PHYSICAL ACTIVITY COUNSELLING: THE APPLICATION OF MOTIVATIONAL INTERVIEWING AND BRIEF NEGOTIATION

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Abstract

The Department of Culture Media and Sport (2002) set a national target for sport and physical activity (PA) that 70% of the population be reasonably active by 2020. However, the proportion of the population meeting these levels of activity is currently only 30% (DoH, 2004a). There is now unequivocal evidence that the UK population is becoming increasingly inactive leading to increases in premature mortality and illness and disease. There is also clear evidence that increased PA can assist in both the avoidance and management of hypokinetic disease such as CHD and type II diabetes. Part of the health strategy for the UK includes the use of interventions such as PA referral schemes (PARS). Within such schemes specific techniques such as PA counselling are increasingly popular in both community and clinical settings (Tulloch et al., 2006).

The aim of the thesis was to examine the context and efficacy of PARS, the prevalence of PA counselling and the levels of competence and consistency applied within empirical studies, and finally an assessment of the efficacy of behaviour change counselling in PARS settings based on Motivational Interviewing (Miller & Rollnick, 2002).

The first study provided a systematic review of PA counselling from 1995 to 2006 and examined whether a theoretical framework was applied to each study reporting a PA counselling component and if so, which theory. Furthermore, it assessed the number of studies that report the use of a treatment fidelity framework in order to ensure internal validity of the intervention as well as an assessment of competence of the interventionist. Results indicated the dominant theory to be the transtheoretical model (TTM) and in particular stages of change (a sub-component of TTM). No studies applied a treatment fidelity framework with only 2 from 25 assessing competence of the PA counselling interventionist.

Prior to delivering an MI intervention, the second study followed a treatment fidelity framework and assessed the competence of the investigator in delivering MI. This applied validated tools with regards to levels of MI competency and proficiency. Results indicated that the investigator demonstrated proficiency across MI global ratings of empathy and spirit and used commensurate levels of open to closed questions and complex to simple reflections.

Having assessed the competency and consistency of the MI intervention Study 3 examined the impact of MI applied to a randomly allocated patient group referred to a PARS by GP's. The results of the intervention, as compared to a control group receiving traditional PARS interventions only, were equivocal. Additional measures such as patient 'readiness to change' and 'exercise motivation' were also recorded and it appears from the current study that 'pure' MI is not appropriate for those patients reporting a high level of readiness.

The final study assessed the impact of a 2-day training workshop in MI to an experienced PARS officer with little or no previous counselling training. The assessment of competence was carried out using the same measure as Study 2 for comparison. The impact of the training was assessed by applying a similar design to that of Study 3. Competency tests indicated the 2-day training did not create competence and proficiency across all facets of MI though adaptations were recorded. The impact on the patient adherence rates in the PARS was similarly equivocal to the previous study.

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Abbreviations

BACR	British Association of Cardiac Rehabilitation
BCC	Behaviour Change Consortium
BECCI	Behaviour Change Counselling Inventory
BHF	British Heart Foundation
BN	Brief Negotiation
BREQ-2	Behaviour Regulation Exercise Questionnaire - version 2
CBT	Cognitive Behavioural Therapy
EMI-2	Exercise Motivation Inventory - version 2
EoP	Exercise on Prescription
FRAMES	Feedback, Responsibility for change, Advice giving, Menu of options, Empathetic counselling, and Self-efficacy and optimism
GP	General Practitioner
HBM	Health Belief Model
MI	Motivational Interviewing
MISC	Motivational Interviewing Skills Checklist
MITI	Motivational Interviewing Treatment Integrity
NHS	National Health Service (UK)
NQAF	National Quality Assurance Framework
PA	Physical Activity
PARS	Physical Activity Referral Scheme
PCT	Primary Care Trust (UK)
RP	Relapse Prevention
RPT	Relapse Prevention Theory
SCT	Social Cognitive Theory
SDT	Self-Determination Theory
SoC	Stages of Change (a facet of TTM)
TAU	Treatment as Usual
TF	Treatment Fidelity
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
TTM	Transtheoretical Model (of behaviour change)

APPENDICES

Chapter 1: Thesis introduction

1.1 The purpose and aims of this thesis

In light of increasing levels of inactivity in the UK population (Section 1.2) this thesis aims to critically examine the potential for physical activity (PA) counselling as a vehicle for achieving increased levels of PA. Specifically, the thesis will assess the efficacy of training PA professionals in counselling based on Motivational Interviewing (MI; Miller & Rollnick, 2002). The context within which the intervention will be delivered and assessed is physical activity referral schemes (PARS). The thesis consisted of four studies which addressed the following aims and objectives:

1. Critically examine the design, content and efficacy of studies reporting to have applied a PA counselling intervention.
2. Assess the competence of the principal investigator (PI) (applying a treatment fidelity framework; Bellg et al., 2004), and examine the role of MI as a PA counselling intervention in a PARS setting at initial consultation, as opposed to traditional inductions.
3. Assess the training effects of MI on a PARS officer in terms of their counselling competence (using validated instruments) and their subsequent affect on client PA behaviours.

The thesis will provide a literature review of PARS and the potential for interventions such as MI to achieve PA behaviour change. It will then meet the first aim by carrying out a systematic review of studies which have applied a PA counselling as a primary intervention or adjunct. Having first ensured proficiency and competence in delivering MI (using validated tools), the second aim will be met by examining the efficacy of the MI intervention in a typical PARS setting. The delivery of the MI-based PA counselling will also apply additional analyses of patient characteristics such as motives and readiness to change. The impact of these factors will be evaluated by adherence rates as compared to a control receiving traditional PARS content and measures. The final aim is fundamental to treatment efficacy and will be met by assessing the impact of MI training to a PA professional. This individual reflects the competence and experience of those PA professionals currently

operating PARS in the UK and recommendations will be made as to the most appropriate (and realistic) methods of PA counselling training for this group. As with the previous aim, this will be based on a suggested treatment fidelity framework which emphasises that counselling interventions address core aspects such as 'competence'.

1.1.1 Chapter synopses

Chapter 1: *Thesis introduction*

This chapter provides the aims and objectives of the thesis, a structural framework and provides a critical review on the context within which the PA counselling intervention is being delivered. It offers an insight into the multifaceted impact of sedentary lifestyles and the subsequence of hypokinetic disease across age and socioeconomic groups focussing primarily on obesity. It will also consider the political drivers for PA interventions and identify the key white papers and legislature that inform the provision of PA interventions in primary and community settings.

Chapter 2: *Physical activity referral schemes and physical activity counselling*

Having considered the prevalence of sedentary lifestyles, and its multifaceted health impact on health policy in Chapter 1, Chapter 2 will focus on a specific community-based intervention. This is designed to elucidate lifestyle change through lifestyle adaptations such as physical activity adoption and diet modification. PARS have been commonplace in the UK for over a decade although they still appear to suffer from poor patient adherence and equivocal results. This chapter will provide a critical analysis of the empirical research on PARS since it provides the setting for the interventions delivered in Studies 2-4. The chapter will also consider the role that PA counselling plays within PARS and the promotion of lifestyle change more widely. This provides a foundation for Study 1 (Chapter 4), and will justify the intervention delivered in Study 2-4.

Chapter 3: *Motivational interviewing in physical activity programmes*

This chapter provides a critical examination of the technique of MI, it's theoretical foundation(s), and the context within which it is currently applied. It then reports current findings and examines the efficacy of MI in a physical activity (behaviour change) context as opposed to its traditional setting of drug and substance

misuse. The chapter then critiques the adaptations of MI (AMI's) such as 'Brief Negotiation' and their evolution into vehicles for eliciting change talk, and readiness for change in healthcare settings. Finally, the psycholinguistic properties of MI are discussed within the context of the current thesis.

Chapter 4 (Study 1): *Physical activity counselling: a systematic review*

Following the critique in Chapter 2 of health behaviour change and PARS interventions, this chapter provides a systematic review of PA counselling studies based on the Behaviour Change Consortium (BCC; Bellg et al., 2004) framework for treatment fidelity. The review critically examines whether or not existing studies, that reported a PA counselling intervention, applied any form of treatment fidelity or indeed any quality check on the delivery or receipt of the counselling intervention. The inclusion criterion follows the five BCC treatment fidelity stages of design, training, delivery, receipt and enactment.

Chapter 5 (Study 2): *Competence testing for MI interventions*

The previous chapter examined the extent to which problems of inconsistency and variability of existing PA counselling interventions. Having identified these issues, this chapter examines the intervention of MI as a treatment fidelity using two valid and reliable measures. These measures test counsellors adherence to MI using the MI Treatment Integrity (MITI) as well as an assessment of counsellor skills and client responses, via the MI Skills Code (MISC). In line with the BCC framework the results should demonstrate competence (and therefore reliability) of the intervention prior to delivery to the treatment sample.

Chapter 6 (Study 3): *The efficacy of MI within a physical activity intervention*

Following checks for fidelity of the MI intervention, this chapter examines its impact in PARS with a cause-and-effect intervention over a 16 week referral period with a 12 month follow-up. This intervention reflects the frequency and duration of a typical patient-referral officer interaction, prior to the commencement of a prescribed PA programme. While other interventions applying MI often interact with a greater frequency and longer duration it was important to use an ecologically valid intervention. Baseline measures were taken for all treatment and control participants

and included: exercise motives, readiness and confidence to change, decisional balance about change, medical referral condition and demographic data.

Chapter 7 (Study 4): *Training effects of MI in a PA setting*

Having evidenced the need for a more consistent and reliable PA counselling intervention in Chapter 4, tested its fidelity in Chapter 5 and applied it to a treatment group in Chapter 6, the final study examines the 'trainability' of MI to a PA professional. The effectiveness of MI as a PA counselling intervention is tested by the PARS officer and assessed using MITI. PA counselling is delivered to a treatment group again in a PA referral scheme and the intervention was compared to patient results in four control schemes who received treatment as usual (TAU).

Chapter 8: *General discussion*

Due to the nature of the applied research carried out in the current thesis, the context within the interventions are delivered was considered and included an examination of PARS and PA statistics and trends. PA and health behaviour change issues are discussed specifically focussing on interventions such as PARS and issues of treatment fidelity in relation to PA counselling. This considers PA counselling and implications for developing competence with PA professionals. The interventions (Studies 1 to 4) examined the impact and potential of an MI-based PA counselling intervention and the discussion integrates findings with existing evidence, government policy and published guidelines. Finally the thesis examines the studies individually as a suite of findings, before identifying key conclusions, implications for further research, implications for policy and implications for practice in PARS. This includes an examination of the potential impact of PA counselling for training staff involved in PARS and allied health professionals more widely who are likely to be tasked with delivering a PA message.

1.2 The prevalence of hypokinetic disease and inactivity

The Department of Culture Media and Sport (2002) set a national target for sport and physical activity (PA) that 70% of the population is reasonably active[1] by 2020. Currently the proportion of the population meeting these levels of activity is

[1] 'Reasonably active' is described by the DCMS (2002) as 30 minutes of moderate activity 5 times a week

around 30% (Department of Health, 2004a). Indeed, there is now undisputed evidence that the UK population is becoming increasingly inactive leading to increases in premature mortality, illness and disease. Moreover, there is an increasingly aged population (DCMS, 2002) and the burgeoning increase of this demographic is a major concern with the number of adults over 60 years of age predicted to represent 30% of the UK population by 2020 (DCMS, 2002). As a result, it has been frequently reported that the NHS will not be able to cope with the spiralling costs associated with the predicted rates of hypokinetic disease in adults and older adults.

There is however an increasing body of evidence that supports, through controlled studies, the proposition that PA can assist in the prevention, management and treatment of ill-health (Department of Health, 2004a). In addition to the clear health benefits gained by regular PA, it is clear that this approach to health care (preventive and treatment) provides a cost-effective alternative to increasingly expensive pharmacological interventions (Morris, 1994). This chapter will examine the incidence of inactivity, and subsequent levels of ill-health, across the UK population. It will then examine the role that the government may play by applying legislature, guidelines and PA policy. Faulkner and Taylor (2005) stated that although the physiological benefits of PA have long been advocated, only recently have the potential psychological advantages become more tangible and although still not equivocal a greater sagacity is occurring. Behaviour change is an essential component of PA programming (Biddle & Mutrie, 2001). It demands that the client take responsibility for the process and action of not only avoiding, or decreasing contact with tempting or risk environments but that the client actively engages in regular PA (HDA, 2003). It has recently been suggested "*that physical activity counselling becomes part of normal healthcare in the prevention, treatment and management of chronic diseases for all health professionals*" (Foster, Hillsdon, Cavill, Allender & Cowburn, 2005; p.6). However, while calls have been made to adopt such interventions and support techniques, a number of fundamental questions exist regarding the theoretical and technical approach to take in applying PA counselling. These issues will be addressed throughout the current thesis.

Interventions advocating PA at their core are increasingly popular in primary care (Taylor, 2003) and greater links between such settings and the community based

interventions such as PARS (the description used throughout the current thesis) are increasingly prevalent (Morgan, 2005). These schemes provide an innovative approach to delivering interventions such as PA counselling and PA prescriptions and now sit firmly as a strategy to compliment the medical model of disease management (Kahn et al., 2002). However, these approaches are not without their problems and will be considered in Chapter 2.

Prior to exploring the role of counselling and motivation at an individual level in subsequent chapters, it is important to understand and contextualise the environment within which interventions such as PA are being, or may be delivered. Specifically, the client may receive an intervention in a variety of settings or from a variety of health or PA professionals and specialists. The demands on the UK health system have increased significantly. This appears to be due to the dramatic increase of hypokinetic disease and the subsequent physical and psychological ramifications (James & Johnston, 2004). The focus of the intervention in the current thesis is upon adults and older adults (which is reflected in this chapter) although it is important not to neglect health trends of children and young people as this will impact upon future service delivery. The shift in health focus toward interventions such as PA cannot be considered apolitically and therefore key government policy and legislature will be discussed. While the current thesis does not aim to critique political facets of PA and health policy it will attempt to frame the intervention of PA and PA counselling and behaviour change. It will do so to reflect upon future trends of primary and allied health professionals in delivering support to individuals to increase levels of PA. As highlighted in Chapter 2, PA counselling by health professionals is limited while the potential gains are extensive from a patient adherence perspective (Tulloch, Fortier & Hogg, 2006). Finally the Chapter 2 will focus on the physical activity referral setting as a specific community based intervention. This reflects the setting within which the intervention of motivational interviewing (MI; Miller & Rollnick, 2002) was delivered in the current thesis (see Chapters 5-7).

Inactivity results in increased mortality from diseases and disabilities such as coronary heart disease (CHD), strokes, obesity, type II diabetes, hypertension, some cancers, stress, anxiety, osteoarthritis and low back pain (WHO, 2002). Despite the risk, and favourable health benefits associated with regular PA, inactivity levels in

developed countries is alarmingly high (Cameron, Craig, Stephens & Ready, 2002; United States Department of Health & Human Services, 2000). In particular, chronic diseases are reported to be increasing in the UK as a result of three modern trends; the epidemic of obesity, inactivity in children, and the increasing age of the population (Hardman & Stensel, 2003). While the latter is difficult to affect, most governments in the developed world are attempting to implement policy to reduce these trends. For example, in the UK, White papers such as Choosing Health (Department of Health, 2004a) and Delivering Choosing Health (Department of Health, 2004b) are the latest in a long line of strategies to reduce this slide toward an epidemic of ill-health caused by the populations health and lifestyle choices. While the UK compares reasonably well to the European Union average (Figure 1.1), the Department of Health (2004c) report that opportunities exist in peoples everyday lives to be more physically active in both work and leisure time but that the majority are failing to take those opportunities. Subsequently, it is clear that a sedentary lifestyle is now the norm for the majority of people in developed countries, in addition to a trend of relapse from regular physical activity (Department of Culture, Media and Sport, 2002; Scottish Office, 2000; US Department of Health and Human Services, 1996).

The direct impact of inactivity in the UK for specific disease classifications has resulted in 37% mortality for cancer (Britton & McPherson, 2002) with cardiovascular disease (CVD, one of the main causes of death in the UK) resulting in 35% premature deaths (death before the age of 75; British Heart Foundation, 2004) in men and 27% of premature deaths in women. The most significant single cause of death is CHD which accounts for 22% and 13% of premature deaths in men and women respectively (British Heart Foundation, 2004). The number of diagnosed cases of type II diabetes in both adults and children is 1.35 million people in the UK. In addition, the British Heart Foundation suggested that nearly half of diabetes goes undiagnosed, which potentially increases the figure beyond 2 million.

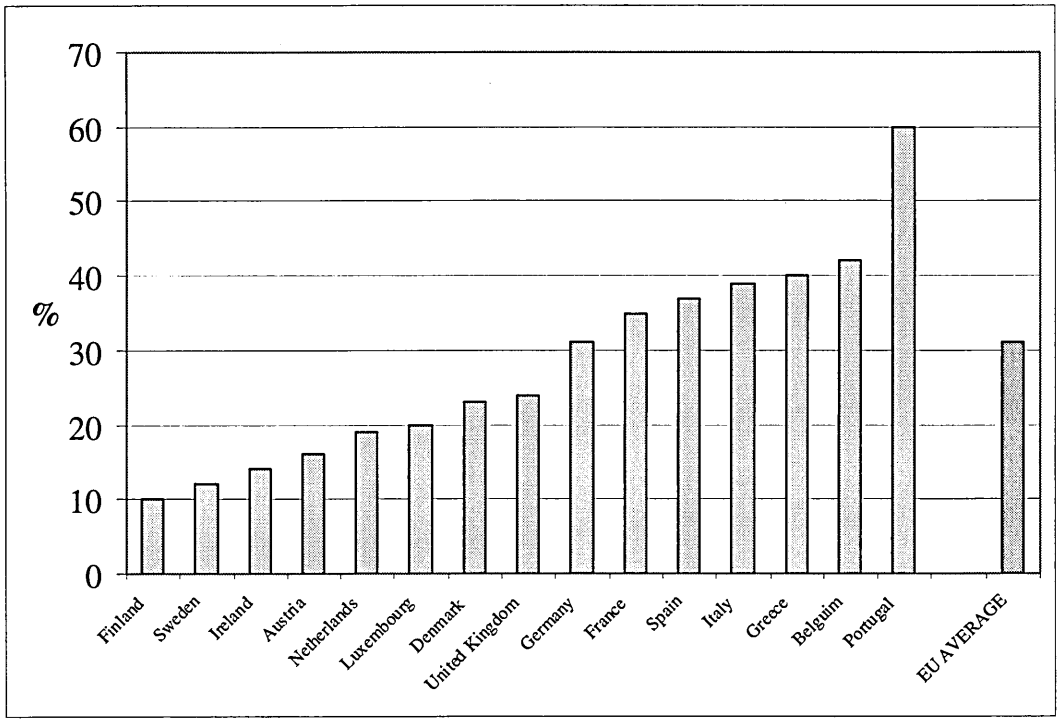

Figure 1.1 Prevalence of people aged 15 and over reporting no physical activity in a typical week: A European Union comparison (Adapted from Hardman & Stensel, 2003 p.10).

1.2.1 The obesity epidemic

As well as the health concerns stated above, the increasing dominance of obesity as a national and international concern is well founded with the World Health Organisation labelling obesity as a global epidemic (WHO, 2003). In most countries its impact is increasing, and in the UK (even though activity levels appear comparable to those of European neighbours), the rate of obesity has tripled in the last two decades (Hardman & Stensel, 2003). This is a rate which is far higher than many other European countries. The UK is now reported to have 37% of adults that are overweight or and 22% obese (59% total) (Office for National Statistics and Medical Research Council, 2004). Chambers and Swanson (2006) highlight the wide range of health problems associated with obesity (e.g., heart disease, back and joint pain, some forms of cancer, hypertension and diabetes) as well as the huge, and increasing, burden on the NHS. Prentice and Jebb (1995) suggested that in the last 20 years our eating and activity levels have been instrumental in the current obesity epidemic across all age groups.

While the epidemiological and physiological effects of inactivity are well documented, an increasing body of evidence highlights the serious psychological and emotional problems which can manifest from obesity in a variety of cognitive and behavioural ways (Must et al., 1999). As indicated by Devlin, Yanovski and Wilson (2000) "*Obesity is the most easy to recognize and the most difficult to treat of medical conditions*" (p.854); and, according to Devlin et al. there is no consensus on whether or how to address obesity. Its affects can also be the result of negative attitudes in Western Society from both the public and health professionals alike. Indeed, the impact for the obese individual translates into everyday social activities such as lower educational achievement, increased employment and less frequent and stable relationships (Pi-Sunyer, 1998) demonstrating the difficulty in managing the diet and PA relationship and its multifaceted impact.

Gard and Wright (2005) contended that researchers have always had difficulty in establishing the diet and PA relationship and their direct effect on health. The authors suggested that dietary restraint and PA "*remain the mainstay of anti-obesity public health campaigns*" (p.51), a point supported by Klein (1999) who cited lifelong modifications to eating and physical activity as fundamental to the process of reducing obesity. While criticisms exist as to the positivistic nature of epidemiological analyses in areas such as PA referral, it does provide a specific consideration of population groups rather than consolidating data erroneously (Crone, Smith & Gough, 2005). A more specific consideration of PA and mental health is provided in Section 2.2 while the following sections identify the issues specific to age and socioeconomic groups.

1.2.2 Children and young people

The 2002 Health Survey for England (cited in Sproston & Primatesta, 2003) found that over a fifth of boys (21.8%), and over a quarter of girls (27.5%) were either overweight or obese with only 70% of boys and 61% of girls reaching recommended levels of PA to benefit their health. As well as a cross-sectional snapshot, the survey also highlighted upward trends of obesity for both sexes during 1995 to 2002 with the prevalence for boys doubling from 2.9% to 5.7% and increasing from 4.9% to 7.8% for girls. The survey highlighted health and social implications for this age group moving into adulthood and suggested mental health implications which include social

conduct disorders, emotional disorders and hyperactivity. Low levels of PA, and subsequent related ill-health, can have an impact on mental wellbeing amongst young people. Indeed, evidence already suggests that 10% of 5-15 year olds have one or more mental health disorders (Office for National Statistics, 2000). These rates are increasing and are affected by several social and biological factors (e.g., race, ethnicity, age and socioeconomic status). Figure 1.2 illustrates the PA participation trends of young people from 2 to 15 years of age in England. This concern is amplified when considering specific genders, and as the figure shows, the percentage of adolescent girls participating in recommended levels of PA is well below 40%. These levels of inactivity correspond closely to the increasing obesity trend in young people in the UK and also illustrate the declining pattern of activity from around 10 years of age. It is this trend that government white papers such as *Game Plan* (DCMS, 2002) aims to reduce.

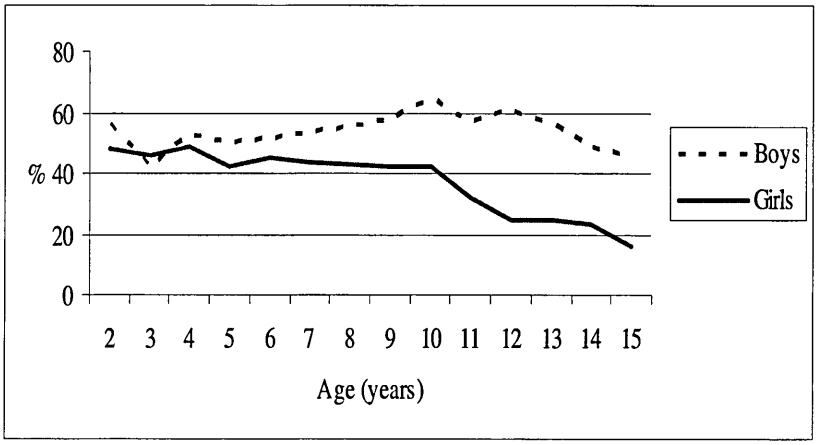

Figure 1.2 The percentage of children in England participating in at least 60 Minutes of physical activity on five or more Days a Week (Joint Health Surveys Unit, 1998).

1.2.3 Adults and the elderly

The level of disease and illness in the population as a whole has been clearly documented. Adults (16-64 years old; BHF, 2006), and older adult's (50 years of age and older, BHF, 2006) health has been highlighted as a concern for government due to the increasing demographic in these age categories. The 2003 Health Survey for England produced by the Joint Health Surveys Unit (JHSU, 2004) reported that the rates of activity for adults are low with only 44% of males and 30% of females reaching the recommended levels to achieve health benefits. The figure for younger men (Figure 1.3) is slightly higher (52%) but declines sharply after the age of 24 to

around 44%. This level of activity is sustained up to around 34 years of age after which it declines again to around 40% of the recommended physical activity levels. While evidence from current PARS (see 2.5.1) reflects participants that are older adults, it is clear from the Health Survey for England where this downward trend begins. It appears that PA interventions are underused as a means of health promotion to such adult groups, even though the health benefits are well understood (Phillips, Schneider & Mercer, 2004).

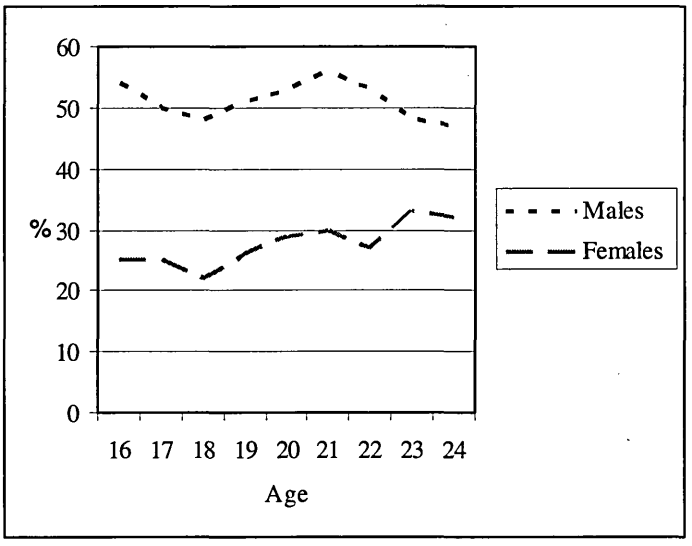

Figure 1.3 Proportions of young adults (15-24 yrs) meeting the physical activity guidelines (5 days a week or more of at least 30 minutes of at least moderate intensity)(Adapted from 'The Health of Children and Young People', Health Survey for England, 2002)

The Department of Transport (2004) reported that total distances walked per year have fallen by 19% since 1989/91. An important facet of the PARS intervention is the dovetailing of gym-based and home-based activities (see Sub-section 2.5). This provides a supportive and educational environment in the gym whilst encouraging independence and autonomy in home-based activities such as walking. This is an important consideration for engendering 'lifestyle activities' which are essential considering the findings of the DoT (2004).

There is also concern with decreasing levels of activity in adult and older adult populations. Skelton, Young, Walker and Hoinville (1999) reported that 39% of men and 42% of women over 50 are totally sedentary. Alarmingly at 74 years of age this figure reduces to only 14% of both men and women being active enough to benefit

their health. More recent data has shown the level of inactivity to still be worryingly low with 81% of men and 87% of women over 55 years old not reaching recommended levels of activity (JHSU, 2004). The study applied in the current thesis had a control and treatment population with a mean of over 44 years of age. The sample reflected this ageing population and reflected those with lower functional capacity and often retirement through disability. The loss of independence is often due to the loss of functional capacity (strength, endurance and flexibility) which declines at around 10% per decade with muscle power lost at around 30% a decade (Skelton & McLaughlin, 1996). Stathi, Fox and McKenna (2002) suggested that older people do not just desire an avoidance of illness and disease but still seek personal development and control in tandem with social functioning and mental health. PARS must reflect this, and as such, the PA counselling intervention and subsequent PA prescription must differentiate by age, gender and individual motives. The need then to promote PA for older adults is clear. In particular, as well as the increased risk of illnesses such as diabetes, CVD, CHD and stroke (BHF, 2004), older people value their independence although this is highly likely to be compromised by following an inactive lifestyle (Stathi, McKenna & Fox, 2003).

1.2.4 Socioeconomic markers of ill-health

The evidence is increasing that poverty and social disadvantage correlates with rates of reduced PA and reduced health promoting behaviours. Lowther, Mutrie and Scott (2002) reported clear differences between social classes regarding PA and as a subsequence increased risks of hypokinetic illness and disease and increased risk of morbidity. When reporting figures from the 1997 Scottish Health Survey (Scottish Office, 2000), the authors suggested that lower social classes tend to do more occupational PA in line with their manual occupations and subsequently perceive PA as a 'chore'. Higher social classes on the other hand do less occupational PA tending to perceive PA as a pleasurable, leisure based activity, and the result of 'choice'. This perception may add to the complex determinants of health inequalities between social classes. Evidence suggests that those who are poorer in material or social conditions are likely to eat less healthily, take less exercise, and are probably more likely to smoke (Dowler, 2001).

On the whole the explanations for social inequalities [regarding health] are largely unresolved. However, with few exceptions, there are strong (and significant) trends of increasing risk from classes I and II to classes IV and V (Power & Matthews, 1997). Power and Matthews also suggested that multiple health risks are influenced powerfully by social position although this appears over decades rather than mid-life exclusively. This supports the need to strengthen the modification of life choices for all social groups whilst appreciating the potentially greater barriers for lower socioeconomic groups. Real barriers to PA may exist that are termed 'structural', these being distances to leisure centres, crime and risk of crime in particular areas, lack of transport and attitudes of social groups (Dowler, 2001). While Chapter 3 considers PA counselling at an individual level in an attempt to encourage self-efficacy, and self-determined behaviours, it must be appreciated that choice is often not possible for some individuals and their lifestyle may be determined or controlled by environmental and social factors. While the health implications are clear, the options for interventions toward PA may be less apparent. This underpins the need to develop individualistic lifestyle modifications based on the perceptions of opportunity and ability of the patient or client.

1.3 Physical Activity and Psychological Well-Being

The effects of exercise can be described as a "win-win" situation with both positive physical and mental health outcomes (Mutrie & Faulkner, 2003). However, although the physiological benefits of PA have long been advocated, only recently have the potential psychological advantages become more tangible. Specifically, a greater sagacity appears to be occurring with regards to the role of PA on factors such as mood state, self-esteem, and depression (Kennedy & Meeuwisse, 2003). While the evidence appears equivocal, it encourages the proposition that PA can assist in the prevention, management, and treatment of mental ill-health (Biddle & Mutrie, 2001; Buckworth & Dishman, 2002). The potential of PA as a form of prevention and management of psychological ill-health has been the focus for exercise interventions worldwide. It is also increasing as a method in rehabilitation and general lifestyle and behaviour change programmes. There is now a general acceptance among medical authorities that PA is an essential facet of healthy living, and improved wellbeing (Fox, Boutcher, Faulkner & Biddle, 2000). Indeed, evidence is increasingly targeting specific aspects of mental health rather than a broad brush approach to its relationship

with exercise and lifestyle PA. This includes the positive impact of exercise on managing anxiety and stress (Taylor, 2000), self-esteem (Fox, 2000), and psychological dysfunction (Szabo, 2000). While the two terms 'exercise' and 'physical activity' have different connotations regarding levels of formality and structure, it appears that a convincing body of evidence now supports both approaches as strategies for promoting mental health (Faulkner & Taylor, 2005).

The philosophical standpoint and perspective of the intervention provider plays an important role in the subsequent approach taken. In attempting to have a sedentary individual adopt an active lifestyle, a physiologist might take the perspective of asking 'what physiological barriers exist toward this initiation?', or 'where should the intervention start?' or 'what are the physical effects of exercise training?'. A sociologist may have a different perspective and ask 'what are the social barriers that inhibit the exercise adoption?' or 'what incentives can society provide?' For a psychologist the perspective toward the same question may be significantly different and include questions such as 'How do I motivate the person to move?', or 'what incentives might work?' or 'how do they feel about the effects of exercise training?' (Kretchmar, 2005). The challenge within the current physical activity environment is to have PA professionals that are aware of these differing perspectives from a physiological, sociological and psychological philosophy toward client motivation. An appreciation of only one perspective is negating other important mechanisms affecting the individual.

1.4 Government policy and legislature: Public health, inactivity and obesity

It is clear from the evidence cited so far that the population shift toward a sedentary lifestyle is having a significant impact across all ages, both genders and all socioeconomic groups. This increases the need for government policy shifts which accommodate these levels of inactivity, lifestyle choices and subsequent health issues. The potential of PA as an adjunct to pharmacological therapy has been voiced since the worrying findings of levels of inactivity in the Allied Dunbar National Fitness Survey (ADNFS, 1992). Morris (1994) recommended the value of PA in assisting public health policy suggests that PA holds great value for public health development and is a 'best buy in public health' (p.807). While there has been a frustrating lag time since the key survey of the ADNFS it does appear that, since the turn of the

millennium, the government has increased its awareness of inactivity and the need for increased PA. This raised awareness can be evidenced in both policy and PA recommendations. For example, there has been a significant shift from an 'exercise-for-fitness' approach seen in the recommendations of 20 minutes of *vigorous-intensity* activity 3 times per week to the current 30 minutes of *moderate intensity* exercise on most days of the week promoting a 'physical-activity-for-health' approach (Blair, Cheng & Holder, 2001). This section will examine the variety of health policy approaches which provides the backdrop for current and future PA interventions such as PARS.

1.4.1 Epidemiological support for PA and health policy

The epidemiological evidence in support of PA as a health therapy has provided 'patterns of behaviour' emerging which have now found a place in public health policy such as 'Choosing Health' (Department of Health, 2004a) and 'At Least Five a Week: Evidence on the impact of physical activity and its relationship to health' (Department of Health, 2004c)'. However, the evidence regarding direct cause-and-effect is still equivocal lacking prophylactic data. Indeed, many policies and strategies are based on what Gard and Wright (2005) described as a 'mechanistic approach' suggesting the analysis of behaviour and the human body supports the idea that;

> "*if you look hard enough, laws - or at least patterns – concerning health, food and physical activity will emerge and that these patterns can then be communicated to the public so that they might lead 'healthier' lives*" (p. 51).

A number of patterns do seem to have emerged from recent research and reviews of evidence (e.g., Hillsdon, Foster, Cavill, Crombie & Naidoo, 2005). These patterns, and subsequent guidelines, have formed the basis for UK government policy and the use of PA as an intervention in the public health strategy at all levels of delivery. It is important to note that disagreements exist as to the quality of the evidence available to support programme and policy shifts for PA as an intervention for obesity (Sesso, Paffenbarger & Lee, 2000). However, what is clear is the financial need to intervene and effect a change since illnesses such as stroke and CHD cost over £1.7 billion pounds each per annum for the NHS to treat (Bosanquet & Franks, 1998; Liu, Maniadakis, Gray & Rayner, 2002). Along these lines, Foster et al. (2005)

carried out a systematic review of sport and exercise participation research. This considered not only the potential benefits of regular PA participation but also the barriers that exist and issues (real and perceived) restricting increased and regular PA and sport participation. The authors subsequently reported three implications for UK policy makers;

- An urgent need for well-documented qualitative research into attitudes to physical activity. This should investigate in depth the social and psychological barriers to taking part in sport and physical activity across the lifespan.
- This research should be used to inform national policy-making on sport and physical activity, to inform the 'culture shifts' to which almost all government documents refer.
- In the absence of such evidence-based policy-making we are likely to continue to see well-meaning policy statements from government that are not rooted in the realities of people's lives.

(Foster et al., 2005, p. 6)

What is clear from Foster et al.'s recommendations is that there is currently insufficient evidence regarding individual's lifespan attitudes to PA. This obviously undermines the potential to produce a coherent and appropriate strategy for national intervention policies. As suggested by Gard and Wright (2005), policy is based more on 'patterns' than empirically sound and reliable data which is specific to individuals across geographical and demographic domains. This undermines the potential impact of such policies, and consequently, aspects such as PA are still marginalised by health policy when compared other health issues such as smoking and cancers (Crone, Johnston & Grant, 2004). Based on the PRECEDE-PROCEED health promotion model of Green and Kreuter (1991), Taylor (2003) provided a useful 9-phase model (Figure 1.4) providing a schema for the development, implementation and evaluation of policy which may drive interventions in what Taylor describes as a 'whole systems approach'. Specifically, Taylor suggested that phases 1-4 provide a diagnosis of why and how PA is promoted through primary health care (PHC) while phases 7-9 explore the potential of interventions to increase levels of PA. Behavioural diagnosis (phase 3) is certainly considered within schemes such as PARS whereby lifestyle analysis (smoking, alcohol and diet) and activity levels (sport, exercise and fitness activity)

may be recorded although the level and accuracy of the data will vary hugely (Taylor, 2003).

