this reflected the fact that for
both the Student and Non-student samples, older males
were more anxious than younger males, whilst for both
samples, older females were less anxious than younger
females. It is possible that the small numbers in some of
these cells and large within-cell variance prevented
these results being statistically significant.

These results are supportive of Hypothesis 3B, which
predicted that student and non-student subjects would
report significantly different levels of telephone
apprehension.

DISCUSSION

Sex differences

The differences in levels of telephone apprehension and
in use of the telephone are consistent with the general
pattern of gender differences in conversational behaviour
which show that women tend to have higher levels of
skill and lower levels of anxiety (eg Aries, 1987; Hall,
1987). They are also consistent with the identification
of the telephone as "a female instrument" (Pool, 1977,
1983). The popular belief that the telephone is
particularly suited to women's talk, and is used in

particular by women, is supported by these findings.

The reasons for this sex difference may be related to
both communicative competences and to the roles played
and the purposes for which the telephone is used.
However, it must be recognised that these sex differences
may only be apparent, and may in fact be due to other
factors. For instance, the Telephone Apprehension
Inventory may simply reflect a more generalised anxiety,
such as social or communication anxiety. For instance, if
males experience greater general anxiety than females,
then it would follow that males are also likely to be
more anxious about the telephone than females. Other
possible confounding variables are self-esteem,
evaluation apprehension and social desirability needs.
The significance of these plausible alternative
explanations will be explored in Chapter Ten.

Age differences

The absence of simple main effects for age is surprising.
A number of factors may account for this pattern of
results. Two of the three samples consisted of students,
with a highly restricted age range and small numbers of
older subjects. In addition, it is likely that those
students who were older are likely to differ from their
contemporaries in terms of communicative confidence and
competence. An additional factor may be that there are
opposing trends which cancel each other out, such as
increasing experience with the medium which balances out
any increasing difficulty due to auditory deficits in
older people. In particular, the significant interaction
effect noted in the UK Non-student sample, between
subject age and sex, was such that the overall main
effect was not significant, with decreasing levels of
telephone apprehension in women cancelling out increasing
levels of telephone apprehension in men.

This significant age by sex interaction is consistent
with the suggestion made by Skelton (1989) that amongst
teenagers, sex differences in the use of the telephone
are minimal, but that sex-related attitudes to, and
beliefs about sex-related use of the telephone do exist.
These beliefs and attitudes are then realised when
teenagers become adults, and women assume the role of
maintaining networks of family and friends, not only for
themselves, but also for their partners. The significant
age by sex interaction is inconsistent with Burgoon's
suggestion (1985) that gender differences in
communication diminish with increasing age. In the case
of attitudes to, and use of the telephone, these
differences appear to increase.

Culture differences

The observed patterns of differences in levels of
telephone apprehension are broadly consistent with the
predictions made on the basis of the numbers of
telephones per head of the population, and associated
telephone use, in the three countries examined. They are
also consistent with popular beliefs about the importance
of, and attitudes to the telephone in those countries.

It is possible that the observed differences reflect
differential charging structures, with anxiety being
primarily dependent on the financial cost of the call.
The USA telephone system operates overwhelmingly on the
basis of 'free' local calls (the charge for all local
calls being included in the telephone rental charge, with
this rental being the same irrespective of the number and
duration of local calls that are then made). Australia
uses a 'connect-charged' local call system (ie the charge
is made for the connection, with the call costing the
same irrespective of the duration of the call), and the
UK uses 'metered' local calls, where the cost is
(approximately) proportional to the length of the call.

It may be predicted that anxiety is likely to be greatest under metered conditions, and least under 'free' charging conditions.

This possibility could be examined by examining cultural differences in telephone apprehension in the case of long-distance calls only, where the differences between systems would be minimised (all are metered), or by examining anxiety associated with receiving as opposed to making calls, where again the condition of 'receiving' would reduce the 'economic anxieties' and hence reduce the disparity between cultures. (However, it should be noted that it would not reduce cultural differences entirely, in that for many people there would be both conditioned anxiety and empathic anxiety).

It is also possible that differences in telephone apprehension could simply reflect the differing perceived costs of telephone calls vis-a-vis disposable income. That is, the reported level of telephone apprehension would be expected to bear a relationship to the prevailing standard of living in the different countries and the relative costs of telephone use. Both of these possibilities suggest that telephone apprehension is at least partially a function of economic anxieties.

It is also possible that differences between cultures in levels of telephone apprehension, like sex differences, merely reflect more general cultural differences in generalised social or communication anxiety, self-esteem, evaluation apprehension or social desirability needs.

Sample differences

The significantly lower levels of telephone apprehension in the UK Non-student sample is most likely to be due to the greater use of the telephone in the work environment by this sample. This suggests that familiarity may be a

major element influencing telephone apprehension.

It should be noted that all subject samples were in some sense atypical. The Student samples, as compared with a representative sample of the general public, were not only likely to be younger, but were also likely to be more intelligent, better educated and more verbal, and were likely to be from more socially and economically privileged backgrounds. All of these factors are likely to have attenuated variations in telephone apprehension. The Non-student sample included a much wider range of people, from van-drivers, porters and part-time refectory staff, through secretaries and administrators, to both full- and part-time academics, and included a much wider range of ability and age. However, it under-represented people not in employment (housewives/husbands, retired, unemployed) and is likely to have included an unrepresentative number of educationally well-qualified respondents. These limitations in the representativeness of the samples limits the extent to which these results can be generalised confidently to the population as a whole.

CHAPTER SIX

TELEPHONE PHOBIA and TELEPHILIA:

CATEGORICAL ANALYSES OF THE

TELEPHONE APPREHENSION INVENTORY

SYNOPSIS

In this chapter the concept of "Telephone Phobia" was
explored in terms of both criterion-referenced and norm-
referenced definitions. A criterion-referenced approach
to the definition of "Telephone Phobia" suggested that
some 5-10% of the populations sampled should be described
as experiencing moderate to extreme telephone
apprehension. The less demanding, norm-referenced
approach suggested that approximately 15-20% of the
populations studied could be described in this way. It
was suggested that the criterion-referenced approach is a
more satisfactory way of defining both high and low
levels of telephone apprehension for further study.

The concept of telephilia was also explored, and the
absence of analyses of telephilia in previous research
was noted.

CHAPTER SIX

TELEPHONE PHOBIA and TELEPHILIA

CATEGORICAL ANALYSES OF THE

TELEPHONE APPREHENSION INVENTORY

INTRODUCTION

In this chapter the categorical concepts of "telephobic" and "telephilic" orientations to the telephone are explored, and norm-referenced and criterion-referenced definitions of these concepts are proposed. Estimates of the proportion of subjects in each sample who would experience differing levels of "telephobia" are offered.

Telephone Phobia

Although used loosely, the notion of telephone phobia is frequently mentioned in discussions of telephone apprehension. There are two general approaches to defining telephone phobia, or more properly, to defining "problematic" levels of telephone apprehension.

The first uses the normative distribution of scores, with people suffering "moderate" levels of telephone apprehension having TAI scores more than one standard deviation above the mean, people with "severe" levels of telephone apprehension having scores two standard deviations above the mean, and people with "extreme" levels of telephone apprehension having scores more than three standard deviations above the mean. These definitions produce the following distribution when applied to the data presented in Chapter Five:

SAMPLE	CATEGORY	LOWER CUT-OFF SCORE	UPPER CUT-OFF SCORE	PERCENTAGE IN CATEGORY
UK STUDENTS				
	MODERATE	64	76	13.6
	SEVERE	77	90	2.7
	EXTREME	91	100	0.7
	TOTAL			17.0
AUSTRALIAN STUDENTS				
	MODERATE	60	72	15.7
	SEVERE	73	86	2.8
	EXTREME	87	100	0.3
	TOTAL			18.8
UK NON-STUDENT				
	MODERATE	57	70	11.1
	SEVERE	71	84	4.2
	EXTREME	85	100	0.3
	TOTAL			15.6

Steele and Reinsch (1983, 1984) adopted the normative conceptualisation of problematic apprehension proposed by McCroskey (eg 1982a) and widely used in the study of communication apprehension. Using this approach, they suggested that between 14% and 20% of American undergraduates would experience moderate to severe levels of telephone apprehension. Steele and Reinsch (1983) report that 12.3% (41) of their respondents scored between one and two standard deviations above the mean, and 7.8% (26) scored between two and three standard deviations above the mean. Seven respondents (2.1%) scored more than three standard deviations above the mean. In their 1984 study, Steele and Reinsch found that 14% of respondents scored one or more standard deviations above the mean.

(Note: Checks on the data used by Steele and Reinsch (1983) suggest that their figures may be inaccurate. Recalculation of the figures suggest that 9.3% (31)

respondents scored between one and two standard
deviations above the mean, 4.2% (14) scored between two
and three standard deviations above the mean, and 2.1%
(7) scored more than three standard deviations above the
mean. That is, a total of 15.6% scored more than one
standard deviation above the mean. This figure is much
more comparable both with data from Steele and Reinsch
(1984), and with the data reported here.)

The problem with this normative approach to defining
telephone phobia is that the cut-off points vary from
sample to sample, whilst, by definition, the proportions
of people in any given sample in the different categories
will stay more-or-less the same. Comparisons between
samples then become relatively meaningless. An
alternative, criterion-referenced approach is to define
the cut-off scores in terms of the content of the
Telephone Apprehension Inventory. For instance, if half
of the responses indicated that use of the telephone is
problematic, and assuming that the other responses were
neutral, then the TAI T20 score would be 70. If all
responses indicated strong agreement with the negative
pole, then the score would be 80. Reasonable cut-off
points would then seem to be 70 for moderate, and 80 for
severe phobia. That is, moderate telephone phobia is
defined as agreeing with the negative pole of at least
half of the items. Severe telephone phobia is defined as
strongly agreeing with the negative pole of at least half
of the items. Extreme telephone apprehension can then be
defined as agreeing with the negative pole of half the
items, and strongly agreeing with the other half. This
would result in a score of at least 90.

Applying these criteria to the three samples analysed
here gives the following distributions:

HIGH APPREHENSIVES: CRITERION REFERENCED CATEGORISATION

CATEGORY		PERCENTAGE IN CATEGORY		
		UK STUDENTS	AUSTRALIAN STUDENTS	UK NON-STUDENTS
MODERATE	(70-79)	7.2	6.7	4.2
SEVERE	(80-89)	1.0	0.3	0.6
EXTREME	(90-100)	1.0	0.0	0.3
TOTAL		9.2	7.0	5.1

Wurtzel and Turner (1977) suggested that 3.7% of an American urban population experienced severe telephone apprehension, indicating that they would "avoid using the phone as much as possible" in response to a multiple-choice question, and that a further 11.6% experienced some degree of apprehension, answering that they would use the phone only "when necessary" in response to the same multiple-choice item. The distribution of responses reported by Steele and Reinsch (1983) suggests that some 4.8% of their sample had scores of 70 or above on the TAI. Noble (1987) estimated that 4% of the Australian population were "telephonophobic".

Taken together, these figures suggest that the particular criterion-referenced approach outlined above is rather more demanding than either the normative approach used by McCroskey (1982a) and adopted by Steele and Reinsch (1983, 1984), or the initial criterion-referenced approach used by Wurtzel and Turner (1977). However, based on current population figures, even these estimates suggest that nearly 2.5 million people in the UK, some 420,000 in Australia, and some 12-15 million in the USA would be expected to experience significant telephone apprehension.

Telephilia

The opposite of telephone phobia is an undifferentiated attraction to the telephone. Using a criterion referenced

approach, telephilic respondents may be defined as the mirror image of telephobic respondents. That is, if half or more of the responses agree with the positive pole of scale items, and assuming that the other responses are neutral, then the TAI score would be 50 or less. If all of the positive responses indicated strong agreement, then the score would be 40 or less. Thus, moderate telephilia can be defined as agreeing to the positive pole of half or more of the items, with a resultant TAI score of 50-41. Severe telephilia may be defined as strongly agreeing to half or more of the positive poles of the scale items, with a resultant TAI score of 40-31. Extreme telephilia may be defined as agreeing with half of the positive items, and strongly agreeing with the other half, with a resultant TAI score of 30 or less. The three samples then give the following distribution of low telephone apprehensives:

LOW APPREHENSIVES: CRITERION REFERENCED CATEGORISATION

CATEGORY		PERCENTAGE IN CATEGORY		
		UK STUDENTS	AUSTRALIAN STUDENTS	UK NON-STUDENTS
MODERATE	(50-41)	32.8	37.9	23.9
SEVERE	(40-31)	21.0	19.6	26.1
EXTREME	(30-20)	6.9	12.8	26.5
TOTAL		60.7	70.3	76.5

HIGH AND LOW APPREHENSIVES
CRITERION REFERENCED CATEGORISATION
See Figure C06F01

It is noteworthy that, unlike telephobia, Wurtzel and Turner (1977), Steele and Reinsch (1983, 1984) and Noble (1987) do not quote figures for telephilia, again suggesting that undifferentiated liking for telephone use is in practice not seen as pathological, and is not the psychological converse of telephobia.

CRITERION-REFERENCED CATEGORISATION OF TAI T20 SCORES

Figure C06F01
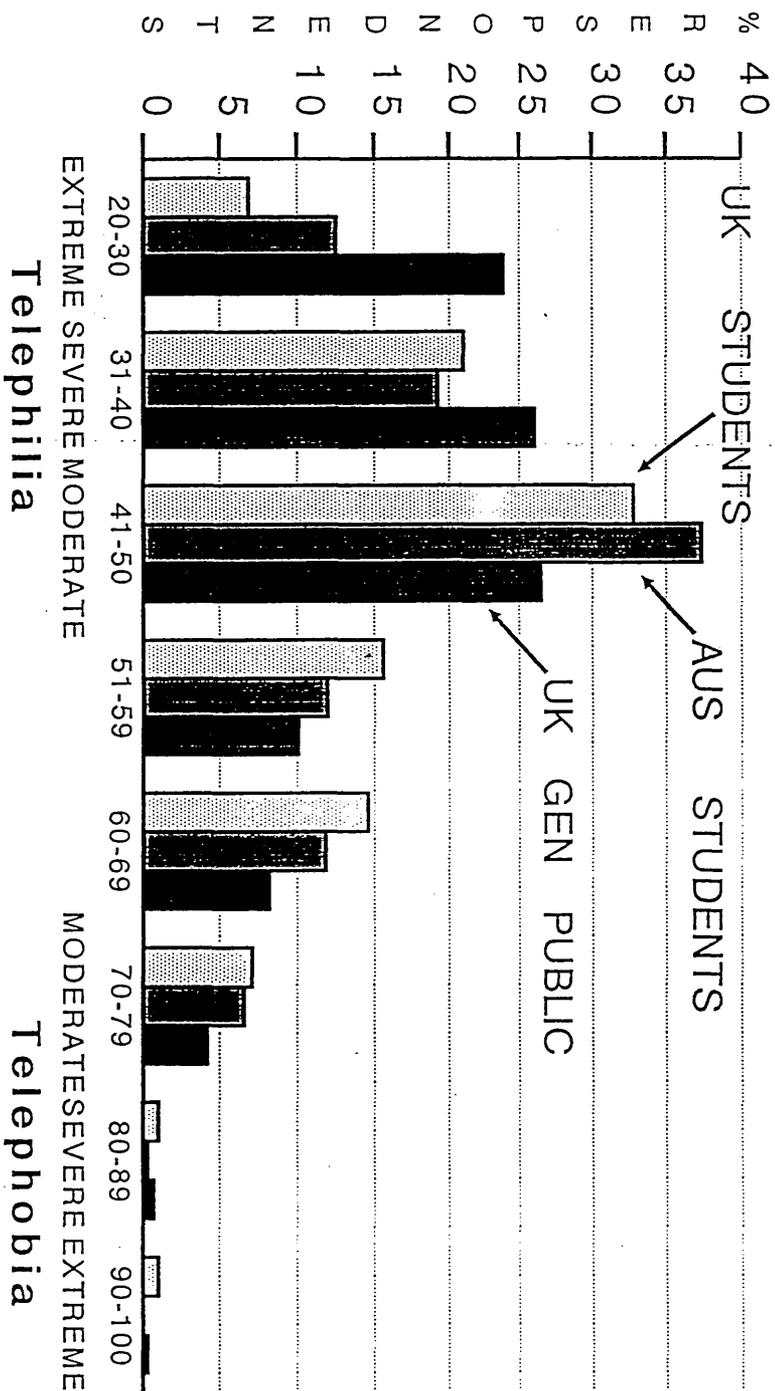
THE STRUCTURE OF THE TELEPHONE APPREHENSION INVENTORY

SYNOPSIS

Steele & Reinsch (1983) claimed that the 20-item TAI constituted a uni-factorial scale. In this chapter the factorial structure of the TAI was examined. The data previously analysed in Chapter Five 5 were factor analysed. In the UK student, Australian student and UK non-student samples broadly similar, multi-factorial structures were extracted. The three factors were labelled "Problematic Communication", "Active Avoidance" and "Positive Enjoyment".

Analyses of sex and age differences showed no sex differences in Problematic Communication, but males scored significantly higher on the Active Avoidance factor, and significantly lower on the Positive Enjoyment factor. Overall, younger subjects saw the telephone as significantly more problematic than older subjects, but also reported significantly greater positive enjoyment of telephone use, and there was some evidence that older subjects reported greater active avoidance of telephone use.

Given the similarities in the three separate factor analyses, culture and sample differences were compared by combining the data sets in pairs (Culture differences: UK and Australian students; Sample differences: UK students and non-students) and factor analysing the combined data sets before submitting the factor scores to ANOVA.

These analyses showed that Australian subjects saw telephone use as significantly more problematic than UK subjects, but did not differ in their reported approach or avoidance of the telephone, and they reported significantly greater confidence in their use of the telephone. Non-students, as compared with students, saw the telephone as significantly less problematic, but did

not differ significantly in either their active avoidance or positive enjoyment of the telephone.

Finally, all three data sets were combined and submitted to factor analysis. This analysis extracted three factors. The first was a "Problematic Communication" factor, the second a bi-polar "approach-avoidance" factor, and the third was concerned with the notion of "confidence". A comparison of this structure with that reported by Reinsch (1986) showed considerable similarity, indicating significant differences from the uni-dimensional structure posited by Steele and Reinsch (1983, 1984), but providing support for telephone apprehension as a cross-cultural, cross-sample phenomenon. Possible explanations for, and the implications of these results, were then discussed.

CHAPTER SEVEN

THE STRUCTURE OF THE TELEPHONE APPREHENSION INVENTORY

INTRODUCTION

In this chapter the factorial structure of the TAI when used with non-US subject samples is examined. Data from the UK Student, Australian Student and UK Non-student samples will be factor analysed, and sex and age differences within each sample analysed using ANOVAs of the factor scores. Culture and sample differences are then compared by combining the data sets in pairs (Culture differences: UK and Australian Students; Sample differences: UK Students and Non-students) and factor analysing the combined data sets before submitting the factor scores to ANOVA. Finally, the data from all three samples are combined and factor analysed.

REVIEW

The TAI scale was developed by Steele and Reinsch (1983) with the specific aim of being uni-factorial. An initial pool of 92 items was generated and tested for internal reliability. On this basis 62 items were eliminated. The remaining 30 items were then presented to a second group of subjects. Correlations between the composite score for the 30 items and the individual scales were examined, and the items with the lowest correlations systematically discarded until only 20 items remained. An unrotated factor analysis "strongly indicated the presence of a single major factor" (Steele and Reinsch, 1983, p.11). Every scale had its primary loading on the first factor, and every primary loading was 0.56 or greater. Steele and Reinsch (1983) therefore suggested that the 20-item TAI constituted "a reliable and unidimensional scale" (p.11).

However, Reinsch (1986) reanalysed data from several studies and suggested that the TAI may have a multi-

factorial structure. He identified three factors with eigenvalues greater than 1.0. Most items loaded cleanly on only one of the three factors (at least a 0.2000 difference between the primary and any secondary loadings). According to Reinsch (1986), Factors One and Two were difficult to differentiate conceptually, but he suggested that "Factor One seems to contain more items expressing apprehension (eg "I do not feel comfortable using the telephone") whilst Factor Two seemed to contain more items which expressed the absence of apprehension (eg "I look forward to telephone conversations")" (Reinsch, 1986, p.12). He suggested that Factor Three was concerned with the person's perceived telephone conversation skills.

US Student Data: Based on Table 3 in Reinsch (1986)

ITEM	FACTOR 1	FACTOR 2	FACTOR 3	ITEM SUMMARY
				FACTOR ONE
18	0.6979	0.3044	0.2192	NOT COMFORTABLE
16	0.6598	0.3771	0.0602	DREAD
09	0.6299	0.1707	0.2675	NERVOUS
11	0.6029	0.1514	0.3539	MISUNDERSTOOD
19	0.5969	0.1632	0.1926	FRUSTRATION
14	0.5717	0.2101	0.2992	INHIBITED
17	0.5684	0.3437	0.3425	CALM & COMFORTABLE
13	0.5562	0.5978	0.1112	DON'T LIKE
12	0.5387	0.0934	0.5382	PROBLEMS
15	0.5355	0.3766	0.3759	RELAXED
08	0.5097	0.3017	0.2141	RUSHED AND PUSHED
10	0.4827	0.3938	0.1241	HURRY TO FINISH
02	0.4248	0.3618	0.3574	DIFFICULT
				FACTOR TWO
01	0.2253	0.7729	0.1509	LOOK FORWARD
07	0.2180	0.7630	0.3545	ENJOY
04	0.2991	0.7310	0.2802	PLEASANT
13	0.5562	0.5978	0.1112	DON'T LIKE
10	0.4827	0.3938	0.1241	HURRY TO FINISH
16	0.6598	0.3771	0.0602	DREAD
15	0.5355	0.3766	0.3759	RELAXED
02	0.4248	0.3618	0.3574	DIFFICULT
17	0.5684	0.3437	0.3425	CALM & COMFORTABLE
18	0.6979	0.3044	0.2192	NOT COMFORTABLE
				FACTOR THREE
06	0.2335	0.2274	0.7347	EASY
12	0.5387	0.0934	0.5382	PROBLEMS
05	0.2243	0.3193	0.5329	TAKE PRIDE
15	0.5355	0.3766	0.3759	RELAXED
02	0.4248	0.3618	0.3574	DIFFICULT
07	0.2180	0.7630	0.3545	ENJOY
11	0.6029	0.1514	0.3539	MISUNDERSTOOD
17	0.5684	0.3437	0.3425	CALM & COMFORTABLE

Eigenvalue

8.73	1.35	1.10

%VAR (Cum%Var)

48.5 (48.5)	7.5 (56.0)	6.1 (62.1)

(Note that Items 3 and 20 were not included in Reinsch's analysis)

AIMS OF THE ANALYSIS

The basic proposition to be examined is that, when used with non-US subject samples, the TAI will have a multi-factorial structure. The wider aim is to examine the nature of this multi-factorial structure when the TAI is used with non-US, and non-student samples.

METHOD

The data collected from three of the four samples analysed in Chapter Five were factor analysed. The three samples were undergraduate students from all years of a variety of courses in different faculties of Sheffield City Polytechnic (N=405), Australian undergraduate students on all years of a variety of courses in various faculties at the Darling Downs IAE, Queensland (N=389), and a sample of members of the academic (full and part-time) and the non-academic staff working at the Dorset Institute, Poole.

RESULTS: UK STUDENT SAMPLE

A factor analysis of the scale's 20 items was performed. A principal components extraction was used, employing a varimax orthogonal rotation of the resultant factor structure. The principal components extraction shows that the first unrotated eigenvalue is larger than all of the others combined, indicating the presence of a primary factor with only one or two minor additional factors. However, the conceptual and/or psychological significance of the factors beyond the primary factor is not necessarily related to the proportion of common variance explained, if for no other reason than that the original scale was constructed so as to minimise the variance attributable to such additional factors. Rotation of the factor structure allows the psychological/conceptual

significance of the primary and additional factors to be
explored. The rotated factor matrix is presented
below:

FACTOR LOADINGS: UK Student Data

ITEM	FACTOR 1	FACTOR 2	FACTOR 3	ITEM SUMMARY
				FACTOR ONE
20	0.754	0.179	-0.188	AVOID USING
16	0.735	0.312	-0.214	DREAD
19	0.644	0.391	0.023	FRUSTRATION
03	0.632	0.190	-0.388	AVOID
18	0.591	0.383	-0.342	NOT COMFORTABLE
13	0.584	0.425	-0.471	DON'T LIKE
10	0.527	0.421	-0.258	HURRY TO FINISH
08	0.435	0.414	-0.264	RUSHED AND PUSHED
02	0.434	0.410	-0.358	DIFFICULT
				FACTOR TWO
12	0.196	0.822	-0.201	PROBLEMS
11	0.296	0.730	-0.033	MISUNDERSTOOD
14	0.357	0.665	-0.218	INHIBITED
06	-0.084	-0.632	0.520	EASY
09	0.495	0.606	-0.178	NERVOUS
				FACTOR THREE
07	-0.354	-0.123	0.769	ENJOY
05	0.145	-0.315	0.693	TAKE PRIDE
04	-0.438	-0.154	0.639	PLEASANT
01	-0.517	0.051	0.666	LOOK FORWARD
15	-0.429	-0.424	0.565	RELAXED
06	-0.084	-0.632	0.520	EASY
17	0.465	0.413	0.513	CALM & COMFORTABLE
13	0.584	0.425	-0.471	DON'T LIKE

Eigenvalue
| | 10.019 | 1.463 | 1.172 | |

%VAR (Cum%VAR)
| | 50.1(50.1) | 7.3(57.4) | 5.9(63.3) | |

This analysis defines three meaningful factors. The first
factor consists of 9 items, and appears to describe a
feeling of "Dislike and Active Avoidance" of the
telephone. The second factor consists of 5 items, and
seems to describe respondents' feelings that
communication via the telephone is likely to be difficult
and to involve problems, and that the telephone

constrains communication. It might perhaps be termed
"Problematic Communication". The third factor, which
consists of the remaining six items, clearly describes a
feeling of "Positive Enjoyment" associated with using the
telephone.

The structure extracted is clearly not consistent with
the uni-factorial structure reported by Steele and
Reinsch (1983). Unlike their analysis, where every scale
had its primary loading on the first factor, and where
every primary loading was 0.56 or greater, in this
analysis only nine of the twenty items had their primary
loadings on the first factor, and of these only seven
items had loadings of 0.50 or greater. The proposition
that the TAI-20 will have a multi-factorial structure
when used with UK student subjects is therefore supported
by this analysis.

The association of items within Factor One referring to
dislike of the telephone and to avoidance of the
telephone suggests that the relation between overall
negative evaluation and avoidance of use is supported by
this data. On the other hand, overall positive
evaluations does not appear to be associated with use.
The behavioural significance of disliking the telephone
may be greater than the significance of liking the
telephone.

The emergence of the second factor, concerned with the
constraining effect of the telephone upon communication,
and orthogonal to both "disliking" and "liking" the
telephone, is particularly interesting. This suggests
that respondents are aware of channel effects, and of the
notion of "fit" between their conversational purposes and
the communication channel used. However, the emergence of
this factor as independent of both overall like and
dislike suggests that these constraints are only part of
the overall evaluation of the medium.

Sex and Age Differences

Two-way ANOVAS were performed on each set of factor scores.

UK STUDENT DATA
FACTOR ONE: DISLIKE AND ACTIVE AVOIDANCE

MEAN FACTOR SCORES BY SEX AND AGE OF RESPONDENT

AGE	-25	26+	TOTAL
MALE	-0.03 (n=216)	-0.31 (n=26)	-0.06 (n=242)
FEMALE	0.10 (n=146)	-0.05 (n=17)	0.09 (n=163)
TOTAL	0.02 (n=362)	-0.21 (n=43)	0.00 (n=405)

(Note: Because of the scoring conventions used, positive factor scores indicate disagreement with the positively loaded pole of the factor, whereas negative factor scores indicate endorsement of the positively loaded pole of the factor.)

There are no clear, significant differences in terms of "dislike and active avoidance" as a function of either age or sex, nor are there significant interaction effects (see Table 7.01, Appendix 2).

UK STUDENT DATA
FACTOR TWO: PROBLEMATIC COMMUNICATION

MEAN FACTOR SCORES BY SEX AND AGE OF RESPONDENT

AGE	-25	26+	TOTAL
MALE	-0.02 (n=216)	-0.05 (n=26)	-0.02 (n=242)
FEMALE	-0.01 (n=146)	0.43 (n=17)	0.04 (n=163)
TOTAL	-0.02 (n=362)	0.14 (n=43)	0.00 (n=405)

There are no significant differences in terms of
"anticipating problems and feeling constrained" as a
function of either age or sex, nor are there significant
interaction effects (see Table 7.02, Appendix 2).

UK STUDENT DATA
FACTOR THREE: POSITIVE ENJOYMENT

MEAN FACTOR SCORES BY SEX AND AGE OF RESPONDENT

AGE	-25	26+	TOTAL
MALE	0.15 (n=216)	-0.13 (n=26)	0.12 (n=242)
FEMALE	-0.16 (n=146)	-0.29 (n=17)	-0.17 (n=163)
TOTAL	0.02 (n=362)	-0.19 (n=43)	0.00 (n=405)

There is a highly significant difference in the "positive
enjoyment" of the telephone, with females having
significantly higher enjoyment than males ($F=8.378$; df=1,
401, $p<0.001$) (see Table 7.03, Appendix 2) . There are no
significant differences as a function of age, and the age
by sex interaction is not significant.

The proportion of variance accounted for by sex and age
is rather small. For Factor One it is 1.059%, for Factor
Two it is 0.828%, and for Factor Three it is 2.532%, a
total of just 4.419%. Clearly, variations in telephone
apprehension are related primarily to variables other
than the sex and age of the respondent.

RESULTS: AUSTRALIAN STUDENT SAMPLE

As with the data obtained from the UK Student sample, in
order to explore the internal structure of the TAI, a
factor analysis was performed on the 20 items comprising
the TAI. A principal components extraction was used, with
a varimax orthogonal rotation being performed on the
resultant factor structure.

FACTOR LOADINGS: Australian Student Data

ITEM	FACTOR 1	FACTOR 2	ITEM SUMMARY
			FACTOR ONE
12	0.83543	0.21654	problems
11	0.78972	0.17205	misunderstood
14	0.74247	0.39447	inhibited
06	-0.73397	-0.24289	easy
09	0.69734	0.33270	nervous
18	0.65051	0.52390	not comfortable
17	-0.65011	-0.53096	calm and comfortable
08	0.63459	0.27092	rushed and pushed
02	0.62739	0.44454	difficult
19	0.62715	0.27961	frustration
15	-0.56000	-0.53410	relaxed
16	0.55217	0.55393	dread
13	0.54002	0.70904	don't like
05	-0.52333	-0.26393	take pride
10	0.50495	0.54000	hurry to finish
20	0.49200	0.61365	avoid using
			FACTOR TWO
01	-0.07237	-0.87953	look forward
07	-0.29508	-0.79605	enjoy
04	-0.33737	-0.75907	pleasant
03	0.37216	0.74040	avoid
13	0.54002	0.70904	don't like
20	0.49200	0.61365	avoid using
16	0.55217	0.55393	dread
10	0.50495	0.54000	hurry to finish
15	-0.56000	-0.53410	relaxed
17	-0.65011	-0.53096	calm and comfortable
18	0.65051	0.52390	not comfortable

Eigen value	11.22	1.41
%Var	56.1 (56.1)	7.0 (63.2)

The first factor describes communication via the telephone as "Problematic versus Non-Problematic", with the problematic pole being associated with arousal and anxiety, and the non-problematic pole being associated with the absence of tension. The second factor seems to define an "Active Avoidance versus Approach" dimension. The negative pole involves avoiding the use of the telephone, experiencing dislike and dread when using it, and hurrying to finish calls. The positive pole involves

looking forward to calls, feeling relaxed, calm and
comfortable when making calls, and seeing the experience
of making a call as pleasant and enjoyable.

As with the analysis of the UK Student sample, the
structure which emerges from this analysis of the TAI is
clearly not consistent with the uni-factorial structure
reported by Steele and Reinsch (1983). Two quite clear
factors emerge, with each being defined in terms of items
having primary loadings of 0.50 or greater, and with the
majority of items defining each factor having quite
distinct loadings on a single factor. Thus, the
proposition that the TAI-20 will have a multi-factorial
structure when used with Australian student subjects is
supported by this analysis.

Compared with the structure which emerged from the UK
Student data, the first factor in this structure seems
similar to Factor Two: Problematic Communication. The
other factor seems to combine the "Dislike" and "Like"
factors found in the UK Student analysis.

Sex and Age Differences

Sex and age differences were explored using the two sets
of factor scores.

AUSTRALIAN STUDENT DATA
FACTOR 1: PROBLEMATIC vs NON-PROBLEMATIC

MEAN FACTOR SCORES BY SEX AND AGE OF RESPONDENT

AGE	-25	26+	TOTAL
MALE	-0.13	0.25	-0.04
	n=102	n=33	n=135
FEMALE	-0.12	0.47	0.02
	n=195	n=59	n=254
TOTAL	-0.12	0.39	0.00
	n=297	n=92	n=389

Younger subjects see the telephone as significantly more problematic than older respondents (F=19.524; df=1, 385; p<0.0001). There are no significant sex differences, and the sex by age interaction effect is non-significant (see Table 7.05, Appendix 2).

AUSTRALIAN STUDENT DATA
FACTOR TWO: AVOIDANCE vs APPROACH

MEAN FACTOR SCORES BY SEX AND AGE OF RESPONDENT

AGE	-25	26+	TOTAL
MALE	-0.19	-0.56	-0.28
	n=102	n=33	n=135
FEMALE	0.26	-0.24	0.15
	n=195	n=59	n=254
TOTAL	0.11	-0.35	0.00
	n=297	n=92	n=389

Males are more likely to avoid the telephone (F=16.604; df=1, 385; p<0.0001), and younger people are less likely to avoid the telephone than are older people (f=15.637; df=1, 385; p<0.001) (see Table 7.05, Appendix 2). Taken together, these two factors suggest an intriguing pattern. Women, rather than men, feel more positive about the telephone, and actively seek to use it. On the other hand, there appear to be no differences between men and women in terms of their perception of the telephone as a problematic means of communication. Most interestingly, younger respondents are more likely to seek to use the telephone, whilst at the same time seeing the telephone as a more problematic communication medium than do older correspondents.

Compared with the UK Student sample, the proportion of the total variance accounted for by the variables of sex and age is greater, but is still rather small. For Factor One it is 5.060% and for Factor Two it is 7.887%, a total of 12.947%.

RESULTS: UK NON-STUDENT DATA

As with the UK and Australian Student data, a factor analysis of the TAI scale's 20 items was performed. A principal components extraction was used, employing a varimax orthogonal rotation of the resultant factor structure.

FACTOR LOADINGS: UK Non-student Data

ITEM	FACTOR 1	FACTOR 2	FACTOR 3	ITEM SUMMARY
				FACTOR ONE
11	0.795	0.116	0.243	MISUNDERSTOOD
12	0.782	0.287	0.258	PROBLEMS
06	0.610	0.580	.....	EASY
14	0.579	0.323	0.448	INHIBITED
08	0.579	0.142	0.357	RUSHED AND PUSHED
09	0.575	0.212	0.498	NERVOUS
02	0.528	0.527	0.261	DIFFICULT
19	0.492	0.171	0.377	FRUSTRATION
				FACTOR TWO
07	0.234	0.771	0.379	ENJOY
04	0.116	0.760	0.413	PLEASANT
05	0.314	0.738	0.042	TAKE PRIDE
01	0.046	0.715	0.465	LOOK FORWARD
15	0.439	0.590	0.415	RELAXED
06	0.610	0.580	.....	EASY
02	0.528	0.527	0.261	DIFFICULT
17	0.424	0.508	0.492	CALM & COMFORTABLE
				FACTOR THREE
20	0.268	0.279	0.780	AVOID USING
03	0.190	0.448	0.688	AVOID
16	0.405	0.130	0.645	DREAD
10	0.270	0.203	0.630	HURRY TO FINISH
18	0.468	0.368	0.591	NOT COMFORTABLE
13	0.442	0.427	0.519	DON'T LIKE
09	0.575	0.212	0.498	NERVOUS
17	0.424	0.508	0.492	CALM & COMFORTABLE

Eigenvalue

10.808	1.359	1.040

%VAR (Cum%VAR)

54.0 (54.0)	6.8 (60.8)	5.2 (66.0)

This analysis defines three factors with eigenvalues greater than one. The first factor consists of 7 items with loadings greater than 0.50. It describes respondents' feelings that communication via the telephone is likely to be difficult and to involve problems, and that the telephone constrains communication. It can be termed "Problematic Communication". The second factor consists of 8 items with eigenvalues greater than 0.50, and clearly describes a feeling of "Positive Enjoyment" associated with using the telephone. The third factor consists of 6 items, and describes feelings of dislike and of avoidance of the telephone. It may be termed the "Active Avoidance" factor. As with previous analyses, this structure is clearly not consistent with the uni-factorial structure reported by Steele and Reinsch (1983).

Sex and Age Differences

Sex and age differences were examined using the three sets of factor scores.

UK NON-STUDENT DATA
FACTOR ONE: PROBLEMATIC COMMUNICATION

MEAN FACTOR SCORES BY SEX AND AGE OF RESPONDENT

Age	16-25	26-35	36-45	46-55	56-65	TOTAL
MALE means	-0.20	0.17	0.11	-0.45	0.39	-0.02
n	7	29	55	44	18	153
FEMALE means	0.74	0.63	-0.16	-0.20	-0.09	0.02
n	10	25	70	35	13	153
TOTAL means	0.36	0.38	-0.04	-0.34	0.19	00.00
n	17	54	125	79	31	306

With respect to Problematic Communication, there is no clear sex difference. However, there is a highly significant age difference (F=5.622; df=1, 296;

p<0.0001), and a significant age x sex interaction
(F=3.151, df=4, 296; p<0.015) (see Table 7.06, Appendix
2).

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┌──────────────────────────────────────────────┐
│            UK Non-student data: Factor One     │
│               Problematic Communication        │
│             Factor Scores by Age and Sex       │
│                See Figure C07F01               │
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Overall, with increasing age, the telephone is seen as
less problematic (overall correlation between age and
factor scores for Problematic Communication is -0.1558,
p<0.003). However, this pattern is not consistent. For
female respondents, the two youngest age groups have
higher factor scores than the three older age groups. A
comparison of the female '26-35' with the '36-45' age
groups gives a t value of 3.84 (df=93, p<0.0001, 2-
tailed). For male respondents, the oldest age group sees
the telephone as most problematic, whilst the next oldest
group (the 46-55 age group) see it as least problematic.
Comparisons of the first three male age groups show no
significant differences amongst them, whereas the
comparison between the '36-45' and '46-55' group gives a
t value of 2.99 (df=97, p<0.004, 2-tailed), and
comparison of the '46-55' and '56-65+' groups shows a t
value of -2.75 (df=60, p<0.008, 2-tailed). There seems to
be no obvious explanation for this pattern of results.

UK NON-STUDENT DATA
FACTOR TWO: POSITIVE ENJOYMENT

MEAN FACTOR SCORES BY SEX AND AGE OF RESPONDENT

Age	16-25	26-35	36-45	46-55	56-65	TOTAL
MALE						
means	0.00	-0.06	0.29	0.44	0.49	0.28
n	7	29	55	44	18	153
FEMALE						
means	-0.30	-0.15	-0.22	-0.37	-0.56	-0.28
n	10	25	70	35	13	153
TOTAL						
means	-0.17	-0.10	0.00	0.08	0.05	00.00
n	17	54	125	79	31	306

UK NON-STUDENT SAMPLE

FACTOR ONE: PROBLEMATIC COMMUNICATION

Factor Scores by Sex and Age

Figure C07F01

204
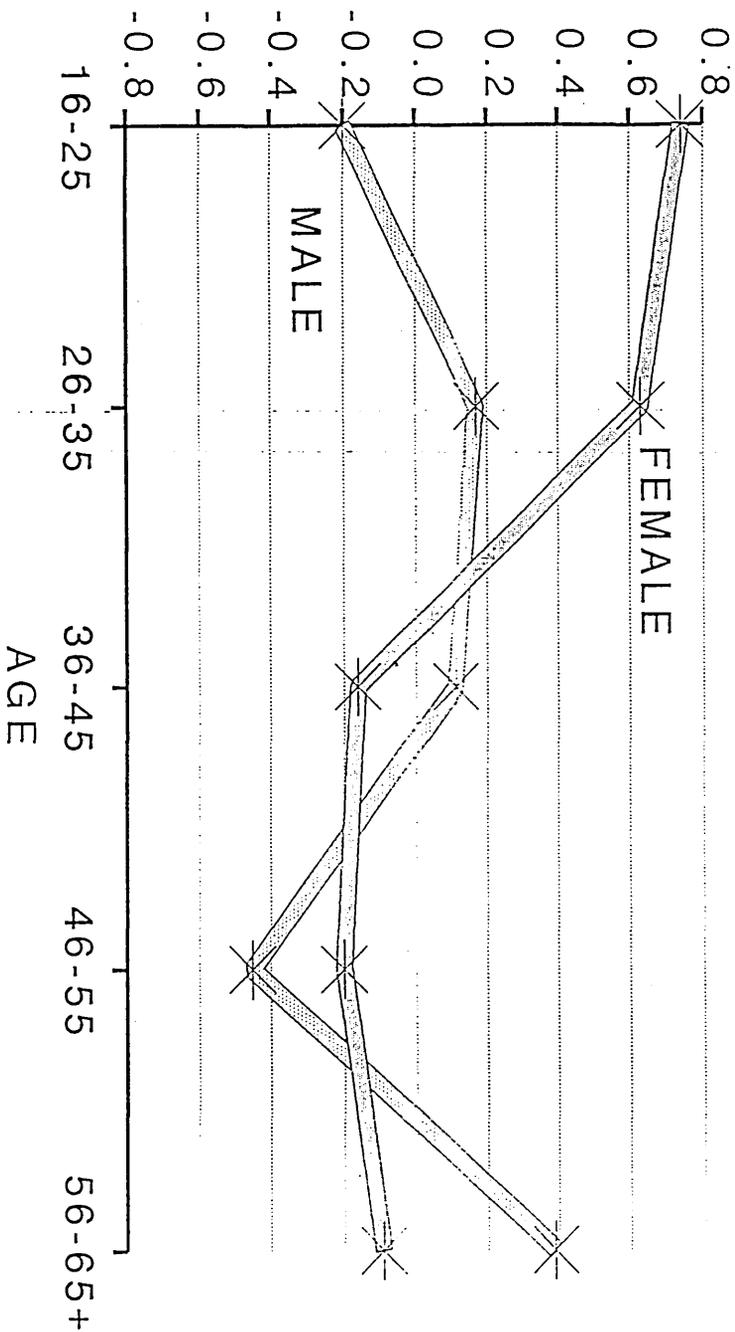
There is a significant sex difference in "Positive Enjoyment", with females having significantly greater levels of enjoyment than males (F=25.324; df=1, 296; p<0.0001) (see Table 7.07, Appendix 2). The age and sex by age interaction effects are not significant, although there does appear to be a tendency for sex differences to increase in the older age groups. Comparisons of males and females within each age group show that in the two younger age groups the difference is not statistically significant, whilst in the three older age groups it is significant (Age 16-25: t=0.78, p<0.445; Age 26-35: t=0.32, p<0.749; Age 36-45: t=2.94, p<0.004; Age 46-55: t=3.60, p<0.001; Age 56-65+: t=3.47, p<0.002).

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+-----------------------------------------------+
|        UK Non-student data: Factor Two        |
|              Positive Enjoyment               |
|        Factor Scores by Age and Sex           |
|             See Figure C07F02                 |
+-----------------------------------------------+
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UK NON-STUDENT DATA
FACTOR THREE: ACTIVE AVOIDANCE

MEAN FACTOR SCORES BY SEX AND AGE OF RESPONDENT

Age	16-25	26-35	36-45	46-55	56-65	TOTAL
MALE means	-0.35	-0.17	0.11	0.24	0.49	0.12
n	7	29	55	44	18	153
FEMALE means	-0.17	-0.33	-0.20	-0.16	-0.39	-0.12
n	10	25	70	35	13	153
TOTAL means	-0.24	0.07	-0.07	0.06	0.13	00.00
n	17	54	125	79	31	306

Males have significantly higher Active Avoidance scores than females (F=3.697; df=1, 296; p<0.055). The age difference is not significant, but the age by sex interaction effect is significant (see Table 7.08, Appendix 2).

205

UK NON STUDENT SAMPLE

FACTOR TWO: POSITIVE ENJOYMENT

Factor Scores by Sex and Age

Figure C07F02

206
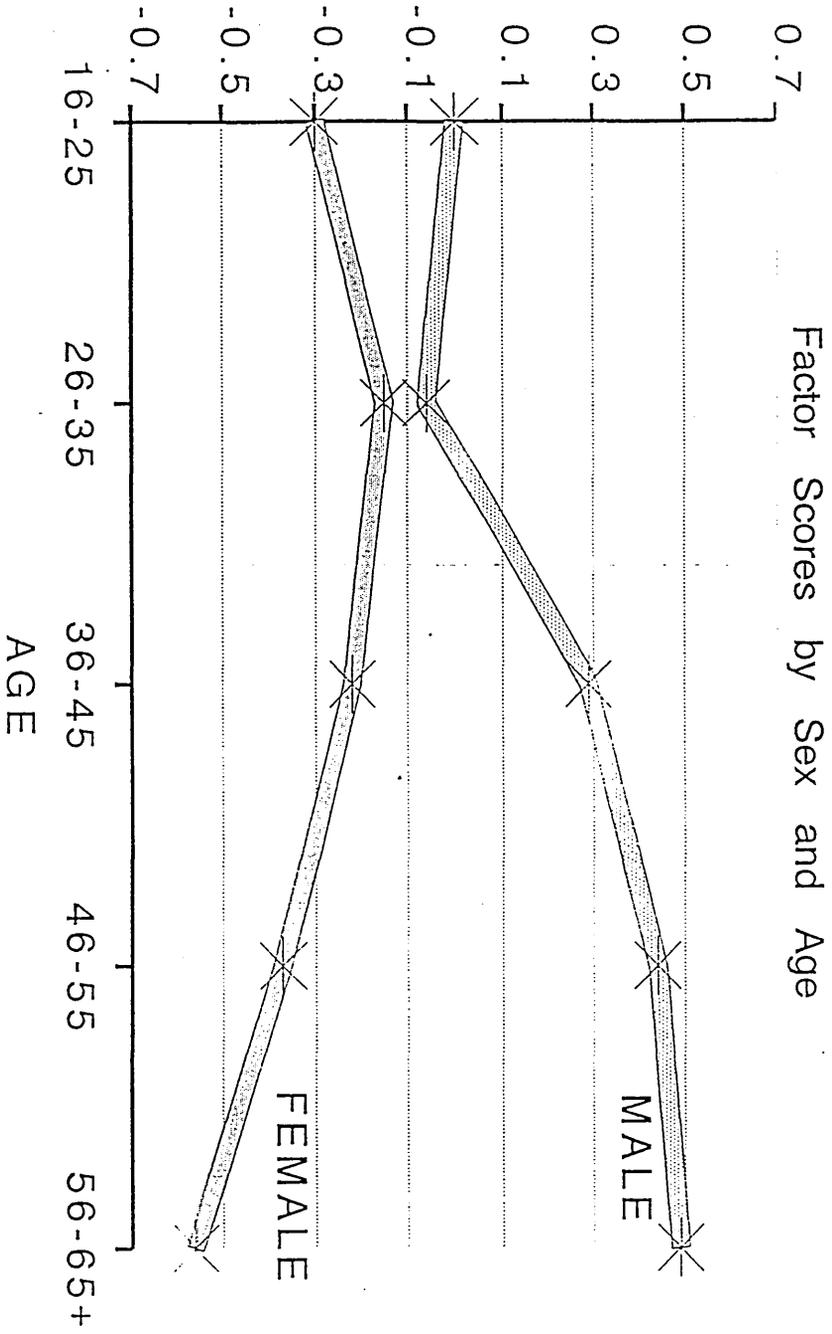
UK Non-student data: Factor Three
Active Avoidance
Factor Scores by Age and Sex
See Figure C07F03

Examination of the means suggests that this results from a general trend for active avoidance to increase in males with increasing age, whilst the opposite is the case for females, such that in younger age groups females have higher active avoidance scores than males, whilst in older age groups, males have higher active avoidance scores than females. Comparisons of males and females within each age group show that in the two younger age groups the difference is not statistically significant, whilst in the three older age groups it either approaches or is significant (Age 16-25: $t=-0.33$, $p<0.743$; Age 26-35: $t=-1.61$, $p<0.113$; Age 36-45: $t=1.85$, $p<0.066$; Age 46-55: $t=1.88$, $p<0.064$; Age 56-65+: $t=2.36$, $p<0.025$).

Compared with previous analyses, the proportion of the total variance accounted for by the variables of sex and age is considerably larger. For Factor One it is 10.639%, for Factor Two it is 10.362%, and for Factor Three it is 5.872%, a total of 26.873%. The more highly differentiated classification of respondent age, as well as the greater spread of respondent ages sampled, may underlie this difference.

ESTIMATES OF TELEPHONE USE AS A FUNCTION OF FACTOR SCORES

Correlations between estimates of calls made and received and the three sets of factor scores suggest that these estimates are significantly related to the degree of "positive enjoyment" (Calls made: $r=-0.2073$, $p<0.0001$; Calls received: $r=-0.1374$, $p<0.008$). Greater "positive enjoyment" is associated with higher estimates of both calls made and received. However, there is no significant relation between the extent to which use of the telephone is seen as problematic and respondents' estimates of

UK NON-STUDENT SAMPLE

FACTOR THREE: ACTIVE AVOIDANCE

Factor Scores by Sex and Age

Figure C07F03

208
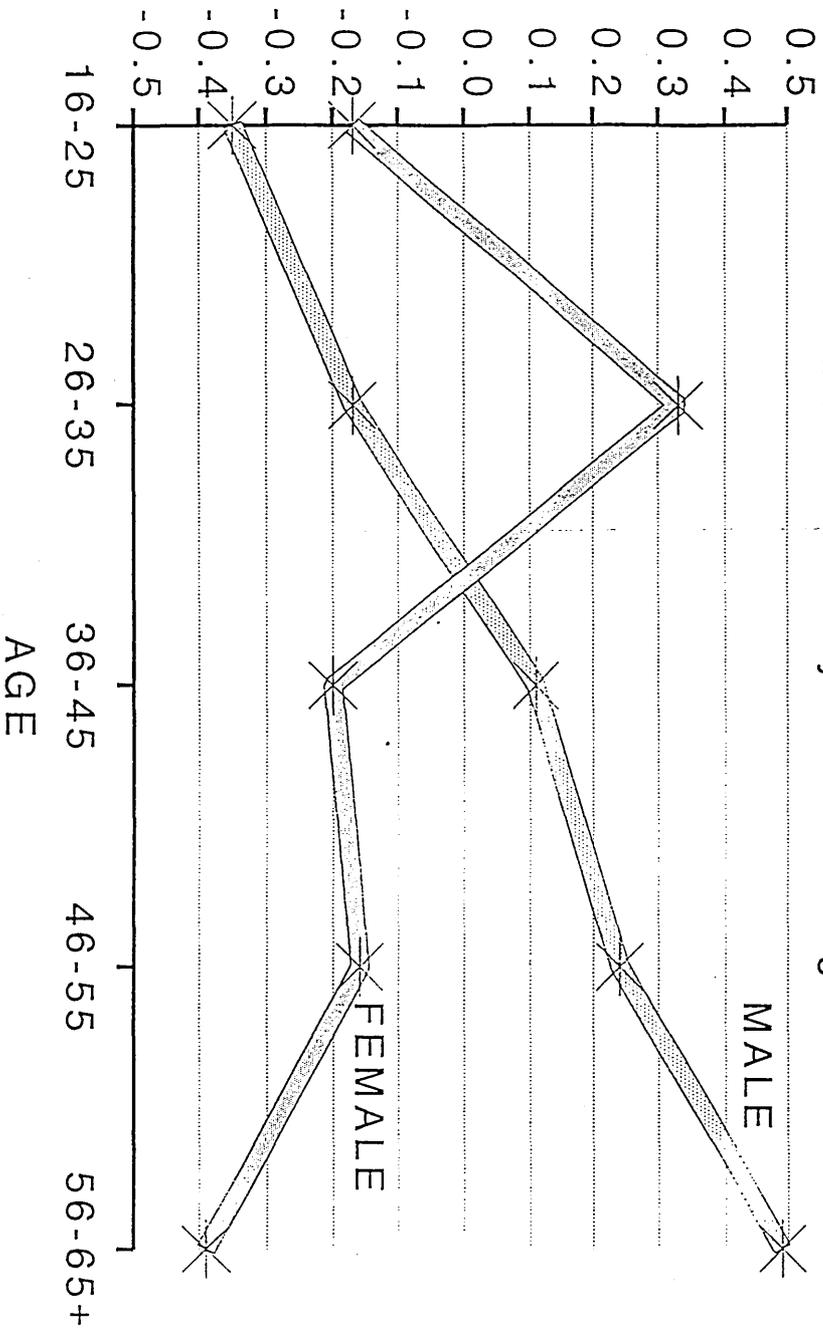
either how many calls they make, or of how many calls they receive. Similarly, and rather surprisingly, there is no significant relation between respondents' scores on the avoidance factor and the number of calls made or received.

UK Non-student Sample
Correlations between telephone use and factor scores

	Calls Made	Calls Received
Factor One: Problematic Communication	r=-0.0638 p<0.133 not sig	r=-0.0179 p<0.378 not sig
Factor Two: Positive Enjoyment	r=-0.2073 p<0.0001	r=-0.1374 p<0.008
Factor Three: Active Avoidance	r=-0.0731 p<0.101 not sig	r=-0.0343 p<0.275 not sig

COMPARISON OF CULTURES: UK AND AUSTRALIAN STUDENT SAMPLES

The factor analyses of the UK and Australian Student data, whilst extracting differing numbers of factors, show clear similarities of factor structure. Factor One in the Australian data is equivalent to Factor Two in the UK data, whilst the second factor extracted from the Australian Student data appears to be a combination of the first and third factors appearing in the UK Student analysis.

COMPARISON OF UK and AUSTRALIAN STUDENT FACTOR STRUCTURES

UK Factor Two	Aus Factor One
12 PROBLEMS	12 problems
11 MISUNDERSTOOD	11 misunderstood
14 INHIBITED	14 inhibited
06 EASY	06 easy
09 NERVOUS	09 nervous

UK Factor 1	UK Factor 3	Aus Factor Two
		01 look forward
	07 ENJOY	07 enjoy
	05 TAKE PRIDE	
	04 PLEASANT	04 pleasant
	01 LOOK FORWARD	
20 AVOID USING		03 avoid
16 DREAD		13 don't like
19 FRUSTRATION		20 avoid using
03 AVOID		16 dread
18 NOT COMFORTABLE		10 hurry to finish
13 DON'T LIKE		
10 HURRY TO FINISH		
	15 RELAXED	15 relaxed
	06 EASY	
	17 CALM & COMFORTABLE	17 calm & comfortable
	13 DON'T LIKE	
		18 not comfortable

A comparison of the ANOVA results from the two samples shows that the direction of differences in both sets of data are the same, with the differences usually reaching significance in the Australian sample.

YOUNGER compared with OLDER subjects

FACTOR		UK SAMPLE	AUSTRALIAN SAMPLE	
less avoidance	(F1)	nsd	(F2)	$p < 0.001$
more problematic	(F2)	nsd	(F1)	$p < 0.001$
more enjoyment	(F3)	nsd	(F2)	$p < 0.001$

MALE compared with FEMALE subjects

more avoidance	(F1)	nsd	(F2)	$p < 0.001$
more problematic	(F2)	nsd	(F1)	nsd
less enjoyment	(F3)	nsd	(F2)	$p < 0.001$

A direct comparison of differences between the two
samples can be made by combining the data from the two
samples, factor analysing the combined data set, and then
comparing the two samples in terms of the factor scores
of the resultant factor structure. Given the absence of
2-way and 3-way interactions in the analyses of T20
scores as a function of culture (UK Student data vs.
Australian Student data), and the similarity of
structures in the separate factor analyses noted above,
the two sets of data were combined and submitted to a
factor analysis using a principal components extraction
of factors, and a varimax orthogonal rotation of the
resultant factor structure. The resulting factor
structure was used to generate factor scores for each
respondent, and ANOVAs were then used to examine
cultural, sex and age differences.

FACTOR LOADINGS: UK and Australian Student Data

ITEM	FACTOR 1	FACTOR 2	FACTOR 3	ITEM SUMMARY
				FACTOR ONE
11	0.72960	-------	-0.32051	misunderstood
19	0.70551	0.25393	-------	frustration
09	0.70014	0.25929	-0.27641	nervous
12	0.69453	-------	-0.50965	problems
14	0.68004	0.25096	-0.35578	inhibited
16	0.62821	0.52404	-------	dread
18	0.58038	0.48528	-0.27173	not comfortable
10	0.57799	0.43980	-0.14756	hurry to finish
20	0.57712	0.57442	-------	avoid using
08	0.55194	0.27646	-0.26654	rushed and pushed
13	0.55156	0.61963	-0.28132	don't like
17	-0.49446	-0.48810	0.44560	NOT calm and comfortable
02	0.49007	0.38123	-0.40071	difficult
				FACTOR TWO
01	-------	-0.83992	0.19115	NOT look forward
07	-0.15835	-0.72757	0.43853	NOT enjoy
04	-0.22911	-0.70680	0.39486	NOT pleasant
03	0.43701	0.66275	-------	avoid
13	0.55156	0.61963	-0.28132	don't like
20	0.57712	0.57442	-------	avoid using
16	0.62821	0.52404	-------	dread
15	-0.43153	-0.50365	0.47040	NOT relaxed
17	-0.49446	-0.48810	0.44560	NOT calm and comfortable
18	0.58038	0.48528	-0.27173	not comfortable
				FACTOR THREE
05	-------	-0.23272	0.76551	take pride
06	-0.43068	-0.18588	0.69520	easy
12	0.69453	-------	-0.50965	NOT problems
15	-0.43153	-0.50365	0.47040	relaxed
17	-0.49446	-0.48810	0.44560	calm and comfortable
07	-0.15835	-0.72757	0.43853	NOT enjoy

Eigenvalues
10.53	1.38	1.15

%Var (Cum%Var)
52.6 (52.6)	6.9 (59.5)	5.8 (65.3)

This analysis presents a three factor solution. The first factor indicates a view of telephone communication as "problematic", as indexed by scales such as 'misunderstood', 'frustration', 'problems' and

'difficult'. It also indexes the resultant feelings of
nervousness, inhibition, dread and discomfort, of feeling
'rushed and pushed', and of 'hurrying to finish'. The
second factor is a bi-polar factor which may be labelled
an "approach-avoidance" factor. The positive pole is
defined by items such as 'avoid' and 'avoid using',
whilst the negative pole is indexed by items such as
'look forward to', 'enjoy', 'relaxed' and 'pleasant'. The
third factor seems to be concerned with a notion of
"confidence", indexed primarily by the scales 'take
pride' and 'easy'. There is, as might have been expected,
substantial similarity between this factor structure and
those derived from the separate analyses of the UK and
Australian samples. The first factor corresponds to the
"problematic communication" factors identified earlier
(as Factor 2 in the analysis of the UK Student data, and
as Factor 1 in the analysis of the Australian Student
data). The second factor corresponds to the similar bi-
polar Factor 2 identified in the analysis of the
Australian data, and to the two uni-polar factors (Factor
1 and Factor 3) which emerged from the UK analysis. The
third factor was not identified in the previous analyses,
but given that the eigenvalue of this third factor is
near to 1.0 it is possible that it previously fell below
the eigenvalue of 1.0 cut-off applied in the factor
extraction algorithm.

ANALYSIS OF CULTURE, SEX AND AGE DIFFERENCES

The data from the combined UK and Australian Student
samples was analysed in terms of ANOVAs performed on the
factor scores, with variables of culture (UK vs
Australia), respondent sex and respondent age. The total
sample size was 794.

FACTOR ONE: PROBLEMATIC COMMUNICATION					
CULTURE	SEX	AGE	MEAN FACTOR SCORE		
UK	MALE	-25	0.07 (n=216)	0.04	0.07
		26+	-0.22 (n= 26)		
	FEMALE	-25	0.08 (n=146)	0.10	
		26+	0.31 (n= 17)		
AUSTRALIAN	MALE	-25	-0.17 (n=102)	-0.11	-0.07
		26+	0.09 (n= 33)		
	FEMALE	-25	-0.11 (n=195)	-0.05	
		26+	0.17 (n= 59)		

(Note: Because of the scoring conventions used, positive factor scores indicate disagreement with the positively loaded pole of the factor, whereas negative factor scores indicate endorsement of the positively loaded pole of the factor.)

Summary of Comparisons FACTOR 1: MEAN SCORES: PROBLEMATIC COMMUNICATION
Culture: UK = 0.07 (n=405) Australian=-0.07 (n=389)
Sex: Male=-0.01 (n=377)   Female= 0.01 (n=417)
Age: -25 =-0.02 (n=659)   26+ = 0.09 (n=135)

The analysis of variance table (see Table 7.09, Appendix 2) shows that there was a significant difference in scores on Factor One: Problematic Communication as a function of culture, with the Australian sample seeing the telephone as significantly more problematic than respondents in the UK sample (UK mean=0.07, Aus mean=-0.07, f=5.146, df=1, 786; p<0.024). (Note that this is despite the significant and opposite difference in the overall T20 score, where the UK sample had significantly higher overall telephone apprehension.) Differences as a function of age and sex were not significant, nor were any of the two-way or three-way interactions.

FACTOR TWO: AVOIDANCE-APPROACH					
CULTURE	SEX	AGE	MEAN FACTOR SCORE		
UK	MALE	-25	-0.12 (n=216)	-0.12	-0.01
		26+	-0.13 (n= 26)		
	FEMALE	-25	0.19 (n=146)	0.17	
		26+	0.01 (n= 17)		
AUSTRALIAN	MALE	-25	-0.16 (n=102)	-0.25	0.01
		26+	-0.53 (n= 33)		
	FEMALE	-25	0.27 (n=195)	0.14	
		26+	-0.25 (n= 59)		

Summary of Comparisons
FACTOR 2: MEAN SCORES: AVOIDANCE-APPROACH
Culture: UK =-0.01 (n=405) Australian= 0.01 (n=389)
Sex: Male=-0.17 (n=377)   Female= 0.15 (n=417)
Age: -25 = 0.05 (n=659)   26+ =-0.26 (n=135)

In terms of Factor Two: Approach-Avoidance the culture difference is non-significant (UK=-0.01, Aus=0.01, f=0.168, df=1, 786; nsd), but there are significant differences as a function of both the sex and age of respondents. Males are more likely to avoid the use of the telephone (male=-0.17, female=0.15, f=22.378, df=1, 786; p<0.0001), and older are more likely than younger people to avoid using the phone (younger=0.05, older=-0.26, f=12.152, df=1, 786; p<0.0001). None of the two-way or three-way interaction terms are significant, although the culture by age interaction (f=2.962, df=1, 786; p<0.086) approaches significance (see Table 7.10, Appendix 2). Examination of the means suggests that this is due to the age difference being much clearer in the Australian sample. In the separate analyses reported above, the age difference with respect to Factor 2:

Avoidance-Approach in the Australian analysis of sex and age differences was significant (p<0.001), whereas neither Factor 1: Avoidance nor Factor 3: Positive Enjoyment in the UK Student analysis were significant.

FACTOR THREE: CONFIDENCE					
CULTURE	SEX	AGE	MEAN FACTOR SCORE		
UK	MALE	-25	0.45 (n=216)	-0.12	-0.01
		26+	-0.11 (n= 26)		
	FEMALE	-25	0.31 (n=146)	0.17	
		26+	-0.11 (n= 17)		
AUSTRALIAN	MALE	-25	-0.26 (n=102)	-0.25	0.01
		26+	-0.45 (n= 33)		
	FEMALE	-25	-0.28 (n=195)	0.14	
		26+	0.80 (n= 59)		

Summary of Comparisons FACTOR 3: MEAN SCORES: CONFIDENCE
Culture: UK = 0.35 (n=405) Australian=-0.37 (n=389)
Sex: Male= 0.16 (n=377)   Female=-0.14 (n=417)
Age: -25 = 0.09 (n=659)   26+ =-0.45 (n=135)

Confidence varies significantly as a function all three variables: culture, sex and age (see Table 7.11, Appendix 2). Australian respondents are significantly more confident when using the telephone (UK=0.35, Aus=-0.37; f=85.129, df=1, 786; p<0.0001), there is a strong trend towards greater female confidence (male=0.16, female=-0.14; f=3.468, df=1, 786; p<0.063), and older respondents are more confident than younger (younger=0.09, older=-0.45; f=19.810, df=1, 786; p<0.0001). None of the two-way or three-way interactions are significant.

SUMMARY OF CULTURE DIFFERENCES IN TERMS OF FACTORS EXTRACTED

Problematic Communication	UK < Australian	$p<0.024$
Approach Avoidance	UK = Australian	no sig diff
Confidence	UK < Australian	$p<0.0001$

These results suggest that whilst Australian respondents are more confident when using the telephone, they simultaneously see the telephone as a more problematic medium of communication. Despite these differences, there are no differences in tendencies to approach or avoid the telephone.

COMPARISON OF STUDENT AND NON-STUDENT SAMPLES

Comparison of student and non-student samples in terms of T20 scores demonstrated significant differences. It is possible that these differences reflect differences in the conceptualisation of telephone apprehension by these two groups, and hence, in the resultant factorial structure of the TAI. However, a comparison of the factor structures of the UK Student and UK Non-student data show clear similarities.

COMPARISON OF UK STUDENT AND NON-STUDENT FACTOR STRUCTURES

UK NON-STUDENT: Factor One	UK STUDENT: Factor Two
11 misunderstood	12 PROBLEMS
12 problems	11 MISUNDERSTOOD
06 easy	14 INHIBITED
14 inhibited	06 EASY
08 rushed & pushed	
09 nervous	09 NERVOUS
02 difficult	
19 frustration	

UK NON-STUDENT: Factor Two	UK STUDENT: Factor Three
07 enjoy	07 ENJOY
	05 TAKE PRIDE
04 pleasant	04 PLEASANT
05 take pride	
01 look forward	01 LOOK FORWARD
15 relaxed	15 RELAXED
06 easy	
02 difficult	
17 calm & comfortable	17 CALM & COMFORTABLE

UK NON-STUDENT: Factor Three	UK STUDENT: Factor One
20 avoid using	20 AVOID USING
03 avoid	
16 dread	16 DREAD
10 hurry to finish	
	19 FRUSTRATION
	03 AVOID
18 not comfortable	18 NOT COMFORTABLE
13 don't like	13 DON'T LIKE
	10 HURRY TO FINISH
09 nervous	
	08 RUSHED & PUSHED
17 calm & comfortable	17 CALM & COMFORTABLE

A comparison of the ANOVA results from the two samples shows that the pattern of differences in terms of both direction and significance are very similar, with the differences tending to be greater in the Non-student sample.