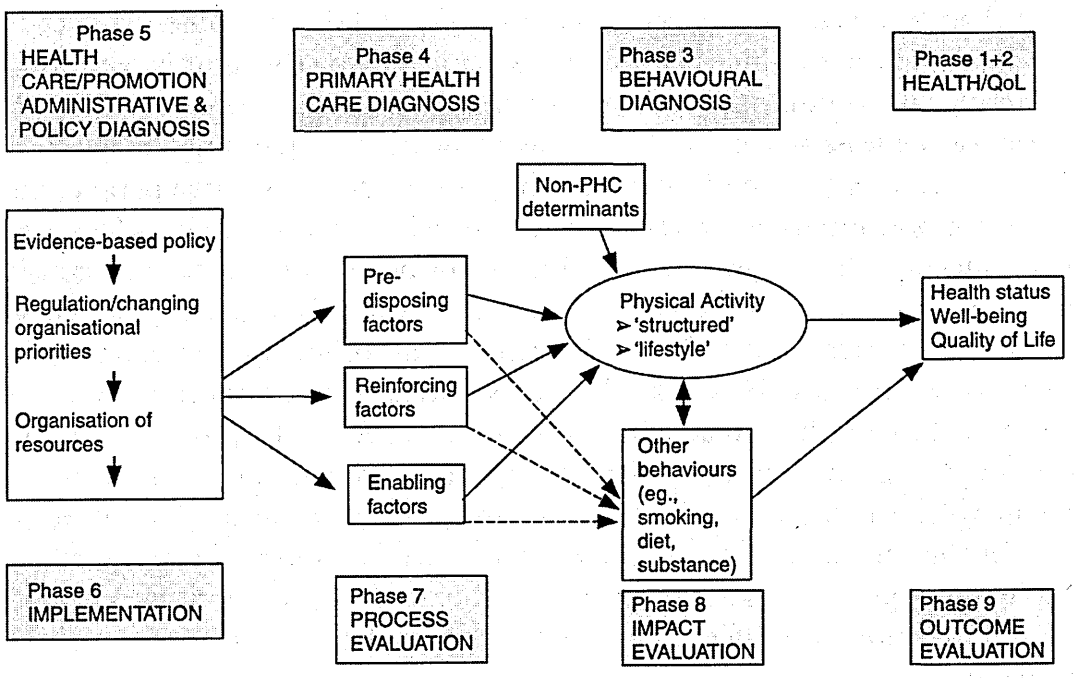

Figure 1.4 A framework for promoting physical activity (Taken from Taylor, 2003, p.155)

It could be argued that from phase 4 onwards the consistency and application of measurement techniques is disparate. Indeed, Taylor described this phase as *pre-disposing factors* such as knowledge, beliefs, attitudes and values [toward the health benefits of PA] that the patient or client brings to the primary-care setting as well as those expectations of the healthcare worker, or in the case of the current thesis, the PA professional. Section 2.5.1 in the current chapter emphasises that in relation to such a coherent framework phases 6 onwards are not considered adequately in current PARS provision with specific limitations toward phase 7 (process evaluation) and phase 8 (impact evaluation).

The following sub-sections examine the role that PA policy has taken in creating effective interventions. In addition, it will consider models such as that of Taylor. It will therefore review issues such as monitoring and evaluation and which phases appear to have been embedded into key government PA legislature and guidance.

1.4.2 Contemporary PA and health policy issues

Problems exist with government health and PA policy although it is important to outline the most significant (and recent) of these and their potential impact for practitioners and the development of PA interventions (summarised in Appendix 1.1). The most significant recent policy and White papers have been Choosing Health (Department of Health, 2004a) and the NICE guidelines for PA (2006) which have emerged following the National Service Framework (NSF) for CHD (Department of Health, 2000) and the Health Survey for England (HSE, 2003). However, while the NSF placed PA as a secondary outcome and health target behind smoking cessation parity was restored between this and PA with the HSE (2003). For example, the HSE made clear the prevalence of smokers (27% of men and 24% of women) as compared to those living a sedentary life (63% of men and 76% of women) although this was a survey in the same vein as the ADHFS (1992) rather than a guidance or policy/procedural Government White paper. It has therefore taken a considerable amount of time for PA to be placed at the centre of a strategic approach to PA and health behaviour change by the government. This does however appear to have happened with greater propensity in recent years with action orientated documents such as 'Choosing Health', the NICE community PA strategies and 'Game Plan' (DCMS, 2002).

There are some key problems with the key government policies aimed at tackling inactivity and promoting PA across the population. For example, the NICE guidelines have oversimplified the PARS schemes and the processes involved providing little if any information of strategic approaches beyond the 2001 National Quality Assurance Framework (NQAF; Department of Health, 2001a). Moreover, the guidance notes on community based PA interventions provided for *Brief interventions in primary care* have as much relevance for PARS and yet recommendations such as *adopt individualistic approaches* have not been emphasised for PARS. The emphasis for the PARS in the NICE recommendations is very much outcome orientated and as a result provided little if any support to the need for behaviour change interventions and an analysis of processes of change beyond merely "*a tailored physical activity programme including monitoring or progress and follow-up*" (DoH, p.5). Of even more concern is that the Public Health Interventions Advisory Committee (PHIAC)

that determined the recommendations and the cost effectiveness of PARS stated in the NICE guidance that;

> *"PHIAC determined that there was insufficient evidence to recommend the use of exercise referral schemes to promote physical activity other than as part of research studies where their effectiveness can be evaluated"* (DoH, 2006, P.6).

This is concerning since the number of PARS that fit this criteria is significantly low. For example, Activity Sheffield (which currently oversees 9 referral schemes and is the city policy and development group for PA in the city) has no PARS aligned with a research study. While Chapter 2 will consider PARS in more detail, it seems inappropriate for NICE to doubt the benefit of the majority of UK schemes whilst simultaneously recommending it as one of four key methods of intervention. In terms of PARS, pedometers and cycle/walk schemes it seems that the NICE guidelines have tried to apply a biomedical model to what is essentially a behavioural-administrative problem and have ignored secondary prevention to a large degree. There is also a definite lack of stated evidence regarding the relationship between PA and health gains, either physical, psychological and/or emotional. What was made clear in the NQAF (DoH, 2001a) was that GPs and primary health care teams should utilise a wide variety of schemes only once they are satisfied that their local provision provides for the appropriate administrative and psycho-behavioural support that will result in long term healthy behaviour (e.g., as that recommended by the NQAF). This appears diluted at best, and at worse omitted, from the NICE guidance. As outlined previously, the replacement recommendation appears to be to place each PARS within a research study.

'Game plan' (Department of Culture, Media and Sport, 2002) and numerous other government policies (e.g., the Priorities and Planning Framework, DoH, 2001b) highlighted the importance of partnership working between government bodies and those numerous community bodies involved in delivering PA (James & Johnston, 2004). This again has not been explicitly stated as an operational point in the NICE guidance and overall a diluted and somewhat ambiguous set of directives and suggestions have been presented. The following sections will consider the operationalisation of these policies and the implementation of community-based interventions.

1.5 Summary

The Chief Medical Officer (Department of Health, 2004d) declared the current evidence for the health benefits of physical activity to be compelling suggesting that people who are active can reduce their risk of major diseases (e.g., coronary heart disease, stroke and type II diabetes) by up to 50%. However, what was illustrated in the chapter was the considerable lack of PA undertaken by the wider population to achieve these health gains. This again highlights the predisposition of the 'worried-well' and those described as 'almost active' (Morgan, 2005) to undertake change through schemes such as PARS and to adopt a more active lifestyle while the majority remain sedentary. A clear rationale exists for increasing PA across all UK population groups to help tackle the worryingly high proportion of adults and older adults in the population suffering hypokinetic disease over the next two decades (Taylor et al., 2004). It is also apparent that even though the PA message is understood by most, the motivation to effect lifestyle change appears lacking and that both primary care and community interventions need to accommodate individual attitudes and approaches to behaviour change using a less medical orientated and more person-centred set of techniques (Rosal et al., 2001).

The current downward trend of inactivity is clear across all age groups. The subsequent health implications are unequivocal and interventions are required to assist individuals in adopting lifestyle adaptations. The rationale for programmes such as PARS is therefore apparent though the most effective programmes, and strategies to assist individuals achieve change, is less apparent. The current thesis will critically review PARS as an intervention and will apply a PA counselling intervention to assess its efficacy in this context.

Chapter 2: Physical activity referral schemes and physical activity counselling

2.1 Introduction

Having evidenced the downward trends of PA in Chapter 1, this chapter will examine the role of PARS in the UK and assess their effectiveness. The development of such schemes has often occurred with little sagacity toward monitoring and evaluation and the determinants of scheme success. These issues will be considered prior to critically examining the role that PA counselling should play in PARS since these two form the basis for the context and the intervention in Studies 1 to 4.

2.2 Public health interventions for increasing physical activity

Traditional 'medical approaches' to health which entail advice, education and information provision have been shown to be ineffective and are slowly giving way to more client-centred and community orientated interventions (Brodie & Inoue, 2004). However, Riddoch, Puig-Ribera and Cooper (1998) suggested that PA promotion was a relatively new facet of health promotion and that 'cultural shifts in society' and 'support for environmental initiatives' were required before large scale changes in behaviour toward PA will be seen. It does not appear that these cultural shifts or environmental initiatives have occurred sufficiently to date and, as highlighted in Chapter 1, the policies supporting these shifts have been slow to materialise. However, the role of the health professional has changed and there has been an increasing part being played by allied health and fitness professionals toward increasing PA in the community. It is important to note the changing role of the health professional (e.g., GP's) from the role of 'diagnosis and prescription' to one of 'referral' to PA specialists. Indeed the changing role of primary care to promoting lifestyle modifications, in PA for example, may seem obvious but it has created challenges for both the systems and individuals within primary care. This is clearly a new foci for the government with new health specialist roles (e.g. Health Trainers) being developed as a result of white papers such as 'Choosing Health' (DoH, 2004).

Kahn et al. (2002) identified three types of community interventions designed to increase PA. Firstly, *information based* interventions designed to motivate people to change their behaviour (which is the approach taken in Study 3 and 4). These approaches are often as an adjunct (and therefore support) the medical model

approach of disease management. Secondly, *behavioural and social* approaches which are based on health-promotion models and are designed to adapt individual and group health and activity behaviours. The third approach aims to increase opportunities for PA by increasing *access to PA facilities and activities*. Morgan (2005) suggested the latter approach to be increasingly common in the UK with the majority of NHS primary care organisations adopting schemes such as PARS and increasing opportunities for health professionals to refer patients onto such schemes.

Mutrie and Woods (2003) argued that policies in education, countryside access and traffic planning (level one) and communities, workplaces, schools and local councils (level two) need far more research and evaluation before they can be fully supported as viable initiatives. Moreover, the way within which each will be funded and outcomes assessed also requires far greater knowledge and research in order to fully exploit the potential of each in increasing population PA levels (Section 1.5 will consider these interventions in more detail). Biddle and Mutrie (2001, p.276) propose several reasons why primary healthcare (PHC) should address physical activity promotion more than it has done in the past;

- PHC has become increasingly orientated towards prevention; therefore physical activity can more easily be promoted alongside other health behaviours, such as smoking cessation and dietary modifications.
- the PHC team has regular contact with large numbers of people who could benefit from increases in physical activity. It is estimated in England that 90 per cent of a practice population visit their surgery within a three year period, and about 70 per cent annually.
- GPs (family physician; 'General Practitioner') are thought to be particularly influential in changing attitudes and behaviours since they are often viewed as credible sources of information.

2.3 Physical activity and health behaviour change

As suggested in Section 2.2, three types of community interventions exist to promote PA (Kahn et al., 2002). It is clear that whatever type is used the dominant measure of success of these interventions is PA behaviour change. For more than a

decade researchers in exercise psychology have recognised that much of the work in behaviour change was atheoretical (in a similar vain to the critique of Motivational Interviewing, see Chapter 3) and based primarily on pragmatic results of interventions while lacking a sound conceptual or theoretical basis (e.g., Rejeski, 1992; Sonstroem, 1988). Biddle and Mutrie (2001) reported that in the last decade a more theoretical foundation has emerged within exercise psychology having borrowed well-known educational, motivational and social psychology theories. These increasingly prevalent health behaviour models have suggested more effective methods for achieving behaviour change than a reliance on subjective interventions. These traditional interventions of primary care attempt to elucidate behaviour change through 'persuasion', 'informational power' and 'expert power'. However, these do not fully articulate health behaviour change theories and empirically supported approaches (Elder, Ayala & Harris, 1999). These approaches emphasise the negative impact of the health behaviour status quo and use professional credentials (at least implicitly) to impress patients re-iterating the expert-role. A movement away from such 'expert-driven' approaches to 'client-centred' styles of interaction is fundamental to the current thesis and is explored further in Study 3 and 4.

Health behaviour change models have been classified within categories determined by their social, cognitive or environmental foundations (Foster et al., 2005). This includes social-cognitive, cognitive behavioural and stage models. Effective research studies into PA adoption have employed at least one behaviour modification strategy which has generally included stimulus control, reinforcement and self-monitoring (Foster et al., 2005). These operant conditioning facets (evolving from the early research of Skinner, 1953) propose that behaviour change activities, such as adopting PA, can be determined by manipulating their antecedents and consequences. In this context antecedents to PA are environmental and physical stimuli increasing the intention to change behaviour. This includes educational or promotional information from posters or a GP regarding ill-health avoidance or lifestyle adaptation.

However, these approaches appear to have largely ignored the importance of the cognitive component of behaviour change. The intervention delivered in the current thesis considers a both the cognitive and behavioural aspects of client change.

When compared to a pure cognitive-behaviour therapy (CBT) (which assumes patients are in the 'action stage') MI considers far more the exploration of *why* to change rather than merely *how* to change offered by (Miller & Rollnick, 1991). There are however similarities (between the latter action stages of MI and CBT) since CBT proposes that clients and therapists work together to identify and understand problems in terms of the relationship between thoughts, feelings and behaviour. The CBT treatment outcome focuses on specific psychological and practical skills (e.g., in reflecting on and exploring the meaning attributed to events and situations and re-evaluation of those meanings) aimed at enabling the client to tackle their problems by harnessing their own resources (Pollard, 2005).

Foster et al. (2005) suggested that an awareness of antecedents, stimulus control (the process of manipulating the antecedents) and reinforcement (affirming positive feelings that resulted from the PA) is pivotal to understanding the behaviour change process. As part of this process, a model of behaviour change must embed issues such as cognitive and behavioural components and have sensitivity enough to analyse internal factors that influence behaviour. Internal reinforcement for example is suggested by Deci and Ryan (1987) to emphasise mastery and self-efficacy and therefore assist in creating a longer lasting behaviour change whereas external reinforcement (e.g., praise from family and friends, certificates) is more superficial and less meaningful over the longer term. The expansion of the paradigm of reinforcement is examined in greater detail in Chapter 3. Within this chapter the relationship of the Transtheoretical Model (TTM; Prochaska & DiClemente, 1983) and Self-Determination Theory (SDT; Deci & Ryan, 1985) to MI will be examined. Before examining the theoretical and applied issues of MI as a PA intervention however, the context within which it is applied (in the current thesis), will be reviewed.

2.4 Physical activity and PARS

The UK government is attempting to integrate more closely primary care and community based PA interventions. This is evident in recommendations form the NICE public health intervention guidance (2006) which describes PARS as one of four methods to increase PA. This section will first consider how and where PARS have developed before considering the role they may play in the primary and

secondary treatment of conditions commonly cited in clinical and non-clinical PA referral settings such as mental illness, obesity, and cardiovascular disease. It will critically examine the evidence reporting the effectiveness of these schemes in the UK (see Section 2.4.2) and will highlight recommendations for enhancing current and future schemes.

2.4.1 The development of PARS schemes in the UK

It is clear that PARS are becoming popular with the UK NHS. Indeed, the government has continued to prioritize such schemes to increase activity levels, reduce obesity and tackle chronic disease (DoH, 2001a). Over the last decade the number of PARS in the Britain has risen dramatically from an estimated two hundred in 1994 (Fox, Biddle, Edmunds, Bowler & Killoran, 1997) to over 800 in 2005 (Gidlow, Johnston, Crone & James, 2005). However, there have been a number of problems with the quantification of schemes in the UK. Riddoch (2002) estimated the number of schemes to be in excess of 1000[2] which vary in size and complexity and indeed effectiveness. They are estimated to be operating in 89% of Primary Care Trusts (Department of Health, 2004b). It is thought that this proliferation has been largely driven the leisure industry and a lack of time and expertise available for health professional-delivered interventions (Section 4.3.3), rather than a sound evidence base. Indeed, despite their popularity, the dearth of robust evidence of their effectiveness continues to be a source of contention (Fox et al., 1997; Health Development Agency, 2004; Riddoch et al., 1998)

The process of referral typically consists of a meeting with a primary care (e.g., GP or practice nurse) or allied health professional (e.g., dietitian) who, based on agreed patient medical conditions (see NQAF; DoH, 2001a), refers the patients to a local PARS. Figure 2.1 illustrates the systematic movement (through identified stages) of patients through such a scheme which provides clear 'markers' for parameters such as physiological change, health change and programme adherence. It is the latter which has raised major concerns in the UK (Harrison, Roberts & Elton, 2005).

[2] The recent NICE 'four commonly used methods used to increase physical activity' (DoH, 2006) reports there to be around 600 PA or exercise referral schemes.

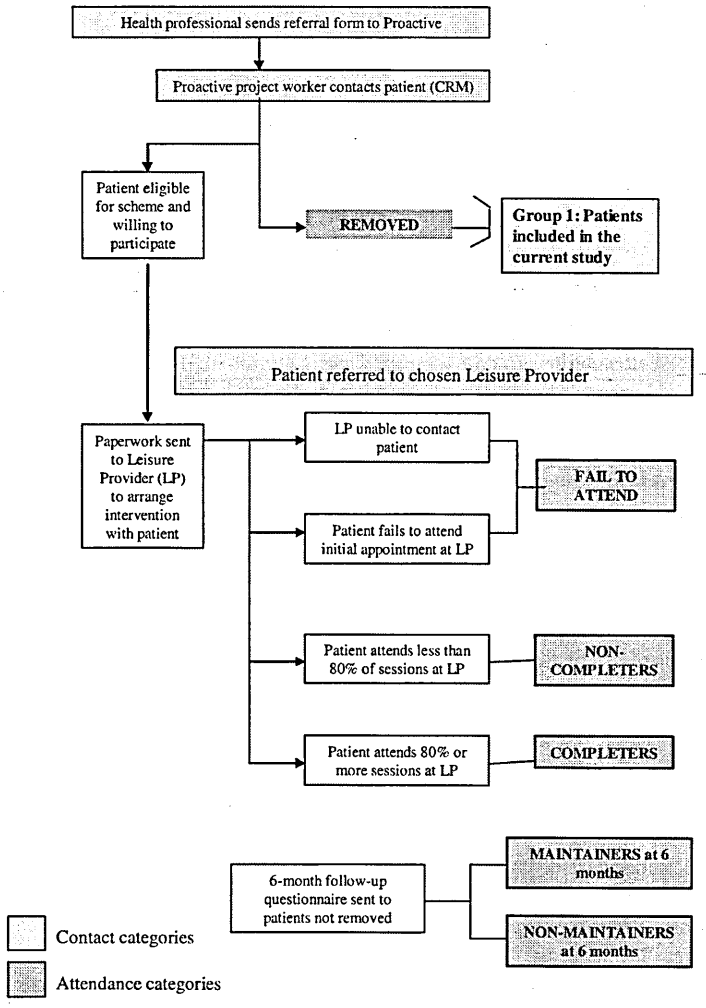

Figure 2.1 The process of referral and the role of the central referral mechanism (Taken from Johnston, Warwick, De Ste Croix, Crone & Sidford, 2005, p.60)

Figure 2.1 illustrates a robust process of referral with a number of opportunities for monitoring and evaluation at an individual and programme wide level which is a key priority for quality assurance in any scheme. However, the lack of such coherent and clearly structured referral processes may be a contributory factor in poor reporting and inaccurate systems of data collection by many UK schemes.

New policy initiatives such as Healthy Living Centres have seen a systematic increase in PARS prevalence, although again, the evidence demonstrating their effectiveness is not convincing. This UK increase is based on similar primary care based schemes in the United States and New Zealand (Elley, Kerse, Arroll & Robinson, 2003; Norris, Grothaus, Buchner & Pratt, 2000). Thurston and Green (2004) described a key justification for PARS to have been "*the aim of bringing about long-*

term adherence to active lifestyles among those who, typically, have disengaged from physical activity earlier in their lives" (p.379). Graham, Dugdill and Cable (2005) suggested that the use of primary care to deliver the PA message does however seem logical since a large and diverse range of people can be targeted. This view was based on the Health Education Authority (1994) statistic indicating that 78% of the UK population visit their GP surgery once every 5 years. An effective PARS therefore provides an interface between allied health professionals and PA professionals and represents a true test of collaboration and partnership between PCT's and local authorities. It is important that techniques and systems are developed to assist these schemes to work since PARS have become one of the most prevalent primary care-based PA interventions in the UK (Crone et al., 2004).

In light of the perceived potential that PARS offered these organisations to assist in the management of a plethora of hypokinetic and lifestyle diseases, it became clear that guidelines were required to introduce quality assurance. This need reflected increasing concerns with regards to the reliability, consistency and overall quality of a burgeoning number of schemes (Thurston & Green, 2004). This increasing concern saw the development of the National Quality Assurance Framework (NQAF; NHS, 2001a) which set out guidelines (although not mandatory legislation) for PARS operators to achieve and maintain minimum standards of provision. This provision included staff qualifications, training, facility equipment and safety and procedural directives in order to increase consistency and appropriateness commensurate with the needs of the patients being referred. Overall, the provision of national guidelines was an attempt to increase the rigorous application of quality control to an approach which up to that time had shown limited success (Lawlor & Hanratty, 2001).

2.4.2 Research evidence: PARS

This section will consider the research evidence of the effectiveness of PARS from the referrer (often the GP), to the process and procedures involved and the client in relation to the population from which they are drawn. First however, the primary outcome measure will be considered; that issue is patient adherence.

A common issue for most UK PARS has been patient attrition, and although the measurement of PA (either with leisure centre or home-based sessions) is

notoriously difficult, most schemes do attempt to record adherence (Gidlow, et al., 2005). Gidlow and colleagues carried out a systematic review of PARS studies and found that the levels of attendance was generally poor highlighting three schemes (Dugdill & Graham, 2004; Lord & Green, 1995; Martin & Woolf-May, 1999) which recorded the attendance of only twelve to eighteen percent of patients at the final assessment. This compares poorly to early evaluations of PARS such as Fox et al. (1997) who found a 60-70% patient uptake (i.e., initial induction attendances) following a referral to a scheme by a GP. This highlighted the attrition over the duration of the programme from initial induction. Fox et al. did however report concerns over the self-evaluation of schemes illustrating the lack of objective analysis, inconsistent monitoring, and poor evaluation techniques across schemes. This issue is supported by Morgan (2005) who suggested that adherence and activity reporting in UK schemes is a problem. The result of the lack of accuracy in reporting adherence for example is a notable design feature but one which varies considerably across schemes. For example Morgan's review highlighted a range of studies using participant's recall of exercise (e.g., Lamb et al. 2002), activity logs (e.g., Robertson, Gardner, Devlin, McGee & Campbell, 2001) or attendance at exercise sessions (e.g., Marcus & Stanton, 1993). Studies reporting a similar intervention to the current thesis (although with no reported application of treatment fidelity) such as Harland et al. (1999) found similar adherence issues with exercise uptake (41%) even though attendance at the initial MI session was high (82%).

It seems intuitively logical that GP's referring patients will result in adherence (or compliance) and low attrition to the 'prescription'. This does not appear to be the case with PARS however. Indeed, there is a fundamental flaw in the assumption cited by many PARS advocates that patients are motivated to exercise as a consequence of receiving advice from their GP and will initiate and maintain activity with minimal support (Elley et al., 2003; McKenna, Naylor, & McDowell, 1998). Evidence from Lawlor and Hanratty (2001) suggested that advice giving and education in routine primary care consultations may not be effective in leading to sustained physical activity behaviour which questions why, in a different setting, a different result may occur. McKay, MacDonald, Reed and Khan (2003) also suggested that if government targets for increased PA levels in the population are to be met then knowledge of the effectiveness of interventions aimed at improving PA need to be improved. This

includes greater awareness of the effectiveness of treatment pathways such as PARS rather than a mere assumption that GP or health professional advice, and a PA prescription or referral, is sufficient to encourage sustainable behaviour change. Evidence-based PARS proving effectiveness through economic, health and attendance markers is then urgently needed (Sorensen, Skovgaard & Puggaard, 2006).

Part of the challenge for achieving success in these schemes is having a coherent and effective referral pathway as well as referrers that are confident in the programme. Graham et al. (2005) describe health professionals as *'the primary gatekeeper"* (p.1412) for clients entering PARS and hence are pivotal in the scheme design. Graham et al. found however that a number of barriers exist for a GP or health professional referring patients to a PARS. This included a lack of knowledge of the benefits of the scheme, valuing smoking cessation as a priority over PA, time available to refer and a feeling that the patients will/do not take advice from them to attend the scheme. The latter (health professional) barrier to referring patients clearly contradicts with the perception that the GP is respected and their advice is generally taken (Elley et al., 2003). Results indicated a perception by GPs that patients would find smoking cessation easier than adopting PA because it was *"a simpler process and that patients would find it easier to use a patch than do something that takes more will power"* (Graham et al., 2005, p.1415).

The survey carried out by Graham et al. provided one of the first extensive reviews of GP perceptions of the referral process. It is surprising that this had not been done before since these health professionals are so pivotal to the scheme's success. Importantly the review also highlighted concerns over issues of medico-legal responsibility making more explicit anecdotal feedback from many schemes that GPs have concern over. It may then be this confidence (or indeed lack of confidence) in the referral officers or procedures that have been a natural barrier for GP's and health professionals referring their patients. To date only two studies (Gould, Thorogood, Illfe & Morris, 1995 and Smith, Gould, Tai & Illfe, 1996) have examined health professional's opinions and attitudes to PA in referral schemes, both of which preceded the NQAF (DoH, 2001a).

This does however ignore the problem of inappropriate uses of the scheme by the same health professionals. For example, it has been suggested that analyses of schemes that have occurred (e.g., Riddoch et al., 1998) have not considered sufficiently the processes involved. These processes include the characteristics of the patients referred (including those dropping out prior to the initial PARS session) and the nature of referrals which are often found to be inappropriate (Johnston et al., 2005). It is this lack of detail and communication between the referring GP and PARS lead officer that often undermines the quality of evidence and evaluation of PARS. Furthermore, there is limited knowledge on the effectiveness of different components within the referral processes which includes a lack of detail on levels of intensity and types of activities and attendance patterns (Sorensen et al., 2006).

It has been reported that different levels of activity intensity and patient contact exist between UK and non-UK schemes with the latter having increased contact and greater intensity (Morgan, 2005). Morgan reports that the UK PARS model closely reflects interventions used in primary care. Non-UK schemes have shown consistently better results although they often adopt a more intensive and increased client contact model which may not be feasible in the UK. There are however lessons to be learnt from facets of international schemes such as those in the US which emphasise home-based activities and a motivational aspect (e.g., Harland et al., 1999; Marcus & Stanton, 1993). Such schemes do not appear to have been replicated in the UK. In addition to the design and processes applied in non-UK models, the population from which referrals are drawn has also been cited as a key factor as to their lack of effectiveness as an inclusive PA intervention.

Citing the findings of Caroll, Ali and Azam (2002), Morgan (2005) reports that the majority of those attending PARS are often white and already active to some degree and that population groups such as Asian women are not provided appropriate opportunities or settings. The impact of this low recruitment is a reduction in cost effectiveness, a problem also highlighted by Gidlow et al. (2005) as being the result of very specific population groups attending PARS. These patients were typically middle-aged and older with two-thirds typically being females. Morgan (2005) stressed the need for a wider range of the population to be targeted for these schemes in order to better test their effectiveness for more than merely specific demographics.

A range of problems have been highlighted regarding the effectiveness of PARS in the UK and research evidence has certainly emphasised the equivocal nature of this evidence. Therefore, it appears clear that further improvements, clearer guidelines or a more rigorous application of the existing guidelines (e.g., the NQAF; NHS, 2001a) is required.

2.4.3 Recommendations for future developments of PARS

Having considered the equivocal findings from UK programmes, a number of reviews have provided implications for practice and recommendations. The following draws together some of these key points and provides a synopsis of issues for UK PARS. First, what appear clear are the inconsistent and inappropriate referrals of patients onto PARS (Johnston et al., 2005). It is clear that more systematic and effective (less opportunistic) referrals are required which select patients who are most likely to benefit (Graham et al., 2005). Second, closer links and more effective communication is required between referring health professionals and PA providers and officers (DoH, 2001a) with all parties understanding the aims, objectives and processes of the scheme (Taylor, 2003). Third, schemes that have been shown to be most successful have targeted 'almost-active' populations using existing infrastructure (Morgan, 2005). This should be maintained although a more thoughtful process should be undertaken to accommodate more varied population groups needing different exercise opportunities. Fourth, UK schemes (at a regional level) should be more actively encouraged to implement the NQAF guidelines through a steering group who will assess individual schemes and accredit them. This has been illustrated to work already in the UK (e.g., Somerset Physical Activity Group; SPAG, Crone et al., 2004). Fifth, it is clear that there is no 'one size fits all' for PARS in the UK with regards to staff, interventions and facilities therefore a range of strategies and interventions is clearly required (Harrison et al., 2005). This flexible and adaptive range of content and provision must however be accountable and provide clear opportunities for reliable and sustainable monitoring and evaluation. Finally, it is clear that an interdisciplinary model should be developed for UK PARS whereby the referral pathway is clearly defined and that more effective PA counselling content is provided (Tulloch et al., 2006). It has been shown that GP's and physicians rarely offer PA advice or prescriptions (Francis, 2000) and that the same group often lack

training and knowledge on behaviour change and PA counselling (Walsh, Swangard, Davis & McPhee, 1999). Therefore training for PARS officers in PA counselling and behaviour change may provide important skills that are currently lacking. The remainder of this chapter will examine this issue in more detail and offer a critical examination of current PA counselling guidelines and its delivery.

2.5 Physical activity counselling and motivation

As seen in the Chapter 1, rates of inactivity in adult and child populations have led to increased rates of hypokinetic disease and a pandemic of obesity and increased coronary heart disease (Blamey & Mutrie, 2004). However, there does appear to be an increasing conflict between individual's increased knowledge regarding the health implications of inactivity and poor diet with a an increasing reluctance to engage in health enhancing behaviours such as physical activity (PA). Indeed, the Secretary of State for Health (2004) suggested that while the majority of the UK population have the knowledge and intellect regarding healthy lifestyles and physical activity (PA), the population lack the motivation to do anything about it. Foster et al. (2005) reported that that "*it does appear that the majority of people hold very positive attitudes to physical activity..*" (p.23) but that "*there is evidence to support the idea that many people in the UK are in what might be termed 'chronic contemplation*" (p.23). At an individual level, the role of the health professional is to support, guide and facilitate the desired change having first explored the client's willingness, enthusiasm and ability to achieve this shift (Rollnick, Mason & Butler, 1999). More and more contemporary evidence is available to support the use of PA counselling in a variety of primary and secondary healthcare and community settings. Indeed, a recent systematic review has advocated that "*physical activity counselling becomes part of normal healthcare in the prevention, treatment and management of chronic diseases for all health professionals*" (Foster et al., 2005, p. 5)

The aim of this section is to question the current fidelity of PA counselling and consultation guidelines, by examining the HOW and WHAT of interventions rather than simply focussing on the outcomes of systematic reviews and meta-analyses. The section will move to critically examine the research evidence around the terms 'exercise' and 'physical activity' counselling and consultation, specifically focussing on the processes and content of the guidelines and the diverse use of terminology both

in research and applied settings. First, the section will examine current guidelines which have formed the basis for studies, then identify the current problems in physical activity counselling and consultation guidelines. These include misuse and confusion in terminology of counselling and consultation guidelines and the lack of distinction between the content of consultation interventions, and style of delivery of the intervention. Finally, recommendations for applied PA counselling and consultation will be provided for both practitioners and researchers.

2.5.1 Physical activity counselling: Contemporary issues

As evidenced in Study 1 (Chapter 4) many interventions have underpinned their PA counselling with frameworks such as Transtheoretical Model of Behaviour Change (TTM; Prochaska & Diclemente, 1983) and more specifically, Stages of Change (SoC; Prochaska & Marcus, 1994). However, a key issue in recent studies is the reported use of PA counselling with no theoretical framework or set of guidelines (e.g., de Blok et al., 2006; Melanson, Dell'Olio, Carpenter & Angelopoulos, 2004). While guidelines such as the 'A' factor approach (Pinto, Goldstein & Marcus, 1998) have been produced, UK interventions have commonly applied the exercise consultation guidelines of Loughlan and Mutrie (1995) with a varied application of theoretical underpinning models (e.g., Kirk, Mutrie & MacIntyre, 2004b). The term 'exercise consultation'[3], chosen by Loughlan and Mutrie, was reported as being purposeful because it described the "*distinguishing core element of giving advice*" (p.79) rather than the counselling process which Loughlan and Mutrie describe intimates establishing a long term relationship with the client and developing *participant* communication skills. Indeed their 1995 paper reports the conscious decision to avoid a 'patient orientated' style which the authors suggest being typical within a counselling, rather than consultation, approach to the relationship. These guidelines report that "*consultation on the other hand implies a more basic problem, e.g., fitting exercise into an already busy schedule or understanding the amount of exercise that is needed.*" (p.80) which undermines the wealth of stated evidence suggesting the need for a greater appreciation of barriers and motivational issues (e.g., Secretary of State for Health, 2004; Hillsdon, Thorogood, White & Foster, 2002; Lowther et al., 2002). This process has been found to take time, skill and ongoing

[3] The term 'exercise' has been superseded by the term 'physical activity' encompassing the shift in perspective to a broader acceptance of lifestyle activity for health (Fox, 2001).

support which may help to explain why many exercise referral schemes have suffered high attrition rates so far (see Chapter 2). The guidelines offered by Loughlan and Mutrie, and reaffirmed by Lowther et al., (2002), were based on the early work of Long and Haney (1986), Harris et al. (1989) and King et al. (1992). They described the need for standardised counselling protocols in physical activity and exercise settings although it took Loughlan and Mutrie to consolidate these facets into a set of guidelines.

However, while the terminology has shifted perspective and evolved, the underpinning guidelines have been slow to do so. Indeed a number of problems exist with the guidelines which include a lack of clarification of terminology used, a lack of distinction between different behaviour change interventions and a lack of detail in the nature of the interventions themselves. For Example studies such as Kirk et al. (2001) and Kirk, MacIntyre, Mutrie and Fisher (2003) based the exercise intervention on the original Loughlan and Mutrie (1995) guidelines. However, they reported an outline rather than a detailed synoptic of the *content* and *style* of the consultation. This has meant that the replication of this and similar designs (to assess the efficacy of the intervention in other similar settings) is difficult to do achieve due to the lack of a detailed protocol regarding the intervention.

The accurate recall of PA counselling by both patient and primary care physician (and cross referenced against audio tape of actual didactic) has shown that the primary care setting can provide an encouraging setting for a patient to receive this form of intervention (Sciamanna, Goldstein, Marcus, Lawrence & Pinto, 2004). However, one concern is not necessarily the consistency of recall but the style and content of the counselling. Studies have shown that immediate recall of the content from a primary care health message delivered during a consultation is poor for primary care patients (Pbert et al., 1999; Ward & Sanson-Fisher, 1996). The interpretive analysis using the Patient Activity Exit Interview, (PAEI) adapted by Sciamanna et al. as a patient and physician adapted version, lacked description as to why recall by either patients or physician recall was poor therefore not providing recommendations for content and style of delivery in a primary care setting. Similar follow-up analyses by Bull, Jamrozik and Blanksby (1999) found recall to not be significantly different (but still fairly high) between patients receiving tailored advice

against those receiving standardised exercise materials. This indicated that content may not the compounding factor. Without doubt, the *content* of the message provided between the health professional and patient is important, however, the *style* of the delivery is key to the prolonged involvement of the client in the behaviour change process (Rollnick et al., 1999). The style of the delivery will be considered in more detail in Chapter 3. It is important to explore what the content and guidelines recommend. It may be that researchers have not given due consideration to the time allowed and the mere context within which these exercise consultation guidelines are being applied. The guidelines must accommodate the fact that in excess of 70% of health and PA consultations will take place during a counselling session lasting less than five minutes (Long et al., 1996).

As highlighted already, guidelines for what an exercise consultation should include were suggested by Loughlan and Mutrie (1995). These exercise consultation guidelines included a) a discussion of *current and past activity*, b) explore client's *decisional balance* on change, c) examine with the client their perceived *barriers to change,* d) discuss the client's perceived *social support available*, and, e) work with the client to formulate *client* goals. The approach provided by Loughlan and Mutrie still remains today one of the few outlines of what an exercise or PA counselling session should include from a *process* perspective. There are many others that provide a *content* based set of guidelines (e.g., Lin, Hyman & Larson, 2005; McKenna & Vernon, 2004; Bull et al., 1999). However, few of these studies report sufficient detail to enable a health professional to elucidate information on the content or style of PA counselling

One of the few contemporary studies that do begin to explore the *style* of delivery rather than merely the content is that of Hillsdon et al. (2002). This study examined the effect of the style of the intervention by allocating patients to either brief negotiation (BN) "*characterized by absence of advice about the need to increase physical activity*" (p. 809) or direct advice (DA) interventions. Direct advice is described as "'*usual care' in primary care*" (p.809). The BN group were counselled using a menu of six strategies which are reported as being suitable for a variety of clients in a variety of states of readiness, not just relying on those who are in a position (emotionally, or physically) to change. The delivery style for the six

strategies was described as being based on Motivational Interviewing (Miller & Rollnick, 1991). The central purpose of this technique is described by the authors to examine and resolve ambivalence and this particular application of the principles were further modified along the lines of a 'time limited' approach developed for medical settings by Rollnick, Heather and Bell (1992). No additional detail was provided by the authors as to the six strategies applied within the intervention. However, cross referencing to the work of Miller and Rollnick (1991; 2002), upon which these strategies were based (see Section 3.1), reveals the underpinning principles. The recommendations reported by Hillsdon et al. include;

1. Feedback about current physical activity versus recommendations
2. Assessment of motivation and confidence for increasing physical activity
3. Weighing up the pros and cons of increased physical activity.
4. Information exchange
5. Helping with decision making.

While the strategies outlined above do not appear particularly different to those proposed, nearly a decade earlier, by Loughlan and Mutrie, the difference is perhaps fairly subtle. The underpinning skills used to facilitate this didactic or exchange between the counsellor and patient have been added to these strategies and recommendations (something that was missing in the Loughlan & Mutrie version). The 30-minute BN consultation designed by Hillsdon et al. (based on a brief negotiation programme formulated by Rollnick et al., 1992) was available during the time of the original Loughlan and Mutrie guidelines. It is perhaps indicative of the modern trend to envelop lessons and strategies from a wider health psychology perspective. It is also interesting to note that Biddle and Mutrie (2001) suggest that a more person-centred approach has become popular in 'exercise' consultations citing the early work of Loughlan and Mutrie (1995) as an example of where this exists. Yet, while MI (Miller & Rollnick, 1991) is cited it does not appear in the Loughlan and Mutrie paper.

2.5.2 Current problems in exercise and physical activity counselling

Two key issues appear to exist. First, that exercise consultation guidelines need to be systematic and consistent within a clear and rational protocol. This is an

issue which has not been sufficiently analysed and reported since the work of Loughlan and Mutrie (1995). The role of these updated guidelines would be to help the patient or client identify their own perceived motives and barriers for change in an effective and respectful (patient-centred) manner. The opposite is imposing an educational or medical (expert-driven) approach. Second, the type of message that can be realistically provided by a health care professional (e.g., GP or Practice Nurse) during an exercise or health consultation needs to be identified. While research such as Lin et al. (2005) has explored rates of specific health counselling provided in primary care settings, and the impact it has, very few have examined the content and quality of the intervention. Indeed, this underpins a concern that a lack of formal training in the area of PA counselling is causing less than half of physicians to use the access opportunities they have to encourage this health behaviour change (Nawaz, Adams & Katz, 2000). This raises the question as to whether it is reasonable to expect a primary care consultant, physician or GP to acquire micro communication and communication skills in a time-restrained consultation.

Taylor (1999) suggests that in either research or applied settings "*it is not easy to differentiate between what is simply advice giving and what constitutes counselling*" (p.51). Taylor goes on to differentiate between the two in the context of PA although describes the two to perhaps be differentiated within the practitioner-patient relationship. This relationship may be formed through either an authoritarian (advice giving) style, or a client centred (counselling) approach based on a mutual alliance. It must also appreciate the difference between process and content. The latter has been the traditional focus of many consultations in exercise and health settings focussing on what the PA message should be rather than giving appropriate consideration of the process of how to deliver that message.

2.5.2.1 Misuse and confusion of terminology

There are two clear issues which will be presented here which is paradoxical since both relate to lack of clarity and confusing terminology. The first issue is one which has already emerged in Section 2.5. relating to the terms 'exercise' versus 'physical activity'. Fox (2001) reported a shift from formal, structured exercise to physical activity for health behaviour change. However, the empirical research has been slow to clearly distinguish between the two either descriptively, or indeed,

conceptually. The interchangeable terms of 'exercise' and 'physical activity' infer a different approach as suggested at the outset in this section. Again, misleading descriptions occur in research such as Melanson et al. (2004) who stated the hypothesis as being;

> "*the group receiving counseling on diet and exercise would show greater improvements in outcome variables than would the group receiving counseling on physical activity alone*" (p.850).

This illustrates the common problem of interchangeable and inconsistent terminology of 'exercise' and 'physical activity', two different terms describing the same intervention in the same sentence and assuming the two to be the same. The second concern regarding the misuse of terminology is that of the 'counselling' versus 'consultation' intervention. There are variations in terminology within the PA counselling topic which causes confusion since many of the underlying facets of the intervention are similar. The variety of terms used to describe the health professional-client interaction in this context includes 'exercise consultations' (Loughlan & Mutrie, 1995), 'exercise counselling' (Sciamanna et al., 2004), 'physical activity promotion' (McKenna & Vernon, 2004) and 'tailored exercise advice' (Bull et al., 1999). While the terms 'exercise counselling' (Sciamanna et al., 2004) and 'exercise guidelines' (Kirk et al., 2003) have been utilised in a variety of studies and settings (e.g., G.P surgeries, hospital and community exercise referral programmes), there is often little or no distinction made between the content of either term. Indeed, as has been seen in some empirical research (e.g., Kirk et al., 2003), different terms are used interchangeably with little reference to a norm or attempt to clarify the content of processes involved. One of the few papers that have provided a definition of the encounter is provided by Kennedy and Meeuwisse (2003) where "*exercise was considered to be continuous physical activity.*" (p.227). The authors definition provided, for family physicians in Canada, of "exercise counselling" was an encounter where:

- a physical activity history (and medical history if unknown) is taken from the patient,
- a physical exam and/or fitness testing is done if necessary, and
- exercise prescription is given to the patient.

This overview does begin to define the outline of the process of the exercise counselling intervention. However, it is too simplistic, open to interpretation and criticism, and lacks sufficient detail on content or style of delivery. Another key issue being is the fact that the final two sub-categories of the 'exercise counselling' have little to do with 'counselling' of any form, since those two facets consist of physical examinations and exercise programme prescription. While the intervention was based on ACSM (1990) exercise guidelines it offers little, if any, expansion to the Loughlan and Mutrie (1995) guidelines cited earlier and indeed, is far more superficial.

Kirk et al. (2003) described an increase in physical activity and improved glycemic control and cardiovascular risk factors in people with type 2 diabetes following 'exercise consultations'. The intervention terminology used throughout this particular paper included the terms 'PA guidelines', 'PA counselling', 'PA recommendations', 'exercise guidelines', 'exercise consultation', 'exercise information' and 'counselling intervention' all on the first page. This begins to outline the multitude of descriptors that are applied across health, exercise, physical activity and rehabilitation settings and which have lead to confusion over the real or perceived differences between counselling or consultation interventions. It would therefore be useful to examine systematically the terms 'consultations' and 'counselling' in a related health behaviour change and, where possible, specific PA context. The multifaceted description of the 'exercise counselling' creates a lack of coherence although the underpinning content no doubt provides a potentially effective adjunct to existing physical therapy.

Bull et al. (1999) applied the term 'tailored advice' when providing an exercise programme and identified three issues for the fitness professional to address within the verbal advice giving. These three issues were; "(1) *identify the importance and relevance to each patient of increasing physical activity*, (2) *explain the recommendations for moderate intensity exercise, and* (3) *address any concerns about injuries (current or potential)"* (p.231). A generic set of terms applied here to those cited throughout this section. But again, a different term used to describe the intervention. Lowther et al., (2002) suggested that 'physical activity recommendations offer "*a promising strategy for attracting sedentary people to increase physical activity*" (p. 1186). Overall, while little foci have been afforded, to the clarity of the

terms used, there seems little doubt that the PA consultation has also been neglected within primary and secondary care client contact points. A key recommendation then for PA counselling is clarity of terms for applied settings.

2.5.2.2 Health professional's confidence in applying PA consultations

Studies 2 to 4 emphasised the need for competence testing of those delivering the PA counselling intervention. This seems wholly reasonable on reflection of current empirical evidence. It seems clear that a lack of experience or ability by the health professional, in counselling clients and supporting the health behaviour change process, undermines their confidence and therefore inclination to do so. Consultations about behaviour change can be seen as being of wider scope than more specific PA counselling and are fairly widespread in healthcare settings (primary, secondary and tertiary care). They embrace both the management and prevention of a wide range of conditions (Lane et al., 2005). It is clear however that consultations about behaviour change present numerous challenges to practitioners and patients alike (Rollnick et al., 1999). The key skill (for practitioners) within these consultations is to be able to motivate patients, and to encourage them to be more active in the change process (Lane et al., 2005). It is important to be able to work with patients to overcome such motivational barriers as primary care settings offer contact with a high proportion of the population each year and therefore provide an opportunity for effective holistic promotions of PA in primary-care (Taylor, 2003; Biddle & Mutrie, 2001). Long et al. (1996) report that several barriers have been repeatedly documented with regards to health professional's delivery of a PA message. These barriers include a lack of time, a lack of reimbursement and a lack of a standard protocol. Historically, it has been suggested (Gemson & Elinson, 1986; Orleans, George, Houpt, & Brodie, 1985) that the lack of a standard protocol does inhibit an effective PA counselling approach; however, where a protocol has been introduced health professionals have embraced the approach (Bostick, Luepker, Kofron & Pirie, 1991). It is also apparent that a large numbers of GP's and physicians are not interested in the communication and counselling technique and feel more comfortable in a directive 'medical' style of intervention. Results from studies such as Calfas et al. (1996) have supported this notion by selecting "*only those that were interested*" (p.266) in providing counselling in physical activity. This bias may justify the equivocal results found across numerous empirical studies which have used this primary care group to deliver the intervention.

It may not be as simple as lack of remuneration or time however. Indeed, a lack of confidence from the health professional has also been suggested as precipitating the slow uptake of behaviour change counselling (Dunn & Rollnick, 2003). Dunn and Rollnick also suggest that aversion plays a significant part whereby "*many [practitioners] have tried it but stopped after suffering unpleasant encounters that damaged rapport with patients*" (p.16). Although few studies have assessed physician ratings of confidence and knowledge in exercise counselling (Kennedy & Meeuwisse, 2003), results have often indicated at best only two thirds of physicians felt confident in their exercise counselling advice (Petrella &Wight, 2000). Reed, Jensen and Gorenflo (1991) reported that only 27% of primary care physicians felt very knowledgeable in exercise counselling. In common with the findings of Orleans et al. (1985) and Gemson and Elinson, (1986), Kennedy and Meeuwisse (2003) highlight the most common factors influencing physician perceptions of their ability to provide exercise counselling to be lack of time, lack of continuing education (in the subject area), and inadequate remuneration to provide this adjunct therapy.

While it has been reported that continuing education and training may provide reduced reluctance of GPs to engage in the PA counselling process, it has also been reported that an exercise or health professional must be helped to find constructive ways through these consultations. This 'guidance' and 'scaffolding' (Rollnick et al., 1999) and formal framework have led to the application of the 'Stages of Change' in many settings (Prochaska & Marcus, 1994). However, this appears to be due to a void in alternative approaches rather than the positive conceptual and applied facets of the model. Physical activity interventions in general practice, whilst numerous in extent, have shown varied, and occasionally disappointing outcomes (Kreuter, Chheda & Bull, 2000; Nawaz et al., 2000; Harland et al., 1999). There is still a tendency to use an educational approach perhaps due to lack of time available for client-health professional interactions, other priorities in the health consultancy, lack of information or expertise regarding PA or a combination of these.

2.5.2.3 The lack of distinction between behaviour change interventions

While 'exercise consultations' have been delivered as interventions (such as that of Kirk et al., 2003) by trained research assistants, little detail is provided as to

the type, duration, or fidelity measures of the training. This creates uncertainty over the repeatability of the intervention, its consistency between deliverers and sites. It is such uncertainty that has lead authors such as Eden, Orleans, Mulrow, Pender and Teutsch (2002) to report that there is currently insufficient evidence to recommend PA counselling to patients by physicians in primary care settings. A key issue however is the lack of follow up studies beyond 1 year and therefore adoption and maintenance of patient behaviour change in PA are short term only. Hughes, et al. (2002) contradict this viewpoint however and suggest there to be growing evidence from randomised-controlled trials supporting the effectiveness of exercise consultations in increasing adherence to physical activity. A potential justification for these equivocal findings may come from Kennedy and Meeuwisse (2003) who suggest that there is no standardisation regarding measurement of exercise outcomes, exercise counselling content, exercise counselling techniques, and patient psychological readiness. This provides a strong indication that methodological and recording inconsistencies are occurring to the detriment of coherent and well-designed PA counselling interventions. The issue of terminology has already been addressed and a subsequence of the confusing terminology is often the lack of detail with regards to the intervention. While the studies of Kirk et al. (2001 and 2003) have based the 'exercise counselling' on the guidelines of Loughlan and Mutrie (1995), other research (e.g., Bull et al., 1999) has not provided detail on the basis for the verbal intervention even though common elements exist in both. While the ACSM (1990 & 1991) guidelines have formed the basis for the exercise prescription by a number of RCT's (Bull et al., 1999; Melanson et al., 2004; Long et al., 1996) very few have provided a conceptual or underpinning theoretical framework for the PA and exercise counselling intervention.

One key distinction, when reported, between interventions has been that of the frequency and duration of the counselling, brief advice or consultation. Bull et al. (1999) reported two to three minutes of verbal tailored advice as compared to 30 minutes provided by Kirk et al. (2003). In other studies 20 minutes was provided for consultation as part of a 50 minute exercise prescription (Daley, Mutrie, Crank, Copeland and Saxton, 2004) while research such as Melanson et al. (2004) provided weekly counselling (albeit by an exercise physiologist and dietician). Melanson and colleagues design differed from others discussed previously in that one group

received counselling on exercise and diet whilst a second group received counselling on physical activity alone. This inconsistent 'dosage' could be a compounding factor in the effectiveness of the intervention and is often overlooked in many empirical studies, not least lacking detail and justification for the amount or duration of the intervention. Melanson et al. also detail the content of the dietary advice with the exercise counselling content again lacking to the point that replication of the type and frequency of the PA counselling would not be possible. This inconsistent and often scant detail of the PA counselling intervention will be explored further in the next subsection.

2.5.2.4 The theoretical and conceptual underpinning of PA counselling

This section critically examines the limited detail provided in empirical and review-based studies with regards to the theoretical underpinning of PA counselling. Many UK based studies such as Kirk et al. (2003; 2004a) and Hughes et al. (2002) have reported interventions as one-on-one discussions carried out using exercise guidelines based on those proposed by Loughlan and Mutrie (1995). Research such as Kirk et al. also reported that "*exercise consultation is based on the transtheoretical model*" [Marcus & Simkin, 1994] (p.878) making little differentiation between 'exercise guidelines' and 'exercise consultation'. The stage-matched approach used in these studies does provide some structure and a conceptual framework where many lack even this level of detail in the reported protocol (e.g., Melanson et al., 2004). The Transtheoretical model includes three mediators of change which include self-efficacy, decisional balance, and processes of change which are commensurate facets to the Loughlan and Mutrie guidelines. This appears to explain the use of the two approaches together. While studies such as these do provide a greater level of awareness of the client's current 'stage' they neglect to inform the readership how the PA professional was able to develop a 'stage-matched' communication intervention. Further evidence of this can be seen in a cancer rehabilitation study (Daley et al., 2004) whereby a stage-matched approach was used but again limited descriptions provided as to the counselling content (other than it being a 20 minute exercise counselling session based on TTM) or the style of delivery. Where studies such as these have been effective, it is frustrating that little or no detail is provided for researchers to test the efficacy of the exercise or PA counselling in a variety of similar settings. Moreover, a lack of detail as to the training (and subsequent ability) of those

delivering the intervention is apparent for numerous studies cited within this chapter which challenges the level of consistency, repeatability and reliability achieved within the intervention.

A limited number of recent articles have begun to explore the importance of a process and style as much as the content of the PA counselling intervention including McKenna and Vernon (2004) and Hillsdon et al. (2002). Prior to this, very few exercise counselling or consultation articles initiated training or analysis of the process orientation of the client-health professional interaction. Studies that neglected the process-orientation element of the interaction included for example Hughes et al. (2002), Kirk et al. (2003) and Kirk et al. (2001). Key findings from Hillsdon and colleagues have shown that those patients that operationalise choice by seeking advice from a health professional find more benefits from brief negotiation than a style of convincing or coercing.

2.6 Delivering an effective PA counselling intervention

Having examined the dominant issues of PA counselling, the following section will identify principles for effective interventions. Woolfe, Dryden and Strawbridge (2003) suggest that counselling psychology should emphasise the value basis of practice, the empathetic engagement with the world of the client, and that the client's subjective world is meaningful and valid in its own terms. This supports the viewpoint that an effective counselling strategy (in any setting) must be based around the perceptions, thoughts and feelings of the client with little or no imposed values from the counsellor. The result of this approach is the development of a therapeutic alliance and a more effective style of interaction. It is the development of this partnership between the client and counsellor that appears to over-ride many other more technical aspects of communication. However, in addition to a greater appreciation of the *style* of the counselling intervention, there is an increasing emergence of support for the appreciation of both a cognitive and somatic element to PA in the early stages (Lavallee, Kremer, Moran & Williams, 2004). The challenge however appears to be how best to develop an efficacious relationship between client and counsellor that encourages the likelihood of a client adopting, and maintaining behaviour change. Indeed, encouraging client commitment to practice behaviour

leading to a favourable outcome is a goal of many therapeutic approaches (Mahrer, Gagnon, Fairweather, Boulet, & Herring, 1994).

The initiation of PA programmes, or indeed, 'structured exercise' is a challenge for PA co-ordinators and prescribers. Moreover, there is an increasing awareness of the need to accommodate, at initial induction, some form of motivational session to assist the client in identifying, and analysing PA motives and perhaps more significantly barriers to change. This 'client-centeredness', as opposed to 'expert-direction', is fundamental to a fairly recent shift toward appreciating the need to have the client take responsibility and to 'engage' with the process of behaviour change. The traditional techniques have attempted to 'convince' clients of the benefits of PA without truly considering the potential roadblocks, be they financial, logistical, physical or emotional. This may have been as a result of lack of time, experience or client knowledge on the part of the PA prescriber (as highlighted in Section 2.5.2.2).

There is a need for a client-centred, empathetic and reflective approach to PA communication be they described as 'counselling' or 'consultations' the underlying principles are homogeneous. This demand follows closely the principles provided by Motivational Interviewing (Miller & Rollnick, 2002) which is considered in detail in Chapter 3. This approach may be an appropriate vehicle for demonstrating client centeredness in a behavioural context. It offers greater detail than simply outlining *what* an exercise counselling or consultation should involve providing far greater detail as to *how* it may be carried out and by outlining key skills such as reflective listening, exploring ambivalence and dealing with resistance. The move toward a client-centred approach demands greater consideration of the style of the delivery as much as the content. This may involve key skills such as identifying, eliciting and strengthening change and more specifically 'commitment language' (Amrhein, Miller, Yahne, Palmer & Fulcher, 2003). More recent advances in the field of psycholinguistics and client commitment language (Amrhein et al., 2003) has seen a more detailed analysis of the style of the consultation toward facilitating commitment language. The role that commitment plays to PA, and the subsequent determinants of the exercise behaviour, requires greater consideration (Biddle, Fox & Boutcher, 2000). It is logical to suggest that an important starting point is an evaluation of the commitment language used by the client as a predictor of behavioural change. It has

been found that an effective method to promote client verbal commitment to change involved the therapist's exploration of the client's readiness and willingness (Stage 1, Phase 3) to carry out the post-session behaviour (Amrhein et al., 2003). It would appear logical then to suggest this as an integral aspect of creating change talk and commitment from the client (see Chapter 3).

While there is a lack of consistent empirical evidence with regards to the concept of client-centeredness and its association with improved outcomes it is increasingly regarded as a proxy for high quality interpersonal care (Mead & Bower, 2000). This may be due to a lack of consistency since patient centeredness has been defined as 'a professional attitude' (Grol, de Maeseneer, Whitfield & Mokkink, 1990), 'a set of knowledge' (Lipkin, Quill & Napodano, 1984) and in terms of 'consultation behaviours' (Stewart, 1984).

2.6.1 A PA counselling framework

It may be effective to consider a model, developed from health behaviour change (and based on Motivational Interviewing, Miller & Rollnick, 2002), within which the PA consultation guidelines cited throughout this chapter (Loughlan & Mutrie, 1995) can be integrated. While these guidelines are content or outcome focussed, they have provided one of the very few frameworks within which many empirical studies have examined the potential efficacy of PA and exercise counselling. This can be seen by the plethora of empirical studies that have integrated their principles together with those of the transtheoretical model (Marcus & Simkin, 1994). Another concern within the interventions utilising a stage-matched approach is the brevity of detail as to whether or not the interventions was indeed client-centred, stage-matched and the accuracy of this measurement. It can be suggested that by virtue of the client approaching the research study or RCT, they cannot be deemed a pre-contemplator. Rollnick et al. (1999) suggest a number of key tasks in consultations about behaviour change (Figure 2.1) which may help to combat these omissions.

This framework integrates a client-centred approach with communication skills such as reflective listening, expressing empathy, exploring ambivalence, rolling with resistance (Miller & Rollnick, 1991). While this framework complements the

guidelines produced by Loughlan and Mutrie, the key skills of how to elicit this information from the client require further description.

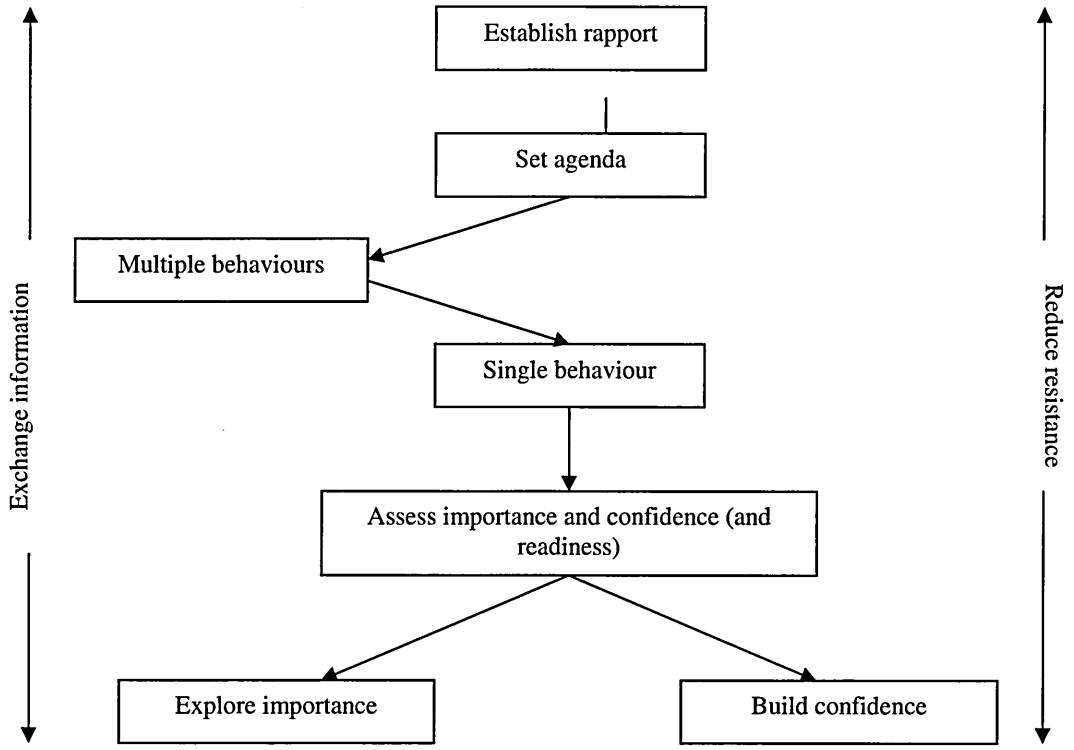

Figure 2.1 Key tasks in consultations about behaviour change (Taken from Rollnick, et al., 1999, p.12).

For example the exchange of information can be omni-directional (expert led) or bi-directional (a partnership) and the agenda setting should be set by both parties if the client is to feel empowered and part of the change process (Miller & Rollnick, 2002). The detailed description and analysis of the key skills of Motivational Interviewing are considered in detail in Chapter 3 while studies 1-4 will examine the efficacy of such interventions as well as the training effects of MI to PA professionals. Chapter 3 also provides examples for practitioners of common mistakes and traps to avoid in behaviour change counselling and the chapter as a whole provides a critical review of MI and its potential as a therapeutic intervention in PA settings.

2.6.2 Treatment fidelity and the Behaviour Change Consortium (BCC) framework

Studies such as Bull et al. (1999) and Hughes et al. (2002) employed a PA counselling component without reporting whether a test of competence of the therapist or PA professional delivering the intervention was applied. Indeed, this

approach is further investigated in Chapter 4 (Study 1) within a systematic review of PA counselling studies against which a treatment fidelity framework is applied. Bellg et al. (2004) report the need for methodological procedures that preserve internal and external validity of studies. In order to address the issue of treatment fidelity for behaviour change settings, a consortium of health behaviour change studies was gathered in the US under the auspices of the National Institute of Health Behaviour Change Consortium (BCC). The BCC developed a tailored Treatment Fidelity Workgroup whose primary objective was to identify treatment fidelity concepts and strategies in health behaviour change research. This resulted in an examination of BCC strategies and techniques and subsequently enabled the BCC group to table recommendations and guidelines for incorporating fidelity measures into practice more consistently. In this context the concept of fidelity testing is based on the early work of Moncher and Prinz (1991) who added *treatment differentiation* (whether treatment conditions differed between one another intentionally) to the existing term of *treatment integrity* (whether the treatment was delivered as intended). Bellg et al (2004), citing the subsequent work of Lichstein, Riedel and Grieve (1994), argued for the addition of two additional processes, these being *treatment receipt* and *treatment enactment.*

Following these additions, and further development, the BCC group recommended five areas for implementing fidelity treatment measures in behavioural trials . The five components are summarised as a need to encourage fidelity at the design, training, delivery, receipt and enactment stages (Bellg et al., 2005). An application of this to PA setting is considered within the strategies for achieving each criterion and the following are based on the original BCC recommendations (Bellg et al., 2004);

a) *at study design stage*; i) Ensure same treatment dose within conditions
ii) Ensure equivalent dose across conditions
iii) Plan for implementation setbacks

b) *for provider training*; i) Standardise training
ii) Ensure provider skill acquisition
iii) Minimise "drift" in provider skills
iv) Accommodate provider differences

c) *at point of treatment delivery;* i) Control for provider differences
ii) Reduce differences within treatment
iii) Ensure adherence to treatment protocol
iv) Minimise contamination between conditions

d) *at receipt of treatment;* i) Ensure participant comprehension
ii) Ensure participant ability to use cognitive skills
iii) Ensure participant ability to perform behavioural skills

e) *enactment of treatment skills;* i) Ensure participant use of cognitive skills
ii) Ensure participant use of behavioural skills

For more detail and full explanations on each fidelity goal, description and strategy the reader is referred to Bellg et al. (2004). A summary of each stage of the treatment fidelity framework applied in a PA setting is provided in Table 2.1.

Table 2.1 Treatment fidelity components and exercise counselling applications

Component of treatment fidelity	*Definition and description*	*Application to an exercise counselling intervention*
Design	Treatment fidelity applied at the design stage to ensure that the intervention can adequately test the proposed hypotheses. This in relation to underlying theory and clinical processes.	Intervention consistent with behaviour change theory such as stages of change, self-determination or social learning theory. Clear exercise counselling protocol developed.
Training	To ensure that those delivering the intervention have been satisfactorily trained, assessment is carried out of their skills and competencies in relation to the study.	A combination of supervised role-playing, clinical supervision and reviews of audiotapes applied as an adjunct to a training manual.
Delivery	Treatment fidelity processes are applied to monitor that the intervention is delivered in line with the proposed design.	Exercise counselling interventions audio taped and reviewed using a behavioural checklist based on the study protocol. Correction of observed intervention deviations.
Receipt	The focus is toward the recipient of the intervention. The fidelity facet here aims to ensure that the intervention or treatment received is understood by the individual and that they can apply the intervention at a cognitive and behavioural level.	Evaluation of the effects of the exercise counselling intervention using post-session questionnaires (cognitive) and checklist of participant strategies employed (behavioural).
Enactment	An analysis is taken of the application of the treatment by the individual. This monitoring ensures that behavioural and cognitive strategies are applied in real-life settings.	Completion of intervention strategy goals specific to the study outcomes. Clients encouraged to record accurately completed and missed sessions and to report occurrences of relapse.

While the five strategies appear exhaustive and potentially restrictive (Leventhal & Friedman, 2004) the BCC approach is based on validity and reliability checks from other counselling settings and offer a framework which has never been seen in PA counselling, Considering the unequivocal need to enhance reliability and validity of intervention design and delivery, it is seen as essential that a framework is applied be it in a community or RCT setting. The need for treatment fidelity has been

clearly identified and guidelines produced. It is important to examine the potential efficacy of health behaviour change fidelity measures in order to ensure reliable, valid and robust interventions based on sound theoretical and scientific principles. Only by developing more powerful, scientifically-based, behaviour change strategies will increased success be achieved (Orleans et al., 1985). Intervention fidelity testing is therefore a key methodological requirement for research into PA behaviour change counselling. Treatment fidelity increases external validity (its application and relevance to other settings) and results from the application of strategies to monitor and enhance the reliability and validity of behavioural interventions in clinical and research settings. It provides a systematic process for the intervention design and when applied correctly, should ensure consistent and reliable results (Resnick et al., 2005).

Treatment fidelity therefore plays a central role in ensuring that an intervention has been accurately evaluated. A recent synopsis of research projects into behaviour change fidelity has suggested that treatment fidelity requirements are only met if: a) the treatment provided was given consistently to all participants randomised to treatment, b) there was no evidence of non-treatment-related effects, and c) the intervention was true to the goals and theory underpinning the research (Bellg et al., 2004).

2.7 Discussion

It is clear from evidence available on PARS that adherence is a key issue. Of concern are not just this poor uptake but the tools and techniques available for measuring uptake and the subsequent uncertainty as to the accuracy of, predominantly self-report, attendance figures. It is the bias from PA measures that Morgan (2005) reports to be "*one of the greatest weaknesses of most of the studies and the principal reason for low quality grading*" (p.368). The chapter has raised concerns over the quality of PARS as a process and intervention regimen. However, of even more concern is the individual PA professional and their competence in delivering the PA counselling component. This has ramifications for the appropriateness of the interaction. Perhaps just as important as the content and style of the intervention is the application of a consistent protocol. Without doubt, in-service training of GP's in the US and UK has shown that a systematic patient-centred protocol for PA promotion is

efficacious (McKenna & Vernon, 2004). This is certainly true when compared to loose guidelines or recommendations that are not underpinned with provision or training into the *how* and *what* to deliver. According to Long et al. (1996) "*protocols for physical activity counselling may remove some of the ambiguities inherent in counselling for changes in [PA] behaviour.*"

Pinto et al. (1998) suggested that physician and health professional training in PA counselling is essential. This is mainly due to the high volume of patients they regularly see although research into the content and effects of training is yet to be determined. This view was supported by Rosal et al. (2001) who strongly suggested increasing the volume of formal training for health professionals in counselling and communication. This issue is not lost in the current thesis and forms one of its aims. Loughlan and Mutrie (1995) provided early frameworks and content for exercise and health professionals and outlined the benefits of a systematic and structured set of contents for the consultation. However, the applied field has been slow to expand on these early guidelines leading to protocols which still lack methodological consistency and empirical rigour. There is certainly value in the Loughlan and Mutrie guidelines (who also described a client-centred counselling approach). When considering research such as Melanson et al. (2004) and Bull et al. (1999) they lack a detailed protocol applied using the PA consultation. Many studies applying the Loughlan and Mutrie guidelines (Hughes et al., 2002; Kirk et al., 2004b, 2003, 2001) have also applied a stage matched approach based on the 'stages of change' and the 'transtheoretical model' . While this provides a theoretically grounded approach it provides little detail as to how to interact with the client, elicit their perceptions of the need and desire for change and how to deal with more subtle issues such as client ambivalence and resistance. Disappointing then that the original 1995 guidelines have been cherry picked and one of the most important elements which are the interaction style and client-centeredness has been diluted and removed altogether. A greater awareness then of the *style* of the interaction, and the relationship between the PA specialist and client, may facilitate greater self awareness and change talk from the client and provide a more appropriate, client-centred, PA consultation.

As shown within the treatment fidelity framework (Bellg et al., 2004), health psychology has begun to conceptualise quality control at all stages of the intervention

when working with clients. Similarly, sport psychology has begun to critically examine the philosophy of service delivery that underpins the practitioner-athlete interaction (Poczwardowski, Sherman & Revizza, 2004). The consulting process has been examined by Hill (2001) who reflected on the impact theories such as psychodynamic, behavioural, cognitive and humanistic have had on sport psychology consultations. This approach is needed urgently in physical activity settings along with the introduction of frameworks such as the BCC treatment fidelity version. Until such frameworks, and tests of interventionist competence, are being applied it will remain impossible to have confidence in the integrity and reliability of the counselling intervention being delivered.

CHAPTER 3: Motivational Interviewing and physical activity

3.1 Introduction

Chapters 1 and 2 examined the PA context, and previous PA counselling attempts in clinical and community settings. This chapter aims to describe and critically examine a method and style of counselling which has a sound empirical base (albeit dominated by its application to addictions settings). The chapter will therefore describe the theory of motivational interviewing (MI) and brief negotiation (Miller & Rollnick, 2002; Miller, 1983) and its application as a counselling tool and intervention for PA specifically and health promotion more generally.

One of the challenges to physical activity referral schemes (PARS) is the client or patient adherence to the prescribed behaviour change in order to "*maximise the likelihood of long-term participation in physical activity*" (Department of Health (2001a, p.vii). However, intervention strategies have yet to clearly identify the underlying factors which promote adherence to prescribed exercise and longer term-[PA] behaviour change (Harrison, et al., 2005). As highlighted in the previous chapters it has become increasingly apparent that there is a need for a method of PA counselling, at the initial consultation and beyond, that would begin to address the high attrition rates that many programmes were, and are still suffering. As outlined in Chapter 2, PARS schemes do not appear to embed monitoring and evaluation of behaviour and cognitive components. The schemes often focus solely on client physical changes (e.g., body fat %, weight, BP, HR and VO^2 Max) over the duration of the programme.