	UK STUDENT SAMPLE	UK NON-STUDENT SAMPLE

YOUNGER vs OLDER

less avoidance	(F1) nsd	(F3) nsd (sig age x sex interaction)
more problematic	(F2) nsd	(F1) p<0.0001
more enjoyment	(F3) nsd	(F2) nsd

MALES vs FEMALES

more avoidance	(F1) nsd	(F3) p<0.055
more problematic	(F2) nsd	(F1) nsd
less enjoyment	(F3) nsd	(F2) p<0.0001

ANALYSIS OF COMBINED UK STUDENT AND NON-STUDENT SAMPLES

Given the absence of 2-way and 3-way interactions in the analyses of the TAI T20 scores as a function of sample (UK Student vs Non-student), and the similarity of structures in the separate factor analyses noted above, the two sets of data were combined and factor analysed using a principal components extraction and varimax orthogonal rotation. The resulting factor structure generated factor scores for each respondent and differences in sample, sex and age were explored using ANOVAs.

FACTOR LOADINGS: UK Non-student and Student Data

ITEM	FACTOR 1	FACTOR 2	FACTOR 3	ITEM SUMMARY
				FACTOR ONE
20	0.76129	0.16254	0.29244	avoid using
16	0.71801	0.32045	0.21024	dread
03	0.63574	0.15276	0.46640	avoid
19	0.60964	0.37600	0.06165	frustration
18	0.57706	0.43029	0.37581	not comfortable
10	0.56685	0.35288	0.25694	hurry to finish
13	0.55659	0.41333	0.46794	don't like
09	0.50806	0.60545	0.18921	nervous
				FACTOR TWO
12	0.26483	0.81521	0.19218	problems
11	0.33874	0.73703	0.05267	misunderstood
06	0.06923	0.68463	0.47792	NOT easy
14	0.41956	0.61978	0.26260	inhibited
09	0.50806	0.60545	0.18921	nervous
08	0.41513	0.50128	0.21382	rushed and pushed
02	0.34970	0.50059	0.43393	difficult
15	0.40020	0.46063	0.57969	NOT relaxed
17	0.44270	0.45724	0.52042	NOT calm and comfortable
				FACTOR THREE
07	0.29158	0.21658	0.80081	enjoy
04	0.35482	0.19759	0.74924	pleasant
01	0.42994	-0.02378	0.74226	look forward
05	-0.09105	0.43849	0.66165	take pride
15	0.40020	0.46063	0.57969	relaxed
17	0.44270	0.45724	0.52042	calm and comfortable
06	0.06923	0.68463	0.47792	easy
13	0.55659	0.41333	0.46794	NOT don't like
03	0.63574	0.15276	0.46640	NOT avoid

Eigenvalues

10.56	1.42	1.23

%Var (Cum%Var)

52.8 (52.8)	7.1 (59.9)	5.6 (65.5)

The first factor extracted indexes "active avoidance" of
the telephone, with high loadings of items such as
'avoid', 'avoid using' and 'dread'. The second factor is
concerned with the "problematic" nature of telephone
communication, with items such as "problems",
"misunderstood", 'inhibited' and 'nervous' loading highly
on this factor. The third factor indexes feelings of

"positive enjoyment" when using the telephone, and consists of items such as 'enjoy', 'pleasant', 'relaxed', 'calm and comfortable' and 'look forward'.

There is, as might have been expected, substantial similarity between this factor structure and those derived from the separate analyses of the UK Non-student sample, and in particular, from the UK Student sample. The first factor corresponds to the "active avoidance" factors identified as Factor 1 in the analysis of the UK Student data, and as Factor 3 in the analysis of the UK Non-student data. The second factor corresponds to the "problematic communication" Factor 2 identified in the analysis of the UK Student data, and to Factor 1 in the UK Non-student analysis. The third factor, "positive enjoyment", corresponds to Factor 3 in the UK Student data, and Factor 2 in the UK Non-student data.

ANALYSIS OF SAMPLE, SEX AND AGE DIFFERENCES

The data from the combined UK Student and Non-student samples was analysed using ANOVAs of factor scores, with variables of sample (Student vs Non-student), respondent sex (male vs female) and respondent age (25 or less vs 26 or more). The total sample size was 711.

COMBINED UK SAMPLES: STUDENT and NON-STUDENT MEAN FACTOR SCORES: FACTOR ONE: ACTIVE AVOIDANCE					
SAMPLE	SEX	AGE	MEAN FACTOR SCORE		
STUDENT	MALE	-25	0.00 (n=216)	0.04	-0.02
		26+	0.35 (n= 26)		
	FEMALE	-25	-0.12 (n=146)	-0.11	
		26+	-0.03 (n= 17)		
NON-STUDENT	MALE	-25	-0.26 (n= 7)	0.10	0.03
		26+	0.11 (n=146)		
	FEMALE	-25	-0.01 (n= 10)	-0.04	
		26+	-0.04 (n=143)		

Summary of Comparisons COMBINED UK SAMPLES: STUDENT and NON-STUDENT MEAN FACTOR SCORES: FACTOR ONE: ACTIVE AVOIDANCE	
Sample: Student=-0.02 n=405, Non-student= 0.03 n=306	
Sex: Male= 0.06 n=395	Female=-0.07 n=316
Age: -25 =-0.05 n=379	26+ = 0.06 n=332

There was no significant difference in scores on Factor
One: Active Avoidance as a function of sample (see Table
7.12, Appendix 2). There was a strong trend as a function
of sex, with males having higher active avoidance scores
than females (Male=0.06, Female=-0.07, f=3.279, df=1,
710; p<0.071). The age difference was also non-
significant, but with a trend towards younger subjects
showing more active avoidance than younger subjects
(Younger=-0.05, Older=0.06, df=1, 710; p<0.116) None of
the two-way or three-way interactions reached
significance.

COMBINED UK SAMPLES: STUDENT and NON-STUDENT FACTOR SCORES: FACTOR TWO: PROBLEMATIC COMM'TION					
SAMPLE	SEX	AGE	MEAN FACTOR SCORE		
STUDENT	MALE	-25	0.36 (n=216)	0.04	-0.02
		26+	0.32 (n= 26)		
	FEMALE	-25	0.34 (n=146)	-0.11	
		26+	-0.09 (n= 17)		
NON-STUDENT	MALE	-25	-0.62 (n= 7)	0.10	0.03
		26+	-0.45 (n=146)		
	FEMALE	-25	0.15 (n= 10)	-0.04	
		26+	-0.47 (n=143)		

Summary of Comparisons COMBINED UK SAMPLES: STUDENT and NON-STUDENT FACTOR 2: MEAN SCORES: PROBLEMATIC COMMUNICATION
Sample: Student= 0.33 n=405, Non-student=-0.44 n=306
Sex: Male= 0.04 n=395,   Female=-0.05 n=316
Age: -25 = 0.33 n=379,   26+ =-0.38 n=332

ANOVA shows (see Table 7.13, Appendix 2) that in terms of Factor Two: Problematic Communication the difference between the samples is significant (Student mean=0.33, Non-student mean=-0.44, $f=21.619$, $df=1$, 710; $p<0.0001$), with the Student sample seeing the telephone as more problematic than the Non-student sample. There were no significant differences as a function of either the sex or the age of respondents, although there was a tendency for younger subjects to see the telephone as more problematic than did older subjects (younger mean=0.33, older mean=-0.38, $f=3.184$, $df=1$, 710; $p<0.075$). The sample by age interaction was not significant, but both the sex by sample and the sex by age interactions were significant (sex x sample $f=4.119$, $df=1$, 710, $p<0.043$;

sex x age f=4.064, df=1, 710; p<0.044). It is not clear
how these interactions should be interpreted. Examination
of the means by sample and sex shows that for both the
Student and Non-student samples, there was an absence of
significant sex differences (Students: Male=0.36
Female=0.30, t=0.61, df=403, nsd; Non-students: Male=-
0.46 Female=-0.42, t=-0.34, df=304, nsd), whilst for both
males and females the sample difference was significant
(Males: Student=0.36 Non-student=-0.46, t=8.36, df=393,
p<0.0001; Females: Student=0.30, Non-student=-0.42,
t=7.15, df=314, p<0.0001), Similarly, the sex x age
interaction reflects the absence of significant overall
sex differences (Young: Male=0.33 Female=0.33, t=-0.01,
df=377, nsd; Old: Male=-0.33 Female=-0.43, t=0.93,
df=330, nsd), whilst for both males and females the age
difference was significant (Males: Younger=0.33 Older=-
0.33, t=6.74, df=393, p<0.0001; Females: Younger=0.33,
Older=-0.43, t=7.54, df=314, p<0.0001),

COMBINED UK SAMPLES: STUDENT and NON-STUDENT MEAN FACTOR SCORES: FACTOR THREE: +ENJOYMENT					
SAMPLE	SEX	AGE	MEAN FACTOR SCORE		
STUDENT	MALE	-25	0.19 (n=216)	0.04	-0.02
		26+	-0.05 (n= 26)		
	FEMALE	-25	-0.09 (n=146)	-0.11	
		26+	-0.13 (n= 17)		
NON-STUDENT	MALE	-25	-0.14 (n= 7)	0.10	0.03
		26+	0.27 (n=146)		
	FEMALE	-25	-0.39 (n= 10)	-0.04	
		26+	-0.41 (n=143)		

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Summary of Comparisons

COMBINED UK SAMPLES: STUDENT and NON-STUDENT
MEAN FACTOR SCORES: FACTOR THREE: POSITIVE ENJOYMENT

Sample: Student= 0.06 n=405, Non-student=-0.08   n=306

 Sex:      Male= 0.20 n=395,       Female=-0.25   n=316

 Age:      -25 = 0.06 n=379,          26+ =-0.07  n=332
```

For the Positive Enjoyment factor (see Table 7.14, Appendix 2) the non-student/student comparison is not significant. However, positive enjoyment of telephone use varies significantly as a function of the sex of the respondent (male mean=0.20, female mean=-0.25; $f=35.448$, df=1, 710; $p<0.0001$), with females having significantly higher enjoyment of telephone use. Positive enjoyment of the telephone does not vary significantly as a function of age. None of the two-way or three-way interactions were significant.

SUMMARY OF SAMPLE DIFFERENCES IN TERMS OF FACTORS EXTRACTED

The comparison of Non-student and Student samples suggests that whilst students have significantly higher factor scores in terms of seeing telephone communication as problematic, in other respects the two samples are comparable. Students and Non-students do not differ significantly in terms of positive enjoyment of telephone use, nor in terms of avoidance of the telephone.

FACTOR	COMPARISON	SIGNIFICANCE
Problematic Communication	Student>Non-student	$p<0.0001$
Active Avoidance	Student=Non-student	no sig diff
Positive Enjoyment	Student=Non-student	no sig diff

Most importantly, the structure of telephone apprehension appears to be very similar in the two samples, suggesting that results derived from student samples are likely to be generalisable to non-student populations.

ANALYSIS OF COMBINED SAMPLE

Given the similarity of structures in the various factor analyses noted above, the three sets of data were combined and submitted to a factor analysis using a principal components extraction of factors, and a varimax orthogonal rotation of the resultant factor structure.

ITEM	FACTOR 1	FACTOR 2	FACTOR 3	ITEM SUMMARY
				FACTOR ONE
09	0.69939	0.21645	0.33141	nervous
16	0.69774	0.40912	0.05545	dread
11	0.69692	-------	0.41884	misunderstood
19	0.68596	0.20443	0.10480	frustration
12	0.65222	0.05828	0.57926	problems
14	0.65193	0.24929	0.40802	inhibited
20	0.64000	0.53356	-0.02266	avoid using
18	0.61745	0.44763	0.29583	not comfortable
10	0.59891	0.40013	0.14028	hurry to finish
08	0.57785	0.20983	0.30714	rushed and pushed
13	0.57387	0.55950	0.29449	don't like
17	0.49809	0.49137	0.43869	NOT calm and comfortable
03	0.49153	0.64106	0.08544	avoid
02	0.47364	0.36902	0.46544	difficult
				FACTOR TWO
01	0.14714	0.84025	0.15835	NOT look forward
07	0.18523	0.74652	0.41853	NOT enjoy
04	0.23864	0.72848	0.37062	NOT pleasant
03	0.49153	0.64106	0.08544	avoid
13	0.57387	0.55950	0.29449	don't like
20	0.64000	0.53356	-0.02266	avoid using
15	0.43461	0.51839	0.47163	NOT relaxed
17	0.49809	0.49137	0.43869	NOT calm and comfortable
				FACTOR THREE
06	0.36749	0.20595	0.73182	easy
05	0.04567	0.34078	0.72999	take pride
12	0.65222	0.05828	0.57926	NOT problems
15	0.43461	0.51839	0.47163	relaxed
02	0.47364	0.36902	0.46544	NOT difficult

Eigen	10.71	1.41	1.10	
%Var	53.5 (53.5)	7.0 (60.6)	5.5 (66.1)	

This analysis suggests that there are three clear factors involved in the notion of "telephone apprehension" as measured by the TAI. The first of these factors indicates a view of telephone communication as "problematic", as indexed by scales such as 'misunderstood', 'frustration', and 'problems'. It also indexes the resultant feelings of nervousness, dread, and inhibition. The second factor is a bi-polar factor which may perhaps be best labelled as an "approach-avoidance" factor. The positive pole is defined by items such as 'avoid', 'don't like' and 'avoid using', whilst the negative pole is indexed by items such as 'look forward', 'enjoy', 'pleasant' and 'relaxed'. The third factor seems to be concerned with a notion of "confidence", indexed by the scales such as 'take pride' and 'easy' as opposed to seeing telephone calls as 'difficult' and as a 'problem'.

As might have been expected, there is substantial similarity between this factor structure and those derived from the separate analyses of the UK Student, the UK Non-student and the Australian Student samples. The first factor corresponds to the "problematic communication" factors identified earlier (as Factor 2 in the analysis of the UK Student data, and as Factor 1 in the analysis of the Australian Student and UK Non-student data). The second factor corresponds to the similar bi-polar Factor 2 identified in the analysis of the Australian Student data, and to the two uni-polar factors (Factors 1 and 3 in the UK Student analysis; Factors 2 and 3 in the UK Non-student analysis). The third factor was not identified in the analyses of the separate data sets, but given that the Eigenvalue of this third factor is near to 1.0 it is possible that it previously fell below the Eigenvalue of 1.0 cut-off applied in the factor extraction algorithm.

There is also considerable similarity between this structure and that obtained by Reinsch in his 1986 reanalysis. As can be seen from examining the Table

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below, Factors 2 and 3 in the present analysis are to all intents and purposes identical with the second and third factors extracted by Reinsch (1986). Whilst the present Factor 1 and the first factor extracted by Reinsch differ in the ordering of the items, there is almost perfect correspondence in the content of the items included in both factors.

COMPARISON COMBINED AND REINSCH (1986) FACTOR STRUCTURES

Combined Data Sets (n=1100)		Reinsch (1986) (n= 950)	
Factor One		**Factor One**	
09	nervous	18	NOT COMFORTABLE
16	dread	16	DREAD
11	misunderstood	09	NERVOUS
19	frustration	11	MISUNDERSTOOD
12	problems	19	FRUSTRATION
14	inhibited	14	INHIBITED
20	avoid using	(20	not included)
18	not comfortable	17	CALM & COMFORTABLE
10	hurry to finish	13	DON'T LIKE
08	rushed and pushed	12	PROBLEMS
13	don't like	15	RELAXED
17	calm & comfortable	08	RUSHED AND PUSHED
03	avoid	(03	not included)
		10	HURRY TO FINISH
02	difficult	02	DIFFICULT
% Variance=53.5		% Variance=48.5	
Factor Two		**Factor Two**	
01	look forward	01	LOOK FORWARD
07	enjoy	07	ENJOY
04	pleasant	04	PLEASANT
03	avoid	(03	not included)
13	don't like	13	DON'T LIKE
20	avoid using	(20	not included)
15	relaxed		
17	calm & comfortable		
% Variance= 7.0		% Variance= 7.5	
Factor Three		**Factor Three**	
06	easy	06	EASY
05	take pride	05	TAKE PRIDE
% Variance= 5.5		% Variance= 6.1	
Total % Variance=66.1		Total % Variance=62.1	

The impressive similarity of these two independent factor analyses suggests that the structure of telephone apprehension is stable across subject samples from different cultures and backgrounds.

Further implications can be drawn out. For instance, Factor One: Problematic Communication appears to be equivalent to the concept of "apprehension" as originally conceived, whilst Factor two: Approach-Avoidance involves notions of both like-dislike and use-avoidance of the telephone. These two factors are independent of each other, indicating that a person may be apprehensive of the telephone but still evaluate it positively overall and (report) using it.

The striking similarity of these two independent analyses is methodologically reassuring. There is a danger that factor analyses may be "over-extracted", producing small, unreplicable factors (Peterson, 1965), and this is accentuated by use of the varimax method which tends to spread variance evenly amongst such small factors. The net result is a solution that is unstable across studies and lacks inherent psychological meaning. The similarity of the three separate analyses reported here, and their similarity to the independent analysis of Reinsch (1986) suggests that, even though some of the factors are small, they are stable and replicable across studies. They clearly possess psychological meaning. In addition, it should be noted that oblique rotations (oblimin) of the initial factor extractions were performed for each of the three data sets. These oblique rotations produced factors which were very similar to the orthogonal rotations, suggesting that the orthogonal constraint did not enforce artificial structures. Because of the marked similarity between structures produced by orthogonal and oblique rotations the oblique solutions have not been reported separately.

<u>DISCUSSION</u>

The major implication of these analyses is that no
support has been found for the claimed uni-dimensional
structure of telephone apprehension. Instead, a three
factor structure has emerged. This structure appears to
be stable across both cultures (UK, Australia and the
USA) and subject samples (Student and Non-student). These
factors are systematically related to variables such as
sex, age and culture or sample, and vary such that, for
instance, males, compared with females, were less likely
to report enjoying using the telephone, and were more
likely to report avoiding use of the telephone. Younger
people saw the telephone as more problematic than older
people, but also reported significantly greater positive
enjoyment of telephone use, and there was some evidence
that younger subjects reported less active avoidance of
phone use.

This pattern of results indicates that the summing of
sub-scales to generate a single, composite T20 score is
inappropriate. Although it may apparently be appropriate
to combine scores from the "Problematic" sub-scale with
those from "Positive Enjoyment" and "Active Avoidance"
sub-scales, if these sub-scales are not only factorially
orthogonal, but are also differentially related to
characteristics such as subject age and sex, then it is
clearly unwise to submerge these differences in an
overall, summative score.

The three factors which constitute the TAI appear to
reflect the behavioural, affective and competence
distinctions discussed in Chapters Two and Three.
However, these distinctions do not bear a one-to-one
correspondence with the separate factors. For instance,
whilst one pole of the "approach-avoidance" factor is
defined primarily in terms of self-reports of behaviour,
such as 'avoid' and 'avoid using', the other pole is
defined by primarily affective items such as 'enjoy',

'pleasant' and 'relaxed'.

The emergence of a factor indexing the extent to which telephone communication was seen as "problematic", and which included items such as 'misunderstood', 'frustration', and 'problems', as well as tapping the resultant feelings of nervousness, dread, and inhibition may be seen as a primarily affective factor, and as equivalent to the original conceptualisation of apprehension. It also may be related to the notion of the transparency of the telephone medium, discussed in Chapter One. The independence of the "approach-avoidance" and "problematic" factors is particularly noteworthy. It appears that an individual can be both apprehensive of the telephone, reporting their perception of the telephone as "problematic", and can report an overall positive evaluation of the telephone, and that they enjoy and actively seek to use it.

The third factor is concerned with the notion of "confidence", indexed by the scales such as 'take pride' and 'easy' as opposed to seeing telephone calls as 'difficult' and as a 'problem'. This appears to be a measure of self-perceived communicative competence, and in conjunction with perceptions of task difficulty, is likely to be related to notions of self-efficacy with respect to use of the telephone.

Analysis of the UK Non-student sample showed that whilst estimates of telephone use were significantly related to the degree of "positive enjoyment" reported, they were not related to self-reports of either "problematic communication" (ie apprehension) or to "active avoidance". Whilst providing some support for the link between overall evaluation and behaviour, this finding calls into question the implicit model underlying apprehension research, namely, that apprehension is directly related to behaviour.

CHAPTER EIGHT

TELEPHONE APPREHENSION INVENTORY SUB-SCALES

SYNOPSIS

Based on the results of the factor analysis of the combined data reported in the previous chapter, three TAI sub-scales were defined. These were TAI P-, indexing Problematic Telephone Communication (6 items); TAI A-, indexing the tendency either to Approach or Avoid Telephone Communication (3 items), and TAI C-, indexing a Lack of Confidence in Telephone Communication (2 items). All three sub-scales have adequate to good intra- and inter-test reliability.

ANOVAs were used to examine, for all three sub-scales, age and sex differences in the UK and Australian Student data, and in the UK Non-student sample. Comparisons were also conducted to examine differences as a function of culture (UK vs Australia) and sample (Student vs Non-student).

For all three data sets there were significant differences as a function of respondent sex. All comparisons showed that males had significantly higher TAI P-, A- and C- scores than females (except in the case of TAI C- for the Australian Student sample, where the difference approached significance). The effect of age differences was complex. In the UK Student sample no significant differences were found on any of the sub-scales. In the Australian Student sample, the age difference either approached or was significant, with younger respondents finding the telephone more problematic and having less confidence than older respondents, but with older respondents having higher avoidance scores. In the UK Non-student sample with respect to all three sub-scales there were significant age by sex interactions. Hence, the scores of female subjects decreased with age, whilst those for male subjects increased with age, such that males and females

in the younger age groups did not differ in their sub-scale scores, while older males had significantly higher scores than older females.

The comparisons of UK and Australian students showed that there was no culture difference with respect to the TAI P- sub-scale, but that scores on the TAI A- and TAI C- sub-scales were significantly higher in the UK sample. The UK Student sample had significantly higher TAI P- and TAI C- scores than the UK Non-student sample, but that TAI A- scores did not differ significantly.

A short form of the TAI, combining the three sub-scales, was outlined, and its equivalence to the full T20 measure noted. However, the non-additivity of the sub-scales was commented on, and the inconsistencies between results provided by analysis of the composite and individual sub-scales noted.

TELEPHONE APPREHENSION INVENTORY SUB-SCALES

INTRODUCTION

The factor analysis of the combined data reported in the previous chapter suggest that it is possible to define usable sub-scales of the 20-item Telephone Apprehension Inventory. In this chapter three such sub-scales are defined, the reliability of the scales explored, and analyses of the three previously analysed data sets performed. A new, short-form of the TAI is proposed, based on these three sub-scales, and results from analyses of this new scale compared with results from previous T20 analyses.

Shortened Scales

The factor structure identified in the last chapter suggests that telephone apprehension consists of three consistent factors: Problematic Telephone Communication, Approach-Avoidance of Telephone Communication, and Confidence in Telephone Communication. It is possible to identify items in the original TAI scale which are good indices of each of these factors, and to use these to construct three separate sub-scales. A shorter form of the TAI has practical advantages in reducing subject effort and maintaining interest, and if this can be achieved with no loss of validity or reliability, a shorter scale is to be preferred.

The following criteria have been applied to the selection of the items for each sub-scale:

> 1: The item should have its highest loading on the factor in question.

> 2: The item should load 0.50 or greater on the factor in question

3: The loading on the factor in question should be
   at least 0.20 greater than the loading on any
   other factor.

4: Ideally, the item should meet the same criteria
   in the factor analysis performed by Reinsch
   (1986).

Scale P- : Problematic Telephone Communication

Six items meet the criteria outlined above, namely Items
09, 16, 11, 19, 14 and 08. All other items are excluded
by these criteria.

ITEM	Current Study (Data from all 3 samples)			Reinsch (1986)		
	Rank	Loading	Difference	Rank	Loading	Difference
09	1	0.69939	0.36798	3	0.6299	0.3624
16	2	0.69774	0.28862	2	0.6598	0.2827
11	3	0.69692	0.27808	4	0.6029	0.2490
19	4	0.68596	0.48153	5	0.5969	0.4043
12	5	0.65222	0.07296	9	0.5387	0.0005
14	6	0.65193	0.24391	6	0.5717	0.2725
20	7	0.64000	0.10644	not included		
18	8	0.61745	0.16982	1	0.6979	0.3935
10	9	0.59891	0.19878	12	0.4827	0.0889
08	10	0.57785	0.27071	11	0.5097	0.2080
13	11	0.57387	0.01437	8	0.5562	*
17	12	0.49809	0.00672	7	0.5684	0.2247
03	13	0.49153	*	not included		
02	14	0.47364	0.00820	13	0.4248	0.0630

(* Not highest loading)

Scale P- : Problematic Telephone Communication:
            Scale Items

   8:   I feel rushed and pushed when I use the phone

   9:   When I have to talk on the phone, I grow nervous and
        uncomfortable

  11:   I feel misunderstood when I use the phone

  14:   I feel inhibited using the phone

  16:   I dread speaking on the phone

  19:   I have feelings of frustration after most phone
        calls

For this sub-scale to be scored in the negative
direction, that is, high scores indicate that the person
finds telephone communication problematic, then the
overall P- sub-scale score is obtained by summing the
reversed scores for Items 09, 16, 11, 19, 14 and 08.

   TAI P- = Reversed (I08 + I09 + I11 + I14 + I16 + I19)

The distribution of TAI P- scores approximates to a
normal distribution, with some positive skewing, but an
absence of marked kurtosis.

SUMMARY TAI P- STATISTICS:

	UK Students	Australian Students (min=6, max=30)	UK Non-students	Combined Samples
MEAN	13.684	13.244	11.258	12.848
SD	4.518	4.141	3.985	4.349
KURTOSIS	-0.043	-0.059	1.611	0.203
SKEWNESS	0.541	0.407	0.948	0.589

```
Distribution of TAI P- Scores: Combined data
            See Figure C08F01
```

This sub-scale has good intra- and inter-test
reliability.

Distribution of TAI P- Scores

Figure C08F01
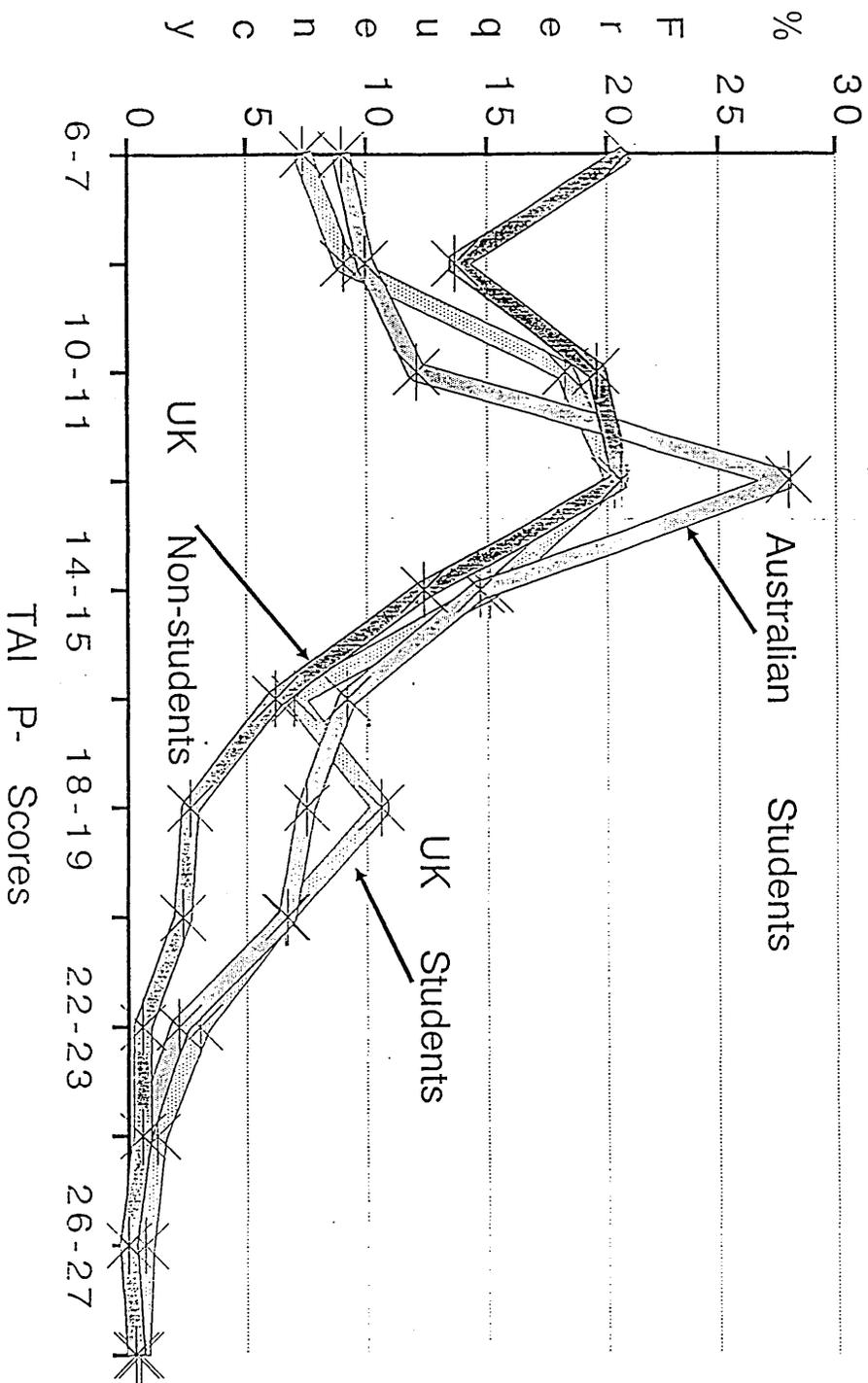
237

MEASURES OF INTERNAL RELIABILITY	UK STUDENTS (n=405)	AUSTRALIAN STUDENTS (n=389)	UK NON-STUDENTS (n=306)	COMBINED DATA SET (n=1100)
Cronbach's Alpha	0.8465	0.8720	0.8500	0.8629
Simple split half reliability	0.7172	0.7584	0.7291	0.7427
Equal length Spearman-Brown	0.8353	0.8626	0.8434	0.8523
Guttman split-half	0.8351	0.8610	0.8378	0.8514
Test-retest reliability	(n=94) 0.7742			

Scale A- : Approach-Avoidance of Telephone Communication

Three items meet the criteria outlined, namely Items 01, 07, and 04. All the other items loading on this factor must be excluded as failing to meet one or other of the criteria.

ITEM	Current Study (Data from all 3 samples)			Reinsch (1986)		
	Rank	Loading	Difference	Rank	Loading	Difference
01	1	0.84025	0.68190	1	0.7729	0.5476
07	2	0.74652	0.32799	2	0.7630	0.4085
04	3	0.72848	0.35886	3	0.7310	0.4319
03	4	0.64106	0.14953	not included		
13	5	0.55950	*	4	0.5978	0.0416
20	6	0.53356	*	not included		
15	7	0.51839	0.04676	7	0.3766	*
17	8	0.49137	*	9	0.3437	*

(* Not highest loading)

Scale A- : Approach-Avoidance of Telephone Communication
        Scale Items

1: I look forward to telephone conversations

4: I find speaking on the telephone pleasant

7: I thoroughly enjoy speaking on the telephone

This sub-scale is scored in the negative direction, that is, high scores indicate that the person avoids telephone communication, whereas low scores indicate that the person seeks to use the telephone. The overall A- sub-scale score is obtained by simply summing Items 01, 07 and 04.

$$TAI\ A- = I01 + I04 + I07$$

The following graph and summary statistics present the distribution of TAI A- scores for the three samples.

SUMMARY TAI A- STATISTICS:

	UK Student	Australian Students (min=3, max=15)	UK Non-students	Combined Samples
MEAN	8.180	7.545	7.686	7.818
SD	2.418	2.421	2.881	2.569
KURTOSIS	-0.135	-0.310	-0.706	-0.385
SKEWNESS	0.107	0.136	0.269	0.162

```
Distribution of TAI A- Scores: Combined data
                See Figure C08F02
```

This sub-scale has good intra- and inter-test reliability.

MEASURES OF INTERNAL RELIABILITY	UK STUDENTS (n=405)	AUSTRALIAN STUDENTS (n=389)	UK NON-STUDENTS (n=306)	COMBINED DATA SET (n=1100)
Alpha	0.8605	0.8704	0.8836	0.8711
Simple split half reliability	0.7680	0.7677	0.7819	0.7736
Unequal length Spearman-Brown	0.8803	0.8801	0.8885	0.8836
Guttman split-half	0.7991	0.8074	0.8307	0.8151
Test-retest reliability	(n=94) 0.8358			

Distribution of TAI A- Scores

Figure C08F02

240
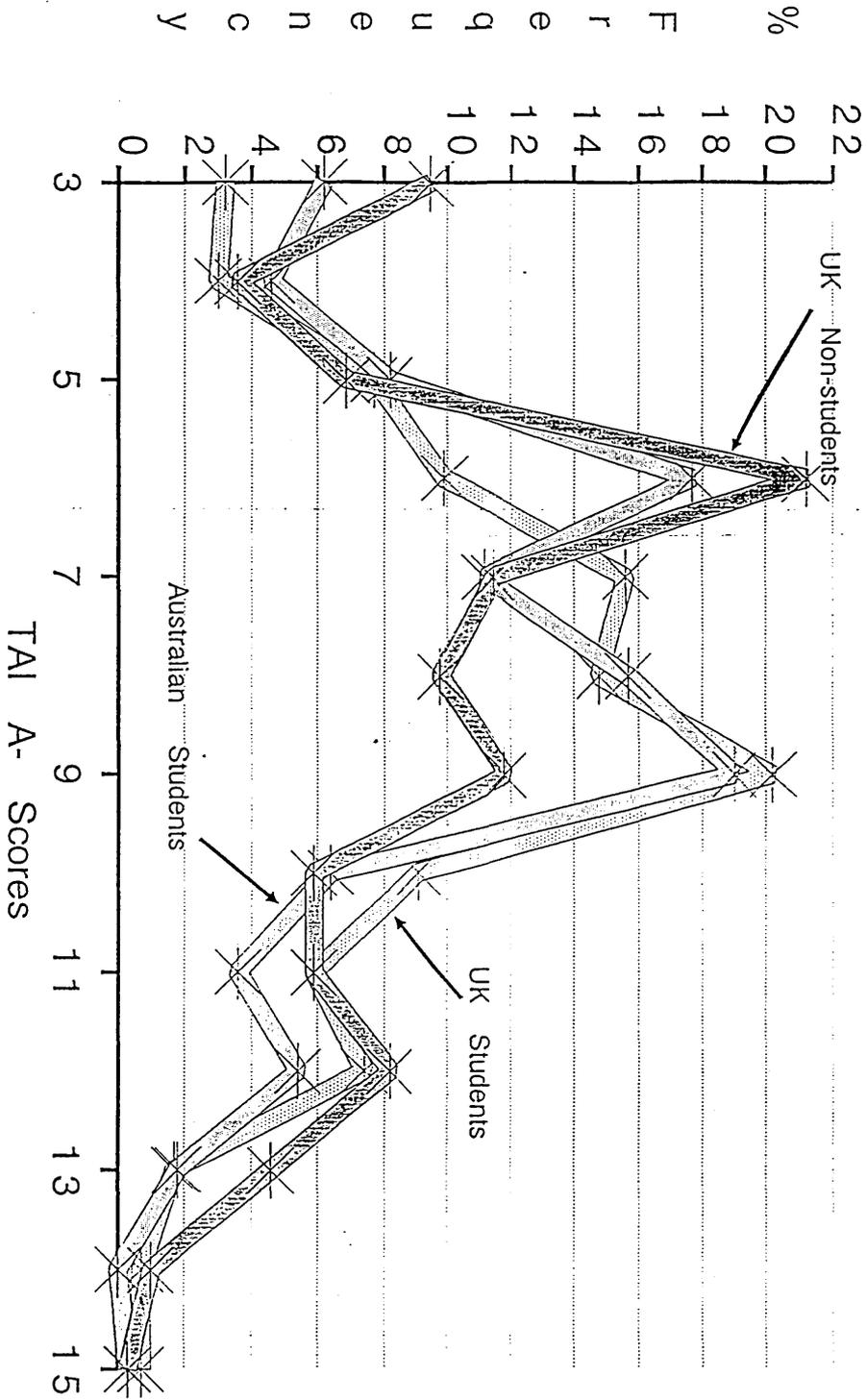
<u>Scale C- : Confident Telephone Communication</u>

Two items meet the criteria outlined above, namely Items 06 and 05. The other items loading on this factor must be excluded

ITEM	Current Study			Reinsch (1986)		
	(Data from all 3 samples)					
	Rank	Loading	Difference	Rank	Loading	Difference
06	1	0.73182	0.36433	1	0.7347	0.2136
05	2	0.72999	0.38921	3	0.5329	0.5012
12	3	0.57926	*	2	0.5382	*
15	4	0.47163	*	4	0.3759	*

(* Not highest loading)

Scale C- : Confident Telephone Communication: Scale Items
5: I take pride in my speaking ability over the phone
6: It is easy for me to express myself on the telephone

This scale is scored in the negative direction, that is, high scores indicate that the person lacks confidence when using the telephone. The C- sub-scale score is obtained by simply summing the scores for Items 05 and 06.

$$TAI\ C- = I05 + I06$$

The following graph and summary statistics show the distribution of TAI C- scores for the three samples.

SUMMARY TAI C- STATISTICS:

	UK Students	Australian Students (min=2, max=10)	UK Non-students	Combined Samples
MEAN	6.052	5.244	4.941	5.457
SD	1.587	1.553	1.822	1.709
KURTOSIS	0.024	-0.403	0.170	-0.160
SKEWNESS	0.146	0.098	0.549	0.196

Given that this is a 2-item scale, measures of
reliability indicate that overall the scale has
acceptable intra- and inter-test reliability for all
three data sets.

MEASURES OF INTERNAL RELIABILITY	UK STUDENTS (n=405)	AUSTRALIAN STUDENTS (n=389)	UK NON-STUDENTS (n=306)	COMBINED DATA SET (n=1106)
Alpha	0.6351	0.6955	0.7195	0.7042
Simple split half reliability	0.4675	0.5425	0.5625	0.5447
Equal length Spearman-Brown	0.6372	0.7034	0.7200	0.7053
Guttman split-half	0.6351	0.6955	0.7195	0.7042
Test-retest reliability	(n=94) 0.7026			

Correlations between Shortened Scales

Examination of the correlations between these sub-scales
shows that, whilst there is some shared variance between
the scales, this is of the order of no more than 30-40%.

	UK STUDENT SAMPLE			
	TAI P-	TAI A-	TAI C-	T20
	correlations			
TAI P-		0.5689	0.5114	0.9136
TAI A-	32.36%		0.5219	0.7788
TAI C-	26.15%	27.24%		0.6743
	shared variance			

Distribution of TAI C- Scores
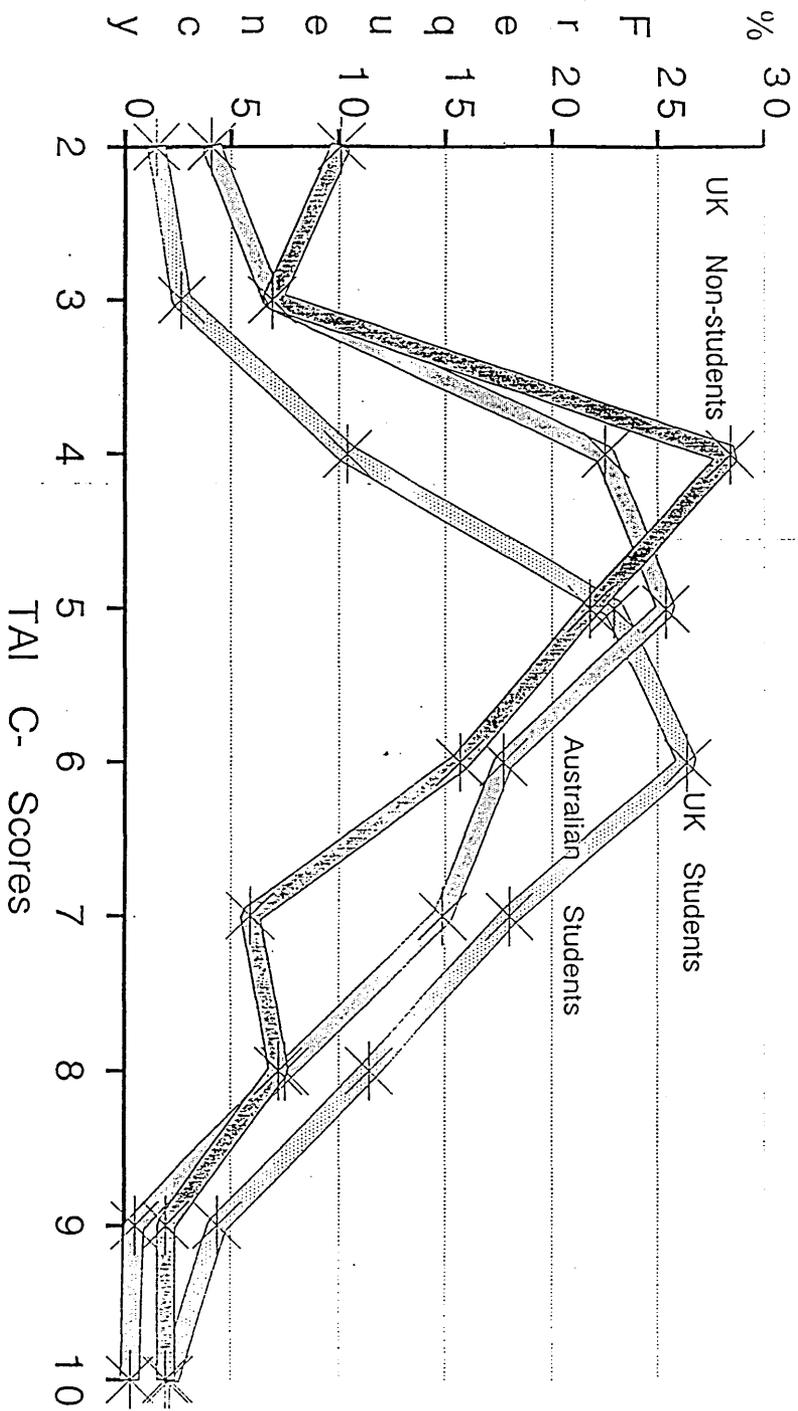
Figure C08F03

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AUSTRALIAN STUDENT SAMPLE			
TAI P-	TAI A-	TAI C-	T20
	correlations		
	0.6052	0.6415	0.9272
36.63%		0.5040	0.7998
41.15%	25.40%		0.7407
shared variance			

Row labels for Australian table: TAI P-, TAI A-, TAI C-

UK NON-STUDENT SAMPLE			
TAI P-	TAI A-	TAI C-	T20
	correlations		
	0.6077	0.5823	0.8964
36.93%		0.6496	0.8398
33.91%	42.20%		0.7497
shared variance			

COMBINED DATA SET			
TAI P-	TAI A-	TAI C-	T20
	correlations		
	0.5816	0.5870	0.9146
33.83%		0.5628	0.7979
34.46%	31.67%		0.7294
shared variance			

Overall, these three sub-scales appear to have adequate reliability, and, whilst there is some common variance, there is sufficient independent variance to warrant separate investigation of these sub-scales in terms of sex, age, culture and sample differences, and the correlations of these sub-scales with other measures, such as indices of telephone usage.

ANALYSES OF SEX, AGE, CULTURE AND SAMPLE DIFFERENCES USING THE SUB-SCALE SCORES

PROBLEMATIC COMMUNICATION: TAI P- SCORES

ANOVA's were performed on TAI P- scores for both the UK and Australian Student data, and for the UK Non-student sample. Comparisons were also conducted to examine differences as a function of culture (UK vs Australia) and sample (Student vs Non-student).

UK STUDENT DATA

Within the UK Student sample, males have significantly higher TAI P- scores than females (Male=14.06, Female=13.12; $F=4.233$, $df=1$, 401; $p<0.04$). There are no significant differences in TAI P- scores as a function of age ($F=0.036$, $df=1$, 401, nsd), and the interaction effect of age and sex is non-significant ($F=1.405$, $df=1$, 401, nsd) (see Tables 8.01 and 8.02, Appendix 3).

AUSTRALIAN STUDENT DATA

Males see telephone communication as significantly more problematic than females (Male=13.87, Female=12.89; $F=5.563$, $df=1$, 385, $p<0.019$). The difference in TAI P- scores as a function of age approached significance (Younger=13.44, Older=12.55; $F=3.514$, $df=1$, 385, $p<0.062$), with younger respondents seeing the telephone as more problematic. The sex by age interaction effect was not significant ($F=0.003$, nsd) (see Tables 8.03 and 8.04, Appendix 3).

UK NON-STUDENT DATA

Males see the telephone as significantly more problematic than females (Male=11.84, Female=10.67; $F=7.262$, $df=1$, 305, $p<0.007$). The perception of telephone communication as problematic also varies significantly as a function of

age (F=2.760, df=4, 305, p<0.028). However, the pattern of variation is different for males and females, with the sex by age interaction effect being highly significant (F=5.748, df=4, 305, p<0.0001). Examination of the pattern of means suggests that for female respondents, younger age groups see telephone communication as more problematic than older age groups. For males, the opposite pattern applies, with older respondents seeing telephone communication as more problematic than younger respondents. Another way of expressing this is to note that for the two youngest age groups, females tend to have higher TAI P- scores than males, whilst for the three oldest age groups, male TAI P- scores tend to be greater than female scores. (See Tables 8.05 and 8.06, Appendix 3).

UK Non-student Data: Mean TAI P- Scores

Age Group	Combined	Male	Female	t	df	2-tailed probability
16-25	11.88	10.43	12.90	-1.07	15	0.301
26-35	12.44	11.38	13.68	-1.85	52	0.070
36-45	11.04	12.31	10.04	3.39	123	0.001
46-55	10.41	11.02	9.63	1.97	77	0.052
56-65+	11.90	13.72	9.38	3.21	29	0.003
TOTAL	11.26	11.84	10.67			

UK Non-student sample: TAI P- Scores by sex and age
See Figure C08F04

CULTURE DIFFERENCES:

UK STUDENT AND AUSTRALIAN STUDENT COMPARISONS

A 3-way ANOVA was performed to examine TAI P- scores as a function of respondent culture, sex and age (see Tables 8.07A, 8.07B and 8.08, Appendix 3). There were no significant overall differences in the TAI P- scores of the UK and Australian Student samples (F=0.205, df=1, 786, nsd). There was a highly significant sex difference,

UK Non-Student

TAI P- Scores by Sex and Age

Figure C08F04

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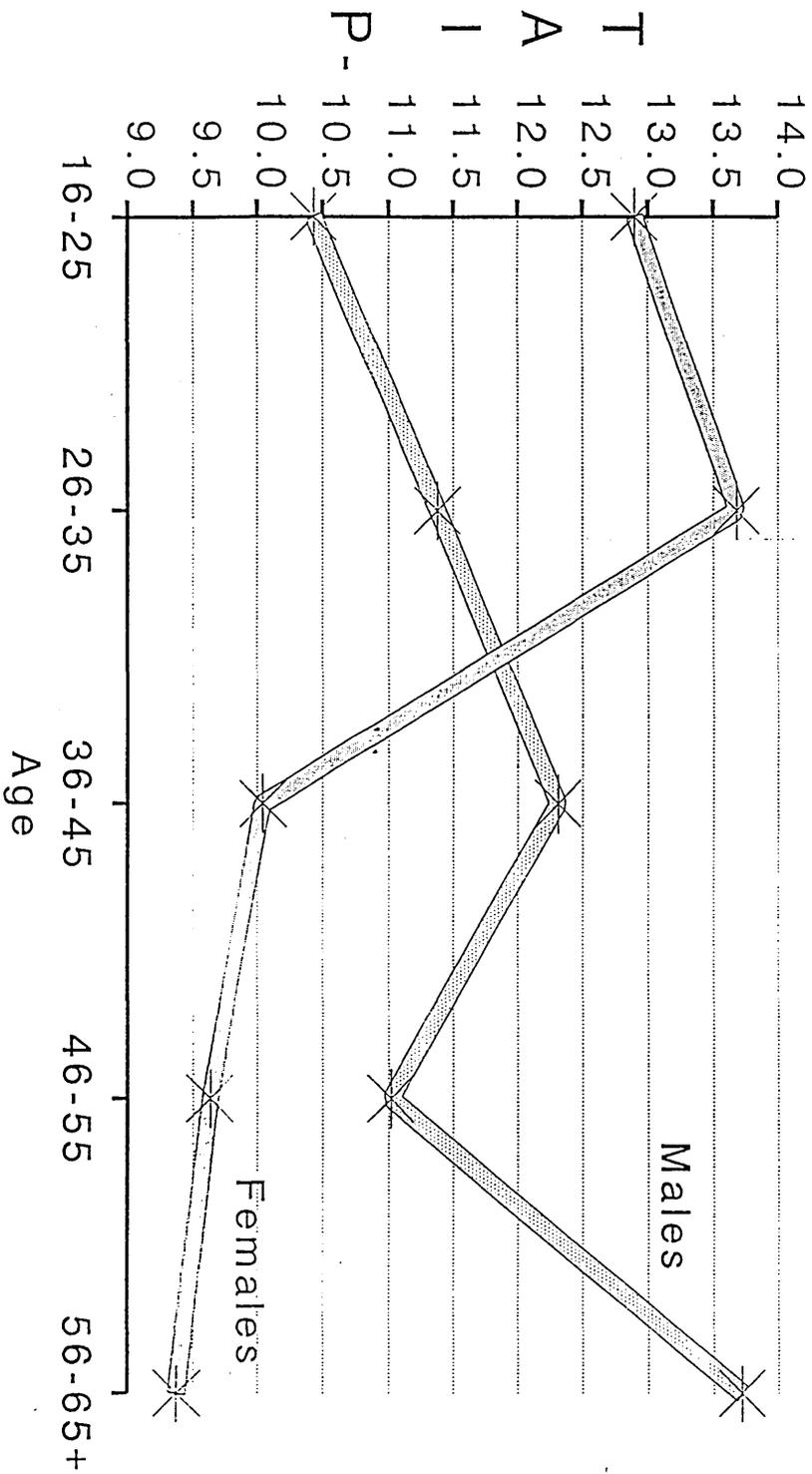
with the scores of males being significantly higher than the scores of females (Male=13.99, Female=12.98, F=9.241, df=1, 786, p<0.001), but there was no significant difference in TAI P- scores as a function of age (F=1.657, df=1, 786, nsd). None of the 2-way or 3-way interactions were significant.

SAMPLE DIFFERENCES: UK STUDENT AND NON-STUDENT SAMPLES

A 3-way ANOVA was used to examine the effects of respondent sample, sex and age upon TAI P- scores. The Student sample see the telephone as significantly more problematic (Student=13.68, Non-student=11.26; F=14.427, df=1, 703, p<0.0001). Males have significantly higher scores than females (Male=13.20, Female=11.94, F=10.366, df=1, 703, p<0.0001). The age difference was not significant, although examination of the means shows an apparently large difference, with older subjects in general being markedly less anxious than younger subjects. (Younger TAI P-=13.59, Older=11.56). However, the sex by age interaction was significant (F=4.095, df=1, 703, p<0.043).

TAI P- Scores by Sample, Sex and Age			
SAMPLE	SEX	AGE	MEAN TAI P- SCORE
S T U D E N T	MALE 14.06	-25	13.97 (n=216)
		26+	14.81 (n= 26)
	FEMALE 13.12	-25	13.22 (n=146)
		26+	12.29 (n= 17)
G E N E R A L P U B L I C	MALE 11.84	-25	10.43 (n= 7)
		26+	11.91 (n=146)
	FEMALE 10.67	-25	12.90 (n= 10)
		26+	10.52 (n=143)

Examination of the means shows that, whilst both male and female younger subjects had higher TAI P- scores than older subjects, the age difference was much greater for female than for male subjects (Males: t=3.44, df=393, p<0.001; Females: t=5.18, df=314, p<0.0001). None of the other 2-way or 3-way interactions were significant. (See Tables 8.09A, 8.09B and 8.10, Appendix 3).

SUMMARY OF TAI P- ANALYSES

For all three data sets, males had significantly higher TAI P- scores than females. The effect of age differences was complex. In the UK Student sample, with a very restricted older age group, no significant differences were found. In the Australian Student sample, with a slightly more extensive older age sample, the age difference approached significance, with younger respondents tending to find the telephone more problematic than older respondents. In the UK Non-student sample there was a significant age by sex interaction. For female respondents, TAI P- scores were higher for younger than for older respondents, whilst for male subjects TAI P- scores increased with age. The comparison of UK and Australian students showed that the culture difference was not significant with respect to the TAI P- sub-scale. The comparison of samples showed that students had significantly higher TAI P- scores than non-students.

APPROACH-AVOIDANCE: TAI A- SCORES

UK STUDENT DATA

Males have significantly higher levels of telephone avoidance than females (Male=8.55, Female=7.63; F=14.423, df=1, 401; p<0.0001). There were no significant age differences (F=0.163, df=1, 401, nsd), and the interaction effect of age and sex was non-significant

(F=0.160, df=1, 401, nsd) (see Table 8.11 and 8.12, Appendix 3).

AUSTRALIAN STUDENT DATA

Males had significantly higher avoidance scores than females (Male=8.26, Female=7.17; F=18.726, df=1, 385, p<0.0001). Older respondents had greater avoidance scores than younger respondents (Younger=7.38, Older=8.09; F=6.087, df=1, 385, p<0.014). The sex by age interaction effect was not significant (see Tables 8.13 and 8.14, Appendix 3).

UK NON-STUDENT DATA

Males had significantly greater avoidance scores (Male=8.62, Female=6.75; F=36.706 df=1, 305, p<0.0001). There was no significant difference in TAI A- scores as a function of age, but the sex by age interaction effect was significant (F=5.124, df=4, 305, p<0.001) (see Tables 8.15 and 8.16, Appendix 3). For younger respondents, male and female TAI A- scores do not differ significantly, with the mean TAI A- score for males being, if anything, slightly lower than for females. However, for older respondents, males have significantly higher scores than females. The overall effect is for TAI A- scores for the male respondents to increase with age, but to decrease with age amongst female respondents.

UK Non-student Data: Mean TAI A- Scores

Age Group	Male Combined	Female	t	df	2-tailed probability
16-25	7.65	7.71	7.60	0.100	15	0.920
26-35	7.57	7.34	7.84	-0.61	52	0.544
36-45	7.54	8.62	6.70	4.10	123	0.0001
46-55	7.94	9.23	6.31	4.63	77	0.0001
56-65+	7.84	9.56	5.46	4.92	29	0.0001
TOTAL	7.69	8.62	6.75			

CULTURE DIFFERENCES: UK AND AUSTRALIAN STUDENT COMPARISONS

UK respondents had higher avoidance scores (UK=8.18, Australian=7.54; F=6.541, df=1, 786, p<0.011). Males had significantly higher TAI A- scores (Male=8.45, Female=7.35, F=32.890, df=1, 786, p<0.0001), and older subjects had higher scores than younger subjects (Younger=7.81, Older=8.16; F=4.910, df=1, 786, p<0.027). None of the 2-way or 3-way interactions were significant (see Tables 8.17, 8.18 and 8.19, Appendix 3)..

SAMPLE DIFFERENCES: UK STUDENT AND NON-STUDENT SAMPLES

The analysis of sample differences showed (see Tables 8.20, 8.21 and 8.22, Appendix 3) that the two samples did not differ significantly in TAI A- scores (F=1.554, p<0.213). Male scores were significantly higher than female scores (Male=8.58, Female=7.21, F=48.125, df=1, 703, p<0.0001), but there were no significant differences in TAI A- scores as a function of age, and none of the 2-way or 3-way interactions were significant.

SUMMARY OF TAI A- ANALYSES

For all three data sets, males had significantly higher TAI A- scores than females. The effect of age differences was again complex. In the UK Student sample, with its restricted older age group, no significant differences were found. In the Australian Student sample, with a slightly more extensive older age sample, the age difference was significant, with older respondents having higher TAI A- scores than younger respondents. In the UK Non-student sample the overall age difference was not significant, but there was a significant age by sex interaction. For female respondents, TAI A- scores tended

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UK Non-Students

TAI A- Scores by Sex and Age

Males

Females

Age

T A I A-

Figure C08F05
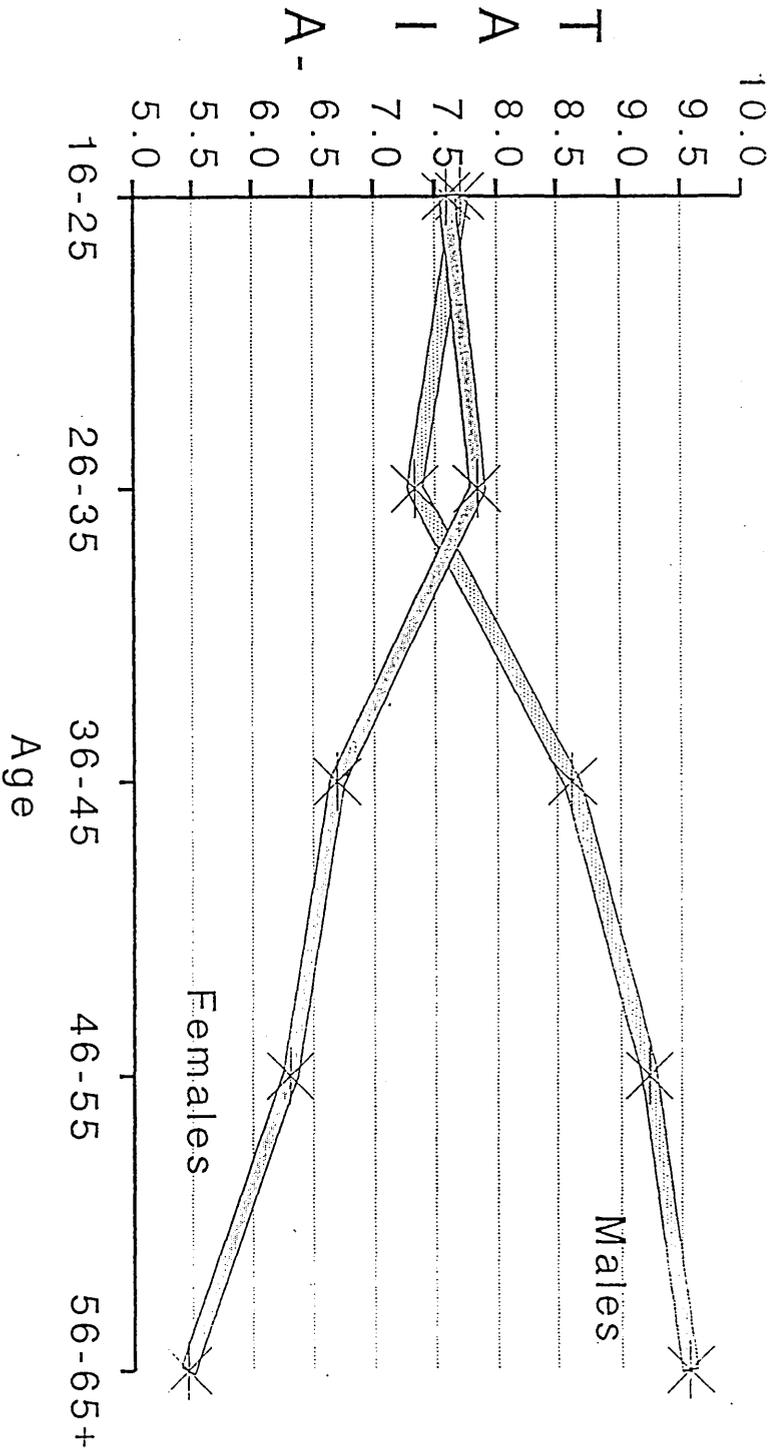
to decrease with increasing age, whilst for male subjects
TAI A- scores tended to increase with age. The comparison
of UK and Australian students showed that TAI A- scores
were significantly higher in the UK sample. TAI A- scores
did not differ significantly between Student and Non-
student samples.

CONFIDENCE: TAI C- SCORES

UK STUDENT DATA

Males have significantly less confidence when using the
telephone than females (Male=6.20, Female=5.83; F=5.230,
df=1, 401; p<0.023). The age difference approaches
significance, with younger respondents being less
confident than older respondents (Younger=6.10,
Older=5.67; F=2.796, df=1, 401, p<0.095). The interaction
effect of age and sex is non-significant (F=0.602, df=1,
401, nsd) (see Tables 8.23 and 8.24, Appendix 3).

AUSTRALIAN STUDENT DATA

Younger respondents having less confidence than older
respondents (Younger=5.39, Older=4.77; F=11.656, df=1,
385, p<0.001). Whilst the sex difference did not reach
significance, there was a strong tendency for males to be
less confident than females about using the telephone
(Male=5.42, Female=5.15; F=2.958, df=1, 385, p<0.086).
The sex by age interaction effect was not significant
(see Tables 8.25 and 8.26, Appendix 3).

UK NON-STUDENT DATA

Males have significantly less confidence than females
(Male=5.35, Female=4.54; F=15.938, df=1, 305, p<0.0001).
There was no significant overall difference in confidence
as a function of age, but the sex by age interaction
effect was significant (F=2.853, df=4, 305, p<0.024) (see

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Tables 8.27 and 8.28, Appendix 3). Examination of the
means suggests that for younger respondents, male and
female TAI C- scores did not differ significantly, but
the mean male TAI C- score was lower than for females.
However, for older respondents, males had significantly
higher scores than females.

UK Non-student Data: Mean TAI C- Scores

Age Group	Combined	Male	Female	t	df	2-tailed probability
16-25	4.94	4.71	5.10	-0.45	15	0.662
26-35	5.22	5.10	5.36	-0.50	52	0.620
36-45	4.86	5.47	4.39	3.79	123	0.0001
46-55	4.68	5.07	4.20	2.14	77	0.035
56-65+	5.42	6.28	4.23	2.74	29	0.010
TOTAL	4.94	5.35	4.54			

UK Non-student data: TAI C- Scores by sex and age
See Figure C08F06

CULTURE DIFFERENCES: UK AND AUSTRALIAN STUDENT COMPARISONS

UK respondents were less confident about using the
telephone than Australian respondents (UK=6.05,
Australian=5.24; F=32.009, df=1, 786, p<0.0001). Male
scores were significantly higher than female scores
(Male=5.92, Female=5.42, F=8.103, df=1, 786, p<0.005).
Younger respondents were significantly less confident
than older respondents (Younger=5.78, Older=5.06;
F=13.789, df=1, 786, p<0.0001). None of the 2-way or 3-
way interactions were significant (see Tables 8.29, 8.30,
8.31, Appendix 3).

SAMPLE DIFFERENCES: UK STUDENT AND NON-STUDENT SAMPLES

The Student sample was significantly less confident than
the Non-student sample (Student=6.05, Non-student=4.94;

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UK Non-students

TAI C- Scores by Sex and Age

Males

Females

T

I

A

C-

6.5
6.0
5.5
5.0
4.5
4.0
3.5

16-25   26-35   36-45   46-55   56-65+

Age
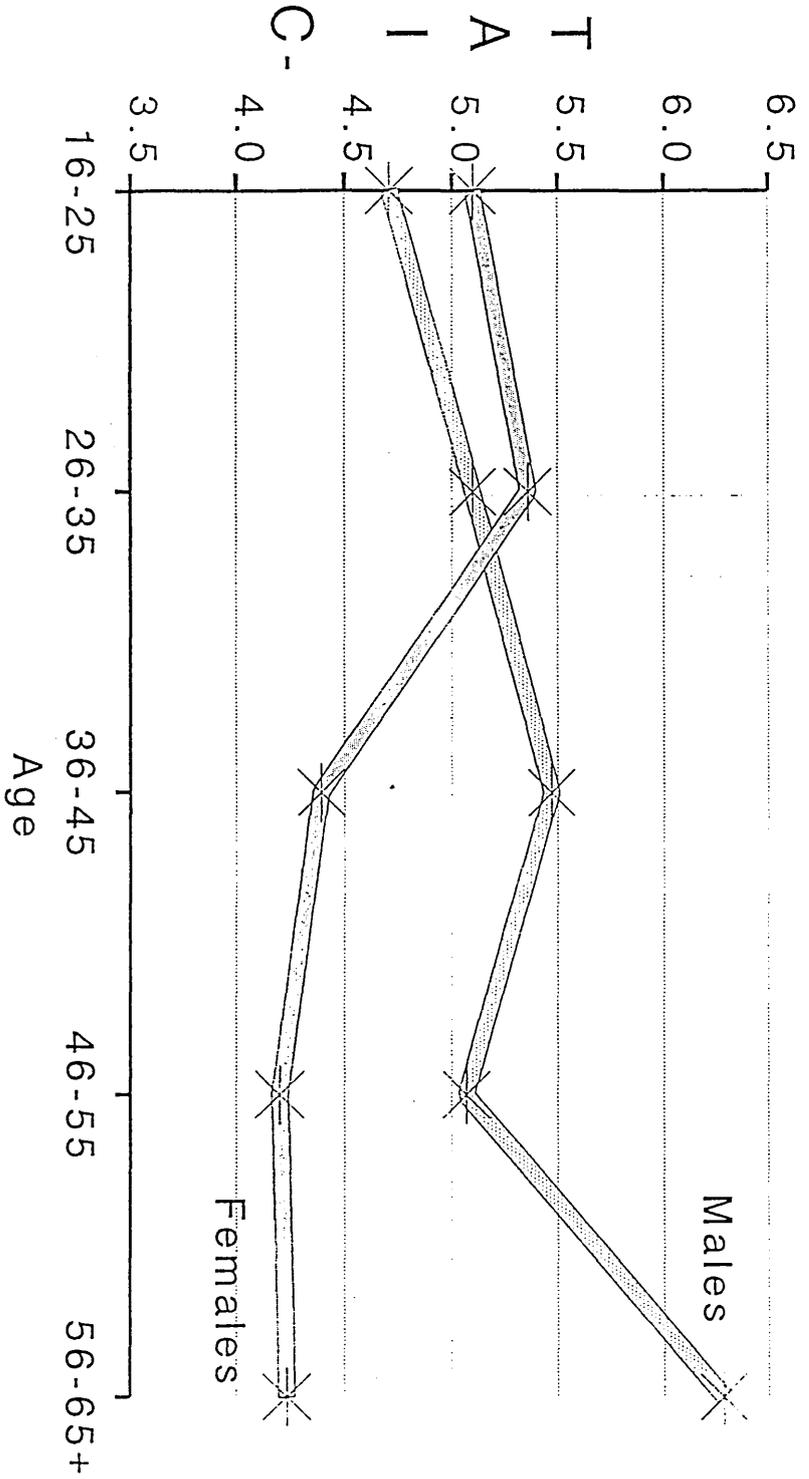
Figure C08F06

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F=12.010, df=1, 703, p<0.001). Male scores were significantly higher (ie less confident) than female scores (Male=5.87, Female=5.21, F=19.883, df=1, 703, p<0.0001). The age difference was not significant, although examination of the means shows an apparently large difference, with younger subjects being less confident than older subjects. (Younger=6.04, Older=5.04). None of the 2-way or 3-way interactions were significant (see Tables 8.32, 8.33 and 8.34, Appendix 3).

SUMMARY OF TAI C- ANALYSES

In both the UK Student and UK Non-student samples, males had significantly higher TAI C- scores than females, that is, they were significantly less confident about using the telephone. In the Australian Student sample, males had higher TAI C- scores than females, and this difference approached significance. The pattern of age differences was similar to that found in previous analyses of the TAI P- and A- scales. In the UK Student sample, with its restricted older age group, no significant difference was found, but younger respondents tended to have higher TAI C- scores, with this difference approaching significance. In the Australian Student sample, with a slightly more extensive older age sample, the age difference was significant, with younger respondents having higher TAI C- scores than older respondents. In the UK Non-student sample the overall age difference was not significant, but there was a significant age by sex interaction. For female respondents, TAI C- scores tended to decrease with increasing age (ie older women were more confident), whilst for male subjects TAI C- scores tended to increase with age (ie older men were less confident). The comparison of UK and Australian students showed that TAI C- scores were significantly higher in the UK sample. Student TAI C- scores were significantly higher than Non-student scores.

Sub-Scale Scores and estimates of Telephone Use

Within the UK Non-student sample, estimates of telephone use were examined as a function of the three sub-scale scores. Estimates of daily calls made were significantly related to all three sub-scale scores. Higher TAI P-, A- and C- scores are all significantly correlated with lower estimates of calls made.

	Calls Made	Calls Received
TAI P- Problematic Communication	r=-0.1484 p<0.005	r=-0.0598 p<0.149 not sig
TAI A- Avoidance of Communication	r=-0.2107 p<0.0001	r=-0.1144 p<0.023
TAI C- Lack of Confidence	r=-0.1692 p<0.001	r=-0.1046 p<0.034

The largest correlation is between TAI A- scores and estimates of calls made, although this is not significantly larger than that between either TAI P- or TAI C- scores and calls made (TAI A-/calls made=-0.2107, TAI P-/calls made=-0.1484, t=1.253, df=303, nsd; TAI A-/calls made=-0.2107, TAI C-/calls made=-0.1692, t=0.884, df=303, nsd). Both TAI A- and TAI C- scores correlate significantly with estimates of the number of calls received, with respondents with higher TAI A- and TAI C- scores reporting receiving fewer calls. However, the correlation between TAI P- and estimates of calls received is non-significant.

With number of calls made as the predicted variable, and the three sub-scale scores, together with age and sex, as the predictor variables, a stepwise multiple regression showed that only TAI A- and age contributed significantly to the regression equation. The regression equation was:

Calls Made = -0.0948 TAIA + 0.1399 AGE + 1.8235

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with a multiple r = 0.23922 (standard error = 1.247). The total variance accounted for by the predictor variables was 5.7%. The inclusion of only one of the sub-scale scores as predictors might have been expected given the high inter-correlations between the three sub-scales.

A stepwise multiple regression, with number of calls received as the predicted variable, and the three sub-scale scores and age and sex as the predictor variables, showed that only the TAI A- sub-scale contributed significantly to the regression equation. The regression equation was:

$$\text{Calls Received} = -0.0625 \text{ TAIA} + 2.510$$

with a multiple r = 0.11443. The standard error was 1.565, and the total variance accounted for by the single predictor variable was only 1.3%. Again, given the high inter-correlations between the three sub-scales, the inclusion of only one of the sub-scale scores as predictors was expected. Neither respondent age nor sex contributed significant additional power to the regression equation.

Conceptualising the Sub-scales

The content of the items included in the "Problematic Communication" sub-scale ('misunderstood', 'frustration', and 'rushed and pushed', 'nervousness', 'dread', discomfort and inhibition) suggest that this forms a measure of telephone apprehension as originally defined, that is, of anxiety or fear associated with the anticipated or actual use of the telephone.

The "Avoidance" sub-scale was derived from a bi-polar factor termed "Approach-Avoidance". This factor was defined in terms of a mixture of positive affective ('looking forward to telephone conversations', 'finding speaking on the telephone pleasant', and 'enjoying

speaking on the telephone') and behavioural items . The
sub-scale, because of the criterion used for item
selection, does not include any avoidance items.
Avoidance items loading on this factor, but excluded from
the scale, included 'avoid using' and 'avoid speaking' on
the telephone. It can be suggested that this sub-scale
should be interpreted as tapping overall evaluation of
the telephone, as well as predispositions to use or avoid
the telephone.

The "Confidence" sub-scale consists of the items 'take
pride' and 'easy' and may be interpreted as a measure of
self-perceived competence or self-efficacy.

These scales are short, and further development,
elaboration and validation of the sub-scales is needed.
However, they do provide a (admittedly crude) means by
which the different aspects of telephone apprehension can
be investigated further, and a basis for further
development of models of apprehension, and of the
relation of apprehension to telephone use.

Short form of the T20: the T11 scale

It is possible to combine the three sub-scales to produce
a measure of overall telephone apprehension. This eleven-
item scale (T11) consists of the following items:

$$TAI\ P- = I08 + I09 + I11 + I14 + I16 + I19$$
$$TAI\ A- = I01 + I04 + I07$$
$$TAI\ C- = I05 + I06$$

The T11 score can be calculated by summing the scores
from the three sub-scales, which are all scored in a
negative direction:

$$T11 = TAI\ P- + TAI\ A- + TAI\ C-$$

The overall distribution of T11 scores approximates to a normal distribution, with some positive skewing, but with no marked kurtosis. Levels of both intra-test and inter-test reliability are acceptable (see Tables 8.35A, 8.35B and 8.36, Appendix 3).

Repetition of the analyses previously performed using the T20 scores (see Chapter Five) showed that analyses using the T11 scores were entirely consistent with those performed using the T20 scores from the complete scale. For all three data sets, males had significantly higher levels of overall telephone apprehension as measured by the T11 scale than females. In none of the three samples was the simple age effect significant. However, in the UK Non-student sample there was a significant age by sex interaction. For female respondents, T11 scores decreased from younger to older age groups, whilst for male respondents T11 scores increased from younger to older age groups. The effect of this was that males and females in the younger age groups did not differ in their T11 scores, whilst for older respondents males had significantly higher levels of overall telephone apprehension than females. The comparison of UK and Australian Student samples showed that the culture difference was significant, with UK respondents having significantly higher T11 scores. The comparison of UK Student and Non-student samples showed that students had significantly higher levels of telephone apprehension non-students.

However, comparison of the analyses using this overall measure with those using the three sub-scales showed that the overall measure masked some scale-specific effects. For instance, whilst UK samples appear to have higher levels of telephone apprehension overall (T20 and T11 measures) than Australian samples, the extent to which telephone communication is seen as problematic (TAI P-) is not significantly different. The extent to which it is avoided (TAI A-), and differences in confidence (TAI C-)

when communicating by telephone, are significant. Similarly, whilst overall, Student samples appear to have higher levels of telephone apprehension than Non-student samples, they do not differ in the extent to which the telephone is said to be avoided (TAI A-), but only in the extent to which it is seen as problematic, and the lack of confidence in dealing with it.

These differential findings support the validity and utility of the identification of separate sub-scales within the TAI, and the non-additivity of these sub-scales. It indicates that conclusions based on composite measures of telephone apprehension may be misleading, and that analyses using the sub-scales should be primary.

THE TELEPHONE APPREHENSION INVENTORY: A VALIDITY STUDY

SYNOPSIS

This study examined the proposition that Telephone Apprehension can be considered as a trait, and that the Telephone Apprehension Inventory constitutes a valid measure of that trait. Four fundamental characteristics of such a valid measure were examined. The first concerned the unambiguous specification of the stimulus. Examination of the original TAI showed that it contains two different kinds of items. Some items referred to "use" of the telephone, whilst others referred to apprehension associated with "talking" (or "speaking") on the telephone. No items referred to "listening" or "communicating". If the inventory is intended to focus upon telephone <u>communication</u> apprehension, terms other than "communicating" should not be included. As both "speaking" and "using" items were included, and both "communicating" and "listening" items were excluded, the basic requirement for clearly specified stimuli was only partially and ambiguously satisfied by the original TAI.

The second requirement is that the measure should correlate, at least moderately, with other trait measures of the same construct. That is, telephone apprehension scores specified in terms of, say, telephone communication should correlate moderately with another measure of trait apprehension associated with communicating by telephone. The third characteristic is that the measure should correlate to a greater extent with the mean of a number of measures of state responses to these stimuli than with any one of those measures. The fourth requirement is that the measure should demonstrate high intra-test and inter-test reliability.

A revised version of the original TAI was developed containing 45 items (TAI-45). Items referred to "communicating", "speaking", "listening", and "using" the

telephone. These items were derived from items in the
original TAI-20. Four sub-scores could be calculated, for
Telephone Usage Apprehension (TUA), Communication
Apprehension (TCA), Speaking Apprehension (TSA), and
Listening Apprehension (TLA). An overall Telephone
Apprehension (T45) score could also be calculated, as
well as the original T20 scores and sub-scores from the
TAI-20.

47 subjects (14 male, 33 female) took part in three
sessions in which they completed test and retest
administrations of the TAI-45, a set of validating
measures, and both made and received a telephone call,
completing a measure of state anxiety after each call.

The overall T45 and the four sub-scales scores had high
internal and test-retest reliability, and there were no
significant differences between test and retest scores.
Examination of differences between sub-scales with
different loci of apprehension indicated that, contrary
to predictions, clear distinctions were not made between
speaking and listening when telephoning. There was a high
correlation between sub-scales for apprehension
associated with speaking and listening, and between both
of these and communicating. These sub-scales appear to be
measuring the same underlying loci of apprehension.
However, to the extent that there are differences,
speaking appears to be a more salient component of
communicating than is listening. Apprehension associated
with both "communicating" and "using" is more closely
related to apprehension associated with speaking than
that associated with listening.

All sub-scales correlated significantly with
appropriately focused validating measure, and the T45
measure correlated significantly with all four validating
measures. The correlations of the trait measure, TCA, to
the two individual measures of state anxiety were low,
but the correlation with the mean of the two state

measures was greater than the correlations with either of the two individual measures.

It was concluded that the TAI-45 constituted an appropriately specified, valid and reliable measure of telephone apprehension. However, whilst the distinctions between speaking and listening, and communicating and using, were in the main supported, the relatively small effects associated with these distinctions suggested that whilst their continued separation may be conceptually necessary, and should be followed as 'good practice', the empirical justification for doing so remains to be demonstrated. In addition, the results of a limited factor analysis of the TAI-45 indicated that the Problematic, Avoidance and Confidence dimensions identified earlier are quite robust, and transcend these distinctions. Taken together with analyses which support the validity of the original TAI-20 against the same criteria applied to the TAI-45, these results suggest that the TAI-20 and its sub-scales can be used in further research.

CHAPTER NINE

THE TELEPHONE APPREHENSION INVENTORY: A VALIDITY STUDY

Introduction

Whilst the studies reported in Chapters Five to Eight
demonstrated that the TAI had acceptable levels of
internal and test-retest reliability, that there were
meaningful sub-dimensions to the overall score, and that
variables such as culture, age and sex were related to
both overall and sub-sclae TAI scores, no proper
investigation of the external validity of the TAI has as
yet been undertaken. In particular, the proposition that
Telephone Apprehension can be considered as a trait, and
can be measured by means of the TAI needs to be tested.
This chapter examines these questions, first by outlining
the characteristics required of a valid trait measure,
then by examining the current TAI in terms of these
criteria, and then by reporting an empirical test of each
of these criteria.

Validation of the TAI: Conceptual Issues

There are four fundamental characteristics of a valid
trait measure (Zuckerman, 1976). The first is that the
respondent refers to several previous experiences when
describing their response, and that the evoking stimuli
are specified unambiguously. For instance, in a measure
designed to measure trait anxiety associated with
"programming computers", the respondent would be asked to
describe their response to "programming computers" and
would be asked to give a response that was generalised
across a number of different instances of "programming
computers". These responses would be expected to differ
from those given to a scale measuring trait anxiety
associated with "using computers", a more inclusive and
ambiguous term. A measure which included items referring
to both "programming computers" and to "using computers"
would produce highly ambiguous data.

Examination of the TAI shows that it contains two different kinds of items. Some of the items refer to "use" of the telephone, whilst others refer to apprehension associated with "talking" (or "speaking") on the telephone. No items refer to apprehension experienced when listening on the telephone, and no items refer directly to communicating by telephone. If the focus of the measure is upon apprehension associated with telephone communication (Steele and Reinsch, 1983, 1984), the inventory should contain items specifying this as the stimulus. As communicating involves both speaking and listening, to the extent that items specifying talking or speaking are included, then listening items should also be included. To the extent that the focus of the measure is upon communicating by telephone, items which specify using the telephone, a more inclusive and ambiguous term than communicating, should not be included. As both "speaking" and "using" items are included, and neither "communicating" nor "listening" items are included, the basic requirement that the stimuli evoking the response are clearly specified is, at best, satisfied only partially and ambiguously by the original TAI.

Wheeless (1975) noted that most self-report measures of communication apprehension had focused exclusively upon the source of communication, and had ignored anxiety associated with the process of receiving communication. He developed a measure of Receiver Apprehension (RAT) consisting of 20 items. The correlation between RAT and PRCA-20 scores was low (but significant), with $r=0.20$ (N=324), and with the two tests accounting for only 4% of the common variance. It may be noted that Wheeless (1975) explains this low correlation as stemming not only from the difference in source-receiver focus, but as also due to differing emphases on public speaking (PRCA-20) and interpersonal (RAT) contexts in the two instruments.

Studies using the RAT have been reported by Beatty, Behnke and Henderson (1980), by Clark (1989), and by

Steele and Reinsch (1984). Beatty, Behnke and Henderson (1980) reported a correlation of r=0.561 (n=82, p<0.05) between the RAT instrument and Speilberger's STAI-trait instrument when subjects were instructed to respond to the STAI instrument in terms of how they generally felt when listening. They did not include the PRCA measure in their study. Clark (1989) reported significant correlations between the RAT and both PRCA and WTC. The correlation between RAT and PRCA scores was 0.463 (p<0.0001) (PRCA version not specified, but assumed to be PRCA-24), and between RAT and WTC scores it was -0.260 (p<0.009). These figures show that approximately 21.4% of the variance is shared between the concepts of apprehension as a speaker and as a listener. This is a much higher figure than that reported by Wheeless in his original study, and may be due to the use of the revised version of the PRCA which includes a much better representation of interpersonal situations. The separate correlations between RAT and PRCA scores for males and females showed that speaking and listening are more clearly differentiated for females than for males (females: r=0.360, p<0.003; males: r=0.638, p<0.0001). Steele and Reinsch (1984) used two forms of the PRCA and reported significant correlations of both with the RAT. They used the PRCA-OF developed by Scott, McCroskey and Sheahan (1978), and the PRCA-13 short form developed by Porter (1981). The correlation between RAT and PRCA-OF scores was 0.4261 (N=434, p<0.0001), and between RAT and PRCA-Short scores it was 0.2438 (N=434, p<0.0001).

Overall, there appears to be only limited shared variance between receiver and sender apprehension. In using the telephone the user has to take both roles. Therefore, measures of telephone apprehension should include measures of both sender and receiver apprehension. Measures of telephone apprehension which tap only one kind of apprehension are likely to be less effective predictors of telephone usage than those which incorporate both, and incorporate them to approximately

equal extents.

The following table shows that in the original TAI-20, only 9 items refer to using the telephone, whilst 11 items explicitly refer to "speaking". No items refer to "communicating" or "listening".

ITEM	USING	SPEAKING	LISTENING	COMMUNICATING
1	*	-	-	-
2	*	-	-	-
3	-	*	-	-
4	-	*	-	-
5	-	*	-	-
6	-	*	-	-
7	-	*	-	-
8	*	-	-	-
9	-	*	-	-
10		*	-	-
11	*	-	-	-
12		*	-	-
13		*	-	-
14	*	-	-	-
15		*	-	-
16		*	-	-
17	*	-	-	-
18	*	-	-	-
19	*	-	-	-
20	*	-	-	-
TOTAL	9	11	0	0

Items referring to using the telephone are ambiguous in several ways. It may be that respondents take this term to refer to the overall activity of using the telephone, including such activities as, for instance, finding the number of the person being called, locating a phone to use, and the coins to put into it. On the other hand, they may take the term to be equivalent to "communicating" and respond in terms of the much more limited activity of the person-to-person interaction involving speaking and listening. If this is the case, they may then respond in terms of their overall telephone apprehension, combining in some way the apprehension associated with both telephone speaking and telephone listening. On the other hand, it may be that people respond in terms of that aspect of the process of communicating by telephone that is the most salient for

them, and this may be that aspect which is most anxiety provoking.

Given that the inventory includes both "using" and "speaking" items, it may be that the preponderance of "speaking" items focuses attention primarily on apprehension associated only with speaking, rather than listening, on the telephone. Similarly, the mixture of "using" and "speaking" items may influence people to respond in terms of a "set" determined by the first few items. The first two items of the TAI specify "using", but the next five items specify "speaking". Seven of the first ten items are speaking items.

Thus, the TAI-20 score is likely to be some mixture of the two trait-like characteristics of apprehension associated with the overall activity of "using" the telephone, and apprehension associated with the much more specific activity of "speaking" on the telephone. The trait-like apprehension associated with "communicating" by telephone is either not tapped at all, or is tapped in an unknown way by either or both "using" and "speaking" items. Apprehension associated with "listening" via the telephone is not tapped at all (or it may be in some unknown way by the "using" items).

In general, the separation of apprehension associated with listening from that associated with speaking is both important and frequently neglected (Wheeless, 1975). In general, as noted above, the correlation between measures of speaking apprehension and listening apprehension is relatively low. In the context of communicating by telephone, it is not clear to what extent the two sources of apprehension are independent, nor how they contribute to overall telephone apprehension.

A second characteristic of a trait measure is that it should correlate, at least moderately, with other trait measures of the same construct. That is, Telephone

Apprehension scores specified in terms of, say, "speaking" on the telephone should correlate, at least moderately, with scores on another measure of trait apprehension associated with speaking on the telephone. Given that it is possible to distinguish four different foci for such apprehension (communicating, speaking, listening and using), each of these should correlate, at least moderately, with other appropriately focussed trait measures.

A third characteristic of a trait measure is that it should correlate with any given state response to the same referent stimulus, although this correlation will tend to be quite low. However, the trait measure should correlate to a greater extent with the mean of a number of measures of state responses to these stimuli, and this correlation will be greater than that with any one state measure.

A fourth requirement of a trait measure is that it should have high intra-test and inter-test reliabilities. Such high reliabilities were reported in Chapter Five for the original TAI-20.

Rationale and Hypotheses

An initial task was to explore the significance of different specifications of the stimulus, that is, apprehension associated with using, communicating, speaking and listening by telephone. A revised version of the TAI containing a total of 45 items was therefore developed. (The TAI-45, see Table 9.01, Appendix 4 for details). The TAI-45 contained items which explicitly specify apprehension associated with using the telephone, with communicating by telephone, with apprehension associated with speaking, and with apprehension associated with listening on the telephone. These items allow sub-scores for Telephone Usage Apprehension (TUA),

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Telephone Communication Apprehension (TCA), Telephone Speaking Apprehension (TSA) and Telephone Listening Apprehension (TLA) to be computed, as well as an overall Telephone Apprehension score (T45). In addition, the TAI-45 contained all 20 of the items from the original TAI, and allowed the original full-form (T20) and short-form (T11) scores, and the three sub-scale scores to be calculated.

As noted above, there are relatively low correlations between communication apprehension (as measured, for instance, by the PRCA) and listening apprehension (as measured, for instance, by the RAT). It may therefore be predicted that there will be relatively low correlations between apprehension associated with speaking on the telephone and that associated with listening on the telephone.

Hypothesis 1: There will be a low correlation between Telephone Speaking Apprehension (TSA) and Telephone Listening Apprehension (TLA) scores.

It is reasonable to assume that when people are asked to consider communicating by telephone they are likely to take both speaking and listening activities into account. Thus, scores based on apprehension associated with communicating by telephone will have at least moderate correlations with both listening apprehension and speaking apprehension scores. To the extent that the TCA score reflects the respondent taking into account both speaking and listening, the correlations between the "combination" measure and each of the constituent measures is likely to be greater than that between the two constituent measures themselves.

Hypothesis 2: The correlations between Telephone Speaking Apprehension (TSA) and Telephone Communication Apprehension (TCA), and between Telephone Listening Apprehension (TLA) and Telephone Communication

Apprehension (TCA) will be moderate, and will be greater than the correlation between TSA and TLA.

In general, the activity of speaking tends to be more salient than the activity of listening. The same is likely to apply when communicating by telephone. Therefore, when people are asked to consider communicating by telephone, and respond in terms of some "combination" of speaking and listening activities, they are likely to give greater attention to speaking than to listening.

Hypothesis 3: The correlation between TSA and TCA will be greater than that between TLA and TCA.

When people are asked about using the telephone, they are likely to take this to refer to communicating by telephone, that is, to both speaking and listening, rather than to either just speaking or just listening.

Hypothesis 4: There will be a high correlation between TUA and TCA, and this will be higher than the correlation between TUA and TSA, and that between TUA and TLA.

Because of the greater salience of speaking as opposed to listening, when people are asked to consider their reactions to using the telephone, they will give greater weight to their reactions to speaking on the telephone than they will to their reactions to listening on the telephone.

Hypothesis 5: The correlation between TUA and TSA will be greater than that between TUA and TLA.

The second basic requirement of a usable trait measure is that it should correlate with other trait measures of the same construct. The revised TAI generates both an overall measure of telephone apprehension and four sub-scores. Each of these scores should correlate, at least

moderately, with other appropriately specified trait measures. For each of the sub-scores an appropriate trait measure was identified which already had well established validity and reliability. These were then modified to refer specifically to the telephone.

Hypothesis 6: There will be a high correlation between the sub-score for Telephone Communication Apprehension (TCA) and the individual's score on a measure of trait-like telephone communication apprehension.

The measure examined was a version of the STAI-Trait inventory (Spielberger, Gorsuch and Lushene, 1970), modified to refer to apprehension associated with communicating by telephone. (See Table 9.02, Appendix 4 for details of this measure.)

Hypothesis 7: There will be a high correlation between the sub-score for Telephone Speaking Apprehension (TSA) and the individual's score on a measure of trait-like speaking apprehension.

The measure examined was a version of the Situational Communication Apprehension Measure (Richmond and McCroskey, 1985), modified to refer specifically to apprehension associated with speaking on the telephone. (See Table 9.03, Appendix 4 for details of this measure.)

Hypothesis 8: There will be a high correlation between the sub-score for Telephone Listening Apprehension (TLA) and the individual's score on a measure of trait-like listening apprehension.

The measure examined was a version of the Receiver Apprehension Test (Wheeless, 1975), modified to refer specifically to apprehension associated with listening on the telephone. (See Table 9.04, Appendix 4 for details of this measure.)

Hypothesis 9: There will be a high correlation between the sub-score for Telephone Usage Apprehension (TUA) and the individual's score on a measure of trait-like telephone usage apprehension.

The measure examined in this study was a shortened version of the PRCA-24 (McCroskey, 1982c), modified to refer specifically to apprehension associated with using the telephone. (See Table 9.05, Appendix 4, for details of this measure.)

The third basic characteristic and requirement of a measure of trait-like responses, is that, whilst it may only correlate to a low degree with any given state response to the same referent stimulus, it should correlate to a greater extent with the mean of a number of such measures of state responses to that stimulus. This requirement was examined by asking subjects to take part in two telephone calls, and measuring the state anxiety experienced in these two situations. The two situations involved making and receiving a telephone call, and state anxiety was measured using the STAI-State inventory developed by Spielberger, Gorsuch and Lushene (1970).

Hypothesis 10: The correlation between state anxiety scores when making a telephone call and TCA scores will be low.

Hypothesis 11: The correlation between state anxiety scores when receiving a telephone call and TCA scores will be low.

Hypothesis 12: The correlation between the mean of state anxiety scores when making and receiving telephone calls, and TCA scores will be moderately high, and greater than either of the individual correlations.

Given that it is possible to differentiate between apprehension associated with speaking and apprehension associated with listening on the telephone, it is possible to predict that the pattern of results discussed above will differ depending on which activity is associated with the greatest apprehension. People whose Telephone Speaking Apprehension scores are greater than their Telephone Listening Scores can be referred to as "Telephone Speaking Apprehensives", and those people whose Telephone Listening Apprehension scores are greater than their Telephone Speaking Apprehension scores can be referred to as "Telephone Listening Apprehensives". When responding to items specifying "communicating", Telephone Speaking Apprehensives are likely to give greater weight to that aspect of the overall activity which is most salient to them, and this is likely to be "speaking". The opposite is likely to apply to Telephone Listening Apprehensives, who are likely to give greater weight to "listening". Thus, the following hypotheses can be formulated:

Hypothesis 13: For Telephone Speaking Apprehensives, the correlation between TCA and TSA scores will be greater than the correlation between TCA and TLA scores.

Hypothesis 14: For Telephone Listening Apprehensives, the correlation between TCA and TLA scores will be greater than the correlation between TCA and TSA scores.

Similarly, when considering apprehension associated with "using" the telephone, Telephone Speaking Apprehensives are likely to give greater weight to that aspect of the overall activity which is most salient to them, and this is likely to be "speaking". The opposite is again likely to apply to Telephone Listening Apprehensives, who are likely to give greater weight to "listening".

Hypothesis 15: For Telephone Speaking Apprehensives, the correlation between TUA and TSA scores will be greater

than the correlation between TUA and TLA scores.

Hypothesis 16: For Telephone Listening Apprehensives, the correlation between TUA and TLA scores will be greater than the correlation between TUA and TSA scores.

METHOD

TAI-45: The Revised TAI

A revised version of the original TAI was developed (TAI-45). This contained 45 items. Twelve of these 45 items refer to "communicating" by telephone, 12 specify "speaking" and 12 specify "listening", and 9 simply refer to "using" the telephone. In the TAI-45, the 9 "using" items are the same as those which appeared in the original TAI (originally Items 1, 2, 8, 11, 14, 17, 18, 19, 20). Of the 12 "communicating", "speaking" and "listening" items, 11 were "speaking" items in the original TAI-20 (Items 3, 4, 5, 6, 7, 9, 10, 12, 13, 15, 16). They were converted to "communicating" items by substituting the verb "to communicate", and to "listening" items by substituting the verb "to listen". One (Item 8) was originally a "using" item and "communicating", "speaking" and "listening" versions of it were created by substituting the appropriate verbs. The 12 "speaking" items therefore consisted of the original 11 "speaking" items together with an additional item converted from an original "using" item. The 12 "listening" items consisted of the original 11 "speaking" items converted to "listening" items, and 1 item converted from an original "using" item. The 12 "communicating" items consisted of the original 11 "speaking" items converted to "communicating" items, and 1 item converted from an original "using" item.

Four sub-scores could be calculated:

Telephone Usage Apprehension (TUA) (9 items)
Telephone Communication Apprehension (TCA) (12 items)
Telephone Speaking Apprehension (TSA) (12 items)
Telephone Listening Apprehension (TLA) (12 items)

An overall Telephone Apprehension (T45) score could also be calculated by combining the four sub-scores:

Telephone Apprehension (T45) (45 items)
$$= TUA + TCA + TSA + TLA$$

In addition, the original long-form T20 score can be calculated, as well as the short-form T11 score and the three sub-scales from the original TAI-20. (See Table 9.01, Appendix 4 for further details of the TAI-45 scale.)

Tele-STAIT: The modified STAI-Trait Inventory

A modified version of the STAI-Trait inventory (Spielberger, Gorsuch and Lushene, 1970) was used as a measure of trait-like anxiety associated with communicating by telephone. This measure of trait anxiety was selected because of its well-documented validity and reliability. It has been used in other studies examining trait communication apprehension (for instance, see Beatty, Behnke and Henderson, 1980, Strohkirch and Parks, 1986). Form X-2 of the original STAI-Trait inventory was modified by changing the instructions to focus respondents' attention solely and specifically on their reactions when communicating with other people by telephone, and the phrase "when I communicate by telephone" was included in each of the items. A number of other minor changes to item wording were made (see Table 9.02, Appendix 4 for full details.)

Tele-SCAM: The modified Situational Communication Apprehension Measure

The original SCAM (Richmond and McCroskey, 1985) is a measure of state communication apprehension, where the specific situation is specified, often in the form: "Think of the last occasion when you talked about x with y...". The respondent is then asked to record how they felt on that occasion by indicating how accurately each of 20 adjectives describes their reactions. In constructing the Tele-SCAM the instructions were changed to refer to the respondent's general reaction to a number of experiences of speaking when using the telephone. That is, the instructions converted the instrument from a state to a trait focus. In addition, the presentation of the adjectives was changed from the past tense to the present, by using the verb "to feel" rather than "felt". A number of other minor changes to item wording were made (see Table 9.03, Appendix 4 for full details.)

Tele-RAT: The modified Receiver Apprehension Test

The original RAT (Wheeless, 1975) was modified to focus on apprehension when listening on the telephone. The instructions were modified to focus the respondent's attention specifically on how they feel about receiving communications by telephone. The phrase "... when I am using the telephone..." was included in each item (except in the case of one, which already refers explicitly to listening on the telephone). A number of other minor changes to item wording were made (see Table 9.04, Appendix 4 for full details.)

Tele-PRCA: The modified PRCA

McCroskey's PRCA-24 (McCroskey 1982c) was used as measure of trait-like telephone usage apprehension. This measure

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was selected because of its centrality to research on the communication apprehension construct, and also because it embodied the same ambiguities concerning the specification of using versus speaking versus listening as did the original TAI-20.

The PRCA-24 was modified by deleting the 18 items referring to group discussions, meetings and public speaking. The remaining six items referring to interpersonal conversation were modified by adding the qualifying reference "telephone" to the words "conversation", "conversing", etc. In the original PRCA two items refer to "speaking up" in conversations (Original Items 14 and 18). In the Tele-PRCA these were changed to "speaking out" in order to avoid any confusion with issues of speech amplitude and telephone audibility. The instructions were modified to focus respondents' attention specifically on their feelings about using the telephone, rather than on communicating in general. (see Table 9.05, Appendix 4 for full details.)

Two of the six items in the Tele-PRCA specify "speaking" (Items 2 and 6), with only four items being strictly "using" items (Items 1, 3, 4 and 5). In addition to the overall Tele-PRCA score therefore, these four items can be used to calculate a "pure" usage sub-score. This will be referred to as the Tele-PRCA4 scale.

The Experimental Sessions

Two situations in which the subject was required to use the telephone were designed. The first involved making a call, the second involved receiving a call.

In the first session (Session X), each subject completed a questionnaire providing various demographic data, and the TAI-45. Each subject then made the allocated telephone call, and immediately after ending it,

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completed a copy of the STAI-State inventory. Before
leaving subjects were given, in a sealed envelope,
another copy of both the STAI-State and the TAI-45, to be
used during the later session when they were to receive a
telephone call. Finally, the time and date of the next
session were arranged. The first session took some 20-30
minutes to complete.

In the next session (Session Y), the subject was
telephoned, normally at their home telephone number.
During the latter part of this call, they were asked to
open the envelope given to them during the first session
and complete the STAI-State inventory. Subjects were then
asked, immediately following the end of the call, to
complete another TAI-45 (the retest data), and to post
the completed questionnaires back to the experimenter.
This session took some 10-15 minutes.

During a separate session (Session Z), subjects were
asked to complete copies of the Tele-STAIT, the Tele-
SCAM, the Tele-RAT and the Tele-PRCA. This session took
approximately 10-15 minutes to complete.

The Experimental Sequence

For all subjects, Session X was the first session.
However, in order to control for possible order effects,
half of the subjects completed Session Y (receiving a
call) followed by Session Z (validating measures). The
other half completed Sessions Y and Z in the reverse
order, that is, they completed Session Z (validating
measures) followed by Session Y (receiving a call).
Allocation to these two orders was random. The time
between test and retest versions of the TAI-45 (ie
between Sessions X and Y) was kept constant, at
approximately 10 days. In order to do this, Session Z for
subjects in the X-Z-Y ordering was scheduled one week
after Session X, whilst for subjects in the X-Y-Z

ordering it was scheduled two weeks after Session X. Four
different orders of presentation of the four
questionnaires in Session Z were used, with each
questionnaire appearing an equal number of times in each
position of presentation (first, second, third, fourth).

The Experimental Situations

The first situation involved the subject using the
telephone to seek information. Each subject was asked to
act as an experimenter in the collection of a sample
telephone call, to be used in later analysis. To do this,
subjects were asked to telephone a local hire-car firm
for information concerning the availability, costs and
conditions involved in hiring a car, and to record this
call. Part of the call involved seeking the permission of
the callee for the recording of the call. (A copy of the
script provided to callers is included in Table 9.06,
Appendix 4.) A total of 48 separate car-hire outlets in
East Dorset and West Hampshire were identified, and a
different outlet randomly allocated to each subject.

The second situation involved the subject being called,
and asked to discuss their attitudes and feelings about
the previous telephone call. The call consisted of a
simple and standardised introduction followed by three
open-ended questions. The call was normally made by the
experimenter to the person's home telephone, usually in
the evening or at a weekend. (The script used by the
experimenter is included in Table 9.07, Appendix 4.)

In both cases, making a call and receiving a call, state
anxiety experienced while using the telephone was
operationally defined as the subject's score on the
Spielberger STAI-State Inventory (Form X-1). This was
completed immediately the telephone call had finished in
the case of the first call, and towards the end of the
call, but during it, in the case of the second call.

NOTE: All of these telephone conversations were recorded
with the full knowledge of all participants.

Experimenter and Subjects

All sessions were conducted by the same experimenter, a
confederate of the researcher who was uniformed as to the
experimental hypotheses. The subjects were students
enrolled in a variety of courses at a UK College of
Further Education.

RESULTS

A total of 47 subjects completed the three sessions, with
26 completing the X-Y-Z sequence and 21 completing the X-
Z-Y sequence. The distribution by sex and age of these
responses was as follows:

Age	16-20	20-26	26-35	36-45	TOTAL
MALE	14	0	0	0	14 (29.8%)
FEMALE	31	0	1	1	33 (70.2%)
TOTAL	45	0	1	1	47

All subjects were students. Of these, 28 (59.6%)
currently had part-time jobs. Only one described herself
as the head of household. All but 2 (4.3%) had access to
a home telephone.

Overall Telephone Apprehension: T45

TEST DATA	RETEST DATA
MEAN = 94.255	MEAN = 91.681
SD = 25.211	SD = 31.264
MODE = 65	MODE = 48
MEDIAN = 94	MEDIAN = 92
MIN SCORE = 47	MIN SCORE = 46
MAX SCORE = 164	MAX SCORE = 172
KURTOSIS = 0.431	KURTOSIS = 0.167
SKEWNESS = 0.519	SKEWNESS = 0.633

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┌─────────────────────────────────────────────┐
│          Distribution of T45 Scores:        │
│              SEE FIGURE C09F01              │
└─────────────────────────────────────────────┘
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The distribution of TAI T45 scores approximates to a
normal distribution, with some positive skewing, but no
marked kurtosis. Relative to the theoretical mean of 135,
the observed mean indicates that most subjects were
positively oriented to the telephone, with few subjects
experiencing marked apprehension with respect to the
telephone.

Telephone Usage Apprehension: TUA

                TEST DATA   RETEST DATA

             MEAN = 18.191   MEAN = 17.787
               SD = 4.771   SD = 5.912
             MODE = 17   MODE = 18
           MEDIAN = 18   MEDIAN = 18
        MIN SCORE = 11   MIN SCORE = 9
        MAX SCORE = 32   MAX SCORE = 32
         KURTOSIS = 0.387   KURTOSIS =-0.215
         SKEWNESS = 0.415   SKEWNESS = 0.499

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┌─────────────────────────────────────────────┐
│          Distribution of TUA Scores:        │
│              SEE FIGURE C09F02              │
└─────────────────────────────────────────────┘
```

This sub-scale has a bi-modal distribution, with the
majority of subjects reporting positive attitudes to
using the telephone.

Telephone Communication Apprehension: TCA

                TEST DATA   RETEST DATA

             MEAN = 26.234   MEAN = 24.872
               SD = 7.402   SD = 8.938
             MODE = 23   MODE = 23
           MEDIAN = 26   MEDIAN = 24
        MIN SCORE = 12   MIN SCORE = 12
        MAX SCORE = 47   MAX SCORE = 48
         KURTOSIS = 1.166   KURTOSIS = 0.559
         SKEWNESS = 0.871   SKEWNESS = 0.760

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┌─────────────────────────────────────────────┐
│          Distribution of TCA Scores:        │
│              SEE FIGURE C09F03              │
└─────────────────────────────────────────────┘
```

DISTRIBUTION OF T45 SCORES

N=47

TEST

RETEST

RESPONDENTS	9 8 7 6 5 4 3 2 1 0

T45 SCORES: 45-54 75-84 105-114 135-144 165-174 195-204

Figure C09F01

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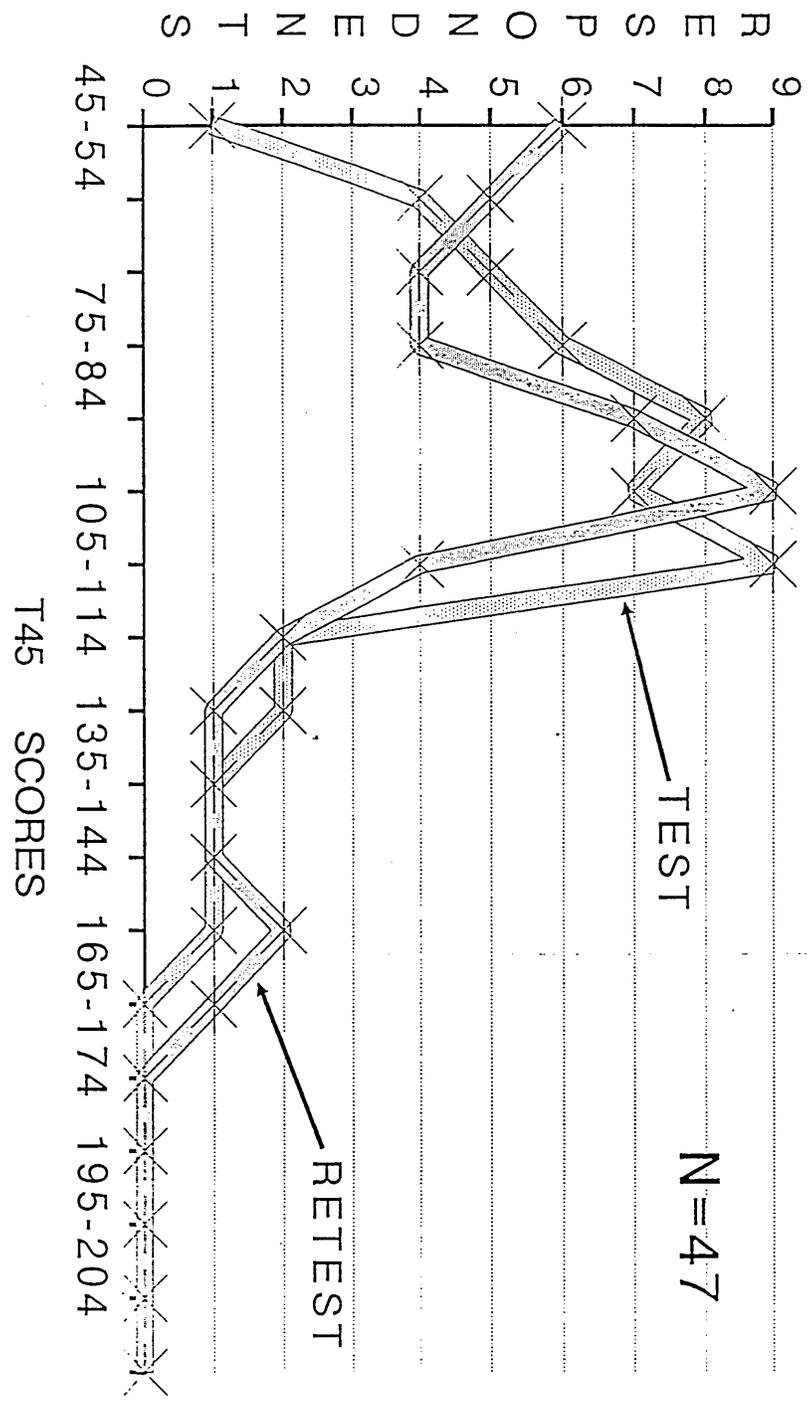
DISTRIBUTION OF TUA SCORES

Figure C09F02
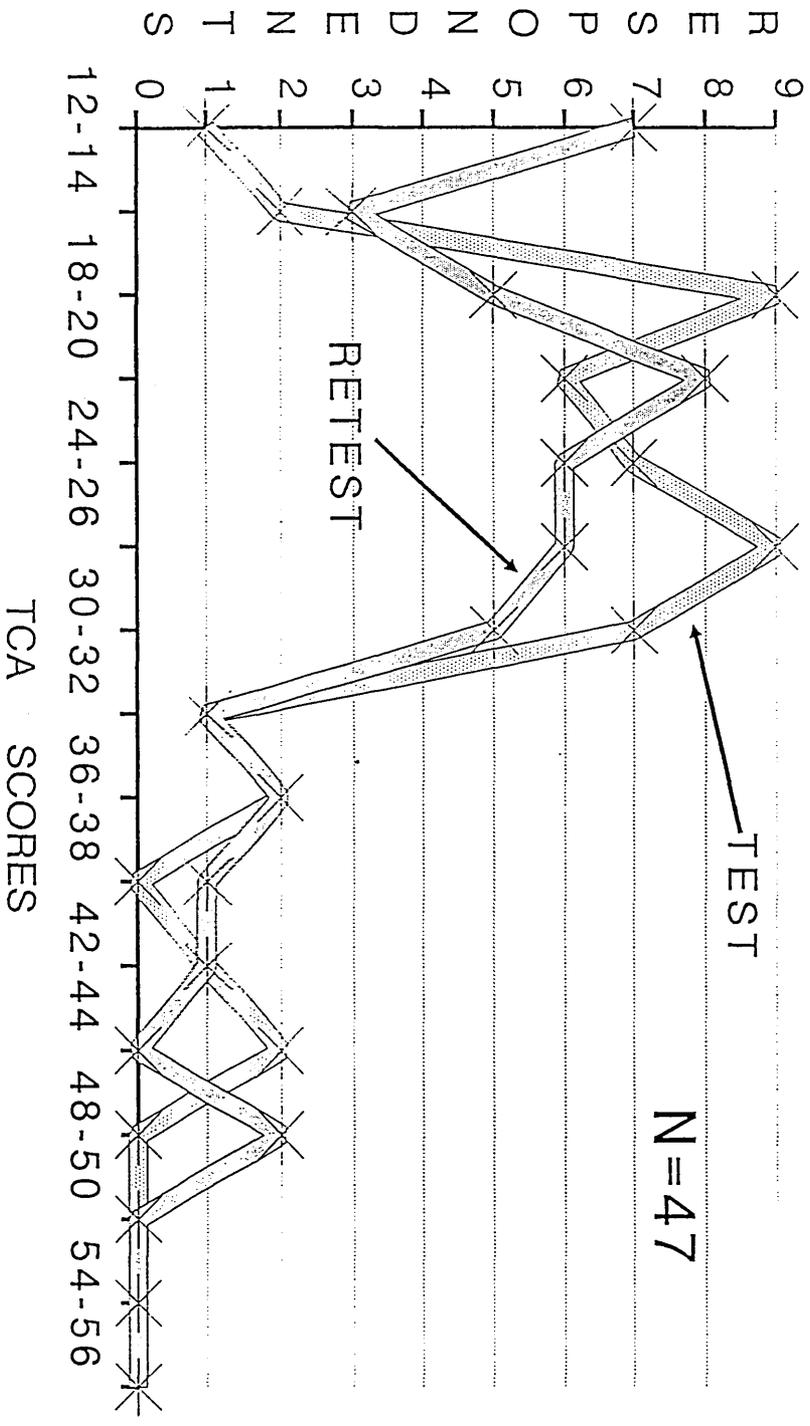
285

DISTRIBUTION OF TCA SCORES

Figure C09F03

N=47

RESPONDENTS

TCA SCORES

TEST

RETEST

These responses approximate to a normal distribution, with few subjects having markedly high, negative scores with respect to telephone communication apprehension.

Telephone Speaking Apprehension: TSA

TEST DATA		RETEST DATA	
MEAN =	25.149	MEAN =	24.915
SD =	7.807	SD =	8.839
MODE =	23	MODE =	26
MEDIAN =	24	MEDIAN =	25
MIN SCORE =	12	MIN SCORE =	12
MAX SCORE =	47	MAX SCORE =	47
KURTOSIS =	0.356	KURTOSIS =	0.222
SKEWNESS =	0.585	SKEWNESS =	0.682

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+--------------------------------------+
|      Distribution of TSA Scores:     |
|           SEE FIGURE C09F04          |
+--------------------------------------+
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These responses approximate to a normal distribution, with few subjects having markedly high, negative scores indicating that for this group there are low levels of apprehension concerning speaking on the telephone.

Telephone Listening Apprehension: TLA

TEST DATA		RETEST DATA	
MEAN =	24.681	MEAN =	24.106
SD =	6.647	SD =	8.294
MODE =	25	MODE =	21
MEDIAN =	25	MEDIAN =	25
MIN SCORE =	12	MIN SCORE =	12
MAX SCORE =	42	MAX SCORE =	45
KURTOSIS =	0.707	KURTOSIS =	-0.009
SKEWNESS =	0.498	SKEWNESS =	0.552