However, a shift in perspective away from a directive and educational model of PA programming has resulted in an increased need for PA behaviour change counselling skills. This shift has increased the awareness of the importance to be able to train PA and allied health professionals the fundamentals of PA counselling and communication (see Chapter 2). Only once this has occurred will these specialists and health professionals be more able to facilitate client adherence and to begin to demonstrate the complex determinants of behaviour change (Tulloch et al., 2006). Physical activity and health professionals are ideally positioned to affect behaviour change. Indeed, Rollnick et al. (2005) emphasise the potential for this group since

"almost every healthcare worker interacting with almost every patient has an important opportunity to change health behaviour" (p.961). After providing a background to MI and its empirical base, the chapter will critique its application to PA and behaviour change settings specifically and then consider its theoretical and conceptual links to models such as the Transtheoretical model (TTM, Prochaska DiClemente, 1983) and Self-determination Theory (SDT, Deci & Ryan, 1985). These models are considered since the former has been allied to MI prodigiously (e.g., Elder et al., 1999; Resnicow, McCarty & Baranowski, 2003; Stotts, DeLaune, Schmitz & Grabowski, 2004; Tomlin & Richardson, 2004; Wilson & Schlam, 2004) and that TTM (and its sub-facets) was a strong influencing model on MI which was reflected in the 1991 text (Miller & Rollnick, 1991). More recently SDT has been increasingly cited as a potential explanation as to why MI works (Markland, Ryan, Tobin & Rollnick, 2005; Thøgersen-Ntoumani & Ntoumanis, 2006; Vansteenkiste & Sheldon, 2006) and as such is worth considering for future developments of MI in settings such as PA.

Recent calls have been made to increase the general quality of trials of MI in physical health care settings since there is currently inadequate applied research in the domain (Knight, McGowan, Dickens & Bundy, 2006). This follows a wealth of evidence supporting the inclusion of MI in substance abuse settings and while high face validity exists across a variety of addictions settings, evidence in lifestyle behaviour change trials is still somewhat equivocal. First, the chapter will provide an examination of the technique and adaptations and the empirical base that has developed. The adaptations (e.g., brief negotiations) differ in terminology, duration and sometimes content but follow the MI approach that is embodied in the 'spirit' of MI as described by Miller and Rollnick (1991). The approaches taken by psychiatrists, psychologists, counsellors, care workers, and PA prescribers may differ but the application and adaptability to a variety of patients and clients from a variety of providers vindicates its flexibility as a method of intervention (Noonan & Moyers, 1997).

3.2 What is Motivational Interviewing?

Traditionally, health practitioners have taken an educational and advice-based (information with persuasion) approach to client behaviour change (Tuckett, Boulton,

Olsen & Williams, 1985) although the evidence base to show this approach works is not strong (Rollnick, Kinnersley & Stott, 1993). There has been evidence available for a number of years (e.g., Stott & Pill, 1990) to suggest that 'being told what to do' is not effective yet it is still commonplace in health settings. This approach has parallels with everyday life as Rollnick et al. (2005) suggest telling a child to do something creates a high likelihood that they will do the opposite. In GP practices the authors report the outcomes of this confrontation approach are weariness and reduced enthusiasm on the part of both the client and practitioner. A new approach was therefore required and the last two decades have seen MI become increasingly recognised as an effective approach for assisting clients adopt behaviour change in a supportive and respectful manner using at its core the principle of 'client-centeredness' (Britt, Hudson & Blampied, 2004). Rollnick (1996) suggests that during this period MI has gathered increased interest in health settings for a variety of practitioners. Whether the setting be addiction, probation or health, the technique has been applied in order to explore and resolve the client's ambivalence to change and is based on the early work on non-directive counselling of Carl Rogers (1953).

However, subtle adjustments to this original work was made in alcohol addiction settings by Miller (1983) retaining the client at the heart of the change process using their skills, knowledge, enthusiasm and willingness while applying a more directive element than the original Rogers approach. This directive counselling style helps the client identify the problem and guide them toward a solution. Miller (1996) suggests that MI is rarely dramatic and "*often simply reinforces what the person already knew to be true*"(p.840).

Following this early work it evolved through continued work with similar groups until being described in its current form by Rollnick and Miller (1995): "*Motivational interviewing is a directive, client-centred counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence*" (p.325). Lawendowski (1998) described MI as "*...a brief psychotherapeutic intervention to increase the likelihood of a client's considering, initiating, and maintaining specific strategies to reduce harmful behavior*" (p.39)

This intervention strategy responds on the premise that change happens most effectively when the client generates it and indeed Miller and Rollnick (1991) suggested that for some people the client resolving ambivalence is all they really need to move on a path of change. This is a fundamental principle that is apparent in the use of reflective listening strategies that are applied in order to elicit self-motivational statements as a consequence of exploring ambivalence to change. The approach of generating or eliciting self-motivational statements (now described as 'change talk' and described later in this chapter) is fundamental to the techniques of MI creating an approach that is more persuasive than coercive, more supportive than argumentative (Rubak, Sandbaek, Lauritzen & Christensen, 2005). These principles are based on the development of the client as the key to change eliciting change talk with the aim of encouraging and maintaining intrinsic motivation rather than motivation generated from external sources (Miller & Rollnick, 2002)

Following the original Miller (1983) descriptions of the clinical development of MI, Miller and Rollnick (1991 & 2002) further developed and refined the approach to the form it currently takes with key principles and philosophies clearly described and thoroughly applied in a wealth of empirical and community settings. The difference between a traditional confrontation-denial approach to therapy and MI was reported in the original Miller and Rollnick (1991) text and maintains as much relevance today as it did then (Table 3.1). This contrast is most clearly identified by the role the client is given by the therapist (e.g., GP, physiotherapist, PA professional) in the expert-driven approach which can often manifest itself in a relationship which is uneven and which lacks respectfulness. This can have serious ramifications for the likelihood of the client not feeling integrated or involved in their own health behaviour change process.

What is clear from the contrasting styles in Table 3.1 is that with MI, the emphasis is on the client to choose the direction for change and more importantly when they will begin that change. MI may operate in a number of ways and may act as a motivational boost, as a challenge to the client's status quo or as a prelude to further treatment and paving the way for change (Miller and Rollnick, 1991).

Table 3.1 Contrast of the 'Confrontation-denial' versus 'Motivational interviewing' approaches (from, Miller & Rollnick, 1991, p.53)

Confrontation-denial approach	*Motivational interviewing approach*
Heavy emphasis on acceptance of self as having a problem; acceptance of diagnosis seen as essential for change	De-emphasis on labels; acceptance of "alcoholism" or other labels seen as unnecessary for change to occur
Emphasis on personality pathology, which reduces personal choice, judgment, and control	Emphasis on personal choice and responsibility for deciding future behaviour
Therapist presents perceived evidence of problems in an attempt to convince the client to accept the diagnosis	Therapist conducts objective evaluation, but focuses on eliciting the client's own concerns
Resistance is seen as 'denial', a trait characteristic requiring confrontation	Resistance is seen as an interpersonal behaviour pattern influenced by the therapist's behaviour
Resistance is met with argumentation and correction	Resistance is met with reflection
Goals of treatment and strategies for change are prescribed for the client by the therapist; client is seen as 'in denial' and incapable of making sound decisions	Treatment goals and change strategies are negotiated between the client and therapist, based on data and acceptability; client's involvement in and acceptance of goals is seen as vital

The original work of Miller (1983) and the first MI text (Miller & Rollnick 1991) highlighted five key principles of MI which were express empathy, develop discrepancy, avoid argumentation, roll with resistance, and support self-efficacy. However, these were refined (losing 'avoid argumentation') to the following four principles in the most recent edition (Miller & Rollnick, 2002);

1) Express empathy,

2) Develop discrepancy,

3) Roll with resistance, and

4) Support self-efficacy.

The sequential application of these principles (see Miller & Rollnick, 2002) assists counsellors in developing a 'respectful' method of moving a client through the stages of behaviour change. As noted by Gerber and Basham (1999) the position of motivational interviewing is nicely summarised in the statement "*If you wish, I will help you to change yourself*". A very helpful and practical adjunct to the principles and 'spirit' are the 'traps to avoid'. Miller and Rollnick (1991) stressed the importance of the first session in order to set the tone and expectations from the perspective of both the client and counsellor. Falling into these traps (especially in early encounters) can undermine the subsequent interactions and reduce the impact of the client-centred approach. The traps are *'question and answer trap'*, *'confrontation-*

denial trap', *'expert trap'*, *'labelling trap'*, *'premature-focus trap'* and the *'blaming trap'* (for detailed descriptions on each the reader is referred to Miller and Rollnick, 1991, p.65).

3.2.1 Motivational Interviewing and brief interventions

Some confusion exists between MI and brief interventions because where MI describes the 'spirit' of the technique; brief interventions use a systematic approach in order to provide 'solutions'. These solutions are provided as a facet of techniques of brief intervention such as FRAMES (Bien, Miller & Burroughs, 1993; Miller & Rollnick, 1991) an acronym referring to *F*eedback of personal risk or impairment, *R*esponsibility for change lying with the individual, *A*dvice-giving, *M*enu of change options, *E*mpathic counselling style, and *S*elf-efficacy and optimism

It is settings such as PA referral schemes and primary care where approaches such as FRAMES or adaptations to MI (AMI; Rollnick & Miller, 1995) have found prevalence. Indeed it is often schemes where patients are not being directly treated by any one specific practitioner (Goldstein et al., 1998), such as a PA referral, where skills based on AMI may be effective. Examples of AMI's include the Drinkers Check-Up (DCU; Miller, Sovereign & Krege, 1988), Motivational Enhancement Therapy (MET; Miller, Zwebden, DiClemente & Rychtarik, 1992) and Brief Motivational Interviewing (BMI; Rollnick et al., 1992). Figure 3.1 outlines the basic movement from brief advice to full MI whereby derivatives such as those mentioned here lie within this continuum and are not restrained by any one set of skills but rather determined by the underpinning approach of the practitioner and logistic aspects such as time available and frequency of client contact sessions. A more comprehensive description of the differences between the three approaches with regards to the skills and techniques used is provided in Appendix 3.1.

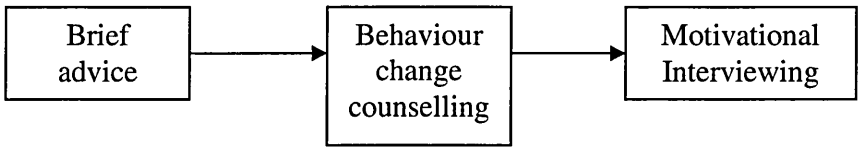

Figure 3.1 A schematic of the relationship between BA, BCC and MI.

Rollnick et al. (1993) described that disparity exists between MI and brief interventions;

> "*Although many of these ingredients are clearly congruent with a motivational interviewing style, some applications (e.g., of advice-giving) are not*" (p.190).

Miller and Sanchez (1994) identified these six common elements when reviewing counselling sessions that had led to the client reducing the risk behaviour and moving from pre-contemplation to contemplation and beyond. These generic components provide a skeleton on which MI is built. The fundamental difference between MI and brief interventions is the 'style' that Miller (1983) describes in MI as compared to the 'set of particular procedures' that underpins brief interventions. However, Dunn and Rollnick (2003) describe brief interventions as a generic approach referring primarily to patient encounters where time is limited or the patient is moving through a treatment pathway where brief advice is the only possibility. As a result brief interventions may not necessarily use counselling skills *per se* but may certainly use principles such as *reflective listening* and *rolling with resistance* to maintain client involvement and motivation for subsequent meetings. A more general term of behaviour change counselling (BCC) utilises similar skills to those of MI and as described by Dunn and Rollnick (2003) is a technique based on 'opportunistic encounters' ranging from 1 minute to many years and;

> *"any deliberate effort to use counselling skills to discuss behaviour (including medication use) with patients that encourages them to consider for themselves the why and the how of changing their behaviour"* (p.18).

Techniques born from a similar client-centred school of thought include those of the Elicit-Provide-Elicit (E-P-E) framework. While its foundations lie in the techniques and approach of MI, Dunn and Rollnick (2003) provided the framework in order to provide practitioners with an effective method of using open questions and summaries which are used "*as key junctures in the consultation*" (p.26). It appears that adaptations to MI (and techniques drawn from MI such as E-P-E) such as brief interventions have occurred by necessity whereby clinicians and researchers have embraced the fundamental principles and style of MI but have needed a more succinct version that accommodates time-restricted consultations. There have been concerns

voiced regarding the widening variety of adaptations and brief versions distorting or diluting MI (Rollnick & Miller, 1995). It has been recognised that in order to avoid this potential misrepresentation, it is imperative that adaptations based on MI clearly describe their content in detail (Berg-Smith et al., 1999) a point supporting the concept of treatment fidelity (Bellg et al. 2004) raised in Chapter 3 (PA counselling and motivation). It is clear however that irrespective of time restraints and the frequency of patient encounters, the underpinning style, way of being or rather spirit of the didactic is fundamental to the MI method.

3.2.2 The 'Spirit' of Motivational Interviewing

Miller and Rollnick (2002) stated that as MI had evolved since the original 1991 text, and that they were.. "*...placing less emphasis on the techniques of motivational interviewing and ever greater emphasis on the fundamental spirit that underlies it.*" (p.33). While this underpinning ethos and philosophy of MI has always been at the forefront for Miller and Rollnick there has been a move away from the 'spirit' in many applications of MI by many others. Indeed this can be evidenced from the fact that few empirical studies emphasise, or even include, the spirit within the methods, of say an RCT study, against the high percentage that focus on the techniques and strategy. These include studies such as Baer et al. (2004) which outline skills delivered as part of training clinicians without any mention of the underpinning spirit of the approach.

As described by Miller and Rollnick (2002), MI is a skilful clinical method and more than a set of techniques that can be learned, it is a way of *being* with people which is perhaps best described within the spirit of MI. The following headline the 'spirit' of MI and its principle of eliciting self-change through 'negotiation' (Miller, 2001).

1. *Motivation to change is elicited from the client, and not imposed from without.*
2. *It is the client's task, not the counsellor's, to articulate and resolve his or her ambivalence.*
3. *Direct persuasion is not an effective method for resolving ambivalence.*
4. *The counselling style is generally a quiet and eliciting one.*
5. *The counsellor is directive in helping the client to examine and resolve ambivalence.*

6. *Readiness to change is not a client trait, but a fluctuating product of interpersonal interaction.*
7. *The therapeutic relationship is more like a partnership or companionship than expert/recipient roles.*

The above criteria can be summarised as characteristics of the spirit of MI (p.30, Hecht et al., 2005). MI training that is skills orientated (Miller & Mount, 2001) has resulted in non-significant changes in practitioner MI skills whereas a focus on the 'spirit' and learning from clients often results in greater acquisition of MI skills and proficiency over a greater follow-up period (Miller & Moyers, 2006).

3.2.3 Stages in motivational interviewing practice: Phase I and II

A number of adaptations exist in the application of MI strategies as indicated in 3.2.1 although the generic skills of reflective listening and exploring ambivalence are important if it is to have a positive influence in therapy (Miller & Rollnick, 1991). While the key skills and principles outlined already in the chapter (e.g., reflective listening) underpin the approach, common stages are often applied within MI sessions. However, these differ between interactions based on the duration of the session, the number of sessions and the stage of therapy that the client is at. The stages applied with an MI session are however encapsulated within the two phases (Miller & Rollnick, 2002). Phase 1 focuses on *'building intrinsic motivation for change'* (p.52) while phase 2 is concerned with *'strengthening commitment to change'* (p.126). Table 3.2 indicates these two phases as mapped against a linear readiness ruler and the stages of change. As outlined in the current chapter, MI was conceptually linked by many authors and while Miller and Rollnick (1991) included a chapter in the original MI text on TTM (and stages of change more specifically) Miller (2006) has attempted to disentangle the two. However, Table 5.2 clearly illustrates the intuitive attractiveness of the link between MI and TTM. In clinical settings the table provides a tool with which the therapist can prompt the client and explore ambivalence although only the top two lines ('not ready' to 'trying' and '1' to '10') would be visible (Miller & Rollnick, 1999).

As the table indicates, MI phase 1 is concerned with the client early in the change process or high in ambivalence whereas phase 2 is applied to a client who has

expressed a desire, ability, readiness, need or commitment (Amrhein et al., 2003) verbally to initiate change to their lifestyle.

Table 3.2 Readiness Ruler: Countdown version. (Miller & Rollnick, 1999)

Not Ready		Unsure		Ready				Trying	
1	2	3	4	5	6	7	8	9	10
Precontemplation		Contemplation		Determination/Preparation				Action	
Motivational Interviewing Phase I				Motivational Interviewing Phase II					

Phase 1 strategies include the use of Open ended questions, Affirmations, Reflective listening and Summaries (OARS) and elicit change talk (Amrhein et al., 2003; Miller & Rollnick, 2002). The five opening strategies can be adapted in a variety of ways although Miller and Rollnick (1991) provide examples of patient-therapist scenarios and contexts within which progress can be achieved and ambivalence examined. These include exploring *ground work, a typical day,* and carrying out a *decisional balance.* Each of these is explained in more detail in Study 2 (Chapter 5) where the principles are applied. Having examined the client ambivalence and current perceived readiness to change a clear transitional process occurs in order to lead into MI phase 2. The point at which this transition can occur (without pushing or prematurely progressing the client) can be identified by signs of client readiness (Table 3.3). The skill of the therapist in identifying and reacting to these signs of change are paramount. Only in recent years has evidence been provided that assists therapists in being able to more clearly identify 'client reactions' such as *change talk* (Amrhein et al., 2003). Table 3.3 does provide an outline and headline characteristics of signs of readiness to change although it is only the parameter of *change talk* that has been examined extensively.

The use of summaries here can contextualise the client's readiness although, as reported by Rollnick et al. (1999), the practitioner must be able to know 'what' it is the client is ready to do. For risk behaviours such as smoking or substance misuse the health behaviour may be obvious although for more complex health outcomes (e.g., weight loss) a combination of behaviours may be required which could include physical activity, diet change, reduced alcohol consumption and smoking cessation.

Table 3.3 Signs of readiness for change

Client reaction	*Description*
Decreased resistance	Client resistance decreases while dissonance in the relationship also reduces.
Decreased discussion about the problem	The client reduces their discussion and focus on the problem area and begins to focus on the next step.
Resolve	Some sort of resolution has been reached by the client that appears more restful and calm. Often manifests itself by a sense of loss or resignation.
Change talk	Reduced client resistance talk and increasing change talk emphasising the pro's of change and cons of not changing.
Questions about change	The client begins to explore how others have effected a change from a similar position asking questions to formulate a change.
Envisioning	The client may begin to consider 'life after change'. This may appear similar to resistance since they consider difficulties as much as positives.
Experimenting	The client may have begun to introduce new lifestyle behaviours between sessions such as diet and some physical activity.

Adapted from Miller and Rollnick (2002; p.127).

These multilateral changes require change programmes that are equally complex and involve a client at different stages of readiness to change (using the SoC model) individual events. Rollnick et al. suggest that while these issues are not insurmountable moving to action planning (phase 2 in MI) requires the therapist to identify readiness specific to a particular change rather than the whole suite of health issues. Phase 2 can be initiated by recapitulating phase 1 and drawing it to a close. This recapitulation is summarised by Miller and Rollnick (2002) as including the following elements (p.130);

- A summary of the client's own perceptions of the problem
- A summing up of the client's ambivalence
- A review of objective evidence relevant to the change
- A restatement of client wanting, intending, or planning to change (and confidence in that change)
- Therapist assessment of the client's situation.

The movement toward negotiating a change plan with the client involves the techniques above before determining the content of the plan. Miller and Rollnick (2002) suggest that setting goals considering change options, arriving at a plan and eliciting commitment are fundamental to the client adopting change at this stage. This

approach must be carried out avoiding the traditional 'expert-role' adopted by many health professionals. Even though feedback about objective parameters (e.g., physiological or psychosocial) may be used a clear distinction between this traditional approach and a client-centred approach must be applied (Emmons & Rollnick, 2001). This transition from phase 1 to phased 2 and the action planning that ensues provides a clear systematic process of counselling techniques not seen in current PA counselling literature (the reader is referred to the summary in Chapter 2). Questions do however exist as to the relevance and appropriateness of applying both phases to all clients in all settings. It seems clear that adaptations to MI in settings such as PA referrals may be appropriate in line with the health care modifications of MI (e.g., Dunn & Rollnick, 2003; Emmons & Rollnick, 2001; Rollnick et al., 2005).

3.2.4 Dealing with resistant clients

Client reactions such as resistance to change can occur in either phase 1 or 2 although, by virtue of the client ambivalence and reluctance to change, are more likely in the early stages. Rolling with resistance has been identified as a key principle in MI. As outlined in Table 3.4, Gordon (1970) identified twelve 'Road Blocks' that are to be avoided by using this technique. This includes avoiding sympathising, providing unsolicited advice and persuading with logic.

Table 3.4 Gordon's Twelve Roadblocks

Roadblock	Description
1	Ordering, directing or commanding
2	Warning or threatening
3	Giving advice, making suggestions, providing solutions
4	Persuading with logic, arguing, lecturing
5	Moralizing, preaching, telling them their duty
6	Judging, criticizing, disagreeing, blaming
7	Agreeing, approving, praising
8	Shaming, ridiculing, name-calling (labelling)
9	Interpreting, analysing
10	Reassuring, sympathizing, consoling
11	Questioning, probing
12	Withdrawing, distracting, humouring, changing the subject

These roadblocks are commonly cited by clients in therapy settings and develop resistance in the client. Ultimately the result is a reduced likelihood of client change. Miller et al. (1988) found that therapist listening and reframing was associated with low levels of client resistance. This produced a result that was described by Miller et al. as being consistent with the premises of MI.

3.2.6 Eliciting change talk

Orford (1985) labelled addictions such as alcohol, drugs, tobacco, eating and gambling as "*excessive appetites*" and as such these addictive behaviours are obviously extremely difficult to move away from. A key facet for the change process is having the client begin to verbalise their current perceived state and perhaps more importantly have the client describe their reasons, motives and needs to impart a lifestyle and behaviour change. Already this chapter has emphasised the crucial role the client should take in the change process and the importance the therapist should place on the language and elicited change (or resistance) talk. The stark contrast between the two is highlighted in Table 3.5. However, without doubt the most significant development of MI in recent years has been that of change talk (Amrhein et al., 2003).

Table 3.5 Change talk and resistance talk (from Miller & Rollnick, 2002; p.49)

Change talk	*Resistance talk*
Disadvantage of status quo	Advantages of status quo
Advantages of change	Disadvantages of change
Intention to change	Intention not to change
Optimism about change	Pessimism about change

The verbal exploration of current and desired status has been researched extensively and has been coined with the term 'cognitive dissonance' (Draycott & Dabbs, 1998b). This concept, it has been suggested, may offer a theoretical grounding for motivational interviewing and as such is integral to the analysis and exploration of the process of client-centeredness that is so pivotal to the approach of MI. Additional works by Draycott and Dabbs (1998a) had stated that clinical psychology, a field within which MI exists, "*may not be making full use of the experimental psychological research available to it*" (p.341). To this end, Draycott and Dabbs

provided a review of literature on cognitive dissonance in order to assess its usefulness in developing and deconstructing clinical psychological therapies such as MI. The concept of cognitive dissonance is therefore fundamental to exploring ambivalence that is in turn a key facet of MI (Miller & Rollnick, 2002). This may help to describe and analyse the underlying psychological processes that affect the client in such as way as to have them verbalise their ambivalence, motives and desire for change through self-motivational statements (SMS; Miller & Rollnick, 1991) and more recently the updated version of this, Commitment language (DARN-C; Amrhein et al., 2003). It is interesting to note that in 1998, Draycott and Dabbs (1998a) had recommended that research into areas such as psycholinguistics and social psychology had not been utilised to the same extent as behavioural and cognitive research. A point that is now being realised in the research literature.

Research such as Gollwitzer (1999) has demonstrated the impact of verbal commitments and 'implementation intentions' across a variety of settings including exercise while recent evidence (e.g., Moyers & Martin, 2006) has supported verbal commitments such as self-motivational statements as a "*reasonable predictor of behavioral outcomes*" (p.246) although further examination of this field has occurred through commitment language (Amrhein et al., 2003).

3.2.6.2 Contemporary developments: DARN-C

As reflected in the stages of training of MI (Miller & Moyers, 2006), the psycholinguistic analysis of client-counsellor interactions of Amrhein et al. (2003), has been pivotal to the contemporary development of MI. While empirical evidence in support of change talk is not broadly available, it has received support from the originators of MI and the training community. This support has centred on the logical progression from Self-Motivational Statements (SMS) to Desire, Ability, Readiness, Need and Commitment (DARN-C; Amrhein et al., 2003) providing more detail on the frequency, duration, type and direction of change talk rather than the mere existence of it. Client commitment language was measured by Amrhein et al. (2003) regarding its frequency of occurrence and strength during psychotherapy sessions. While studies such as Mahrer et al. (1994) examined the prevalence of commitment language following specific therapeutic approaches, the work of Amrhein et al. considered the role of that language in the therapeutic process. Indeed, Amrhein et al. suggest that

predictions of treatment outcome cannot be made by assessing the frequency of verbal commitments. As noted throughout this thesis, and supported through the psycholinguistic research, commitment has emerged as a clear indicator of self-efficacy which in itself is so fundamental to motivation to change (Bandura, 1977). This does not however wholly clarify the issue. As Amrhein et al. indicate commitment language in isolation is not a good predictor of behavioural change (although stronger than desire, ability, readiness and need). Rather, it is the pattern of that change talk that is a stronger predictor of intention and outcome behaviour change. As reported by Amrhein et al.;

> *"...strength of client commitment language, particularly toward the end of the MI session, provides unique prognosticinformation beyond the prediction of future behavior (outcome) from past behavior..."* (p.872)

Advances in research in change talk have raised some concerns for example the distinctions between categories of change talk. As noted by Clark (2006) there are clear definitions of D (desire), A (ability) and C (commitment) although the two facets of the mnemonic R (reasons) and N (need) do not appear to be distinct from each other and nor, as reported by Clark, do they have a clear definition in the Amrhein et al. (2003) study. 'Reason' appears to describe issues of incentive, motive or rationale whereas 'Need' is concerned with necessity (what is emotionally charged) rather than dispassionate logic and rationale (Clark, 2006). Following further correspondence with Amrhein, Clark attempts to differentiate and clarify the two as 'R' = Rationale and 'N' = Necessity. Here, 'R' is anything said following linguistic markers (e.g., "or else" or "because") and 'N' represents anything said before the linguistic marker. Farbring (2006) expands this debate to highlight that the pragmatic use of all facets of the DARN-C pneumonic has implications for the client. Specifically, Farbring highlights that there must be a balance between 'ability' and 'desire' since a client heavy on desire talk but low on perceived ability may relapse and not attempt again. A second note of caution from Farbring is the options for the client to change from a social, economic or opportunity perspective. While the client may feel an emotionally rooted desire the environment may not correspond to that desire.

While the subtle developments (and conceptual discussions) of the definitions will no doubt progress, it is clear that the end goal for practitioners is to elicit 'C' (commitment) since there appears little disagreement as to this facet of the new change talk mnemonic taking hold in MI. Irrespective of further developments in change talk it is clear that MI has provided a complex dimension to therapeutic interactions and advanced the original (and now apparently too simplistic) idea of self-motivational statements. The contribution of psycholinguistics research such as that of Amrhein and colleagues has provided four key recommendations when carrying out consultation and counselling sessions such as in exercise and PA settings. Firstly, the approach of eliciting 'change talk' (e.g., "I want to...", "I need to...") from the client is too global and that natural language markers of readiness must be used. Secondly, this work highlighted that the strength scaling of client speech should be measured, so for example the strength of Desire, the strength, of Ability and so on. Thirdly, that the pattern of language will change during a session so the counsellor should consider in more detail opportunities of when to 'approach' and when to 'withdraw' with a client as a stage approach will exist within the session. This will involve an appreciation of the 'slope' (or direction and movement of change talk) as much as the 'intercept' of language (the point at which a threshold or point of readiness is reached). Fourthly, client motivation and verbal commitment will change throughout a session and evidence has revealed that the most predictive speech will occur at the end of the session.

3.3 Theoretical and conceptual underpinning of MI

This section will examine the models and conceptual frameworks that have been linked to MI and been used to explain its efficacy. Motivational interviewing has been drawn from approaches such as the client-centred philosophy of Carl Rogers (1953) and social psychology, cognitive dissonance and self-efficacy (Bandura, 1977; 1982). However, while it has developed as a therapeutic intervention it has been suggested that MI lacks a specific theoretical basis (Britt et al., 2004). Motivational interviewing appears different to cognitive dissonance and self-efficacy, with regards to terminology and emphasis, although it has been suggested that they each share three common constructs (Doherty, James & Roberts, 2000). These are 1) the patient's expectations about the consequences of engaging in the behaviour, 2) the influence of

the patient's perceptions of, or belief's about, personal control over the behaviour, and 3) the social context of the behaviour.

5.3.1 Motivational interviewing and self-efficacy

It is the concept of personal control that appears pivotal to the success of MI interventions. More specifically the integration of Bandura's (1977) theory of self-efficacy into the technique appears to be underplayed in many empirical studies. Indeed, it may be that it is this facet of TTM that is the common link between the two rather than the stages of change (Prochaska & DiClemente, 1983). Self-efficacy has often been used to predict health behaviour change in areas such as smoking cessation, weight reduction and exercise adoption (Fluery, 1992). Recent evidence such as Dupree-Jones, Burckhardt and Bennett (2004) supports the need to develop self-efficacy in patients on PA and exercise programmes and suggest that MI may be one method to achieve this. Moreover, the authors report that *"...advice or education about exercise will not motivate an individual if he or she does not have self efficacy" (p.864).* Self-efficacy provides the foundation for human motivation, personal accomplishments and well-being and are essential for achieving self-regulation. Supporting its importance, Rollnick et al. (1999) highlight the link that self-efficacy creates between the person and the social world and the importance of client skill levels, ability and pragmatic approaches in adopting lifestyle change. Additionally self-efficacy sits with social support, decisional processes and perceived relevance or vulnerability as important determinants of achieving health behaviour change (Emmons & Rollnick, 2001).

Sniehotta, Scholz and Schwarzer (2005) describe self-efficacy and outcome expectancies to be most influential variables in behaviour change with those low in self-esteem and self-efficacy being less likely to adopt change. MI applies self-efficacy enhancing strategies such as change talk (and affirmations) to support outcome expectancies and efficacy expectation. The strategic elicitation of past experiences through reflections, readiness rulers and change talk in MI is designed to elucidate increased feelings of self-efficacy and self-worth (Britt et al., 2004). The role of the practitioner is to support and guide the client in strategically planning change scenarios and developing cognitive and social plans to initiate and maintain behaviour change such as physical activity.The conceptual link between MI and self-

efficacy does appear appreciated by Miller and Rollnick (2002) since it forms one of the four principles although it is the two main theories of behaviour change (SDT and TTM) that have received the greatest attention. The reason for considering MI in relation to TTM and SDT has been outlined previously although while many studies and subsequent text have conceptually linked MI to TTM in particular the originators of MI (Miller & Rollnick, 1991) appear keen to disentangle the two. Indeed, Miller (2006) described his concern over the increasing association of the two [MI and TTM] attempting to make clear that MI is not rooted in the TTM or stages of change but that MI was practice–based and developed through the accumulation of empirical processes and outcome data. A more extensive description and critical analysis of both TTM and SDT is provided in Chapter 3.

5.3.2 Motivational interviewing and the transtheoretical model

Authors such as Wilson and Schlam (2004) reported that the transtheoretical model of behaviour change (TTM) influenced the development of MI. Moreover, it provided a stage specific approach which is applied in the development of interventions with clients in a variety of settings. It is easy to assume that MI techniques are mapped against the theoretical construct of behaviour change described by Prochaska and DiClemente (1983). This can be seen by the use of tools such as readiness rulers (see Table 3.2) that map Likert scales, or stages of readiness, onto the traditional 'stages' of pre-contemplation and contemplation. These readiness rulers are an important example of the relationship between MI and the 'stages of change' (a facet of the transtheoretical model). It is often suggested by authors such as Britt et al. (2004) that a major development was to link MI to TTM. This is reported that the two provide a framework for understanding the change process (TTM) whilst also providing a means for facilitating that change (MI). However, Wilson and Schlam suggest a note of caution that while MI and the transtheoretical model (TTM) have a common set of principles, no theory links the two. The fact that the two grew up together in the early eighties may be the only justification as to how a conceptual link has been formed.

The application of TTM is often problematic and the number of stages varies depending on the study. The sequence of five stages are most common and are qualitatively defined as precontemplation (not thinking about change within the next

six months), contemplation (intending to change in the next six months), preparation (planning to change in the next month having typically relapsed recently), action (making health-relevant changes in the behaviour), and maintenance (having made behavioural changes for longer than six months) (Hunt & Hillsdon, 1996). More than one facet of behaviour can be mapped onto the readiness ruler. This supports the fact that risk behaviours are not mutually exclusive and that an inter-relationship between behaviours may often exist. When applying the readiness ruler in an MI session a number of statements are used to elicit the client's perception of their current 'readiness for change'. For example a non-exerciser might be asked "on a scale of 1 to 10, 1 being 'Not ready' and 10 'currently trying', where would you put yourself?" The follow up question emphasises the positive element of the response where the client, depending on the result would be asked (if for example they responded with a '3') "why 3 and not 2 or 1?" Miller and Rollnick (1999) describe using only a colloquial language line that eliminates the 'stages of change' and 'Motivational Interviewing Phase' descriptors with clients. This clarifies the respondent's view of the process.

An update by Prochaska and Velicer (1997) stated that research should focus on decisional balance and self-efficacy and cited the reason to be the current lack of research on this part of the transtheoretical model. Decisional balance, exploring ambivalence and developing discrepancy, is an essential component of the approach taken in motivational interviewing (Miller & Rollnick, 1999) and therefore correlates closely to the need for additional research in this area. Resistance reduction and ambivalence is being studied more and more in relation to motivational interviewing. Shaffer and Simoneau (2001) argue that the reduction of resistance to change has to do with "*exercising ambivalence without an investment in clients changing.*" (p.100). The study of potential determinants of the adoption and maintenance of exercise has become a major area of interest within exercise psychology (Ingledew, Markland & Medley 1998). They suggest that much of the work in this area has "*examined the influence of health-related attitudes and beliefs, and perceptions of health benefits, in exercise adoption and maintenance*" (p.478).

A number of studies have attempted to measure the relationship between health behaviours, PA adherence, behaviour change, and exercise (e.g., Dishman &

Buckworth, 1996; Dzewaltowski, 1994; Shepherd & Bouchard, 1996). The Transtheoretical Model of behaviour change (Prochaska & DiClemente, 1983) has enabled MI trainers assist addiction and health counsellors in understanding the processes that can enable a patient or client to move away from risk behaviours. Irrespective of the conceptual limitations of TTM and its components this is a popular tool in the delivery of MI training as it assists the explanation of 'ambivalence' and the more theoretical concepts of cognitive dissonance (Draycott & Dabbs, 1998). Previous sections described the perceptual importance of MI and indeed its link with cognitive dissonance as a theoretical underpinning paradigm has already been identified (Draycott & Dabbs, 1998). The systematic approach taken by MI attempts to elicit and explore dissonance or 'ambivalence' in terms of beliefs and 'readiness for change' and is an area where further research is required. More recently empirical studies and reviews have turned their attention to the potential of SDT as a conceptual descriptor as to why MI works.

5.3.3 Motivational Interviewing and self-determination theory

This section will examine the potential for SDT to theoretically explain MI since it has been accepted that MI lacks a sound theoretical explanation for its efficacy (Miller, 1999). Self-determination theory (Deci & Ryan, 1985; 2002) has been applied to health-related behaviours (Sheldon, Joiner & Williams, 2003) although has received little consideration to counselling and psychotherapy settings. Likewise, the theories basic concept of 'autonomy-support' has received less attention than it deserves although is consistent with the 'autonomy-support' function offered by MI (Vansteenkiste & Sheldon, 2006). Moreover, Markland et al. (2005) suggest that while MI has become widely adopted, it lacks a coherent theoretical framework, something that SDT may provide. This may assist in elucidating the mediating processes by which the techniques of MI are effective (Burke, Arkowitz & Dunn, 2002). Additionally, the theory of SDT is reported as a contemporary framework increasingly used to understand exercise motivation and adherence (Thøgersen-Ntoumani & Ntoumanis, 2006) which makes it appropriate for consideration in the current thesis since it considers MI in a PA setting.