```
+--------------------------------------+
|      Distribution of TLA Scores:     |
|           SEE FIGURE C09F05          |
+--------------------------------------+
```

Comparison of the TSA and TLA scores shows that, overall, there are no significant differences, that is, that there was no significant trend for subjects to be more apprehensive about speaking on the telephone than of listening on the telephone, or vice-versa (Test data: TSA=25.15, TLA=24.68, t=0.78, df=46, p<0.437; Retest

DISTRIBUTION OF TSA SCORES

N=47

Figure C09F04

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DISTRIBUTION OF TLA SCORES

Figure C09F05

N=47
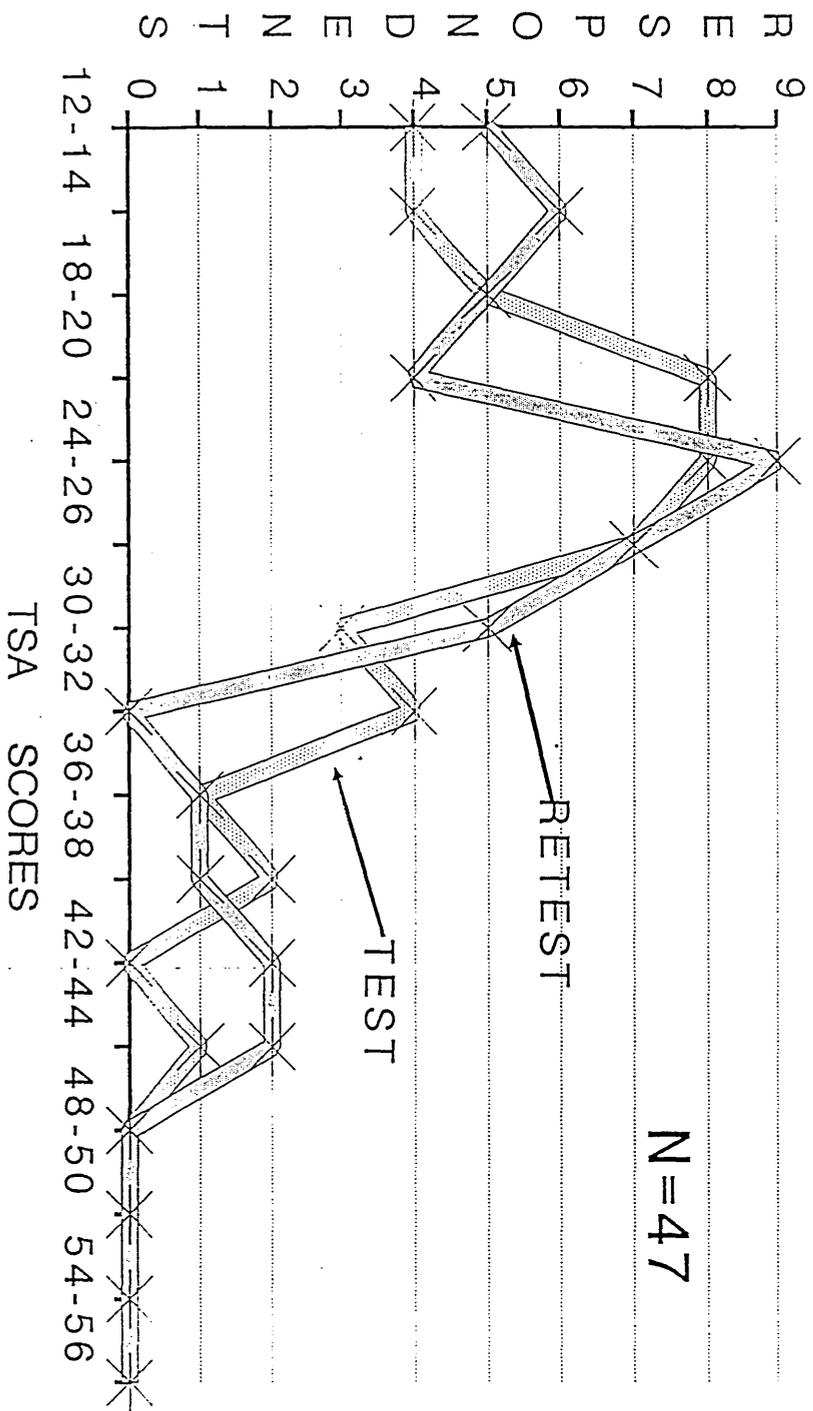
TLA SCORES
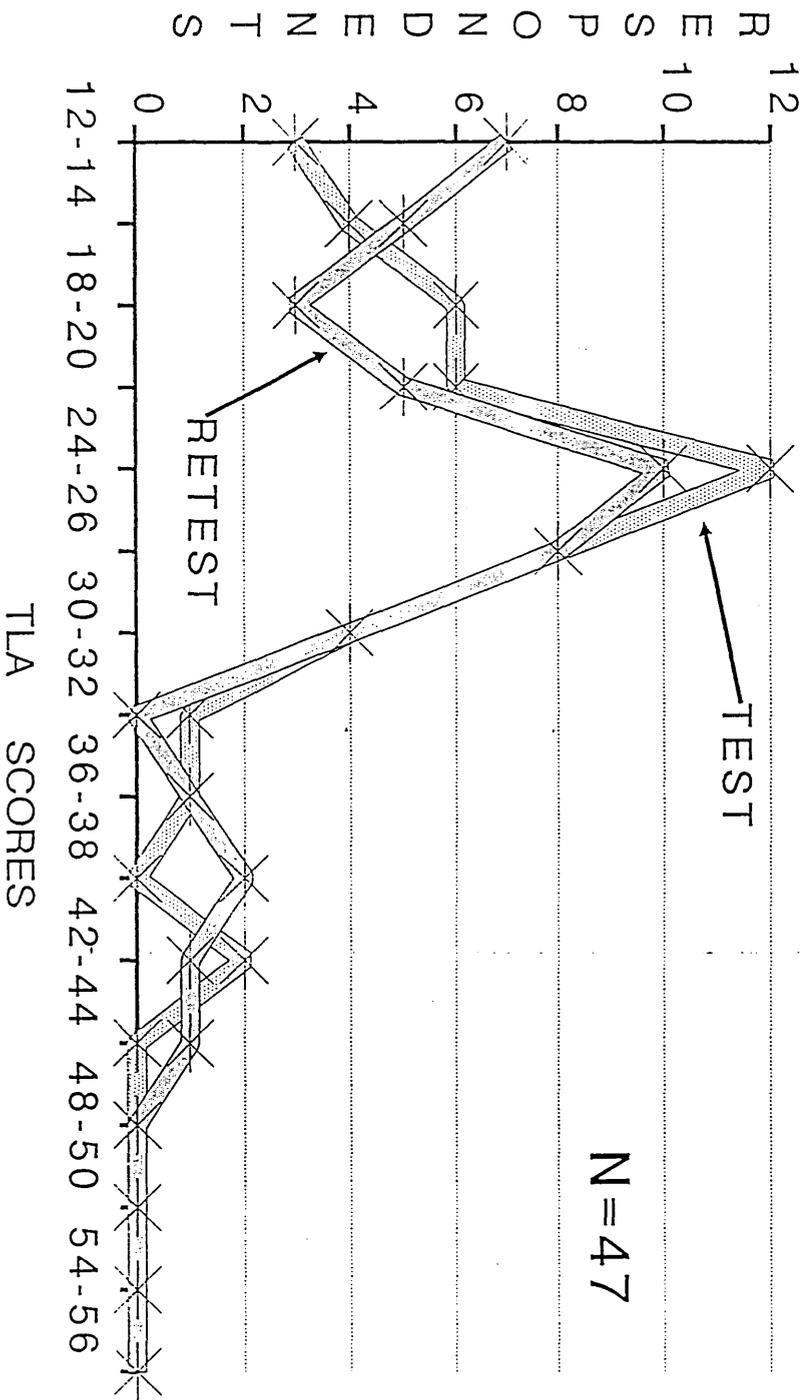
TEST

RETEST

data: TSA=24.91, TLA=24.11, t=1.77, df=46, p<0.084), although the retest data suggests that there is some tendency for apprehension about speaking to be greater than apprehension associated with listening.

An item-by-item examination of the 45 items comprising the TAI was also undertaken, which showed correlations between individual items and overall T45 scores ranging from 0.8844 to 0.2632 (see Tables 9.08 and 9.09, Appendix 4).

A number of tests to examine the reliability of the overall T45 scale and the four sub-scales were calculated. These included Cronbach's Alpha (Cronbach 1951), a number of split-half reliability statistics, and the test-retest product moment coefficient. For both the test and the retest data, all of these measures indicated adequate, indeed very high, levels of internal and test-retest reliability both for the overall, 45-item scale and for each of the sub-scales, with Alphas ranging from 0.9671 to 0.8936 for the test data, and from 0.9831 to 0.9075 for the retest data (see Tables 9.10 and 9.11, Appendix 4).

Comparisons of the test and retest scores were conducted for each of the scales using t-tests.

	T45	TUA	TCA	TSA	TLA
Test mean	94.26	18.19	26.23	25.15	24.68
sd	25.21	4.77	7.40	7.81	6.65
Retest mean	91.68	17.79	24.87	24.91	24.11
sd	31.26	5.91	8.94	8.84	8.29
t value	0.93	0.72	1.63	0.28	0.72
df	46	46	46	46	46
probability (2-tailed)	0.359 (nsd)	0.474 (nsd)	0.110 (nsd)	0.777 (nsd)	0.475 (nsd)

These comparisons indicate that the differences between scores at test and retest were non-significant.

STATE ANXIETY

Following each telephone call respondents completed the State Anxiety Inventory (Spielberger, Gorsuch and Lushene, 1970). The mean for making a call was 38.28 (sd=9.08), and for receiving a call the mean was 34.15 (sd=7.59). The internal reliability of the scale was acceptable, with Alphas of 0.8852 when making a call, and 0.8714 when receiving a call.

Male and female state anxiety scores were not significantly different.

	Means				2-tailed
	Males	Females	t-value	df	probability
Making a Call	36.21	39.15	-1.01	45	0.316
Receiving a Call	31.50	35.27	-1.58	45	0.120

State anxiety when making a call was greater than when receiving a call (Mean State Anxiety: Making=38.28, Receiving=34.15, t=2.81, df=46, p<0.007, 2-tailed). This may indicate that people find making calls more anxiety arousing than receiving calls. However, other factors could account for this difference. The call received always followed the call made, and therefore, familiarity may have lessened overall anxiety. The call received was also anticipated, was from a known person, and the conversation was about a topic of which the subject had direct personal knowledge. Finally, in almost all cases, the call was received in the person's own home. Spielberger and Sharma (1976) note that the STAI A-State instrument is sensitive to quite minor sources of stress, such as those associated with the ordering of experimental conditions.

The Validation Measures

Overall scores were calculated for each of the four validating measures, and for the sub-scale measure of the

Tele-PRCA, the Tele-PRCA4. The mean score of the Tele-Stait was 36.64 (sd=9.09), with an Alpha of 0.9031. The mean score of the Tele-SCAM was 59.68 (sd=23.29), with an Alpha of 0.9551. The mean score of the Tele-RAT was 41.83 (sd=15.12), with an Alpha of 0.9474. The mean score of the Tele-PRCA was 14.21 (sd=4.78), with an Alpha of 0.8440. The mean score of the Tele-PRCA4 was 9.83 (sd=3.25), with an Alpha of 0.7951.

COMPARISON OF EXPERIMENTAL CONDITIONS

Scores were compared as function of condition, that is, of the order in which subjects completed the various questionnaires.

TEST DATA

MEASURE	Mean X-Y-Z	X-Z-Y	t value	probability
T45	100.35	86.71	1.92	p<0.061
TUA	19.19	16.95	1.66	p<0.104
TCA	27.81	24.29	1.65	p<0.107
TSA	26.81	23.10	1.66	p<0.104
TLA	26.54	22.38	2.30	p<0.026

RETEST DATA

T45	97.62	84.33	1.47	p<0.149
TUA	18.96	16.33	1.54	p<0.130
TCA	26.50	22.86	1.40	p<0.168
TSA	26.38	22.86	1.27	p<0.211
TLA	25.77	22.05	1.57	p<0.123

VALIDATING MEASURES

State Anxiety				
Make call	40.85	35.10	2.29	p<0.027
Receive call	35.23	32.81	1.11	p<0.273
Tele-STAIT	38.35	34.52	1.46	p<0.152
Tele-SCAM	62.31	56.43	0.84	p<0.408
Tele-RAT	46.04	36.62	2.30	p<0.026
Tele-PRCA	15.42	12.71	2.09	p<0.043
Tele-PRCA4	10.73	8.71	2.20	p<0.033

Whilst the majority of these comparisons show no significant differences, a number do indicate significant differences, and most comparisons show a tendency for subjects in the X-Y-Z condition (n=26) to have higher levels of telephone apprehension at both test and retest, and higher scores on the validating measures, than those in the X-Z-Y condition. Given that this tendency exists across measures in all three sessions (ie including the very first session), it is unlikely to be due to order effects within the conditions, and is more likely to be the result of variations between subjects and their allocation to experimental conditions.

Given these differences as a function of experimental condition, analyses of sex differences used 2x2 analyses of variance, with both sex and condition as variables. No analyses by age were performed due to the limited distribution of subject ages.

The following summary presents the results of ANOVAs in terms of sex differences and sex by condition interactions:

TEST DATA

MEASURE	Mean Males (n=14)	Females (n=33)	Main effect F value & probability		Interaction F value & probability	
T45	98.29	92.55	0.747	p<0.392	0.887	p<0.352
TUA	19.71	17.55	2.516	p<0.120	0.550	p<0.462
TCA	26.57	26.09	0.101	p<0.752	0.543	p<0.465
TSA	26.57	24.55	0.883	p<0.353	0.499	p<0.484
TLA	25.43	24.36	0.466	p<0.498	1.953	p<0.169

RETEST DATA

MEASURE	Mean Males	Females	Main effect F value		Interaction F value	
T45	89.29	92.70	0.059	p<0.809	1.478	p<0.231
TUA	17.57	17.88	0.003	p<0.954	1.228	p<0.274
TCA	23.93	25.27	0.141	p<0.709	0.867	p<0.357
TSA	24.21	25.21	0.071	p<0.791	1.494	p<0.228
TLA	23.57	24.33	0.034	p<0.854	2.209	p<0.145

VALIDATING MEASURES

MEASURE	Mean Males (n=14)	Females (n=33)	Main effect F value & probability		Interaction F value & probability	
State Anxiety						
Make call	36.21	39.15	0.804	p<0.375	0.540	p<0.466
Rec' call	31.50	35.27	2.294	p<0.137	1.280	p<0.264
Tele-STAIT	35.71	37.03	0.135	p<0.715	3.910	p<0.054
Tele-SCAM	56.86	60.88	0.229	p<0.635	1.297	p<0.261
Tele-RAT	37.93	43.48	1.285	p<0.263	8.285	p<0.006
Tele-PRCA	11.93	15.18	4.809	p<0.034	2.739	p<0.105
Tele-PRCA4	8.36	10.45	4.154	p<0.048	1.706	p<0.198

Overall, these results indicate few significant sex differences. The only significant main effect is that with respect to Tele-PRCA (and Tele-PRCA4), where females responses are significantly higher than those of males. There are two significant sex by condition interaction effects, those of Tele-STAIT and the Tele-RAT. In both cases, this is because female responses are significantly higher than males in the X-Y-Z condition, whilst the reverse is true in the X-Z-Y condition. There appears to be no obvious explanation for this pattern of results.

The first set of hypotheses to be considered dealt with the relationships of anxiety about speaking and listening to anxiety about communicating, and with the relationship of anxiety about communicating to anxiety about using the telephone. (Both test and retest data are reported, but given the interdependence of these two sets of data, primacy should be given to the results of the test data.)

Hypothesis 1 was based on the proposition that apprehension associated with speaking and with listening were distinctly different, and that there would therefore be a low correlation between Telephone Speaking Apprehension (TSA) and Telephone Listening Apprehension (TLA). There is a correlation of $r=0.8513$ (n=47, p<0.0001) between these two scales on the first, test administration, and of $r=0.9348$ (n=47, p<0.0001) on the

second, retest administration (see Tables 9.12 and 9.13, Appendix 4). Thus, there is a high and significant correlation between scores on the speaking and listening sub-scales, and Hypothesis 1 must therefore be rejected.

Hypothesis 2 proposed that when people are asked to consider communicating by telephone they take both speaking and listening activities into account. Thus, scores based on communicating (TCA) will have at least moderate correlations with both listening (TLA) and speaking (TSA) scores, and these correlations will be greater than the correlation between the component TSA and TLA scores. There is a correlation of $r=0.9402$ (n=47, p<0.0001) between TCA and TSA scales on the test administration, and of $r=0.9668$ (n=47, p<0.0001) on the retest administration. The correlation between the TCA and TLA scales on the test administration is $r=0.8221$ (n=47, p<0.0001), and on the retest administration it is $r=0.9382$ (n=47, p<0.0001). Both correlations between TCA and TSA scales are significantly greater than the corresponding correlations between TSA and TLA scales (Test: TCA/TSA=0.9402, TSA/TLA=0.8513, t=3.173, df=44, p<0.005, 1-tailed; Retest: TCA/TSA=0.9668, TSA/TLA=0.9348, t=2.488 df=44, p<0.01, 1-tailed). However, neither of the correlations between the TCA and TLA scales are significantly greater than the corresponding correlations between TSA and TLA scales (Test: TCA/TLA=0.8221, TSA/TLA=0.8513; Retest: TCA/TLA=0.9382, TSA/TLA=0.9348, t=0.266, df=44, nsd).

Clearly, there is a high and highly significant correlation between the communicating and speaking sub-scales, and a similar (but slightly smaller) correlation between the communicating and listening sub-scales. This aspect of Hypothesis 2 is therefore supported. However, whilst the prediction that the correlation between the TCA and TSA scores would be higher than between the corresponding correlations for the TSA and TLA scores, this prediction was not supported in the case of the

correlation between the TCA and TLA scores. However, it should be noted that all of the sub-scales of the TAI-45 are very highly inter-correlated, and this must limit the confidence which can be placed in this test of Hypothesis 2, and of subsequent hypotheses based on tests of the significance of differences between correlations.

Hypothesis 3 proposed that when people are asked to consider their attitudes to communicating by telephone, they give greater attention to speaking than to listening. Hypothesis 3 predicted that the correlation between TSA and TCA scores would be greater than that between TLA and TCA scores. On both the test and retest administrations of the inventory, the correlation between the TCA and TSA scales was significantly greater than that between TCA and TLA scales (Test: TCA/TSA=0.9402, TCA/TLA=0.8221, t=4.249, df=44, p<0.0005, 1-tailed; Retest: TCA/TSA=0.9668, TCA/TLA=0.9382, t=1.911, df=44, p<0.05, 1-tailed). Hypothesis 3 was therefore supported.

These results are consistent with the results when testing Hypothesis 2, which also imply that speaking has greater salience than listening in determining communication apprehension.

Hypothesis 4 proposed that when people consider using the telephone, this is equivalent simply to communicating by telephone. It was therefore predicted that there will be a high correlation between TUA and TCA, and this will be higher than the correlations between TUA and TSA, and between TUA and TLA. On both the first and second administrations of the inventory the TUA/TCA correlations were high and highly significant. However, on the first administration of the inventory, the correlation between the TUA and TCA scales was <u>less</u> than that between the TUA and TSA scales (Test: TUA/TCA=0.8580, TUA/TSA=0.9008, t=-1.896, df=44, p<0.07, 2-tailed), whilst the TUA/TCA correlation was significantly higher than the correlation between the TUA and TLA scales (Test: TUA/TCA=0.8580,

TUA/TLA=0.7450, t=2.4669, df=44, p<0.01). Similarly, on the second administration of the inventory, the correlation between the TUA and TCA scales was significantly less than that between the TUA and TSA scales (Retest: TUA/TCA=0.9341, TUA/TSA=0.9594, t=-2.319, df=44, p<0.05, 2-tailed), whilst the correlation between the TUA and TCA scales was significantly greater than that between the TUA and TLA scales (Retest: TUA/TCA=0.9341, TUA/TLA=0.8947, t=2.106 df=44, p<0.025). The implication is that using and speaking are seen to be very similar, whilst listening is given less weight when considering reactions to using the telephone. This proposition is tested directly by Hypothesis 5.

Hypothesis 5 suggested that when people are asked to consider their reactions to using the telephone, they give greater attention to speaking than they do to listening. It was predicted that the correlation between the TUA and TSA scores would be greater than that between the TUA and TLA scores. On both the test and retest administrations of the inventory, the correlation between the TUA and TSA scales was significantly greater than that between TUA and TLA scales (Test: TUA/TSA=0.9008, TUA/TLA=0.7450, t=4.384, df=44, p<0.0005, 1-tailed; Retest: TUA/TSA=0.9594, TUA/TLA=0.8947, t=4.215, df=44, p<0.0005, 1-tailed). Hypothesis 5 was therefore supported. These results are consistent with those obtained when testing Hypothesis 4.

The second set of hypotheses considered the correlations of the TAI sub-scales with other trait measures of the same constructs: each of the Telephone Apprehension scores should correlate, at least moderately, with other appropriately focussed trait measures.

Hypothesis 6 predicted that there would be a high correlation between Telephone Communication Apprehension (TCA) and a measure of trait-like telephone communication

apprehension. The validating measure was a modified version of the STAI-Trait inventory. On the test administration the correlation between TCA and Tele-Trait scores was r=0.6657 (n=47, p<0.0001), on the retest administration it was r=0.7174 (n=47, p<0.0001). Thus, Hypothesis 6 was supported.

Hypothesis 7 predicted that there would be a high correlation between Telephone Speaking Apprehension (TSA) and a measure of trait-like speaking apprehension. The validating measure was a modified version of the Situational Communication Apprehension Measure. On the test administration the correlation between TSA and Tele-SCAM was r=0.5750 (n=47, p<0.0001), on the retest administration it was r=0.5583 (n=47, p<0.0001). Thus, Hypothesis 7 was supported.

It should be noted that in general the correlations with the SCAM measure are lower than those between the TAI sub-scales and other validating measures. This may stem from the state-focused origin of the SCAM. Responses to the Tele-SCAM had considerable variance (Mean=59.68, sd=23.29). However, the internal reliability was comparable with those of the other validating scales used.

Hypothesis 8 predicted that there would be a high correlation between Telephone Listening Apprehension (TLA) and another measure of trait-like listening apprehension, namely a specially modified version of the Receiver Apprehension Test. On the test administration the correlation was r=0.6878 (n=47, p<0.0001), on the retest administration it was r=0.7333 (n=47, p<0.0001). Thus, Hypothesis 8 was supported.

Finally, Hypothesis 9 predicted that there would be a high correlation between Telephone Usage Apprehension (TUA) and a measure of trait-like telephone usage apprehension. The measure examined was a version of the

PRCA, modified to refer to apprehension associated with using the telephone. On the test administration the correlation between TUA and Tele-PRCA was r=0.5027 (n=47, p<0.0001), on the retest administration it was r=0.6828 (n=47, p<0.0001). Thus, Hypothesis 9 was supported. As noted above, the Tele-PRCA4 sub-score consists of the four items (Items 1, 3, 4 and 5). These items do not specify the form of conversational activity, and excludes the two items (2 and 6) which refer specifically to "speaking". On the test administration the correlation between TUA and Tele-PRCA4 was r=0.5162 (n=47, p<0.0001), on the retest administration it was r=0.6911 (n=47, p<0.0001). Thus, Hypothesis 9 was supported by the analysis of this more restricted measure of usage apprehension. In both the test and retest, the correlation was greater, but not significantly so, when using the more restricted, 4-item form of the Tele-PRCA (Test: t=0.355 df=44, nsd; Retest: t=0.260, df=44, nsd).

The third basic characteristic and requirement of a measure of trait-like responses, that whilst it may only correlate to a low degree with any given state response to the same referent stimulus, it should correlate to a greater extent with the mean of a number of such measures of state responses to that stimulus, was tested by examining the correlation of TCA scores with the state anxiety scores of respondents when making and receiving telephone calls.

Hypothesis 10 predicted that the correlation between state anxiety when making a telephone call and TCA scores would be low. The observed correlation was r=0.3435 (n=47, p<0.009). Hypothesis 11 predicted that the correlation between state anxiety when receiving a telephone call and TCA scores would be low. The observed correlation was r=0.3498 (n=47, p<0.008). Whilst both of the (test) correlations are in fact significant, they are markedly lower than the correlations obtained between TCA

scores and any of the validating measures (TCA/Tele-STAIT=0.6657, TCA/Tele-SCAM=0.5468, TCA/Tele-RAT=0.7008, TCA/Tele-PRCA=0.5395). Hypotheses 10 and 11 are therefore supported.

Hypothesis 12 predicted that the correlation between the mean state anxiety scores and TCA scores will be moderately high, and greater than either of the individual correlations. The mean state anxiety scores was 36.21 (sd=6.69). The correlation between the mean state anxiety score and telephone apprehension, as measured by (test) TCA scores, was r=0.4319 (n=47, p<0.001). This correlation is greater, but not significantly, than that between TCA and the state anxiety associated with making a call (t=1.145, df=44, nsd, 1-tailed) and that between TCA and the state anxiety associated with receiving a call (t=0.870, df=44, nsd, 1-tailed). Hypothesis 12 is therefore partially supported.

Given that it is possible to differentiate between apprehension associated with speaking and apprehension associated with listening on the telephone, it is possible to predict that the pattern of results will differ between individuals as a function of the activity which is associated with the greatest apprehension. When responding to items specifying "communicating", Telephone Speaking Apprehensives (where TSA>TLA) are likely to give greater weight to that aspect of the overall activity which is most salient to them, and this is likely to be "speaking". The opposite is likely to apply to Telephone Listening Apprehensives (where TLA>TSA), who are likely to give greater weight to "listening". Hypothesis 13 predicted that for Telephone Speaking Apprehensives, the correlation between TCA and TSA scores will be greater than the correlation between TCA and TLA scores, whilst Hypothesis 14 predicted that for Telephone Listening Apprehensives, the correlation between TCA and TLA scores will be greater than the correlation between TCA and TSA scores.

Five groups of subjects were identified. 'Definite' Speaking Apprehensives were defined as subjects whose TSA score was greater than their TLA score at both test and retest. 'Possible' Speaking Apprehensives were defined as subjects whose TSA score was greater than their TLA score at either test or retest, and where their TSA and TLA scores were the same on the other occasion. 'Neutral' Apprehensives were defined as subjects having equal TSA and TLA scores at both test and retest, or whose TSA score was were greater than their TLA score on one occasion, and less on the other. 'Possible' Listening Apprehensives were defined as subjects whose TSA score was less than their TLA score at either test or retest, and where their TSA and TLA scores were the same on the other occasion. 'Definite' Listening Apprehensives were defined as subjects whose TSA score was less than their TLA score at both test and retest. 10 subjects were classified as Definite Speaking Apprehensives, 8 as Possible Speaking Apprehensives, 12 as Neutrals, 7 as Possible Listening Apprehensives, and 9 as Definite Listening Apprehensives.

The correlations calculated between TCA and TSA and TLA scores are as follows:

	TCA/TSA	TCA/TLA
Definite Speaking Apprehensive	0.9471	0.8719
Possible Speaking Apprehensive	0.9700	0.8828
Neutral Apprehensive	0.9075	0.8410
Possible Listening Apprehensive	0.9754	0.9416
Definite Listening Apprehensive	0.9486	0.8523

For all groups, TCA/TSA correlations are greater than TCA/TLA correlations. This analysis provides no support for Hypothesis 14 and only very limited support for Hypothesis 13.

The same reasoning applies to apprehension associated with "using" the telephone. Hypothesis 15 therefore predicted that for Telephone Speaking Apprehensives, the

correlation between TUA and TSA scores would be greater than the correlation between TUA and TLA scores, whilst Hypothesis 16 predicted that for Telephone Listening Apprehensives, the correlation between TUA and TLA scores will be greater than the correlation between TUA and TSA scores.

The correlations are as follows:

	TUA/TSA	TUA/TLA
Definite Speaking Apprehensive	0.9107	0.7856
Possible Speaking Apprehensive	0.8739	0.8337
Neutral Apprehensive	0.8104	0.7629
Possible Listening Apprehensive	0.9450	0.9225
Definite Listening Apprehensive	0.8997	0.7880

Again, for all groups, the TUA/TSA correlations are greater than the TUA/TLA correlations, and this analysis provides no support for Hypothesis 16 and only very limited support for Hypothesis 15.

Overall Telephone Apprehension: Validation of the T45 scale

As discussed above, it is a basic requirement of a measure of trait-like responses that the measure should correlate, at least moderately, with other trait measures of the same construct. Thus, the T45 measure of overall telephone apprehension should, if it is a valid measure, correlate, at least moderately, with scores on another trait measure of overall telephone apprehension. The T45 measure consists of all four kinds of items (ie "using", "communicating", "speaking" and "listening"). It would therefore be predicted that there would be a high correlation between the T45 scale and measures of each of these aspects of overall telephone apprehension.

T45

	TEST DATA	RETEST DATA
Tele-STAIT	0.5858	0.5726
Tele-SCAM	0.6164	0.5783
Tele-RAT	0.6430	0.6628
Tele-PRCA	0.5326	0.5370
Tele-PRCA4	0.4203	0.2923

(all significant at p<0.02 or better)

These significant correlations demonstrate that the T45
measure has acceptably high correlations with other
measures of trait-like telephone apprehension.

The other basic requirement of a measure of trait-like
responses is that, whilst it may only correlate to a low
degree with any given measure of a state response, it
should correlate to a greater extent with the mean of a
number of measures of such state responses. The
correlation between state anxiety when making a call and
T45 scores was r=0.0.3544 (n=47, p<0.007). The
correlation between state anxiety when receiving a call
and T45 scores was r=0.3496 (n=47, p<0.008). The
correlation between the mean state anxiety scores and T45
scores was r=0.4391 (n=47, p<0.01). This correlation is
greater, but not significantly so, than that between T45
and state anxiety when making a call (t=1.101, df=44,
nsd, 1-tailed) and that between T45 and state anxiety
when receiving a call (t=0.951, df=44, nsd, 1-tailed).
This characteristic of a measure of traitlike response is
therefore only partially demonstrated by this measure.

Significance of Speaking/Listening Distinction

The fundamental proposition explored here was that the
distinction between speaking and listening was
significant in the measurement of telephone apprehension.
Telephone communication apprehension would be distinct
from, but would be related to both telephone speaking and

listening apprehension. The evidence presented here
suggests that whilst these propositions are justified
logically, they receive only partial empirical support.
Whilst subjects appear to make these distinctions, in
practice the primacy of apprehension associated with
speaking in determining communication apprehension, and
the relatively greater importance of speaking as compared
with listening apprehension, means that the distinctions
were not as clear-cut and powerful as anticipated.
This conclusion is supported by the results of a factor
analysis of the TAI-45. (This analysis is merely
indicative, as the correlation matrix on which it is
based is ill-conditioned, with the number of items
roughly equalling the number of cases analysed.) A
principal components analysis, with orthogonal varimax
rotation, extracted nine factors with eigenvalues greater
than 1. The first factor appears to correspond to a
combination of the "Confidence" and "Approach-Avoidance"
factors identified earlier:

FACTOR ANALYSIS OF TAI-45

Factor One (Eigenvalue=20.67)

Item	
22	..take pride in ability to listen well
45	..thoroughly enjoy communicating
15	..thoroughly enjoy speaking
30	..speaking on the telephone is pleasant
05	..take pride in ability to communicate well
36	..communicating by telephone is pleasant
34	..thoroughly enjoy listening
33	..easy to listen
42	..take pride in ability to speak well
35	..feel calm and comfortable when using
37	..relaxed and comfortable when speaking
04	..relaxed and comfortable when listening
23	..relaxed and comfortable when communicating
43	..dread listening
03	..look forward to telephone conversations
09	..do not like talking
10	..listening on the telephone is pleasant
11	..easy to communicate
02	..easy to express myself

This factor correlates highly and significantly with the
sub-scale scores for TAI C- (0.6774, n=47, p<0.0001) and
TAI A- (0.7744, p<0.001). Fifteen of these 19 items are

derived from the communicating, speaking and listening versions of just five items: ..take pride, ..thoroughly enjoy, ..pleasant, ..easy, and ..relaxed and comfortable. This analysis suggests that the cognitive-affective response, and not the mode of communication, is the most important element in determining the structure of telephone apprehension as measured by the TAI-45.

All of the other factors demonstrate a tendency for the communicating, speaking and listening versions of the same item to appear within the same factor. That is, the factor structure does not reflect, and does not generate factors which represent the communication-speaking-listening distinction, or even partial distinctions such as communication-speaking and communication-listening (see Table 9.14, Appendix 4).

Factors Two and Three both consists of items which appear to reflect the "Problematic" dimension identified in earlier analyses. Factor Two includes items such as: difficult to converse, feel misunderstood, problems expressing myself, nervous and uncomfortable, and dread. Factor Three includes inhibited, rushed and pushed, and problems expressing myself, and feel misunderstood. Factor Three has the highest correlation with the TAI P-sub-scale score (0.7193, p<0.0001), with Factor Two also correlating significantly with the Problematic sub-scale score (0.4713, p<0.0001).

Significant correlations between these factor scores and the state anxiety measures for both making and receiving calls suggest that these factors are measures of apprehension.

Factor	State Anxiety Making a Call	State Anxiety Receiving a Call	Mean State Anxiety
1	0.233 (p<0.058)	0.310 (p<0.017)	0.334 (p<0.011)
2	0.189 (p<0.102)	0.027 (p<0.430)	0.143 (p<0.169)
3	0.215 (p<0.073)	0.155 (p<0.148)	0.234 (p<0.056)
4	0.030 (p<0.420)	0.029 (p<0.423)	0.037 (p<0.402)

Except for a significant correlation between Factor 8 and State Anxiety (Making) scores, none of the other correlations between factor scores (Factors 5 to 9) and state anxiety scores are significant.

Whilst recognising the limitations of this analysis, this factor structure seems to indicate that the Problematic, Avoidance and Confidence dimensions identified earlier are robust, and that they transcend distinctions between communicating, speaking and listening. Whilst the continued separation of speaking and listening may be justified conceptually, as may the distinctions between these terms and communicating and using, the empirical justification remains to be demonstrated.

The Original Measures: T20, T11 and sub-scale scores

In addition to the measures derived from the expanded, 45-item TAI, it was also possible to calculate the following measures derived from the original 20-item TAI.

> Original long-form T20 score
> Problematic Telephone Communication score (TAI-P)
> Avoidance of Telephone Communication score (TAI-A)
> Non-Confident Telephone Communication score (TAI-C)
> Short-form T11 score

The mean test T20 score was 41.21 (sd=11.60), and for the retest T20 it was 40.60 (sd=13.83). Comparison of the T20 means and standard deviations of this sample with those of comparable samples examined previously suggests that apprehension was lower in this sample than either of the two student samples examined previously, and was comparable to the level of apprehension reported by Steele and Reinsch for their two American samples (1983, 1984):

T20 Scores	Current Sample	UK STUDENTS	AUS STUDENTS	US (1983) STUDENTS	US (1984) STUDENTS
MEAN =	41.213	49.146	46.062	40.86	42.96
SD =	11.602	13.915	13.375	11.64	11.52
MIN SCORE =	22	21	20	20	20
MAX SCORE =	75	94	88	83	93
RESPONDENTS	47	405	389	333	434

The mean test T11 score was 23.87 (sd=6.29) and the mean retest T11 score was 23.30 (sd=7.48). Comparison of the TAI P-, A- and C- scores with those from other samples also suggests that apprehension was lower than that in previously studied student samples, and was comparable with the levels of apprehension observed in the UK Non-student sample.

SUMMARY TAI P- STATISTICS (min=6, max=30)

	UK Student	Australian Students	UK Non-Students	Current Sample (Test data)
MEAN	13.684	13.244	11.258	11.723
SD	4.518	4.141	3.985	3.481
MIN SCORE	6	6	6	6
MAX SCORE	28	28	30	21

SUMMARY TAI A- STATISTICS (min=3, max=15)

MEAN	8.180	7.545	7.686	7.213
SD	2.418	2.421	2.881	2.395
MIN SCORE	3	3	3	3
MAX SCORE	15	15	15	12

SUMMARY TAI C- STATISTICS (min=2, max=10)

MEAN	6.052	5.244	4.941	4.936
SD	1.587	1.553	1.822	1.580
MIN SCORE	2	2	2	2
MAX SCORE	10	10	10	8

Except for low split-half reliability of the 2-item "Confidence" sub-scale on the initial administration of the inventory, measures of test-retest and intra-test reliability all indicate adequate reliability for the sub-scales (see Table 9.15, Appendix 4). T-tests comparing the test and retest scores indicated that none of the differences were significant.

	T20	T11	TAI-P	TAI-A	TAI-C
Test mean	41.21	23.87	11.72	7.21	4.94
sd	11.60	6.29	3.48	2.40	1.58
Retest mean	40.60	23.30	11.57	6.91	4.81
sd	13.83	7.48	4.27	2.56	1.70
t value	0.51	0.92	0.35	1.41	0.68
df	46	46	46	46	46
probability (2-tailed)	0.614 (nsd)	0.361 (nsd)	0.725 (nsd)	0.164 (nsd)	0.503 (nsd)

Sub-scale scores were compared as function of condition, that is, of the order in which subjects completed the various sessions.

TEST DATA

MEASURE	Mean X-Y-Z	X-Z-Y	t value	probability
T20	43.65	38.19	1.66	p<0.104
T11	25.27	22.14	1.73	p<0.090
TAI-P	12.81	10.38	2.51	p<0.016
TAI-A	7.31	7.10	0.30	p<0.766
TAI-C	5.15	4.67	1.05	p<0.298

RETEST DATA

MEASURE	Mean X-Y-Z	X-Z-Y	t value	probability
T20	43.00	37.62	1.34	p<0.188
T11	24.50	21.81	1.23	p<0.221
TAI-P	12.35	10.62	1.39	p<0.171
TAI-A	7.12	6.67	0.59	p<0.556
TAI-C	5.04	4.52	1.03	p<0.308

Whilst the majority of comparisons are non-significant, those for both T11 and TAI P- on the initial test data are significant, and a number of others (on both the test and retest) approach significance. Therefore, sub-scales were compared in terms of sex using 2x2 ANOVAs, with both sex and condition as variables.

MEASURE	Mean Males (n=14)	Females (n=33)	Main effect F value & probability (2-tailed)		Interaction F value & probability	
TEST DATA						
T20	43.93	40.06	1.393	p<0.244	0.582	p<0.450
T11	25.50	23.18	1.711	p<0.198	0.535	p<0.468
TAI-P	12.86	11.24	3.029	p<0.089	0.326	p<0.571
TAI-A	7.79	6.97	1.150	p<0.289	0.141	p<0.709
TAI-C	4.86	4.97	0.022	p<0.882	1.168	p<0.286

RETEST DATA

T20	39.79	40.94	0.029	p<0.866	1.476	p<0.231
T11	23.43	23.24	0.027	p<0.871	1.330	p<0.255
TAI-P	11.64	11.55	0.029	p<0.867	1.682	p<0.202
TAI-A	7.21	6.79	0.305	p<0.584	0.282	p<0.598
TAI-C	4.57	4.91	0.300	p<0.587	1.043	p<0.313

There are no significant differences as a function of sex
of subject. Although the TAI P- analysis approaches
significance on the test data, the same comparison
performed on the retest data shows that the difference is
non-significant. There are no significant sex by
condition interactions.

Validation of the short-form T11 scale

It is not possible to test directly the validity of the
three TAI-20 sub-scales, as suitable validating measures
were not included in this study. However, it is possible
to test the validity of the combined T11 short-form
scale. The T11 short-form measure should correlate, at
least moderately, with scores on another trait measure of
overall telephone apprehension. The T11 measure consists
of items which have been termed "using" and "speaking"
items in this chapter, and it would therefore be
predicted that there would be a high correlation between
the T11 scale and the individual's score on measures of
both trait-like telephone usage apprehension (Tele-PRCA)
and telephone speaking apprehension (Tele-SCAM). In
addition, it is desirable that the short-form T11 score
be used as a measure of overall (ie communication)
telephone apprehension, and it is therefore appropriate
to examine the correlation between it and a measure of
trait-like telephone communication apprehension (Tele-
STAIT). (In the following tables, data for the long-form
T20 score have also been included.)

TEST DATA

	Tele-SCAM	Tele-PRCA	Tele-PRCA4	Tele-STAIT
T11	0.6164	0.5783	0.5696	0.7341
TAI-P	0.5326	0.5370	0.5142	0.6060
TAI-A	0.4203	0.2923	0.3340	0.6026
TAI-C	0.6430	0.6628	0.6458	0.6733
T20	0.5858	0.5726	0.5742	0.7208

(all significant at p<0.02 or better)

RETEST DATA

	Tele-SCAM	Tele-PRCA	Tele-PRCA4	Tele-STAIT
T11	0.5950	0.6665	0.6667	0.7640
TAI-P	0.5644	0.6724	0.6471	0.7700
TAI-A	0.4454	0.3853	0.4393	0.5682
TAI-C	0.5250	0.6628	0.6458	0.5713
T20	0.5750	0.6858	0.6916	0.7712

(all significant at p<0.004 or better)

These significant correlations demonstrate that the short-form T11 measure has acceptably high correlations with other measures of trait-like telephone apprehension.

The other basic requirement of a measure of trait-like responses is that, whilst it may only correlate to a low degree with any given measure of a state response, it should correlate to a greater extent with the mean of a number of measures of such state responses. The correlation between state anxiety when making a call and T11 scores was r=0.3323 (n=47, p<0.011). The correlation between state anxiety when receiving a call and T11 scores was r=0.3150 (n=47, p<0.016). The correlation between mean state anxiety and T11 scores was r=0.4045 (n=47, p<0.002). This correlation is greater, but not significantly, than that between T11 and state anxiety when making a call (t=0.929, df=44, nsd, 1-tailed) and that between T11 and state anxiety when receiving a call (t=0.934, df=44, nsd, 1-tailed). These correlations provide partial validation of the measure.

Discussion

The analyses presented above support the conclusion that the TAI-45 constitutes an appropriately specified, valid and reliable measure of telephone apprehension. However, these claims must be qualified by recognising a number of limitations present in this study.

Whilst the reliability of the TAI-45 demonstrated in this study is high, with a variety of measures indicating very high levels of both internal and test-retest reliability, the trustworthiness of this claim is limited by the small number of subjects (n=47) used in this study.

Although support was provided for the majority of the predicted differences resulting from the distinctions between speaking and listening, and between these terms and communicating by, and using the telephone, the failure to demonstrate powerful empirical differences related to these distinctions suggests that whilst the continued separation of speaking and listening may be conceptually necessary, and should be adhered to as 'good practice', the empirical justification for doing so remains to be demonstrated.

In addition, the factor analysis (whilst recognising the limitations of that analysis) indicates that the Problematic, Avoidance and Confidence dimensions identified earlier are quite robust, and that they transcend distinctions between communicating, speaking and listening. Taken together with analyses which support the validity, against the same criteria applied to the TAI-45, of the original 20-item TAI and its sub-scales, these results suggest that the TAI-20 (or short forms of the TAI-20) may also be acceptable instruments for use in further research.

CHAPTER TEN

THE CORRELATES OF TELEPHONE APPREHENSION

SYNOPSIS

Even though consistent differences in reported levels of
telephone apprehension have been reported in previous
chapters, it is possible that the apprehension tapped by
the TAI is not specific to the telephone. Rather, it may
simply be tapping some other, more general dimension of
individual difference, so that, for instance, differences
in overall levels of generalised anxiety are reflected in
all activities, including use of the telephone. In this
chapter relationships were investigated between a number
of dimensions of general personality and communication
orientation and differences in levels of telephone
apprehension. It is concluded that telephone apprehension
is context specific, and that differences in telephone
apprehension are not merely, and cannot be accounted for
as merely the result of differences in other, more
generalised personality or communication dimensions.

A sample of 77 respondents completed measures of
telephone apprehension, generalised trait anxiety,
communication apprehension, social desirability, self-
esteem and sex-role identification. In general,
correlations between telephone apprehension scores and
these measures were low and were not significant.
Covariance analyses showed that when generalised anxiety,
CA, social desirability and self-esteem are taken into
account, differences in telephone apprehension were
neither eliminated nor accentuated. The prediction that
generalised trait anxiety, CA, social desirability and
self-esteem scores would account for only a small
proportion of the overall variance in telephone
apprehension scores was supported by multiple regression
analysis, which showed that all four predictor variables
produced a multiple r of just 0.2529, with only 6.4% of
the variance in overall telephone apprehension being
accounted for by these predictor variables.

These results mean that "reductionist" accounts of
variation in telephone apprehension can be rejected. That
is, the argument that differences in telephone
apprehension are merely a manifestation of variations in
more generalised anxiety, more generalised CA, levels of
global self-esteem, or social desirability pressures,
receives no support from this data.

CHAPTER TEN

THE CORRELATES OF TELEPHONE APPREHENSION

INTRODUCTION

Whilst the existence of consistent differences in reported telephone apprehension has been established in previous chapters, the possibility exists that this apprehension is not specific to communication via the telephone. A number of general dimensions of individual differences suggest that people may differ in, for instance, their overall level of anxiety, and it may be that amongst other activities, they will be anxious about the telephone, just as they may be anxious about driving a car or going to a party. The study reported here investigates the relationship between dimensions of general personality and communication orientation. The intention is to demonstrate that telephone apprehension is context specific, and that differences in telephone apprehension are not merely, and cannot be accounted for simply in terms of other, more generalised personality or communication dimensions.

HYPOTHESES AND RATIONALE

A number of consistent differences in levels of telephone apprehension have previously been reported, primarily as a function of age and sex differences. It is possible that these differences may in some sense be artifactual, reflecting variables other than telephone apprehension per se. Some of these possible "plausible alternative explanations" are outlined below, and hypotheses are proposed which, if confirmed, would support the validity of these alternative explanations.

<u>Trait Anxiety</u>: Trait anxiety refers to relatively stable individual differences in anxiety proneness that are manifested in the frequency with which an individual experiences elevations in state anxiety over time. People

who have high trait anxiety are more disposed to see the world as dangerous or threatening than low trait anxiety people. Consequently, high trait anxiety individuals tend to experience state anxiety reactions of greater intensity and with greater frequency than low trait anxiety individuals. Thus, if a person is in general anxious, it would be expected that they would be anxious about any given specific activity, such as using the telephone. Differences in telephone apprehension may therefore simply reflect differences in generalised trait anxiety.

Noble (1987) noted that people who in general were more anxious reported "making fewer phone calls yesterday" (r=-0.18, n=100, p<0.035). However, there were no significant relationships with the other five measures of telephone use used in that study. Moderate positive correlations have been reported, ranging from 0.39 to 0.66, between CA and general anxiety (Beatty, 1986; Beatty and Andriate, 1985; McCroskey, Daly and Sorensen, 1976; Porter, 1979).

As reported in previous chapters, men appear to be more telephone apprehensive than women. However, these sex differences in telephone apprehension may simply reflect sex differences in more generalised anxieties. If this were the case, and if males experience greater anxiety in general than females, then it would follow that males are also likely to be more anxious about the telephone than females. Magnusson (1985) noted that sex differences in trait anxiety were inconsistent, but that greater male anxiety tended to occur in situations which could be characterised by a demand for achievement of some sort. In order to be able to dismiss sex differences in telephone apprehension as merely reflecting other, more generalised sources of anxiety, it is necessary to show not only that there is a relationship between telephone apprehension and generalised trait anxiety, but also that the sex differences in generalised trait anxiety are such

that, when trait anxiety is entered as a covariate, sex
differences in telephone apprehension disappear.

**HYPOTHESIS 1: THERE WILL BE A HIGH, POSITIVE AND
SIGNIFICANT CORRELATION BETWEEN LEVELS OF TELEPHONE
APPREHENSION AND LEVELS OF TRAIT-LIKE GENERALISED
ANXIETY.**

**HYPOTHESIS 1A: WHEN INDIVIDUAL DIFFERENCES IN LEVELS OF
TRAIT-LIKE GENERALISED ANXIETY ARE TAKEN INTO ACCOUNT BY
MEANS OF ANALYSES OF COVARIANCE, THEN APPARENT
DIFFERENCES IN LEVELS OF TELEPHONE APPREHENSION BETWEEN
GROUPS, SUCH AS THOSE BETWEEN MALES AND FEMALES, WILL BE
ELIMINATED.**

Communication Apprehension: People who have high trait-
like CA are in general more likely to see communication
activities as threatening and anxiety arousing than low
communication apprehensives. Consequently, high
communication apprehensives are likely to report
apprehension of greater intensity and/or frequency than
people low communication apprehensives about any given
communication activity, such as using the telephone.

In their initial study of telephone apprehension, Lewis
and Reinsch (1982), using a 3-item scale to measure
telephone apprehension, found no significant correlation
with Porter's PRCA-13 ($r=0.141$, $n=126$, ns), but a
significant correlation with CA as measured by the PRCA-
OF ($r=0.383$, $n=126$, $p<0.001$). However, Steele and Reinsch
(1984) reported significant, positive correlations
between both measures and TAI-20 scores. The TAI/PRCA-OF
correlation was 0.2740 ($p<0.0001$), and the TAI/PRCA-13
correlation was 0.1268 ($p<0.004$). (The correlation
between the two different forms of the PRCA in this study
was 0.6244 ($p<0.001$)). No study reports the relationship
between telephone apprehension and the PRCA-20 or PRCA-
24.

Given the possibility of positive correlations between CA and telephone apprehension, differences in telephone apprehension may reflect nothing more than differences in generalised CA. However, there is little substantial evidence that there are reliable sex differences in CA, whereas the existence of such differences is a robust finding with respect to telephone apprehension (see Chapters 5 to 8). Nevertheless, it could be argued that differences in CA could account for the observed sex difference in levels of telephone apprehension. If males in general experience greater CA than females, then it would also follow that males are likely to be more apprehensive with respect to the telephone than females.

In order to be able to dismiss sex differences in telephone apprehension as merely reflecting more generalised differences in levels of CA, it is necessary to show firstly that there is a relationship between levels of telephone apprehension and levels of CA, and secondly that the sex differences in levels of CA are such that, if CA is entered as a covariate, sex differences in levels of telephone apprehension disappear.

HYPOTHESIS 2: THERE WILL BE A HIGH, POSITIVE AND SIGNIFICANT CORRELATION BETWEEN LEVELS OF TELEPHONE APPREHENSION AND LEVELS OF TRAIT-LIKE COMMUNICATION APPREHENSION.

HYPOTHESIS 2A: WHEN INDIVIDUAL DIFFERENCES IN LEVELS OF TRAIT-LIKE COMMUNICATION APPREHENSION ARE TAKEN INTO ACCOUNT BY MEANS OF ANALYSES OF COVARIANCE, THEN APPARENT DIFFERENCES IN LEVELS OF TELEPHONE APPREHENSION BETWEEN GROUPS, SUCH AS THOSE BETWEEN MALES AND FEMALES, WILL BE ELIMINATED.

Even if it is shown that there are reliable sex differences in either generalised trait anxiety and/or CA, and that these correlated with telephone

apprehension, than this in itself would not necessarily
lead to the dismissal of telephone apprehension as merely
reflecting other kinds of anxiety/apprehension. Rather,
the conceptualisation and size of the relationships are
significant. That is, following Zuckerman (1976), in this
thesis telephone apprehension is conceptualised as a
specific trait anxiety, which is necessarily a component
of the more generalised, broad-based, trait-like CA,
which in turn is a component of the most generalised
level of trait anxiety. It would therefore be predicted
that, with respect to group scores, there would
necessarily and properly be a (small) correlation between
telephone apprehension and CA scores, and a (smaller)
correlation between telephone apprehension and
generalised trait anxiety. It is possible to represent
these relationships as follows:

```
                        TRAIT-LIKE
                    GENERALISED ANXIETY
                            |
   _____|_____
  |         |               |            |              |
  |         |               |            |           eg TECHNO-
            |         COMMUNICATION                     PHOBIA
            |         APPREHENSION
            |               |
     _____|_____|_____
    |       |               |        |       |
 eg PUBLIC  eg MEETING                |
    SPEAKING   APPREHENSION           |
    APPREHENSION                      |
                              _____|_____
                             | TELEPHONE       |
                             | APPREHENSION    |
                             |_____|
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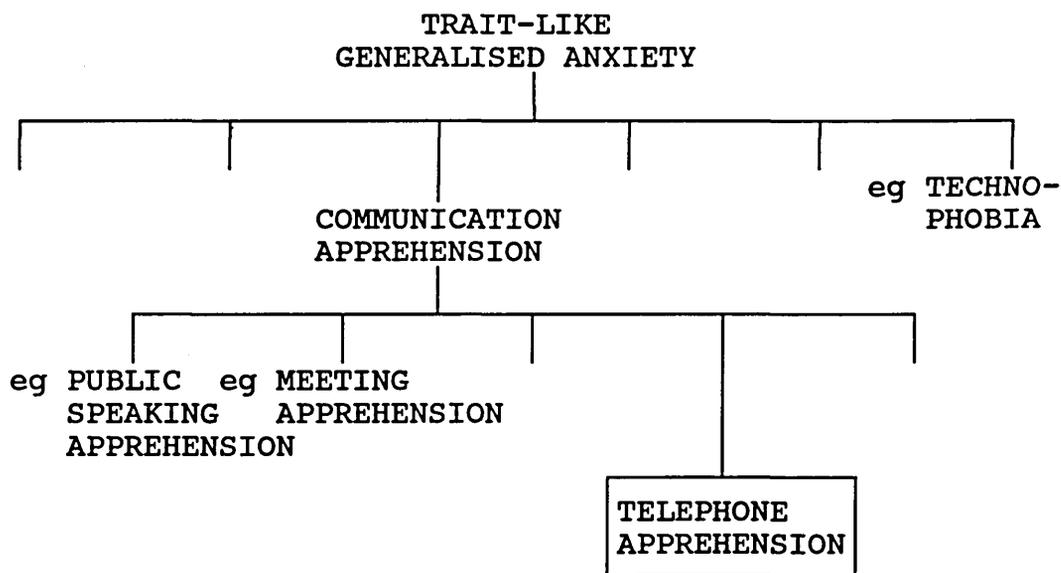
Social Desirability: Differences in reported telephone
apprehension may result from social desirability
pressures. In general, admitting to problems is seen to
be socially undesirable. Therefore, admitting to having
difficulty when communicating by telephone may be
considered to be a socially undesirable response.

Holtzman (1976) notes that responses to measures of
anxiety will be affected by strategies of denial and

repression. "Self-report inventories are always subject to serious distortion due to faking." (Holtzman, 1976, p.177). Porter (1986), with respect to CA, has taken this argument further and suggested that the PRCA is heavily confounded by evaluation apprehension pressures.

This is likely to have implications for sex differences in reported anxiety. In general, it may be argued that the creation and maintenance of an image of competence is more important for males than it is for females (Gecas and Mortimer, 1987). If this is the case, admitting to a weakness such as experiencing difficulties when communicating by telephone would probably reflect less well on males than on females. Because of this increased social pressure (an increased evaluation apprehension) it can be argued that males would be less willing to report anxieties concerning the use of the telephone, and hence their (self-)reported levels of telephone apprehension would appear to be lower. (Note that this argument suggests that it is necessary to investigate the perceived social desirability of telephone competence, and to take these into account in any measure of telephone apprehension.)

Supportive evidence for this argument is provided by Antill, Cunningham, Russell and Thompson (1981) who reported males as having significantly higher social desirability scores than females. Kent (1987), and Kent and Gibbons (1987) also note that males tended to claim more control over their ability to control anxiety than females, and that this could have been due to males being less willing to disclose loss of control. This is consistent with Block's study of differential socialisation practices for boys and girls. Block (1973) found that parents of boys were more likely than parents of girls to endorse the importance of teaching self-control of behaviour in the development of their children. Diaz-Guerrero (1976) in a cross-cultural study of Mexican and American children, noted that in both

cultures girls had significantly higher test anxiety
scores than boys, and that some of this difference may
have been due to a greater defensiveness and a tendency
to fake good by the boys, as indicated by higher scores
on Lie and Defensiveness scales.

It is clear, however, that this argument leads to the
opposite prediction to that so far reported in this
thesis, that is, that men would in general report lower
levels of telephone apprehension than women. However, it
must also be noted that social desirability pressures are
likely to act only as moderating influences on reports of
apprehension, and the prediction should more properly be
that, in a situation where males actually experience
greater anxiety, then differential social desirability
pressures will attenuate reported differences, whereas in
situations where females experience greater anxiety,
differential social desirability pressures would tend to
accentuate reported differences. An extension of this
argument is to note that if social desirability pressures
also vary with age, then the sex by age interaction
effects noted previously could also be accounted for. For
instance, if social desirability effects are greatest in
young males, and reduce with increasing age, then the
reported sex differences in telephone apprehension would
be expected to increase with increasing age, exactly as
observed. It may also be suggested that social
desirability pressures associated with developing sex
role differentiation may cause some female respondents to
exaggerate their reports of anxiety and lack of
confidence and competence. This would be expected to be
most marked amongst young women.

The argument outlined so far presumes that social
desirability pressures operate uniformly across all
spheres of activity and competence. This is unlikely, and
the argument must be modified to take into account known
sex differences in perceived spheres of competence. If
this is done, the observed differences in reported levels ·

of telephone apprehension are in fact predictable. Whilst admitting competence deficits (loss of control) may in general constitute a threat to the person's self presentation, this is probably less threatening to males than to females when this lack of competence concerns socio-emotional areas of activity, such as interpersonal communication (Bush, 1987). Males would perceive a threat to their self-presentational strategies only if they were to admit to lack of competence with respect to task demands. Thus, if it is the case that use of the telephone is seen as primarily a socio-emotional skill, and as primarily a female domain, then admission of lack of competence would constitute a greater threat to female self-presentations, and it would therefore be predicted that females would be less willing to admit to high levels of telephone apprehension than would males, and males would therefore appear to experience higher telephone apprehension than females. It has already been noted that there is evidence that the telephone is seen as primarily a female activity and sphere of competence (Skelton, 1989, Rakow, 1988, Moyal, 1989), and as an interpersonal medium where socio-emotional competences are paramount (cf Strohkirch and Parks, 1986). The telephone is seen as a specifically female skill when intrinsic, as opposed to instrumental, uses of the telephone are discussed. Investigations of telephone use in non-work contexts, and with student samples, are likely to emphasise intrinsic uses of the telephone, and hence the differential threat to self-presentation proposed above would apply. (Investigations of instrumental telephone use, in task-orientated contexts, and with occupationally-based samples, might be expected to emphasise the threat to male self-presentation of reported telephone apprehension.)

In order to dismiss sex differences in telephone apprehension as merely reflecting social desirability pressures, it is necessary to show, firstly, that there is a relationship between social desirability needs and

reported telephone apprehension, and that additionally there are reliable sex differences in social desirability needs. Then the effects of sex differences need to be considered. Whilst the arguments outlined above lead to the prediction that reported levels of telephone apprehension will be related to social desirability, there are two different but plausible predictions with respect to the effect upon observed sex differences. The first draws upon the argument that social desirability pressures are global and, with respect to telephone apprehension, will be greatest in males. This leads to the following hypotheses:

HYPOTHESIS 3: THERE WILL BE A HIGH, NEGATIVE AND SIGNIFICANT CORRELATION BETWEEN LEVELS OF TELEPHONE APPREHENSION AND LEVELS OF SOCIAL DESIRABILITY NEED.

HYPOTHESIS 3A: WHEN INDIVIDUAL DIFFERENCES IN LEVELS OF SOCIAL DESIRABILITY ARE TAKEN INTO ACCOUNT BY MEANS OF ANALYSES OF COVARIANCE, THEN APPARENT DIFFERENCES IN LEVELS OF TELEPHONE APPREHENSION BETWEEN MALES AND FEMALES, WILL BE ACCENTUATED.

The second draws upon the argument that social desirability pressures are domain specific, and, with respect to telephone apprehension, will be greatest in females. This leads to the following covariance hypothesis:

HYPOTHESIS 3B: WHEN INDIVIDUAL DIFFERENCES IN LEVELS OF SOCIAL DESIRABILITY ARE TAKEN INTO ACCOUNT BY MEANS OF ANALYSES OF COVARIANCE, THEN APPARENT DIFFERENCES IN LEVELS OF TELEPHONE APPREHENSION BETWEEN MALES AND FEMALES, WILL BE ELIMINATED.

Existing evidence relevant to these hypotheses is limited. In Chapter Four, it was proposed that differences in correlations of telephone apprehension with communication, speech and writing apprehension

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reflected differences between situations where personal evaluation was salient and situations where it was not. It was argued, with respect to the results reported by Lewis and Reinsch (1982), that if Porter's (1981) PRCA-13 taps anxieties about speaking in public, it is also likely to be tapping anxieties about situations where evaluation of the speaker is likely to be highly salient to all participants. Similarly, measures of writing apprehension were likely to be tapping anxieties not only about producing text, but also about the evaluation of that text. Thus, evaluation is likely to be a salient aspect of both public speaking and writing situations. On the other hand, evaluation per se is likely to be a less salient aspect of the one-to-one or small group, face-to-face interactions referred to in the PRCA-OF (Scott, McCroskey and Sheahan, 1978). The pattern of results reported by Lewis and Reinsch (1982), and by Steele and Reinsch (1984), with telephone apprehension correlating with PRCA-OF to a greater extent than with the PRCA-13, suggests that telephone apprehension is not merely a manifestation of a more generalised evaluation apprehension.

Self-Esteem Effects: Differences in self-report levels of telephone apprehension may simply be a reflection of differences in generalised self-esteem, with low self-esteem being associated with higher levels of reported telephone apprehension. To the extent that people see themselves, their abilities and activities as lacking in value, then they are likely to extend this evaluation to all spheres of their activities, such as their ability to use the telephone. If this were the case, then people who in general had lower global self-esteem would be likely to report experiencing higher levels of telephone apprehension, particularly such aspects as lack of confidence in using the telephone, and seeing telephone communication as problematic.

Evidence on sex differences in levels of global self-esteem is both limited and contradictory. Wylie (1979) and Maccoby and Jacklin (1974) reviewing pre-college-age adolescents report no global self-image differences by gender. However, significantly lower female self-esteem is indicated in nationally representative samples by O'Malley and Bachman (1979) and Conger, Peng, and Dunteman (1977), as well as a series of large-scale, random-sample surveys by Simmons and her colleagues (Simmons and Rosenberg, 1975; Rosenberg and Simmons, 1975; Bush, Simmons, Hutchinson and Blyth (1977); Simmons and Blyth, 1987). Llewelyn and Osborne (1990) suggest that sex differences in self-esteem appear as a result of socialisation pressures and experiences, and developing sex role differentiation upon entry to, and during adolescence. Simmons (1987) suggests that the differences between studies can be accounted for simply by noting that the majority of the studies of early and middle adolescents reviewed by Maccoby and Jacklin (1974) do not in fact involve the individual's own view of their own self-esteem, and the studies of adolescents which Wylie (1979) reviews are not based on large random samples with differences in the class structure fully represented. When these issues are taken into account, the evidence on balance seems to suggest that there are reliable sex-based differences in self-esteem amongst late adolescents and young adults, with women having lower global self-esteem scores than men.

In a manner analogous to social desirability pressures, the effect of these generalised differences in global self-esteem would be to attenuate the observed differences between males and females. That is, higher male global self-esteem would reduce reported telephone apprehension, whereas lower female global self-esteem would increase reported telephone apprehension. It can therefore be predicted that, if the effects of sex differences in global self-esteem were taken into account, then observed sex differences in telephone

apprehension would be accentuated.

HYPOTHESIS 4: THERE WILL BE A HIGH, NEGATIVE AND SIGNIFICANT CORRELATION BETWEEN LEVELS OF TELEPHONE APPREHENSION AND LEVELS OF SELF ESTEEM.

HYPOTHESIS 4A: WHEN DIFFERENCES IN GROUP LEVELS OF SELF ESTEEM ARE TAKEN INTO ACCOUNT BY MEANS OF ANALYSES OF COVARIANCE, THE DIFFERENCES IN LEVELS OF TELEPHONE APPREHENSION BETWEEN MALES AND FEMALES WILL BE ACCENTUATED.

However, it could also be argued that responses to the TAI are not influenced by global self-esteem, but by evaluations of more specific aspects of the self-concept. Bush (1987) summarises a considerable amount of research on self-concept in young men and women by noting that both the process and content of socialisation centre on affiliation for girls and separation for boys. If this is the case, and if it is also the case that telephone use is one of the affiliation processes, then positive evaluations of the self relative to the use of the telephone would be expected to be more important to female than to male subjects. This proposition can be tested as follows:

HYPOTHESIS 4B: THE CORRELATION BETWEEN TELEPHONE APPREHENSION AND GLOBAL SELF-ESTEEM WILL BE GREATER IN FEMALE THAN IN MALE SUBJECTS.

In general, empirical research suggests that older subjects have higher global self-esteem than younger subjects (Wylie, 1989). If this is the case, then these differences may obscure underlying differences in telephone apprehension. For instance, it was earlier suggested that older people are more anxious about the telephone than younger people. However, higher global self-esteem in older people may attenuate differences in reported telephone apprehension, resulting in non-

significant age differences. It would then be predicted
that an analysis of telephone apprehension scores, with
self-esteem scores as a covariant, would reveal
significant differences between younger and older
subjects, with older subjects having higher underlying
levels of telephone apprehension. (It should be noted
that in previous samples, such as the UK non-student
sample, there has been a tendency for older people to be
less telephone apprehensive than younger people. These
hypotheses suggest that this may have been an artifact of
response bias resulting from differences in global self-
esteem.)

**HYPOTHESIS 4C: WHEN DIFFERENCES IN GROUP LEVELS OF SELF
ESTEEM ARE TAKEN INTO ACCOUNT BY MEANS OF ANALYSES OF
COVARIANCE, THE DIFFERENCES IN LEVELS OF TELEPHONE
APPREHENSION BETWEEN YOUNGER AND OLDER SUBJECTS WILL BE
ACCENTUATED.**

Demographic Variables

A number of possible demographic correlates of telephone
apprehension, including social class and family size,
were explored in this study.

Social class may be related to levels of telephone
apprehension as it relates to the likelihood of the
person possessing (or rather, of their parents
possessing) a telephone, and is also likely to influence
the overall frequency and duration of telephone usage. To
the extent that higher social class is likely to increase
the likelihood of a telephone being present in the
household, telephone apprehension is likely to be lower
in subjects of higher social class. On the other hand,
the evidence noted in Chapter One, cited by Mayer (1977),
that the number and duration of calls made and received
on a domestic telephone is _inversely_ correlated with
income suggests that telephone apprehension may be higher

in higher social class subjects. Hypothesis 5 was
therefore formulated non-directionally:

**HYPOTHESIS 5: THERE WILL BE A HIGH AND SIGNIFICANT
CORRELATION BETWEEN LEVELS OF TELEPHONE APPREHENSION AND
THE RESPONDENT'S SOCIAL CLASS.**

Family size may also be related to levels of telephone
apprehension. The number of calls made and received is
likely to be greater the larger the number of people in a
household. This would then lead any one member of that
household to become more familiar with the telephone, and
therefore to be less apprehensive about its use.

**HYPOTHESIS 6: THERE WILL BE A HIGH, NEGATIVE AND
SIGNIFICANT CORRELATION BETWEEN LEVELS OF TELEPHONE
APPREHENSION AND THE RESPONDENT'S FAMILY SIZE.**

An alternative hypothesis is that the larger the number
of people in a household, the greater the possibility of
any one person being able to avoid use of the telephone.
This would tend to accentuate telephone apprehension in
those individuals predisposed to such an orientation, and
to have the opposite effect on those who are predisposed
to low levels of telephone apprehension. This would lead
to the prediction that the variance in telephone
apprehension scores would be greater the larger the
family size.

**HYPOTHESIS 7: THE VARIABILITY OF TELEPHONE APPREHENSION
SCORES WILL BE HIGHER IN RESPONDENTS FROM LARGER FAMILIES
THAN IN THOSE FROM SMALLER FAMILIES.**

Measures used in the Study

In addition to the 20-item Telephone Apprehension
Inventory (TAI-20) used in previous studies, which
provided both sub-scale (TAI P-, TAI A-, and TAI C-) and

composite scores (T11), the following measures were
included:

> Generalised Trait Anxiety
> Communication Apprehension
> Social Desirability (Need for Social Approval)
> Self-Esteem

In addition to information about respondents' age and
sex, information was also sought to allow socio-economic
status and family size to be determined.

Overall, it was expected that although there might be a
number of significant correlations between the TAI
measure and these measures of general personality and
communication style, these correlations would be small
and non-significant, and would not account for the
majority of the variance observed.

TRAIT ANXIETY: The State-trait Anxiety Inventory (STAI)
published by Spielberger, Gorsuch & Lushene (1970) is the
most widely used paper and pencil measure of anxiety. It
measures two distinct concepts of anxiety, state anxiety
(A-state) and trait anxiety (A-trait). Trait anxiety
refers to relatively stable individual differences in
anxiety proneness, that is, to differences between people
in the tendency to respond to situations perceived as
threatening with elevations in state intensity. Levitt
(1980) concluded that the STAI was the most carefully
developed available measure of anxiety. Since its
publication in 1970 (Spielberger et al, 1970), the STAI
has been used more often in psychological research than
any other anxiety measure.

A number of factor analytic studies of the STAI have been
reported, the most comprehensive of these being
Spielberger, Vagg, Barker, Donham and Westberry (1980).
These suggest that the scales are effectively uni-
dimensional, with multiple factors focussing on item

format, ie whether items are "anxiety-present" or "anxiety-absent". These differences reflect differences in the intensity of response, with "anxiety-present" items being most sensitive to higher intensities of anxiety. The Trait Anxiety scale appears to measure anxiety proneness in social evaluative situations, that is, in situations which pose threats to self-esteem, and especially in interpersonal relationships in which personal adequacy is evaluated (Spielberger, 1966, 1971, 1972a, 1972b, 1975, Spielberger, Pollard and Worden, 1984). In a factor analytic study of the scale, Kendall, Finch, Auerbach, Hooke, and Mikulka (1976) concluded that the STAI-Trait scale measures individual differences in fear of failure or loss of self-esteem.

COMMUNICATION APPREHENSION: For this study, the original 20-item PRCA was chosen as an appropriate measure of general CA. As noted earlier, this measure has good intra-test and inter-test reliability, and has been used extensively in previous research. The measure assumes an American educational context in which speech education is a taken-for-granted. Given that the subjects were Australian, an appropriately modified version of the measure was produced. A student population was still assumed by the measure.

SOCIAL DESIRABILITY: As part of their development of a sex-role scale specifically for use with adult Australian populations, Antill, Cunningham, Russell and Thompson (1981) developed a 10-item social desirability sub-scale. The individual items are neutral with respect to masculinity/femininity, but they indicate a desire on the part of the respondent to give a socially acceptable answer, that is, they provide a measure of the respondent's need for social approval. Within the sub-scale, five items are social desirability positive and five are social desirability negative. Antill et al

(1981) note that any social desirability sub-scale must be essentially "contentless", and coefficient Alpha is therefore unlikely to be high for such instruments.

SELF-ESTEEM: Wylie (1974, 1989) noted that a number of the most common measures of self-concept and self-esteem have serious methodological shortcomings. Among the well-known measures she identifies as problematic are Coppersmith's Self-Esteem Inventory, the Tennessee Self-Concept Scale and Kuhn's Twenty Sentences Test. Wylie (1989) reviews the most recent evidence concerning available measures of self-concept, and identifies only the Rosenberg Self-Esteem Scale (RSE) (Rosenberg, 1965) and the Self-Description Questionnaire III (SDQ III) (Marsh and O'Neill, 1984) as both methodologically sound and suitable for use with late adolescent through to adult subject populations. The RSE is a short, 10-item scale specifically designed to measure self-esteem. The SDQ III is a general, 136-item measure of 13 aspects of self-concept, including a self-esteem scale derived from Rosenberg's RSE scale. The RSE was therefore selected as the best available measure of self-esteem.

Each item in the RSE is designed to measure "global self-esteem" which Rosenberg (1965) sees as an integration of a set of component parts which are hierarchically organised and interrelated in complex ways. Therefore, rather than attempting to measure global self-esteem by summing across scores for items of disparate content, Rosenberg attempts to tap global self-esteem directly, assuming that individuals have already consciously or unconsciously taken into account and appropriately weighted a personally unique set of attributes of varying personal importance.

The scale consists of 10 items with high face validity and unidimensionality (Wylie, 1989), and uses a 5-point Likert scale ranging from Strongly Agree to Strongly

Disagree. There are no published normative data for the scale, although published distributions indicate that it is heavily and negatively skewed, ie most respondents report high levels of global self-esteem. Reported Alphas range from 0.72 to 0.87, and test-retest coefficients of 0.85 over a two-week interval, and 0.63 over a 7-month interval. Results of factor analyses vary, with some reporting uni-dimensionality and some a two-factor solution. However, the two-factor solution appears to represent some kind of "response set" or "format factor", the two factors coinciding perfectly with the negative or positive wording of items. Thus, the scale can be assumed to be basically unidimensional.

Details of experimental procedure

Data was collected over the course of an academic year from approximately one hundred undergraduate students studying a second-year introductory social psychology course at an Australian tertiary institution. Students voluntarily completed the various measures at intervals during the year, normally completing only one measure per session. A total of 77 students completed the majority of measures used in this study.

In addition, a separate questionnaire was used to collect information about the respondent's sex, age, social class (socio-economic status) and family size. Age was simply recorded in years, and respondents were later classified into 10-year age groups. Social class was assessed by means of questions asking for information on the respondent's current occupational status and, given that the majority of respondents were full-time students, about the occupational status of both of their parents. These were than coded using a seven-point scale (Congalton, 1969), which provides a scale appropriate to Australian occupational and class stratification. In this coding scheme low scores indicates high status. Family

size was assessed by asking for number of siblings.

Data Analysis

77 usable data sets were completed. However, because of
the protracted data collection, data from a number of
respondents were missing from the data set for any given
variable, the missing respondents differing from variable
to variable.

SEX: Of the 77 respondents, 26 were male and 51 were
female. Of the subset of 64 subjects who provided data on
both their sex and their age, 22 were male and 42 were
female.

AGE: Data from 64 of the 77 respondents was available,
and these had a mean age of 25.98 years (sd = 10.16). It
should be noted that, relative to the norm for UK and USA
undergraduate populations, this is relatively high for an
undergraduate course. For the purposes of further
analyses, subjects were classified by age into groups, as
in previous studies. There were relatively small numbers
of respondents over 25, despite the high mean age.
Therefore, for some further analyses, the age
classification consisted of just two categories, those of
"25 and under" and "26 and over".

Age	-25	26+	TOTAL
MALE	13 (20.3%)	9 (14.1%)	22 (34.4%)
FEMALE	26 (40.6%)	16 (25.0%)	42 (65.6%)
TOTAL	39 (60.9%)	25 (39.1%)	64

SOCIAL CLASS: Because the majority of respondents were
full-time students, the classification of social class
was based primarily on the coding of their father's
social class. However, for part-time students in jobs the

coding was based on their own current occupation. For those full-time students who did not provide information about their father's occupation, but who did provide information about their mother's occupation, coding was based on their mother's occupation. On the 1-7 scale devised by Congalton (1969), the mean for the 58 cases who could be classified was 3.72.

FAMILY SIZE: 61 subjects provided information about the number of siblings. Of these, 30 (49.2%) had either 1 or 2 siblings, but 15 reported 5 or more siblings, and the overall mean was 3.07.

Distribution of Telephone Apprehension Scores

Summary descriptive statistics are provided for the overall T11 score and each of the three sub-scales. Data is also provided for the original T20 long-form score.

TELEPHONE APPREHENSION SCORES: SUMMARY STATISTICS (N=77)

	T11	TAI P-	TAI A-	TAI C-	T20
MEAN	25.260	12.429	7.390	5.442	44.494
SD	6.810	3.942	2.289	1.526	12.802
MIN SCORE	13	6	3	3	22
MAX SCORE	45	24	14	10	84
KURTOSIS	0.450	0.331	0.478	0.176	0.852
SKEWNESS	0.672	0.644	0.356	0.718	0.968

For comparison, figures for the original Australian student sample (n=389), reported in Chapter Five, are as follows:

TELEPHONE APPREHENSION SCORES: SUMMARY STATISTICS
ORIGINAL AUSTRALIAN STUDENT SAMPLE (N=389)

	T11	TAI P-	TAI A-	TAI C-	T20
MEAN	26.033	13.244	7.545	5.244	46.062
SD	7.043	4.141	2.421	1.553	13.375
MIN SCORE	11	6	3	2	20
MAX SCORE	48	28	15	10	88
KURTOSIS	-0.217	-0.059	-0.310	-0.403	-0.227
SKEWNESS	0.256	0.407	0.136	0.098	0.406

It can be seen that these distributions are comparable
with those from the larger sample analysed in previous
chapters, and suggest that the results from this study
are likely to be generalisable with reasonable confidence
to other samples.

ANALYSIS OF RELIABILITY

A number of tests to examine the reliability of each of
the sub-scales were calculated, including Alpha and
several split-half reliability statistics. As in previous
analyses, all showed acceptable levels of reliability, as
follows:

	T11	TAI P-	TAI A-	TAI C-	T20
Alpha	0.9087	0.8683	0.8591	0.6839	0.9549
split half reliability	0.7113	0.7552	0.7945	0.5331	0.8817
Spearman-Brown split-half	0.8323	0.8605	0.8958	0.6954	0.9371
Guttman split-half	0.8246	0.8604	0.8421	0.6839	0.9366

Analyses of Telephone Apprehension by sex and age

TAI P-: A 2 x 2 ANOVA was performed on the TAI P- scores
to examine age and sex differences. Males had
significantly higher TAI P- scores than females
(Male=13.95, Female=11.60; F=6.191, df=1, 60; p<0.016).
There were no significant age differences (Younger=12.56,
Older=12.16; F=0.254, df=1, 60; nsd), and the sex by age
interaction effect was not significant (F=0.821, df=1,
60; nsd) (see Table 10.01, Appendix 5).

These results are consistent with those reported in
Chapter Eight, in particular with those reported for the
sample of 389 Australian students who also showed

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significant differences in TAI P- scores as a function of sex differences, with males having higher TAI P- scores than females. The age difference approached significance in that larger sample, whilst there is little difference as a function of age in the present sample. The age by sex interaction was not significant in either sample.

TAI A-: A 2 x 2 ANOVA was used to examine age and sex differences in TAI A- scores. There was a just significant difference in TAI A- scores as a function of respondent sex, with males having significantly higher scores than females (Male=8.32, Female=7.17; F=3.902, df=1, 60; p<0.053). There were no significant age difference (Younger=7.36, Older=7.88; F=0.766, df=1, 60; nsd), and the sex by age interaction effect was not significant (F=0.369, df=1, 60; nsd) (see Table 10.02, Appendix 5).

These results again partially replicate those reported in Chapter Eight, in particular those reported for the Australian student sample. This showed significant differences in TAI A- scores as a function of sex differences, with males having higher TAI A- scores than females. However, the significant age difference reported in Chapter Eight was not present in the current data, although the direction of difference was consistent, with older respondents having higher TAI A- scores than younger respondents. The age by sex interaction was not significant in either case.

TAI C-: A 2 x 2 ANOVA examined age and sex differences in TAI C- scores. There were no differences in TAI C- scores as a function of either sex (Male=5.68, Female=5.33; F=0.697, df=1, 60; nsd) or age (Younger=5.51, Older=5.36; F=0.155, df=1, 60; nsd). The sex by age interaction effect was not significant (F=0.334, df=1, 60; nsd) (see Table 10.03, Appendix 5).

These results are again partially consistent with those

reported in Chapter Eight, in particular with the results for Australian students. In that sample also, the differences in TAI C- scores as a function of sex differences were not significant, although they were in the two UK samples. As in the current study, in the previous Australian student sample, males had higher mean TAI C- scores than females, but the difference did not reach significance. In the previous sample younger respondents were found to be significantly less confident than older respondents. In this sample the direction of difference of TAI C- scores is consistent with this finding, but the difference does not reach significance. The age by sex interaction was not significant in either sample.

TAI 11: Finally, A 2 x 2 ANOVA examined age and sex differences on T11 scores. Males have significantly higher scores than females (Male=27.95, Female=24.10; F=5.254, df=1, 60; p<0.025). There were no age significant differences (Younger=25.44, Older=25.40; F=0.007, df=1, 60; nsd), and the sex by age interaction effect was not significant (F=0.331, df=1, 60; nsd) (see Table 10.04, Appendix 5). These results are completely consistent with those reported in Chapter Eight, in particular with those for the Australian student sample. This sample also showed significant differences in T11 scores as a function of sex differences, with males having higher scores than females, but no significant differences were reported as a function of either age or the age by sex interaction.

(The T11 results for overall telephone apprehension were checked by running the analyses on the T20 scores, with identical results (see Tables 10.05 and 10.06, Appendix 5). For the rest of this chapter, only T11 results will be reported).

Distribution of STAIT, PRCA20, Social Desirability,
Self-esteem and sex-role identification

STAIT: The theoretical minimum score on this scale is 20, whilst the theoretical maximum is 80, with a theoretical mean of 50. Low scores indicate low generalised trait anxiety. There were 77 usable responses, with a mean of 38.662 (sd=7.769). The actual minimum score was 25, and the maximum was 58.

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┌─────────────────────────────────────────────┐
│    Distribution of STAI-Trait Scores        │
│           See Figure C10F01                 │
└─────────────────────────────────────────────┘
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STAIT SCORES			
AGE	-25	26+	TOTAL
MALE	m=39.85 n= 13	m=39.33 n= 9	m=39.64 n= 22
FEMALE	m=38.65 n= 26	m=37.44 n= 16	m=38.19 n= 42
TOTAL	m=39.05 n= 39	m=38.12 n= 25	m=38.69 n= 64

There were no significant sex (F=0.472, p<0.495) or age (F=0.216, p<0.644) differences in STAI-Trait scores, and the sex by age interaction effect (F=0.026, p<0.873) was not significant (see Table 10.07, Appendix 5).

PRCA: Low scores indicate low generalised CA, with a theoretical minimum score of 20, and maximum of 100. The theoretical mean is 60. There were 77 usable responses, with a mean of 59.571 (sd=13.564). The minimum score was 26, the maximum was 88.

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┌─────────────────────────────────────────────┐
│    Distribution of PRCA-20 Scores           │
│           See Figure C10F02                 │
└─────────────────────────────────────────────┘
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Figure C10F01

Distribution of Trait Anxiety Scores

Figure C10F02

Distribution of Communication Apprehension Scores

% Frequency

18
16
14
12
10
8
6
4
2
0

PRCA-20 Scores

20-24 30-34 40-44 50-54 60-64 70-74 80-84 90-94
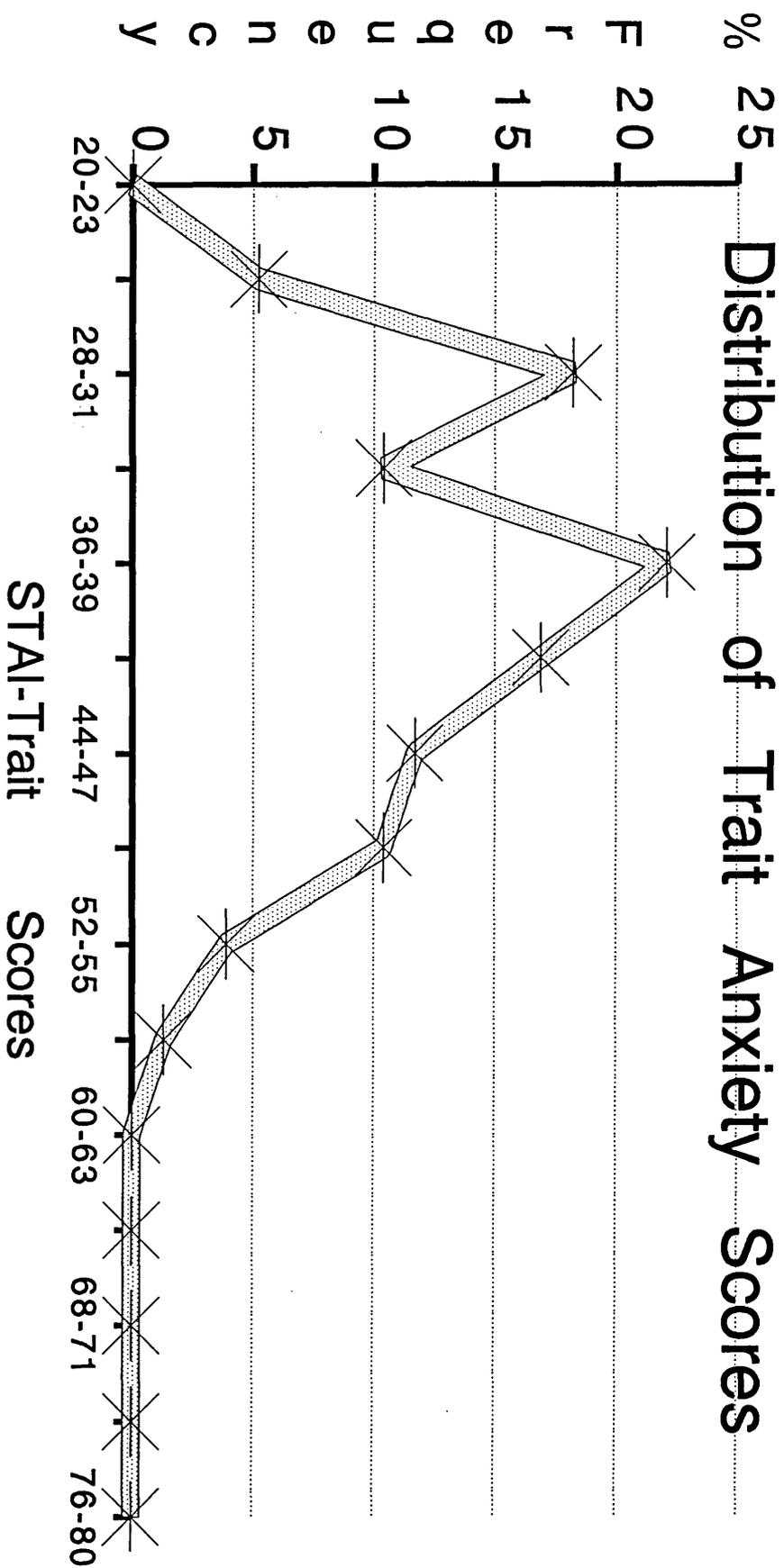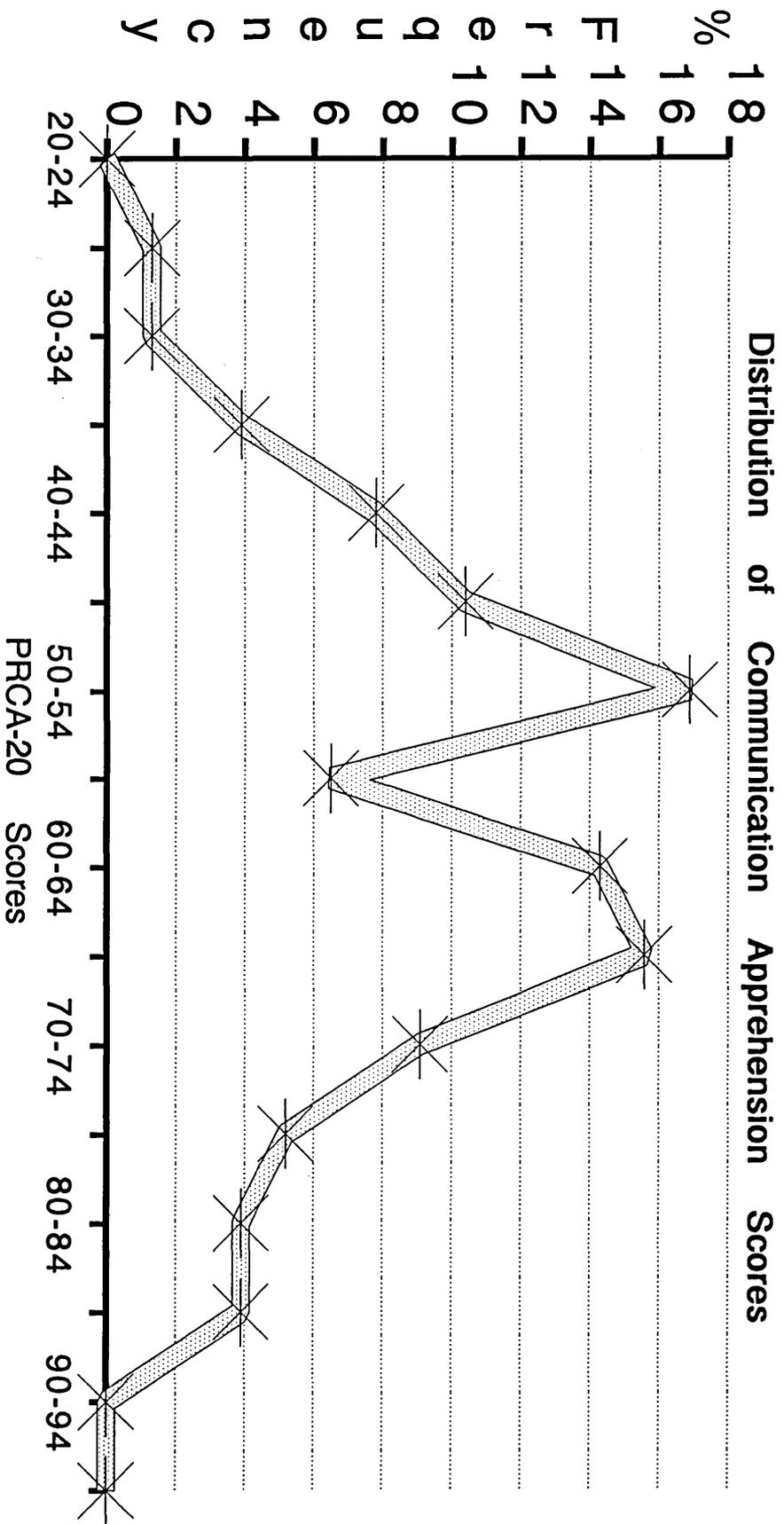
There were no significant sex or age differences. However, the sex by age interaction effect was significant (F=4.665, df=1, 60; p<0.035). Examination of the cell means and planned comparisons indicated that this was because amongst younger respondents, males had higher PRCA scores than females, (but not significantly so: Younger Males=62.77, Younger Females=57.04, t=1.34, df=37, 2-tailed, p<0.187) whereas amongst older respondents, men had lower PRCA scores, but again not significantly so, than women (Older Males=53.22, Older Females=62.81, t=1.63, df=23, 2-tailed, p<0.118) (see Table 10.08, Appendix 5).

PRCA-20 SCORES			
AGE	-25	26+	TOTAL
MALE	m=62.77 n= 13	m=53.22 n= 9	m=58.86 n= 22
FEMALE	m=57.04 n= 26	m=62.81 n= 16	m=59.24 n= 42
TOTAL	m=58.95 n= 39	m=59.36 n= 25	m=59.11 n= 64

Social Desirability: Low scores indicate low social desirability needs, with a theoretical minimum of 10 and a maximum of 70; the theoretical mean is 40. There were 67 usable responses, with a mean of 42.925 (sd=5.168). The minimum score was 28, the maximum was 58.

Distribution of ASRSD Scores See Figure C10F03

A 2 x 2 ANOVA was performed to examine age and sex differences. Of the 67 usable responses, only 61 provided information allowing both the age and sex of the respondent to be classified.

Distribution of Social Desirability Scores

Figure C10F03
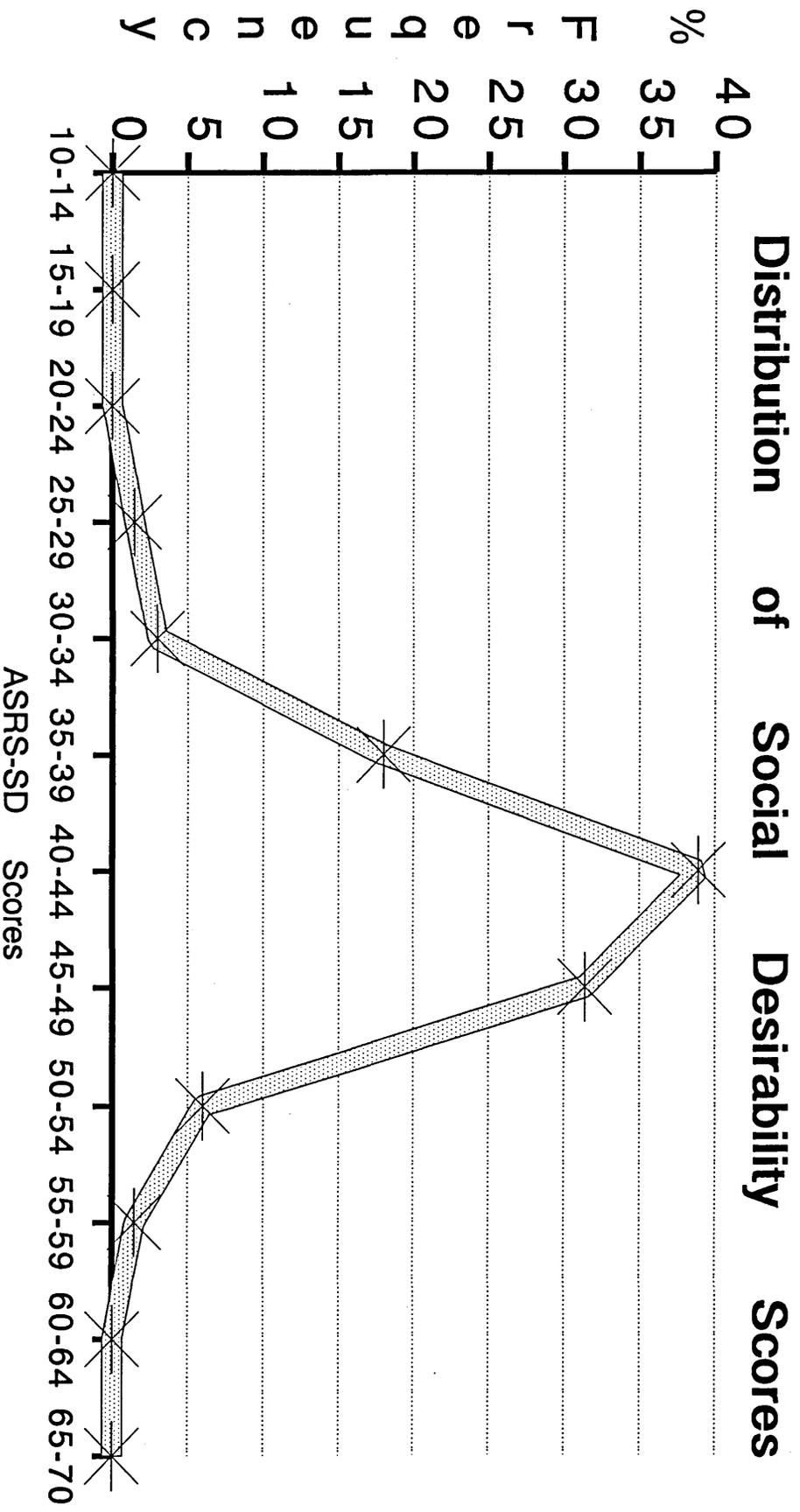
SOCIAL DESIRABILITY SCORES			
AGE	-25	26+	TOTAL
MALE	m=44.62 n= 13	m=42.67 n= 9	m=43.82 n= 22
FEMALE	m=42.29 n= 24	m=42.47 n= 15	m=42.36 n= 39
TOTAL	m=43.11 n= 37	m=42.54 n= 24	m=42.89 n= 61

None of the main or interaction effects were significant (see Table 10.09, Appendix 5).

Rosenberg Self-Esteem Scale: A total of 75 usable responses were available for analysis. With a theoretical range of scores of 10-50, and with low scores indicating low self-esteem, the mean score was 38.04 (sd=5.434), with a minimum of 23, and a maximum score of 48.

Distribution of Self-Esteem Scores See Figure C10F04

ANOVA showed that there were no significant sex differences (Male RSES=36.91, Female RSES=38.51; F=1.480, df=1, 59; nsd). Older respondents had higher self-esteem than younger respondents (Younger RSES=36.37, Older RSES=40.36; F=8.942, df=1, 59; p<0.004). The sex by age interaction effect was not significant (F=0.209, df=1, 59; nsd) (see Table 10.10, Appendix 5).

SELF-ESTEEM SCORES			
AGE	-25	26+	TOTAL
MALE	m=34.92 n= 13	m=39.78 n= 9	m=36.91 n= 22
FEMALE	m=37.12 n= 25	m=40.69 n= 16	m=38.51 n= 41
TOTAL	m=36.37 n= 38	m=40.36 n= 25	m=37.95 n= 63

Distribution of Self-Esteem Scores

Figure C10F04

Distribution of Self-Esteem Scores

Y-axis (Frequency %): 0, 5, 10, 15, 20, 25, 30, 35

X-axis (RSE Scores): 10-13, 14-17, 18-21, 22-25, 26-29, 30-33, 34-37, 38-41, 42-45, 46-50
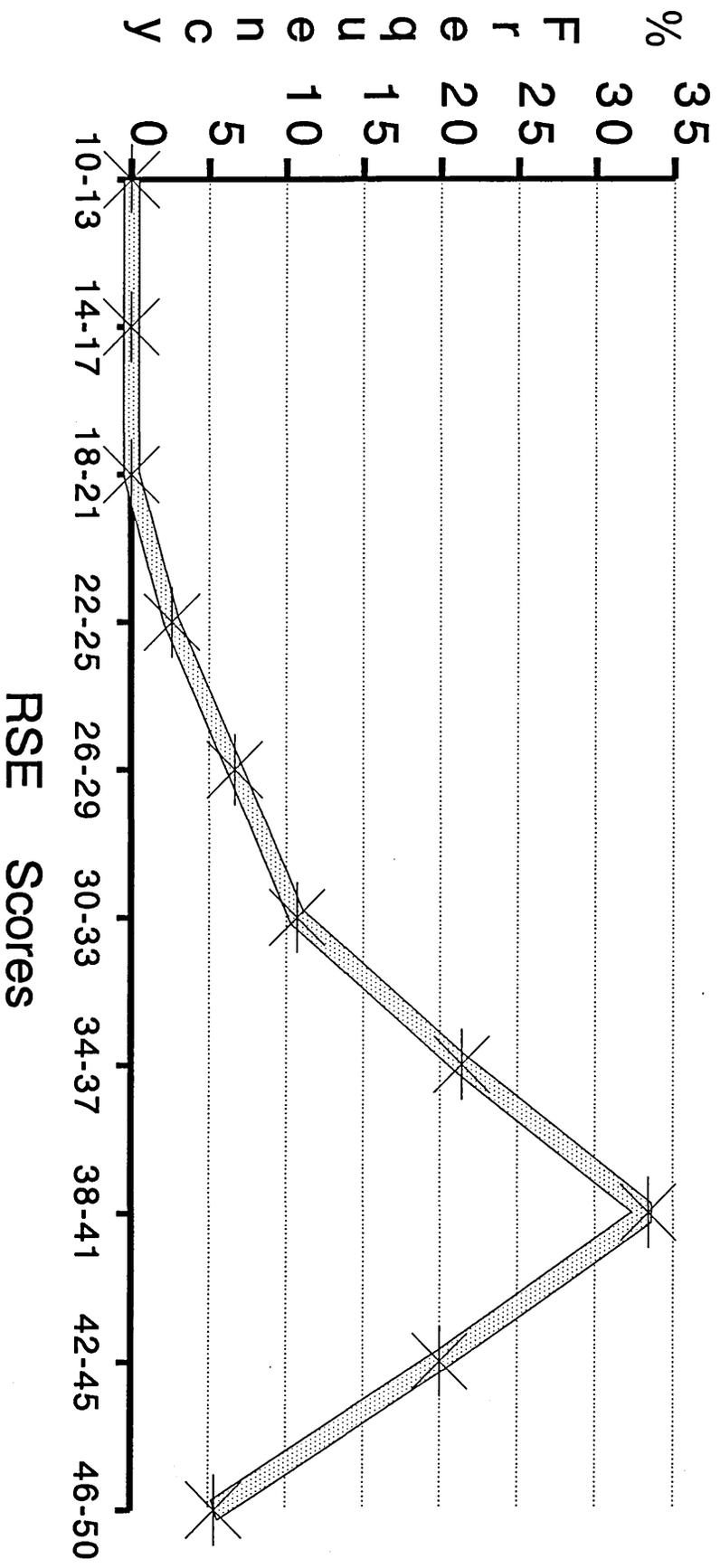
These results are consistent with other research which reports that older subjects have higher global self-esteem than younger subjects (Wylie, 1989).

Correlations with TAI T11 and TAI sub-scores

STAIT: The correlations between trait anxiety scores and the various TAI scores were:

Item	T11	TAI P-	TAI A-	TAI C-	TAI-20
STAI: A-Trait (n=77)	0.1611 p<.081	0.2351 p<.020	-0.0273 p<.407	0.1526 p<.093	0.1564 p<.087

Respondents with higher levels of trait anxiety reported experiencing telephone communication as more problematic. There is no relation between trait anxiety and TAI A-scores. The correlation between trait anxiety and overall telephone apprehension (T11) is not significant. Hypothesis 1, that there will be a high, positive and significant correlation between levels of overall telephone apprehension and levels of trait-like generalised anxiety, must therefore be rejected.

PRCA: The correlations between CA scores and the various Telephone Apprehension scores were:

Item	T11	TAI P-	TAI A-	TAI C-	TAI-20
PRCA-20 (n=77)	0.1358 p=.119	0.1135 p=.163	0.0991 p=.196	0.1644 p=.077	0.1542 p=.090

The correlation between PRCA-20 and TAI C- scores approaches significance, whilst none of the correlations with the other sub-scales reaches significance. The correlation between CA and overall telephone apprehension

(T11) is not statistically significant. Thus, it is possible to reject Hypothesis 2, which predicted that there would be a high, positive and significant correlation between levels of telephone apprehension and levels of trait-like CA.

These results are consistent with those of Lewis and Reinsch (1982), who used a 3-item scale to measure telephone apprehension, and found that this did not correlate significantly with Porter's PRCA-13 (r=0.141, n=126, ns). However, they did report a significant correlation with CA as measured by the PRCA-OF (r=0.383, n=126, p<0.001). Steele and Reinsch (1984) also reported significant correlations of 0.2740 (p<0.0001) between TAI T20 scores and the PRCA-OF. However, in this later study a significant correlation of r=0.1268 (p<0.004) with Porter's PRCA-13 was also reported. It may be noted that this correlation is small, and in particular is smaller than that between the TAI T20 score and PRCA-OF.

Overall, it appears that the relationship between overall CA and telephone apprehension is small and inconsistent, and the rejection of Hypothesis 2, which proposed a strong and therefore consistent relationship, is justified. However, the pattern of results do suggest that measures of CA specifically focused on informal, dyadic interactions would have higher correlations with measures of telephone apprehension than those focussing on formal, public situations.

Social Desirability: The correlations between social desirability scores and the various telephone apprehension scores were:

Item	T11	TAI P-	TAI A-	TAI C-	TAI-20
Australian Sex Role Scale:					
social desirability	0.0619	0.0064	0.1386	0.0443	0.0424
score (n=67)	p=.309	p=.480	p=.132	p=.361	p=.367

There are no significant correlations between social desirability scores and overall telephone apprehension, nor on scores on any of the three sub-scales. Hypothesis 3, which predicted that there would be a high, negative and significant correlation between levels of telephone apprehension and social desirability scores, can therefore be rejected.

Rosenberg Self-Esteem Scale: The correlations between self-esteem and the various telephone apprehension scores were:

Item	T11	TAI P-	TAI A-	TAI C-	TAI-20
Rosenberg Self-Esteem Scale score	-0.1300	-0.2121	0.0430	-0.0993	-0.1371
(n=75)	p=.133	p=.034	p=.357	p=.198	p=.120

The correlation between scores on the Problematic Communication sub-scale and scores on the Self-Esteem scale was significant, with people having lower self-esteem reporting that they saw telephone communication as more problematic. However, there were no significant correlations with the Avoidance of Communication or the Lack of Confidence sub-scales. The lack of correlation with the Avoidance sub-scale is understandable, but the absence of a significant correlation with the TAI C-scale is rather surprising. There was no significant relation between overall telephone apprehension and self-esteem. Overall then, there was only partial support for Hypothesis 4, which predicted that there would be a high, negative and significant correlation between levels of overall telephone apprehension and levels of self esteem.

Hypothesis 4B predicted that the correlation between telephone apprehension and global self-esteem would be greater in female than in male subjects. The correlations between the telephone apprehension scales and RSES scores for males and females were:

Item	T11	TAI P-	TAI A-	TAI C-	TAI-20
Rosenberg Self-Esteem Scale					
Males (n=25	-0.0031	-0.0292	0.1547	-0.1025	-0.0218
	p<.494	p<.445	p<.230	p<.313	p<.459
Females (n=50)	-0.1747	-0.2993	0.0345	0.0809	-0.1878
	p<.113	p<.017	p<.406	p<.288	p<.096

The direction of difference for the overall T11 score was as predicted (Male=-0.0031, Female=-0.1747), as was that for the TAI P- sub-scale (Male=-0.0292, Female=-0.2993), with the latter correlation being significant (p<0.017). However, neither of these pairs of correlations are significantly different (TAI P-: z=1.084, ns; T11: z=0.569, ns). The direction of difference for both the TAI A- and the TAI C- sub-scales was opposite to that predicted. Thus, whilst some support was provided for this hypothesis, this support was limited and non-significant.

ANALYSES OF COVARIANCE

Given the lack of significant correlations between overall telephone apprehension (T11 scores) and generalised trait anxiety, CA, social desirability and self-esteem scores, the possibility that telephone apprehension is merely a particular manifestation of one or more of these other dynamics is unlikely. Similarly, the existence of significant sex differences in overall telephone apprehension (T11 scores), and the absence of such differences in levels of generalised trait anxiety, CA, social desirability and self-esteem suggest that it is unlikely that differences in levels of telephone apprehension as a function of sex can be accounted for simply in terms of variations in these other variables. This was confirmed by undertaking covariance analyses of T11 scores with generalised trait anxiety, CA, social desirability and self-esteem scores as covariates.

T11 SCORES BY SEX AND AGE OF RESPONDENT,
WITH STAI-TRAIT SCORES AS THE CO-VARIATE

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F
WITHIN CELLS	2410.34	59	40.85		
REGRESSION	48.37	1	48.37	1.18	0.281
SEX	167.53	1	167.53	4.10	0.047
AGE	1.61	1	1.61	0.04	0.843
SEX x AGE	14.65	1	14.65	0.36	0.552

This covariance analysis leads to the rejection of
Hypothesis 1A. When individual differences in levels of
trait-like generalised anxiety are taken into account,
differences in levels of telephone apprehension between
males and females are not eliminated.

T11 SCORES BY SEX AND AGE OF RESPONDENT,
WITH PRCA-20 SCORES AS THE CO-VARIATE

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F
WITHIN CELLS	2369.24	59	40.16		
REGRESSION	89.47	1	89.47	2.23	0.141
SEX	203.34	1	203.34	5.06	0.028
AGE	0.95	1	0.95	0.02	0.878
SEX x AGE	1.02	1	1.02	0.03	0.874

It is also possible to reject Hypothesis 2A, which
predicted that when individual differences in levels of
trait-like CA are taken into account, differences in
levels of telephone apprehension between groups, such as
those between males and females, would be eliminated.

T11 SCORES BY SEX AND AGE OF RESPONDENT,
WITH ASRS SOCIAL DESIRABILITY SCORES AS THE CO-VARIATE

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F
WITHIN CELLS	2272.86	56	40.59		
REGRESSION	5.95	1	5.95	0.15	0.703
SEX	179.53	1	179.53	4.42	0.040
AGE	10.23	1	10.23	0.25	0.618
SEX x AGE	2.57	1	2.57	0.06	0.802

Hypothesis 3A predicted that when individual differences
in social desirability scores were taken into account,
then apparent differences in levels of telephone
apprehension between males and females would be
accentuated, while Hypothesis 3B made the opposite
prediction, that group differences would be eliminated.
Examination of the covariance table, and comparison with
the original ANOVA (see Table 10.04, Appendix 5) suggests
that the effect of the covariate is minimal, and both
hypotheses should be rejected.

T11 SCORES BY SEX AND AGE OF RESPONDENT,
WITH ROSENBERG SELF-ESTEEM SCORES AS THE CO-VARIATE

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F
WITHIN CELLS	2429.48	58	41.89		
REGRESSION	28.42	1	28.42	0.68	0.413
SEX	159.59	1	159.59	3.81	0.056
AGE	0.13	1	0.13	0.00	0.956
SEX x AGE	10.79	1	10.79	0.26	0.614

The simple ANOVA on T11 scores showed that the sex
difference was significant ($F=5.254$, $p<0.025$), whilst the
age comparison was not significant ($F=0.007$, $p<0.933$).
The simple ANOVA on self-esteem scores showed that the
sex difference was not significant ($F=1.480$, $p<0.229$),
but that the age difference was significant, with older
people having significantly higher global self-esteem
scores than younger people ($F=8.942$, $p<0.004$).

Hypothesis 4B predicted that if individual differences in
levels of self esteem were taken into account, then the
differences in male and female telephone apprehension
would be accentuated, while Hypothesis 4B made the
opposite prediction, that differences would be
eliminated. The analysis of covariance shows that neither
hypothesis is clearly supported by the data. Similarly,
the prediction (Hypothesis 4C) that underlying age
differences in telephone apprehension, previously
obscured by covarying differences in global self-esteem,

would be significant when differences in self-esteem were taken into account, received no support. The possibility that the differences in telephone apprehension as a function of age, such as those reported for the UK non-student sample, merely reflected, or were distorted by differences in global self-esteem, can therefore also be rejected.

Finally, variations in overall telephone apprehension were examined with generalised trait anxiety, CA, social desirability and self-esteem scores entered <u>simultaneously</u> as co-variates.

T11 SCORES BY SEX AND AGE OF RESPONDENT, WITH STAI-TRAIT, PRCA, ASRS-SD AND RSE SCORES AS CO-VARIATES

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F
WITHIN CELLS	2144.00	52	41.23		
REGRESSION	133.07	4	33.27	0.81	0.526
SEX	189.45	1	189.45	4.59	0.037
AGE	4.71	1	4.71	0.11	0.737
SEX x AGE	2.68	1	2.68	0.06	0.800

The difference between males and females in levels of telephone apprehension remained significant in this analysis.

The prediction that generalised trait anxiety, CA, social desirability and self-esteem scores would account for only a small proportion of the overall variance in telephone apprehension scores was tested by entering all four variates into a multiple regression equation as predictors, with telephone apprehension as the dependent variable. The multiple r was 0.2529, with just 6.4% of the variance being accounted for by the combined predictor variables.

<u>Covariance Analyses of Sub-Scales</u>

There were significant correlations between both
generalised trait anxiety and self-esteem scores and
scores on the Problematic Communication sub-scale.
Covariance analysis was therefore used to test the
possibility that with respect to this sub-scale,
differences in TAI P- scores as a function of sex would
be reduced by, and could be accounted for simply in terms
of variations in more generalised trait anxiety, whilst,
if differences in global self-esteem are taken into
account, TAI P- differences as a function of sex and age
would be accentuated.

TAI P- SCORES BY SEX AND AGE OF RESPONDENT,
WITH STAI-TRAIT SCORES AS THE CO-VARIATE

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F
WITHIN CELLS	739.56	59	12.53		
REGRESSION	47.41	1	47.41	3.78	0.057
SEX	56.35	1	56.35	4.50	0.038
AGE	5.63	1	5.63	0.45	0.505
SEX x AGE	11.73	1	11.73	0.94	0.337

Whilst the regression function approaches significance,
the difference in TAI P- scores as function of respondent
sex, whilst slightly reduced, is still present after the
covariate has been taken into account.

TAI P- SCORES BY SEX AND AGE OF RESPONDENT,
WITH RSES SCORES AS THE CO-VARIATE

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F
WITHIN CELLS	753.03	58	12.98		
REGRESSION	33.64	1	33.64	2.59	0.113
SEX	51.78	1	51.78	3.99	0.051
AGE	0.22	1	0.22	0.02	0.897
SEX x AGE	8.31	1	8.31	0.64	0.427

The regression function is non-significant, and the
difference in TAI P- scores as function of respondent sex

remains at the same order of magnitude after the effect
of the covariate has been taken into account, and the age
difference does not become significant.

As a final check on the robustness of the sub-scale sex
differences, differences in TAI P- scores were examined
when all four covariates were entered simultaneously.

TAI P- SCORES BY SEX AND AGE OF RESPONDENT, WITH STAI-
TRAIT, RSE, PRCA-20 and ASRS-SD SCORES AS CO-VARIATES

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F .
WITHIN CELLS	667.23	52	12.83		
REGRESSION	59.28	4	14.82	1.15	0.341
SEX	53.60	1	53.60	4.18	0.046
AGE	9.52	1	9.52	0.74	0.393
SEX x AGE	2.60	1	2.60	0.20	0.655

A similar analysis was undertaken to confirm the
robustness of the sex and age differences identified in
TAI A- sub-scale scores.

TAI A- SCORES BY SEX AND AGE OF RESPONDENT, WITH STAI-
TRAIT, PRCA, ASRS-SD AND RSE SCORES AS CO-VARIATES

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F
WITHIN CELLS	243.78	52	4.69		
REGRESSION	30.73	1	7.68	1.64	0.179
SEX	18.34	1	18.34	3.91	0.053
AGE	1.33	1	1.33	0.28	0.597
SEX x AGE	0.86	1	0.86	0.18	0.671

The difference in TAI A- scores as a function of the sex
of the respondent remains just significant when all
covariates are included, and the lack of significant age
differences is not altered.

Overall then, it can be concluded that, with respect to
either measures of overall telephone apprehension, or
with respect to sub-scale scores, differences in levels
of generalised anxiety, CA, social desirability or self-

esteem neither account for, nor obscure, differences
related to the sex and age of respondents.

Social Class

The correlations between social class codings and the
various telephone apprehension scores were as follows:

Item	T11	TAI P-	TAI A-	TAI C-	TAI-20
social class score	0.0015	0.0679	-0.0583	-0.0717	0.0241
(n=58)	p=.990	p=.612	p=.664	p=.592	p=.858

(Probablilities are 2-tailed)

Clearly, none of these correlations are significant.
Thus, Hypothesis 5, which predicted that there would be a
high and significant correlation between levels of
telephone apprehension and the respondent's social class,
is not supported.

Family Size

A total of 61 respondents gave information about their
family size (ie number of siblings). The mean number of
siblings was 3.07 (sd=1.879). The correlations between
number of siblings (family size) and the various
telephone apprehension scores were:

Item	T11	TAI P-	TAI A-	TAI C-	TAI-20
number of siblings	0.0323	0.0206	0.0670	-0.0118	0.0160
(n=61)	p=.397	p=.434	p=.295	p=.462	p=.449

None of these correlations are significant. Hypothesis 6,
which suggested that there would be a high, negative and
significant correlation between levels of telephone
apprehension and the respondent's family size, must
therefore be rejected.

Hypothesis 7 was explored by calculating the standard deviations of telephone apprehension scores (T11) for the following groups of respondents:

T11 Scores:			
Number of Siblings	N	Mean	sd
1	15	25.87	4.454
2	15	26.20	9.608
3-4	16	25.00	6.122
5+	15	24.47	5.983

Whilst not conclusive, these figures provide little support for the prediction that variability in levels of telephone apprehension is greater in respondents from larger families.

DISCUSSION OF RESULTS

In many ways, it is not surprising that there were few correlations between TAI scores and scores on other measures. This is a similar pattern of findings to that in many other areas of trait research. Measures specific to a particular domain are in general only weakly correlated with general personality measures. However, the four variables investigated here were chosen because, on both theoretical and empirical grounds, they could be expected to be related to telephone apprehension. The most general implication of these results is that telephone apprehension appears to be highly specific, and unrelated to other, conceptually similar, personality traits. If this argument is accepted, it may therefore be proposed that variations in levels of telephone apprehension are related to, and possibly dependent upon, variations in the quantity and quality of experience in using the telephone (although these do not appear to be related to social class or family size variables).

More specifically, these results allow the rejection of

the "reductionist" argument that differences in telephone apprehension are merely a manifestation of variations in more generalised anxiety, more generalised communication apprehension, levels of global self-esteem, or evaluation apprehension/social desirability demands.

CHAPTER ELEVEN

IMPROVING THE TELEPHONE APPREHENSION INVENTORY

SYNOPSIS

In the chapter the definition of telephone apprehension
and its relationship to other related concepts is
clarified. The crucial distinction between affect,
cognition and behaviour is central to this clarification,
and distinctions are made between the beliefs strengths
attributed to outcomes associated with telephone use, and
the evaluation of those outcomes. A distinction is also
made between affective and non-affective outcomes.
Telephone apprehension is identified as the summed
products of the evaluative components of the person's
beliefs about the negative affective outcomes of
telephone use, and their associated outcome expectancies.

The relation of perceived competence to telephone use is
also discussed. Perceived competence, together with
perceived task difficulty (beliefs about the skills
needed to achieve the outcomes associated with telephone
use), determines self-perceived telephone efficacy. In
turn, self-efficacy is likely to be one of the
determinants of the overall evaluation of personal (as
opposed to other people's) telephone use, and of personal
intentions to use the telephone.

For each of these concepts, examples are discussed of the
kinds of items and response formats appropriate to their
measurement. The relations of the sub-scales identified
within the current TAI to these concepts are also noted.
In addition, the limitations of the current TAI with
respect to the imbalanced sampling of positive and
negative items are discussed, and equated with the
distinction between 'affect present' and 'affect absent'
items. This imbalance is shown to lead to positive
skewing in the distribution of responses to the TAI, and
to lead to difficulties in accurately differentiating
amongst positive attitudes to telephone use.

The application of Brown and Fraser's (1979) taxonomy of communication situations is discussed, both in terms of the specific dimensions applicable to the sampling of telephone apprehension and use, and also in terms of the utilisation of this framework in the development of improved measures of telephone apprehension and use.

Finally, a set of propositions is presented summarising the predicted relationships amongst the concepts discussed in the chapter. These propositions provide a summary of the significance of telephone apprehension in the determination of telephone usage. That is, telephone apprehension (defined as the summed evaluation-expectancies of the negative affective outcomes of telephone use) is predicted to be related to self-reports of past telephone use. It is also predicted to be one of the components determining the overall evaluation of (attitude to) the person's use of the telephone. Other components include non-affective outcomes and self-efficacy. As one of the components of this overall evaluation, telephone apprehension will also be one of the determinants of intentions to use the telephone in future. Intentions to use will be closely related to actual future use of the telephone. On the other hand, as only one of the components of overall evaluations of telephone use, intentions to use, and actual usage, the relationship between these and telephone apprehension can be predicted to be low to moderate.

CHAPTER ELEVEN

IMPROVING THE TELEPHONE APPREHENSION INVENTORY

INTRODUCTION

The review of telephone apprehension (see Chapter Four), of communication apprehension and related concepts (see Chapters Two and Three), and the empirical studies reported in Chapters Five to Eight, and in Nine, provide a basis for developing a revised TAI. In this chapter the specification of such a revised and improved TAI is developed.

AFFECT, COGNITION and BEHAVIOUR

The relationships between affect, cognition and behaviours, as discussed in Chapters Two and Three, are not only central to the conceptualisation and operationalisation of telephone apprehension, but also constitute the basic empirical questions that need to be addressed in the investigation of the concept. It is therefore important that further refinement of the TAI should occur in order to provide independent measurement of these three components.

Telephone apprehension was defined as "anxiety or fear associated with the anticipated or actual use of the telephone as a communication channel" (Steele and Reinsch, 1983). It is proposed that this definition should be refined, by introducing the distinction between affect and cognition, and by following the model of beliefs and attitudes adopted by Fishbein and Ajzen (1975). According to Fishbein and Ajzen (1975), an individual holds many beliefs about a given attitude entity. Beliefs are taken to be attributes linked to an entity, and possess belief strength or expectancy, which is the confidence that the individual has that that attribute is true/not true of that entity. Associated with each attribute is an implicit evaluative response,

and the product of belief strength or expectancy and associated evaluative response summate and constitute the overall attitude to that entity. Attitude is the overall positive or negative affect (or evaluation) which is associated with the attitude entity. With respect to telephone apprehension, the overall attitude entity is "my use of the telephone".

Belief strengths or expectancies about "my use of the telephone" would be assessed by listing items such as:

    I use the telephone to keep in touch with my parents
    I use the telephone to arrange meetings and visits
    The telephone interrupts me when I am working
    People who call me talk for too long

and asking subjects whether these items were "true" or "not true" of their own use of the telephone.

The evaluative component of each item would be determined by listing the same items and asking subjects whether, if these items were true of their use of the telephone, they would see this as "good" or "bad" (or if they would "like" or "dislike" this). The person's overall attitude to their "use of the telephone" would then be determined by summing the product of the belief strength and evaluative judgment for each of these items.

These items constitute specifications of a range of possible outcomes associated with telephone use. Each individual subject would then be indicating whether they believed each particular outcome to be associated with their use of the telephone, and if it is, how positive or negative that outcome is felt to be. At the present time, the research informed by the "uses and gratifications" approach, and reported by Noble (1989), probably provides the best basis for the development of such measures of outcome. As noted in Chapter Four, Noble (1989) divided the reasons people gave for disliking the phone into 11

categories:

1: Expense
2: Interruptions (time inconvenient)
3: Invasion of privacy (caller inconvenient)
4: Nuisance calls (topic unwelcome eg obscene calls, sales calls)
5: Unwanted availability (caller unwelcome)
6: Failure to connect (wrong number, no reply, engaged, wrong person, answer machine)
7: Problematic communication (medium creates difficulties for effective/efficient communication)
8: Over-convenience (user over-uses phone)
9: Obedience (obligation to answer)
10: Impersonal (difficult to communicate feelings)
11: Brings bad news

Noble also provided a similar categorisation of the reasons people gave for liking the telephone:

1: Convenience (quick and easy to use)
2: Time economies (saves time socially and work)
3: Maintains contact (family and friends)
4: Distance reduction
5: Provides sense of psychological security (reduces loneliness and isolation)
6: Limits/Enables discussion of emotions
7: Limits/Enables gossip and small talk
8: Access to information
9: Provides sense of physical security

These categorisations provide an initial comprehensive analysis of the possible outcomes of telephone use identified by a wide-ranging sample of users. Items based on, and specifying each of these categories could then, and should then, be used in the development of measures of telephone use outcome.

In order to specify properly the behavioural component of

telephone apprehension a number of further distinctions need to be made. Fishbein and Ajzen (1975) noted the importance of intentions within the belief-attitude-behaviour sequence. They defined intentions as a special case of beliefs, in which the attitude object was always the person, and the attribute was a specific behaviour. The strength of the intention was the person's subjective probability that they would perform the behaviour in question. In the case of "my use of the telephone" an "Intention Scale" would consist of the subject's judgments about the probability that they would or would not be likely to use the telephone for a series of specified tasks on a series of specified occasions. In practice, a scale of this kind would be equivalent to scales such as McCroskey's "Willingness to Communicate" (McCroskey and Baer, 1985; McCroskey and Richmond, 1985). The instructions for this scale are as follows:

Below are 20 situations in which a person might choose to communicate or not to communicate. Presume you have completely free choice. Indicate the percentage of time you would choose to communicate in each type of situation. Indicate in the space at the left what percent of the time you would choose to communicate. 0 = never, 100 = always.

In developing a scale of intention to use the telephone, rather than asking subjects what percentage of time they would communicate within each situation, subjects could be asked to indicate the likelihood of their using the telephone, as opposed to some other medium such as face-to-face communication (or as opposed to all other media), to communicate in a given situation. Thus the instructions would be as follows:

Below are 20 situations in which a person might choose to communicate by telephone. Presume that you have a completely free choice. Indicate the likelihood that you would choose to communicate by telephone in each type of

situation. Indicate in the space at the left the probability that you would choose to communicate by telephone.

0 = certain that you would not use the telephone to communicate in this situation

100 = certain that you would use the telephone to communicate in this situation.

This measure of behavioural intention should be distinguished from two other kinds of behavioural measures. The first is a self-report of past telephone use. Items of this kind are often included in measures of communication apprehension, and some are included in the original TAI (eg Item 20: I avoid using the phone). A measure of this kind would be equivalent to the Predisposition towards Verbal Behaviour scale (Mortensen, Arnston and Lustig, 1977) and verbal activity constructs (McCroskey, Andersen, Richmond, and Wheeless, 1981; McCroskey and Richmond, 1982) with respect to communication in general. These scales use items of the following kind:

The Predisposition towards Verbal Behaviour Scale:

1. I am inclined to let other people start conversations.

3. When I am with other people I generally talk often.

5. When I am with others it generally takes me quite a while to warm up enough to say very much.

6. I generally rely on others to keep conversations going.

7. In more social situations I generally speak quite frequently.

and the Verbal Activity Scale:

2: Other people think I talk a lot.
3: I am a very talkative person.
5: I talk a lot.
7: I don't talk much
8: I talk more than most people
9: I am a quiet person.

Scales of this kind ask respondents to provide either
absolute estimates of activity (eg I talk a lot) or
relative ones (eg Compared with most people, I don't talk
much). Items which are apparently absolute are often
implicitly relative. In order to provide a useful measure
of past telephone behaviour, a scale of this kind should
include items which tap use of the telephone for a
variety of different tasks with a variety of
interlocutors, on a number of different occasions.

The second kind of behavioural measure is an objective
measure of use. As Fishbein and Ajzen (1975) note,
relationships between past behaviours, beliefs,
attitudes, intentions and actual behaviour cannot
properly be determined on the basis of single-act
measures of behaviour, as these are subject to
unreliability and inconsistency in exactly the same way
as belief and attitudinal measures. Thus, a scale of
actual behaviour would measure use of the telephone for a
variety of different tasks with a variety of
interlocutors, on a number of different occasions.

These distinctions amongst past behaviour, belief,
attitudes, intentions and actual behaviour can be
represented as follows:

```
┌─────────────────────────────────────┐
│ Self-report Scale                   │
│ Own Past Telephone Use              │
└─────────────────────────────────────┘
                    │
┌─────────────────────────────────────┐
│ Person's Beliefs about              │
│ Outcomes associated with their      │
│ Use of the Telephone                │
└─────────────────────────────────────┘
                    │
┌─────────────────────────────────────┐
│ Person's Evaluation of their        │
│ Use of the Telephone                │
└─────────────────────────────────────┘
                    │
┌─────────────────────────────────────┐
│ Person's Intentions                 │
│ with respect to their               │
│ Future Use of the Telephone         │
└─────────────────────────────────────┘
                    │
┌─────────────────────────────────────┐
│ Objective Scale                     │
│ Future Telephone Use                │
└─────────────────────────────────────┘
```
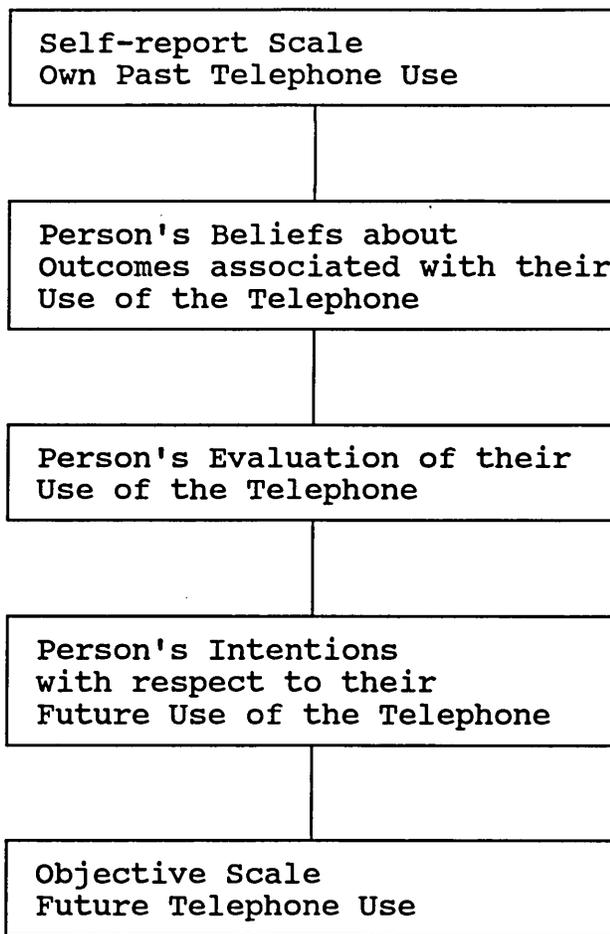
Following Fishbein and Ajzen, the refinement of the
concept of telephone apprehension proposed has separated
these components of past behaviour, belief, attitudinal,
intentional and actual behaviour. However, the concept of
perceived competence has not, as yet, been separately
identified within this scheme. Competence is however
likely to be related to the cognitive (belief) and
affective (evaluative) components of telephone
apprehension. The relationship can be described by noting
that in the definition of telephone apprehension used in
this thesis the attitudinal entity is "my use of the
telephone", and all attributes associated with their use
of their telephone are included in that assessment.
However, it is possible to separate beliefs and
evaluations concerning the possible outcomes of the use
of the telephone in general (outcome expectancies) from
beliefs concerning the ability to perform the behaviours
needed to bring about those outcomes (self-efficacy
expectancy). This self-efficacy expectancy would itself

be a function of, on the one hand, beliefs about the constraints, opportunities and other operational characteristics of the telephone, and on the other, of beliefs about the ability to cope with these demands. This latter information would be equivalent to information about the cognitive elements of self-perceived competence.

A scale of self-perceived competence concerning telephone use could be constructed by specifying a series of interactional behaviours and determining the extent to which the person sees themself as able to perform each of these when using the telephone. This approach would be similar to that taken by, for instance, Spitzberg and Cupach (1984) in their measure of relational competence. Their measure included items such as:

  3: S expresses her/himself clearly.
  4: S gives positive feedback.
13: S interrupts too much.

A measure of overall competence would then be obtained by summing responses across items. Spitzberg and Cupach (1989) note that there is currently no clear agreement as to the factor structure of interpersonal competence, and therefore any measure of telephone competence would initially need to include a comprehensive sample of behaviours in order that the structure of competence within this domain could be established. An alternative approach would be to measure self-perceived competence directly, by simply asking respondents to estimate their overall competence. This approach is similar to that adopted by McCroskey and McCroskey (1986b). The scale items would then consist of specifications of a variety of different communication situations, specifying the use of the telephone for a variety of different tasks with a variety of interlocutors, on a number of different occasions. Again, a measure of overall competence would be obtained by summing responses across items.

Given that a measure of self-efficacy or self-perceived competence was available, it would then be predicted that, to the extent that the person saw the outcomes of telephone use in general to be positive, and perceived themselves as able to cope effectively, then that person's affective response to the medium would be positive. However, even if they saw the outcomes of telephone use in general to be positive, to the extent that they saw themselves as unable to cope effectively, their affective response to their use of the telephone would be negative. On the other hand, if the person saw the outcomes of telephone use in general to be negative, whether they perceived themselves as able to cope effectively or not, then that person's affective response to the medium would be negative.

If measures of self-efficacy or self-perceived competence are employed, the person's beliefs concerning outcomes can be assessed at the level of general outcomes, ie those which are seen to apply to telephone use in general. Beliefs about such outcomes associated with use of the telephone in general could be assessed by listing items such as those noted above:

> People use the telephone to keep in touch with their parents
>
> The telephone is used to arrange meetings and visits
>
> The telephone interrupts people when they are working
>
> People who use the telephone talk for too long

and asking subjects whether these items were "true" or "not true" of use of the telephone in general (eg by the average person). The evaluative component of each item would be determined by listing the same items and asking subjects whether, if these items were true of telephone use, would they see this as "good" or "bad" (or if they would "like" or "dislike" this). The person's overall attitude to "use of the telephone" would then be determined by summing the product of the belief strength

and evaluative judgment for each of these items.

The relation of competence to the other components
identified earlier can be represented as follows:

```
+---------------------------------+
| Self-report Scale               |
| Own Past Telephone Use          |
+---------------------------------+
        |
+---------------------------------+
| Person's Beliefs about          |
| Outcomes associated with        |
| Use of the Telephone            |
|   (Outcome Expectancies)        |
+---------------------------------+
        |
        |   +----------------------------+   +----------------------------+
        |   | Person's Beliefs about     |   | Person's Beliefs about     |
        |   | Skills needed to           |   | their competence in        |
        |   | Use the Telephone          |   | Using the Telephone        |
        |   | (Task Requirements)        |   | (Perceived Competence)     |
        |   +----------------------------+   +----------------------------+
        |              |                                |
        |              +----------+  +------------------+
        |                         |  |
        |              +----------------------------+
        |              | Person's Beliefs about     |
        |              | their Self-efficacy        |
        |              | with respect to            |
        |              | Use of the Telephone       |
        |              +----------------------------+
        |                         |
+---------------------------------+
| Person's Overall Evaluation     |
| of their                        |
| Use of the Telephone            |
+---------------------------------+
        |
+---------------------------------+
| Person's Intentions             |
| with respect to their           |
| Future Use of the Telephone     |
+---------------------------------+
        |
+---------------------------------+
| Objective Scale                 |
| Future Telephone Use            |
+---------------------------------+
```

In the above discussion, the "outcomes" associated with use of the telephone (the outcome expectancies) have been treated in an undifferentiated way. It is possible, however, to distinguish between different kinds of outcome, and in particular, to identify one important category of outcome, namely that of the affect associated with, or experienced as a result of actual or anticipated use of the telephone. That is, one category of outcome might include items of the kind: "Outcome of telephone use is to deliver message over distance". Another kind of outcome would be: "Outcome of telephone use is to cause user to feel nervous". Telephone apprehension, as originally defined by Steele and Reinsch (1983, 1984), is the sub-set of these affective outcomes that are negative. These distinctions, between affective and non-affective outcomes, and between negative and positive affective outcomes, can be incorporated as follows:

```
┌─────────────────────────────┐
│ Self-report Scale           │
│ Own Past Telephone Use      │
└─────────────────────────────┘
      │
┌─────────────────────────────┐
│ Person's Beliefs about      │
│ Outcomes associated with    │
│ Use of the Telephone        │
│   (Outcome Expectancies)    │
└─────────────────────────────┘
      │
  ┌───────────────────┬──────────────────────┐
┌──────────────────────┐   ┌──────────────────────┐
│ Person's Beliefs about│   │ Person's Beliefs about│
│ Affective Outcomes    │   │ Non-affective Outcomes│
│ associated with       │   │ associated with       │
│ Use of the Telephone  │   │ Use of the Telephone  │
└──────────────────────┘   └──────────────────────┘
      │                          │
  ┌────────────┬─────────────┐   │
┌──────────────────────┐   ┌──────────────────────┐
│ Person's Beliefs about│   │ Person's Beliefs about│
│ Negative Affective    │   │ Positive Affective    │
│ Outcomes assoc'd with │   │ Outcomes assoc'd with │
│ Use of the Telephone  │   │ Use of the Telephone  │
└──────────────────────┘   └──────────────────────┘
```

```
┌──────────────────────┐   ┌──────────────────────────┐
│ Person's Beliefs about│   │ Person's Beliefs about   │
│ Skills needed to      │   │ their competence in      │
│ Use the Telephone     │   │ Using the Telephone      │
│ (Task Requirements)   │   │ (Perceived Competence)   │
└──────────────────────┘   └──────────────────────────┘
              │                     │
        ┌──────────────────────────┐
        │ Person's Beliefs about   │
        │ their Self-efficacy      │
        │ with respect to          │
        │ Use of the Telephone     │
        └──────────────────────────┘
```

```
┌─────────────────────────────┐
│ Person's Overall Evaluation │
│ of their                    │
│ Use of the Telephone        │
└─────────────────────────────┘
      │
┌─────────────────────────────┐
│ Person's Intentions         │
│ with respect to their       │
│ Future Use of the Telephone │
└─────────────────────────────┘
      │
┌─────────────────────────────┐
│ Objective Scale             │
│ Future Telephone Use        │
└─────────────────────────────┘
```

It can be seen from this diagram that the term "Telephone Apprehension" can be defined at four different levels of generality. The most general level is that telephone apprehension is multi-componential, and includes behavioural, affective and cognitive components. The next most general level is that it refers exclusively to the evaluative components, but that these components include the evaluation of both affective and non-affective outcomes of telephone use. The next level is that where telephone apprehension refers specifically to the person's affective reaction to the use (or anticipated use) of the telephone, this includes both positive and negative affective outcomes. That is, telephone apprehension is defined as a bi-polar construct. The most specific definition of telephone apprehension is that it refers specifically and exclusively to the negative affective outcomes of the use of the telephone itself (that is, it is a uni-polar construct). It is this latter definition of telephone apprehension that seems most useful.

ELABORATION OF THE TAI SUB-SCALES

Having examined these general issues concerning the definition and measurement of telephone apprehension, it is now possible to examine specific points concerning the TAI. In Chapter Eight three sub-scales were identified, based on factor analyses of the original 20-item TAI. These scales were as follows:

TAI P-: Items

  8: I feel rushed and pushed when I use the phone
  9: When I have to talk on the phone, I grow nervous and uncomfortable
11: I feel misunderstood when I use the phone
14: I feel inhibited using the phone
16: I dread speaking on the phone

19:   I have feelings of frustration after most phone
      calls

TAI A-: Items

1:   I look forward to telephone conversations
4:   I find speaking on the telephone pleasant
7:   I thoroughly enjoy speaking on the telephone

TAI C-: Items

5:   I take pride in my speaking ability over the phone
6:   It is easy for me to express myself on the
     telephone

It has been argued earlier that the TAI P- sub-scale
corresponds most closely to apprehension as originally
defined, that the TAI A- sub-scale corresponds most
closely to an overall evaluation of telephone use, and
the associated behavioural avoidance-use, and the TAI C-
sub-scale corresponds to the person's beliefs about their
competence in using the telephone (self-perceived
competence) or to their beliefs about their self-efficacy
with respect to use of the telephone. Given the limited
number of items in each of these sub-scales, and the
limited range of outcomes sampled, additional items
should be added to each of these scales.

ITEM FORMAT IN THE TAI

The distributions of responses obtained from all of the
samples analysed so far are all positively skewed,
suggesting that the scale in its present form may
restrict subjects who wish to express more positive
orientations to the use of the telephone. In each sample,
the minimum score obtained was, or was close to, the
theoretical minimum score, whilst the obtained maximum
score was not, and was not particularly close to the

theoretical maximum score. This tendency to skewing was not as marked as in the US student data reported by Steele and Reinsch (1983, 1984), but would still suggest that the scale may need to be extended at the evaluatively positive end.

One reason for this may be the imbalanced proportions of positive and negative items which constitute the present scale. Of the 20 items, 13 are negative, that is, agreeing with these items indicates the existence of telephone apprehension (Items 2,3, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19 and 20), whilst only 7 items are positive (Items 1, 4, 5, 6, 7, 15, 17). Thus, there are approximately twice as many negative as positive items.

Conventionally, the negative/positive statement of scale items has been considered to be of methodological rather than substantive significance. However, Spielberger, Vagg, Barker, Donham and Westberry (1980) have argued that, with respect to the State-Trait Anxiety Inventory, distinct factors can be reliably identified which group together all, and only, those items which are "anxiety present". This also applies to those which are "anxiety absent". They have argued that rather than reflecting response bias, these factors reflect differences in "item-intensity specificity". That is, anxiety-absent items are more sensitive in measuring low levels of anxiety, because they measure the absence of "comfort" rather than the presence of "discomfort". Anxiety-present items are better for measuring high levels of anxiety, because they measure the presence of "discomfort".

If this argument is applied to the TAI, the scale can be seen to have a preponderance (13/20) of items which are "anxiety-present", and which are appropriate for the measurement and discrimination of high levels of telephone apprehension. On the other hand, the TAI has a lack of "anxiety-absent" items, which are appropriate for the measurement and discrimination of lower levels of

telephone apprehension. It is likely that responses to the scale would be less skewed if there were more positive ("anxiety-absent") items included. This would allow discrimination amongst respondents with low levels of telephone apprehension. Another reason for the failure to discriminate amongst respondents with relatively low levels of telephone apprehension may be the use of a limited 5-point response scale, rather than a more differentiated 7-point scale.

In Appendix 6, Table 11.01, the 13 negative ("anxiety-present") items in the original TAI are listed, together with suggested positive ("anxiety-absent") versions of each item. A 26-item scale, with 13 "anxiety-absent" (positive) items and 13 "anxiety-present" (negative) items is also outlined. It is predicted that the responses to this revised scale would be less skewed than to the original 20 item scale.

It is possible to test the prediction that the skew of the distribution is related to the ratio of positive ("anxiety absent") to negative ("anxiety present") items by reanalysing the existing data for the three samples reported in Chapter Five (UK Students, Australian Students, and UK Non-students). This can be done by constructing a shortened TAI scale consisting of just 14 items, the 7 original positive "anxiety-absent" items and a sub-set of just 7 of the original 13 negative "anxiety-present" items. A set of seven "T14" sub-scales of this kind were constructed, by randomly drawing seven different sets of 7 negative items from the total array of 13 negative items. For each of these T14 sub-scales the skewness of the distribution was calculated for each of the three samples. The resultant data shows that in all 21 of the 21 comparisons, the skewness was, as predicted, less positive than for the comparable T20 distributions.

SKEWNESS	UK STUDENTS (n=405)	AUSTRALIAN STUDENTS (n=389)	UK NON-STUDENTS (n=306)
T20	0.574	0.406	0.727
T14A	0.476	0.376	0.628
T14B	0.551	0.348	0.620
T14C	0.520	0.367	0.654
T14D	0.552	0.353	0.619
T14E	0.546	0.322	0.639
T14F	0.573	0.379	0.654
T14G	0.545	0.353	0.621

An alternative test of this prediction is to compare the skew of the distribution for a particular Telephone Apprehension Scale when the proportion of positive to negative items in that scale is varied. Consider, for example, a scale consisting of a total of ten items. If balanced for positive and negative items, it would contain 5 of each. Increasing the number (and hence proportion) of negative items would, according to the hypothesis proposed above, increase the positive skewing of the distribution, whilst increasing the number of positive items would decrease this skewing. To test this hypothesis, a T10 sub-scale (T10C) was constructed by randomly selecting 5 positive and 5 negative items from the 7 positive and 13 negative items in the original TAI. Four different versions of this were then constructed by choosing:

1 positive item to eliminate and 1 negative item to replace it with (T10B).

1 negative item to eliminate and 1 positive item to replace it with (T10D).

2 positive items to eliminate and 2 negative items to replace them with (T10A).

2 negative items to eliminate and 2 positive items to replace them with (T10E)

Examination of the resultant distributions shows that in all three samples, the degree of positive skewing decreases, and the mean of the distribution increases as the proportion of negative items decreases. The only

exception to this is the unexpectedly high skewness for
T10C in the UK student sample.

	[+:-]	UK STUDENTS (n=405)		AUSTRALIAN STUDENTS (n=389)		UK NON-STUDENTS (n=306)		[+ :-]
		Mean	Skew	Mean	Skew	Mean	Skew	
T20	(7:13)	49.15	0.574	46.06	0.406	41.97	0.727	(0.53:1)
T10A	(3:7)	24.92	0.498	22.92	0.487	20.69	0.772	(0.42:1)
T10B	(4:6)	25.26	0.467	23.23	0.417	21.30	0.682	(0.66:1)
T10C	(5:5)	25.36	0.505	23.35	0.409	21.83	0.663	(1.00:1)
T10D	(6:4)	26.04	0.440	23.79	0.367	22.58	0.561	(1.50:1)
T10E	(7:3)	26.93	0.387	24.27	0.315	23.02	0.522	(2.33:1)

It therefore appears to be important for substantive as
well as purely methodological grounds to include a
balance of not only positive and negative items, but also
affect-present and affect-absent items. In a scale which
includes both negative and positive items, this would
generate four different kinds of items:

	AFFECT PRESENT	AFFECT ABSENT
NEGATIVE AFFECT		
POSITIVE AFFECT		

An example of an "affect present, negative affect" item
would be "I feel nervous". An example of an "affect
absent, negative affect" item would be "I do not feel
nervous". Similarly, examples of "affect present,
positive affect" and "affect absent, positive affect"
items would be "I feel relaxed" and "I do not feel
relaxed". Inclusion of these four different kinds of
items would be particularly important in a measure of
apprehension.

Using, Communicating, Speaking and Listening

As noted in Chapter Nine, to the extent that telephone apprehension is concerned with apprehension associated with telephone communication (Steele and Reinsch, 1983, 1984), rather than with merely speaking on, or listening to, the telephone, it is necessary that the items included in any measures should specify communication as the stimulus, rather than speaking or listening. To the extent that the focus of these measures is upon communicating by telephone, items which specify using the telephone, a more inclusive and ambiguous term than communicating, should not be included. However, as reported in Chapter Nine, in practice, respondents do not appear to distinguish clearly between communicating on the one hand, and speaking and listening on the other. Whilst the separation of speaking and listening, and of communicating from both, is justified on logical grounds, and on the basis of other research, it may not be justified empirically on the basis of the evidence reported here.

The most prudent strategy in the development of a revised TAI would therefore seem to be to specify most items in terms of "communicating" by telephone, but to include at least some items which specify "speaking" and "listening". These items should be such as to allow the construction of sub-scales having adequate reliability to allow separate analyses to be performed if required.

A Taxonomy of Telephone Communication

In Chapter Two the taxonomy of communication situations proposed by Brown and Fraser (1979) was discussed.

```
                        Situation
                            |
        ┌───────────────────┴───────────────────┐
      Scene                                 Participants
        |                                        |
   ┌────┴─────────┐                               |
 Setting       Purpose                            |
   |              |                               |
 ┌─┴──────┐    ┌──┴──────┐                         |
Locale Time Bystanders Activity  Subject           |
                       Type     Matter             |
                        |         |                |
                        |         |                |
                      Goals,    Task,              |
                      Activated Topic              |
                      Roles                        |
                                                   |
                          ┌────────────────────────┴──────┐
                      Individual                    Relationships
                      Participants                    between
                          |                         Participants
            ┌─────────────┴────────────┐                 |
        Individual               Individual              |
           qua                    as member of           |
        Individual               Social Category         |
            |                          |                 |
      ┌─────┴──────┐                    |                 |
   Stable      Temporary            Sex, Age,             |
   Features    Features             Class,                |
      |           |                 Ethnicity,            |
      |           |                 etc                   |
  Personality, Moods,                                     |
  Interests,   Emotions,                                  |
  Appearance,  Attitudes,                                 |
  etc          etc                                        |
                                                          |
              ┌───────────────────────────────────────────┤
        Interpersonal                             Role and
        Relations                                 Category
            |                                     Relations
            |                                         |
         Liking,                                  Social power,
         Knowledge,                               Social status
         etc                                      In-group vs
                                                  Out-group,
                                                  etc
```

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It was noted that even this very detailed analysis was
incomplete, so that, for instance, with respect to
"interpersonal relations", further dimensional
differences could be specified:

> Dimension 1: Co-operative vs. Competitive
>
> Dimension 2: Equal vs. Unequal
>
> Dimension 3: Intense vs. Superficial
>
> Dimension 4: Socio-emotional vs. Task-oriented
>
> (Wish, Deutsch and Kaplan, 1976)

With these additions, Brown and Fraser's (1979) taxonomy
provides a scheme for identifying the variables which
should be included within measures designed to
investigate telephone apprehension. These variables are
now briefly described.

Brown and Fraser (1979) made a primary distinction
between 'Scene' and 'Participants'. They identified
'setting' as one element in the classification of the
'Scene'. Within the setting, they noted the elements of
'time', 'locale' and 'bystanders'. In the investigation
of telephone behaviour, each of these is likely to be a
significant influence. A number of studies have shown
that time is a significant influence upon telephone use
(Mayer, 1977), and hence this should be specified and an
appropriate range of times included. One way of doing
this would be to specify time in terms of charge bands,
such as 'peak-rate' vs 'standard rate' vs 'cheap rate'.
In terms of telephone use, one element of 'locale' may be
said to constitute the distance over which the call is
being made, distinguishing between local, long-distance,
and international calls. Another aspect of 'locale' is
the location of the telephone, for instance in terms of
being a domestic or business telephone. Whilst
investigations of telephone conferencing indicate that
the presence or absence of 'bystanders', ie of multi-
party calls, may be a significant influence upon
telephone use, the majority of telephone calls are

dyadic, and unless telephone conferencing is of specific interest the inclusion of this variable would not appear to be worthwhile. Similarly, whilst it is possible that bystanders will influence the behaviour of both the person making and the person receiving the call, in general telephone calls are seen to be primarily one-to-one events in which bystanders are either not present,or where they exercise "civil inattention". Although of interest if the influence of bystanders was the focus of investigation, it can be argued that the inclusion of this variable would not in general be worthwhile.

'Purpose' is defined in terms of 'activity type' and 'subject matter'. In turn, activity type is specified in terms of 'goals' and 'activated roles'. Within the investigation of telephone behaviour, activity type includes the activated roles of 'caller' and 'called'. Subject matter is specified in terms of 'task' and 'topic'. Although a number of quite elaborate classifications of both of these terms are available, such as the classification of communication episodes outlined by Short, Williams and Christie (1976), the distinction between instrumental and intrinsic uses of the telephone (Keller, 1977) appears to both appropriate and useful in this context. Intrinsic calls are those made for social reasons to family and friends, whereas Instrumental calls are those made for business purposes such as emergencies, shopping and arranging meetings. This distinction has been shown to have significance for understanding differential patterns of telephone use, for instance, distinguishing between male and female usage (Maddox, 1977; Noble, 1987), and in this thesis it has been suggested that it is related to the extent of sex differences in telephone apprehension.

In their analysis of 'Participants', Brown and Fraser (1979) distinguished between characteristics of the individual participants qua individuals, and relationships between individuals. For the purposes of

investigating telephone apprehension and telephone behaviour, measurement of individual characteristics can best be achieved using purpose-designed instruments. However, inclusion of variables which allow the range of relationships between individuals to be tapped would seem to be essential. As suggested above, one appropriate way of doing this is to use the taxonomy of relationships developed by Wish, Deutsch and Kaplan (1976). In a study of interactions, they identified four dimensions as significant: Co-operative vs Competitive, Equal vs Unequal, Intense vs Superficial, and Socio-emotional vs. Task-oriented. The latter dimension appears to duplicate the distinction introduced within the analysis of settings, namely that between intrinsic and instrumental uses of the telephone, and therefore need not be duplicated within an analysis of relationships.

As noted in Chapter Two, a complete specification of communication situations would be highly complex, and the specification of general variables, as attempted above, involves an extensive set of distinctions. However, if useful general purpose measures are to be developed, it is clearly important that each of the distinctions noted above should be included in order to sample the domain comprehensively and systematically. In terms of the measures noted earlier, the distinctions that should be included in the specification of items can be summarised as follows:

Past Telephone Use

Measure should include sampling of:
            time: 'peak-rate', 'standard rate', 'cheap rate'.
          locale: local vs long distance vs international.
           roles: caller vs called
      task/topic: instrumental vs intrinsic
relationship: co-operative vs competitive,
                equal vs unequal,
                intense vs superficial.

Metric: frequency of use

Non-affective Outcomes

Measure should include sampling of:

   valency: positive vs negative outcomes
  polarity: present vs absent

Metrics: belief strength
      : evaluation

Affective Outcomes

  valency: positive vs negative affect
intensity: affect present vs affect absent

Metrics: belief strength
      : evaluation

Skills needed (task requirements)
and
Self-perceived competences
or
Self-efficacy

Measure should include sampling of:
         interactional skills
or sampling of:
     time: 'peak-rate', 'standard rate', 'cheap rate'.
    locale: local vs long distance vs international.
     roles: caller vs called
  task/topic: instrumental vs intrinsic
relationship: co-operative vs competitive,
        equal vs unequal,
        intense vs superficial.

Metrics: belief strength

Overall Evaluation (Attitude to own use of the telephone)

Measure should include sampling of:

    valency: positive vs negative outcomes
   polarity: present vs absent

Metrics: belief strength
       : evaluation

Intention to use (Willingness/Unwillingness to Use)

        time: 'peak-rate', 'standard rate', 'cheap rate'.
      locale: local vs long distance vs international.
       roles: caller vs called
   task/topic: instrumental vs intrinsic
relationship: co-operative vs competitive,
              equal vs unequal,
              intense vs superficial.

Metrics: belief strength

Relationships amongst Measures

The set of measures identified above have been derived
from the recognition of significant conceptual
distinctions. These distinctions also imply a set of
relationships, which are conceptually casual and
empirically correlational. The following relationships
may be predicted:

Proposition 1: Past telephone use will be related to
belief strength (expectancies) of non-affective outcomes,
and also to evaluation of non-affective outcomes.

Proposition 2: Past telephone use will be related to belief strength of affective outcomes, and also to evaluation of affective outcomes

Proposition 3: Self-efficacy will be related to both the skills seen to be needed (task requirements), and to the person's self-perceived competences.

Proposition 4: Overall evaluation (ie attitude to the person's own use of the telephone) will be related to the evaluation of both affective and non-affective outcomes, and to self-efficacy.

Proposition 5: Intention to use the telephone in future (Willingness/Unwillingness to Use) will be related to overall evaluation to the person's current use of the telephone.

Proposition 6: Objective measures of future telephone use will be closely related to stated intentions to use the telephone.

These propositions also provide a summary of the significance of telephone apprehension in the determination of telephone usage. That is, telephone apprehension (defined as the summation of the expectancy-evaluations of the negative affective outcomes of telephone use) is predicted to be related to self-reports of past telephone use. It is also predicted to be one of the components determining the overall evaluation of (attitude to) the person's use of the telephone. Other components include non-affective outcomes and self-efficacy. As one of the components of this overall evaluation, telephone apprehension will also be one of the determinants of intentions to use the telephone in future, and this will be closely related to actual future use of the telephone. On the other hand, as only one of the components of overall evaluations of telephone use, intentions to use, and actual usage, the relationship

between these and telephone apprehension can be predicted to be low to moderate.