Burke et al. (2002) have reported the potential benefits of MI for a variety of settings including exercise and diet change due to its consideration of generic intrinsic motivation facilitators. Thøgersen-Ntoumani and Ntoumanis (2006) suggest that self-determined motivation may be associated with a range of adaptive exercise-related behaviours, cognitions and physical self-evaluations. In addition the authors report that both intrinsic and extrinsic factors are important since "*some exercise activities are not inherently enjoyable*" (p.403). However, it has been suggested that, from an SDT-perspective, MI is unlikely to promote intrinsic motivation with a more likely explanation being that it facilitates greater identified or integrated motivation (Vansteenkiste & Sheldon, 2006). The authors however identify similarities in the two approaches that may have led to calls for a greater marrying to include a reduction in the value of extrinsic motivating factors. For example, a client that does not initiate a task and does not therefore feel autonomous will feel controlled by external factors reducing the value they place upon it and thus reducing their enjoyment. Similarly, Vansteenkiste and Sheldon report MI to have been developed from dissatisfaction from prescriptive and confrontational therapies which generate similar client responses. The authors suggest that SDT and MI therefore offer complementary accounts of self-motivated change.

The parallels between the two are increasingly clear although it is important to consider conceptually what each provides the other with. Fundamentally, Vansteenkiste and Sheldon suggest that SDT's concept of autonomy-support requires greater elaboration and application (which MI intuitively offers) while MI may require a more articulated language for describing types of motivation beyond merely intrinsic and extrinsic (something that SDT clearly provides). The reciprocal relationship already appears beneficial for both clinicians and researchers. Further conceptual mapping of the MI and SDT was suggested by Markland et al. (2005) who suggested that MI (or rather adaptations of MI; AMI) offers a method of application whereby SDT offers a theoretical underpinning (Foote et al., 1999; Ginsberg, Mann, Rotgers & Weekes, 2002). In relation to the three SDT dimensions of competence, autonomy and relatedness MI does appear to offer techniques for achieving these facets in client sessions (Figure 3.2). What is evident from Markland et al. (2005) is the role that self-efficacy and empathy play in both approaches. This can be seen by

the importance placed in SDT on autonomy and choice and in MI by change-talk elicited as client commitment rather than expert-driven approaches. Clinical evidence has supported this view (e.g., Williams, Deci & Ryan, 1998) although has suggested that most clinical approaches attempt to internalise and integrate non-intrinsically motivated behaviours such as exercise and physical activity.

Figure 3.2 indicates the practice of achieving the three SDT facets through MI though as Markland et al. suggest; it is the facilitating environment within which these facets sit which determines how facilitated or obstructed the individual perceives themselves to be in relation to change. Such approaches within MI as 'expressing empathy', 'avoiding judgments and blame' and 'exploring client's concerns' can assist with client feelings of 'relatedness' on the SDT framework while 'rolling with resistance', 'encouraging change talk' and 'avoiding coercion' correlates well with the facet of client-autonomy.

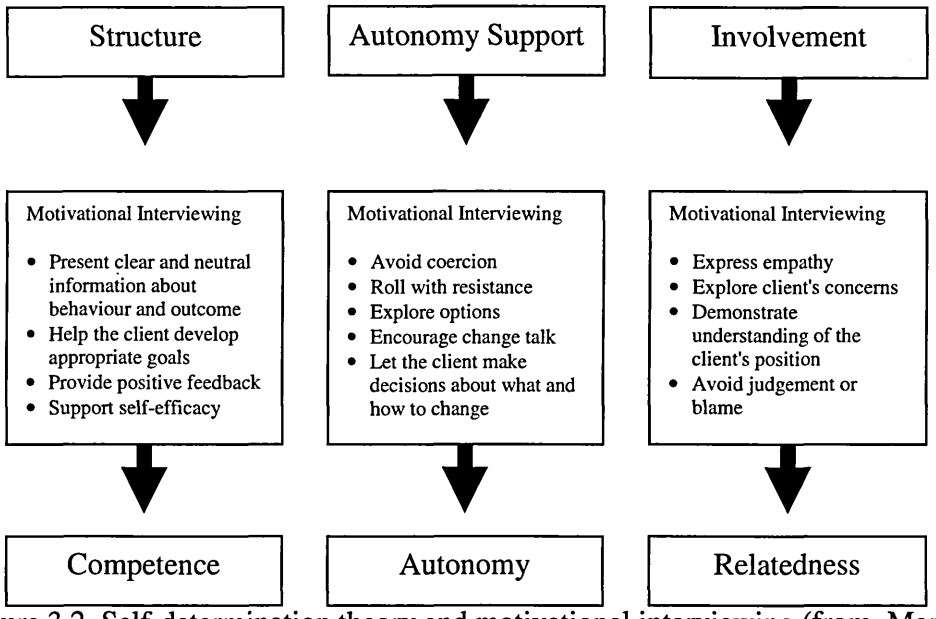

Figure 3.2. Self-determination theory and motivational interviewing (from, Markland et al., 2005, p.821)

SDT and MI may complement each other and the benefits both practically and theoretically include;

- A description of the mediating processes of MI by SDT
- An application of the theoretical concept of SDT by MI

- A method by which the autonomy-support can be achieved in a non-prescriptive and supportive style
- The provision of a clear framework for future testing regarding the change mediating and change impeding impact of counselling sessions in a range of settings.
- MI and SDT can foster the genuine growth (through client-centred approaches) through an exploration of values, goals and a sense of self
- SDT can inform the application of MI by considering closely the individuals motivation along a robust continuum

An important theoretical consideration of SDT is its overlap or mapping to the SoC and subsequently the role each play in describing the client 'ambivalence' to change from the risk to the health behaviour. This exploration of ambivalence and readiness to change is a key component of the MI intervention and a movement to the state described within SDT as autonomous and intrinsically regulated. Indeed this process through which this 'client-centred' outcome can be achieved is a key outcome aim in the MI technique and has a generic focus to SDT by way of a conscious acceptance of the behaviour change and a self-reflection of its importance. This maps against the final 'identification' stage of SDT where Ryan (1995) and Vallerand (2001) suggest that identified regulation is likely to be more relevant than intrinsic motivation to the maintenance of behaviours that are not inherently interesting or enjoyable. The challenge for practitioners is how this can be generated by external forces such as counsellors, exercise professionals and health practitioners.

The field of psychology is indeed divided on the issue of inherent tendencies toward personal growth, of a unified and autonomous self and by Deci and Ryan's own admission (2004 & 2002) conflict exists between this perspective and those social-cognitive approaches (p.4). What is key to the conceptual explanation of the interrelationship of SDT and MI could be the acceptance that in order to understand fully intrinsic motivation, and to facilitate successful internalisation, requires a consideration of the extent which the social environment supports satisfaction of the fundamental needs (Koestner & Losier, 2004). The role then of MI within this

achievement of optimal change and control may be to facilitate an exploration of the client's perception of this environment and their role within it.

3.4 The evidence base for motivational interviewing and PA

Motivational interviewing is certainly a popular technique with more than 80 randomised control trials having been published up to 2005 (Hettema, Steele & Miller, 2005) and the number of publications in MI doubling every 2-3 years (Miller & Moyers, 2006). Indeed, up to the submission of this thesis 2006 had already seen a further 11 RCT's published which had included MI as its primary intervention. MI is then popular in community, clinical and research settings due to its presumed cost-effectiveness and relevance to interventions in non-treatment seeking population (Heather, 2005). Questions have however been raised as to the justification for this popularity in all settings since some reviews (e.g., Knight et al., 2006) have indicated worryingly low internal content validity. This section will consider some of the key reviews and empirical evidence available to examine these perspectives.

Rubak et al. (2005) carried out a systematic review and meta-analysis of MI interventions in RCT's highlighting an effect of 74% with no reported adverse or harmful effects following its application. Rubak et al. also found MI to outperform traditional advice giving (in a scientific setting) in approximately 80% of studies. The meta-analysis highlighted the dominant session duration was 60 minutes although suggested that MI can be effective even in brief encounters of only 15 minutes. Importantly however, the authors also cited numerous evidence to suggest that more than one encounter with a patient increases the likelihood of effect (e.g., Berg-Smith et al., 1999; Harland et al., 1999; Miller, Meyers & Tonigan, 1999). In addition to the duration and frequency of MI sessions it is also important to examine the patient characteristics of those receiving MI. Evidence has suggested that lower dependence patients are more likely to benefit from MI or an adaptation which follows the context of these more brief interventions (Moyer, Finney, Swearingen & Vergun, 2002). This context is reported as those receiving 'opportunistic interventions' which reflects more a clinical health setting or outpatient setting than a programmed therapy setting. However, this data reflects a substance abuse setting than that of a PARS which reiterates the increased need for evidence to examine the frequency, duration and client characteristics synonymous with this context.

Whatever the setting it is interesting to note that evidence from studies emanating from Miller's laboratory have produced higher effect sizes for MI than studies conducted independently (Burke, Aroids & Menchola, 2003a). These findings are context and setting specific with a dominant application to substance abuse and addiction patient population groups. Of more interest in the present thesis is the evidence for the intervention in health promotion and more specifically PA programming applications.

There are a number of studies examining the application of 'stages of change' (which has been conceptually linked to MI by some authors; e.g., Stotts et al., 2004) to exercise settings with varied populations (Booth et al., 1993; Hellman, 1997; Ingledew et. al., 1998; Pinto & Marcus, 1995). However, there are still very few pieces of empirical evidence testing the efficacy of applying MI techniques specifically in PA and lifestyle change settings at the initial consultation stage and beyond. Although there are some reviews highlighting the potential for MI in PA settings (e.g., Breckon, 2002), only a limited number of studies have been carried out in exercise and PA programming (e.g., Harland et al., 1999; Hillsdon et al., 2002; Scales & Miller, 2003). Indeed, results have been equivocal with conclusions not reflecting those found in addiction settings (Burke et al., 2003a). Similar behaviour change (e.g., diet change and cardiac rehabilitation) and healthcare settings do however support the use of MI which may support the calls for further research in this area (Britt et al., 2004; Knight et al., 2006).

While very few studies have examined the role of MI for promoting exercise exclusively, many have considered other healthcare issues such as diet and cardiac rehabilitation as an adjunct to PA. These include for example Berg-Smith et al. (1999) who found MI to be effective and popular with both clients and practitioners in a diet change intervention. Also, cardiac rehabilitation (Brodie & Inuoe, 2005) where MI was found to provide improved levels of types of activities as compared to standard care. Research, such as Rollnick (1996), vindicates the emergence of MI in the treatment of other health behaviour change topics such as obesity and diet control by stating that "*it should be possible to encourage patients to be much more active in the consultation, and for practitioners to avoid some of the pitfalls of ineffective advice-giving*" (p.22). This raises questions regarding the efficacy of MI training for research

in PA settings (Ory, Jordan & Bazzarre, 2002) and the accurate reporting of facets of behaviour change such as stages of change, processes of change and self-efficacy.

Evidence such as Yates, Price-Fowlkes and Agrawal (2003) has reported self-efficacy (Bandura, 1977) to be a central facet of the variance of patients adopting PA lifestyles. The importance of self-efficacy toward behaviour change was highlighted previously in this chapter and although it dominates the likelihood to adopt change, other personal factors (e.g., age and gender) and barriers (e.g., symptom distress and negative wellbeing) also play a central role. Therefore interventions such as MI may only be effective if they consider closely these facets and develop change strategies that accommodate personal factors and barriers in PA settings (Brodie & Inoue, 2004). Many PARS patients were found in Chapter 7 to suffer from a hypokinetic disease or be rehabilitating from an illness or surgery. The evidence from studies such as Yates et al. supported the idea that for these patients, even 6-12 months post-event, individuals need skills such as high self-confidence and specific strategies to manage and adopt a PA lifestyle and that self-efficacy plays an important part in continued behaviour change.

While MI may offer a technique or style of intervention to assist in this PA behaviour change management and support there is a paucity of research to support it. As seen previously, the dominance of MI applications has been in the addictions field although studies applying MI to clinical rehabilitation (e.g., Kremen et al., 2006) have become increasingly popular. Kremen et al. for example considered the application of MI on physiological outcomes such as lipid and cardio respiratory fitness, issues not too dissimilar to those of PARS patients. Other applications of MI in related fields such as PA as rehabilitation from chronic heart failure are increasingly popular. In this context MI provides an attractive alternative to the client-expert relationship which is so prevalent (Brodie & Inoue, 2005). Indeed Brodie and Inoue applied an MI intervention specifically to empower patients to feel more confident about PA and to develop more effective coping strategies. While the study failed to clearly report the level of MI content and competence of the person delivering the session (akin to the problems highlighted in Chapters 3 and 5), outcomes from this trial did support the use of MI for PA and exercise programming. Of more interest however was that while the authors did encourage adaptations to the expert-driven model, recommendations

were also made to not dismiss completely the use of information-giving and persuasion. The authors argue that a thorough knowledge of the patient, their circumstances and their preferences is required prior to allocating them to an advice-based or MI based intervention. Brodie and Inoue argue that certain individuals may adhere more to one approach than the other, not necessarily always a client-centred approach such as MI.

Frequently cited studies of MI and PA, such as Harland et al. (1999), have shown equivocal results although it has been suggested that this may due as much to the lack of competence and MI experience of those delivering the intervention rather than the intervention itself (Kerse & Walker, 2000). This would suggest that future research into MI in PA settings must embed treatment fidelity into the trials to account for such issues (Bellg et al., 2005). However, both Harland et al. (1999) and Hillsdon et al. (2002) do suggest that further empirical analysis is required to test the effectiveness of MI. However, a distinction must first be made between the extent of MI (is it a full version or AMI?) and proficiency of the practitioner in delivering the intervention. Not until this issue of treatment fidelity has been determined can more robust decisions be taken regarding the efficacy of MI in PA settings.

A further weakness of studies such as these has been the use of outcome measures which are based on questionnaire responses (e.g., Harland et al., 1999; Hillsdon et al., 2002; Sheedy et al., 2000) which conflicts with the approach. Miller (2006) reports concerns that whereas the intervention [MI] aims to develop cognitive and behavioural change through exploration of ambivalence and elicitation of change talk, the outcome measures of success of these kinds of studies do not reflect this. Miller suggests that "*most questionnaire items are far removed from spontaneous speech and highly susceptible to contextual demand*" (p19). This suggests that behavioural and qualitative feedback is more representative of the interventions effect.

While studies have shown partially successful applications of MI in PA settings, there still lacks a sound foundation which appears to reflect the under-developed research applications when compared to addictions, substance misuse and even probation settings. It is clear then that much greater validity of MI interventions is required in PA settings with more accurately applied and reported content, training and delivery (Ory et al., 2002). This could certainly be a training and competence

issue and the training of MI to practitioners in PA settings must be accurately applied and reported (esepcially in RCT's) before credance can be given to studies suggesting that MI was delivered. Having examined the development and theoretical underpinning of MI, the final section will consider the implications of training PA professionals in MI; the stages involved and the competence levels required.

3.5 Motivational interviewing training: PA and health professionals

The previous sections have highlighted the evidence and conceptual development of MI which formed the basis for the intervention to be examined in Chapters 5, 6 and 7. Chapter 7 specifically examines the effects of training MI to PA professionals and the subsequent outcomes (e.g., programme adoption and adherence) on a patient sample. The clinical procedures of MI are well specified by Miller and Rollnick (1991 & 2002) and Miller, Zweben, DiClemente and Rychtarik (1992) and a reasonable evidence base for the success of MI in treating addictions and modifying behaviours exists (Burke et al., 2002). Indeed the demand for MI training is high and increasing year on year (Baer et al., 2004; Miller, Yahne, Moyers, Martinez & Pirritano, 2004). However, despite the popularity for MI in health settings, there is a dearth of data available regarding the effectiveness and efficiency of existing training which typically takes the form a 2-day workshop (Baer et al., 2004). Moreover, little is known of how best to effect technology transfer of MI to clinicians by training and supervision (Miller & Moyers, 2006).

This section will therefore provide a more detailed critical analysis of training health professionals in MI following its development as a therapy and technique since 1983 (Miller, 1983). It will unpack key issues of training which include the duration and content of training and effectiveness of workshops for trainees from different fields and with different levels of existing counselling skills and training. While most studies and empirical papers that have been published relate to MI training in a substance abuse setting, key principles are similar to those in behaviour change. Where differences may exist these are highlighted in the text. Such similarities between substance abuse and behaviour change counselling do however include the duration of training (2-day workshops; Miller & Mount, 2001), the problems of clinical intervention skills transfer (Rogers, 1995), and problems of skills dissemination from clinical to community settings (Walters, Matson, Baer & Ziedonis,

2005). Moreover, the intervention (MI training) and the population of participants (clinicians) have known characteristics and behavioural outcomes (practice behaviours) across clinical and health setting (Miller et al., 2004). This provides comparability between settings and training issues of MI.

Miller et al. (2004) described a far too simplistic range of questions being asked of the efficacy of training. The authors suggest that rather than a simple question of whether training worked or not far more appropriate would be questions of what it takes to change practice behaviour, what kinds of training interact with client attributes and what effects do different forms of training have on the long term skills of the trainee. The following sub-sections will approach these issues from the perspective of training duration and content, trainee (PA and health professionals) skills and backgrounds and training study outcomes. MI is commensurate to existing environments and approaches taken by clinicians although, while the demand for MI training is high, little is known about how best to develop skills [in approaches such as MI] for these health professionals (Miller et al., 2004). *"The training of practitioners is sometimes viewed as an inconvenient by-product of a more worthy endeavour: getting the patients to change"* (p.169; Rollnick et al., 1999).

3.5.1 Current research on MI training

Studies such as Baer et al. (2004), Miller and Mount (2001), Miller et al. (2004), Rubel, Shepell, Sobell and Miller (2000) and Saitz, Sullivan and Samet (2000) have all examined the specific aspects of clinician training of MI; the dominant duration for training of these groups being 2 days. With regards to these studies however, questions remain in terms of both the content and assessment of competency and inconsistent approaches between studies. As shown in Table 5.6 for example, Rubel et al. used only a paper and pencil assessment of *clinician knowledge* of MI (post-training) with Saitz et al. reporting only clinician self perceptions of their adaptations to practice a number of years later (based on only one 4 hour training workshop). Other studies such as Baer et al. (2004) used a more comprehensive assessment of *clinician competence* although based on coding sessions at 2 months

follow-up with validated instruments[4]. Similarly, Miller and Mount used reported outcome data based on both paper and pencil tests and coded audio tapes. It is these subsequent study designs that provide a greater confidence and potential reflection of practitioner competence, an issue highlighted as fundamental in treatment fidelity (see Chapter 2). However, while the study design may appear more appropriate the actual findings of the Miller and Mount study showed large gains in self-report measures, moderate gains in MI-consistent behaviours but limited reductions in MI-inconsistent behaviours during subsequent client interactions. Baseline MI skills in the Baer et al. study *"left considerable room for improvement"* (p.104) following a 2 day (14 hour) training programme. A result which could be either the workshop or the participants or indeed the patients upon which the MI sessions was performed. While Baer et al. attempted to control for client inconsistency using standardised patients (SP's), results highlighted that MI consistent behaviour was robust even between diverse SP's suggesting that good quality training will account for, and be demonstrated upon, real-life patients with varying dispositions and characteristics. Baer et al. did note however the difficulty in acquiring tapes of real-life clinical meetings made complex by permissions required by both the patient and therapist and the use of recording equipment.

3.5.2 Motivational interviewing training content and duration

The intervention delivered to patients in the PA referral scheme (Chapter 7) was carried out by a PA professional who had received a 2 day training programme in MI. While this was a bespoke programme designed for PA professionals, the duration and content was commensurate to the few studies that have examined MI training. Recent reviews (e.g., Walters et al., 2005) and studies such as Baer et al. (2004) and Miller et al. (2004) have examined the efficacy of MI training although few of these provided detail as to the content of the training. The focus of each was predominantly toward the design, participants and assessment of competency rather than the actual content that was delivered to the trainee's. This resonates closely to the problems highlighted in Chapter 4 whereby empirical evidence of PA counselling lacks detail as to the content of the intervention. This allows for very limited comparisons of, in this

[4] The instruments used were the Helpful response questionnaire (HRQ; Miller, 1991) and Motivational interviewing skills checklist (MISC; Miller, 2000).

case, training techniques relying heavily on the assumption that the delivery of training is consistent and commensurate with appropriate skills development.

While Miller et al. (2004) highlighted the importance of *accurate empathy* as a fundamental clinical skill to be taught during training; only Baer et al. provided any detail as to the topics that were covered in the MI workshops in the study. The Baer et al. paper highlighted micro-MI skills which were described as open questions, reflective listening, summaries, affirmations and eliciting change talk. The study also mentioned briefly the need for clinicians to understand the *collaborative spirit* of MI. Although it is not clear how this was delivered (probably due to word limits and journal capacity) the spirit of MI is so influential in creating an empathetic and respectful therapist (Miller & Rollnick, 1991) and yet receives scant attention in training studies as discussed previously in this chapter. In line with the assessment tools used to assess clinician MI consistency (e.g., HRQ and MISC), the authors reported that clinicians were encouraged to reduce the number of questions, reduce their percentage talk-time, increase the diversity and number of reflections and increase the use of open questions. Global rating scales for MISC (and indeed derivatives such as MI treatment Integrity, MITI; Moyers, Martin, Manuel & Miller, 2003b) reflects these adjustments in practitioner skills and applications by way of global rating scales and Question to Reflection ratio's (Q:R). It is clear that the original focus of MI (Miller & Rollnick, 1991) aimed to create an equal relationship between client and counsellor avoiding traps such as blaming, premature focus and labelling and creating a guiding principle which had at its heart respect, empathy and understanding. The global MI principle of *collaborative spirit* appears to have been somewhat lost or disregarded in many studies of MI training (e.g., Rubak, Sandbaek, Lauritzen, Borch-Johnsen & Christensen, 2006) where studies have tended to focus on the more trainable skills and techniques. Rubak et al. is similar to other studies that have identified techniques such as reflective listening, affirmations, rolling with resistance and accurate empathy although the MI context within which these were first developed is less explicit.

It is suggested by Baer et al (2004) that the dominant period as suggested previously is 2 days. However, to deliver complex communication skills and embed a change in style and approach to the patient is generally regarded as a change in self

and as Miller describes there is a difference between *doing* MI and *being* MI. The latter suggests a greater appreciation of the *spirit* of MI which reduces the dependence on the acquisition of skills, rather adapting the clinicians approach and way of working with the client, in essence moving from expert (or clinician centred) to client-centred. This is an ongoing process of support and coaching which may require more than a 2-day workshop (Miller & Moyers, 2006).

3.5.3 Recommendations for training PA professionals in MI

What is clear from the existing studies of MI training is the inconsistent duration and content of workshops even though the underpinning concepts and techniques (including the collaborative spirit) of MI have been clearly presented (e.g., Miller & Rollnick, 1995). It does appear that workshops delivered over 2-days appear the norm and while not the optimal (ongoing supervised training appears to offer this) the duration and frequency is determined by funding authorities. However, the scope of this chapter is not to examine the financial, logistical, sociological or political aspects of this but rather to focus on the content of training MI for PA professionals.

Following an examination of evidence this sections aims to identify the characteristics and content of training that are reasonable to expect in a 2-day training programme and perhaps more importantly to highlight priorities in light of papers such as that of Miller and Moyers (2006) who have provided the sequential stages of learning MI. The principles of MI are a spine throughout the stages of learning although have been enhanced by the work of Amrhein et al. (2003). This psycholinguistic research has informed the most recent guidelines and training recommendations. Miller and Moyers (2006) produced the stages within which they had found practitioners acquire the skills in MI. These are currently the most concise and systematic guidelines toward MI training and as such are suggested providing a sound framework for MI training to PA professionals. The stages are recommended as a framework for training and evaluation of practitioner expertise. The sequential learning of each stage provides a set of building blocks with each stage underpinning the next. The stages are headlined below and the reader is referred to Miller and Moyers (2006) for a full description of each stage (Appendix 3.2 expands each stage for MI training to PA professionals).

STAGE 1: The spirit of motivational interviewing.
STAGE 2: OARS: Client-centred counselling skills
STAGE 3: Recognising and reinforcing change talk
STAGE 4: Eliciting and strengthening change talk
STAGE 5: Rolling with resistance
STAGE 6: Developing a change plan
STAGE 7: Consolidating client commitment
STAGE 8: Switching between MI and other counselling methods

A framework such as this does raise questions for training in PA settings that are seldom considered. One key question are the base skills with which PA practitioners approach MI (and similar) training. This may help to distinguish between this group and others such as allied health practitioners in their skilfulness in working with patients. MI trainers continue to explore the best-practice of MI training in terms of time, content, philosophy and follow-up. As highlighted by Corbett (2006) MI proficiency is best developed following 2-3 days of practice with feedback followed by individual coaching, telephone follow-up and feedback based on taped-sessions (including assessment of skills proficiency using coding).

3.6 Discussion

The current chapter examined what MI was and its conceptual and theoretical underpinning. What is clear (and supported by Miller, 2006) is that MI was not developed or grounded on a theoretical model but rather arose from practice. This Miller suggests, has led to many making more of the conceptual link of MI to TTM (and stages of change) than was intended. It is now apparent that extensive criticisms of TTM from authors such as Bunton, Baldwin, Flynn and Whitelaw (2000) and West (2005) are leading many to look for other theoretical explanations for the predominantly successful MI approach. It does appear then that MI has reached a point whereby mature examinations of its application are providing researchers and practitioners with a less myopic vision of the theory of MI. This appears to be a turning point whereby theories of behaviour change such as SDT (e.g., Markland et al., 2005) are finding favour by explaining the intrinsic nature of sustainable behaviour change with MI.

It is clear that MI does provide a set of skills and techniques that will assist health professionals to work more effectively with patients. However, a thorough and appropriate application of MI to patients is suggested by Miller and Rollnick (1995) to demand more than just these components since it is more a *counselling style* that requires careful training. Indeed, the behavioural outcomes of client's have been found to be affected by the characteristics of the therapist by whom they are counselled (Najavits & Weiss, 1994) rather than merely the techniques they use. Training of these techniques and the style (or spirit) of MI is difficult and is restricted by the time and funding available. Moreover the varied skills base and the level of ability that workshop participants enter the training with will have an effect. Subsequently one-shot training of MI in health and PA settings is the norm although rather frustratingly (although again unsurprising) there is little empirical evidence to suggest that single workshop delivery of such interventions is sufficient to create longitudinal changes in clinician counselling behaviours (Miller et al., 2004). Moreover, Rollnick et al. (1999) suggest that MI is too onerous a style for many health settings which requires extensive training and skill development. Rollnick et al. suggest that brief strategies which are underpinned with listening skills are likely to be more efficacious and realistic for health practitioners to learn. This more pragmatic approach questions the relevance of techniques such as reflection (which are time consuming to learn) in favour of summaries and action planning based on the shorter model of brief interventions. It would appear that this approach may be more relevant in PA settings than the formal multiple MI delivery since patients enter sessions expecting 'action'.

While the 8 stages of learning MI does provide a logical and systematic approach based on empirical and experiential findings, it is clear that additional ongoing support is necessary to provide coaching and performance feedback in order to improve PA professional's skilfulness in MI (Miller et al., 2004). This approach in developing counselling and behaviour change skills using an ongoing supervisory (or mentoring) approach is currently missing from workshops provided by training bodies such as the British Association of Cardiac Rehabilitation (BACR) and Register of Exercise Professionals (REPS). However, accreditation standards and guidelines are currently being produced by both the British Psychological Society (BPS; 2006) and British Association of Sport and Exercise Sciences (BASES; 2006) specific to the PA

and exercise environments. Although this is too late for those currently holding qualifications from the BACR and REPS (unless ongoing training is taken) , the increasing demand for MI training to these groups may provide an opportunity to address the current dearth of proficiency in generic skills such as accurate empathy and a general understanding of client-centeredness. It is this underpinning approach that appears so pivotal to MI. Indeed, adaptations (e.g., brief interventions) appear more effective where this meeting between experts (Tuckett et al, 1985) approach is taken as opposed to the PA or health professional taking the single expert role. In briefer consultations or 'brief interventions' full MI interventions may not be possible. A PA professional may then need to highlight the core skills commensurate with the spirit of MI whilst working within the time constraints of a PA referral. Such skills (taken from MI) would be the technical aspects such as client-centred counselling, reflective listening and dealing with resistance (Emmons & Rollnick, 2001). The skill for the MI trainer may then be to assist the PA professional in determining the extent to which they have the capacity to apply counselling skills and select accordingly the technical skills they are best able to learn and deliver proficiently.

What cannot be underestimated is the impact of psycholinguistic research such as that or Amrhein et al. (2003) and Amrhein (2004) for the development of MI. The micro skills of client commitment language have indeed opened up a myriad of issues and will demand future empirical research to demonstrate its effectiveness (Knight et al., 2006). However, by virtue of the fact that MI is critiquing its effectives through studies such as MARMITE (Hettema et al., 2005) demonstrates a willingness to self-critique and provide an empirically supported therapeutic intervention. It must also be understood by practitioners that MI has not been developed as a single therapy but rather has found most effect when applied as an adjunct to other techniques. Moreover, the synergistic effects of MI have been shown to endure over periods in excess of a year (Hettema et al., 2005). Miller and Rollnick (1991) described these alternative therapies as including twelve-step programmes, behavioural training, and cognitive therapy. However, evidence from recent reviews (e.g., Britt et al., 2004; Heather, 2005; Rubak et al., 2005) have highlighted that while MI has a wealth of support in addiction settings there is a real need for research into MI *per se* rather than derivatives and adaptations in addition to examining more extensively its benefits in behaviour change settings such as PA.

Chapter 4 (Study 1): Systematic review of physical activity counselling

4.1 Introduction

Evidence reviewed in Chapter 2 (e.g., Department of Health, 2004a) suggested that physical activity (PA) health behaviour change is high on the NHS agenda. Indeed the introduction of 'Health Trainers' appears to be a significant drive by the government to provide support mechanisms to effect this change in community settings. It is however clear that behaviour change is challenging for the individual and those strategies for primary care, allied health professionals and PA specialists need to appreciate this personal challenge. While a number of interventions such as physical activity referral schemes (PARS) have been delivered in conjunction with primary care settings the results so far have proved equivocal (Graham et al., 2005). As suggested previously this may be the result of inconsistency in the intervention itself. While epidemiological and physiological evidence is increasingly robust (Sallis & Owen, 1999) doubts remain over the behavioural and cognitive processes involved and the 'generalist' or 'specialist' roles of those delivering the counselling intervention (James & Johnston, 2004).

Guidelines for PA counselling were presented and critically examined in Chapter 2 which illustrated that appropriate examples have been presented (e.g., Loughlan & Mutrie, 1995) although inconsistent applications of these methods have been often resulted. Moreover, the context within which the intervention is delivered has been questioned and concerns have been raised over the internal validity of interventions which do not exhibit clear treatment fidelity frameworks (Ory et al., 2002). The first study will therefore explore (by carrying out a systematic review) the quality of PA counselling interventions in terms of their integration of theoretical behaviour change frameworks and the training and competency of those delivering the counselling intervention. This will provide a foundation from which the intervention delivered in Chapter 5 can be introduced in an attempt to accommodate limitations in existing studies.

4.2 Current problems in behaviour change counselling

As illustrated in Chapter 2, there has been an increasing call for researchers to fully articulate the exact nature of their interventions for behaviour change

counselling. The approach adopted is termed *treatment fidelity* (Resnick et al., 2005). However, while health behaviour change research has for some time embedded fidelity tests into counselling interventions and research (Dusenbury, Brannigan, Falco & Hansen, 2003; Fiander, Burns, McHugo & Drake, 2003; Hahn, Noland, Rayens & Christie, 2002), it has been suggested that there is inconsistency in their use (Bellg et al., 2004). The training of practitioners has also been cited as a concern. Bellg et al. (2004) reported that preserving internal validity and enhancing external validity in studies receives scant attention in research journals and training curricula. The authors compare this lack of attention to the importance placed on the validity and reliability of questionnaires and other instruments.

This study uses an example framework for treatment fidelity (Bellg et al., 2004; Resnick et al., 2005) to examine, by way of a systematic review, the detail reported in PA counselling interventions. It then reports implications for future interventions and offers guidelines for designing and implementing PA counselling interventions. For additional detail on the BCC treatment fidelity framework the reader is referred to Chapter 2 (Section 2.6.2).

4.3 Why a systematic review?

A variety of interventions have been applied in clinical and community settings which have included a PA component. In order to assess the quality of these interventions a systematic review of PA counselling studies was carried out to:

- assess the impact of PA counselling on behaviour change;
- identify the extent to which PA counselling adopts a treatment fidelity approach;
- review the use of underpinning theoretical models and frameworks in the development of the intervention;
- critically examine the interventionist and level of training prior to the delivery of the intervention;
- identify the opportunity for the adoption of fidelity treatment at all stages of the research process.
- examine the outcomes measured (e.g., epidemiological, behavioural & cognitive).

4.4 Methods

The methodology for Study 1 was qualitative in nature and based on the Cochrane collaboration systematic review guidelines as reported by Van Tulder, Furlan, Bombardier and Bouter (2003).

4.4.1 Selection of studies for inclusion

A search of the following major electronic databases was used to identify relevant papers for inclusion in the review: Psychinfo, Sciencedirect, Cinahl, Web of Science and Scopus. The review was interested in interventions that included an element of counselling and that required personal interaction, patient-centeredness and sound communication. Loughlan and Mutrie (1995) provided some of the first UK guidelines for exercise and PA counselling which logically provided the lower date limit for the current search. Key search terms were 'physical activity counselling', 'physical activity consultation', 'exercise counselling' and 'exercise consultation'. Papers retrieved using these search terms were included in the review if they met the following criteria:

1. English language.
2. Published in an international peer-reviewed journal.
3. Randomised controlled trials (RCTs) based explicitly on physical activity/exercise behaviour change counselling or consultation and not as an adjunct to a larger behaviour change intervention or in conjunction with other lifestyle behaviours (trials in which the physical activity counselling or consultation is conducted as part of a larger intervention or in conjunction with another health behaviour cannot demonstrate the absolute effect of the exercise counselling or consultation).
4. Individually adapted (i.e., not group), face-to-face (i.e., not telephone or mail) behaviour change interventions.
5. Interventions aiming to increase physical activity and include behavioural or cognitive outcome measures (the effect of a physical activity behaviour change intervention can measured by observing differences in physical activity levels or by evaluating cognitive processes that determine behaviour change (e.g., stage of change, self-efficacy, perceived benefits of physical activity)).

6. Publication between the Loughlan and Mutrie (1995) guidelines and 2006 inclusive.
7. Adult population (age ≥ 16 years).

4.4.2 Procedures

Hard copies of those publications that met the inclusion criteria were obtained and analysed based on the aims of the review. The selection procedure involved two researchers in order that any discrepancies could be discussed and resolved. Main outcomes were analysed as were theoretical frameworks and treatment fidelity regimens for each study. Once selected, study corresponding authors were contacted to fully examine procedures (regarding PA counselling training and competence). This was done to clarify whether the PA counselling competence had been assessed although omitted due to page limits, assessed and published or reported elsewhere or whether no assessment of practitioner PA counselling competence had been applied.

4.4.3 Data Extraction

In addition to the quality assessment of each RCT, the following data was extracted using a structured form: design, treatments, consultation (theoretical framework), consultant (interventionist), intensity (and follow-up), duration, outcome measures and outcome results. Based on the BCC framework, a descriptive account was formulated to identify the strengths and weaknesses in the literature, with specific references to the BCC components of treatment fidelity (Table 4.1). Where procedures (regarding PA counselling training and competence) were not fully described for the included studies, corresponding authors were contacted for further details. This was done to clarify whether the PA counselling competence had been assessed although omitted due to page limits, assessed and published or reported elsewhere or whether no assessment of practitioner PA counselling competence had been applied. The results are presented in Table 4.1.

Table 4.1 Behaviour change studies including a physical activity counselling component.