The model of telephone apprehension outlined here will be expanded and developed in Chapters Twelve and Thirteen.

CHAPTER TWELVE

ANXIETY, STRESS AND TELEPHONE APPREHENSION

SYNOPSIS

In this chapter telephone apprehension is placed within the context of existing psychological theory and research on emotion, anxiety and stress, and on social anxiety.

The Differential Emotions Theory of Anxiety proposes that anxiety is a combination of the fundamental emotion of fear and a number of other emotions such as guilt, and in other cases, interest, anger, shame or shyness. That is, anxiety is not a unitary phenomenon. It is noted that because the original definition of telephone apprehension did not recognise the intrinsic complexity of anxiety, no systematic way of predicting the differential behavioural correlates of telephone apprehension is possible.
However, the revised definition of telephone apprehension proposed in this thesis does allow variations in the emotional pattern underlying telephone apprehension to be identified, and more precise predictions made concerning the behavioural correlates of telephone apprehension.

The Transactional Model of stress proposes that stress occurs when there is a mismatch between the perceived demands placed upon a person and the perceived resources they have available to meet those demands, and anxiety is one of the possible outcomes of such stress. This model predicts that telephone apprehension will be related to the differential between self-perceived telephone competence and the perceived difficulty of telephone communication. The role of predictability and controllability in stress was examined and the importance of controllability to attitudes towards the telephone was noted.

The literature on social anxiety was reviewed, and social anxiety was defined primarily in terms of the discomfort (affect) experienced in the presence of others. The

social skills and information processing approaches to
the understanding of social anxiety were outlined, and
some of the implications of these approaches for the
understanding of telephone apprehension were identified.

An examination of the relation between social anxiety and
telephone apprehension was reported. Social anxiety was
measured using Cheek and Buss's Shyness and Sociability
scales, and Leary's Interaction and Audience Anxiousness
Scales. Telephone apprehension was measured using the TAI
and the associated subscales TAI P-, TAI A-, and TAI C-.
The results suggested that telephone apprehension is not
simply a manifestation of, and solely due to social
anxiety. To the extent that social anxiety is related to
telephone apprehension, it appears to be most closely
related to the individual's expressed self-confidence in
their ability to use the telephone well.

It was concluded that a comprehensive understanding of
telephone apprehension could only be developed within a
properly grounded understanding of the relation between
emotion and anxiety, of stress, and of social anxiety.

CHAPTER TWELVE

ANXIETY, STRESS AND TELEPHONE APPREHENSION

INTRODUCTION

In this chapter, the phenomena of telephone apprehension, and of communication apprehension in general, is placed in the context of existing theorising and research on anxiety, social anxiety and stress. Within psychology, there is an extensive research literature concerned with these superordinate concepts, which appears not to have been taken into account and incorporated into theorising about telephone and communication apprehension. This review situates these concepts within the superordinate psychological concepts, and suggests a number of specific hypotheses concerning telephone apprehension which then follow.

In this thesis, communication apprehension has been defined as "an individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons" (McCroskey, 1978, p. 200). Following this model, telephone apprehension was initially defined as "anxiety or fear associated with the anticipated or actual use of the telephone as a communication channel" (Steele and Reinsch, 1983). In Chapter Eleven, a revised definition of telephone apprehension was proposed, defining it as the summation of the products of belief strength and evaluation of each of the negative affective attributes associated use of the telephone. That is, telephone apprehension is the summated negative affective expectancy-outcomes associated with telephone use.

The understanding of telephone apprehension would be facilitated by relating further communication research and theorising to existing psychological work on emotion and anxiety. The hierarchical relationships amongst the various key terms can be represented as follows:

```
        ┌─────────┐
        │ Emotion │
        └─────────┘
     ┌────────┴────────┐
┌─────────┐      ┌────────┐
│ Anxiety │      │ Stress │
└─────────┘      └────────┘
     └────────┬────────┘
        ┌──────────────┐
        │ Social Anxiety │
        └──────────────┘
              │
    ┌──────────────────────────┐
    │ Communication Apprehension │
    └──────────────────────────┘
              │
    ┌────────────────────────┐
    │ Telephone Apprehension │
    └────────────────────────┘
```
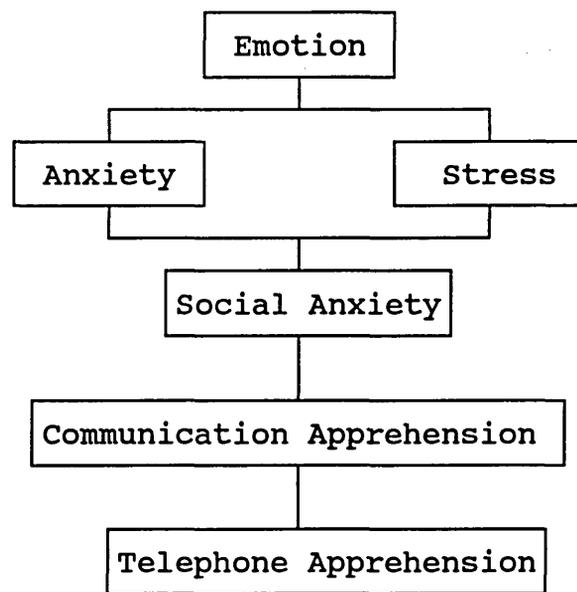
This chapter begins by exploring the relation between emotion and anxiety, and then examines the relationship between stress and anxiety. It then considers social anxiety, and the relationship of social anxiety to telephone anxiety.

THE RELATIONSHIP BETWEEN EMOTION AND ANXIETY

Izard and Blumberg (1985) note that, whilst few would deny that anxiety and emotion are related in some important fashion, the majority of current research and theorising has in fact tended to ignore the emotional aspects of anxiety in favour of cognitive formulations (for example, the work of Beck, Emery and Greenberg, 1985). In contrast to this, Izard and Blumberg (1985) assume that anxiety is a complex, multidimensional phenomenon which involves affective responses, associated cognitions, expressive behaviours and physiological reactions. The Differential Emotions Theory of anxiety (Izard, 1972, 1977, 1985; Buechler and Izard, 1980; Izard and Blumberg, 1985) is an attempt to incorporate all of these aspects. It proposes that there are a number of fundamental emotions which are defined by unique neurophysiological, expressive, and phenomenological

components. These fundamental emotions are interest, joy, surprise, sadness, anger, disgust, contempt, fear, shame, shyness, and guilt. According to these authors, the neurophysiological component is an innately programmed pattern of electrochemical activity. The expressive component involves, primarily, characteristic facial expressions and some bodily responses. The phenomenology of an emotion is the quality of the sensed experience, the feeling state.

Izard and Blumberg (1985) see the emotional system as the principal human motivational system. Emotions are seen as adaptive and motivating organisers of experience and behaviour. They recognise three other motivational systems, the biological maintenance system (eg hunger, thirst, and sex), the transitory affective-cognitive system, and the stable, trait-like system resulting from the repeated occurrence of particular patterns of transitory affective-cognitive interactions. These affective-cognitive structures can develop into complex personality traits, such as introversion and anxiety. The emotional system interacts with these other systems in determining awareness, focusing perception and organising action. According to Izard and Blumberg (1985), the particular pattern of emotions, and the other motivational systems, provide a basis for predicting an individual's cognitions and actions.

A pattern of emotions is defined as an interactive set of emotions, in which one of them, the key emotion, is experienced more intensely than the others. Fear is the key element in anxiety. Other emotions (eg guilt) and affective-cognitive structures (eg guilt-aggression fantasies) form the remainder of the pattern. Bartlett and Izard (1972) and Izard (1972) showed that other fundamental emotions which can be involved in anxiety are interest, anger, shame and shyness. One of the implications of this analysis is that anxiety is not a unitary phenomenon, but both within and between

individuals there are different "anxieties".

Thus, the term anxiety refers to a variety of feeling states and associated cognitions and action tendencies. The particular pattern of emotions experienced will depend upon situational and personological variables, and because anxiety is a complex and variable pattern of emotions, Differential Emotions Theory predicts that anxiety can motivate a number of different kinds of behaviours. Whilst fear is the key or essential element, and by itself would be associated with motivation to escape or avoid, the other emotions experienced will also influence behaviour. For example, a fear-interest pattern of anxiety may motivate cautious exploration, whilst fear-anger may motivate protest and aggression (Izard and Blumberg, 1985).

Thus, whilst McCroskey's (1978) definition of communication apprehension and Steele and Reinsch's (1983) definition of telephone apprehension recognise the key emotion of fear, by not recognising that anxiety is a complex emotional pattern, and that different kinds of anxiety exist, no systematic way of predicting differential behavioural correlates of telephone or communication apprehension is provided. The revised definition of telephone apprehension proposed above ("the summated negative affective expectancy-outcomes associated with telephone use") allows variation in patterns of anxiety to be identified. The Differential Emotions Scale-IV (Izard, Dougherty, Bloxom, and Kotsch, 1974) provides a self-report measure of the fundamental emotions, and this scale could be used as the basis of a measure of the fundamental emotions experienced when using the telephone. Thus, in addition to predicting a relationship between an overall quantitative measure of affective outcome and telephone use, the Theory of Differential Emotions leads to the prediction that the precise nature of the behavioural correlates of telephone apprehension will depend upon the particular pattern of

fundamental emotions involved, such as interest, anger, guilt, shame and shyness. That is, a basis is provided for predicting whether particular individuals will, at any given level of telephone apprehension, approach or avoid telephone use, actively engage in or withdraw from telephone conversations they do participate in, and whether their participation is likely to be fluent or disrupted. The Differential Emotions Theory even appears to offer a basis on which the prediction of over-communication as a response to anxiety may be made.

ANXIETY AND STRESS

In discussions of anxiety, the term stress is frequently used as if it were synonymous. However, stress is properly a more general term than anxiety. It is used to refer to both the pattern of physiological, emotional, cognitive and behavioural responses that occur when a person is faced with excessive environmental demands, and to the cause of those responses.

According to the Transactional model of stress (Cox and Mackay 1981), stress occurs when there is a mismatch between the demands placed upon a person and the resources they have available to meet these demands. More accurately, it proposes that stress occurs when there is a mismatch between the demands that a person perceives themselves to be facing and the resources they see themselves as possessing which allow them to meet those demands. Anxiety would be one of the consequences of such stress, occurring in cases where the perceived demands were greater than the perceived resources. Stress will also be experienced when resources are greater than perceived environmental demands, and in this case emotions such as frustration would arise.

When applied to the problem of telephone apprehension, the transactional model of stress predicts that

experienced telephone apprehension would only be partially correlated with self-perceived levels of communicative competence. It would be more closely correlated with the <u>difference</u> between perceived levels of competence and perceived task demands. Anxiety will be high when perceived competence was lower than the perceived task demands. Anxiety would be low when perceived competence was greater than perceived task demands. Telephone apprehension will therefore be related to the ratio or difference between perceived telephone communication competence and perceived difficulty of telephone communication. When perceived difficulty of telephone communication is (relatively) greater than self-reported telephone communication competence, then telephone apprehension will be high, whereas when perceived difficulty of telephone communication is less than self-reported telephone communication competence, then telephone apprehension will be relatively low.

STRESS AND CONTROLLABILITY

Predictability and perceived controllability are two of the critical determinants of people's response to stressors. A variety of empirical studies show that unpredictable and uncontrollable stressors have more adverse effects than stressors which are predictable and controllable (eg Averill, 1973; Cohen, Glass, and Phillips, 1979; Lefcourt, 1973). A number of theories have been proposed to account for this relationship (eg Averill, 1973; Cohen, 1978; Glass and Singer, 1972; Seligman, 1975).

The concepts of controllability and predicatbility appear to be particularly relevant to the understanding of telephone apprehension. Some of the most common complaints about the telephone concern its lack of controllability. As noted in Chapter Four, Noble (1987) developed a set of scales to assess "telephone

obedience", the extent to which people felt compelled to answer a ringing telephone. The scale consists of items which seem to tap the extent to which the person feels in control of, as opposed to controlled by, the telephone. Noble's results indicated that the phone is widely seen as uncontrollable. Most people felt that they had to answer a ringing telephone (73%), even when they know that the call is not for them (59%), and 55% of people reported feeling 'guilty if the telephone rings and I don't answer it'.

In a later study, Noble (1989) asked people why they sometimes disliked the telephone, and how they felt the phone "used" them. The reasons given (including items such as 'Can't tell who is on the other end', 'Inconvenient calls at inconvenient times', and 'People talk too long on the phone') suggest that uncontrollability and unpredicatbility are central to the reasons given for disliking the telephone. As noted in Chapter Four, Noble (1989) classified the reasons people gave for disliking the phone into 11 categories:

What people dislike about the telephone

 1: Expense
 2: Interruptions (time inconvenient)
 3: Invasion of privacy (caller inconvenient)
 4: Nuisance calls (topic unwelcome eg obscene calls,
    sales calls)
 5: Unwanted availability (caller unwelcome)
 6: Failure to connect (wrong number, no reply, engaged,
    wrong person, answer machine)
 7: Problematic communication (medium creates
    difficulties for effective/efficient communication)
 8: Over-convenience (user over-uses phone)
 9: Obedience (obligation to answer)
10: Impersonal (difficult to communicate feelings)
11: Brings bad news

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and similarly for the classification of how people felt the phone 'used' them.

1: Obedience (obligation to answer)
2: Time damage (interruptions, time wasted, invasion of
                        privacy)
3: Nuisance calls/callers (unwanted calls)
4: Powerful persuasive medium (manipulated via phone in
                                unwanted ways)
5: Cost of convenience (too convenient leads to too
                        costly)
6: Too enticing (over-use)
7: Insensitive callers (callers don't take account of
                        receiver's situation)
8: Unpleasant anticipation (uncomfortable waiting for
                                important incoming call)
9: Pressure to acquire telephone

The majority of these eleven categories appear to tap
notions of uncontrollability and unpredictability.

Examination of the process of both making and receiving
calls indicates that uncontrollability and
unpredictability is intrinsic to the nature of the
telephone. When receiving a call, the extent of
uncontrollability is considerable:

* Lack of control over when the telephone rings
* Lack of control over who is calling
* Lack of control over the topic they are calling about

When making a call control seems greater, but there are
still uncertainties which may generate stress:

* Am I using the right number?
* Have I dialled the right number?
* Will I get the number I called?
* Will the call be answered?
* Will the call be answered by the person I want to speak
  to?
* And if not, will the person I want to speak to be
  available?
* And if they are, will they be able (or want) to speak
  to me at this time?
and so on ....

Given the degree to which uncontrollability and unpredictability are features of telephone use, stress and anxiety may be expected to be associated with its use.

The notion of controllability can also be applied to other aspects of telephone use. For instance, the telephone answering machine, which tends to arouse strongly negative feelings, offers the callee considerably increased controllability, but does so by reducing controllability for the person calling. For the person being called it increases control over when calls arrive and are dealt with, and it allows greater control over whom one talks to about what, and with what degree of preparation. At the same time, for the caller, it removes their control over when they call, and also introduces another possible outcome to the call, that of being greeted by a telephone answering machine. It may be this transfer of control that accounts for the strong feelings associated with the use of answering machines by both the callers and the called.

Given the importance of these notions of predictability and controllability, and their relation to the experience of stress and anxiety, it is likely that there will be a relationship between:

> 1) the extent to which a person sees the telephone
> as unpredictable and uncontrollable, and the level
> of telephone apprehension they experience,

and

> 2) the person's general tolerance of
> unpredictability and uncontrollability, as measured
> by personality dimensions such as tolerance for
> ambiguity, dogmatism and sensation seeking, and the
> level of telephone apprehension experienced.

Anxiety associated with social situations and social
interaction is clearly both a sub-set of general anxiety,
and a supra-ordinate set with respect to communication
and telephone apprehension. Social anxiety is amongst the
most commonly studied and treated anxiety disorders. It
has been cited as the most pervasive, debilitating, and
distressing of anxieties (Curran, 1977). It is also
associated with social performance deficits that have
been implicated in more severe forms of social pathology
or psychopathology (Libet and Lewinsohn, 1973; Zigler and
Phillips, 1961; see also Curran, 1977; Hersen and
Bellack, 1977).

Social anxiety and shyness are often used as
interchangeable terms. Like shyness (see Chapter Three),
there is a tendency to define social anxiety in terms of
multiple elements. Some definitions emphasise the
internal discomfort experienced by the socially anxious
person, others focus upon the observable behaviours of
the socially anxious person (eg avoidance of
interaction), whilst others identify social anxiety with
inadequate social competence. Many definitions employ
some combination of some or all of these elements. As
with the case of shyness, it appears most appropriate to
use the term social anxiety to refer to the negative
affect associated with social interaction. This approach
is illustrated by Buss (1980), who defined social anxiety
as the discomfort experienced in the presence of others,
identifying the affective component as primary. Within
social anxiety, he identified four types of discomfort,
which he labelled embarrassment, shame, audience anxiety
and shyness. Leary (1983b) also proposed the use of the
social anxiety concept, but suggested that the term
should be used to refer simply to the affective component
of shyness.

Two approaches dominate current research attempts to

understand the causes of social anxiety. Both are cognitive-behavioural approaches. The first derives from work on social skills, which emphasises the role of learning and behavioural skills. The second derives from work on information processing and social cognition, and emphasises the importance of perceptual and interpretative processes. The position advocated by the social skills approach (eg Merluzzi, Rudy and Krejci, 1986) is that various deficits in social skills, particularly those of performance, lead to anxiety. In turn, anxiety will affect the performance of skills, for instance, by altering the effectiveness with which particular behaviours are performed. Skills-based models can be divided into three main types: conditioning, deficient skills learning, and inappropriate role modelling. The conditioning model has as its basis the classical conditioning of fear responses. Avoidance and fear of social interaction is learned through the association of early fear-provoking situations with social interaction or specific social stimuli. The skills deficit model is based upon the operant conditioning paradigm. The socially anxious person's learning environment is seen as one which did not reinforce, or which actively punished, socially skilled behaviours. The problem of social anxiety then persists because of the resultant skills deficit, and the inability of the person to execute socially skilled behaviours that will be positively reinforced. The social learning model is an extension and liberalisation of the operant learning model. Social anxiety occurs because of learning from role models which lead to the acquisition of withdrawn, phobic-type or other inappropriate behaviours. The social behaviours learnt from such role models are then reinforced, with the social phobias, for some social situations at least, being maintained.

The other dominant approach to the understanding of social anxiety is the information processing perspective. This can in fact be seen as an extension of the social

learning approach, which encompasses the more general
principles of the acquisition, representation and
interpretation of social and interactional information,
explored within a general information processing
paradigm. A variety of empirical studies support the
utility of the information processing approach to
understanding of social anxiety, demonstrating that
social actions are, at least in part, determined by the
types of information processing strategies used (eg
Fiedler and Beach, 1978; Kuperminc and Heimberg, 1983)

A particularly interesting aspect of the information
processing approach to the understanding of social
anxiety is the attention recently given to maladaptive,
self-focused, negative thought patterns. A number of
investigators have emphasised the importance of these
patterns of thought in anxiety states. They have
suggested that such patterns are the cause of both the
affect and performance deficits associated with anxiety
states (see Meichenbaum, 1977; Meichenbaum, Gilmore and
Fedoravicious, 1971; Sarason, 1972b, 1975; Wine, 1971).
This pattern has been termed "anxious self-preoccupation"
by Sarason (1975), and includes cognitions of self-doubt,
self-derogation, concern about poor performance, the
anticipation of harm to the self, and fear of loss of
self-esteem. A variety of theoretical approaches and
empirical studies have emphasised the importance of
maladaptive cognitive processes in social anxiety (eg
Cacioppo, Glass and Merluzzi, 1979; Houston, 1977; Leary,
1983b; Sutton-Simon and Goldfried, 1979). Many empirical
studies of social anxiety have provided support for this
position. For instance, Heimberg, Dodge and Becker (1987)
have suggested that social anxiety is characterised by
dysfunctional patterns of self-focused, negative
thinking. Several studies have found evidence of negative
self-evaluations (Clark and Arkowitz, 1975; Leary, 1983a)
and an increased frequency of negative self-statements
(Cacioppo, Glass and Merluzzi, 1979; Glass, Merluzzi,
Biever and Larsen, 1982; Merluzzi, Rudy and Krejci, 1986)

in subjects with high levels of social anxiety.

If these findings are extrapolated to telephone apprehension, it can be predicted that this pattern of anxious self-preoccupation, that is, of maladaptive, self-focused, negative thought patterns will characterise high telephone apprehensives. These patterns will be associated with both negative affect and performance deficits associated with use of the telephone. The pattern will include cognitions of self-doubt and self-derogation, concern about poor performance, the anticipation of negative consequences for the self, and fear of loss of self-esteem.

Smith, Ingram and Brehm (1983) have suggested that social anxiety is characterised by an increased concern with the evaluations of others, but not necessarily by increased concern with self-evaluation. In addition, the accuracy of self-reports may actually be greater in socially anxious individuals, as a result of the breakdown of normally protective self-deception processes. (See Leary 1983a, following Alloy and Abramson (1979, 1982) and Abramson and Martin (1981)). A number of researchers have also noted the association between social anxiety and irrational beliefs concerning the necessity of other people's approval (eg Ellis, 1962; Goldfried and Sobocinski, 1975). If these findings are extrapolated to telephone apprehension, it would be predicted that high telephone apprehensives would be characterised by an increased concern with the evaluations of others, relative to the importance attached to their own self-evaluations, with respect to their ability to use the telephone. To low telephone apprehensives, the importance attached to these evaluations of others would appear to be over-estimated and irrational.

It would be expected that there would be a relationship between social anxiety and telephone apprehension. Whilst telephone apprehension might be specific in its determinants, it would be expected that a proportion of people describing themselves as socially anxious would experience high levels of telephone apprehension as a function of the generalisation of that social anxiety to all channels of social interaction.

Leary (1983a) developed a measure designed to measure only the affective components of social anxiousness. In addition, Leary distinguished between interaction anxiousness and audience anxiety. Leary (1983b) describes interaction anxiety as "social anxiety experienced in contingent interactions, whereas audience anxiety is experienced in non-contingent interactions". Leary's Social Anxiety measure therefore consisted of two sub-scales, one focusing on interaction anxiousness (15 items), and one focussing on audience anxiety (12 items). The two sub-scales correlate 0.44 with one another, indicating the presence of some common underlying factor of social anxiety.

Cheek and Buss (1981) developed separate measures of shyness and sociability. The 9-item Shyness Scale taps both the affective and behavioural components of their definition of shyness ("tension and inhibition when with others"). They reported good internal consistency of the scale (Alpha=0.79) and test-retest reliability of 0.74). The scale excludes items that assess sociability per se (a preference for being with others rather than being alone) and focuses on, and includes both anxiety and inhibition items. As such it is not a pure measure of social anxiousness, but Leary (1983b) suggests that it is perhaps the best available combined measure of social anxiousness and inhibition (ie shyness). The Sociability Scale consists of five items which assess the

individual's preference for being with others rather than being alone. A factor analysis conducted by Cheek and Buss indicated that shyness and sociability are distinct personality dispositions. Self-reported shyness showed only a moderate negative correlation with self-reported sociability (r=-0.30), and the measures of sociability and shyness had quite different patterns of correlations with various personality scales. On the basis of these different patterns, Cheek and Buss (1981) suggested that shyness is most closely related to the larger construct of psychological insecurity (e.g. Ainsworth and Ainsworth, 1958; Maslow 1942), rather than to the absence of sociability per se.

Data were collected to examine the relationship of telephone apprehension and social anxiety. The data were collected from volunteer undergraduate students taking social science courses at a UK Institute of Higher Education. Measures included were the TAI-20, Leary's Interaction Anxiousness and Audience Anxiousness Scales (Leary, 1983a), and Cheek and Buss's Shyness and Sociability scales (Cheek and Buss, 1981). Not all measures were completed by all subjects, and the following numbers of subjects completed each measure:

| SCALE | SAMPLE SIZE | | |
	SAMPLE ONE	SAMPLE TWO	TOTAL
TAI-20	33	31	64
Leary Interaction Anxiousness	33	31	64
Leary Audience Anxiousness	--	31	31
Cheek & Buss Shyness	33	--	33
Cheek & Buss Sociability	33	--	33

In Chapter Eleven it was suggested that the TAI P- sub-scale corresponds most closely to the original definition of apprehension. That is, it is a measure of anxiety associated with use of the telephone. The TAI A- sub-scale appears to combine a measure of overall evaluation and behavioural predispositions. The TAI C- sub-scale corresponds most closely to the person's beliefs about

their competence in using the telephone (self-perceived competence) or self-efficacy.

It was predicted that whilst Cheek and Buss's Shyness measure might correlate significantly with all three TAI sub-scales, the highest correlation would be expected to be with the TAI P- sub-scale, as both this and the Shyness Scale tap anxiety. It was predicted that there would be no significant correlations between scores on Cheek and Buss's Sociability Scale and either sub-scale or overall telephone apprehension scores.

Leary's measure of Interaction Anxiousness is a purely affective measure. As such, it was predicted that it would correlate significantly and most highly with the TAI P- sub-scale scores. As a measure of non-contingent interaction anxiety, it was predicted that there would be no correlation between scores on Leary's Audience Anxiousness scale and TAI sub-scale or overall scores.

Results

There were 49 female and 15 male subjects. 60 were in the age group 18-25, 4 were in the 26-35 age group. Comparison of male (N=15) and female (N=49) subjects showed that in the combined sample males tended to have higher telephone apprehension scores, with some comparisons being significant.

SCALE	MALE Mean	sd	FEMALE Mean	sd	t value	significance (df=62, 1-tailed)
T11	27.47	10.11	24.10	6.83	1.48	0.072
TAI P-	13.13	5.38	11.61	3.66	1.25	0.107
TAI A-	8.67	3.75	6.84	2.53	2.17	0.017
TAI C-	5.67	1.99	5.65	1.76	0.03	0.490
T20	48.13	19.09	42.67	12.66	1.29	0.101

The distribution of the Sociability, Shyness and
Interaction Anxiousness scales were as follows:

CHEEK & BUSS MEASURES: SUMMARY STATISTICS (N=33)

	SHYNESS	SOCIABILITY
MEAN	22.485	19.394
SD	5.933	3.749
MIN SCORE	13	6
MAX SCORE	39	25
KURTOSIS	0.490	3.975
SKEWNESS	0.287	-1.324
Alpha	0.8454	0.7664

The distribution of the Interaction Anxiousness and
Audience Anxiousness scores were as follows:

LEARY MEASURES: SUMMARY STATISTICS

	INTERACTION ANXIOUSNESS (N=64)	AUDIENCE ANXIOUSNESS (N=31)
MEAN	39.297	35.484
SD	10.274	8.177
MIN SCORE	17	22
MAX SCORE	63	50
KURTOSIS	-0.058	-1.081
SKEWNESS	0.032	-0.027
Alpha	0.8871	0.7458

There were no significant sex differences in scores on
the measures of shyness (Male=23.00 Female=22.35, df=31,
t=0.26, p<0.800, 2-tailed, nsd) and sociability
(Male=18.57 Female=19.62, df=31, t=-0.65, p<0.522, 2-
tailed, nsd) as a function of respondent sex. Male and
female Interaction Anxiety scores did not differ
significantly (Male=37.27 Female=39.92, df=62, t=-0.87,
p<0.386, 2-tailed, nsd), but females were significantly
more Audience Anxious than males (Male=28.63
Female=37.87, df=29, t=-3.13, p<0.004, 2-tailed).

The sex distribution of subjects was very imbalanced, and
therefore no great weight should be attached to these
comparisons. Given the very restricted age distribution,

no comparison of levels of telephone apprehension as a function of age were undertaken.

The following correlation matrix between Telephone Apprehension scores and the four measures was calculated:

	T11	TAI P-	TAI A-	TAI C-	T20
Shyness (n=33)	0.0766 p<0.463	0.0725 p<0.344	-0.1066 p<0.278	**0.4169** **p<0.008**	0.0322 p<0.429
Sociability (n=33)	0.0168 p<0.463	-0.0891 p<0.311	0.1786 p<0.160	-0.1048 p<0.281	0.0241 p<0.447
Interactional Anxiety (n=64)	**0.5361**	**0.4609**	**0.3348** **(all significant at P<0.0001)**	**0.7098**	**0.5248**
Audience Anxiety (n=31)	**0.4167** **p<0.01**	**0.3561** **p<0.025**	**0.3012** **p<0.05**	**0.5526** **p<0.001**	**0.4296** **p<0.008**

The matrix shows that, contary to predictions, the highest correlation with Shyness scores was the significant correlation with the TAI C- sub-scale, whereas correlations with both the TAI P- and TAI A- sub-scales were non-significant. As predicted, there were no significant correlations between sociability scores and any of the sub-scale measures. There were no significant correlations between overall telephone apprehension (T11 or T20 scores) and shyness (social anxiety and behavioural inhibition), and as predicted, there was no significant relation between sociability and overall telephone apprehension. These results can perhaps best be interpreted by suggesting that telephone apprehension is not simply a manifestation of, and solely due to social anxiety. To the extent that social anxiety is related to telephone apprehension, it appears to be most closely related to the individual's expressed self-confidence in their ability to use the telephone well.

There were significant correlations between both overall and sub-scale telephone apprehension scores and the

Interactional Anxiety measure, with the greatest
correlation being with the TAI C- sub-scale. However,
contary to predictions, all three telephone apprehension
sub-scale scores correlate significantly with Audience
Anxiety scores. However, the correlations between
Interactional Anxiety and telephone apprehension are
higher than those between telephone apprehension and
measures of Audience (ie non-contingent) Anxiety. It
should be noted that the correlation between the
Interactional Anxiety and Audience Anxiety scales was
0.6521 (n=31, p<0.0001) and this correlation probably
accounts for the significant correlations between
telephone apprehension and audience anxiety.

An alternative interpretation is to note that the
existence of significant correlations between audience
anxiety and telephone apprehension is unexpected only if
it is assumed that the telephone is primarily a private,
dyadic, interactional medium. However, it appears that
the telephone is not necessarily seen in this way.
Instead, it appears to be seen as a public, relatively
formal medium of communication, at least by some people,
and for these people it would be expected that there
would be significant correlations between telephone
apprehension and audience anxiety.

The correlation between the two measures which included a
social anxiety component (Shyness and Interactional
Anxiety) was highly significant (r=0.8487, p<0.0001),
whereas those between these two measures and sociability
were low and non-significant (Sociability/Shyness: r=-
0.1198, ns; Sociability/Interactional Anxiety: r=-0.1929,
ns).

These findings can be summarised by noting that telephone
apprehension and general social anxiety are correlated,
but there is no relation between telephone apprehension
and sociability. Social anxiety is most clearly related
to the Lack of Confidence aspect of telephone

apprehension, with the correlation between measures of
social anxiety and the TAI C- sub-scale either being
significant when overall correlations were non-
significant, or consistently greater amongst a pattern of
significant correlations.

CONCLUSION

In this chapter the review of existing psychological
research dealing with issues such as the nature of
anxiety, of stress, and of social anxiety has shown that
in each case, significant implications arise for the
understanding of the genesis and maintenance of telephone
apprehension. It is clear that, if a comprehensive
understanding of telephone apprehension is to be
developed this must be done within a properly grounded
understanding of the relation between emotion and
anxiety, of anxiety and stress, and of the nature of
social anxiety.

CHAPTER THIRTEEN

COMMUNICATION COMPETENCE, SELF-EFFICACY

AND TELEPHONE APPREHENSION

SYNOPSIS

In this chapter, the relation of telephone apprehension to communicative competence and self-perceived efficacy expectancies is reviewed, and the implications of this research for the understanding of telephone apprehension are explored.

It is proposed that telephone competence will be related to telephone apprehension, but that telephone competence will not be the only determinant of telephone apprehension.

Self-efficacy theory proposes that a central determinant of an individual's behaviour is that person's sense of personal mastery, or self efficacy. Empirical studies are reviewed which show that self-efficacy expectancies are significant predictors of behaviour. It is proposed that a model to predict individual telephone use should contain three elements: the individual's estimates of the value of particular outcomes (evaluation outcome), the individual's estimates of the likelihood that particular outcomes would result from their use of the telephone (belief strength or outcome expectancies), and the individual's self-perceived efficacy expectancies, that is, their belief that they could perform the behaviours necessary to achieve those outcomes. Within this model, telephone apprehension is defined as a particular subset of outcome expectancies, namely the expectation of negative affective outcomes

Self-efficacy theory proposes that both fearful expectations and avoidance behaviour arise from perceived inefficacy in coping, and that avoidance behaviour is not directly related to fear or anxiety. It is therefore proposed that low telephone self-efficacy is predictive

of telephone avoidance and telephone apprehension, but
that telephone apprehension is not necessarily predictive
of telephone avoidance.

It is concluded that, if a complete understanding of
telephone apprehension is to be developed this must be
done within a properly grounded understanding of the
relation between competence, self-efficacy and
apprehension.

CHAPTER THIRTEEN

COMMUNICATION COMPETENCE, SELF-EFFICACY

AND TELEPHONE APPREHENSION

INTRODUCTION

In this chapter, the relation of telephone apprehension, and of communication apprehension in general, to interpersonal competence, and communicative competence in particular, is examined. Recent research and theorising concerned with self-perceived efficacy expectancies is also reviewed and the implications of this research for the understanding of telephone apprehension are explored. Areas which are promising for future investigation are noted throughout the discussion.

TELEPHONE APPREHENSION AND COMMUNICATIVE COMPETENCE

The concept of competence in the area of interpersonal relationships and communication was first explicitly addressed by Sullivan (1953). Since then various writers have attempted to define interpersonal communication competence in terms of its logical constituents (eg Argyris, 1968; Bennis, Schien, Steele and Berlow, 1968; Bochner and Kelly, 1974; Cushman and Craig, 1976; Foote and Cottrell, 1955; Wiemann, 1977; Wienstein, 1969). An alternative approach is to attempt to identify empirically the components of interpersonal or communication competence. Spitzberg and Cupach (1989) reviewed a large number of factor analytic studies of competence and noted that the factor structures reported contained from two to eleven factors, with relatively little commonality of naming and interpretation. At the present time, whilst there may be agreement that the concept of competence is of considerable interest and potential significance, there is little agreement about what communication competence is, nor is there agreement about either its conceptual or its empirical

underpinnings. The concept of competence has clear
implications for the understanding of telephone
apprehension, since competence on the telephone is likely
to be related to the genesis and maintenance of telephone
apprehension. It is necessary therefore, to examine these
issues in some detail.

Models of Competence

Whilst models of competence are divided over fundamental
issues such as the definition of competence, they are in
broad agreement that three domains of activity are
involved. For instance, Spitzberg's (1983) model of
competence suggests that knowledge, behavioural skill and
motivation (ie affect) are critical, but relatively
independent, components of competence. The models also
implies that there is no necessary relationship between
these three components and the overall level of
performance actually achieved in a given situation.
Whilst there is general agreement as to the need to take
account of these three components, there is little or no
agreement as to how they are related to one another. In
particular, there is little information about, but a need
to understand, how the cognitive and affective dimensions
of competence relate to overt behavioural dimensions. It
should also be noted that in most discussions involving
competence the primary focus of the term is taken to be
knowledge, that is, the cognitive dimension.

Two further issues arise from a multi-component view of
communication competence such as Spitzberg's. The first
is that whilst a person may be rated highly at various
component skills, there are no models available to
indicate how these are combined in order to be competent
overall. Such models are needed. A second issue is that
since notions of effectiveness and appropriateness are
normally seen as intrinsic to the concept of competence,
then competence should properly be seen as situation

specific. In other words, a given style of communication
might be termed appropriate in one situation but not in
another, in the same way that a person might be seen as
effective in one situation but less so in another.
However, the problem is that available measures of
communication competence are global, measuring and
referring to communication competence as a whole. An
analysis and operationalisation of how different patterns
of the constituent factors relate to specific
communication tasks and situations has not yet been
attempted. In particular, it might be expected that
telephone apprehension is only moderately correlated with
face-to-face communication competence, and to overall
communication competence.

With respect to the problem of understanding telephone
apprehension, it can be suggested that, in line with
models of general communication competence, whilst
logically independent, in practice the cognitive
component (telephone competence) will be related to the
affective component, ie, to telephone apprehension, and
that both will be related to both past and future use of
the telephone. It can be predicted that empirically
people who have low self-perceived telephone competence
are likely to associate negative affective outcomes with
their use of the telephone. It should be noted that this
relationship may be two-way, that is, not only may lack
of self-perceived telephone competence cause a person to
anticipate negative affective outcomes, but also anxiety
may have impact on self-perceived communicative
competence ("If I were competent, I wouldn't be feeling
this anxious, therefore I must be incompetent..").

There are no studies which provide direct evidence
concerning the overall relationship between the cognitive
(telephone competence) and affective (telephone anxiety)
components of telephone apprehension. As noted in Chapter
Four, Reinsch and Lewis (1984a) reported an attempt to
test the proposition that low competence in the nonverbal

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skills needed to conduct successful telephone calls would lead to negative experiences of telephone calls, and consequently, to high levels of telephone apprehension. They found limited support for one of their predicted relationships, but no support for three others, suggesting that the relation between telephone competence and telephone apprehension is not primarily determined by nonverbal competences.. Downs (1986) found significant negative correlations between general communication apprehension and overall communication competence, and suggested that self-perceived competence is one of, but is not the only determinant of communication apprehension.

The relationship between actual competence and self-perceived competence is unclear. In other areas of activity, the relationship has been shown to be low. For example, Marteau, Johnston, Wynne and Evans (1989), and Marteau, Wynne, Kaye and Evans (1990) reported two studies of the relationship between confidence (ie self-perceived competence) and objectively measured competence in resuscitation skills displayed by junior doctors and qualified nurses. Objectively assessed skill was not significantly related to confidence in either group. However, confidence was related to previous experience, accounting for 30% and 28% of the variance. There appeared to be no relation between confidence and either the role played in previous experience (passive or active), or the outcomes associated with previous experience.

Taken together, The results suggest that telephone competence will not be the only determinant of telephone apprehension. Self-perceived telephone competence is not likely to be closely related to objectively measured telephone competence, but is more likely to be related to the frequency of previous telephone use. However, it may not be closely related to the quality of that experience, such as the success or failure of the interactions.

Clark (1989) has noted that, for many years, it has been taken for granted that a person's confidence is an aid to effective communication. Self-confidence is taken not only to underlie the desire to communicate, but is also thought to enhance a person's ability to achieve goals through communication. Trainers wanting to enhance communication competence and skill have placed a premium on establishing communicator confidence, and on the display of that confidence in communication performances (eg DeVito, 1986; Jeffrey and Peterson, 1983). However, the relationship between confidence and skill has not normally been stated explicitly, nor has it been tested. The notion of self-efficacy appears to offer a formal framework within which these assumptions can be stated, examined and used to explore the problem of telephone apprehension. The following discussion will therefore introduce and discuss the concept of self-efficacy, and its implications for the understanding of telephone apprehension.

Since 1977, when Bandura first proposed the notion of self-efficacy, it has become one of the most important general integrating concepts in the literature of social and clinical psychology (see Bandura 1977, 1982a, 1982b, 1986a, 1989). Recent overviews of self-efficacy theory and associated findings has been provided by Maddux and Stanley (1986), and by Kirsch (1986). A specific integration of self-efficacy and social anxiety perspectives has been proposed by Leary and Atherton (1986).

One of the major question addressed by self-efficacy researchers has concerned the role of a person's self-perceived ability or competence in their decision to engage in certain behaviours, and to persist in those behaviours in the face of difficulties and failures. Other questions addressed have concerned the relation

between self-perceived efficacy, the anticipated outcomes of the behaviour, and the actual outcomes of that behaviour. Thus, self-efficacy theory, and the body of research evidence that is associated with it, is clearly relevant to the issue of communication, and in particular, telephone apprehension.

Self-efficacy theory proposes that a central determinant of an individual's behaviour is that person's sense of personal mastery, or self efficacy (Bandura, 1977, 1982a, 1986a, 1989). According to the theory, when considering any given action, people hold two distinct, but related expectancies. The first concerns the belief that a given behaviour will or will not lead to a given outcome; this is referred to as the outcome expectancy. The second is the person's belief that they are, or are not, capable of performing the behaviour in question. This is their self-efficacy expectancy. A major proposition of the theory is that the self-efficacy expectancy has a more powerful influence on the initiation and persistence of behaviour than the outcome expectancy. According to Bandura (1989), convergent evidence from many different research areas supports the proposition that self-beliefs of efficacy function as important proximal determinants of human motivation, affect and action. The implication, when applied to telephone apprehension, is that self-efficacy with respect to telephone use will be a better predictor of telephone use than telephone apprehension.

Bandura (1977) outlines four main factors influencing perceived self-efficacy: previous performance experiences, vicarious experiences, verbal (social) persuasion, and emotional or physiological arousal. Each of these may influence perceived self-efficacy, although they differ in their relative power. The first of these, previous performance accomplishments, particularly clear success or failure experiences, is held to be of primary importance. Vicarious experience (observational learning, modelling, etc.) is held to be the next most powerful

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influence. Vicarious experience can best be seen as providing information about other people's performance experiences in the same or similar situations, that is, it provides social-comparative information. Verbal (or social) persuasion is the attempt of another person to establish particular self-efficacy expectancies using strategies of influence. Verbal persuasion can take the form of feedback about the person's own previous performance experiences. It can include bogus feedback, attributional evaluations, and proffered incentives. Emotional or physiological arousal refers to information about the person's own emotional or physiological state during previous performances. If a person associates particular aversive emotional states (eg anxiety) with poor behavioural performances and unsuccessful outcomes, then when that person subsequently experiences such aversive emotional arousal, this is likely to lower their self-efficacy expectancies. This last source of influence on self-efficacy expectancies is particularly relevant to investigations of telephone apprehension, as it implies a causal relationship between state anxiety and self-efficacy expectancies.

Bandura notes that self-efficacy expectancies are based on the person's appraisal of previous performance experiences, etc, not on the experiences per se. This suggests that attributional processes are central to these appraisals, and in particular, because of the attributional biases that are likely to influence these appraisals, that these appraisals are unlikely to be accurate. A number of variables are known to influence the attributional strategies used by a person, such as the person's position with respect to the internal-external locus of control dimension. Self-efficacy is itself likely to affect the kinds of attribution made, so that, for example, people with high self-efficacy may attribute occasional failure to chance or some other temporary condition and thus maintain their self-evaluation. Cervone (1989) showed that self-efficacy

expectancies were biased by focusing on either troublesome or manageable aspects of the anticipated task, and that these self-efficacy expectancies then affected subsequent task performance. Bandura, Reese and Adams (1982) note that the weight given to performance feedback is dependent upon the nature and strength of pre-existing self-efficacy expectancies. Brown and Inouye (1978) showed that, when people are fully confident of their capabilities, despite repeated failure, they will persevere over long time periods and their self-efficacy expectancies will be unchanged. However, overall, feedback indicating success increases self-efficacy, whereas feedback indicating failure decreases self-efficacy, and the debilitating effect of failure is greater than the facilitating effect of success (Kirsch, 1986). Increasing experience at a task stabilises self-efficacy expectancies for that task.

Self-efficacy is not simply self-perceived competence. Rather, self-efficacy depends upon both self-perceived competence and perceived task difficulty. For any given level of self-perceived competence, the greater the perceived difficulty of the task, the lower the self-efficacy expectancies. Bandura (1986b) notes explicitly that self-efficacy scales do not measure skill or ability per se. Rather, they measure what people believe they can do given the skills they possess, the particular skills required by the task, and the circumstances pertaining at the time. Thus, in the case of telephone self-efficacy, it will be a function not only of the level of competence a person believes they possess, but also of the degree of difficulty they associate with using the telephone sufficiently well in particular circumstances to accomplish particular goals.

Self-efficacy Expectancies and Outcome Expectancies

The central proposition of the theory is that self-efficacy expectancies are distinct from outcome expectancies, and that it is the former that provide the best predictor of behaviour. This proposition met with initial skepticism (Borkovec, 1978; Eastman and Marzillier, 1984; Kazdin, 1978b; Teasdale, 1978). Maddux and Barnes (1985) concluded that the majority of relevant studies have conceptual and methodological shortcomings that make their findings uninterpretable or inconclusive. Maddux, Norton, and Stoltenberg (1986) and Barnes and Maddux (1985) found that it possible to distinguish between self-efficacy expectancies and outcome expectancies, and showed that both make significant independent contributions to the prediction of behaviour.

The relative contribution of outcome and self-efficacy expectancies is dependent upon the contingencies between performance and outcome. In activities where outcomes are highly contingent upon the quality of performance, then self-perceived efficacy accounts for most of the variance in expected outcomes. In a series of studies where such contingencies existed (Barling and Abel, 1983; Barling and Beattie, 1983; Beck and Lund, 1981; Betz and Hackett, 1986; Godding and Glasgow, 1985; Lee, 1984a, 1984b; Williams and Watson, 1985), when variations in perceived self-efficacy are partialled out, the outcomes expected for given performances had little independent effect on behaviour..

When outcomes are not completely dependent upon the quality of performance then self-efficacy beliefs account for only part of the variance in expected outcomes (Bandura, 1989). This occurs under a number of circumstances, such as when extraneous factors also affect outcomes, when outcomes are tied to a range of performance rather than varying continuously, and when contingencies are affected by discriminations involving

sex, race, age, etc. Importantly, it is the perception of
these contingencies, rather than the contingencies
themselves, which will affect the proportion of variance
attributable to outcome and self-efficacy expectancies.
It could therefore be predicted that, with respect to
telephone apprehension, if it is believed that outcomes
are in general contingent upon performance, then
telephone use would be significantly related to self-
efficacy expectancies. However, it can also be predicted
that the perception of the contingencies between
performance and outcome may also vary as a function of
levels of telephone apprehension, with low apprehensives
seeing this relationship as less contingent than high
apprehensives, and their telephone use therefore being
determined by outcome expectancies to a greater extent
than is the behaviour of high apprehensives. These
predictions remain to be tested.

The extent to which outcomes are seen to depend on the
nature of performance may also vary as a function of
individual differences, such as Rotter's (1954)
distinction between internal and external locus of
control. "Externals" will tend to see outcomes as
independent of the quality of their performance, and
their behaviour will be a function of outcome rather than
self-efficacy expectancies. "Internals" will tend to see
outcomes as dependent on their performance, and their
behaviour will be a function of self-efficacy
expectancies rather than outcome. This model allows
further predictions to be made concerning the
relationship between telephone apprehension and telephone
usage as a function of locus of control. For "Internals"
there would be a high correlation between self-efficacy
expectancies concerning their use of the telephone and
their frequency of telephone usage (at least, with
respect to outgoing calls). For these subjects, the
frequency of telephone usage would not be closely related
to the associated outcome expectancies. "Externals" would
have low correlations between self-perceived telephone

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efficacy and the observed frequency of telephone use. For these subjects, the observed frequency of telephone use would primarily be a function of the outcome expectancies associated with telephone use. Again, these predictions remain to be tested.

Outcome value does not appear as a formal component of self-efficacy theory. Outcome value is a central component of traditional expectancy-value theories (eg Fishbein and Ajzen, 1975), and it has been proposed that it should be incorporated into self-efficacy theory (Maddux, Norton and Stoltenberg, 1986; Manning and Wright, 1983; Teasdale, 1978). Barnes and Maddux (1985) found that outcome value was a significant independent predictor of behavioural intentions and commitment, in addition to self-efficacy and outcome expectancies. Other studies (McCaul, O'Neill and Glasgow, 1988; Wheeler, 1983) suggest that the predictive ability of expectancy-value theory can be enhanced by including self-efficacy expectancies.

Thus, a model to predict the telephone use of individuals would be expected to contain three elements: the individual's estimates of the value of particular outcomes (evaluation), the individual's estimates of the likelihood that particular outcomes would result from their use of the telephone (belief strength or outcome expectancy), and the individual's self-perceived efficacy expectancies, that is, their belief that they could perform the behaviours necessary to achieve those outcomes. Within this model, the conceptualisation of telephone apprehension appears as a measure of a particular subset of outcome expectancies, namely the expectancy of negative affective outcomes.

Changes in self-efficacy for a particular task brought about by, for instance, performance feedback, have been demonstrated to generalise to other tasks (Heath, 1959, 1961, 1962; Rychlak, 1958; Rychlak and Eaker, 1962).

According to Kirsch (1986) this is an example of "generalised expectancies" (Rotter, 1954, 1982), and generalised self-efficacy can be considered a subset of these expectancies. One consequence of this is that self-efficacy for different tasks should be correlated. Considerable evidence exists to demonstrate moderate to extremely high correlations between self-efficacy scores across a wide variety of tasks (Dean, 1960; Schwartz, 1969). Kirsch (1986) has proposed that self-efficacy generalises to the extent that the traits or abilities that are seen to be required for successful performance on one task are also seen to be necessary to successful performance of another task. On the other hand, Bandura (1986b) notes that whilst generalisations exist, it is important to recognise that self-perceptions of efficacy vary across different domains of activity, across different levels of demand within activity domains, and with variations in the environmental circumstances of performance. Self-efficacy measures should therefore be tailored to particular domains of functioning, and omnibus measures are unlikely to be significant predictors of behaviour (Bandura, 1986b, 1988).

With respect to telephone apprehension, the extent to which telephone self-efficacy is correlated with self-efficacy in other domains is an interesting and important question. As has been noted in earlier chapters, telephone apprehension does not appear to be correlated with either global measures of self-esteem or generalised anxiety, or even with measures of general communication apprehension. It may therefore be surmised that the traits or abilities that are seen to be required for successful telephone use are not seen to be necessary to successful communication and social performance in general, or, more specifically, that there are traits or abilities which are seen to be specific to successful use of the telephone which are not required for successful communication or social performance in general. In addition to establishing the extent to which the traits

or abilities seen to be necessary to successful telephone communication are specific to that domain, it would also be interesting to explore the extent to which the traits and abilities specific to successful telephone use were common to other areas of mediated interpersonal communication, such as electronic mail, voice messaging systems, etc.

One of the most important areas of theorising with respect to telephone apprehension concerns the relationship between self-efficacy and anxiety. Bandura (1984, 1986a) argues that both fearful expectations and avoidance behaviour arise from perceived inefficacy in coping. He cites evidence that avoidance behaviour is not simply predicted by, nor directly controlled by, fearful expectations. This view was challenged by Kirsch (1986) who cited a number of studies in which low self-efficacy was elicited by a variety of experimental manipulations, and in none of which was it reported that subjects became fearful simply as a result of low self-efficacy. Kirsch (1986) therefore proposed that low self-efficacy elicits fear only to the extent that it is associated with aversive outcomes. Bandura (1989) accepted this proposal, arguing that fear results from exposure to situations where there is inadequate self-perceived coping efficacy and in which aversive consequences are likely to arise as a result, whereas exposure to the same situations when there is adequate self-perceived coping efficacy does not produce fear. That is, it is the mismatch between self-efficacy and required competences that leads to the expectation of aversive outcomes, and it is this expectancy that leads to fear.

Bandura points to extensive research involving diverse strategies and methodologies which show that avoidance behaviour is not controlled by anticipatory fear (Bandura, 1986a; Bolles, 1975; Betz and Hackett, 1986; Hernstein, 1969; Leland, 1983; McAuley, 1985; Schwartz, 1978). Williams and his colleagues (Williams, Dooseman,

and Kleifield, 1984; Williams, Kinney, and Falbo, 1989; Williams, Turner, and Peer, 1985) have analysed the relationships between perceived self-efficacy, expected fear, and phobic behaviour (ie avoidance). They showed that perceived self-efficacy predicts avoidance, and that this predictiveness is retained even when expected fear is partialled out. In contrast, whilst expected fear and avoidance behaviour are correlated, this correlation disappears when perceived self-efficacy is partialled out. Thus, it appears that perceived self-efficacy and expected fear are not measuring the same thing, and perceived self-efficacy is the more fundamental variable. Williams and Watson (1985) reported that when perceived dangers and fear are controlled for, perceived self-efficacy still accounted for a substantial proportion of the variance in avoidance behaviour, whereas perceived danger and fear had no predictive value when perceived self-efficacy was partialled out.

There are important implications for the understanding of telephone apprehension. If the results of Williams and his colleagues are extrapolated to telephone apprehension and telephone use, it would be predicted that lack of perceived self-efficacy with respect to telephone use would predict avoidance of the telephone, and that this relationship would remain even when expected negative affective outcomes were partialled out. On the other hand, whilst expectations of negative affective outcomes and avoidance of the telephone would be correlated, this correlation would disappear when perceived self-efficacy was partialled out. More generally, Bandura's formulation focuses attention upon differential expectations concerning the likelihood of aversive consequences resulting from ineffective use of the telephone. That is, it is predicted that low telephone self-efficacy will lead to telephone anxiety if, and only if, aversive outcomes are associated with ineffective use of the telephone. For this group of subjects, low self-efficacy will lead to both anxiety and avoidance. However, for

those subjects who do not expect aversive consequences to follow from ineffective use of the telephone, whilst telephone use will be avoided, this will not be associated with telephone anxiety. This can be presented diagrammatically as follows:

```
                   ┌─────────────────────┐
                   │  Low Self-efficacy  │
                   └─────────────────────┘
              ┌────────────┴────────────┐
   ┌──────────────────┐      ┌──────────────────┐
   │  Expectation of  │      │ No Expectation of│
   │ Aversive Outcomes│      │ Aversive Outcomes│
   └──────────────────┘      └──────────────────┘
        ┌──────────────┐          ┌──────────────┐
        │     High     │          │     Low      │
        │  Telephone   │          │  Telephone   │
        │   Anxiety    │          │   Anxiety    │
        └──────────────┘          └──────────────┘
              └───────────┬───────────┘
                   ┌──────────────┐
                   │   Avoidance  │
                   │      of      │
                   │ Telephone Use│
                   └──────────────┘
```
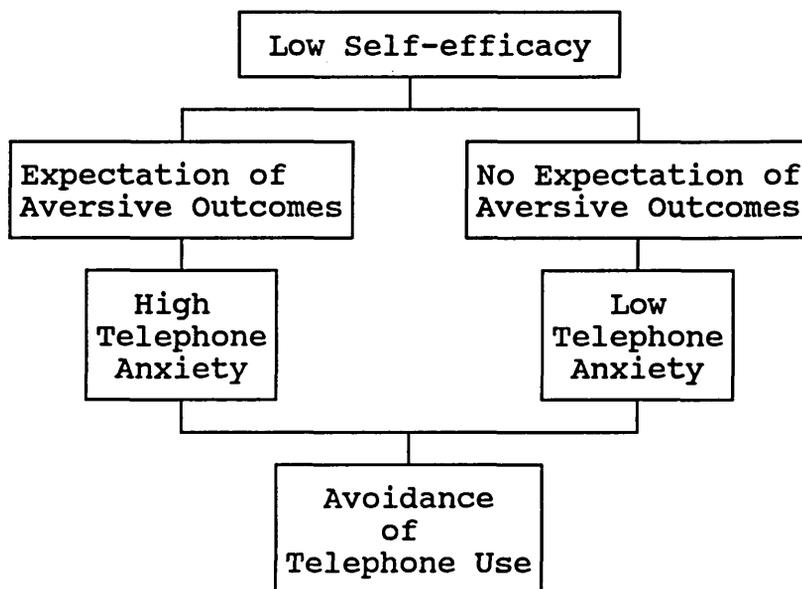
If it is accepted that fear is not necessarily associated with avoidance, it is then appropriate to call attention to the pervasiveness of this assumption, not only in commonsense thinking, but also in the research literature dealing with both telephone and communication apprehension. Bandura (1986b) points to the force of confirmatory biases in judgments of causality (Nisbett and Ross, 1980), and notes that confirming instances, in which fear and avoidance occur jointly, are likely to be very salient, whereas nonconfirming instances (in which fear and approach occur, or where avoidance occurs without fear) are likely to be less salient.

Mediators of Self-efficacy and Behaviour

Significant correlations between self-efficacy and subsequent behaviour have been reported in many studies. Kirsch (1986) reviewed a multitude of studies reported prior to Bandura's (1977) formulation of self-efficacy

theory, whilst Bandura (1989) reviewed studies subsequent to that date. For instance, Bandura, Reese and Adams (1982) raised self-perceived efficacy in phobics from virtually zero to low, medium and high levels, and showed that higher levels of perceived self-efficacy were accompanied by higher levels of subsequent performance. Collins (1982) showed that when ability was controlled, self-efficacy exerted an independent effect upon performance.

Whilst the relation between self-efficacy and subsequent behaviour appears to be well-established, the mediation of that link is less clear. Bandura (1989) identifies four possible mediational processes: motivational, cognitive, affective, and selectional. The motivational processes have been explored most fully, in particular with respect to the relation of self-efficacy expectancies to outcome expectancies, and with respect to the relation of both of these to behaviour (discussed above). Perceived self-efficacy can also have an impact on behaviour via the motivational process of goal setting. Self-efficacy expectancies affect the goals set, the commitment to those goals, and perseverance in pursuit of those goals (Bandura and Cervone, 1986; Cervone and Peake, 1986; Jacobs, Prentice-Dunn, and Rogers, 1984; Peake and Cervone, 1989; Weinberg, Yukelson, and Jackson, 1979).

The role of goal setting extends to more general perceptions of self-efficacy. There is a growing body of evidence that positive well-being and attainment require an optimistic (that is, an inaccurate and positively-biased) sense of personal efficacy (eg Bandura, 1986a). Ordinary social activities are full of difficulties. These inevitably lead to negative feedback, and should lead to lowered self-efficacy expectancies. Bandura (1989) suggests that if high levels of performance are to be sustained, it is important that the person's sense of personal efficacy should recover quickly. Whilst gross

misjudgements of ability can lead to problems, moderately positive (over-optimistic) self-appraisals can be beneficial. They lead people to attempt tasks which extend their capabilities, and require them to produce performances which require considerable effort and attention. The emerging evidence (see Bandura, 1986a) suggests that the successful, the sociable, the nonanxious, and the nondepressed overestimate their capabilities. It appears that, if not unrealistically exaggerated, such self-beliefs enhance and sustain the motivation needed for consistently successful performances to be produced. These observations lead to the expectation that low telephone apprehensives would tend to over-estimate their self-efficacy with respect to the telephone, and would give less attention to, and be less affected by, negative feedback about their performances when using the telephone. On the other hand, high telephone apprehensives would tend to be more accurate, or under-estimate their self-efficacy with respect to the telephone, and would give more attention to, and be more affected by, negative feedback about their performances when using the telephone.

Whilst most attention has been given to the mediation of self-efficacy effects via motivational processes, Bandura (1989) suggests that self-efficacy beliefs also have an impact on performances through the three other mediational processes: cognitive, affective, and selectional. These will be considered in turn. A variety of cognitive processes influence behaviour via self-efficacy expectancies, amongst which are the anticipatory scenarios people create and rehearse prior to actual performance. People with high self-efficacy expectancies tend to create success scenarios which provide positive guides for performance. People with low self-efficacy expectancies tend to create scenarios which anticipate failure and which focus on sources of difficulty rather than on ways of coping. Future performances have been shown to be positively influenced by scenarios in which

subjects visualise themselves as performing skillfully and experiencing success (Bandura, 1986a, 1986b; Corbin, 1972; Feltz and Landers, 1983; Kazdin, 1978a).

A major function of such scenarios is to enable people to predict the occurrence of events and to create and rehearse effective ways of responding to these events. One important determinant of the usefulness of such anticipations concerns the person's conceptualisation of their ability (Dweck and Elliot, 1983; Nicholls, 1984). One possible understanding of this phenomenon is that people with high self-efficacy see abilities are acquirable skills. That is, they consider that abilities can be improved by gaining knowledge, by modifying behaviours or by altering attitudes. People who conceptualise ability in this way are likely to see learning as a generalised goal (and outcome) of experience. They will seek experiences which extend their knowledge, augment their behaviours, and challenge their existing attitudes. They will see errors as inevitable but not disastrous, and as sources of information. Performances will be judged in terms of personal, rather than social comparison. That is, performances will be evaluated in relation to the extent of personal improvement rather than as achievements compared with others.

An alternative view is that ability is a fixed capacity. People who conceptualise ability in this way are likely to see performances as indicative of inherent and unchangeable capacities, with poor performances and errors being highly threatening to the person's self-esteem. They will therefore prefer tasks which allow high levels of performance and which minimise errors, even if they do not provide opportunities for improving abilities. Additionally, such people are likely to see tasks in which they have to try hard as implying low ability, and the success of others threatens the value of their own perceived ability (Wood and Bandura, 1989).

Communication is an ability which can be conceptualised as either an acquirable skill or as a fixed capacity. Fielding and Llewelyn (1987) have argued that communication is commonly seen as a fixed capacity. For instance, it is often said about communicative abilities that "You've either got it or you haven't", "He (or she) is a born communicator", and "Communication is an art". The implication of such sayings is that communication abilities cannot be practised or improved, they cannot be taught or learnt, and that indeed, attempts to change or improve are "dangerous" because the person's existing abilities may be interfered with. In short, these beliefs imply that a person's existing communication style is fixed. With respect to telephone apprehension, it can be predicted that there is likely to be a systematic difference between people with high and low levels of telephone apprehension in the way that they conceptualise the skills and abilities needed to use the telephone. People with high levels of telephone apprehension are likely to see this ability as a fixed capacity, and the way that they communicate by telephone being unchangeable. On the other hand, low telephone apprehensives are likely to see telephone competence as an acquirable skill, which can be improved by gaining knowledge, by modifying behaviours or by altering attitudes. Problems when using the telephone will be seen as inevitable but surmountable. These conceptualisations have considerable implications for any attempt to provide intervention programmes for individuals with high levels of telephone apprehension.

The third mediational process noted by Bandura operates via affective mechanisms. A person's self-efficacy affects the level of anxiety or stress that they feel in that situation. In social cognitive theory (Bandura, 1986a) a person's affective reaction to a situation is dependent on the relation between that person's self-perceived coping capabilities, and their perception of the demands of the situation. (Note that this is

essentially the same formulation as that proposed by Cox and Mackay (1981) in their Transactional Model of stress.) A person who sees their coping capacities as equal to or greater than the demands made by the situation will not experience anxiety. On the other hand, a person who believes that they cannot manage the threats posed by the situation will experience high levels of anxiety arousal (Bandura, 1989). A number of studies have shown that such anxiety arousal in itself tends to lower a person's ability to cope with the threatening situation, thereby creating a situation whereby their prophecy is fulfilled. They tend to dwell on their coping deficiencies, and to emphasise the threatening aspects of the situation, with consequent impairment of functioning (Beck, Emery, and Greenberg, 1985; Lazarus and Folkman, 1984; Meichenbaum, 1977; Sarason, 1975). Again, this has clear implications for an understanding of telephone apprehension, and for the design of programmes of intervention in the cases of individuals with high levels of telephone apprehension.

Most studies of anxiety and self-efficacy have been concerned with beliefs about the ability to execute specific motor behaviours. Kent and Gibbons (1987) and Kent (1987) extended this notion to include control over cognitions and physiological reactions as well. They showed that in addition to the effects of self-efficacy on the behaviours themselves, a person's self-perceived ability to control associated distressing cognitions and physiological reactions also affects anxiety arousal. Perceived self-efficacy in thought control is a key factor in the regulation of cognitively generated anxiety arousal. Whilst a number of studies report that the thought content of people who are highly anxious in a particular situation differs from that of people who are less anxious (eg Last, 1984), and that it is the presence of negative rather than positive thoughts which best differentiates these two groups (Kendall and Hollon, 1979; Kent, 1985; Prins, 1985; Wardle, 1982, 1983), it

appears (Kent, 1987; Salkovskis and Harrison, 1984) that it is not the number or frequency of such negative cognitions per se, but the inability to control them (that is, the inability to dismiss them when they do intrude) that is the major source of distress. Kent and Gibbons (1987) have shown that if variations in subjects' self-perceived thought control are partialled out, then the number of aversive cognitions is unrelated to the level of anxiety experienced. On the other hand, when the number of negative cognitions is controlled for, then self-perceived thought control efficacy is strongly related to anxiety arousal. This indicates that it is the degree of control over negative thoughts and not their number or frequency which is most relevant in discriminating between different levels of anxiety.

This finding parallels other research on cognitive aspects of psychological difficulties which shows that "normal" and "problem" groups may be indistinguishable in the content of their thought (eg Borkovec, Robinson, Pruzinsky and dePree, 1983; Borkovec, Wilkinson, Folensbee and Lerman, 1983; Clark and de Silva, 1985; Rachman and de Silva, 1978; Salkovskis and Harrison, 1984). These results suggest that, with respect to telephone apprehension, the level of anxiety arousal will be related to the relationship between self-perceived telephone competence and perceived task difficulty, such that the greater the difference between these (ie the coping deficit), the greater the level of anxiety aroused. However, this relationship will not be direct. It will be mediated by the person's self-perceived cognitive control efficacy. That is, to the extent that the person sees themselves as being able to control the disturbing thoughts that arise as a result of their perception that there is a coping deficit, then they will not experience anxiety, or will experience less anxiety, despite the fact that they are aware of this coping deficit.

According to this view, a person will only experience telephone apprehension if the following conditions are met:

1: The perceived task demands of using the telephone are greater than their self-perceived ability to cope with those demands. This will lead to the perception of a self-perceived "coping deficit".

For example, a person may have low self-perceived telephone competence, but if they perceive the telephone as making low coping demands, they will not experience a coping deficit. On the other hand, a person with high levels of self-perceived telephone competence will experience a coping deficit if they see the telephone as making greater demands upon their skills than they see themselves as possessing.

2: The person perceives a "coping deficit" and has a low level of self-perceived ability to control the aversive thoughts generated by their awareness of that deficit.

That is, a person may experience a coping deficit, and aversive thoughts arising from awareness of that deficit, but still not experience anxiety because they see themselves as possessing the ability to control the incidence of those aversive cognitions.

Another way of putting this is to suggest that both high and low telephone apprehensives may well experience the same negative thoughts about using the telephone. That is, the two groups may not be distinguishable in terms of the content of their thoughts about telephone use. However, they will be distinguishable in terms of the frequency of these thoughts, and their ability to control (that is, to dismiss) these thoughts. The degree of apprehension experienced will be a function of the

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frequency of these negative thoughts, and of the person's self-perceived cognitive control with respect to these thoughts.

Anxiety and Depression

One of the most interesting developments in current theorising concerning self-efficacy is Bandura's suggestion (1989) that anxiety and depression both result from self-perceived inefficacy. They are differentiated because anxiety and depression are responses to the failure to control different kinds of outcome. Anxiety results from the failure to eliminate or attenuate aversive outcomes. Depression, on the other hand, results from the failure to control outcomes that affect self-esteem, and which provide personal satisfactions. Bandura cites several lines of evidence as providing support for this distinction between anxiety and depression, eg Cutrona and Troutman (1986); Holahan and Holahan (1987a,b); Kanfer and Zeiss (1983). It appears that the analysis of communication apprehension proposed by McCroskey and coworkers implicitly assumes that communicative situations are conceptualised in terms of potentially aversive outcomes, and that anticipated failure to avoid such outcomes generates anxiety. If instead, communication was seen as primarily providing personal satisfactions and self-esteem, failure to control these outcomes would be seen as leading to depression. In such cases, there would be no relationship between self-efficacy and communication apprehension. Instead, such self-perceived inefficacy would lead to lowered self-esteem and depression. It may be noted that it is not necessary that Bandura's model of the distinction between anxiety and depression is correct. Its significance is that it highlights an implicit assumption made within the communication and telephone apprehension literatures. That is, whilst people may see their communication abilities as not matching the demands

of the situation, anxiety is only one of the possible reactions to such deficits. Others may include anger and frustration, disappointment and depression, apathy and flattened affect, etc. Yet this is not generally considered in the communication and telephone apprehension literatures.

The final major mediator of the impact of efficacy expectancies upon behaviour is the choices people make as to the situations they involve themselves in, and the situations they avoid. As noted above, people tend to avoid activities and situations which they believe exceed their coping abilities, but they will involve themselves in highly challenging situations which they believe are within their capabilities. The stronger a person's self-belief in their capabilities, the more behavioural options they consider to be possible, the greater the interest they show in those behavioural options, and the more likely they are to prepare themselves to be able to pursue those options (Betz and Hackett, 1986; Lent and Hackett, 1987).

Self-efficacy and Objective Competence

Whilst Self-Efficacy Theory predicts that an individual's assessment of their own ability will influence the likelihood of their performing that behaviour, the theory makes no clear prediction concerning the relationship between self-efficacy and actual skill. As noted above, previous performance experiences are held to influence self-efficacy expectancies, but only via attributional analyses which are likely to be biased as a function of the person's particular attributional strategies. Similarly, whilst self-efficacy expectancies will influence whether or not a person will perform a given behaviour, there is no clear prediction about the influence of such self-efficacy expectancies upon the competence with which that behaviour is performed.

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Empirical evidence (eg Marteau, Johnston, Wynne and Evans, 1989; Marteau, Wynne, Kaye and Evans, 1990) shows that the relationship is indirect. Self-perceived efficacy expectations are unrelated to objectively assessed ability. Relationships between self-efficacy and status and self-esteem, and to previous experience were found.

With respect to telephone apprehension, these findings predict that there would be no relationship between self-perceived efficacy expectancies and actual communication competence. Telephone efficacy might be expected to be related to generalised self-esteem, and to occupational and general social status. It would be predicted that there would be a relationship between self-efficacy and familiarity with the telephone, and to a belief in the general efficacy of communication as a way of "getting things done".

CONCLUSION

In this chapter the review of existing psychological research dealing with communication competence and self-efficacy shows that there are significant implications for the understanding of telephone apprehension. It is clear that, if a comprehensive understanding of telephone apprehension is to be developed this must be done within a properly grounded understanding of the relation between competence, self-efficacy and apprehension.

CHAPTER FOURTEEN

SUMMARY AND CONCLUSIONS

This thesis explored the concept and the measurement of one particular form of communication apprehension, namely telephone apprehension. Empirical studies were carried out using UK and Australian samples, allowing an examination of the extent and nature of telephone apprehension. Possible correlates and causes of telephone apprehension were also examined.

In this final chapter the findings reported and the research reviewed in this thesis will be summarised and the overall implications explored. Possible explanations of the initial findings, which demonstrated sex, age and culture differences in levels of reported telephone apprehension, will be discussed, and the incidence and practical implications of "telephone phobia" noted. Comments will be made about the multi-factorial structure of the original 20-item TAI, and the implications of this structure for understanding telephone apprehension. The validation of the revised 45-item TAI is noted and the lack of evidence for the empirical discrimination of communication, speaking and listening is discussed. The lack of clear personality and other communication correlates of telephone apprehension is noted and the implications for understanding the causes of telephone apprehension, and the implications for telephone use and the design of telephone systems are discussed. Finally, the concept of telephone apprehension is clarified and redefined, and a model proposed which relates telephone apprehension to telephone use.

Telephone Apprehension: Initial findings

Initially, telephone apprehension was defined as "anxiety or fear associated with the anticipated or actual use of the telephone as a communication channel". Using samples of American undergraduate students, Steele and Reinsch

(1983, 1984) developed a 20-item scale based on this definition. In the first group of empirical studies described in this thesis, the Telephone Apprehension Inventory (TAI) was given to three different samples of subjects. These were 405 undergraduate students from a UK Polytechnic, 389 undergraduate students from an Australian Institute of Advanced Education, and a non-student sample consisting of 306 adult employees of a UK Institute of Higher Education. In this later sample, in addition to the TAI and standard demographic questions, subjects were also asked about their use of their home telephone, both for making and for receiving calls.

Analysis of the three samples showed a consistent pattern of results. In all three samples, males reported significantly higher levels of telephone apprehension than females. In all three samples, no differences in telephone apprehension were found simply as a function of age. However, in the UK Non-student sample there was a significant age by sex interaction, such that sex differences were greater for older subjects. That is, older men were much more anxious about the telephone than older women, whilst sex differences amongst younger subjects were small or non-significant. In neither the UK nor the Australian Student samples were the age by sex interactions significant, but the trends were in the same direction as in the UK Non-student sample. Differences in reported levels of telephone apprehension as a function of culture were found, with UK students reporting significantly higher levels than Australian students, and both UK and Australian students reporting significantly higher levels than comparable US students. No significant culture by age or sex interactions were found. Comparison of the UK Student and Non-student samples showed that students reported significantly greater levels of telephone apprehension. No significant interaction effects of sample with age or sex were found.

Possible Explanations: Sex Differences

One of the most intriguing of these findings is probably
the consistent and significant sex difference in reported
telephone apprehension. The explanation of these findings
is not, however, straightforward. Any satisfactory
explanation requires that some of the most pervasive
beliefs about the nature of the telephone and telephone
use must be questioned. At first sight, this sex
difference appears to be consistent with the notion that
the telephone is an especially important means of
communication for women, and is used more extensively by
women than by men. If there are widespread and
significant sex differences in telephone use, then it
could be argued that because of their greater familiarity
with the telephone, women may experience lower levels of
telephone apprehension than men. There is indeed some
evidence consistent with, and supportive of this possible
explanation. In her study of a small American farming
community, Rakow (1986) identified differences in
telephone use between men and women, in terms of
frequency of usage, functions, and conversational roles,
and she noted that male dislike of the telephone was
frequently cited as a reason for this unequal
distribution of telephone talk. Moyal (1989), in an
Australian study, reported high levels of female use of
the telephone for "psychological care within the
telephone community". Early surveys of self-reported
telephone use noted that both men and women agreed that
women used the telephone most frequently, and cited
greater telephone apprehension as a reason for this:
"Many men said they did not like to use the phone, so
they had the women call for them" (Robertson and Amstutz,
1949, p.18).

However, there are problems with this argument. For
instance, the data about usage is in fact partial and
inconsistent. Noble (1987), for example, found that
whilst women use the telephone more than men for

intrinsic purposes, there were no sex differences in instrumental use of the domestic telephone. Thus, rather than differences in the overall use of the telephone (particularly when the greater occupational use of the telephone by males is taken into account) the differences may be in the purposes for which the telephone is used. Skelton (1989), in her study of the use of the telephone by teenagers, found no sex differences in either the number or in the duration of calls made. She also noted that males tended to believe the conventional wisdom that 'girls use the telephone more often than boys'. Thus, it may be that the differences are in the reported use of the telephone rather than actual differences, and that the reported differences are guided by popular beliefs about sex-role appropriate telephone use. Both of these qualifications suggest that a simple "increased frequency of use leads to decreased apprehension" explanation cannot be accepted.

Even if data were available to support the causative relationship of an initially greater frequency of use by females leading to decreased apprehension, the problem of explanation would remain. Why would females, other things being equal, use the telephone more? One possibility, of course, is that they are initially less apprehensive.

Equally, why might males initially be more apprehensive of the telephone? In the initial discussion of sex differences in telephone apprehension, it was noted that the most obvious, and most widely accepted analyses of both sex differences in communication, and the nature of telephone communication, lead to the prediction that women, rather than men, would be more apprehensive. Research shows that females appear to be more active, and perform better than males on a range of nonverbal skills (Hall, 1984, 1987). If females are more active and more skilled in non-mediated conversation, then it can be argued that their habitual conversational patterns might be expected to be disrupted to a greater extent than less

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skilled and less active users when they converse via a
medium, such as the telephone, which eliminates many of
these cues. Research also suggests that in interaction
women are characteristically more oriented towards the
social-emotional whilst men are more oriented towards
task-instrumental activities (Aries, 1987; Baird, 1976).
This differential orientation to conversation is
associated with differential attention to conversational
cues, with the socio-emotional orientation leading to
increased attention being given to non-verbal cues. For
all these reasons, women would seem likely to see the
telephone as less suited, and men would see it as more
suited to their particular purposes.

The data, however, consistently indicate the opposite of
this; women are less apprehensive than men. An
explanation of this requires either that the accounts
just outlined are challenged and revised, or that an
alternative explanation is developed which either
involves more powerful mechanisms than those outlined
above, or which incorporates these mechanisms. In fact, a
substantial body of evidence now exists (such as that
examining the effectiveness of telephone counselling)
which challenges the view that the telephone is unsuited
to socio-emotional purposes. The telephone can clearly be
used to conduct effective interactions which are
primarily socio-emotionally oriented, and it is used
extensively for these purposes. This observation is
however not at odds with the evidence (eg Williams, 1977)
that the telephone is particularly suited to task-
instrumental purposes, since the evidence suggests only
the superiority of the telephone vis-a-vis face-to-face
interactions for solving problems, exchanging
information, etc, not that the telephone is less suited
to socio-emotional conversation. The evidence which is
available in fact suggests that socio-emotionally
oriented interactions conducted by telephone are
different to those conducted face-to-face, but that in
itself does not indicate that such interactions are

inferior. The suggestion that telephone conversations about socio-emotional issues are inferior to similar conversations conducted face-to-face seems to depend upon three unnoticed assumptions.

The first of these unnoticed assumptions is that in socio-emotional interactions the most important non-verbal cues are visual cues, rather than auditory. Yet, it is possible that the most important non-verbal cues are in fact auditory, and these are transmitted quite effectively via the telephone. Even if certain visual cues are important, it is possible that the information they carry is spontaneously redundant, and is also carried by auditory cues, or that it can be transferred to other cues when the speaker is aware that visual channels are ineffective. It then follows that the greater nonverbal activity and skill characteristic of women would be to their advantage, for it suggests that they would be more likely to encode information redundantly, would be more able to transfer information from visual to auditory cue systems if required, and would be better at accurately decoding information from such limited and normally less salient cue systems if necessary.

The second assumption which needs to be questioned is that such non-verbal cues are particularly important in socio-emotionally oriented interactions, and that their presence is necessarily beneficial. This assumption relates to the notion that non-verbal behaviour is necessarily revealing and truthful. However, some research evidence suggests that deliberate impression management is more difficult via the telephone than face-to-face (Geller, cited in Muson, 1982), and that accuracy of person perception is in fact greater via the telephone. In the extreme case, this helps to explain the success of telephone help-lines, where the ability of the counsellor accurately to identify the caller's feelings and attitudes is of considerable importance. In the

general case it suggests that the absence of cues which may be manipulated may have at least as many advantages as disadvantages. In its most general form, the absence of visual cues may allow the participants to concentrate on what is being said, and this verbally encoded information is the necessary and sufficient core of the interaction.

The description of the telephone as impersonal is based on data which shows that negative outcomes are more common in interactions conducted by telephone. However, negative outcomes can be, and often are, socio-emotional. The implication that interactions in which negative outcomes are more frequent are "impersonal" is unwarranted. It derives from the third unquestioned assumption, that socio-emotionally oriented interactions are, or should be, positive in content and outcome. Yet both theory and evidence from the study of psychotherapy (a quintessentially socio-emotional interaction) suggest that effective therapeutic outcomes result from interactions characterised by a proportion of negative content, and that conflict and confrontation can be productive. The apparently greater ability of interactants to deal with negative issues when conversing by telephone may be an advantage of the medium, not a disadvantage.

In addition to challenging the view that the telephone is unsuited to socio-emotional tasks, it is also possible to challenge the view that women's greater involvement with the non-verbal components of conversation would make women more apprehensive of telephone use. Precisely because women are more active and more skilled non-verbally than men, then they may be less anxious when they use the telephone. If women are more skilled, their conversation is likely to be less disrupted than that of less skilled and less active users, because they are able to make better use of redundant cues, substitute auditory for visual cues, and adopt alternative coping strategies.

Their greater skill allows them to be more flexible, and to adopt more appropriate communication behaviours when using communication channels which place greater demands upon the user.

Rather than assuming initial sex differences in apprehension, it is also possible that such differences are minimal, and/or that they are unrelated to subsequent differences in usage. Rather, other reasons lead females to make greater use of the phone. Greater familiarity may then result in lower levels of telephone apprehension. The sex by age interaction effects present in the UK Non-student sample may be reflective of precisely this pattern. Amongst younger subjects, sex differences are small and/or non-significant. With increasing age, differences in reported telephone apprehension increase, with older men reporting significantly higher levels of telephone apprehension than older women. These differences in telephone apprehension are consistent with the proposition that differences in use lead to (later) differences in apprehension, and not the other way around.

One explanation of such greater female use of the telephone is that patterns of telephone use result from socially influenced sex-role demands. Although one possibility is that these differences in usage result, via differing familiarity, in differences in later apprehension, it is also possible that sex differences in reported apprehension are the result of socially acceptable accounting practices. That is, sex differences in apprehension are used to explain and justify differences in patterns of telephone use. Despite the considerable efforts of the feminist movement, traditional sex-role differentiation continues to exist. The research of Rakow (1988) and Moyal (1989) suggests that the telephone is an essential part of this gender-based division of work within the family, with women being responsible for the maintenance of the family's

kinship and social networks. The unequal division of this demanding, time-consuming and often arduous task may be explained, to the satisfaction of all parties, by reference to the apprehension experienced by the male. In this sense, apprehension is functional to the male with respect to his overall pattern of communication, interaction and relationships.

Possible Explanations: Age Differences

The absence of simple age effects in the data reported in this thesis is rather surprising, but is explained by the significant sex by age interaction effects apparent in the UK Non-student samples. Given that this data should properly be described as cohort data, the most obvious explanation of these interaction effects is in terms of changing patterns of sex differences in telephone apprehension and telephone use across cohorts. It appears that sex differences in telephone apprehension are becoming less marked, and this may reflect a more widespread tendency for all communication and all behaviour to become less markedly sex-typed. However, the data reported here also suggest that sex differences are not disappearing entirely, as significant sex differences were apparent in both the UK and Australian Student samples. It is also unlikely that the data can be explained entirely in terms of cohort effects because it indicates, rather surprisingly, that older women experience less telephone apprehension than younger women. This suggests that a combination of increasing familiarity with increasing age, and changing sex-role related interaction patterns also underlie these patterns. However, insufficient evidence at this point means that these explanations are at best speculative.

It should also be noted that all of the conclusions relating to age must be treated with some degree of caution. In both the UK and Australian student samples there is a very limited range of ages, and the distribution of subjects across these age ranges shows considerable skewing. In addition, there is a confounding of age with sample, such that the older subjects

investigated in the UK non-student sample represent not only older informants, but also informants who are not students. This confounding is a particular problem in the three-way ANOVAs of Sex x Age x Sample, where the distribution of respondents is far from ideal. However, whilst the robustness of these results and conclusions may be questioned, the nature of the age effects is consistent across samples and this suggests that these effects are real, rather than being mere statistical artefacts.

Possible Explanations: Cultural Differences

The differences in telephone apprehension as a function of culture are perhaps the most intriguing of all. On the one hand these differences may be explainable simply in terms of the different telephone charging structures operating in the UK, Australia and the US. On the other hand, they may relate to fundamental differences between the cultures in their attitudes to communication, and in particular to mediated communication. Even if these differences are, in the proximate sense, related to differences in telephone charging structures, it is then necessary to ask why different countries have adopted such different charging structures, and to speculate that this itself is related to cultural attitudes to the role and value of communication.

Telephone Phobia: Incidence and future research

Another issue examined in this thesis was the categorical concept of "Telephone Phobia". This concept was explored in terms of both norm-referenced and criterion-referenced definitions. The norm-referenced approach, which defines sub-groups in terms of their deviation from the mean, suggested that somewhere between 15% to 20% of the samples studied could be described as experiencing moderate, severe or extreme telephone apprehension. However, it was noted that this approach renders comparisons between samples relatively meaningless. The more demanding criterion-referenced approach suggested

that some 5% to 10% of the samples studied experienced moderate to extreme telephone apprehension, with the UK Student sample showing the greatest degree of phobia at 9.2%, the Australian Student sample next at 7.0%, and the UK Non-student sample the least at 5.1%, comparable to the estimated 4.8% reported by Steele and Reinsch for their US Student sample. It was proposed that the criterion-referenced approach was a more satisfactory way of defining both high and low levels of telephone apprehension for further study. Despite being more demanding, the criterion suggested give estimates of nearly 2.5 million people in the UK, approximately 600,000 in Australia, and approximately 12-15 million in the USA who would be expected to experience moderate to extreme telephone apprehension.

These figures suggest that telephone apprehension is of considerable practical significance, not only for the individuals concerned, but also for the organisations in which they work, the companies who operate via telephone services, and the utilities who provide telephone services. The practical significance of telephone apprehension, and its relation to various indices of social and occupational activity, success and satisfaction, is an area where future research is required. The guiding hypothesis would be that telephone apprehension is negatively related to social and occupational success and satisfaction. This hypothesis is derived from the proposition that telephone usage is not only a substitute for, but is also additional to, and complementary to other means of communication, modes of interaction and forms of activity. Therefore, if use of the telephone is avoided, and other, less appropriate channels of communication are substituted, then this will hinder successful communication, and will prevent success being achieved in other, communication-dependent, areas of activity.

The TAI and its component factors

The discussion so far has assumed the validity of the claim made by Steele and Reinsch (1983) that the 20-item

TAI constitutes a uni-factorial scale. The factorial
structure of the TAI when used with non-US, and non-
student samples was then examined using the data from the
UK Student, Australian Student and UK Non-student
samples. In all three samples broadly similar, multi-
factorial structures were extracted. These factors were
labelled "Problematic Communication", "Active Avoidance"
and "Positive Enjoyment". "Problematic Communication"
appeared as a separate factor in all three analyses,
whilst the "Active Avoidance" and "Positive Enjoyment"
factors appeared as separate factors in the UK Student
and Non-student samples, but in the Australian Student
sample the two factors ("Active Avoidance" and "Positive
Enjoyment") appeared as a combined factor.

"Problematic Communication" appeared to be equivalent to
the concept of "apprehension" as originally conceived.
The "Active Avoidance" factor involved notions of both
dislike and avoidance of the telephone, whilst the
"Positive Enjoyment" factor involved notions of both like
and use of the telephone.

Analyses of sex and age differences in terms of these
factors showed that there were no sex differences in
terms of "Problematic Communication" in any of the three
samples. That is, in terms of telephone apprehension as
originally defined, males and females do not appear to
differ significantly. However, in all three samples males
were significantly more likely to "Actively Avoid" the
telephone, and were significantly less likely to
"Positively Enjoy" using it than were females. This
reanalysis is consistent with the view proposed above
that sex differences in attitudes and use of the
telephone are probably related to wider sex-role
dependent patterns of communication and behaviour, rather
than to initial differences in apprehension related to,
and dependent upon specific characteristics of sex-
related communication behaviours, such as dependence upon
non-verbal cues or orientation to socio-emotional aspects
of interaction. It also suggests that males and females
differ, not in the apprehension they experience when
communicating by telephone, but in their overall
attitudes to the telephone, with females evaluating the

telephone more positively than males.

When age differences were examined, in all three samples younger subjects saw the telephone as significantly more "Problematic" than did older subjects. However, younger subjects also reported significantly greater "Positive Enjoyment" of telephone use, and there was some evidence that they reported less "Active Avoidance" of the telephone. These findings are important, for they suggest that apprehension (as measured by the "Problematic Communication" factor) is just one component of (and may be relatively independent of) overall attitudes to and use of the telephone (as measured by the "Active Avoidance" and "Positive Enjoyment" factors). That is, these findings suggest that a person may see the telephone as problematic (ie experience apprehension) and still like it (evaluate it positively overall) and report using it. Equally, a person may see the telephone as non-problematic (ie not be apprehensive about using it) but dislike it (ie evaluate it negatively overall) and report that they avoiding using it.

The results of these three separate analyses were confirmed by an analysis of the combined data set. This analysis extracted three clear factors. The first was a "Problematic Communication" factor, indexed by items such as 'misunderstood', 'frustration', and 'problems', as well as feelings of 'nervousness', 'dread', and 'inhibition'. The second factor was a bi-polar "Approach-Avoidance" factor. The positive pole was defined by items such as 'avoid', 'don't like' and 'avoid using', whilst the negative pole was indexed by items such as 'look forward', 'enjoy', 'pleasant' and 'relaxed'. (This factor appeared to combine the "Active Avoidance" and "Positive Enjoyment" factors which were extracted in the separate analyses.) The third factor was concerned with the notion of "Confidence", indexed by items such as 'take pride' and 'easy', as opposed to seeing telephone calls as 'difficult' and as a 'problem'. As with the separate analyses, "Problematic Communication" appeared to be equivalent to the concept of "apprehension" as originally conceived. "Approach-Avoidance" involved notions of both like-dislike and use-avoidance of the telephone, and

seemed to combine an overall evaluation of the telephone with reports of behavioural preferences and intentions. "Confidence" appeared to be a "can do" factor.

A comparison of this structure with that reported by Reinsch (1986) in his reanalysis of earlier data showed substantial similarity between the two structures. This similarity is methodologically reassuring. There is a danger that factor analyses may be "over-extracted", producing small, unreplicable factors (Peterson, 1965), and this is accentuated by use of the varimax method used here, which tends to spread variance evenly amongst these small factors. The net result can be a solution that is non-parsimonious, is unstable across studies, and lacks inherent psychological meaning. However, the similarity of the factor structures reported in this thesis suggests that, even though some of the factors were small, they are replicable and stable across studies. In addition, it was noted that when oblique rotations (oblimin) of the initial factor extractions were performed for each of the three data sets, these oblique rotations produced factor structures which were very similar to the orthogonal rotations, suggesting that the orthogonal constraint did not enforce artificial structures.

Taken together, these analyses indicated significant differences from the uni-dimensional structure originally posited by Steele and Reinsch (1983, 1984), and suggested that telephone apprehension must be conceptualised multi-dimensionally. However, the similarity of these multi-dimensional structures in the various analyses did provide support for the stability of the structure of telephone apprehension across cultures and samples.

It was proposed that the emergence of these multiple factors, when taken in conjunction with the small size of the correlations observed between telephone apprehension and telephone use, raised a number of problems with respect to the conceptualisation of the relation between telephone apprehension and telephone use. (It was noted that similar problems were posed for the concept of communication apprehension, whose conceptualisation was followed by Steele and Reinsch (1983, 1984) when

formulating the notion of telephone apprehension.) These
two results suggest that, contrary to the assumptions of
much (if not most) of the literature dealing with
telephone and communication apprehension, there might be
no necessary relation between telephone apprehension and
telephone use or avoidance.

Telephone Apprehension as a trait

The results reported so far have suggested that telephone
apprehension is a stable individual characteristic, as
indicated by high inter- and intra-test reliabilities, a
wide range of scores in any given sample, and predictable
group differences, such as those associated with sex and
age, and cultural and sample differences. However, it was
noted that the validity of the concept and its associated
operationalisation had not in fact been tested directly.
According to Zuckerman's (1976) inductive
conceptualisation of traits, a valid measure of a trait
has four fundamental characteristics. The first of these
is the unambiguous specification of the stimulus. The
original TAI contained two different kinds of items, some
referring to "use" of the telephone, whilst the remainder
referred to "talking" or "speaking" on the telephone. No
items referred to "listening" via the telephone, and no
items referred directly to "communicating" by phone. It
was argued that, if the TAI was intended to tap
apprehension associated with telephone communication,
terms other than "communicating" should not be included.
Given that neither "communicating" nor "listening" items
were included, the basic requirement that the stimuli
evoking the response were appropriately and unambiguously
specified was only partially satisfied by the original
TAI.

The other requirements are that the measure should
correlate, at least moderately, with other trait measures
of the same construct, that it should correlate to a
greater extent with the mean of a number of measures of
state responses than it does with any one measure of
state response, and that it has high intra-test and
inter-test reliabilities.

In order to explore these characteristics a revised version (TAI-45) of the original 20-item TAI was developed containing 45 items, referring to "communicating", "speaking", "listening", and simply "using" the telephone. 47 subjects took part in three sessions in which they completed test and retest administrations of the TAI-45, a set of validating measures, and both made and received a telephone call, completing a measure of state anxiety after each call.

All sub-scores (for communicating, speaking, listening and using) correlated significantly with an appropriately focused validating measure. The TCA sub-score correlated with the Tele-STAIT measure, the TSA sub-score correlated with the Tele-SCAM measure, the TLA sub-score correlated with the Tele-RAT measure, and the TUA sub-score correlated with both the Tele-PRCA and Tele-PRCA4 scales. The correlations of the trait measure, TCA, to the two individual measures of state anxiety were low, but the correlation with the mean of the two state measures was, as predicted, greater than the correlations with either of the two individual measures. Various measures of reliability showed that the overall T45 and the four sub-scales (TUA, TCA, TSA, and TLA) had high levels of both inter- and intra-test reliability, although this result must be qualified by recognising the very small sample size involved in this study. Comparisons of test and retest scores indicated that differences were minimal and none were significant. It was therefore concluded that, within the limitations of this study, the evidence suggested that the TAI, in its TAI-45 form, constituted an appropriately specified, valid and reliable measure of telephone apprehension.

However, examination of the differences between sub-scales specifying different loci of apprehension indicated that respondents did not make a clear distinction between speaking and listening when

telephoning. There was a high correlation between sub-scales for apprehension associated with speaking and listening, and between both of these and the sub-scale for communicating. To all intents and purposes these sub-scales appeared to be measuring the same underlying apprehension. However, to the extent that there were differences, speaking appeared to be a more salient component of communicating than did listening. When asked about apprehension associated with "communicating" and "using" the telephone, responses seemed to be more closely correlated with apprehension associated with speaking than with listening. Speaking appeared to be the most salient aspect of telephone apprehension.

Thus, despite the clear conceptual distinctions between communicating, speaking and listening, there is no empirical evidence to support the significance of these distinctions. This is surprising, and in marked contrast to the pattern of results when face-to-face interactions are examined. In face-to-face conversations, correlations between speaking and listening apprehension are only low to moderate. The very high correlations observed with respect to telephone apprehension may be because the differentiation of speaking and listening roles is less marked in the case of telephone conversations, with the context of communicating by telephone predominating, and implying that users' 'mental models' of telephone conversations may be rather different to those for face-to-face conversations. It was argued that, despite the current lack of evidence indicating their empirical significance, in the initial stages of research on telephone apprehension and telephone use these distinctions should be retained. This conservative strategy would allow distinctions to be detected if they are significant, and would not mask or otherwise corrupt relationships if the distinctions prove to be of no importance.

Correlates of Telephone Apprehension

It was pointed out that it is possible that the individual differences tapped by the TAI are not telephone-specific. That is, the TAI could simply be tapping some other, more general dimension of individual difference which results in differences in reported telephone apprehension. For instance, differences in overall levels of generalised anxiety may be reflected in all activities, including use of the telephone, and therefore would be expected to correlate with reported levels of telephone apprehension. On the one hand these relationships provide information about the correlates of variations in telephone apprehension, on the other, they provide alternative plausible explanations of such variations which are not dependent on the specific characteristics of telephone communication.

A sample of 77 male and female Australian undergraduate students completed measures of telephone apprehension, generalised trait anxiety, communication apprehension, social desirability (evaluation apprehension) and global self-esteem. Analyses of generalised anxiety, communication apprehension, social desirability and self-esteem showed that in general there were few significant differences as a function of respondent age or sex. In general, correlations between overall TAI scores and sub-scale scores and generalised anxiety, communication apprehension, social desirability and self-esteem were low and non-significant. The correlation between trait anxiety and overall telephone apprehension was non-significant. However, the correlation between trait anxiety and the Problematic Communication sub-scale was significant , which is consistent with the interpretation of Problematic Communication as tapping apprehension as originally defined. Respondents with higher levels of trait anxiety reported experiencing telephone communication as more problematic, ie as experiencing greater apprehension. They did not differ, however, in

their overall evaluation of the telephone or of telephone usage. The correlation between communication apprehension and overall telephone apprehension was not statistically significant, and none of the correlations with sub-scales scores reached significance. This was consistent with an inductive view of traitlike communication apprehension, with both face-to-face and telephone-mediated communication being components of generalised traitlike communication apprehension. There were no significant correlations between scores on a measure of need for social desirability and overall telephone apprehension, nor on scores on any of the three sub-scales. There were no significant relationships between overall telephone apprehension and self-esteem. However, there was a significant relationship between scores on the Problematic Communication sub-scale and self-esteem, such that subjects with lower self-esteem reported that they saw communicating by telephone as more problematic. This again is consistent with the interpretation of Problematic Communication as indexing apprehension as originally defined. Differences in global self-esteem were not related to overall evaluations of the telephone or telephone usage.

The results of covariance analyses showed that when individual differences in levels of trait-like generalised anxiety, communication apprehension, social desirability and self-esteem were taken into account, differences in levels of telephone apprehension between males and females were neither eliminated nor accentuated. The prediction that generalised trait anxiety, communication apprehension, social desirability and self-esteem scores would account for only a small proportion of the overall variance in telephone apprehension scores was supported by the results of a multiple regression analysis, which showed that all four predictor variables produced a multiple r of just 0.2529, with only 6.4% of the variance in overall telephone apprehension being accounted for by these predictor

variables. It was concluded that telephone apprehension is specific to the telephone and to telephone communication. Differences in telephone apprehension are not merely, and cannot be accounted for as merely, the result of differences in other, more generalised personality or communication dimensions. These results imply that reductionist accounts of variation in telephone apprehension can be rejected.

Further research is needed to explore the correlates and causes of high levels of telephone apprehension in particular individuals. The range of general personality dimensions and communication orientations explored so far is limited, and a number of other dimensions might appear likely to be correlated with telephone apprehension. These include such personality dimensions as introversion-extroversion, sensation-seeking and self-monitoring. However, these results suggest that in general, actual and self-reported behavioural experiences associated with telephone use are likely to account for more of the variance in both telephone apprehension and overall attitudes to telephone use than are general personality dimensions or generalised communication orientations. Such investigations are also needed as a precursor to the development of effective intervention programmes designed to alleviate telephone apprehension. The outlook for such programmes would seem to be better, both in terms of the effort required and in terms of the likelihood of positive treatment effects, if telephone apprehension is related to, and dependent upon, specific past behavioural experiences.

Implications for telephone usage

Rather more speculatively, an investigation of patterns of past behavioural experiences associated with high levels of telephone apprehension is likely to produce results having profound implications for the design of

telephone hardware and software, for the organisation of
telephone systems, and for the training of users. It is a
characteristic of current telephone systems that they are
"feature-driven", with the design of the system being
determined by what current technology appears able to
provide, or engineers feel it is appropriate to offer,
rather than being "market-driven", with technology being
used to provide features, and to configure the system in
response to the needs of the user. An example of this is
given by the current use of answer-machines, fax-machines
and modems. As a caller, the ringing tone provides no
information about the kind of device that will respond to
the call. When the call connects, the user may be faced
with a machine they do not want to, or cannot,
communicate with. A solution to this problem would be to
have ringing tones which provide information about the
kind of device connected, with, for instance, different
tones indicating "plain vanilla telephone", answer-
machine, fax and modem. Whether or not such an innovation
is technically feasible, the point being made here is
that in general users do not think it possible to require
such features of the system. Despite (or perhaps because
of) its familiarity, the telephone system is seen as a
deterministic technology, with the characteristics of the
technology determining the characteristics of the system
as experienced by the user. The advent of digital
technology means that even if this was true in the past,
it is certainly no longer true. Given its practical
importance, the same attention should be given to the
design of "user-friendly" telephone systems as is
currently being given to the design of user-friendly
computer systems.

Clarification and redefinition of Telephone Apprehension

The research reported so far indicates a need to clarify
and redefine the concept of telephone apprehension. This
redefinition must provide a framework within which the

two issues which are fundamental to the understanding of telephone apprehension can be tackled. These issues are the nature of apprehension (or anxiety) itself, and the relationship between apprehension and behaviour. A redefinition of telephone apprehension is proposed that recognises the distinction should amongst the belief strengths attributed to outcomes associated with telephone use (ie outcome expectancy), and the evaluation of those outcomes (outcome evaluation), and the existence of primarily affective and primarily non-affective outcomes associated with telephone use. Telephone apprehension can then be defined as the sum of the product of the evaluative components of the person's beliefs about the negative affective outcomes associated with telephone use, and the outcome expectancies associated with each of those outcomes. That is, telephone apprehension is defined within the expectancy-value paradigm of prediction of behaviour models. Within this model, telephone apprehension is seen to be only one component of overall attitudes to telephone use, with positive affective outcomes and non-affective outcomes constituting the other components.

Recent research has suggested that the predictive ability of expectancy-value models can be enhanced by including estimates of self-efficacy. Bandura's theory of self-efficacy proposes that a central determinant of an individual's behaviour is that person's sense of personal mastery, or self efficacy. When considering any given action, in addition to considering outcome expectancies, people also consider whether or not they believe that are, or are not, capable of performing the behaviour in question (the self-efficacy expectancy). It is possible to distinguish empirically between self-efficacy expectancies and outcome expectancies, and to show that both make significant independent contributions to the prediction of behaviour. It was proposed that a model of individual telephone use should contain three elements: the individual's estimates of the value of particular

outcomes (evaluation outcomes), the individual's estimates of the likelihood that particular outcomes would result from their use of the telephone (outcome expectancies), and the individual's self-perceived efficacy expectancies, that is, their belief that they could perform the behaviours necessary to achieve those outcomes (self-efficacy expectancies). Within this model, telephone apprehension would be conceptualised as a measure of a particular subset of outcome evaluation-expectancies, namely those associated with negative affective outcomes.

Consideration of self-efficacy theory also clarifies the nature of apprehension itself, and its relation to avoidance. Extensive empirical evidence now supports the view that avoidance behaviour is not predicted by, nor directly controlled by, apprehension. Instead, self-efficacy theorists have proposed that lack of perceived self-efficacy is predictive of avoidance behaviours. Apprehension is associated with low self-efficacy if, and only if, aversive outcomes are anticipated as a result of ineffective coping behaviours. When applied to telephone apprehension and telephone use, this leads to the prediction that lack of perceived self-efficacy with respect to telephone use would be predictive of telephone avoidance, and that this relationship would remain even when telephone apprehension was partialled out. It can also be predicted that low telephone self-efficacy would lead to telephone anxiety if, and only if, aversive outcomes are associated with ineffective use of the telephone. The combined self-efficacy and value-expectancy model, and the predictions that it generates, remain to be tested.

Further clarification of the nature of apprehension results from examination of psychological work investigating emotion and anxiety. Izard's work within the framework of the Differential Theory of Emotions demonstrates that anxiety consists of a combination of

the fundamental emotions of fear and guilt. However, anxiety can also consist of combinations of fear and interest, or fear and anger, shame, or shyness. That is, anxiety is not a unitary phenomenon. The term anxiety in fact refers to a variety of differing feeling states and associated cognitions and action tendencies. Because of this, anxiety can motivate a number of different kinds of behaviour, not only avoidance or withdrawal, but also, for instance, cautious exploration or aggression. Because the original definition of telephone apprehension (and similarly, existing definitions of communication apprehension) did not recognise the intrinsic emotional complexity of anxiety, no systematic way of assessing qualitative differences in the kind of apprehension experienced by different people in different circumstances is currently available. As a result, predicting the differential behavioural correlates of telephone apprehension is not possible. However, the revised definition of telephone apprehension proposed here ("the summated negative affective outcome evaluation-expectancies associated with telephone use") does allow variations in the emotional pattern underlying telephone apprehension to be identified. Alternatively, Izard's Differential Emotions Scale would provide the basis for identifying differing patterns of telephone apprehension, and the identification of these differential patterns would allow precise predictions to be made concerning the behavioural correlates of telephone apprehension.

Given the absence both of a proper understanding of the complexity of apprehension, and of an adequate model of the relationship between telephone apprehension, other determinants of telephone behaviour, and telephone use (and also of appropriate measures of each of these elements) it is not surprising that reported relationships between telephone apprehension and telephone use are so small. The model of apprehension and its role within a model of telephone use outlined here

suggests that it is likely, in the aggregate case, to remain a relatively small component. However, in particular individual cases, telephone apprehension is likely to be a major determinant of telephone use.

Conclusion

It can be concluded that whilst the original conceptualisation and operationalisation of telephone apprehension proposed by Steele and Reinsch (1983, 1984) has in many respects proved to be inadequate, it has provided a "point of entry" which has enabled a more sophisticated conceptualisation and framework for future empirical work to be developed. Whilst there are inadequacies in each of the individual studies which constitute this thesis, it is proposed that the thesis as a whole demonstrates that the concept of telephone apprehension has both practical and theoretical significance. In particular, it has been argued that an adequate understanding of telephone apprehension and its relation to telephone use can only be developed if it is derived from, and incorporates an appropriate model of apprehension and behaviour, properly grounded in general psychological and communication theory. In addition to apprehension, other influences upon behaviour must be incorporated, such as outcome expectancies and evaluations, and self-efficacy expectancies. It is proposed that the combined expectancy-value and self-efficacy model outlined here provides one such model, and should be used to guide future empirical research.

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TABLES: CHAPTER FIVE

TABLE 5.01: ITEM ANALYSIS: UK Student Data

ITEM	MEAN	REVERSED MEAN *	SD	CORRELATION WITH T20 SCORE	Steele & 1983	Reinsch 1984
		(* item polarity reversed relative to T20 score)				
01	2.501	2.501	0.919	.6473	.652	.623
02 *	3.368	2.632	1.108	-.7010	.627	.689
03 *	3.968	2.032	1.122	-.7200	.602	.657
04	2.677	2.677	0.877	.7224	.710	.707
05	3.136	3.136	0.881	.4600	.546	.499
06	2.916	2.916	0.971	.6847	.547	.544
07	3.002	3.002	0.937	.6985	.661	.714
08 *	3.341	2.659	1.061	-.6558	.675	.572
09 *	3.664	2.336	1.067	-.7513	.618	.585
10 *	3.681	2.319	1.062	-.7132	.568	.650
11 *	3.607	2.393	0.924	-.6213	.677	.615
12 *	3.501	2.499	0.984	-.6949	.575	.659
13 *	3.726	2.274	1.023	-.8545	.716	.783
14 *	3.595	2.405	1.034	-.7177	.563	.658
15	2.657	2.657	0.924	.7986	.725	.667
16 *	4.202	1.798	0.941	-.7523	.713	.652
17	2.563	3.437	0.884	.7890	.714	.692
18 *	3.654	2.346	1.029	-.7673	.745	.684
19 *	3.906	2.094	0.970	-.6252	.661	.484
20 *	4.091	1.909	1.062	-.6838	.587	.653
mean of absolute correlations				.7029 n=405	.644 n=333	.639 n=434

(all correlations significant at p<0.0001, 2-tailed)

(Details of the correlations calculated by Steele and Reinsch (1983, 1984) between the T20 score and the component item scores have been included for comparison purposes.)

Table 5.02: ANALYSIS OF VARIANCE TABLE: UK STUDENT DATA

T20 SCORE BY SEX AND AGE OF RESPONDENT   (** p<0.01)

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	1496.945	2	748.472	3.919	0.021	
SEX	1474.663	1	1474.663	7.721	0.006	**
AGE	24.132	1	24.132	0.126	0.722	
2-WAY INTERACTIONS	140.251	1	140.251	0.734	0.392	
SEX x AGE	140.251	1	140.251	0.734	0.392	
VARIANCE EXPLAINED	1637.196	3	545.732	2.857	0.037	
RESIDUAL VARIANCE	76589.209	401	190.996			
TOTAL VARIANCE	78226.405	404	193.630			

Table 5.03: ITEM ANALYSIS: Australian Student Data

ITEM		MEAN	REVERSED MEAN	SD	CORRELATION WITH T20 SCORE	STEELE 1983	& REINSCH 1984
(* item polarity reversed relative to T20 score)							
01		2.401	2.401	0.907	.6379	.652	.623
02	*	3.645	2.355	0.975	-.7695	.627	.689
03	*	3.879	2.121	0.938	-.7672	.602	.657
04		2.463	2.463	0.844	.7539	.710	.707
05		2.648	2.648	0.801	.5717	.546	.499
06		2.596	2.596	0.965	.7173	.547	.544
07		2.681	2.681	0.961	.7501	.661	.714
08	*	3.571	2.429	0.878	-.6588	.675	.572
09	*	3.853	2.147	0.931	-.7445	.618	.585
10	*	3.761	2.239	0.904	-.7348	.568	.650
11	*	3.710	2.290	0.871	-.7111	.677	.615
12	*	3.666	2.334	0.912	-.7723	.575	.659
13	*	3.815	2.185	0.932	-.8708	.716	.783
14	*	3.712	2.288	0.960	-.8204	.563	.658
15		2.329	2.329	0.864	.7681	.725	.667
16	*	4.015	1.985	0.780	-.7726	.713	.652
17	*	2.239	3.761	0.807	-.8307	.714	.692
18	*	3.781	2.219	0.889	-.8283	.745	.684
19	*	3.920	2.080	0.844	-.6474	.661	.484
20	*	3.992	2.008	0.943	-.7727	.587	.653
mean of absolute correlations					.7450 n=389	.644 n=333	.639 n=434

(all correlations are significant, p<0.0001, 2-tailed)

Table 5.04: ANALYSIS OF VARIANCE TABLE:
Australian Student Data

T20 SCORE BY SEX AND AGE OF RESPONDENT (** p<0.01)

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	1832.924	2	916.462	5.222	0.006	
SEX	1742.546	1	1742.546	9.930	0.002	**
AGE	101.496	1	101.496	0.578	0.447	
2-WAY INTERACTIONS	9.625	1	9.625	0.055	0.815	
SEX x AGE	9.625	1	9.625	0.055	0.815	
VARIANCE EXPLAINED	1842.548	3	614.183	3.500	0.016	
RESIDUAL VARIANCE	67561.971	385	175.486			
TOTAL VARIANCE	69404.519	388	178.878			

Table 5.05: ITEM ANALYSIS:
          UK and AUSTRALIAN Student Data

ITEM	UK MEAN	SD	AUSTRALIAN MEAN	SD
(* item polarity reversed relative to T20 score)				
01	2.501	0.919	2.401	0.907
02 *	3.368	1.108	3.645	0.975
03 *	3.968	1.122	3.879	0.938
04	2.677	0.877	2.463	0.844
05	3.136	0.881	2.648	0.801
06	2.916	0.971	2.596	0.965
07	3.002	0.937	2.681	0.961
08 *	3.341	1.061	3.571	0.878
09 *	3.664	1.067	3.853	0.931
10 *	3.681	1.062	3.761	0.904
11 *	3.607	0.924	3.710	0.871
12 *	3.501	0.984	3.666	0.912
13 *	3.726	1.023	3.815	0.932
14 *	3.595	1.034	3.712	0.960
15	2.657	0.924	2.329	0.864
16 *	4.202	0.941	4.015	0.780
17 *	2.563	0.884	2.239	0.807
18 *	3.654	1.029	3.781	0.889
19 *	3.906	0.970	3.920	0.844
20 *	4.091	1.062	3.992	0.943
T20	49.15	13.92	46.06	13.38

Table 5.06: ANALYSIS OF VARIANCE TABLE:
          UK and Australian Student Data

T20 Scores by Culture, Sex and Age of Respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	5253.19	3	1751.07	9.510	0.0001	
CULTURE	592.29	1	592.29	3.217	0.073	+
SEX	3352.69	1	3352.69	18.208	0.0001	***
AGE	114.62	1	114.62	0.622	0.430	
2-WAY INTERACTIONS	97.68	3	32.56	0.177	0.912	
CULTURExSEX	0.69	1	0.69	0.004	0.951	
CULTURExAGE	0.03	1	0.03	0.000	0.990	
SEX x AGE	85.41	1	85.41	0.464	0.496	
3-WAY INTERACTIONS	50.10	1	50.10	0.272	0.602	
CULTURExSEXxAGE	50.10	1	50.10	0.272	0.602	
VARIANCE EXPLAINED	5400.98	7	771.57	4.190	0.0001	
RESIDUAL VARIANCE	144730.06	786	184.14			
TOTAL VARIANCE	150131.03	793	189.32			

(+ p<0.10   *** p<0.001)

Table 5.07: ANALYSIS OF VARIANCE TABLE
          UK, Australian and US Student Data

T20 Scores by Sample, Sex and Age of Respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	12026.31	2	6013.15	34.261	0.0001	
SAMPLE	12026.31	2	6013.15	34.261	0.0001	***
VARIANCE EXPLAINED	12026.31	2	6013.15	34.261	0.0001	
RESIDUAL VARIANCE	197273.43	1124	175.51			
TOTAL VARIANCE	209299.74	1126	185.88			

(*** p<0.001)

Table 5.08: ITEM ANALYSIS: UK Non-Student Data

ITEM		MEAN	REVERSED MEAN *	SD	CORRELATION WITH T20 SCORE	Steele & Reinsch 1983	1984
		(* item polarity reversed relative to T20 score)					
01		2.513	2.513	1.025	.7156	.652	.623
02	*	3.886	2.114	1.085	-.7612	.627	.689
03	*	4.098	1.902	1.067	-.7688	.602	.657
04		2.395	2.677	0.974	.7484	.710	.707
05		2.598	3.136	1.055	.6405	.546	.499
06		2.343	2.916	1.006	.6861	.547	.544
07		2.778	3.002	1.189	.8055	.661	.714
08	*	3.830	2.170	0.939	-.6259	.675	.572
09	*	4.212	1.788	0.859	-.7334	.618	.585
10	*	3.971	2.029	0.949	-.6438	.568	.650
11	*	4.062	1.938	0.857	-.6630	.677	.615
12	*	4.111	1.889	0.822	-.7588	.575	.659
13	*	3.980	2.020	1.071	-.8006	.716	.783
14	*	4.016	1.984	1.019	-.7741	.563	.658
15		2.268	2.657	1.011	.8309	.725	.667
16	*	4.490	1.510	0.734	-.6731	.713	.652
17	*	2.180	2.180	0.932	-.8161	.714	.692
18	*	4.062	1.938	0.934	-.8172	.745	.684
19	*	4.131	1.869	0.835	-.6014	.661	.484
20	*	4.252	1.748	0.978	-.7660	.587	.653
mean of absolute correlations					.7315 n=306	.644 n=333	.639 n=434

(all correlations significant, p<0.0001, 2-tailed)

(Details of the correlations calculated by Steele & Reinsch (1983, 1984) between the T20 score and the component item scores have been included for comparison purposes.)

Table 5.09: ANOVA TABLE: UK NON-STUDENT DATA

T20 SCORE BY SEX AND AGE OF RESPONDENT (*** $p<0.001$)

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	3958.596	5	791.719	4.430	0.001	
SEX	2969.182	1	2969.182	16.615	0.0001	***
AGE	858.348	4	214.587	1.201	0.311	
2-WAY INTERACTIONS	4727.852	4	1181.963	6.614	0.0001	
SEX x AGE	4727.852	4	1181.963	6.614	0.0001	***
VARIANCE EXPLAINED	8686.448	9	965.161	5.401	0.0001	
RESIDUAL VARIANCE	52895.343	296	178.700			
TOTAL VARIANCE	61581.791	305	201.908			

Table 5.10: ANOVA TABLE: UK NON-STUDENT DATA

CALLS MADE BY SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	30.569	5	6.114	3.911	0.002	
SEX	5.739	1	5.739	3.672	0.056	+
AGE	24.242	4	6.060	3.877	0.004	**
2-WAY INTERACTIONS	1.341	4	.335	.214	0.930	
SEX x AGE	1.341	4	.335	.214	0.930	
VARIANCE EXPLAINED	31.909	9	3.545	2.268	0.018	
RESIDUAL VARIANCE	462.705	296	1.563			
TOTAL VARIANCE	494.614	305	1.622			

(+ $p<0.10$ ** $p<0.01$)

Table 5.11: ANOVA TABLE: UK NON-STUDENT DATA

CALLS RECEIVED BY SEX AND AGE OF RESPONDENT (* $p<0.05$)

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	33.782	5	6.756	2.824	0.017	
SEX	1.951	1	1.951	.815	0.367	
AGE	31.033	4	7.758	3.243	0.013	*
2-WAY INTERACTIONS	12.766	4	3.192	1.334	0.257	
SEX x AGE	12.766	4	3.192	1.334	0.257	
VARIANCE EXPLAINED	46.548	9	5.172	2.162	0.025	
RESIDUAL VARIANCE	708.187	296	2.393			
TOTAL VARIANCE	754.735	305	2.475			

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Table 5.12: ITEM ANALYSIS
          UK Student and Non-Student Data

ITEM		UK STUDENT MEAN	SD	UK NON-STUDENT MEAN	SD
(* item polarity reversed relative to T20 score)					
01		2.501	0.919	2.513	1.025
02	*	3.368	1.108	3.886	1.085
03	*	3.968	1.122	4.098	1.067
04		2.677	0.877	2.395	0.974
05		3.136	0.881	2.598	1.055
06		2.916	0.971	2.343	1.006
07		3.002	0.937	2.778	1.189
08	*	3.341	1.061	3.830	0.939
09	*	3.664	1.067	4.212	0.859
10	*	3.681	1.062	3.971	0.949
11	*	3.607	0.924	4.062	0.857
12	*	3.501	0.984	4.111	0.822
13	*	3.726	1.023	3.980	1.071
14	*	3.595	1.034	4.016	1.019
15		2.657	0.924	2.268	1.011
16	*	4.202	0.941	4.490	0.734
17	*	2.563	0.884	2.180	0.932
18	*	3.654	1.029	4.062	0.934
19	*	3.906	0.970	4.131	0.835
20	*	4.091	1.062	4.252	0.978
T20		49.15	13.92	41.97	14.21

Table 5.13: ANOVA TABLE: UK STUDENT AND NON-STUDENT DATA

T20 SCORE BY SAMPLE, SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	13289.509	3	4429.836	23.178	0.000	
SAMPLE	2092.620	1	2092.620	10.949	0.001	***
SEX	4317.762	1	4317.762	22.592	0.0001	***
AGE	14.087	1	14.087	0.074	0.786	
2-WAY INTERACTIONS	872.609	3	290.870	1.522	0.208	
SAMPLExSEX	133.641	1	133.641	0.699	0.403	
SAMPLExAGE	49.379	1	49.379	0.258	0.611	
SEX x AGE	599.538	1	599.538	3.137	0.077	+
3-WAY INTERACTIONS	253.060	1	253.060	1.324	0.250	
SAMPLExSEXxAGE	253.060	1	253.060	1.324	0.250	
VARIANCE EXPLAINED	14415.178	7	2059.311	10.775	0.0001	
RESIDUAL VARIANCE	134358.341	703	191.121			
TOTAL VARIANCE	148773.519	710	209.540			

(+ p<0.10   *** p<0.001)

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TABLES: CHAPTER SEVEN

Table 7.01: UK STUDENT DATA
            FACTOR ONE: DISLIKE AND ACTIVE AVOIDANCE

FACTOR SCORES BY SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	4.104	2	2.052	2.058	0.129
SEX	1.993	1	1.993	2.000	0.158
AGE	2.090	1	2.090	2.097	0.148
2-WAY INTERACTIONS	0.175	1	0.175	0.176	0.675
SEX x AGE	0.175	1	0.175	0.176	0.675
VARIANCE EXPLAINED	4.279	3	1.426	1.431	0.233
RESIDUAL VARIANCE	399.721	401	0.997		
TOTAL VARIANCE	404.000	401	1.000		

Table 7.02: UK STUDENT DATA
            FACTOR TWO: PROBLEMATIC COMMUNICATION

FACTOR SCORES BY SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	1.309	2	0.654	0.655	0.520
SEX	0.347	1	0.347	0.347	0.556
AGE	0.968	1	0.968	0.969	0.326
2-WAY INTERACTIONS	2.035	1	2.035	2.037	0.154
SEX x AGE	2.035	1	2.035	2.037	0.154
VARIANCE EXPLAINED	3.344	3	1.115	1.116	0.343
RESIDUAL VARIANCE	400.654	401	0.999		
TOTAL VARIANCE	404.000	404	1.000		

Table 7.03: UK STUDENT DATA
            FACTOR THREE: POSITIVE ENJOYMENT

FACTOR SCORES BY SEX AND AGE OF RESPONDENT (*** p<0.0001)

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F	
MAIN EFFECTS	10.021	2	5.011	5.103	0.006	
SEX	8.227	1	8.227	8.378	0.001	***
AGE	1.833	1	1.833	1.867	0.173	
2-WAY INTERACTIONS	0.207	1	0.207	0.211	0.646	
SEX x AGE	0.207	1	0.207	0.211	0.646	
VARIANCE EXPLAINED	10.228	3	3.409	3.472	0.016	
RESIDUAL VARIANCE	393.772	401	0.982			
TOTAL VARIANCE	404.000	404	1.000			

Table 7.04: AUSTRALIAN STUDENT DATA
            FACTOR 1: PROBLEMATIC vs NON-PROBLEMATIC

FACTOR SCORES BY SEX AND AGE OF RESPONDENT (*** p<0.0001)

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F	
MAIN EFFECTS	19.003	2	9.502	9.931	0.0001	
SEX	0.393	1	0.393	0.411	0.522	
AGE	18.680	1	18.680	19.524	0.0001	***
2-WAY INTERACTIONS	0.631	1	0.631	0.659	0.417	
SEX x AGE	0.631	1	0.631	0.659	0.417	
VARIANCE EXPLAINED	19.634	3	6.545	6.040	0.0001	
RESIDUAL VARIANCE	368.366	385	0.957			
TOTAL VARIANCE	388.000	388	1.000			

Table 7.05: AUSTRALIAN STUDENT DATA
            FACTOR TWO: AVOIDANCE vs APPROACH

FACTOR SCORES BY SEX AND AGE OF RESPONDENT (*** p<0.0001)

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F	
MAIN EFFECTS	30.343	2	15.172	16.343	0.0001	
SEX	15.414	1	15.414	16.604	0.0001	***
AGE	14.516	1	14.516	15.637	0.0001	***
2-WAY INTERACTIONS	0.258	1	0.258	0.278	0.599	
SEX x AGE	0.258	1	0.258	0.278	0.599	
VARIANCE EXPLAINED	30.601	3	10.200	10.988	0.0001	
RESIDUAL VARIANCE	357.399	385	0.928			
TOTAL VARIANCE	388.000	388	1.000			

Table 7.06: UK NON-STUDENT DATA
            FACTOR ONE: PROBLEMATIC COMMUNICATION

FACTOR SCORES BY SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F	
MAIN EFFECTS	20.844	5	4.169	4.527	0.001	
SEX	.098	1	.098	.107	0.744	
AGE	20.707	4	5.177	5.622	0.0001	***
2-WAY INTERACTIONS	11.605	4	2.901	3.151	0.015	
SEX x AGE	11.605	4	2.901	3.151	0.015	*
VARIANCE EXPLAINED	32.449	9	3.605	3.916	0.0001	
RESIDUAL VARIANCE	272.551	296	0.921			
TOTAL VARIANCE	305.000	305	1.000			

(* p<0.05, *** p<0.0001)

Table 7.07: UK NON-STUDENT DATA
           FACTOR TWO: POSITIVE ENJOYMENT

FACTOR SCORES BY SEX AND AGE OF RESPONDENT (*** p<0.0001)

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F	
MAIN EFFECTS	25.115	5	5.023	5.438	0.0001	
SEX	23.390	1	23.390	25.324	0.0001	***
AGE	1.486	4	0.371	0.402	0.807	
2-WAY INTERACTIONS	6.489	4	1.622	1.756	0.138	
SEX x AGE	6.489	4	1.622	1.756	0.138	
VARIANCE EXPLAINED	31.604	9	3.512	3.802	0.0001	
RESIDUAL VARIANCE	273.396	296	0.924			
TOTAL VARIANCE	305.000	305	1.000			

Table 7.08: UK NON-STUDENT DATA
           FACTOR THREE: ACTIVE AVOIDANCE

FACTOR SCORES BY SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F	
MAIN EFFECTS	6.153	5	1.231	1.269	0.277	
SEX	3.586	1	3.586	3.697	0.055	+
AGE	1.905	4	0.476	0.491	0.742	
2-WAY INTERACTIONS	11.757	4	2.939	3.030	0.018	
SEX x AGE	11.757	4	2.939	3.030	0.018	*
VARIANCE EXPLAINED	17.910	9	1.990	2.052	0.034	
RESIDUAL VARIANCE	287.090	296	0.970			
TOTAL VARIANCE	305.000	305	1.000			

(+ p<0.10, * p<0.05)

Table 7.09: COMBINED STUDENT SAMPLES
           FACTOR ONE: PROBLEMATIC COMMUNICATION

FACTOR SCORES BY CULTURE, SEX AND AGE (* p<0.05)

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F	
MAIN EFFECTS	6.550	3	2.183	2.198	0.087	
CULTURE	5.112	1	5.112	5.146	0.024	*
SEX	0.756	1	0.756	0.761	0.383	
AGE	2.291	1	2.291	2.306	0.129	
2-WAY INTERACTIONS	4.177	3	1.392	1.401	0.241	
CULTURExSEX	0.029	1	0.029	0.029	0.864	
CULTURExAGE	2.204	1	2.204	2.219	0.137	
SEX x AGE	1.016	1	1.016	1.023	0.312	
3-WAY INTERACTIONS	1.446	1	1.446	1.456	0.228	
CULTURExSEXxAGE	1.446	1	1.446	1.456	0.228	
VARIANCE EXPLAINED	12.173	7	1.739	1.750	0.094	
RESIDUAL VARIANCE	780.827	786	0.993			
TOTAL VARIANCE	793.000	793	1.000			

Table 7.10: COMBINED STUDENT SAMPLE
            FACTOR TWO: AVOIDANCE vs APPROACH

FACTOR SCORES BY CULTURE, SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F	
MAIN EFFECTS	33.494	3	11.165	11.629	0.0001	
CULTURE	0.161	1	0.161	0.168	0.682	
SEX	21.485	1	21.485	22.378	0.0001	***
AGE	11.667	1	11.667	12.152	0.001	***
2-WAY INTERACTIONS	4.859	3	1.620	1.687	0.168	
CULTURExSEX	0.671	1	0.671	0.698	0.404	
CULTURExAGE	2.844	1	2.844	2.962	0.086	+
SEX x AGE	0.628	1	0.628	0.654	0.419	
3-WAY INTERACTIONS	0.03	1	0.003	0.003	0.956	
CULTURExSEXxAGE	0.003	1	0.003	0.003	0.956	
VARIANCE EXPLAINED	38.356	7	5.479	5.707	0.0001	
RESIDUAL VARIANCE	754.644	786	0.960			
TOTAL VARIANCE	793.000	793	1.000			

(+ p<0.10, *** p<0.0001)

Table 7.11: COMBINED STUDENT SAMPLE
            FACTOR THREE: CONFIDENCE

FACTOR SCORES BY CULTURE, SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F	
MAIN EFFECTS	121.611	3	40.537	47.592	0.0001	
CULTURE	72.510	1	72.510	85.129	0.0001	***
SEX	2.954	1	2.954	3.468	0.0630	+
AGE	16.874	1	16.874	19.810	0.0001	***
2-WAY INTERACTIONS	1.542	3	0.514	0.603	0.613	
CULTURExSEX	0.302	1	0.302	0.354	0.552	
CULTURExAGE	0.017	1	0.017	0.020	0.888	
SEX x AGE	1.399	1	1.399	1.642	0.200	
3-WAY INTERACTIONS	0.356	1	0.356	0.418	0.518	
CULTURExSEXxAGE	0.356	1	0.356	0.418	0.518	
VARIANCE EXPLAINED	123.509	7	17.644	20.715	0.0001	
RESIDUAL VARIANCE	669.491	786	0.852			
TOTAL VARIANCE	793.000	793	1.000			

(+ p<0.10, *** p<0.0001)

Table 7.12: COMBINED UK SAMPLES
           FACTOR ONE: ACTIVE AVOIDANCE

FACTOR SCORES BY SAMPLE, SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	6.334	3	2.111	2.114	0.097
SAMPLE	.683	1	.683	.683	0.409
SEX	3.276	1	3.276	3.279	0.071
AGE	2.475	1	2.475	2.478	0.116
2-WAY					
INTERACTIONS	1.331	3	.444	.444	0.722
SAMPLExSEX	.924	1	.924	.925	0.336
SAMPLExAGE	.030	1	.030	.030	0.863
SEX x AGE	1.188	1	1.188	1.189	0.276
3-WAY					
INTERACTIONS	.050	1	.050	.050	0.822
SAMPLExSEXxAGE	.050	1	.050	.050	0.822
VARIANCE EXPLAINED	7.716	7	1.102	1.103	0.359
RESIDUAL VARIANCE	702.284	703	0.999		
TOTAL VARIANCE	710.000	710	1.000		

Table 7.13: COMBINED UK SAMPLES
           FACTOR TWO: PROBLEMATIC COMMUNICATION

FACTOR SCORES BY SAMPLE, SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F	
MAIN EFFECTS	107.649	3	35.883	42.182	0.0001	
SAMPLE	18.391	1	18.391	21.619	0.0001	***
SEX	.072	1	.072	.085	0.771	
AGE	2.709	1	2.709	3.184	0.075	+
2-WAY						
INTERACTIONS	3.905	3	1.302	1.530	0.205	
SAMPLExSEX	3.504	1	3.504	4.119	0.043	*
SAMPLExAGE	.000	1	.000	.000	0.995	
SEX x AGE	3.458	1	3.458	4.064	0.044	*
3-WAY						
INTERACTIONS	0.421	1	0.421	0.494	0.482	
SAMPLExSEXxAGE	0.421	1	0.421	0.494	0.482	
VARIANCE EXPLAINED	111.975	7	15.996	18.804	0.0001	
RESIDUAL VARIANCE	598.025	703	0.851			
TOTAL VARIANCE	710.000	710	1.000			

(+ p<0.10, * p<0.05, *** p<0.0001)

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Table 7.14: COMBINED UK SAMPLE
          FACTOR THREE: POSITIVE ENJOYMENT

FACTOR SCORES BY SAMPLE, SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F	
MAIN EFFECTS	36.800	3	12.267	12.987	0.0001	
SAMPLE	.092	1	.092	.097	0.755	
SEX	33.481	1	33.481	35.448	0.0001	***
AGE	.204	1	.204	.216	0.642	
2-WAY						
INTERACTIONS	8.072	3	2.691	2.849	0.037	
SAMPLExSEX	2.209	1	2.209	2.339	0.127	
SAMPLExAGE	1.064	1	1.064	1.126	0.289	
SEX x AGE	.004	1	.004	.005	0.946	
3-WAY						
INTERACTIONS	1.133	1	1.133	1.200	0.274	
SAMPLExSEXxAGE	1.133	1	1.133	1.200	0.274	
VARIANCE EXPLAINED	46.006	7	6.572	6.958	0.0001	
RESIDUAL VARIANCE	663.994	703	0.945			
TOTAL VARIANCE	710.000	710	1.000			

Table 8.01: TAI P- SCORES: UK STUDENT DATA

MEAN	-25	26+	TOTAL
MALE	13.97 (n=216)	14.81 (n=26)	14.06 (n=262)
FEMALE	13.22 (n=146)	12.29 (n=17)	13.12 (n=163)
TOTAL	13.67 (n=362)	13.81 (n=43)	13.68 (n=405)

Table 8.02: ANALYSIS OF VARIANCE TABLE: UK STUDENT DATA

TAI P- SCORES BY SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F ($* p<0.05$)
MAIN EFFECTS	86.661	2	43.330	2.137	0.119
SEX	85.848	1	85.848	4.233	0.040 *
AGE	.732	1	.732	0.036	0.849
2-WAY INTERACTIONS	28.497	1	28.497	1.405	0.237
SEX x AGE	28.497	1	28.497	1.405	0.237
VARIANCE EXPLAINED	115.158	3	38.386	1.893	0.130
RESIDUAL VARIANCE	8132.388	401	20.280		
TOTAL VARIANCE	8247.546	404	20.415		

Table 8.03: TAI P- SCORES: AUSTRALIAN STUDENT DATA

MEAN	-25	26+	TOTAL
MALE	14.07 (n=102)	13.24 (n=33)	13.87 (n=135)
FEMALE	13.11 (n=195)	12.17 (n=59)	12.89 (n=254)
TOTAL	13.44 (n=297)	12.55 (n=92)	13.24 (n=389)

Table 8.04: ANOVA TABLE: AUSTRALIAN STUDENT DATA

TAI P- scores by sex and age of respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	151.307	2	75.653	4.479	0.012	
SEX	93.959	1	93.959	5.563	0.019	*
AGE	59.534	1	59.534	3.514	0.062	+
2-WAY						
INTERACTIONS	.045	1	.045	0.003	0.959	
SEX x AGE	.045	1	.045	0.003	0.959	
VARIANCE EXPLAINED	151.352	3	50.451	2.987	0.031	
RESIDUAL VARIANCE	6502.447	385	16.889			
TOTAL VARIANCE	6653.799	388	17.149			

(+ p<0.10   * p<0.05)

Table 8.05: TAI P- SCORES: UK NON-STUDENT DATA

Age	16-25	26-35	36-45	46-55	56-65	TOTAL
MALE means	10.43 (n=7)	11.38 (n=29)	12.31 (n=55)	11.02 (n=44)	13.72 (n=18)	11.84 (n=153)
FEMALE means	12.90 (n=10)	13.68 (n=25)	10.04 (n=70)	9.63 (n=35)	9.38 (n=13)	10.67 (n=153)
TOTAL means	11.88 (n=17)	12.44 (n=54)	11.04 (n=125)	10.41 (n=79)	11.90 (n=31)	11.26 (n=306)

Table 8.06: ANOVA TABLE: UK NON-STUDENT DATA

TAI P- score by sex and age of respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	263.216	5	52.643	3.667	0.003	
SEX	104.257	1	104.257	7.262	0.007	**
AGE	158.507	4	39.627	2.760	0.028	*
2-WAY						
INTERACTIONS	330.053	4	82.513	5.748	0.0001	
SEX x AGE	330.053	4	82.513	5.748	0.0001	***
VARIANCE EXPLAINED	593.269	9	65.919	4.592	0.0001	
RESIDUAL VARIANCE	4249.335	296	14.356			
TOTAL VARIANCE	4842.605	305	15.877			

(* p<0.05   ** p<0.01   *** p<0.001)