Study	Year	Journal	Design	Treatments	Consultation (theoretical framework)	Consultant (interventionist)	Intensity	Study Duration	Training / Intervention manual	Outcome Measures	Outcomes (
Harland et al	1999	BMJ	RCT	Brief v intense counseling with/without vouchers, control	"MI"	Health visitor trained in MI	1 session (40min) / 6 sessions over 12 weeks	12 months	Not mentioned in paper	Behavioural	No signific effects
Calfas et al	2000	Am J Prev Med	RCT	Cognitive behavioural intervention, knowledge-orientated intervention (control)	Lectures based on TTM, SCT with follow up counselling phone calls	Trained behavioural science faculty members and counselors.	50 mins weekly for 15 weeks, phone/mail follow-ups for 18 months	24 months	Not mentioned in paper	Phys	No signific effects for outcomes Behaviour processes change (+) interventi women
Day & Nettleton	2001	Health Bulletin	questionnaire post scheme attendance	Referral scheme	Non specific; motivating behaviour change	Exerc scheme advisor	Unknown	N/A	Not mentioned in paper	Behavioural	40% of respondents significant active at le twice a we
Activity Counselling Trial Research Group (ACTRG)	2001	JAMA	RCT	Advice, advice plus counselling, advice plus counselling plus telephone support	Brief advice based on national recommendations	Physicians / health educators trained by ACT behavioural scientists	1 x 30-40 minute session plus 1 telephone call, further 2 x weekly (6 weeks) and then monthly (1 year) in intense group	24 months	Not mentioned in paper	Behavioural & Phys	VO2 max (+ assistance counselling vs. advice
Titze et al	2001	Psych of Sport & Exerc	Quasi-Experimental	Information/actions for daily life activities/fitness sessions/counseling	"Counselling" no further details	Exerc professional	"Approximately" every 3 weeks for 4 months	4 months	Not mentioned in paper	Cognitive & Behavioural	Significa progressi across the st of chang
Hillsdon et al	2002	Int J Epid	RCT	Direct Advice, BN, control (no intervention)	Clearly defined BN	Health promotion specialist	1 x 30 min with 6 telephone follow-ups	12 months	Not mentioned in paper	Behavioural & Phys	No signific effects

Study	Year	Journal	Design	Treatments	Consultation (theoretical framework)	Consultant (interventionist)	Intensity	Study Duration	Training / Intervention manual	Outcome Measures	Outcomes (-
Hughes et al.	2002	J Cardio - pulmonary Rehab	RCT	Exercise consultation & standard exercise leaflet, or leaflet alone	"Consultation / counselling" matched to stage of exercise behaviour change	Researcher	1 x 30 min	17 weeks	Not mentioned in paper	Behavioural	Short tern adherence to (+) for consultation
Lowther et al.	2002	J Sport Sciences	2 x RCTs	Fitness assessment/control, exerc consultation/control	"Consultation" in accordance with Loughlan & Mutrie (1995).	Researcher	1 x 30 min	12 months	A standard consultation form was followed by the researcher	Behavioural	PA (+) for th receiving ex consultatio
Burke et al	2003b	J Clin Epid	RCT	6 module diet and physical activity programme. high-level - 3 group session/3 mailed, low-level - all mailed, control - no intervention	Informed-based interactive approach to group sessions	Unknown	3 contact modules in 16 weeks	12 months	Not mentioned in paper	Phys & Behavioural	Physical fitn (+) & epi measures (- the high level
Melanson et al	2004	Nutrition	RCT 2-phased	Phase 1 - Exerc only, or exerc plus diet. Phase 2 - no treatment	"Counselling" in accordance with principles put forth by the American College of Sports Medicine (ACSM)	Exerc physiologist / dietitian	Weekly (phase 1)	12/24 weeks	Not mentioned in paper	Phys & Cognitive	Weight & BM for diet/ exerc but not for ex only grp. F mass & wa circum (-) f both grps
Kirk et al.	2004a	Am J Prev Med	RCT	Standard leaflet + counselling, or leaflet alone	Counselling/consultation (multiple terminology) based on TTM, motivational theory/CBT	Trained research assistant	2 x 30 min (baseline and 6 months) + 2 telephone follow-ups (1 and 3 months)	12 months	Not mentioned in paper	Behavioural & Cognitive	PA levels (+ experimental
Kirk et al.	2004b	Diabetolgia	RCT	Standard leaflet + counselling, or leaflet alone	PA counselling was conducted in accordance with Loughlan & Mutrie (1995).	Trained research assistant	1 x 30 min	12 months	Not mentioned in paper	Behavioural & Phys	PA (+) in experimental vs. contro

Study	Year	Journal	Design	Treatments	Consultation (theoretical framework)	Consultant (interventionist)	Intensity	Study Duration	Training / Intervention manual	Outcome Measures	Outcomes (
Kim et al	2004	Int J Nurs Studies	control group pre- and post-test design	Exerc consultation plus prescription, standard educational advice (control)	Stage-matched exerc counselling strategy	Researcher	1 x 60-90 min with telephone follow-ups twice weekly	3 months	Not mentioned in paper	Cognitive, Behavioural & Phys	PA levels (epid measure in intervent grp vs. cont
Prochaska & Sallis	2004	Health Psych	RCT	PA counselling, PA plus diet counselling, control	Modified version of Patient-Centred Assessment and Counselling for Exerc	Unknown	1 x 30 min	3 months	Not mentioned in paper	Behavioural	PA (+) for b but not gir
Aittasalo et al	2004	Pat Ed & Couns	RCT	Counselling, counselling plus fitness, control	Goal-setting, advice giving, based on TTM, supporting self-efficacy	Occupational nurse (numerous); received 11 hrs of training	4 sessions - baseline, 8 weeks, 6 and 12 months	12 months	A Handbook was given to all interventionists	Behavioural & Cognitive	No signific effects
Armit et al	2005	J of Sci & Med in Sport	RCT	Brief verbal and written advice, individualized counselling and follow up phone calls with or without a pedometer	Tailored PA counselling	GP - verbal & written advice, exerc scientist - counselling	1 session of 15-20 minutes	24 weeks	Not mentioned in paper	Phys	No signific effects
Jimmy & Martin	2005	Pat Ed & Couns	RCT	Advice + counselling session, control	Flexible depending on stage of change (motivation/action orientated), no model given	Physicians & practice assistants with 6-hrs training	1 x 45 min + 3 phone follow-ups.	14 months	All interventionists received a document after attending training outlining the counselling protocol	Behavioural	PA increased both interven grps. No betv grp effect
Fitzgibbon et al	2005	Prev Med	RCT	Combined exerc, diet and breast health intervention	Teaching/supporting PA based on social cognitive theory plus exerc training, control	Unknown, trained interventionist, certified by master trainer	45 minute session (all components) once per week for 20 weeks	20 weeks	Not mentioned in paper	Phys & Behavioural	PA (+) for intervention vs. contro
Marshall et al	2005	Pat Ed & Couns	RCT	Advice/support on PA to promote general health (patients without hypertension) or to reduce risk factor (hypertension groups, 2 control groups	Negotiation of preferred activity plus advice, booklets on behaviour change	Physician trained for either 1 hr (individually) or 2-3hrs (group training sessions)	1 session - unknown duration	6 months	Not mentioned in paper	Behavioural	No signific effects

Study	Year	Journal	Design	Treatments	Consultation (theoretical framework)	Consultant (interventionist)	Intensity	Study Duration	Training / Intervention manual	Outcome Measures	Outcomes (
Riebe et al	2005	Prev Med	pre- and post-test with follow up	Weight management program (overall lifestyle), behavioural counselling, nutrition education, exerc sessions	Based on principles and processes of TTM; stage-specific strategies	Unknown, trained interventionist	2-h sessions/week for 3 months, 8 sessions in next 3 months (not exercise specific)	24 months	Not mentioned in paper	Phys Behavioural & Cognitive	Epid measure & PA (+)
Pinto et al	2005	Am J Prev Med	RCT	Brief advice with follow up telephone counselling or brief advice alone	HBC based on 5A's framework tailored to patients stage of readiness	Medical students & general internists trained for 45 mins	3 face to face PA counselling sessions, 12 PA counselling phone calls	9 months	Not mentioned in paper	Phys & Behavioural	Participation in extende advice grp brief advice
Kerse et at	2005	J of Am Geriatrics Soc	RCT	PA counselling or control group	Brief activity counselling	Primary care doctors or practice nurses	1 session, unknown duration, 3 follow-up phone calls	12 months follow up	Not mentioned in paper	Phys & Behavioural	Activity leve energy expenditure between intervention & control
Aittasalo et al	2006	Prev Med	RCT	Prescription based counselling, self monitoring or control	Physical activity counselling based on the 5 A's framework	Physicians - trained for 2 hours	1 session Unknown duration	6 months	User Guides were provided to all trainee participants	Behavioural & Phys	PA (+) fo intervention vs. contro
de Blok et al	2006	Pat Ed & Couns	RCT	Regular rehab program plus 4 counselling sessions or regular rehab only	Counselors followed the general principles of MI	Physical therapist	4 sessions of 30 minutes spread over 11 weeks	9-11 weeks	Not mentioned in paper	Phys Cognitive & Behavioural	PA levels (+) experimental vs. contro

PA, physical activity; HBC, health behaviour counselling; TTM, transtheoretical model; SCT, social cognitive theory; BN, brief negotiation; MI, motivational interviewing; Phys, physiological; vs., versus; grp, group; BM, body mass; exerc, exercise; circum, circumference; (+), significant increase; (-), significant decrease

4.5 Results of the systematic review

The systematic review identified 25 articles that examined the efficacy of PA/exercise counselling or consultations. Table 4.1 shows a summary of the main characteristics of each study. All 25 articles met the inclusion criteria. Some studies did involve telephone counselling as part of the intervention (ACTRG, 2001; Armit et al., 2005; Pinto, Goldstein, Ashba, Sciamanna, & Jette, 2005). However, because the main counselling intervention was face to face these studies were included. Although the search criteria were for studies between 1995 and 2006, only 2 of the included studies were published before 2000 (Taylor, Doust & Webborn, 1998; Harland et al., 1999). Fifteen of the twenty five studies included were published after 2003, suggesting an increased focus in recent years.

4.5.1 Outcome for Design and treatment

While the review criteria were RCT only, this was found to be the dominant design when not filtering by the search parameters. This followed a very prescriptive, positivistic (medical model) approach with cause-and-effect outcome measures defined within behavioural dimensions and time constraints. When mapping the Behaviour Change Consortium (BCC) framework for 'design', same treatment dose is assumed but none of the studies highlighted how this was achieved nor the strategy employed. This is especially important for multiple health behaviours such as exercise, diet and smoking and yet no allowance for the same level of information per health behaviour is reported.

4.5.2 Outcome for Counselling type, provider and training

A wide variety of descriptive terms were used to define the type of counselling used in each study. The most common were counselling (e.g., Kirk et al., 2004a and 2004b) and physical activity counselling (Kim et al., 2004; Lowther et al., 2002), although terms such as brief advice (e.g., ACTRG, 2001), behavioural counselling (e.g., Riebe et al., 2005) and physical activity consultations (e.g., Lowther et al., 2002) were also used. One notable observation concerning these definitions is the lack of consistency within each definition concerning the exact nature of the counselling delivered. As a result it is hard to identify consistent differences between the various definitions used and subsequently develop an understanding of what each one refers to. In some studies researchers even used multiple terminologies such as counselling

and consultation when describing the same intervention (e.g., Hughes et al., 2002; Kirk et al., 2004b).

Most of the studies described the methods and/or theoretical underpinnings of their counselling intervention. While some offered good descriptions of the interventions involved (e.g., Hillsdon et al., 2002; Kirk et al., 2004a), some merely identified a style or framework such as Motivational Interviewing (e.g., de Blok et al., 2006; Harland et al., 1999) or the 5A's framework (e.g., Aittasalo, Miilunpalo, Kukkonen-Harjula & Pasanen, 2006; Pinto et al., 2005) and then provided very brief descriptions concerning the methods used. In some cases detailed descriptions regarding the processes involved in the interventions were included, such as setting goals or planning for future barriers (e.g., Jimmy & Martin, 2005; ACTRG, 2001). No studies provided information regarding the specific 'interpersonal style' or 'core conditions' of the counselling interventions (e.g., client-centred, empathetic understanding or congruence and understanding; Nelson-Jones, 2005)

The providers or interventionists in the reviewed studies represented researchers (e.g., Lowther et al., 2002; Kim et al., 2004), primary care workers (e.g., Armit et al., 2005; Kerse, Elley, Robinson & Arroll, 2005), exercise scientists (e.g., Melanson et al., 2004) and other health professionals (e.g., de Blok et al., 2006). A number of studies failed to identify who the intervention was delivered by (e.g., Fitzgibbon et al., 2005; Prochaska & Sallis, 2004; Burke, Giangiulio, Gillam, Beilin & Houghton, 2003b; Riebe et al., 2005). The BCC framework identifies provider training as an important area where fidelity needs to be considered. Twelve of the twenty-four studies identified that providers received training (e.g., Aittasalo et al., 2006; Pinto et al., 2005; Jimmy and Martin, 2005). However, only five of these (ACTRG, 2001; Aittasalo et al., 2004; Aittasalo et al., 2006; Jimmy & Martin, 2005; Pinto et al., 2005) included any information concerning the frequency, duration and content of training. Of those five studies, training ranged from 1 session of 45 mins (Pinto et al, 2005) to eleven hours of training spread over four sessions (Aittasalo et al., 2004).

The BCC framework highlights the importance of ensuring provider acquisition. However, once again, there is very little evidence in the reviewed studies

concerning the competence of the interventionists. For example, Aittasalo et al. (2004) provided a detailed description of the methods employed to train practice nurses in the delivery of their counselling intervention, but no assessment of competence after training was implemented. Therefore, despite evidence of extensive training, there was no evidence to say that the interventionists had acquired the appropriate skills or that they had demonstrated a level of competence in the application of these skills. Further, the majority of studies reviewed failed to even mention training at all.

4.5.3 Outcome for intensity and frequency of counselling delivery

The BCC framework recommends controlling for provider and treatment differences, and ensuring adherence to the treatment protocol as strategies for monitoring and improving treatment delivery. Only three studies involved any sort of assessment of competence or monitoring process (Fitzgibbon et al., 2005; Calfas et al., 2000; ACTRG, 2001). These involved checklists, (ACTRG, 2001), reviewing audiotapes (ACTRG, 2001; Calfas et al., 2000) and providing certification of competence (Fitzgibbon et al., 2005). However, the details of these procedures were not clear and the reasons for conducting assessments of practitioner competence were not specified. The intensity, frequency and duration of interventions were also highly variable. Some studies involved just one 30 minute consultation (e.g., Lowther et al., 2002; Prochaska & Sallis, 2004), whereas other studies involved much more intensive counselling interventions containing multiple counselling sessions and follow up phone calls (e.g., Pinto et al., 2005). There appears to be no consensus regarding appropriate intensity, frequency or duration of counselling interventions.

4.5.4 Outcome for intervention duration

Programme duration ranged from 9 weeks to 24 months. However, PA counselling was usually conducted in the first 3 months (e.g., Jimmy & Martin, 2005; Marshall, Booth & Bauman, 2005) and then follow-ups ranged from 4 weeks (Hughes et al., 2002) to 24 months (Activity Counselling Trial Research Group, 2001; Riebe et al., 2005; Calfas et al., 2000). Therefore, another inconsistency concerns the duration of the intervention and frequency and timing of the follow-ups.

4.5.5 Outcome measures and study results

For the purposes of this review, outcome measures were categorized into either physiological (e.g., heart rate (HR), blood pressure (BP), body mass index (BMI)), behavioural (adherence) or cognitive (perceptions) outcomes. Most of the studies included outcome measures from more than one category. The most common outcome measures were behavioural (e.g., PA questionnaires; Calfas et al., 2000; Titze, Martin, Seiler, Stronegger & Marti, 2001) and physiological (e.g., HR, BMI; Burke et al., 2003b; Melanson et al., 2004). Only a very small proportion of the reviewed studies included cognitive outcome measures (i.e. stages of change questionnaire (e.g., Titze et al., 2001), processes of change questionnaire (e.g., Riebe et al., 2005), decisional balance measures (e.g., Riebe et al., 2005) or self efficacy measures (e.g., de Blok et al., 2006). As might be expected from such a diversity of outcome measures, the results are themselves varied. 13 studies (54%) reported significant effects with behavioural (e.g., Lowther et al., 2002), epidemiological/ physiological (ACTRG, 2001) or cognitive (Titze et al., 2001) outcomes. Those studies reporting mixed responses (25% of studies) were often the result of significance between demographic groups such as male vs. female (e.g., Calfas et al., 2000). Only 5 studies (21%) reported no significant effects of the PA counselling across either behavioural, cognitive or epidemiological/physiological components (e.g., Hillsdon et al., 2002).

4.5.6 Summary of key points

When considering the reviewed studies in relation to the BCC guidelines the following was found:

- There has been a significant interest in recent years in studies which include a PA counselling intervention.
- *Design*; many of the interventions did provide some outline of the underlying theoretical construct upon which the intervention was based, the dominant model being the transtheoretical model (and stages of change).
- *Training*; only four of the studies described the intensity, frequency or duration of training in PA counselling delivered to those providing the intervention and no studies indicated whether the interventionists had acquired the appropriate skills, or a level of competence, in the application of these skills.

- *Delivery*; only three studies involved any sort of assessment of competence or monitoring process and the intensity and frequency of interventions was also highly variable.
- *Receipt*; No studies reported how well the recipient understood the intervention delivered and their ability to apply it both cognitively and behaviourally.
- *Enactment*; the most common outcome measures were behavioural and epidemiological (18 studies) with only seven of the reviewed studies including a cognitive outcome measure.

4.6 Discussion

A focus on behavioural and physiological outcomes have provided equivocal results regarding the effectiveness of PA counselling (Michie & Abraham, 2004). Therefore recent research has begun to embrace a cognitive and motivational component to the PA intervention. However, this has not been as effective as perhaps it could be, not necessarily due to the intervention per se, but rather the framework within which the intervention sits or lack thereof. Findings of the current systematic review supported findings cited in Chapter 4 which identified concerns over the quality, consistency and reliability of PA counselling interventions. The current review identified this and other key findings which will provide key indicators for future interventions and those delivered in subsequent chapters in this thesis.

4.6.1 The exponential increase in studies which include a PA counselling component

Part of the reason for the exponential increase in studies including a PA counselling component may be that research has typically been outcome focussed, positivistic, and with an emphasis on physiological outcomes (Crone et al., 2005). There has been an increased awareness of the need to embed cognitive and behavioural components into PA behaviour change. As highlighted in Chapters 2 and 3 there has also been an appreciation in recent years of the need for greater motivation and support for PA and lifestyle change which moves beyond advice and education (Foster et al., 2005). People have the intellect and knowledge about PA but they often lack the motivation to do anything about it (Secretary of State for Health, 2004).

Therefore, PA counselling has increasingly been seen as the vehicle to engender this motivation and support. The location for the PA counselling intervention has become increasingly varied and innovative. Delivery of PA counselling interventions within primary health sectors involving allied health professionals has also occurred as a result of public health initiatives and policy (McKenna & Vernon, 2004).

4.6.2 Why was this review necessary?

Health care systems have limited budgets and as a result cannot be expected to continue to fund and develop interventions that lack grounded theory, clarity of delivery of the intervention and confirmation of receipt of training by practitioners. Therefore, the BCC framework has occurred at an opportune moment since health psychology has begun to embrace a more rigorous analysis of design, monitoring, and evaluation. Results of the current review highlight that none of the PA counselling interventions have addressed these issues. At best, PA counselling interventions indicate a theoretical underpinning but do not fully articulate the application of theory to practice by specifically detailing how components of (for example TTM) have been applied. For example, several studies cite the Loughlan and Mutrie guidelines and an approach based on the 'stages of change' and the 'transtheoretical model' (e.g., Hughes et al., 2002; Kirk et al., 2004a, 2003, 2001). While this provides a theoretically grounded approach it provides little detail as to how to interact with the client, elicit their perceptions of the need and desire for change and how to deal with more subtle issues such as client ambivalence and resistance. This has highlighted a lack of theoretical underpinning, illustrated that the original 1995 (Loughlan & Mutrie) guidelines have not been accurately applied, and that one of the most important elements which is the interaction style and client-centeredness has been diluted or ignored altogether.

Arguably just as important as the content and style of the intervention is the application of a consistent protocol. In-service training of GP's in the US and UK has shown that a systematic patient-centred protocol for PA promotion is efficacious (McKenna and Vernon, 2004). When compared to loose guidelines or recommendations that are not underpinned with provision or training into the *how* and *what* to deliver "*protocols for physical activity counselling may remove some of the*

ambiguities inherent in counselling for changes in [PA] behaviour." (Long et al., 1996: p.74). Guidelines such as those of Loughlan and Mutrie (1995) provided early frameworks and content for exercise and health professionals and outlined the benefits of a systematic and structured set of contents for the consultation. However, the current review highlighted that the applied field has been slow to expand on this leading still to protocols which lack methodological consistency and empirical rigour.

4.6.3 Applying the BCC framework for PA counselling interventions

The BCC framework (Bellg et al., 2004) has raised awareness of the need for quality assurance in behaviour change counselling, and especially PA, at all stages of the intervention. There are a limited number of strategies (in health behaviour change) which do embed treatment fidelity by applying treatment manuals (Resnick et al., 2002), mentored support (Williams, et al., 2002), and videotape monitoring (Sher, Bellg & Braun, 2002) although there appears to be no application of such fidelity checks in the physical activity behaviour change research in this systematic review. The internal and external validity facets of behaviour change interventions are fundamental for methodological rigour. However, scant attention is paid to these in research-training curricula and there is a perceived lack of importance in published research (Bellg et al., 2004). By comparison, other inventories and measures in similar settings (such as questionnaires) illustrate as a matter of course their reliability and validity. It is also essential to understand the processes and mechanisms of behaviour change. Michie and Abraham (2004) suggest that without understanding these issues researchers and clinicians "*application of behaviour change technologies is likely to be slow, with wheels being re-invented rather than re-applied*" (p. 30).

The BCC framework also raised awareness of the need for a greater integration of theory to practice. It highlighted the importance of a clear design and the 'processes' involved, not just the 'outcomes' that result. The dominance of RCT designs is clearly illustrated in the review and emphasises the research preference for control of variables and control of extraneous factors. This does not however reflect the diverse nature (and reality) of community settings where the majority of PA interventions are delivered and the lack of ecological validity in RCT designs is a major concern. There is an implicit assumption that because the intervention is part of an RCT design that it is standardised. This may not however reflect real-life situations

(Estabrooks & Gyurcsik, 2003). The measure of success should be based on the fidelity and validity of the design as well as physiological, behavioural and cognitive outcomes. Indeed the application of a form of fidelity strategies may assist in overcoming the need for RCT only designs and subsequently accommodate a more ecologically valid design.

Therefore, the reasons we may be getting equivocal results in the use of PA counselling is that studies have not fully analysed (or reported) the design, training of interventionists, quality of delivery of the intervention, receipt of the intervention by the patient and their ability to enact the new strategy. It is imperative that studies fully report not just 'what' they have done but more so embed monitoring and evaluation of how effective the intervention was at all stages. While many substance addiction and health psychology interventions are applying practitioner measures of competency, such as the behavior change counseling index (BECCI; Lane et al., 2005), PA counselling has been slow to do so. The BCC framework may help to explain more accurately why an intervention has succeeded or not.

However, while there appears unequivocal support for improved techniques of fidelity and consistency across health behaviour change interventions, a note of caution has been sounded by some authors suggesting the demand for fidelity testing may be inappropriate for all steps (Leventhal & Friedman, 2004). The authors purport that the approach suggested by the BCC group ignores two things; firstly that there are few theoretically grounded empirical studies of the processes involved in the successful attainment of this sequence. Secondly, trials with perfect fidelity may produce evidence that lacks a conceptual basis for adaptation across different diseases, treatments, patients, practitioners, institutions and cultures and may therefore lack applicability in clinical practice. In light of this it is important for behaviour change interventions to identify the core principles of treatment fidelity that are fundamental to achieving high quality interventions through research design, interventionist training and delivery, to client receipt and enactment. However, while the BCC strategies may appear exhaustive and potentially restrictive (Leventhal & Friedman, 2004) the BCC approach is based on validity and reliability checks from other counselling settings and offers a framework which has never been applied within the context of PA counselling.

4.6.4 Implications for policy, practice and training

The focus of research papers is toward 'outcome' and significance with very few attending to the intervention processes. This has implications for practitioner competency and the design and delivery of professional accreditation programmes offered by organisations such as the American College of Sports Medicine (ACSM) and those in the UK (e.g., British Association of Cardiac Rehabilitation (BACR), the British Association of Sport and Exercise Sciences (BASES), and Skills Active). All are increasingly looking to address behaviour change but have often based their 'evidence', and subsequent training programme content, on studies which fail to consider treatment fidelity issues. The National Institute for Health and Clinical Excellence (NICE) guidelines (2006) are vague in so far as they have not stated process goals and a clear strategy as to how to achieve increased PA behaviour change but have initiated discussions around behaviour change in domains such as PA. While the treatment fidelity approach may provide clearer guidance on the training and techniques required Leventhal and Friedman (2004) suggest the need for a greater understanding of 1) how different forms of implementation of motivation affect training professionals, 2) how professional's style of delivery affects reception, and 3) how and whether differences in reception affect differences in enactment. This may be achieved by using specialists with greater experience and assessed competency in PA counselling. Indeed, it has recently been suggested that specialist physical activity counsellors be trained and referred to from allied health professionals and physicians because they offer the potential to be more effective because of time and knowledge issues (Tulloch et al., 2006).

In a recent meta analysis of Motivational Interviewing efficacy research, Hettema et al. (2005) highlight the fact that when using epidemiological outcome measures, 'sleeper effects' can occur. Therefore, it is important that follow-up tests are conducted at an appropriate time to ensure that the effects of the intervention are properly assessed. This should be included within an intervention protocol which would provide practitioners and trainers with a consistent framework within which to work and assess their competencies. Training protocols could also include some sort of assessment of practitioner competencies in order to ensure high delivery standards and contributing to increased validity in behaviour change intervention studies.

4.6.5 Summary

A traditional qualitative systematic review methodology was applied based on Van Tulder et al. (2003). This style of systematic review enabled a greater exploration of the quality and nature of the reported counselling interventions. Traditional qualitative reviews are now giving way to much more structured systematic overviews (that use a quantitative method) to calculate the overall effect of treatment. It is however, the latter approach that is dependent on the quality of primary studies, which may introduce bias if they are of poor methodological quality (Khan, Daya & Jadad, 1996). While it is a consideration for future reviews (even those that are predominantly qualitative), a test of study quality was not applied to the current study. However, this did not inhibit the potential of the review to meet its aims and emphasise the dearth of treatment fidelity in PA counselling studies. Indeed, the method applied was similar to that of Lawlor and Hanratty (2001) who included an assessment of study quality. However, where Lawlor and Hanratty failed to gain responses from study authors, the current systematic review did do this and was able to clarify significant questions as a result.

Studies incorporating PA counselling do not adhere to a framework for treatment fidelity and this inevitably had an impact on the quality of the intervention at all stages. There is certainly value in the Loughlan and Mutrie (1995) guidelines (who also described a client-centred counselling approach) although subsequent studies (e.g., Bull et al., 1999; Melanson et al., 2004) have failed to adequately apply a detailed protocol or framework for the PA consultation. If fidelity treatment measures (such as the BCC framework) are not applied to such settings then it appears reasonable to suggest that studies need to explain and fully justify why they have not been applied and to report alternative safeguards for quality assurance. There needs to be a greater understanding of the processes involved in the client-PA professional relationship. Examples already exist in addictions settings where psycholinguistic research (e.g., Amrhein et al., 2003) has explored process variables, a paradigm shift that PA counselling should consider. Recent calls have been made for an increase in RCT studies which include a PA counselling component (National Institute for Health and Clinical Excellence, 2006). However, this would currently have to occur in a research environment where the intervention is not fully understood. A greater awareness then of the *style* of the interaction, and the relationship between the PA

specialist and client, may facilitate greater self awareness and change talk from the client and provide a more appropriate, client-centred, PA consultation. Future research should consider the application of frameworks such as BCC in PA settings and emphasise trainer competency, patient receipt of the change strategy and a consistent PA counselling protocol which has treatment fidelity at its core.

Chapter 5 (Study 2): Competence testing for MI interventions

5.1 Introduction

McKenna and Vernon (2004) suggest that PA counselling, and attempts to effect a health behaviour change within general practice, have shown equivocal results caused by the varied skill and confidence levels of the practitioner, as well as a lack of in-service training (Tulloch et al., 2006). Despite these frequently cited problems there have been increasing calls for PA counselling to be delivered by primary care providers (Ory et al., 2002). As highlighted in Chapter 2 there is an increasing need for high quality counselling which is reliable and consistent and which is underpinned by a sound theoretical model (Resnick et al., 2005). The aim of the current study is to examine the consistency and proficiency of the practitioner delivering the intervention in Study 3 (See Chapter 6). This fidelity check was carried out prior to applying motivational interviewing (MI; Miller & Rollnick, 2002) in a randomised control setting in order to minimise variance in the counselling intervention and to examine its applicability in a PA behaviour change setting. In order to examine whether MI is properly practised clinically, a standardised coding system should be applied for monitoring both MI style and technique (Dunn, Deroo & Rivara, 2001).

5.1.1 The MI coding instruments

The intervention was assessed using both the MI Skills Code (MISC; Miller, Moyers, Ernst & Amrhein, 2003) and the MI treatment integrity (MITI; Moyers et al., 2003b). MISC is designed for conducting detailed process research investigating the critical elements and causal mechanisms within MI and cannot be replaced by MITI for these purposes (Moyers et al., 2003b). The application of MITI however, is suitable when targeted feedback is required or when a simple assessment is required of practitioner consistency to MI principles and practices (Bennett, Roberts, Vaughan, Gibbons & Rouse, 2006). It therefore takes a global score of MI and behaviour counts of the practitioner only and does not consider client responses Moyers et al. (2003b, p.2) describe specific differences between MITI and MISC to be:

1. The MISC provides a comprehensive examination of the interviewer and client behaviours, as well as the interaction between the two, while MITI measures only interviewer behaviours.
2. The MISC may require up to three separate reviews or 'passes' of the tape segment, while the MITI typically uses a single pass.
3. The MISC captures dimensions of the client's readiness to change and commitment language, while the MITI does not. Such client behaviour can be important in predicting outcomes.
4. The MISC is a mutually exclusive and exhaustive coding system, but the MITI is not. Many specific behaviours that are coded in the MISC are collapsed into a single category in the MITI, or left uncoded.

5.1.2 The MI Treatment Integrity (MITI) instrument

The MITI (Moyers, Martin, Catley, Harris & Ahluwalia, 2003a) includes three coding passes to encode and to test how MI consistent an interventionist is. The instrument has been applied to assess practitioner competency in settings such as health coaches in primary care (Adelman & Graybill, 2005) as well as its original setting of alcohol addictions (Moyers, Martin, Manuel, Hendrickson & Miller, 2005). The MITI was preceded by the MI Skills Code (MISC; Miller et al, 2003) although structural, reliability, time and cost implications led to the development of MITI as a condensed tool appropriate for reliably and economically evaluating practitioner competence in MI (Moyers et al., 2005). MITI was designed to be used firstly, as a treatment integrity measure for clinical trials of MI and secondly, as a means of providing structured, formal feedback about ways to improve practice (e.g., MI training) (Moyers et al., 2003b). It has two components which are the *global scores* and the *behaviour counts* (adapted from Moyers et al., 2003b);

- *Global scores*: This requires the coder to assign a value (on a Likert scale of 0-7)[5] to characterise the entire interaction. These scores represent the rater's global impression or overall judgement about the dimension, sometimes called the "gestalt". Two global dimensions are rated: empathy and MI spirit therefore the MITI review will contain two global scores.

[5] The optimum score is 7 with a typical (starting point) score being 4 and 0 being the lowest.

- *Behaviour count*: This count requires the coder to tally the frequency of particular interviewer behaviours. The tallies run from the start to the end of the reviewed segment[6]. The coder does not assess the quality of the interaction or overall adequacy of the event, as seen in global scores, but simply counts frequencies of occurrence.

Typically the coder will evaluate the session as a one- or two-pass event in order to gain the 'gestalt' impression needed for the global scores. Where two passes are used pass one is recommended for the global scores while pass two is used for the behaviour counts. Summary scores are recommended for example ratio scores of reflections to questions which provide a more concise measure of an important MI process. Examples of the summary scores taken and calculations are provided in Table 5.1.

Table 5.1 MI treatment Integrity (MITI) summary scores and calculations.

MITI summary category	*Calculation*
% Complex reflections (%CR)	Rc/Total reflections
% Open questions (% OC)	OQ/ (OQ+CQ)
Reflection : Question Ratio (R:Q)	Total reflections/(CQ+OQ)
% MI Adherent (%MiA)	MiA / (MiA + MiNA)

Rc = Reflection complex; Rs = Reflection simple; OQ = open question; CQ = Closed question; MiA = MI adherent; MiNA = Mi non-adherent.

Finally, the scoring instrument provides recommended proficiency and competency thresholds for clinicians (Table 5.2). However, these were based on the MITI instrument and MI expert opinions and when initially published (Moyers et al., 2003b) lacked normative or validity data to support them. More recent evidence has provided increased evidence as to their accuracy (Moyers et al., 2005).

Table 5.2 MITI competency thresholds

Behaviour count or summary score thresholds	Beginning proficiency	Competency
Global Therapist Ratings	4	6
Reflection to Question Ratio (R:Q)	1	2
Percent Open Questions (%OC)	50%	70%
Percent Complex Reflections (%Rc)	40%	50%
Percent MI-Adherent (%MiA)	100%	90%

[6] The duration of each client segment is included in section 5.2.

For a detailed description of MITI coding instrument the reader is referred to Appendix 5.1 (Moyers et al., 2003b).

5.1.3 The MI Skills Code (MISC) instrument

It has been reported that while many studies have shown that MI is effective in reducing problem behaviours few have investigated purported causal mechanisms (Moyers, Miller & Hendrickson, 2004). It has been suggested that the use of skills codes such as the MISC version 2 (Miller, et al., 2003) would enable a greater understanding of the counselling process and the didactic between client and counsellor. MISC v.2 was developed from the original 2001 version (MISC v. 1.0; Miller & Mount, 2001) to study in depth the interaction between a counsellor and a client and the role that the MI style and techniques play in the client's process of change (de Jonge, Schippers & Schaap, 2005). The second version was intended to improve on reliability, efficiency and relevance to training and clinical practice (Miller et al., 2003). Reliability data has been presented for MISC by Miller and Mount (2001) and Tappin et al. (2000) although the latest version still awaits a substantive raft of validity and reliability tests to be carried out. Overall however, the reliability estimates for MISC have been acceptable and sufficient to observe relationships between independent and dependent variables (Moyers, Martin, Catley, Harris & Ahluwalia, 2003a). However, it has been reported by Moyers, Miller and Hendrickson to have unacceptably low reliability for the MI-consistent construct and it has been highlighted as an expensive and time consuming instrument. Even so, it has provided heuristic benefits and spawned subsequent models such as MITI and the Behaviour Change Counselling Inventory[7] (BECCI; Lane et al., 2005). Where the MITI was designed as a single or two-pass instrument, the original MISC included three coding passes, the third being a 'client talk time' category. However, this third pass was eliminated due to it not being cost effective, it yielding little valuable information and not adding to the predictive utility of MISC (Miller et al., 2003). Version 2 therefore retains simply two passes (which was repeated in the design of the MITI).

[7] The BECCI was not published at the time that the thesis study design was developed.

The first pass considers the *global rating scores*; a judgement of the therapist (similar to MITI), the client and the interaction (unlike the MITI). The six therapist rating scales evaluate 'acceptance', 'egalitarianism', 'empathy', 'genuineness', 'warmth' and the 'spirit of MI'. A high score suggests the counsellor using a client-centred approach with a low score reflecting a disrespectful, authoritarian and unfriendly counselling style (de Jonge et al., 2005). The four client rating scales evaluate 'affect', 'cooperation', disclosure' and 'engagement'. High scores indicate a client that is open, responsive, emotional and involved with a low score reflecting a client in an opposite position. The two interaction global rating scores are 'collaboration' and 'benefit'. A high collaboration score reflects a movement together of the client and counsellor toward a motivated goal while a low score indicates a competitive atmosphere. De Jonge et al. describe a high score on the 'benefit' score as a client "*showing movement toward beneficial change*" (p.287) while a mid score reflects a client who may leave the session no different as when they entered with a low score being the result of a client moving away from the change process.

The second pass evaluates each counsellor and client utterances and are assigned into a mutually exclusive category. In line with studies such as de Jonge et al. the main therapist behaviour counts (including abbreviations) are included in Table 5.3.