Table 8.07A: TAI P- SCORES: UK AND AUSTRALIAN STUDENTS

SAMPLE	SEX	AGE	MEAN TAI P- SCORES	
UK	MALE	-25	13.97 (n=216)	14.06
		26+	14.81 (n= 26)	
	FEMALE	-25	13.22 (n=146)	13.12
		26+	12.29 (n= 17)	
AUSTRALIAN	MALE	-25	14.07 (n=102)	13.87
		26+	13.24 (n= 33)	
	FEMALE	-25	13.11 (n=195)	12.89
		26+	12.17 (n= 59)	

Table 8.07A: TAI P-: Summary of comparisons	
Culture: UK =13.68 (n=405) Australian=13.23 (n=389)	
Sex: Male=13.99 (n=377) Female=12.98 (n=417)	
Age: -25 =13.56 (n=659) 26+ =12.96 (n=135)	

Table 8.08: ANOVA TABLE: UK AND AUSTRALIAN STUDENT DATA

TAI P- Scores by Culture, Sex and Age of Respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	241.815	3	80.605	4.347	0.005	
CULTURE	3.802	1	3.802	0.205	0.651	
SEX	171.378	1	171.378	9.241	0.002	**
AGE	30.721	1	30.721	1.657	0.198	
2-WAY INTERACTIONS	39.566	3	13.189	0.711	0.545	
CULTURExSEX	.098	1	.098	0.005	0.942	
CULTURExAGE	17.292	1	17.292	0.932	0.335	
SEX x AGE	12.801	1	12.801	0.690	0.406	
3-WAY INTERACTIONS	15.898	1	15.898	0.857	0.355	
CULTURExSEXxAGE	15.898	1	15.898	0.857	0.355	
VARIANCE EXPLAINED	297.278	7	42.468	2.290	0.026	
RESIDUAL VARIANCE	14576.011	786	18.545			
TOTAL VARIANCE	14873.290	793	18.756			

(** p<0.01)

Table 8.09A: TAI P- Scores by Sample, Sex and Age				
SAMPLE	SEX		AGE	MEAN TAI P- SCORE
S T U D E N T	MALE 14.06		-25	13.97 (n=216)
			26+	14.81 (n= 26)
	FEMALE 13.12		-25	13.22 (n=146)
			26+	12.29 (n= 17)
N O N S T U D E N T	MALE 11.84		-25	10.43 (n= 7)
			26+	11.91 (n=146)
	FEMALE 10.67		-25	12.90 (n= 10)
			26+	10.52 (n=143)

Table 8.09B: TAI P-: UK Student & Non-student Samples Summary of comparisons	
Sample: Student=13.68 (n=405) Non-student=11.26 (n=306)	
Sex: Male=13.20 (n=395)	Female=11.94 (n=316)
Age: -25 =13.59 (n=379)	26+ =11.56 (n=332)

Table 8.10: ANOVA TABLE: UK STUDENT AND NON-STUDENT DATA

TAI P- scores by sample, sex and age of respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	1214.909	3	404.970	22.237	0.0001	
SAMPLE	262.736	1	262.736	14.427	0.0001	***
SEX	188.771	1	188.771	10.366	0.0001	***
AGE	.874	1	.874	0.048	0.827	
2-WAY INTERACTIONS	86.249	3	28.750	1.579	0.193	
SAMPLExSEX	40.053	1	40.053	2.199	0.139	
SAMPLExAGE	2.356	1	2.356	0.129	0.719	
SEX x AGE	74.571	1	74.571	4.095	0.043	*
3-WAY INTERACTIONS	12.117	1	12.117	0.665	0.415	
SAMPLExSEXxAGE	12.117	1	12.117	0.665	0.415	
VARIANCE EXPLAINED	1313.275	7	187.611	10.302	0.0001	
RESIDUAL VARIANCE	12802.551	703	18.211			
TOTAL VARIANCE	14115.826	710	19.881			

(* p<0.05   *** p<0.001)

Table 8.11: TAI A- SCORES: UK STUDENT DATA

MEAN	-25	26+	TOTAL
MALE	8.55 (n=216)	8.58 (n=26)	8.55 (n=242)
FEMALE	7.60 (n=146)	7.94 (n=17)	7.63 (n=163)
TOTAL	8.16 (n=362)	8.33 (n=43)	8.18 (n=405)

Table 8.12: ANALYSIS OF VARIANCE TABLE: UK STUDENT DATA

Tai A- scores by sex and age of respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F (*** p<0.001)	
MAIN EFFECTS	82.950	2	41.475	7.301	0.001	
SEX	81.934	1	81.934	14.423	0.0001	***
AGE	.927	1	.927	0.163	0.686	
2-WAY INTERACTIONS	.910	1	.910	0.160	0.689	
SEX x AGE	.910	1	.910	0.160	0.689	
VARIANCE EXPLAINED	83.860	3	27.953	4.921	0.002	
RESIDUAL VARIANCE	2277.982	401	5.681			
TOTAL VARIANCE	2361.842	404	5.846			

Table 8.13: TAI A- SCORES: AUSTRALIAN STUDENT DATA

MEAN	-25	26+	TOTAL
MALE	8.11 (n=102)	8.73 (n=33)	8.26 (n=135)
FEMALE	6.99 (n=195)	7.73 (n=59)	7.17 (n=254)
TOTAL	7.38 (n=297)	8.09 (n=92)	7.54 (n=389)

Table 8.14: ANOVA TABLE: AUSTRALIAN STUDENT DATA

Tai A- scores by sex and age of respondent

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG	
MAIN EFFECTS	139.237	2	69.618	12.554	0.0001	
SEX	103.843	1	103.843	18.726	0.0001	***
AGE	33.755	1	33.755	6.087	0.014	*
2-WAY INTERACTIONS	.211	1	.211	0.038	0.845	
SEX x AGE	.211	1	.211	0.038	0.845	
VARIANCE EXPLAINED	139.448	3	46.483	8.382	0.0001	
RESIDUAL VARIANCE	2135.015	385	5.545			
TOTAL VARIANCE	2274.463	388	5.862			

(* p<0.05   *** p<0.001)

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Table 8.15: ANOVA TABLE: UK NON-STUDENT DATA

TAI A- scores by sex and age of respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F (*** p<0.001)	
MAIN EFFECTS	271.105	5	54.221	7.591	0.0001	
SEX	262.194	1	262.194	36.706	0.0001	***
AGE	3.798	4	.950	0.133	0.970	
2-WAY INTERACTIONS	146.409	4	36.602	5.124	0.001	
SEX x AGE	146.409	4	36.602	5.124	0.001	***
VARIANCE EXPLAINED	417.515	9	46.391	6.494	0.0001	
RESIDUAL VARIANCE	2114.367	296	7.143			
TOTAL VARIANCE	2531.882	305	8.301			

Table 8.15: TAI A- SCORES: UK NON-STUDENT DATA

Age	16-25	26-35	36-45	46-55	56-65	TOTAL
MALE means	7.71 (n=7)	7.34 (n=29)	8.62 (n=55)	9.23 (n=44)	9.56 (n=18)	8.62 (n=153)
FEMALE means	7.60 (n=10)	7.84 (n=25)	6.70 (n=70)	6.31 (n=35)	5.46 (n=13)	6.75 (n=153)
TOTAL means	7.65 (n=17)	7.57 (n=54)	7.54 (n=125)	7.94 (n=79)	7.84 (n=31)	7.69 (n=306)

Table 8.17: TAI A- SCORES: UK AND AUSTRALIAN STUDENTS

SAMPLE	SEX	AGE	MEAN TAI A- SCORES	
UK	MALE	-25	8.55 (n=216)	8.55
		26+	8.58 (n= 26)	
	FEMALE	-25	7.60 (n=146)	7.63
		26+	7.94 (n= 17)	
AUSTRALIAN	MALE	-25	8.11 (n=102)	8.26
		26+	8.73 (n= 33)	
	FEMALE	-25	6.99 (n=195)	7.17
		26+	7.73 (n= 59)	

Table 8.18: TAI A-: Summary of comparisons	
Culture: UK = 8.18 (n=405)	Australian= 7.54 (n=389)
Sex: Male= 8.45 (n=377)	Female= 7.35 (n=417)
Age: -25 = 7.81 (n=659)	26+ = 8.16 (n=135)

Table 8.19: ANOVA TABLE: UK AND AUSTRALIAN STUDENT DATA

TAI A- Scores by Culture, Sex and Age of Respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	293.706	3	97.902	17.437	0.0001	
CULTURE	36.723	1	36.723	6.541	0.011	*
SEX	184.663	1	184.723	32.890	0.0001	***
AGE	27.565	1	27.565	4.910	0.027	*
2-WAY INTERACTIONS	9.440	3	3.147	0.560	0.641	
CULTURExSEX	1.677	1	1.677	0.299	0.585	
CULTURExAGE	5.654	1	5.654	1.007	0.316	
SEX x AGE	.887	1	.887	0.158	0.691	
3-WAY INTERACTIONS	.234	1	.234	0.042	0.838	
CULTURExSEXxAGE	.234	1	.234	0.042	0.838	
VARIANCE EXPLAINED	303.381	7	43.340	7.719	0.0001	
RESIDUAL VARIANCE	4412.997	786	5.614			
TOTAL VARIANCE	4716.378	793	5.948			

(* p<0.05 *** p<0.001)

Table 8.20: TAI A- Scores by Sample, Sex and Age				
SAMPLE	SEX		AGE	MEAN TAI A- SCORE
S T U D E N T	MALE	8.55	-25	8.55 (n=216)
			26+	8.58 (n= 26)
	FEMALE	7.63	-25	7.60 (n=146)
			26+	7.94 (n= 17)
N O N S T U D E N T	MALE	8.62	-25	7.71 (n= 7)
			26+	8.66 (n=146)
	FEMALE	6.75	-25	7.60 (n= 10)
			26+	6.69 (n=143)

Table 8.21: TAI A-: UK Student & Non-student Samples Summary of comparisons		
Sample: Student= 8.18 (n=405)		Non-student= 7.69 (n=306)
Sex: Male= 8.58 (n=395)		Female= 7.21 (n=316)
Age: -25 = 8.14 (n=379)		26+ = 7.77 (n=332)

Table 8.22: ANOVA TABLE: UK STUDENT AND NON-STUDENT DATA

TAI A- scores by sample, sex and age of respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F (*** p<0.001)	
MAIN EFFECTS	353.435	3	117.812	18.288	0.0001	
SAMPLE	10.014	1	10.014	1.554	0.213	
SEX	310.025	1	310.025	48.125	0.0001	***
AGE	.372	1	.372	0.058	0.810	
2-WAY INTERACTIONS	41.080	3	13.693	2.126	0.096	
SAMPLExSEX	5.905	1	5.905	0.917	0.339	
SAMPLExAGE	.564	1	.564	0.087	0.767	
SEX x AGE	1.442	1	1.442	0.224	0.636	
3-WAY INTERACTIONS	12.914	1	12.914	2.005	0.157	
SAMPLExSEXxAGE	12.914	1	12.914	2.005	0.157	
VARIANCE EXPLAINED	407.429	7	58.204	9.035	0.0001	
RESIDUAL VARIANCE	4528.827	703	6.442			
TOTAL VARIANCE	4936.256	710	6.952			

Table 8.23: TAI C- SCORES: UK STUDENT DATA

MEAN	-25	26+	TOTAL
MALE	6.23 (n=216)	5.96 (n=26)	6.20 (n=242)
FEMALE	5.90 (n=146)	5.24 (n=17)	5.83 (n=163)
TOTAL	6.10 (n=362)	5.67 (n=43)	6.05 (n=405)

Table 8.24: ANALYSIS OF VARIANCE TABLE: UK STUDENT DATA

TAI C- scores by sex and age of respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	19.852	2	9.926	3.994	0.019	
SEX	12.999	1	12.999	5.230	0.023	**
AGE	6.948	1	6.948	2.796	0.095	+
SEX x AGE	1.497	1	1.497	0.602	0.438	
VARIANCE EXPLAINED	21.349	3	7.116	2.863	0.037	
RESIDUAL VARIANCE	996.562	401	2.485			
TOTAL VARIANCE	1017.911	404	2.520			

(+ p<0.10 ** p<0.05)

Table 8.25: TAI C- SCORES: AUSTRALIAN STUDENT DATA

MEAN	-25	26+	TOTAL
MALE	5.53 (n=102)	5.09 (n=33)	5.42 (n=135)
FEMALE	5.32 (n=195)	4.59 (n=59)	5.15 (n=389)
TOTAL	5.39 (n=297)	4.77 (n=92)	5.24 (n=389)

Table 8.26: ANOVA TABLE: AUSTRALIAN STUDENT DATA

TAI C- scores by sex and age of respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	33.819	2	16.909	7.228	0.001	
SEX	6.919	1	6.919	2.958	0.086	+
AGE	27.267	1	27.267	11.656	0.001	***
2-WAY INTERACTIONS	1.317	1	1.317	0.563	0.453	
SEX x AGE	1.317	1	1.317	0.563	0.453	
VARIANCE EXPLAINED	35.136	3	11.712	5.006	0.002	
RESIDUAL VARIANCE	900.664	385	2.339			
TOTAL VARIANCE	935.799	388	2.412			

(+ p<0.10 *** p<0.001)

Table 8.27: TAI C- SCORES: UK NON-STUDENT DATA

Age	16-25	26-35	36-45	46-55	56-65	TOTAL
MALE means	4.71 (n=7)	5.10 (n=29)	5.47 (n=55)	5.07 (n=44)	6.28 (n=18)	5.35 (n=153)
FEMALE means	5.10 (n=10)	5.36 (n=25)	4.39 (n=70)	4.20 (n=35)	4.23 (n=13)	4.54 (n=153)
TOTAL means	4.94 (n=17)	5.22 (n=54)	4.86 (n=125)	4.68 (n=79)	5.42 (n=31)	4.94 (n=306)

Table 8.28: ANOVA TABLE: UK NON-STUDENT DATA

TAI C- scores by sex and age of respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	66.415	5	13.283	4.314	0.001	
SEX	49.073	1	49.073	15.938	0.0001	***
AGE	16.167	4	4.042	1.313	0.265	
2-WAY INTERACTIONS	35.139	4	8.785	2.853	0.024	
SEX x AGE	35.139	4	8.785	2.853	0.024	*
VARIANCE EXPLAINED	101.554	9	11.284	3.665	0.0001	
RESIDUAL VARIANCE	911.387	296	3.079			
TOTAL VARIANCE	1012.941	305	3.321			

(* p<0.05   *** p<0.001)

Table 8.29: TAI C- SCORES: UK AND AUSTRALIAN STUDENT DATA

SAMPLE	SEX	AGE	MEAN TAI C- SCORES	
UK	MALE	-25	6.23 (n=216)	6.20
		26+	5.96 (n= 26)	
	FEMALE	-25	5.90 (n=146)	5.83
		26+	5.24 (n= 17)	
AUSTRALIAN	MALE	-25	5.53 (n=102)	5.42
		26+	5.09 (n= 33)	
	FEMALE	-25	5.32 (n=195)	5.15
		26+	4.59 (n= 59)	

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Table 8.30 : TAI C-: Summary of comparisons		
Culture:	UK = 6.05 (n=405)	Australian= 5.24 (n=389)
Sex:	Male= 5.92 (n=377)	Female= 5.42 (n=417)
Age:	-25 = 5.78 (n=659)	26+ = 5.06 (n=135)

Table 8.31: ANOVA TABLE: UK AND AUSTRALIAN STUDENT DATA

TAI C- Scores by Culture, Sex and Age of Respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F	
MAIN EFFECTS	181.776	3	60.592	25.103	0.0001	
CULTURE	77.263	1	77.263	32.009	0.0001	***
SEX	19.559	1	19.559	8.103	0.005	**
AGE	33.283	1	33.283	13.789	0.0001	***
2-WAY INTERACTIONS	4.052	3	1.351	0.560	0.642	
CULTURExSEX	.750	1	0.750	0.311	0.577	
CULTURExAGE	.316	1	0.316	0.131	0.718	
SEX x AGE	2.734	1	2.734	1.133	0.288	
3-WAY INTERACTIONS	0.080	1	0.080	0.033	0.855	
CULTURExSEXxAGE	0.080	1	0.080	0.033	0.855	
VARIANCE EXPLAINED	185.909	7	26.558	11.003	0.0001	
RESIDUAL VARIANCE	1897.226	786	2.414			
TOTAL VARIANCE	2083.135	793	2.627			

(** $p<0.01$ *** $p<0.001$)

Table 8.32: TAI C- Scores by Sample, Sex and Age				
SAMPLE	SEX		AGE	MEAN T20 SCORE
S T U D E N T	MALE	6.20	-25	6.23 (n=216)
			26+	5.96 (n= 26)
	FEMALE	5.83	-25	5.90 (n=146)
			26+	5.24 (n= 17)
N O N S T U D E N T	MALE	5.35	-25	4.71 (n= 7)
			26+	5.38 (n=146)
	FEMALE	4.54	-25	5.10 (n= 10)
			26+	4.50 (n=143)

Table 8.33: TAI C-: UK Student & Non-student Samples
Summary of comparisons

Sample:	Student= 6.05 (n=405)	Non-student= 4.94 (n=306)
Sex:	Male= 5.87 (n=395)	Female= 5.21 (n=316)
Age:	-25 = 6.04 (n=379)	26+ = 5.04 (n=332)

Table 8.34: ANOVA TABLE: UK STUDENT AND NON-STUDENT DATA

TAI C- scores by sample, sex and age of respondent

SOURCE OF VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF F (*** p<0.001)	
MAIN EFFECTS	275.091	3	91.697	33.008	0.0001	
SAMPLE	33.363	1	33.363	12.010	0.001	***
SEX	55.235	1	55.235	19.883	0.0001	***
AGE	5.458	1	5.458	1.965	0.161	
2-WAY INTERACTIONS	15.828	3	5.276	1.899	0.128	
SAMPLExSEX	.152	1	.152	0.055	0.815	
SAMPLExAGE	2.454	1	2.454	0.883	0.348	
SEX x AGE	5.705	1	5.705	2.054	0.152	
3-WAY INTERACTIONS	2.035	1	2.035	0.733	0.392	
SAMPLExSEXxAGE	2.035	1	2.035	0.733	0.392	
VARIANCE EXPLAINED	292.954	7	41.851	15.065	0.0001	
RESIDUAL VARIANCE	1952.920	703	2.778			
TOTAL VARIANCE	2245.873	710	3.163			

Table 8.35A: SUMMARY T11 STATISTICS

	UK Students	Australian Students	UK Non-students	Combined Samples
		(min=11, max=55)		
MEAN	27.916	26.033	23.886	26.124
SD	7.249	7.043	7.532	7.423
MODE	23	26	21	25
MEDIAN	27	26	23	25
MIN SCORE	12	11	11	11
MAX SCORE	52	48	53	53
KURTOSIS	0.143	-0.217	0.267	0.041
SKEWNESS	0.519	0.256	0.574	0.400

Table 8.35B: T11 SCORES: Combined Data

AGE	-25	26+	TOTAL
MALE	m=28.29 sd=7.058 n=325	m=26.56 sd=6.784 n=205	m=27.62 sd=6.998 n=530
FEMALE	m=25.97 sd=7.229 n=351	m=22.75 sd=7.623 n=219	m=24.73 sd=7.541 n=570
TOTAL	m=27.08 sd=7.236 n=676	m=24.59 sd=7.469 n=424	m=26.12 sd=7.423 n=1100

Table 8.36

MEASURES OF INTERNAL RELIABILITY	UK STUDENTS (n=405)	AUSTRALIAN STUDENTS (n=389)	UK NON-STUDENTS (n=306)	COMBINED (n=1100)
Alpha	0.8860	0.9066	0.9028	0.9009
Ordered split half reliability	0.6219	0.7087	0.6548	0.6567
Unequal length Spearman-Brown	0.7681	0.8305	0.7925	0.7939
Guttman split-half	0.7522	0.8221	0.7900	0.7885
Test-retest reliability	(n=94) 0.7026			

Table 9.01: TAI: TELEPHONE APPREHENSION INVENTORY

INSTRUCTIONS

This inventory consists of a series of forty-five statements which reflect different feelings about using the telephone. The inventory asks you for your reaction to each of these statements.

The inventory is not a test; there are no right or wrong answers, and we are interested only in your own personal opinion and honest reaction to each statement.

For each statement please circle the response which best indicates your own reaction. Do not spend too long answering each question. Normally, your first reaction is likely to be your 'true' reaction. After each statement, please circle the response which best indicates your reaction to the item.

The following scale is used:
!YES! = strong agreement with the statement;

 yes = moderate agreement with the statement;

 >?< = don't know or feel neutral about the Statement;

 no   = moderate disagreement with the statement;

!NO! = strong disagreement with the statement;

Please respond to all 45 statements, do not miss any out.

This inventory is completely anonymous, the results will only be used for research purposes, and they will be treated in the strictest confidence.

TELEPHONE APPREHENSION INVENTORY

_1: I hurry to finish the conversation when I'm communicating by telephone

!YES!   yes   >?<   no   !NO!

2: It is easy for me to express myself on the telephone

3: I look forward to telephone conversations

4: I feel relaxed and comfortable when listening on the telephone

5: I take pride in my ability to communicate well by 'phone

_6: I have problems listening over the telephone

_7: I avoid having to speak on the telephone whenever possible

_8: I avoid using the 'phone

_9: I do not like talking to people on the 'phone

10: I find listening on the telephone pleasant

11: It is easy for me to communicate by telephone

12: When I have to communicate by 'phone, I grow nervous and uncomfortable

13: I hurry to finish the conversation when I'm listening to someone on the telephone

14: I feel it is difficult to converse over the 'phone

15: I thoroughly enjoy speaking on the telephone

16: I dread communicating with people by 'phone

17: I avoid having to listen on the telephone whenever possible

18: I feel misunderstood when I use the 'phone

19: I feel rushed and pushed when I speak to people on the 'phone

20: When I have to talk on the 'phone, I grow nervous and uncomfortable

21: I do not like communicating by 'phone

22: I take pride in my ability to listen well when using the 'phone

23: I feel relaxed and comfortable when communicating by telephone

24: I have problems expressing myself over the telephone

25: I feel rushed and pushed when I listen to people on the 'phone

26: I feel inhibited using the 'phone

27: I have feelings of frustration after most 'phone calls

28: I avoid having to communicate by telephone whenever possible

29: I do not like listening to people on the 'phone

30: I find speaking on the telephone pleasant

31: I dread speaking to people on the 'phone

32: I feel rushed and pushed when I communicate with people on the 'phone

33: It is easy for me to listen on the telephone

34: I thoroughly enjoy listening on the telephone

35: I feel calm and comfortable using the telephone

36: I find communicating by telephone pleasant

37: I feel relaxed and comfortable when speaking on the telephone

38: When I have to listen to someone on the 'phone, I grow nervous and uncomfortable

39: I have problems communicating over the telephone

40: I feel rushed and pushed when I use the 'phone

41: I hurry to finish the conversation when I'm talking to someone on the telephone

42: I take pride in my ability to speak well when using the 'phone

43: I dread listening to people on the 'phone

44: I do not feel comfortable using the telephone

45: I thoroughly enjoy communicating by telephone

CONSTRUCTION OF THE TAI-45 SCALE

In the original TAI-20 nine of the items did not specify
a focus on either speaking or listening, whereas 11 items
specified a focus on speaking. These items are listed
below:

UNSPECIFIED (Telephone Communication Apprehension)

ITEM	VERB
1	look forward to telephone conversations
2	converse
8	use
11	use
14	use
17	use
18	use
19	feel frustrated after most phone calls
20	use

SPECIFIED (Speaking: Telephone Speaking Apprehension)

ITEM	VERB
3	speaking
4	speaking
5	speaking
6	express myself
7	speaking
9	talking
10	talking
12	express myself
13	talking
15	speaking
16	speaking

No Listening items were included in the original TAI-20.

A revised TAI was constructed by producing versions of the 11 speaking items, and one of the unspecified items for each of the three foci: communicating, speaking and listening.

ITEM		UNSPECIFIED	COMMUNICATING	SPEAKING	LISTENING
1		O			
2	R	O			
3	R		C*	O*	C*
4			C	O	C
5			C*	O*	C*
6			C	O	C
7			C	O	C
8	R	O	C	C	C
9	R		C*	O*	C*
10	R		C	O	C
11	R	O			
12	R		C	O	C
13	R		C*	O*	C*
14	R	O			
15			C	O	C
16	R		C*	O*	C*
17		O			
18	R	O			
19	R	O			
20	R	O			
TAI-20 TOTAL		9		11	0
TAI-45 TOTAL		9	12	12	12

O = PRESENT IN ORIGINAL TAI-20
C = CONVERTED FROM ORIGINAL ITEM IN TAI-20
* = SLIGHT MODIFICATION TO ALLOW EQUIVALENCE ACROSS ALL THREE VERSIONS
R = REVERSED SCORING

The 45 items were then randomly distributed, with the following limitations:

Items were arranged in 12 blocks. In each of the blocks there were 4 items: unspecified, communicating, speaking and listening. These were selected and ordered randomly, except for the constraint that no adjacent block should contain items which were variations on the same basic item, ie there had to be at least four items between similar items. Because there were only nine unspecified items, three blocks did not contain an unspecified item. These were the third, sixth, and ninth blocks.

The final order was as follows:

1	10C		23	15C
2	6S	24	12S	
3	1U	25	8L	
4	15L	26	14U	
5	5C	27	19U	
6	12L	28	3C	
7	3S	29	13L	
8	20U	30	4S	
9	13S	31	16S	
10	4L	32	8C	
11	6C	33	6L	
12	9C	34	7L	
13	10L	35	17U	
14	2U	36	4C	
15	7S	37	15S	
16	16C	38	9L	
17	3L	39	12C	
18	11U	40	8U	
19	8S	41	10S	
20	9S	42	5S	
21	13C	43	16L	
22	5L	44	18U	
		45	7C	

As a check on the randomness of this ordering, the mean position of the unspecified, communicating, speaking and listening items was calculated. These were 23.89, 22.42, 23.08 and 22.83 respectively, suggesting that there were no significant order effects.

Modifying the Scale

The scale used to record subjects responses was also altered in this version of the TAI. Instead of using a numerical scale from 1 to 5, a five-point scale of the following kind was used:

!YES! yes >?< no !NO!

where

!YES! = strong agreement with the statement;

yes = moderate agreement with the statement;

>?< = don't know or feel neutral about the statement;

no = moderate disagreement with the statement;

!NO! = strong disagreement with the statement;

This revised presentation of the scale was introduced to reduce the possibility of confusion as to the direction of response which appeared to be possible when using a numerical presentation of the scale.

The resultant questionnaire produces four sub-scales, and a composite score:

Telephone Usage :   Telephone Communication:
(unspecified)
ITEMS (original TAI)   ITEMS (original TAI)

         3 (1U)   1 (10C)
         8 (20U)   5 (5C)
        14 (2U)   11 (6C)
        18 (11U)   12 (9C)
        26 (14U)   16 (16C)
        27 (19U)   21 (13C)
        35 (17U)   23 (15C)
        40 (8U)   28 (3C)
        44 (18U)   32 (8C)
                                             36 (4C)
                                             39 (12C)
                                             45 (7C)

Telephone Speaking: Telephone Listening:

ITEMS (original TAI)   ITEMS (original TAI)
         2 (6S)   4 (15L)
         7 (3S)   6 (12L)
         9 (13S)   10 (4L)
        15 (7S)   13 (10L)
        19 (8S)   17 (3L)
        20 (9S)   22 (5L)
        24 (12S)   25 (8L)
        30 (4S)   29 (13L)
        31 (16S)   33 (6L)
        37 (15S)   34 (7L)
        42 (5S)   38 (9L)
        41 (10S)   43 (16L)

(The underlined items indicate that they are reversed before adding into the sub-score.)

In addition, the 20 items from the original Original TAI-20 are incorporated and can be used to derive the three sub-scale scores (TAI A-, TAI P-, and TAI C-), as well as the composite T11 and T20 scores:

ITEMS (original TAI)

 2 (6S) , 3 (1U) , 7 (3S), 8 (20U), 9 (13S),
14 (2U), 15 (7S), 18 (11U), 20 (9S), 24 (12S),
26 (14U), 27 (19U), 30 (4S), 31 (16S), 35 (17U),
37 (15S), 40 (8U), 42 (5S), 41 (10S), 44 (18U)

Table 9.02: THE MODIFIED STAI-TRAIT INVENTORY

CONSTRUCTING THE TELE-STAIT

The instructions of the original STAI-TRAIT inventory were changed to focus respondents' attention on their reactions when communicating with other people by telephone. In addition, the phrase "when I communicate by telephone" was included in each of the items.

A number of the items had the qualifier "often" inserted (Items 3, 5, 8, 11, 14, 15. 17, 18, 20) Similarly, in a number of items the verb "to feel" was substituted for the verb "to be". (Items 4, 5, 10, 16, 19)

An example of the changes introduced is Item 5. In the original STAI-Trait Item 5 read:

  5. I am losing out on things because I can't make up my mind soon enough.

In the Tele-STAI this became:

  5. When I communicate by telephone I often feel I am losing out on things because I can't make up my mind soon enough.

In Item 9 the singular "something" was replaced with the plural "things":

  9: When I communicate by telephone I worry too much over things that don't really matter.

It should be noted that even when these changes have been introduced, the appropriateness of a number of the items is still problematic. In particular, Items 8, 11, 14, 18 and 20 may seem strange to some respondents.

SELF EVALUATION QUESTIONNAIRE

Directions:

A number of statements are given below which people have used to describe their reactions when communicating with other people by telephone. Read each statement and then tick the box which best corresponds to how you generally feel when you communicate by telephone.

There are no right or wrong answers. Do not spend too much time on any one statement. Tick the answer which seems to best describe how you generally feel.

1. When I communicate by telephone I feel pleasant.

Almost Never		Sometimes		Often		Almost Always	

2. When I communicate by telephone I tire quickly.

3. When I communicate by telephone I often feel like crying.

4. When I communicate by telephone I wish I could feel as happy as others seem to.

5. When I communicate by telephone I often feel I am losing out on things because I can't make up my mind soon enough.

6. When I have communicated by telephone I feel rested.

7. When I communicate by telephone I am "cool, calm and collected".

8. When I communicate by telephone I often feel that difficulties are piling up so that I cannot overcome them.

9. When I communicate by telephone I worry too much over things that don't really matter.

10. When I communicate by telephone I feel happy.

11. When I communicate by telephone I am often inclined to take things hard.

12. When I communicate by telephone I lack self-confidence.

13. When I communicate by telephone I feel secure.

14. I often try to avoid facing a crisis or difficulty if I am communicating by telephone.

15. When I communicate by telephone I often feel blue.

16. I feel content when I communicate by telephone.

17. When I am communicating by telephone, often an unimportant thought will run through my mind and bother me.

18. When I am communicating by telephone I often take disappointments so keenly that I can't put them out of my mind.

19. I feel I am a steady person when I am communicating by telephone

20. When I am communicating by telephone I often get into a state of tension or turmoil as I think over my concerns and interests.

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE

Table 9.03

THE MODIFIED SITUATIONAL COMMUNICATION APPREHENSION MEASURE

CONSTRUCTING THE TELE-SCAM

The original SCAM is a measure of state communication apprehension, where the specific situation is specified, often in the form: "Think of the last occasion when you talked about x with y...". The respondent is then asked to record how they felt on that occasion by indicating how accurately each of 20 adjectives describes their reactions.

In constructing the Tele-SCAM:

1: The instructions were changed to refer to the respondent's general reaction to a number of experiences of speaking when using the telephone. That is, the instructions converted the instrument from a state to a trait focus.

2: The presentation of the adjectives was changed from the past tense to the present, by using the verb "to feel" eg Item 19: "I felt good" becomes "I feel good".

3: The Americanism in Item 4: "I was loose" was changed to "I feel relaxed".

TELE-SCAM: SITUATIONAL COMMUNICATION APPREHENSION MEASURE

SPEAKING ON THE TELEPHONE

DIRECTIONS: Please complete the following questionnaire which asks you about how you generally feel about speaking when you are using the telephone.

Circle:

7 if the statement is an extremely accurate description of how you feel,
6 if it is moderately accurate,
5 if it is somewhat accurate,
4 if it is neither accurate nor inaccurate,
3 if it is somewhat inaccurate,
2 if it is moderately inaccurate,
or 1 if it is extremely inaccurate.

There are no right or wrong answers. Just respond to the items quickly to describe as accurately as you can how you generally feel about speaking when using the telephone.

--> Increasingly Accurate -->

	1	2	3	4	5	6	7
1. I feel apprehensive.	1	2	3	4	5	6	7
2. I feel disturbed.	1	2	3	4	5	6	7
3. I feel peaceful.	1	2	3	4	5	6	7
4. I feel relaxed.	1	2	3	4	5	6	7
5. I feel uneasy.	1	2	3	4	5	6	7
6. I feel self-assured.	1	2	3	4	5	6	7
7. I feel fearful.	1	2	3	4	5	6	7
8. I feel ruffled.	1	2	3	4	5	6	7
9. I feel jumpy.	1	2	3	4	5	6	7
10. I feel composed.	1	2	3	4	5	6	7
11. I feel bothered.	1	2	3	4	5	6	7
12. I feel satisfied.	1	2	3	4	5	6	7
13. I feel safe.	1	2	3	4	5	6	7
14. I feel flustered.	1	2	3	4	5	6	7
15. I feel cheerful.	1	2	3	4	5	6	7
16. I feel happy.	1	2	3	4	5	6	7
17. I feel dejected.	1	2	3	4	5	6	7
18. I feel pleased.	1	2	3	4	5	6	7
19. I feel good.	1	2	3	4	5	6	7
20. I feel unhappy.	1	2	3	4	5	6	7

Table 9.04

THE MODIFIED RECEIVER APPREHENSION TEST

THE CONSTRUCTION OF THE TELEPHONE RAT

The original 20 item RAT using 5-point scales was
modified to focus on responses to Receiver Apprehension
when using the telephone. The original 5-point scale was
retained, as were the original 20 items as far as
possible.

Each of the 20 items of the original RAT was prefixed by
the phrase "When I am using the telephone...". The
exceptions to this were Item 1, which in the original RAT
referred explicitly to listening to others on the 'phone,
and Items 11 and 19, where a different grammatical
construction was used to embed the explicit reference to
using the telephone.

In a number of items, references to the plural "other
people" or "others" was changed to the singular "the
other person". In two Items (4 and 19) the reference to a
plural audience was simply omitted and the nature of the
audience was left unspecified.

In three Items (9, 12, and 20) specific references to
other media as the source of information (written,
television) were omitted. The "Americanism" in Item 13
("my date") was changed to use a British idiom ("someone
I'm going out with")

The instructions were modified to focus the respondent's
attention specifically on how they feel about receiving
communications by telephone.

THE TELEPHONE RAT

The following statements describe how various people feel about
receiving communications by telephone. Please indicate if
these statements apply to how you feel by circling one of
the numbers to indicate whether you:

> (1) strongly agree,
> (2) agree,
> (3) are undecided,
> (4) disagree,
> or (5) strongly disagree

with each of the statements.

Please work quickly, recording your first reaction to
each of the items. Please respond to each item, do not
miss out any of the items.

1: I feel comfortable when listening to others on the
   'phone.

   <-- agree 1 2 3 4 5 --> disagree

2: When I am using the telephone it is often difficult
   for me to concentrate on what the other person is
   saying.

3: When I am using the telephone and listening to
   members of the opposite sex I find it easy to
   concentrate on what is being said.

4: When I am using the telephone I have no fear of being
   a listener.

5: When I am using the telephone I feel relaxed when
   listening to new ideas.

6: When I am using the telephone I would rather not have
   to listen to the other person at all.

7: When I am using the telephone I generally get
   overexcited and rattled when the other person is
   speaking to me.

8: When I am using the telephone I often feel
   uncomfortable when listening to the other person.

9: When I am using the telephone my thoughts become
   confused and jumbled when receiving important
   information.

10: When I am using the telephone I often have difficulty
    concentrating on what the other person is saying.

11: Receiving new information by telephone makes me feel restless.

12: When I am using the telephone listening makes me nervous.

13: When I am using the telephone to contact someone I'm going out with, I find myself tense and self-conscious when listening to them.

14: When I am using the telephone I enjoy being a good listener.

15: When I am using the telephone I generally find it easy to concentrate on what is being said.

16: When I am using the telephone I like the opportunity to listen to new ideas.

17: When I am using the telephone I have difficulty concentrating on instructions that others give me.

18: When I am using the telephone it is hard to listen or concentrate on what the other person is saying unless I know them well.

19: I feel tense when listening on the telephone.

20: When I am using the telephone, attempts to change my mind about something make me nervous.

<u>Thank you for your assistance</u>

Table 9.05: THE MODIFIED PERSONAL REPORT OF COMMUNICATION
APPREHENSION INVENTORY

THE CONSTRUCTION OF TELE-PRCA

The PRCA-24 instrument developed by McCroskey (1982c) was
modified as follows:

a: The 18 items referring to group discussions, meetings
and public speaking were deleted.

b: The remaining 6 items referring to interpersonal
conversation were modified by qualifying references to
"conversation", "conversing", etc with the additional
"telephone conversation", "conversing by 'phone", etc..

c: The two items referring to "speaking up" in
conversations were changed to "speaking out" in order to
avoid any confusion with issues of amplitude and
audibility.

d: The instructions were modified to focus respondents'
attention specifically on their feelings about using the
telephone.

Note that, like the original TAI-20, many of the items in
the Tele-PRCA do not specify whether speaking or
listening is being referred to, and those that do,
specify "speaking". In addition to the overall Tele-PRCA
score therefore, a "pure" usage sub-score, excluding
those items which specify "speaking", can be created.
This consists of Items 1, 3, 4, and 5.

PERSONAL REPORT OF APPREHENSION

CONCERNING USE OF THE TELEPHONE

DIRECTIONS:

This questionnaire consists of six statements concerning your feelings about using the telephone.

Please indicate the degree to which each statement applies to you by marking whether you:

(1) strongly agree
(2) agree
(3) are undecided
(4) disagree
or (5) strongly disagree with each statement.

Please record your first impression

1: While participating in a telephone conversation with a new acquaintance, I feel very nervous.

AGREE <-- 1 2 3 4 5 --> DISAGREE

2: I have no fear of speaking out in telephone conversations.

3: Ordinarily I am very tense and nervous during telephone conversations.

4: Ordinarily I am very calm and relaxed during telephone conversations.

5: While conversing on the 'phone with a new acquaintance, I feel very relaxed.

6: I'm afraid to speak out in telephone conversations.

THANK YOU FOR YOUR HELP

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Table 9.06: MAKING A TELEPHONE CALL

WE WOULD LIKE YOU TO RECORD A TELEPHONE CALL WHICH WE
WANT TO ANALYSE. WE WOULD LIKE YOU TO CALL XYZ CAR HIRE
ON 123456 AND ASK THEM FOR DETAILS OF CAR HIRE. THE KIND
OF THINGS YOU SHOULD ASK THEM, AND SOME SUGGESTIONS AS TO
WHAT YOU MIGHT SAY ARE GIVEN BELOW. IT IS IMPORTANT THAT
YOU TELL THEM THAT YOU ARE RECORDING THE CALL, AND THAT
YOU GET THEIR PERMISSION TO DO SO.

THE FOLLOWING "SCRIPT" IS A SUGGESTION ONLY. PLEASE FEEL
FREE TO CONDUCT THE CALL AS YOU THINK BEST.

READ THE SCRIPT, AND WHEN YOU ARE READY TO BEGIN, PLEASE
DIAL THE FOLLOWING NUMBER: 123456

"Hullo, I wonder if you can help me? I have some friends
coming to stay in June, and I want some information about
hiring a car."

        "I'm recording this call; do you mind?

    (AND ASSUMING THE ANSWER IS POSITIVE:)

        Thank you."

"My friends are Americans, and they want to hire a car so
that they can tour around the south and south-west. There
are three of them, husband, wife and five year old child.
They will want the car for two weeks, from Wednesday June
13th to Tuesday 26th June.

Can you tell me what kinds of cars you hire?

What would the costs be for that length of hire on those
dates?

Are there any other things I need to be able to tell
them?"

IF THE COMPANY OFFERS TO SEND YOU WRITTEN INFORMATION,
PLEASE ACCEPT AND ASK THEM TO SEND IT TO YOU AT YOUR HOME
OR LODGING ADDRESS.

Table 9.07: RECEIVING A TELEPHONE CALL

Hello, this is Xxxxxx Yyyyyy. I'm following up the
experiment you took part in last week. I wonder if you
have a little time now to answer a couple of questions?

        ASSUMING THE ANSWER WAS "YES":

Do you have the envelope I gave you at the end of the
first session handy?

Do you have a pen or pencil handy?

Okay, then we can begin.

QUESTION 1: What do you think was the most difficult thing about making the telephone call?

QUESTION 2: What do you think was the most interesting thing about making the telephone call?

QUESTION 3: Are there any other things you think we should know about the way the experiment worked?

WHEN THE SUBJECT HAD RESPONDED TO ALL THREE QUESTIONS, THE FOLLOWING INSTRUCTIONS WERE GIVEN:

Please open the envelope I gave you during the first session. Please take out the materials and find the questionnaire printed on yellow paper. Please complete that questionnaire now. Please let me know when you have finished.

WHEN THE SUBJECT HAD REPORTED THAT THEY HAD COMPLETED THIS QUESTIONNAIRE (THE STATE ANXIETY INVENTORY), THE FOLLOWING INSTRUCTIONS WERE GIVEN:

Thank you. In the envelope you will also find a second questionnaire, printed on blue paper. As soon as we have finished this call, would you please complete that second questionnaire. When you have done that, could you put both the yellow and the blue questionnaires into the stamped addressed envelope that came with them, and post them both back to me as soon as possible. Thank you.

FINALLY, THE SUBJECT WAS THANKED. THE FORM OF THE VALEDICTION DEPENDED ON THE SUBJECT'S EXPERIMENTAL SEQUENCE.

If the subject was in the X-Z-Y sequence, that is, the telephone call was their last contact with the experimenter, then the valediction was as follows:

Thank you for all the help you have given us. We will be sending you a copy of the results of this experiment as soon as they have been analysed.

Thank you for helping us with this experiment.

If the subject was in the X-Y-Z sequence, that is, they still had a scheduled meeting with the experimenter, then they were reminded that they were expected at xx pm on xxday, the xxth of xxmonth.

Thank you for all of the help you have given us. We are scheduled to meet at xx pm on xxday, that's the xxth of xxmonth. I look forward to seeing you then.

Thank you for helping us with this experiment.

Table 9.08: TAI-45: ITEM by TOTAL SCORE CORRELATIONS

ITEM		TEST MEAN	SD	CORRELATION WITH TEST T45 SCORE	RETEST MEAN	SD	CORRELATION WITH RETEST T45 SCORE
01	*	2.383	1.114	0.6086	1.979	0.944	0.8131
02		2.447	0.996	0.6604	2.319	0.862	0.7069
03		2.447	0.996	0.5262	2.340	0.841	0.6787
04		1.894	0.814	0.6561	2.043	0.751	0.7065
05		2.617	0.922	0.6084	2.553	0.855	0.6916
06	*	2.064	1.092	0.3201	1.957	0.884	0.6290
07	*	1.702	0.976	0.6692	1.787	0.954	0.8606
08	*	1.596	0.948	0.4266	1.638	0.942	0.7479
09	*	1.532	0.747	0.6583	1.787	0.977	0.6385
10		2.340	0.788	0.6073	2.149	0.807	0.7300
11		2.106	0.759	0.6454	2.064	0.845	0.8637
12	*	2.234	0.937	0.6247	2.149	0.932	0.7522
13	*	2.085	0.775	0.5148	1.957	0.955	0.8066
14	*	2.000	0.722	0.7103	2.085	0.929	0.7169
15		2.489	1.019	0.8609	2.340	1.006	0.7797
16	*	1.851	0.807	0.7018	1.681	0.755	0.7970
17	*	1.681	0.663	0.7074	1.681	0.783	0.8703
18	*	2.021	0.897	0.5114	2.085	0.855	0.6416
19	*	2.128	0.992	0.6630	2.106	1.047	0.7140
20	*	2.000	0.860	0.6078	1.957	0.884	0.7849
21	*	2.064	1.187	0.2632	1.851	0.978	0.8413
22		2.468	0.952	0.6606	2.426	1.037	0.7095
23		2.191	0.741	0.7953	2.064	0.763	0.7897
24	*	2.106	0.938	0.7352	2.128	0.969	0.8068
25	*	2.021	0.737	0.6269	1.979	1.032	0.8037
26	*	1.915	0.803	0.5488	1.915	0.775	0.6732
27	*	2.021	0.794	0.3930	1.894	0.914	0.7523
28	*	1.745	0.675	0.6634	1.723	0.902	0.8072
29	*	1.809	0.741	0.5948	1.830	0.868	0.7832
30		2.277	0.713	0.7709	2.234	0.937	0.7362
31	*	1.809	0.711	0.7713	1.766	0.758	0.7601
32	*	2.000	0.956	0.7210	1.936	0.895	0.7921
33		2.021	0.794	0.6581	2.064	0.895	0.7664
34		2.362	0.764	0.7637	2.362	0.987	0.7742
35		2.170	0.761	0.8781	2.064	0.763	0.8270
36		2.319	0.783	0.8106	2.319	0.887	0.8486
37		2.191	0.825	0.8844	2.085	0.855	0.8334
38	*	2.064	0.895	0.7483	1.915	0.747	0.7231
39	*	2.319	1.125	0.6126	2.149	1.215	0.7147
40	*	1.957	0.859	0.6884	1.957	0.977	0.7802
41	*	1.979	0.921	0.7815	1.915	0.952	0.8956
42		2.489	0.930	0.6022	2.489	1.019	0.8281
43	*	1.872	0.679	0.7495	1.745	0.846	0.7783
44	*	2.064	0.818	0.5640	1.809	0.770	0.7920
45		2.404	1.077	0.8283	2.404	1.378	0.6738

AVERAGE CORRELATION	0.6534			0.7649

(* indicates item scores reversed)
(all r's significant, p<0.05 or better, n=47, 2-tailed)

Table 9.09: TAI-45 RANKED ITEM by T45 SCORE CORRELATIONS

ITEM   CORRELATION WITH TEST T45 SCORE
          (* indicates item scores reversed)

37   0.8844 I feel relaxed and comfortable when
                speaking on the telephone

35   0.8781 I feel calm and comfortable using the
                telephone

15   0.8609 I thoroughly enjoy speaking on the
                telephone

45   0.8283 I thoroughly enjoy communicating by
                telephone

36   0.8106 I find communicating by telephone pleasant

23   0.7953 I feel relaxed and comfortable when
                communicating by telephone

41 *   0.7815 I hurry to finish the conversation when I'm
                talking to someone on the telephone

31 *   0.7713 I dread speaking to people on the 'phone

30   0.7709 I find speaking on the telephone pleasant

34   0.7637 I thoroughly enjoy listening on the
                telephone

43 *   0.7495 I dread listening to people on the 'phone

38 *   0.7483 When I have to listen to someone on the
                'phone, I grow nervous and uncomfortable

24 *   0.7352 I have problems expressing myself over the
                telephone

32 *   0.7210 I feel rushed and pushed when I communicate
                with people on the 'phone

14 *   0.7103 I feel it is difficult to converse over the
                'phone

17 *   0.7074 I avoid having to listen on the telephone
                whenever possible

16 *   0.7018 I dread communicating with people by
                'phone

40 *   0.6884 I feel rushed and pushed when I use the
                'phone

07 *   0.6692 I avoid having to speak on the telephone
                whenever possible

28 *   0.6634 I avoid having to communicate by telephone
                whenever possible

19 *   0.6630 I feel rushed and pushed when I speak to
                people on the 'phone

22		0.6606	I take pride in my ability to listen well when using the 'phone
02		0.6604	It is easy for me to express myself on the telephone
09	*	0.6583	I do not like talking to people on the 'phone
33		0.6581	It is easy for me to listen on the telephone
04		0.6561	I feel relaxed and comfortable when listening on the telephone
11		0.6454	It is easy for me to communicate by telephone
25	*	0.6269	I feel rushed and pushed when I listen to people on the 'phone
12	*	0.6247	When I have to communicate by 'phone, I grow nervous and uncomfortable
39	*	0.6126	I have problems communicating over the telephone
01	*	0.6086	I hurry to finish the conversation when I'm communicating by telephone
05		0.6084	I take pride in my ability to communicate well by 'phone
20	*	0.6078	When I have to talk on the 'phone, I grow nervous and uncomfortable
10		0.6073	I find listening on the telephone pleasant
42		0.6022	I take pride in my ability to speak well when using the 'phone
29	*	0.5948	I do not like listening to people on the 'phone
44	*	0.5640	I do not feel comfortable using the telephone
26	*	0.5488	I feel inhibited using the 'phone
03		0.5262	I look forward to telephone conversations
13	*	0.5148	I hurry to finish the conversation when I'm listening to someone on the telephone
18	*	0.5114	I feel misunderstood when I use the 'phone
08	*	0.4266	I avoid using the 'phone
27	*	0.3930	I have feelings of frustration after most 'phone calls
06	*	0.3201	I have problems listening over the telephone
21	*	0.2632	I do not like communicating by 'phone

Table 9.10: TAI-45 TEST DATA
          Intra-test and Inter-test Reliabilities

	T45 (i=45)	TUA (i= 9)	TCA (i=12)	TSA (i=12)	TLA (i=12)
Alpha	0.9671	0.8050	0.8806	0.9200	0.8936
simple split-half	0.8748	0.6027	0.7498	0.8135	0.7163
Spearman-Brown split-half	0.9332	0.7540	0.8570	0.8971	0.8347
Guttman split-half	0.9330	0.7466	0.8551	0.8952	0.8331
Test-retest product moment	0.7935	0.7621	0.7703	0.7774	0.7534

Table 9.11: TAI-45 RETEST DATA
          Intra-test Reliabilities

	T45 (i=45)	TUA (i= 9)	TCA (i=12)	TSA (i=12)	TLA (i=12)
Alpha	0.9831	0.9075	0.9395	0.9434	0.9409
simple split-half	0.9580	0.7804	0.7730	0.7725	0.7233
Spearman-Brown split-half	0.9786	0.8778	0.8720	0.8716	0.8395
Guttman split-half	0.9784	0.8714	0.8720	0.8716	0.9154

Table 9.12: CORRELATION MATRICES: TAI-45 SUB-SCALES

TEST DATA

	T45	TUA	TCA	TSA	TLA
T45	------	0.9166	0.9639	0.9807	0.9097
TUA		------	0.8580	0.9008	0.7450
TCA			------	0.9402	0.8221
TSA				------	0.8513
TLA					------

Table 9.13: CORRELATION MATRICES: TAI-45 SUB-SCALES

RETEST DATA

	T45	TUA	TCA	TSA	TLA
T45	------	0.9647	0.9848	0.9885	0.9670
TUA		------	0.9341	0.9594	0.8947
TCA			------	0.9668	0.9382
TSA				------	0.9348
TLA					------

Table 9.14: TAI-45: Factor Structure

ITEM	FACTORS 1	2	3	4	5	6
22	.8446	.1251	-.0276	.1404	.0193	.0786
45	.7624	.1559	.2584	.0950	.1819	.2052
15	.7589	.2872	.3229	.1951	.0541	.1479
30	.7548	.1303	.1648	.2878	.1315	.1220
05	.7447	.0308	.2171	.0208	.0401	.1351
36	.7385	.2998	.2103	.1300	.0715	.2065
34	.7252	.2211	.2685	.4261	-.0613	-.0347
33	.6745	.0652	.0301	.2125	.2844	.1420
42	.6319	.0938	.0914	.1312	-.0869	-.0130
35	.6028	.3977	.2331	.2440	.2083	.1721
37	.6004	.3882	.4481	.2636	.1213	.1332
04	.6001	.1731	.1961	.0839	.3936	.1098
23	.5940	.4302	.2018	.0829	.1577	.3856
43	.5569	.1270	.2709	.0279	.3739	.1393
03	.5453	.2070	-.1183	.2141	.0951	.0919
10	.5049	.3557	.0157	.3395	.1831	.2236
20	.1644	.8498	.1996	-.0457	.0164	.1190
16	.2020	.7148	.2377	.3230	-.0775	.0791
12	.3454	.7077	.1728	-.0773	.2402	.....
14	.3023	.6063	.2260	.1918	.1471	.....
38	.2099	.5321	.2780	.3879	.3497	-.0634
26	.0730	.1810	.8325	.0819	-.0407	.0575
40	.3238	.0869	.8072	.0567	.0365	.1290
32	.2350	.2348	.7719	.3931	.1016	.0281
24	.1527	.5312	.6899	.2795	.0677	.0136
25	.3748	.0497	.6484	.4115	.0790	-.2617
18	-.1277	.5690	.6480	.0175	.2035	.0230
19	.2097	.1322	.6444	.1775	.2334	.2405
02	.4849	.4214	.5038	.0467	-.2130	.0547
41	.3289	.3989	.4283	.4170	.2740	-.2251
29	.3317	.1268	.0711	.7839	.0365	.....
27	.0767	-.1451	.3477	.7290	.0720	.1055
44	.2225	.1158	.2148	.5845	-.1251	-.0247
17	.2054	.3214	.1875	.5288	.1813	.1787
31	.1995	.4149	.1599	.5198	.3352	.2973
06	.1221	.0535	.0336	-.0221	.8588	.0664
01	.0951	.4463	.2086	.4230	.5517	.0309
13	.3044	.3496	.0430	.3426	.5065	-.3052
08	.3828	-.0174	.0209	.0263	-.0362	.7098
07	.3944	.4386	.....	.1545	.2207	.5748
09	.5155	-.0113	.2139	.4114	.1082	.5234
11	.4856	.4621	.1053	-.1302	-.0318	.5089
39	.2493	.3206	.2010	.1388	.0481	.1050
28	.3326	.2517	.2151	.3862	.....	.2726
21	.0500	.0705	.1239	-.0263	-.0195	.1169

ITEM	FACTORS 7	8	9
22	.1740	.0615	-.0468
45	.1665	.0865	.2742
15	.1130	-.0345	.1617
30	-.0385	.1540	.2269
05	-.1284	.3278	-.0965
36	-.0280	.1433	.2647
34	-.1810	.1226	.0752
33	.3136	.1263	-.1713
42	.1972	.5504	.0133
35	.3153	.1086	.1084
37	.2468	-.0657	-.0880
04	.3160	-.2182	-.1789
23	.2382	-.0244	-.0780
43	.4178	.1708	.2097
03	.0792	-.2555	.4612
10	-.3502	-.0542	.0924
20	.0457	.2080	.0928
16	.2006	-.0733	.2071
12	.0415	-.0587	.0372
14	.1099	.4485	-.0257
38	.2666	.1539	.0634
26	.0440	.2823	.0998
40	.2494	.....	.1620
32	.0370	.....	-.0759
24	-.0293	.1909	-.0345
25	-.1434	.1014	.1035
18	.0700	.0843	-.0264
19	.3360	-.3071	.2389
02	.1455	-.1786	-.1124
41	.1708	.1788	.1160
29	.1328	.0872	-.0169
27	-.0707	.0295	-.1161
44	.4770	.0942	.1549
17	.1258	.4761	.2441
31	.2600	.2707	.1214
06	.0406	-.0139	.....
01	-.0465	-.0659	.0775
13	-.1988	.2723	-.0409
08	.0228	.1865	.1665
07	.0273	-.0892	.2389
09	.0213	-.0973	.0834
11	.2511	.1569	-.0490
39	.6779	.0554	.1853
28	.0117	.5949	.0302
21	.0955	.0567	.7244

Table 9.15: SUB-SCALE RELIABILITIES: TEST DATA

	T20 (i=20)	T11 (i=11)	TAI-P (i= 6)	TAI-A (i= 3)	TAI-C (i= 2)
Alpha	0.9350	0.8648	0.7978	0.8362	0.5130
simple split-half	0.6719	0.7632	0.6416	0.7591	0.3458
Spearman-Brown split-half	0.8038	0.8665	0.7817	0.8749	0.5139
Guttman split-half	0.8017	0.8626	0.7732	0.8241	0.5130
Test-retest product moment	0.7987	0.8213	0.7418	0.8324	0.6906

SUB-SCALE RELIABILITIES: RETEST DATA

	T20 (i=20)	T11 (i=11)	TAI-P (i= 6)	TAI-A (i= 3)	TAI-C (i= 2)
Alpha	0.9633	0.9260	0.9055	0.9056	0.7701
simple split-half	0.8251	0.8789	0.8732	0.8479	0.6349
Spearman-Brown split-half	0.9041	0.9360	0.9323	0.9256	0.7767
Guttman split-half	0.9041	0.9296	0.9291	0.8594	0.7701

TABLES: CHAPTER TEN

Table 11.01: TAI P- SCORE BY SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	83.689	2	41.845	3.190	0.048
SEX	81.201	1	81.201	6.191	0.016
AGE	3.325	1	3.325	0.254	0.616
2-WAY INTERACTIONS					
SEX x AGE	10.772	1	10.772	0.821	0.368
VARIANCE EXPLAINED	94.462	3	31.487	2.401	0.077
RESIDUAL VARIANCE	786.976	60	13.116		
TOTAL VARIANCE	881.438	63	13.991		

Table 11.02: TAI A- SCORE BY SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	22.809	2	11.405	2.383	0.101
SEX	18.674	1	18.674	3.902	0.053
AGE	3.665	1	3.665	0.766	0.385
2-WAY INTERACTIONS					
SEX x AGE	1.768	1	1.768	0.369	0.546
VARIANCE EXPLAINED	24.577	3	8.192	1.712	0.174
RESIDUAL VARIANCE	287.173	60	4.786		
TOTAL VARIANCE	311.750	63	4.948		

Table 11.03: TAI C- SCORE BY SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	2.154	2	1.077	0.417	0.661
SEX	1.798	1	1.798	0.697	0.407
AGE	0.401	1	0.401	0.155	0.695
2-WAY INTERACTIONS					
SEX x AGE	0.861	1	0.861	0.334	0.566
VARIANCE EXPLAINED	3.015	3	1.005	0.389	0.761
RESIDUAL VARIANCE	154.844	60	2.581		
TOTAL VARIANCE	157.859	63	2.506		

```
Table 11.04: T11 SCORE BY SEX AND AGE OF RESPONDENT
```

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	215.330	2	107.665	2.627	0.081
SEX	215.310	1	215.310	5.254	0.025
AGE	.294	1	.294	0.007	0.933
2-WAY INTERACTIONS					
SEX x AGE	13.569	1	13.569	0.331	0.567
VARIANCE EXPLAINED	228.898	3	76.299	1.862	0.146
RESIDUAL VARIANCE	2458.711	60	40.979		
TOTAL VARIANCE	2687.609	63	42.660		

Table 11.05: T20 SCORES			
AGE	-25	26+	TOTAL
MALE	m=50.46 n= 13	m=47.78 n= 9	m=49.36 n= 22
FEMALE	m=42.46 n= 26	m=42.88 n= 16	m=42.62 n= 42
TOTAL	m=45.13 n= 39	m=44.64 n= 25	m=44.94 n= 64

```
Table 11.06: T20 SCORE BY SEX AND AGE OF RESPONDENT
```

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	663.559	2	331.779	2.091	0.132
SEX	659.928	1	659.928	4.159	0.046
AGE	6.804	1	6.804	0.043	0.837
2-WAY INTERACTIONS					
SEX x AGE	33.194	1	33.194	0.209	0.649
VARIANCE EXPLAINED	696.752	3	232.251	1.464	0.234
RESIDUAL VARIANCE	9520.998	60	158.683		
TOTAL VARIANCE	10217.750	63	162.187		

```
Table 11.07: STAI-Trait SCORE BY SEX AND AGE
```

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	44.523	2	22.261	0.336	0.716
SEX	31.310	1	31.310	0.472	0.495
AGE	14.340	1	14.340	0.216	0.644
2-WAY INTERACTIONS					
SEX x AGE	1.713	1	1.713	0.026	0.873
VARIANCE EXPLAINED	46.236	3	15.412	0.232	0.873
RESIDUAL VARIANCE	3977.514	60	66.292		
TOTAL VARIANCE	4023.750	63	63.869		

Table 11.08: PRCA SCORE BY SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	4.730	2	2.365	0.014	0.987
SEX	2.153	1	2.153	0.012	0.912
AGE	2.706	1	2.706	0.016	0.901
2-WAY INTERACTIONS					
SEX x AGE	812.242	1	812.242	4.665	0.035
VARIANCE EXPLAINED	816.972	3	272.324	1.564	0.207
RESIDUAL VARIANCE	10447.262	60	174.121		
TOTAL VARIANCE	11264.234	63	178.797		

Table 11.09: SOCIAL DESIRABILITY
ASRSD SCORES BY SEX AND AGE OF RESPONDENT

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	35.210	2	17.605	0.598	0.553
SEX	30.539	1	30.539	1.038	0.313
AGE	5.260	1	5.260	0.179	0.674
2-WAY INTERACTIONS					
SEX x AGE	15.218	1	15.218	0.517	0.475
VARIANCE EXPLAINED	50.428	3	16.809	0.571	0.636
RESIDUAL VARIANCE	1677.769	57	29.435		
TOTAL VARIANCE	1728.197	60	28.803		

Table 11.10: SELF-ESTEEM SCORES BY SEX AND AGE

SOURCE OF VARIANCE	SoS	DF	MS	F	SIG OF F
MAIN EFFECTS	280.598	2	140.299	5.146	0.009
SEX	40.343	1	40.343	1.480	0.229
AGE	243.803	1	243.803	8.942	0.004
2-WAY INTERACTIONS					
SEX x AGE	5.703	1	5.703	0.209	0.649
VARIANCE EXPLAINED	286.301	3	95.434	3.500	0.021
RESIDUAL VARIANCE	1608.556	59	27.264		
TOTAL VARIANCE	1894.857	62	30.562		

TABLES: CHAPTER ELEVEN

ORIGINAL NEGATIVE ITEM: 2: I feel it is difficult to
                            converse over the 'phone

POSSIBLE POSITIVE REWRITE : I feel it is easy to talk on
                            the 'phone

POSSIBLE POSITIVE REWRITE : I feel able to talk easily on
                            the phone

        (similar to, but not identical to Item 6)

ORIGINAL NEGATIVE ITEM: 3: I avoid speaking on the
                            telephone whenever possible

POSSIBLE POSITIVE REWRITE : I use the 'phone whenever
                            possible

              (no similar items)

ORIGINAL NEGATIVE ITEM: 8: I feel rushed and pushed when
                            I use the 'phone

POSSIBLE POSITIVE REWRITE : I feel I have plenty of time
                            when I use the 'phone

              (no similar items)

ORIGINAL NEGATIVE ITEM: 9: When I have to talk on the
                            'phone, I grow nervous and
                            uncomfortable

POSSIBLE POSITIVE REWRITE : When I have to talk on the
                            'phone, I feel calm and
                            comfortable

        (very similar to item 17, and also to Item 15)

ORIGINAL NEGATIVE ITEM: 10: I hurry to finish the
                            conversation when talking on
                            the telephone

POSSIBLE POSITIVE REWRITE : I don't feel under pressure
                            to finish quickly when
                            talking on the telephone.

POSSIBLE POSITIVE REWRITE : I can spend a long time talking on the 'phone without worrying about having to finish the conversation.

(no similar items)

ORIGINAL NEGATIVE ITEM: 11: I feel misunderstood when I use the 'phone

POSSIBLE POSITIVE REWRITE : I feel I can make my ideas understood clearly when I use the 'phone

(somewhat similar to Item 6)

ORIGINAL NEGATIVE ITEM: 12: I have problems expressing myself over the telephone

POSSIBLE POSITIVE REWRITE : I do not have problems expressing myself over the 'phone

(similar to Item 6)

ORIGINAL NEGATIVE ITEM: 13: I do not like to talk on the 'phone

POSSIBLE POSITIVE REWRITE : I like to talk on the phone

POSSIBLE POSITIVE REWRITE : I like talking on the phone

(similar to Items 4 and 7)

ORIGINAL NEGATIVE ITEM: 14: I feel inhibited using the 'phone

POSSIBLE POSITIVE REWRITE : I feel no inhibitions about using the 'phone

(no similar items)

ORIGINAL NEGATIVE ITEM: 16: I dread speaking on the phone

POSSIBLE POSITIVE REWRITE : I look forward to speaking on the 'phone

(very similar to Item 1)

ORIGINAL NEGATIVE ITEM: 18: I do not feel comfortable
                             using the telephone

POSSIBLE POSITIVE REWRITE : I feel comfortable using the
                            'phone

    (very similar to item 17, and also to Item 15)

ORIGINAL NEGATIVE ITEM: 19: I have feelings of
                            frustration after most 'phone
                            calls

POSSIBLE POSITIVE REWRITE : I do not feel frustrated
                            after most 'phone calls

    (no similar items)

ORIGINAL NEGATIVE ITEM: 20: I avoid using the 'phone

POSSIBLE POSITIVE REWRITE : I do not avoid using the
                            'phone

    (no similar items)

If rewritten items which involve grammatically negative

constructions, or which are very similar to existing

items are eliminated, and only one rewrite per originally

negative ("anxiety-present") item is allowed, then

positive ("anxiety-absent") rewrites of Items 2, 3, 8,

10, 11, and 13 would seem acceptable (Item 14 might also

be included). If these items were added to the original

TAI-20 it would result in a 26-item scale, with 13

"anxiety-absent" (positive) items and 13 "anxiety-

present" (negative) items. These items should be included

in a newly ordered TAI-26, with positive and negative

items approximately alternating. It is predicted that the

responses to this revised scale would be less skewed than

to the original 20 item scale.

A possible TAI-26 is outlined below:

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1: I look forward to telephone conversations

2: I feel it is difficult to converse over the phone

13: I like talking on the phone

3: I avoid speaking on the telephone whenever possible

4: I find speaking on the telephone pleasant

5: I take pride in my speaking ability over the phone

6: It is easy for me to express myself on the telephone

7: I thoroughly enjoy speaking on the telephone

8: I feel rushed and pushed when I use the phone

11: I feel I can make my ideas understood clearly when I use the 'phone

9: When I have to talk on the phone, I grow nervous and uncomfortable

3: I use the 'phone whenever possible

10: I hurry to finish the conversation when talking on the telephone

11: I feel misunderstood when I use the phone

2: I feel it is easy to talk on the 'phone

12: I have problems expressing myself over the telephone

13: I do not like to talk on the phone

8: I feel I have plenty of time when I use the 'phone

<u>14</u>: I feel inhibited using the phone

15: I feel relaxed and comfortable when speaking on the telephone

<u>16</u>: I dread speaking on the phone

17: I feel calm and comfortable using the telephone

<u>18</u>: I do not feel comfortable using the telephone

10: I don't feel under pressure to finish quickly when talking on the telephone

19: I have feelings of frustration after most phone calls

20: I avoid using the phone

<u>xx</u>: Original negative item
yy: Proposed additional positive item