Table 5.3 MISC second-pass behaviour counts and abbreviations.

Therapist behaviours	*Abbreviation*
Advice (with /without permission)	AD+/AD-
Affirm	AF
Emphasise control	EC
Facilitate	FA
Inform (general)	GI
Closed / Open question	CQ / OQ
Reflection (no affect / affect)	RNA / RA
Rephrase (no affect / affect)	RPN / RPA
Summarise (no affect / affect)	SUN / SUA
Reframe	RF
Structure	ST
Client behaviours	
Ask	
Follow	
Resist change	
Change talk	

As can be seen components such as advice can be given with or without permission, both open and closed questions are recorded and reflection, rephrase and summaries are recorded as having an 'affect' or 'no affect'. Client responses are categorised as ask, follow, resist and change talk.

Examples of some of these categories and a typical client response include:

Advice (with permission): "*Would it be okay if I suggested some activities that you may be able to do*?"

Advice (without permission): "*Why don't you try swimming again to see if you can keep it going this time*?"

Affirm: "*so even though you have started to smoke again you have been able to stop a number of times in the past*"

Emphasise control: "*so whether or not you start a walking programme is up to you*"

Open question: "*so how do you think doing more exercise might make you feel*?"

Reflection: **Client** "*I am getting really fed up with my weight and feel like I need to do something about it*"

Therapist (simple reflection) "*That's the main reason you are here*?"

Therapist (complex reflection) "*you are really concerned about the effects that your weight is having on your moods*?"

Detailed examples of each of these categories and their underpinning relationship to the principles of MI are included in Chapter 3 and for a detailed description of MISC coding instrument the reader is referred to Appendix 5.2 (Miller et al., 2003).

5.2 Methods

The setting (PARS), includes a variety of outcome measures and client and therapist behaviour measures which resulted in a fairly complex intervention. This complexity includes a number of 'active components' and, as outlined by Campbell et al. (2000), this makes it difficult to specify and therefore replicate the intervention.

However, the approach undertaken by the current study to embed a treatment fidelity framework was a conscious attempt to provide a replicable PA counselling intervention. This was achieved through a randomised control design with assessments of PA counselling competence using MITI and MISC. This competence testing of the interventionist is an approach never seen before in PA counselling interventions.

Prior to embarking on the study ethical approval[8] was sought (and approved) from the University of Teesside research ethics committee. The application included a clear statement on the aims and objectives of the study, perceived client (and principal investigator) risk, client informed consent and participant information document. It also included a risk assessment and was confirmed as 'low risk' due to its non-invasive counselling components. However, CRB clearance was attained as a precaution due to the potential for the referred clients to be 'at risk' adults. No referrals under the age of 18 were accepted onto the PARS and therefore onto the study.

The main intervention study involved 84 patients (mean age = 49.31 yrs, std = 14.4) referred by GPs into a physical activity referral scheme (PARS). A sample of two clients from the initial (first week's cohort) group of patients (mean age = 62, std = 3.5) were interviewed in this study as a pilot prior to the delivery of the MI intervention to the main sample (Study 3, Chapter 6). The randomisation of the participants for Study 2 and 3 was carried out, under instruction by the principal investigator (PI), by the lead PARS officer. Having received the initial referral from a partner GP practice, the PARS officer randomly allocated patients into one of either a treatment (MI intervention) or control group (treatment as usual). Where a patient did not attend the initial induction (where they would receive either condition) a replacement was sought into the appropriate group by the PARS officer. The initial referral (week 1) period generated the sample patients from which the current pilot MI recordings were taken.

[8] The ethical approval was filed as one application (and granted as such) for all three client-based interventions in studies 2-4. CRB clearance also covered the suite of studies.

The resulting audio recordings (from this pilot) were independently assessed for MI consistent practitioner behaviours using both MITI (Appendix 5.1) and MISC (Appendix 5.2). The analysis was carried out by a coding team under the direction of Professor John Martin at the Department of Psychology, University of San Diego. Client segment 1 ran for 35.15 minutes, while client segment 2 ran for 32.23 minutes although a 20-minute segment (from the start of the client-practitioner interaction) was analysed using both instruments in line with scoring guidance. This followed the treatment integrity framework for treatment delivery described in Chapter 2 to ensure a valid and reliable intervention. The results were presented using the standard MITI and MISC frameworks and a full transcript taken verbatim of one of the pilot interviews is provided in Appendix 5.3. In line with the Moyers et al. (2003b) scoring guidelines the first pass (for both instruments) gauged the global rating while the second pass generated the behaviour count frequencies. Practitioner competency was assessed using the thresholds (and associated calculations) in Table 5.2.

5.3 Results

5.3.1 MITI coding results

The typical score for proficiency is 4 with competency being taken as 6 and above (see Table 5.2). The coding results for the current client-counsellor sessions using MITI indicated mean global scores for the two coded samples of 6 for empathy/understanding and 5 for spirit (Table 5.4).

Table 5.4 MITI global scores and behaviour counts (pilot sample)

Global scores	*Client 1*	*Client 2*	*Mean*
Empathy/Understanding	6	6	6
Spirit	6	5	5.5
Behaviour counts			
Giving information	7	4	5.5
MI adherent	7	8	7.5
MI Non-adherent	0	0	0
Closed questions	17	8	12.5
Open questions	14	5	9.5
Simple reflections	30	49	39.5
Complex reflections	25	20	22.5

Table 5.5 MITI practitioner competency summary scores (pilot sample)

Behaviour count summary threshold	*Competency*
Reflection to Question ratio (R:Q)	2.8
Percent Open Questions (%OQ)	43%
Percent Complex Reflections (%Rc)	36%
Percent MI-Adherent (%MiA)	100%

Table 5.4, 5.5 and Figure 5.1 illustrate the results of the sample which indicated 100% MI adherent practitioner behaviour. However, the percentage of open questions (43%) was lower than would normally be expected (50% proficiency, 70% competency) with the percentage of complex reflections (36%) being slightly lower than both the proficiency (40% and above) and competency (50% and above) levels. Overall however, the reflection to question ratio was higher than both the proficiency (1) and competency (2) level with a ratio of 2.8. This highlighted that, for the two sample interactions, the MI adherent behaviour and ratio of reflections to questions was above the level of competency and proficiency. However, the number of open questions and complex reflections fell just below the required level. Descriptive feedback from the independent coder added that "overall the technique is MI consistent" (see Appendix 5.4).

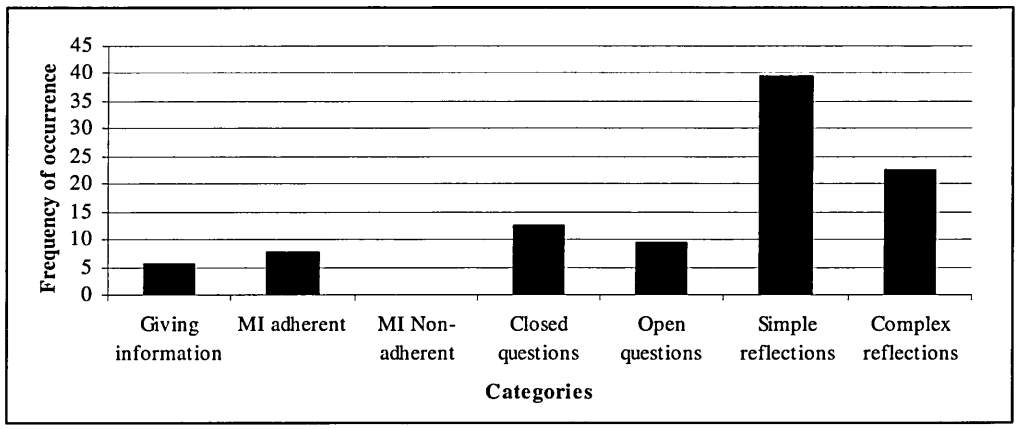

Figure 5.1 MITI frequency counts of practitioner utterances in a 20 minute client MI interaction.

5.3.2 MISC coding results

Similar to the MITI findings, the global rating score (Table 5.6) for all therapist behaviours was above the proficiency level at the competency level. Unlike MITI, MISC analyses client behaviours and this indicated again MI proficient behaviours and a response from the client which was typical of the expected reaction.

However, while cooperation, disclosure and engagement were evaluated as 6 (from a Likert maximum of 7), the affect dimension rated as only 5. Figure 5.2 illustrates the global ratings against the typical global rating score.

Table 5.6 MISC global scores (pilot sample)

Global rating	*Subscale*	*Score*
Therapist	Acceptance	6
	Egalitarianism	6
	Empathy/Understanding	6
	Genuineness	6
	Warmth	5
	Spirit	6
Client	Affect	5
	Cooperation	6
	Disclosure	6
	Engagement	6
Interaction	Collaboration	6
	Benefit	5

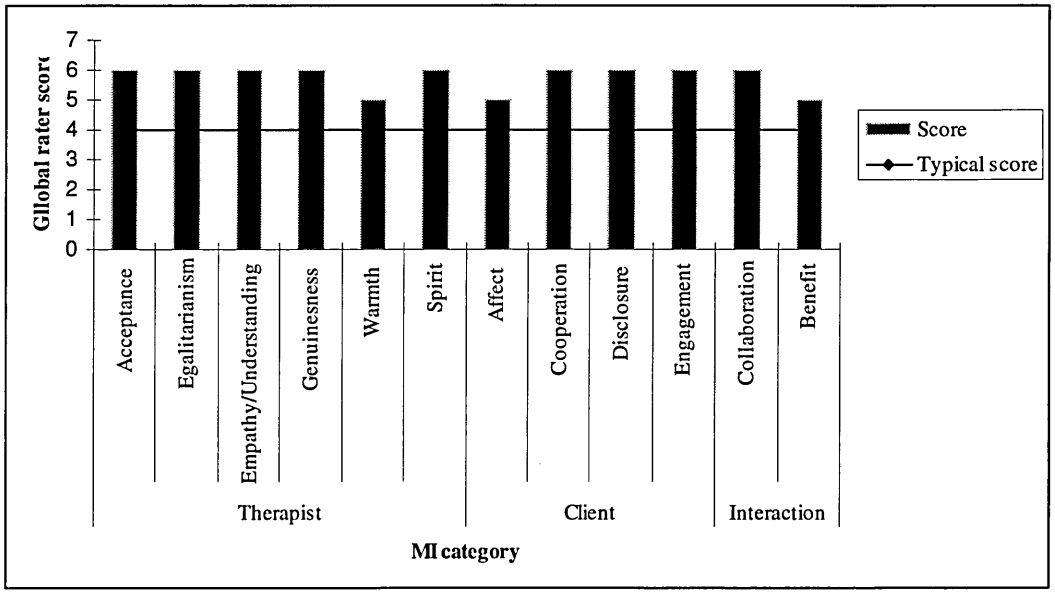

Figure 5.2 MISC global rating scores and typical score (pilot sample)

The results of the therapist frequency counts (collected from second-pass) in Table 5.7 and Figure 5.3 indicated a dominance of 'rephrasing' (no affect) and 'closed questions'. Other dominant therapist behaviour counts included 'facilitating', 'open questions' and 'reflections (no affect)'. The ratio of advice with permission to advice without permission was appropriate (11:1) as was the number of rephrases (56 in total)

and summaries (9 in total). The 'structure' (8 recorded) elements provided a menu of options and a framework for the didactic. Examples include the opening by the therapist (Appendix 5.3, lines 1-5) where the role of the therapist and confirmation of confidentiality and anonymity were expressed.

The client behaviour counts (Figure 5.4) provide less detail than the therapist counts as a consequence of fewer categories recorded. However, high frequency counts were recorded for the client 'following' the flow of the conversation through agreement of adding to the existing flow and direction of the conversation. The 'change talk' frequencies recorded (69 occurrences) did not provide detail as to the direction, magnitude or timing although it did reflect a high proportion of client speak revolving around the 'desire' and 'need' for change (see DARN-C; Chapter 3, Section 3.2.6).

Table 5.7 MISC therapist and client frequency counts

Therapist behaviour count	*Abbreviation*	*frequency count*
Advice (with permission)	AD+	11
Advice (without permission)	AD-	1
Affirm	AF	8
Emphasise control	EC	6
Facilitate	FA	24
Inform (general)	GI	15
Closed question	CQ	34
Open question	OQ	23
Reflection (repeat no affect)	RNA	20
Reflection (repeat affect)	RA	3
Rephrase (no affect)	RPN	40
Rephrase (affect)	RPA	16
Summarise (no affect)	SUN	8
Summarise (affect)	SUA	1
Reframe	RF	1
Structure	ST	8
Client behaviour count	*frequency count*	
Ask	4	
Follow	72	
Resist change	35	
Change talk	69	

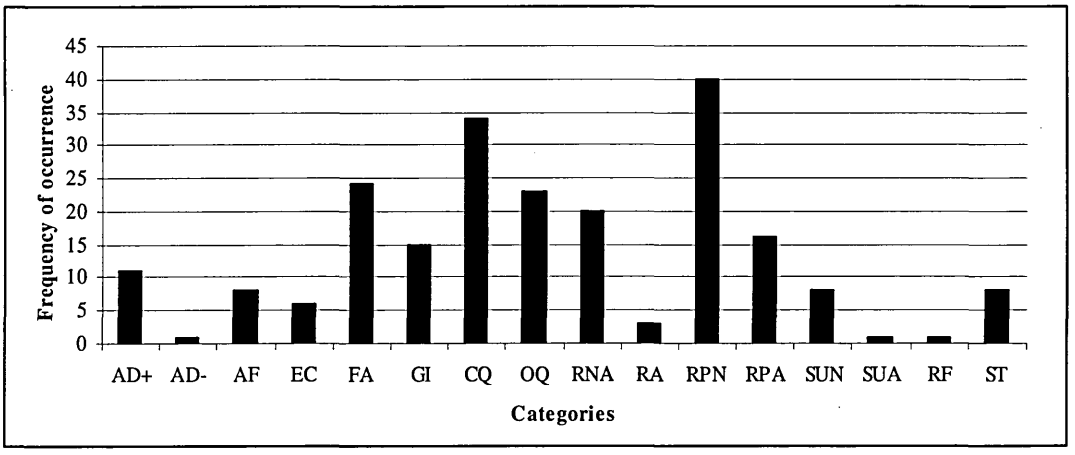

Figure 5.3 MISC frequency counts of practitioner utterances in a 20 minute client MI interaction.

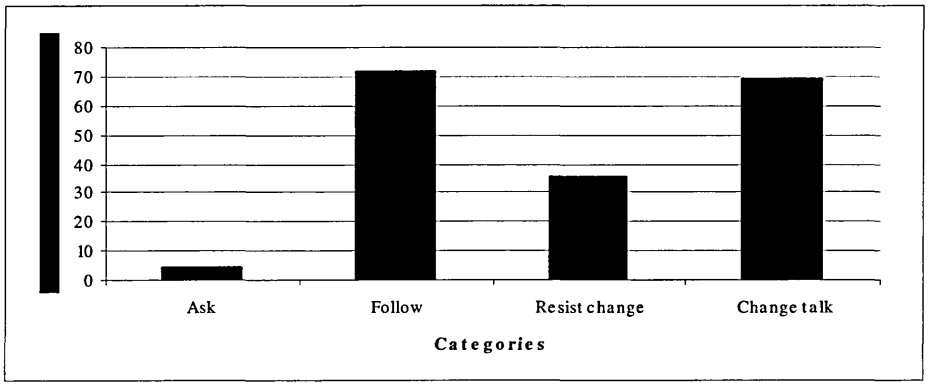

Figure 5.4 MISC frequency counts of client utterances in a 20 minute client MI interaction.

The fairly high proportion of 'resistance' utterances (35) were further examined by the researcher by way of the transcript (Appendix 5.3). This indicated that the majority of instances related to fear of injury and concerns of ability to incorporate physical activity and programmed exercise (e.g., Appendix 5.3; lines 82-83, 85-86, 107 and 109-111). The client had an extremely low number of 'ask' utterances (4) or questions asked of the therapist. Those that did result were toward the latter stages of the interaction within the action planning stage (e.g., line 504) and reflected the high number of change talk responses and experience of previous exercise and weight loss programmes.

5.3.3 Transcript results and sample responses

The overall global scores showed consistent MI proficiency in both samples and with both MISC and MITI (global scores above 4 in all categories). Results from the 20 minute segments of the MI session provide examples of the categories assessed using each instrument (Appendix 5.3; P = Practitioner, S = Patient).

Advice (with permission)

S: Maybe once I got used to it [exercise] I might be alright with it, it's the initial doing of it....

P: So part of this...at the end we need to look at an action plan and explore this a little further if that would interest you? ...we can look at ways...

S: ....yes I would need to see how I felt about it as the time went on.

(lines 176-178)

Affirm

S: ..yes a little bit. But then when I came back I didn't put.. I mean.. on the cruise I only put about a pound on or 2 pound by the time I came back. And then I just sort of watched what I was eating. I didn't stick to the diet I just sort of watched what I was having. And I've found that I would say I've put nearly a stone of it back on again.

P: So you're still a lot better than before you started. You're still half of what you were before.

(lines 134-139)

Emphasise control

P: In the light of....you mentioned that your husband walks as well, is there any frustration there that he goes out and walks without you?

S: No, he's always walked, he's always been interested in being outdoors and I haven't. That doesn't bother me. It's his time. If he wants to go walking that's fine, I'm not bothered about that in the least.

P: So that activity....it doesn't worry you in how well your husband can do it?

S: No, we've never competed where anything like that's concerned.

P: So really [your exercise programme] it's just for you?

S: For myself really, yes. To be able to feel that I'm fitter than what I am.

(lines 60-68)

Open Question

P: So, first things first, why are you here?

S: Because the doctor suggested that I came. I want to do some exercise to try to be a bit fitter than what I am. But the concern is that I've got muscle impingement in both shoulders so I obviously can't do very much where my arms are concerned. They should be operated on but I've got a problem with anaesthetics so they're very reluctant to do anything with it.

(lines 6-11)

Closed question

P: In terms of the job you actually did, you were doing a lot of travelling around and on your feet all the time; did you feel different, physically, then to how you do now?

S: Yes.

(lines 24-26)

Open question (then summary)

P: How different do you feel?

S: I feel tired because I 'm not doing anything, you know.

P: So is it that feel a little bit lethargic? lack of energy?

S: yes. I think as well you haven't got.. when you're working you've got the interest and the company where you haven't when you're not working. I think that makes a difference as well.

P: So the social.. and the challenge as well, that was important to you.

S: yes. I took a bit of adjusting to not working I've got to be honest about that.

(lines 27-34)

5.4 Discussion

In considering how well MISC reflects the competency or MI alignment of the therapist de Jonge et al. (2005) highlight that four of the five global ratings for MISC (acceptance, empathy, genuineness and warmth) relate to only one MI principle; expressing empathy. The authors go on to suggest that the fifth principle of 'spirit of

MI' is itself general not leaving the others well represented in the scales. Moreover, a number of second pass therapist behaviour counts can be interpreted as covering these principles and that MISC does not analyse the 'traps to avoid in MI' (Miller & Rollnick, 2002) particularly clearly with only 'confront' inferring a relationship to the traps. Indeed, while issues of validity and reliability have been highlighted with the MISC and MITI, each one serves a useful purpose of examining the process of the counselling didactic. This examination is essential when attempting to apply techniques from clinical and research settings to non-research and community settings. While psychosocial treatments are being continually developed and adapted Baer et al. (2004) report that "*there are virtually no scientific bases for standard practices in technology transfer for research-based treatment approaches to non-research settings*" (p.99). The authors go on to suggest that clear evidence is available that clinician performance significantly affects client retention and outcomes supporting the need for tools such as MISC and MITI to analyse clinician performance. The continued development of such instruments should help in developing more accurate analyses of client competency and ease the transition from research to non-research settings of skills such as MI. When considering whether the measure and instruments were appropriate for the PA setting, it certainly offered a detailed critique of practitioner competency in PA counselling. This level of detail and analysis of competency is not described in any other PA counselling studies reviewed in Chapter 6 although this format may need to be adapted for general use where practitioners or researchers do not use MI specifically (use more general communication skills) or where coders are not available. This is problematic and the ecological validity of such analysis must be considered in future developments. Although too late for the current study, other instruments have recently been developed to assess behaviour change counselling competency. For example the Behaviour Change Counselling Index (BECCI; Lane et al., 2005) which is designed to measure health practitioner competence and is an adaptation of MI. While in its early stages of application to research and non-research settings, it is designed to assist practitioners learn skills in behaviour change counselling. It provides a more straight forward technique than MISC, and while it still requires coders (or those using the instrument) to have a detailed knowledge of the constructs in order to accurately identify their occurrence, tools such as BECCI may offer a real-world and user friendly method of critically analysing practitioner competence.

Overall the focus of the study was not to examine the validity and reliability of the instruments but rather examine the practitioner competency of MI using the most effective instruments available. Only two samples were measured to provide an overview of practitioner competency and the coded segment was the first 20 minutes of the client and practitioner meeting therefore little opportunity for rapport building. This may have impacted on the client responses and their willingness to expand on open questions. This resulted in a higher than expected number of closed questions and reduced opportunity for simplex and complex reflections. However, as was clear in the transcript of the session, the therapist elicited fairly open and expansive responses even from closed questions (e.g., Appendix 5.3; lines 128-131) highlighting the need to adapt on the techniques used and style of questions and reflective listening. The session and elicited client responses did not appear negatively effected by the ratio of open to closed questions. Again, other clients in the main study may be less responsive requiring a greater use of open questions.

The MITI percentage values for open questions and complex reflections was lower than anticipated although the overall MI adherent practitioner behaviour was appropriate. The small sample number of interviews coded may have impacted on the score and a greater number may have been appropriate. In creating reliability indices for coders a minimum of 5 raters scores is often taken (de Jonge et al., 2005) which could be applied as 5 MI sessions for a single MI practitioner to avoid outliers and smooth the potential for extreme values (in either direction). In addition, neither the MITI nor MISC results provided detail as to when the reflections were complex or simple or whether the flavour of the interaction changed from minute 1 to minute 20. This is a key aspect of the interaction suggested by Amrhein et al. (2003) that researchers and reflective practitioners should not just look at discrete total values but rather the nature of the interaction throughout. This requires instrumentation that analyses both the counts but more importantly the changing patterns of the interaction.

What was highlighted within the current study was the value to the main intervention of assessing the quality and competency of the intervention. The relevance of the delivery of the intervention from treatment fidelity frameworks such as that proposed by the Behaviour Change Consortium (BCC; Bellg et al., 2004) is

clear. There may however be a need to absorb some flexibility into the analysis of the intervention based on the accuracy of the scores which may differ depending on different client demographic and referral conditions and current 'stage' or level of reluctance.

5.4.1 Author reflection on Study 2

The strength of the current study was it is the first MI intervention study in a PARS setting that has applied treatment fidelity principles. While other similar studies have been carried out, none have demonstrated that the interventionist was competent in delivering the PA counselling component (e.g., Brodie & Inoue, 2005; Harland et al., 1999; Hillsdon et al., 2002). Applying such measures in the current suite of studies has provided confidence in the quality, reliability and repeatability of the PA counselling intervention. As highlighted in Study 1, a worryingly low number of studies reporting to have applied a PA counselling component appear to have assessed the competence of the researcher or health professional. However, in the current study the sequential phases of complex interventions (Campbell et al., 2000) could have been embedded more rigorously. This includes the randomisation of the participants into treatment and control groups, effectively by proxy, by the lead PARS officer. The impact of this was an imbalance between the groups which is perhaps more of an issue in Study 3 and 4 although still a consideration here since they were part of the therapist competence assessment. The research design applied in the current study had clear sequential phases. As a consequence, it had clear stages from the pilot assessments (qualitative) through to the mixed method analysis of client-counsellor interactions (qualitative) and behavioural and emotional outcome measures in Studies 2-4.

Chapter 6 (Study 3): The efficacy of MI within a physical activity intervention

6.1 Introduction

It appears that health behaviour change is now a central outcome of health care (Michie & Abraham, 2004) and that for the NHS, physical activity (PA) remains the most cost-effective and desirable of health behaviour modifications although levels of PA adoption and maintenance are worryingly low (Foster & Hillsdon, 2004). Chapter 2 illustrated concerns over the shift of responsibility for health from the state to the individual although it appears unequivocal that this is, and will continue, to occur (McElroy, 2002). This changing emphasis has challenged PA interventions such as physical activity referral schemes (PARS) to provide a treatment pathway from primary care settings into the community. However, the positivist nature of such schemes (taking physiological changes as a measure of success) has failed to recognise the holistic potential in areas such as mental health (Crone et al., 2005). The motivation to achieve behaviour change is an essential component of PA programming (Biddle & Mutrie, 2001). It demands that the client take responsibility for the process and action of not only avoiding or decreasing contact with tempting or risk environments, but actively engaging in regular PA through programmed exercise or lifestyle adaptations (Mulvihill & Quigley, 2003). There is also an increasing emergence of support for the appreciation of both a cognitive and somatic element to PA in the early stages in order to achieve physical and mental health benefits (Oman & King, 2000). The challenge appears to be how best to develop an efficacious relationship between client and counsellor that encourages the likelihood of a client adopting, and maintaining behaviour change.

The potential of approaches such as PA counselling have then been advocated (see Chapter 2). However, questions have been raised as to the internal validity of such interventions since competence has often failed to be demonstrated by those delivering the intervention (Ory et al., 2002). Moreover, interventions such as PARS have yet to clearly identify the underlying factors that promote adherence to the prescribed exercise and, therefore, a consistent feature of these schemes is a failure to achieve adherence in its referred client's (Scales & Miller, 2003; Taylor, 1996). What was illustrated in Chapter 3 was that *client-centeredness*, as opposed to *expert-direction*, is a fundamental approach and essential for increasing autonomy and self-

efficacy in order that the client takes responsibility and engages with the process of behaviour change (Proper, Hildebrandt, Van der Beek, Twisk & Van Mechelen, 2003).

Having tested the competence of the interventionist in Chapter 5, the aim of the current study is to test the efficacy of MI (Miller & Rollnick, 2002) as a PA counselling intervention within a PARS setting. The impact of this intervention will be assessed by measuring programme adherence to a 16 week PARS by a treatment group receiving a single MI session plus a traditional PARS intervention (see Section 6.2.3) as compared to a control group receiving the 'traditional' intervention only. The study will also assess the effects of change talk may have as a predictor of post-session programme adherence/compliance and evaluated the extent to which demographic and referral conditions effect exercise motives and their causal relationship to rates of adherence and programme compliance. Additional facets of the referral are also recorded which included a measure of the diversity of medical conditions following referral from the scheme GPs.

6.2 Methods

6.2.1 Participants

The participants were recruited from a single PARS following referral to the scheme by a GP[9]. Referred patients were allocated into either the treatment group (receiving MI delivered by an MI trainer and traditional PARS baseline assessment and programme) or control group (receiving the traditional PARS intervention alone delivered by the same PA professional) randomly by the lead PARS officer. The allocation occurred prior to the patient's initial visit and baseline assessment (see Section 5.2 for additional information). A total of 84 (range 16-75, M = 49.3 yrs, SD = 14.4) patients were randomly allocated into intervention (n = 54 (male = 42.6%)) and control (n = 30 (male = 33.3%)). The disparity in participant numbers was due to a reduced number of those attending following referral or initial meeting, and reduced number of complete (unspoilt) data being collected by the PARS scheme for the control group as compared to the data collected for the treatment group by the investigator. Previous studies (e.g., Harrison et al., 2005) have found a greater ratio of females to males and this was expected in the current study therefore making equal

[9] A number of UK schemes do provide referrals by other health professionals such as practice nurses and dieticians though at the time of testing only GP's were able to refer patients to this PARS.

allocation of genders into each group difficult. Instructions were however given to the PARS officer to stratify the control and treatment groups to provide a balanced gender split where possible (the allocation by gender does not appear random since drop out was not accounted for by the PARS officer). Both the treatment and control group were residents living within four miles of the referral centre which resulted in the sample being reasonably homogeneous in terms of their background. Patient referral conditions were varied although the majority were related to general fitness, weight loss, and osteoarthritis although commensurate with other referral schemes (Rush, 2003). In addition, referrals were accepted for limited mental health conditions which included stress, depression, and anxiety as well as socialisation problems.

6.2.2 Measures

Study power calculations: It does appear that the imbalance between treatment and control may have an effect on the robustness of study findings and this was taken into consideration. However, power calculations are suitable for prospective design of studies and less relevant for respective analysis (Hoenig & Heisey, 2001). Prospectively a quota of 50 participants was sought for the treatment and control groups to ensure statistical power and allow for drop out. It also enabled comparisons against similar studies (e.g., Ingledew & Sullivan, 2002). However, the allocation of participants across the groups had to be carried out by the PARS officer as referrals were received. The lower number of those people allocated to the control group was the result of dropout and the PARS officer not re-recruiting.

6.2.2.1 Exercise motives

Baseline assessments of exercise motives using the Exercise Motivation Inventory-2 (EMI-2; Markland & Ingledew, 1997) were carried out to assess the intrinsic and extrinsic motives as a map against the qualitative verbal descriptions from the counselling session. These were analysed in terms of gender, age, and referral condition. The EMI-2 has been found to discriminate between individuals at different stages of change for exercise and to predict change in stage (Ingledew et al., 1998). The EMI-2 consists of the following 14 motives for exercising: Stress Management; Revitalization; Enjoyment; Challenge; Social Recognition; Affiliation; Competition; Health Pressures; Ill-Health Avoidance' Positive Health; Weight

Management; Appearance; Strength and Endurance; and Nimbleness. A copy of the EMI-2 is included in Appendix 6.1.

6.2.2.2 Client readiness for change

The readiness ruler was applied within MI (treatment) sessions to assist the client in illustrating their current motivation to change and their confidence to maintain that change. The readiness ruler (see Appendix 6.2) maps onto the stages of change (a facet of the transtheoretical model) from pre-contemplation to action and provides a heuristic link between MI and the stages of change (Miller, Moyers & Rosengren, 2000; Miller & Rollnick, 2002). More than one facet of behaviour is often seen with PARS patients (as illustrated in the current chapter) and indeed can be mapped onto the readiness ruler: for example, physical activity, smoking cessation, and diet adaptation (Miller & Rollnick, 2002). An example of a completed version with scores and the participant-therapist interaction is included in Appendix 6.2. Two versions are included; the client (seen) version and therapist (client unseen) version.

6.2.2.3 Decisional balance

Perceived benefits and barriers to physical activity were recorded using Miller and Rollnick's (2002) measure of decision balance (based on Prochaska & DiClemente, 1983). This enabled the interviewer to work with the client in identifying their perceived pros and cons of change, as well as pros and cons of not changing. Several qualitative measures were also assessed within the MI session including an assessment of client's perceptions on the *good things* and *less good things* of the exercise referral programme, description of a *typical day* and *opportunities for physical activity*. An example of a participant's completed decisional balance sheet is included in Appendix 6.3.

6.2.2.4 Programme adherence

A number of schemes measure adherence in a variety of ways since there is no 'gold-standard' available (Anshel, 2006). Exercise programme adherence data using a class attendance measure was applied in the current study and a rate of 75% programme adherence was taken as an acceptable rate recorded at each attendance to the PA referral centre. The rate of $\geq 75\%$ adherence is seen as meaningful in terms of positive outcomes (at least in the short term) (Jones, Kirby & Thurston, 2001)

although other PARS have applied the 80% rate (e.g., Johnston et al., 2005). While attendance was recorded the content and duration of each visit was not nor was the activities engaged in by the participants away from the referral facility.

6.2.3 Procedures

Following a referral from a GP[10] participating in the referral scheme, patients were randomly allocated (see 5.2 for detail on the randomisation and 6.4 for further comment on its effectiveness) into one of two groups by the lead PARS officer to ensure homogeneity (Thomas & Nelson, 2001). This was done following initial contact by the patient with the scheme administrator prior to the initial meeting with the lead PARS officer (or MI counsellor for the treatment group).

6.2.3.1 Treatment group

The first (MI and PARS) group were provided with a single 50-60 minute MI session. This was based on the approach detailed in Chapter 3 (MI) and Chapter 5 prior to the referral programme induction session which was delivered by the PARS officer. The session was delivered by an experienced clinician and trainer who was a member of the Motivational Interviewing Network of Trainers (MINT) (Miller, 2005). This involved exploring the client's ambivalence to change using techniques such as reflective listening, rolling with resistance and eliciting change talk (see Chapter 3) and eliciting their perceptions of the pros and cons of changing or not changing using a decisional balance (Appendix 6.3) of their current lifestyle behaviours. The latter stages of the session involved action planning in order to assist the client in exploring a menu of options for change (Miller & Rollnick, 2002). The MI session was underpinned by Open ended questioning, Affirming change talk, Reflective listening and Summarising (OARS) and included the following elements;

Ground work: The client-centred nature of MI provides an emphasis of the client being provided with a menu of options and them being central to the agenda of the session. Placing the client at the centre of the process from the outset does not typically occur in primary care settings for issues such as PA (Tulloch et al., 2006). By assessing client motives and asking questions such as "*why have you come to this referral programme?*" avoids this trap and provides a solid

[10] The current PARS received referral's from GP's only though other UK schemes do accept patients referred by other health professionals such as practice nurses or dieticians.

client-centred foundation from which to work. Dissonance and ambivalence become visible early and can be explored through skilful reflective listening (Emmons & Rollnick, 2001).

Typical day: This strategy is used to assist the client in identifying opportunities for change. An important concept in its application to PA adherence is where the therapist assists and guides the client in exploring the context in which the risk behaviour occurs (Miller & Rollnick, 1999).

Decisional balance - Client Strengths, Weaknesses, Opportunities for Change and Threats to change (SWOT analysis, Appendix 6.3) – It is important for the client to describe 'good things' and 'not-so good things' in an attempt to fully explore their feelings about the risk behaviour. This explores the client's feelings without imposing or labelling the behaviour as being a problem.

Assessment of Readiness - Using the readiness ruler (Appendix 6.2) enables the therapist to work with the client and facilitate their exploration of both their perceived motivation to change and confidence in maintaining that change using skilful reflective listening and affirmations. The appropriate use of each provides another opportunity to elicit and affirm change talk (Amrhein et al., 2003).

Good things/Less Good things - An exploration with the client of the perceived impact of the lifestyle change. This provides an opportunity for them to verbalise potential barriers and negative affects as well as what they might notice as the positive results of change. This balanced examination provides an opportunity for affirmation of positives and awareness of both of the potential for relapse therefore providing an opportunity to integrate relapse prevention strategies (Marlatt & Gordon, 1985; Marlatt, Parks & Witkiewitz, 2002).

Action planning - Emphasising the responsibility of the client in the change process and having them explore the environmental and social aspects of their change. This includes and exploration with them on the first aspects to change, who will be involved and how will they identify success and achievement.

The PA programme was individualised, bespoke and consisted of a variety of gym- and home-based physical activity and formal (structured) exercise (optional) activities including stationary cycling, rowing, walking and jogging. Strength and

conditioning including mobility, flexibility and core stability exercises were also delivered. A follow-up telephone interview (again using an MI-based interview technique) with participants (n=17) from the treatment group was carried out twelve months later. The sample was interviewed in order to ascertain adaptations made to their lifestyle post-PARS but following a more substantial period.

6.2.3.2 Control group

The control (PARS only) group received no MI session but received all other information, support and inductions prior to beginning the 16-week programme. The PARS content reflected that of the treatment group outlined in 6.2.3.1. The control group received the initial induction by an appropriately qualified PARS officer but who had no formal counselling experience or training. Allocation into this group was randomised (see Section 5.2) although dropout occurred and was not appropriately accounted for by the PARS officer.

6.2.4 Data Analysis

Analysis of results was carried out between treatment (MI) and control (traditional induction) groups. The outcome data collected was assessed for normality and where it exceeded appropriate levels for skewness and kurtosis ($\geq \pm 2$) the logarithm was taken or nonparametric equivalents were applied for means difference testing. Since the data recorded met parametric assumptions (e.g., EMI-2 sub-group results) a combination of parametric (MANOVA and discriminant function analysis) and non-parametric (chi-square) analyses were applied to group means to test the effects on adherence and programme compliance by gender, age, referral conditions, and exercise motives. While MANOVA was applied to EMI-2 data in the current study, non-parametric equivalents were applied in Study 4 since the data did not meet assumptions for parametric analysis (homogeneity of variance, normality and interval/ratio level data).

Readiness ruler scores (motivation to initiate and confidence to adhere) were only taken for the MI intervention group since this tool is recorded as part of a suite of verbal and tangible measures within an MI session. Other aspects that were recorded were qualitative needs analyses of the client by way of decisional balance sheets.

The first stage of the analysis was an analysis of *treatment* or *control* applied in order to assess the impact of the MI intervention which was the main purpose of the study. An examination of the psychometric properties of the two groups and descriptive statistics of the variables 'adherence' were applied. The programme compliance was coded as 1 = *never started* (referred but never attended), 2 = *dropped out* (attended initial assessment but never attended PA sessions), 3 = *partial completion* (attended <75% of programmed activities) and 4 = *completed* (attended ≥75%). The age categories of the treatment and control participants were categorised (16-30 years, 31-40, 41-50, 51-60, 61-70 and 71-80) in order to identify referral condition trends and motives by age group.

The second stage was to examine exercise motives by age-group and gender using MANOVA in order to examine self-determined motives as a potential predictor of behaviour change between the treatment and control groups. The internal consistency of each EMI-2 scale was tested using Cronbach's alpha (Cronbach, 1951) prior to testing. Analysis of PARS referral programme adherence was then carried out using Chi-Square, again by gender, age-group and rate of programme adherence.

The third stage was analysis of client feedback during the MI intervention in terms of decisional balance, barriers to change and perceived benefits of change. This in addition to PA referral programme adherence collected throughout the 16 week period. The twelve month follow-up was carried out using a structured MI telephone interview to assess the likelihood of long-term PA adoption for treatment versus control groups.

6.3 Results

6.3.1 Psychometric properties and descriptive statistics

Table 6.1 shows the mean age across both genders (including standard deviation) and also the percentage of females for the treatment and control groups. While exercise motives were different between groups as a whole, no significant difference was found between the groups with regards to age and referral conditions. Further, chi-square analysis illustrated no significant difference gender allocations. Table 6.2 provides the 14 subscale results for EMI-2 for the treatment and control groups and

data for completion rates for both groups. The internal reliability of the EMI-2 is also cited in Table 6.2, the majority of which reached acceptable levels (Cronbach, 1951). PARS completion rates for treatment and control group by gender is included in Table 6.3.

Table 6.1 Mean scores for age of treatment (MI) and control (Non MI) groups.

Characteristic	Treatment (n=54)	Control (n=30)	Total (n=84)
Age (years)	48.5 (15.2)	47.5 (13.8)	48.26 (14.6)
Female	45.8 (16.3)	46.3 (13.5)	45.9 (15.1)
Male	52.3 (13.2)	50.1 (14.9)	51.6 (13.4)
Male %	42.6	33.3	39.3
Female %	57.4	66.7	60.7

Table 6.2 Means and Standard Deviations for scores on each subscale of the Exercise Motivation Inventory 2 by Treatment, Control and participants 'not starting or dropping out' and 'partial or full completion' of the PA programme.

EMI-2 Score	Treatment (n=54)	Control (n=30)	Total (n=84)	Not Started/Dropped Out (n=31)	Partial/full completion (n=36)	Cronbach's alpha
Stress management	2.2 (1.4)	3.0 (1.2)	2.6 (1.4)	2.5 (1.5)	2.6 (1.3)	0.65
Revitalisation	2.9 (1.2)	3.4 (1.1)	3.1 (1.2)	3 (1.2)	3.3 (1.2)	0.77
Enjoyment	2.3 (1.5)	3.1 (1.2)	2.6 (1.4)	2.5 (1.5)	2.8 (1.4)	0.83
Challenge	2.3 (1.4)	3.1 (1.2)	2.7 (1.4)	2.8 (1.5)	2.6 (1.2)	0.86
Social	1.3 (1.4)	1.7 (1.4)	1.5 (1.4)	1.7 (1.4)	1.3 (1.4)	0.77
Affiliation	1.9 (1.4)	2.7 (1.5)	2.3 (1.5)	2.1 (1.5)	2.4 (1.5)	0.78
Competition	1.3 (1.3)	1.5 (1.2)	1.4 (1.3)	1.5 (1.4)	1.3 (1.2)	0.74
Health pressures	3.2 (1.5)	3.4 (1.3)	3.3 (1.4)	3.4 (1.3)	3.3 (1.5)	0.54
Ill-health avoidance	4 (1.1)	4.5 (0.9)	4.2 (1.0)	4 (1.1)	4.4 (1)	0.60
Positive health	4.1 (1.0)	4.6 (0.6)	4.3 (0.9)	4.2 (1.1)	4.4 (0.7)	0.65
Weight management	3.3 (1.6)	4.0 (1.1)	3.6 (1.4)	3.4 (1.8)	3.8 (1)	0.64
Appearance	2.1 (1.5)	2.9 (1.5)	2.5 (1.5)	2.6 (1.6)	2.4 (1.5)	0.78
Strength & endurance	3 (1.2)	3.5 (1.2)	3.2 (1.2)	3.3 (1.3)	3.2 (1)	0.86
Nimbleness	3.4 (1.3)	3.9 (1.1)	3.7 (1.3)	3.7 (1.3)	3.6 (1.3)	0.61

6.3.2 PARS completion rates by treatment, control, age and gender

Surprisingly, in relation to programme completion, partial or full completion rates were significantly higher (t (82) =-2.185, p=0.032) for the control group (63%) than for the treatment participants receiving the intervention (37%). Chi-square analysis also indicated a significant difference [χ^2 (5) = 13.15, p=0.022] between age groups in relation to the completion rate showing that older age groups were more likely to complete than younger groups (Tables 6.3 and 6.4). Moreover, the 41-50 age group were more likely to not start or drop out whereas the 51-60 and 61-70 age groups were more likely to record partial or full completion. Table 6.3 also indicated that the majority of the treatment group (61%) either never started or dropped out very soon after starting. Although participant numbers were lower in the control, this group indicated only 36% behaving similarly. No significant difference was found in completion rate by gender. Table 6.4 combined the categories 'never started' and 'dropped out' together as well as 'partial completion' and 'completed' in order to analyse the impact of readiness ruler scores as a predictor of patient intention to adapt behaviour.

Table 6.3 PARS completion rates for treatment vs. control group

Completion category	Treatment (%)	Control (%)	Total (%)
Never started	21 (39)	1 (3)	22 (26)
Dropped out	12 (22)	10 (33)	22 (26)
Partial completion	5 (10)	0 (0)	5 (6)
Completed	16 (30)	19 (63)	35 (42)
Total	54 (64)	30 (36)	84

Table 6.4. 16 week PA referral completion status by treatment and control, gender and age groups.

	Not started or dropped out (%)	Partial or full completion (%)	Completion Total (%)	Readiness score: motivation to start (sd) †	Readiness score: confidence to maintain (sd) †
Treatment (n = 54)	34 (63)	20 (37)	54 (64)	7.8 (1.9)	7.9 (2.4)
Control (n = 30)	11 (37)	19 (63)	30 (36)	n/a	n/a
Male (n = 33)	18 (55)	15 (45)	33 (39)	7.6 (2.1)	7.63 (2.8)
Female (n = 51)	27 (53)	24 (47)	51 (61)	7.9 (1.8)	8.28 (1.7)
Age categories† (n= 82)					
16-30	8 (67)	4 (33)	12 (15)	6.3 (2.2)	8.3 (2.4)
31-40	9 (69)	4 (31)	13 (16)	6.5 (2.5)	7.8 (2.6)
41-50	13 (68)*	6 (32)	19 (23)	8.2 (2.0)	7.6 (3.1)
51-60	7 (41)	10 (59)*	17 (21)	7.7 (1.6)	7.0 (2.4)
61-70	4 (22)	14 (78)*	18 (22)	8.7 (1.0)	9.0 (0.9)
71-80	2 (67)	1 (33)	3 (4)	7 (2.6)	8.0 (2.6)

† 2 missing cases for age category, # data not recorded for the control group.
*(Significant at 95%)

6.3.3 Readiness to start (motivation) and readiness to maintain (confidence)

Mean scores for readiness rulers[11] (confidence to start and motivation to maintain) (see Table 6.4) indicated that all participants were in at least the contemplation stage in terms of their motivation to start (7.8, SD = 1.9) and confidence to maintain compliance (7.9, SD = 2.4) to the programme led lifestyle change, which indicates that the majority of the participants described themselves as being in the 'action' stage. Chi-square analyses for gender and age categories identified no significant difference in readiness ruler scores. However, mean scores indicated the 16-30 age group with the lowest 'motivation to start' (6.3, SD = 2.2) and the 61-70 group with the highest (8.7, SD = 1.0). The same 61-70 group also reported the highest 'confidence to maintain' the programme (9.0, SD = 0.9) while the lowest were the 51-60 age group (7.0, SD = 2.4). MI interviews for this group highlighted that for many patients 'evidence of success' was the greatest motivator and predictor of programme adherence and that 'fear of failure' was the most frequent effecter of the 'confidence to start'.

6.3.4 Exercise motives by gender, age, referral condition and completion rate

For this analysis the dependent variable (DV) was exercise motives while the independent variable (IV) was age, gender, sample group (treatment of control) and referral condition. Figure 6.1 illustrates gender differences by EMI 2 subscales. A MANOVA was applied for Male vs. Female on motives which highlighted significant differences in the EMI 2 subscales of females scoring higher than males in terms of appearance ($F(1, 65) = 4.292$, $p = 0.042$). While affiliation and weight management were also different between male and females these did not reach significance at the 95% CI level. A series of independent t-tests between the separate items of the EMI-2 did indicate females to be significantly more motivated to exercise as a result of *my doctor advising me to exercise* [$t(65) = 2.04$, $p = 0.045$], *to lose weight* [$t(65) = 2.04$, $p = 0.046$], *to improve my appearance* [$t(65) = 2.54$, $p = 0.014$], and *to look more attractive* [$t(65) = 2.81$, $p = 0.007$]. Post-hoc results are reported in the following parapraph..

[11] The readiness ruler scores were taken within the MI and PA referral group (treatment) using the readiness ruler and reflective listening and subsequently the control group's readiness scores could not be recorded.

One-way ANOVA indicated that age categories were significantly different on the subscales *ill-health avoidance* [F (5, 61) = 5.24, p=0.001], *positive health* [F (5, 61) = 4.06, p=0.003], *appearance* [F (5, 61) = 2.5, p=0.04], and *strength and endurance* [F (5,61) = 3.48, p=0.008]. A post-hoc analysis (using Tukey's HSD), shown in Table 6.5, illustrated that the 16-30 age group (predominantly) were less-motivated for *ill-health avoidance* whereas *positive health* motives were different between a range of age groups. *Appearance* differed only between the 31-40 and 71-80 age group (but only at 90% confidence interval). Age categories 31-40 and 41-50 were different when compared to the 71-80 group in terms of *strength and endurance.*

Table 6.5 Exercise motives (from EMI-2) by age categories

EMI-2 category	*Age category (yrs)* high / low	*Mean difference*	*Std. error*	*Sig.* *
Ill-health avoidance	31-40 / 16-30	1.5	0.45	0.016
	41-50 / 16-30	1.7	0.41	0.001
	51-60 / 16-30	1.3	0.42	0.037
	61-70 / 16-30	1.4	0.41	0.009
	41-50 / 71-80	1.8	0.57	0.022
Positive health	41-50 / 16-30	1.1	0.36	0.037
	41-50 / 71-80	1.9	0.51	0.007
	31-40 / 71-80	1.7	0.53	0.032
	61-70 / 71-80	1.6	0.51	0.038
Appearance	31-40 / 71-80	2.7	0.96	0.063†
Strength and endurance	31-40 / 71-80	2.7	0.72	0.006
	41-50 / 71-80	2.3	0.69	0.02

* CI = 95%; † CI = 90%

An unexpected result was that a number of exercise motives were significantly different between the control and treatment groups. Table 6.2 presents the mean scores for this analysis and a one-way ANOVA (exercise motives by group (treatment vs. control)) identified *stress management* (F (1, 65) = 6.702, p = 0.012), *enjoyment* (F (1, 65) = 4.9, p = 0.30), *challenge* (F (1, 65) = 6.5, p = 0.013), *affiliation* (F (1, 65) = 4.7, p = 0.033), *positive health* (F (1, 65) = 5.2, p = 0.026), *weight management* (F (1, 65) = 4.85, p = 0.031) and *appearance* (F (1, 65) = 4.31, p = 0.042) as being significantly higher in control than treatment groups. It is important to note that the control group recorded significantly higher adherence rates. Results also indicated that adherence rates (in either control or treatment group) were not determined by exercise motives.

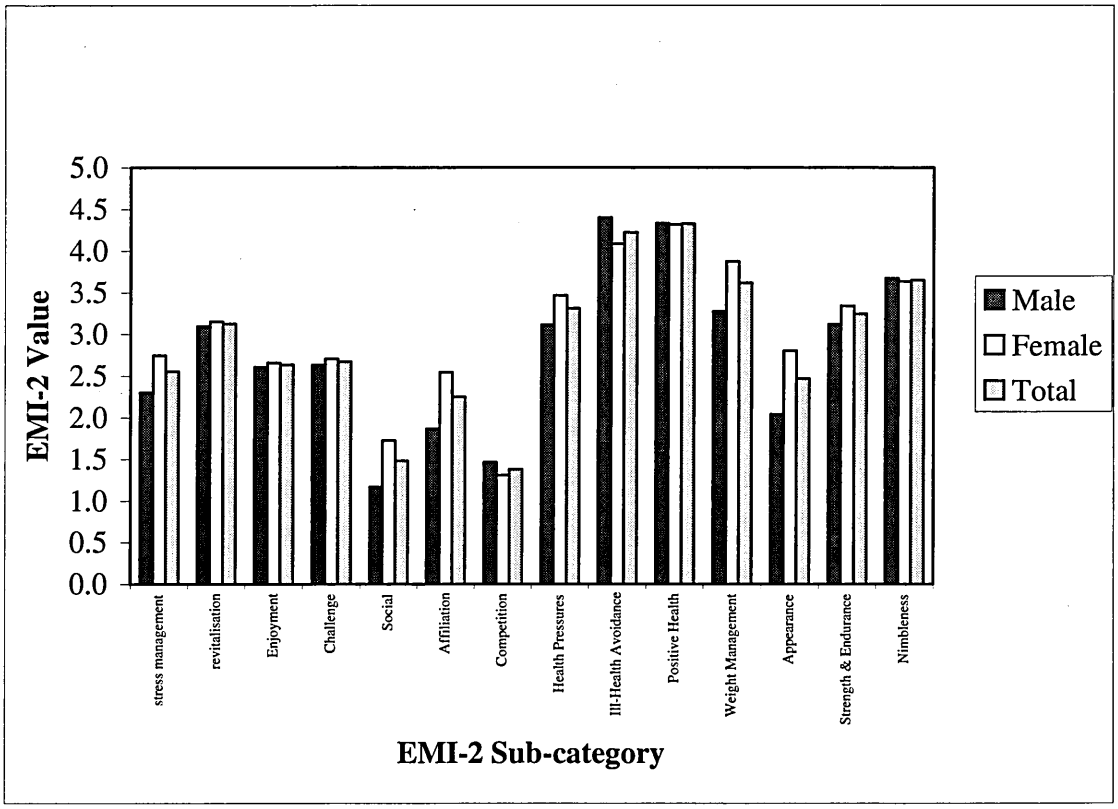

Figure 6.1 Mean EMI-2 Category results by gender

Table 6.6 highlights the diverse range of referral conditions including mental ill-health and social (depression leading to isolation) (n= 13 conditions plus unspecified and combination illnesses). Completion rates evaluated by referral conditions indicated that 64% of patients referred for mental health and social interaction issues were unlikely to not attend the first programmed exercise session or to drop out within four weeks of starting. While chi-square analyses indicated no significant difference between referral condition and likelihood to adhere, it was the mental health and social interaction patients that recorded the highest percentage of early dropout or non-attendance.

6.3.5 *Programme adherence and 12 month follow-up*

Telephone interview follow-ups (using MI techniques; Miller & Rollnick, 2002) with the treatment (MI and PARS) group indicated that 12 of the 17 respondents[12] had

[12] Limited contact with participants at follow-up due to incomplete PARS records, individuals not available or unwilling to comment or incorrect telephone and postal details.

maintained some form of physical activity and/or lifestyle change[13] in the 12-month period post-intervention (see Table 6.7). Of this group of 12, only three had partially or fully completed the initial 16-week prescribed exercise referral programme.

Table 6.6 Referral (illness) condition by treatment (MI) and control (Non MI) group

Referral condition	Treatment (n=54)	Control (n=30)	Total (n=84)
Combination	0	1	1
Diabetes	2	1	3
General fitness	5	4	9
General fitness & weight loss	7	3	10
Hypertension	4	3	7
Mental health	6	2	8
Musculoskeletal	5	1	6
Osteoarthritis	6	6	12
Rehabilitation from illness	3	2	5
Social interaction	2	1	3
Unspecified	2	0	2
Weight reduction	10	5	15

Client responses elicited using MI techniques such as reflective listening highlighted client barriers to begin and maintain the exercise referral programme. These included "*not having sufficient time*", "*feeling embarrassed about how I look*", and "*not being fit enough to start*". However, the decisional balance measure of cons of not changing commonly illustrated the fear that clients had about their health and wellbeing if they did not change which heightened the ambivalent state in the majority of clients (see Appendix 6.3). Follow-up responses also indicated 13 to have modified their diet post-PARS as a result of the programme.

[13] Regular PA and exercise was rated (within the follow-up interview) as at least twice a week and included walking, jogging, swimming, cycling, gym-based activities or other.

Of the control group (n=30), only 11 could be contacted at 12-month follow-up. Using a similar MI -based telephone interview this group were asked about activity levels post-PARS. The results indicated that 3 of the control group (at 12-month follow-up) had partially or fully completed the 16 week intervention. Responses at follow-up also indicated that 5 had participated in PA or structured exercise regularly post-PARS with 8 reporting to having made diet modifications.

Table 6.7 12 month follow-up for treatment and control patients

Category	Treatment group (n=54 study participants)	Control group (n=30 study participants)	Total
Respondents	17	11	28
PARS 16 week partial or full completion	3	3	6
PA or exercise participation (post-PARS)	12	5	17
Diet modification	13	8	21

6.4 Discussion

The purpose of this study was to assess the impact of a client-centred counselling technique on assisting clients in initiating, adopting and maintaining lifestyle change through physical activity. The latter was measured by way of a binary adherence and programme completion rate rather than a continuous (rate of attendance) measure. Additional measures such as exercise motives and readiness rulers (measuring stage of change) also provided an important set of data to compliment the primary findings. The use of MI to promote PA in primary care settings (where patient contact is often time limited) has been encouraged in previous studies together with support for applying measures of patient readiness to change (e.g., Scales & Miller 2003). However, results achieved in this study were surprising in that the control group (traditional PARS intervention only) indicated higher levels of adherence (through programme completion rates) immediate post-intervention as compared to the treatment group. The researcher was reliant on the scheme PARS officer that managed through flow of patients and this may have affected, for example, gender comparisons since treatment and control numbers were uneven. This imbalance is an observation however, and not likely to effect the acceptance of the null hypothesis. Indeed, the use of both parametric and non-parametric illustrated no difference in adherence rates as a result of the MI intervention.

Although the present study identified some adoption of PA behaviour change for the treatment group at 12-month follow-up, the respondents that could be contacted were low (17 from 54 in the original treatment group). A greater percentage of follow-up patient data is required to clearly test the effectiveness of MI in this setting over the longer term. Irrespective of the imbalance between treatment and control participant numbers however, the effects of MI in the current study were surprisingly low. The competence of the investigator in delivering the MI was assessed in study 2 (Chapter 4) and found to be proficient (using validated coding tools; MISC and MITI) which leads the author to first question client factors (such as readiness to change, age, gender, exercise motivation and referral condition), second, the setting (PARS which appear similar to healthcare settings) or third, the appropriateness of 'pure' MI (Miller & Rollnick, 2002) as opposed to AMI's in this setting.

First, then it may have been the 'readiness to change' of the participants that offers the clearest justification for the results here. Section 6.3.3 clearly indicated that both treatment and control groups were in the 'preparation/determination' stage (see Appendix 6.2) indicating a predisposition to enter MI phase II and preparing to take action. It has been suggested that returning the client verbally (and therefore cognitively) to an earlier phase such as exploration of pros and cons of change and status quo (decisional balance) may undermine their perceived readiness (Corbett, 2004; Miller & Rollnick, 2002). While clients' verbalised both a 'motivation to begin' and 'confidence to maintain' the prescribed programme, this positive self-talk proved to be a weak predictor of actual behaviour initiation immediately following the MI session. The current study suggests that the readiness to change, measured by way of readiness rulers, was indeed a poor predictor of subsequent outcome behaviour change when matched with an MI intervention (in the treatment group). Greater consideration needs to be taken not just of the client *desire* but more so the client *commitment*. As Amrhein et al. (2003) have suggested;

> "*a client's degree of commitment to change is viewed as a critical factor leading to behavioural change, and strengthening client commitment is therefore a critical task for the therapist*" (p.862) and that "*commitment*

is a useful final common pathway construct that may elucidate relationships between psychotherapy processes and outcomes" (p.872).

This links closely to implementation intentions which are the culmination of a client's decision making process signalling the end of deliberation and a measure of commitment to change (Gollwitzer, 1990). This linkage to Amrhein and colleagues work and to models of behaviour change does warrant further research in regards to PA and is explored further in the general discussion (Chapter 8).

Section 6.3.2 indicated that older individuals were more likely to adhere (e.g., 51-60 and 61-70 year olds) than those in younger age groups. This supports findings from research with similar population groups such as Ingledew, Markland and Sheppard (2004) and Ingledew & Sullivan (2002). Further, research such as Gidlow (2006) illustrated a more detailed socio-demographic analysis of PARS and concluded that time restraints on younger people was a major contributing factor to such low levels of PARS attendance as was the initial referral of older age groups by primary care referrers. Gidlow also reported that younger participants may drop-out prematurely due to perceptions of the scheme being for older less healthy individuals having mixed with such groups in the PARS. Although the focus of the current study was not toward such detailed demographics these do seem reasonable assumptions since the setting and referral pathway appear similar. Indeed, other studies have reflected a similar opinion toward predictive effect of age on PARS adherence (e.g., Dugdill & Graham, 2004; Riddoch et al., 1998).

While the EMI-2 did not offer a predictive value in terms of rates of completion (see Section 6.3.4), it was interesting to note that homogeneity existed between those that did not start or drop out and those that partially or fully completed the programme in terms of the high and low responses across the 14 exercise motives. This raises questions in the current study over the predictive value of measures such as EMI-2 with regards to actualising behaviour change. All referred participants were low in social and competition motives but were high in ill-health avoidance and positive health. This appears indicative of the ill-health context within which they entered the referral process and not necessarily a determining factor between those likely and those less likely to adopt and maintain change. Appearance was found to be

a key motive for female participants across all age groups in line with previous empirical findings such as Maltby and Day (2001). Additional analyses also found females to be significantly higher in extrinsic motives such as doctor advising them to exercise and weight loss. With regards to referral condition, the current findings highlighted a reduced likelihood to adhere and complete for those with mental health conditions such as stress and anxiety. This was similar to findings of Johnston et al. (2005) who reported that even though guidelines exist within schemes for appropriate referrals many patients are referred with conditions which are not commensurate to PARS staff training and knowledge. It does seem appropriate that greater consideration is given to those with mental health conditions at the referral stage as dropout seems inevitable or at least highly likely.

Second, psycholinguistic research such as Amrhein et al. (2003) reported that the *dose* of the counselling session is important from the perspective of both the number of sessions and the length of each session. The design consisted of only one 45-60-minute session which, although realistic within this PARS setting, may help to explain the limited impact of MI to the treatment group. Other similar interventions in health care settings have been able to apply more sessions and found benefits of MI (e.g., Kreman et al., 2006). Moreover, the PARS patient record system did not contain details on lifestyle modifications such as home-based activity even though it may have been activated. The MI session did provide an action planning phase which facilitated the discussion by the client of centre and home-based activities. It is therefore not clear from the data available whether by not attending the PARS programme they also negated home-based (independent) activities. Future participant recall and data should perhaps attempt to account for all locations and type of activity.

Third, similar (PARS) programmes that have found MI or AMI's to be efficacious (e.g., Harland et al., 1999) have delivered repeat MI (and brief interventions). It appears from the findings of the current study that brief interventions are more suitable to this setting than 'pure' MI due to time restraints and the skill development of exploring ambivalence, reflective listening and rolling with resistance appears fundamental to training allied health professionals (Emmons & Rollnick, 2001). This issue is fundamental to the design of training and delivery of behaviour change counselling in PA settings and is addressed further in the general discussion

(Section 6.7). It appears here that the process of action planning is essential for those reflecting a readiness to change and that perhaps MI in this context is less effective.

An issue in referral schemes, which is supported in the current study, is the widening array of medical and lifestyle conditions that GP's prescribe clients onto the programme with. This challenges the ability of exercise referral officers to become aware not just of hypokinetic disease but also psychological ill health and social mixing problems in addition to being aware of client emotional and motivational issues. This raises an important question as to how equipped referral officers are to deal with such patients. This point is explored further in the general discussion (Chapter 8). A number of clients did not attend the initial session following the GP 'prescription'. A number of these clients had been referred due to mental health reasons. It may therefore be increasingly important to understand how these patients perceive the PA referral either by their perceived health benefits as a result or the location itself. It could be the case that onsite (point of referral) programmes or counselling are more efficacious for patients suffering mental ill-health or social mixing problems since patients attended GP surgeries but were reluctant to accept an additional referral. The current study was limited by the opportunity to record motivation to start and confidence to maintain the lifestyle change for the treatment (MI) group only. While facets of TTM such as stages of change (SoC) is popular in a variety PA settings their benefit is equivocal (Bunton et al., 2000) and inconsistent in its application across PARS schemes (see Chapter 3). Although this is a fundamental facet of the MI session, a recommendation for future studies would be to integrate opportunities for full comparison of readiness for change across the control and treatment groups. In addition, while the majority of alpha values for the 14 EMI-2 subscales were above the recommended threshold of 0.7, stress management, health pressures, ill-health avoidance, positive health, weight management, and nimbleness fell slightly below this level. This must be taken into consideration when considering the results as it may impact on the reliability of the scale (Field, 2005).

Finally, the current study was hamstrung to some degree by the lack of coherent and complete patient data collected, stored and managed by the PARS within which the study occurred. Central to the National Quality Assurance Framework (NQAF; DoH, 2001a) is a clear attempt to encourage all UK PARS to adopt (or at

least improve) standard procedures for data collection and management. Follow-up assessments are pivotal to achieving long term behaviour change through PA adherence, and as such should be an essential component of PARS (Morgan, 2005). As highlighted in Chapter 2, improvements in monitoring and evaluation are paramount although appear inconsistent in PARS to date. Such implications for practice are examined in Section 8.7.

6.4.1 Author reflection on Study 3

There are some concerns over the use of parametric and non-parametric data in the current study when comparing the data for EMI-2 scores here and in Study 4. However, this concern perhaps reflects the misuse of statistical analyses in empirical studies used to compare results against here. For example, Ingledew and Sullivan (2002) was used as a comparison study since it used similar measures including the EMII-2. As with the current study MANOVA was applied to exercise motives in the Ingledew and Sullivan and similarly Cronbach alpha was calculated before hand. However, there must be a question raised regarding the level of data collected. It does not appear to be interval/ratio and as such should not be analysed using parametric methods (Field, 2005). However, this is often overlooked and many such analyses do appear to be carried out erroneously. The difficulty for this study when comparing EMI-2 results to those of Study 4 was that the latter did not meet assumptions for normality either therefore non-parametric equivalents were more suitable. Overall, the study has demonstrated the complex nature of such interventions and a more qualitative analysis of client behaviours and attitudes would probably suit the context rather than inventories. However, to enable comparisons against existing empirical evidence such data is required. One further issue when reflecting on the study was the imbalance between treatment and control participants numbers. As stated in Section 6.2, power was determined by comparable studies such as Ingledew and Sullivan (2002). This was due to a dearth of reliable adherence rate data for PARS. A figure of around 50% programme compliance is often reported although this varies across referral condition (Taylor et al., 1998). However, without such comparisons the standard deviation figure (current PARS attendance to the MI treatment target of 75% or higher attendance) could not be calculated. Therefore, a target of 50 per group was sought. Unfortunately, the reliance on the PARS programme to randomise and account for drop out was a flaw in the management of the study. Ingledew and

Sullivan for equalised their dataset (by randomly deleting individuals) although this approach was not applied to the current dataset. Future studies will take account of this and carry out more rigorous power analyses and more importantly methods for accounting for poor attendance or drop out.

Chapter 7 (Study 4): Training effects of MI in a PA setting

7.1 Introduction

The opportunities for healthcare, and allied health professionals, to play a part in behaviour change counselling with their patients is clear. Indeed, primary-care settings are being targeted to provide counselling, assessments and PA prescriptions (Tulloch et al., 2006). The access to patients, the position they hold and the knowledge they have, makes this group of practitioner's ideal for supporting patients to adapt lifestyles (Rollnick et al., 2005). Not only do these individuals have a direct opportunity to intervene in PA adaptations, the links that now exist with secondary referrals such as PA referral schemes (PARS) means that more and more potential patient influence and contact exists across PA domains. Chapter 2 highlighted the role that PA referral schemes (PARS) play in the modern NHS patient pathway for rehabilitation and hypokinetic disease treatment. However, the practitioners in these settings (PARS officers) often lack training in specific counselling techniques since the qualifications they hold (e.g., British Association of Cardiac Rehabilitation; BACR) focus on physiological factors, training techniques and safe exercise regimens with a limited portion of training aimed at developing motivation, emotional, psychological and counselling skills.

Approaches such as motivational interviewing (MI; Miller & Rollnick, 2002) are being incorporated into PA settings (e.g., Brodie & Inoue, 2005; Harland et al., 1999; Scales & Miller, 2003) although training programmes and the attainment of (and competence in applying) such counselling skills do not appear to be assessed (see Chapter 4 for a systematic review). This mirrors the lack of formal training and competency assessment in counselling skills of GPs in primary care settings (Tulloch et al., 2006). Study 3 (Chapter 6) examined the efficacy of MI in a PARS setting (delivered by an MI trainer that had demonstrated proficiency) the current study will examine the impact on PARS participants of receiving an MI intervention from a PARS officer trained in MI (in line with thesis aim 3). Having first assessed the competence of the PA professional in MI, the study will examine the impact of them delivering MI by way of participant programme adherence and completion rates. Supplementary measures such as exercise motives, referral condition and readiness to

change (measured using readiness rulers) were all assessed in line with the previous study.

7.1.1 Training health professionals in MI

Evidence has been reported suggesting benefits of interventions such as MI and brief interventions (e.g., Burke et al., 2002; Dunn et al., 2001; Miller & Wilbourne, 2002). However, the attempts to develop efficacious treatments such as these have not been matched by efforts to disseminate the interventions into practice through training (Keller & Dermatis, 1999). Training of psychological skills and counselling is widespread in health professions, although typically, the use of empirical investigations into the effectiveness of training techniques such as self-study reading, mentored support and workshops does not occur (Walters et al., 2005). While the focus of Walters et al. systematic review is toward addiction treatments parallels can certainly be drawn to the paucity of evidence of the competence of practitioners following training which has an effect on treatment fidelity (as highlighted in Chapter 2) of counselling interventions in clinical and community - based research. Moreover, despite the interest in MI the efficiency of workshops in producing MI proficient practitioners is not known (Baer et al., 2004) justifying the approach in the current study to assess trainee competency post-training and pre-intervention. Additional detail on training MI generally, and to PA professionals specifically, has been provided in Chapter 3.

An analysis of evidence in this chapter highlighted the need for more than just MI skills development. Indeed evidence such as Miller and Moyers (2006) suggested that a greater appreciation of the *spirit* of MI was essential if longer term adaptations to practice were to be achieved by those trained in MI. This approach was embedded into the training during the present study.

The aims of this chapter are twofold. Firstly, to assess the competence of a PARS officer using the MI treatment integrity (MITI; Moyers et al., 2003b) in delivering MI consistently and effectively to PA referral patients within a conventional scheme. Secondly, to examine the effects of the MI based PA

counselling (plus traditional PARS lifestyle adaptations[14]) on patients in the scheme against a control group receiving traditional PARS content only. Secondary measures on the latter aim included programme adherence, patient exercise motives (measured using EMI-2; Markland & Ingledew, 1997) and physiological change over the duration of the programme.

Therefore the current study examined how efficacious an MI training workshop was for the PA professional regarding their MI consistent behaviour and competence in the real-world setting and just as importantly, the impact on the patient of the receipt of this intervention and enactment of lifestyle change. Therefore Sections 7.2.1 and 7.2.2 (methods) and 7.3.1 (results) will consider the PA professional's MI competence. Sections 7.2.3 to 7.2.4.4 will consider the patient sample (treatment and control) in relation to the PARS programme, patient characteristics, exercise motivation, adherence and readiness rulers (treatment only). The results of the PARS patient sample are provided from Section 7.3.2.

7.2 Methods

7.2.1 MI training content

Recent evidence has recommended a stage approach to learning MI (Miller & Moyers, 2006) although this approach was not available prior to either interventions presented in Studies 3 and 4. There is however a comprehensive range of evidence available which has examined MI training and competence in a variety of settings (e.g., Baer et al., 2004; Moyers et al., 2005; Rubak et al., 2006). It is generally accepted by MINT (2004) that the more supervised training using role-play and interactive techniques the better and that ongoing mentoring provides a feedback system which is effective in continually improving as a practitioner (Baer et al., 2004). The PARS officer (along with other health and PA professionals from a range of backgrounds) received training based on the tenets of MI (Miller & Rollnick 1991, 2002). In line with recent similar training (e.g., Baer et al., 2004), workshop participants were provided with training materials which included copies of all presentation handouts and selected research journals and published evidence. In line

[14] Traditional lifestyle adaptations are outlined in chapter 1 and include baseline fitness and health measures (e.g., peak flow, BP, HR, BMI and VO^2) diet and nutrition advice, physical activity programmes such as walking, swimming and gym-based activities (Department of Health, 2001a).

with the behavioural targets of training (MINT, 2004) the main aims were to encourage the therapist to talk less than the client does, to reflect twice for each question asked, to use a combination of complex and simple reflections, ask mostly open questions and avoid traps such as 'premature focus', 'labelling', 'confronting', 'offering unsolicited advice', 'expert', 'premature focus' and 'blaming'. Clear aims were offered at the beginning of the MI workshop which was:

- To introduce skills in exploring a clients ambivalence and readiness for change
- To identify effective methods of communication and counselling techniques for initial and follow-up consultation sessions.
- To critically assess skills and processes that will aid the client to move through the stages of behaviour change.

Objectives (or learning outcomes and competencies) were also provided in order that upon successful completion of the workshop, the participants should be able to:

- Demonstrate an understanding of key intervention strategies used within MI and brief negotiation, its applications, and limitations for eliciting behaviour change.
- Begin to critically analyse MI in comparison to alternative interventions and to be able to demonstrate a sound understanding of brief negotiation and theoretical principles such as behaviour change, ambivalence, and addiction.

The training in MI delivered in the current study corresponded to the guidance provided by MINT (2004) and provided training on the following topics during the 2-day training workshop:

- Motivational Interviewing and Brief Negotiation: the *spirit* of MI
- Processes of change and Stages of change in physical activity
- Key skills in MI: FRAMES / OARS (Open questions, Affirming, Reflecting, Summarising)
- Opening strategies for consultations
- Exploring ambivalence

- Dealing with roadblocks: Responding to resistance (reflective responses)
- Eliciting and strengthening change talk
- Using key skills in communication (reflective listening - simple and complex reflections)
- Recognising readiness
- Negotiating change plans

Having provided the training content (above) the following outlines the instructed content for the patient sessions;

1. Ground Work - open ended questions, affirmations, reflective listening and summary (OARS).
2. Typical day - assists the client to explore the milieu in which the behaviour takes place, identifying opportunities for change.
3. Motivational Grid - elicit change talk through the use of a decisional balance sheet (the pro's / con's of change and no change) (Appendix 6.2).
4. Assess Readiness - using the 'readiness ruler' (1-10) to explore patients' readiness to change behaviour (Appendix 6.3).
5. Summary - ensures key points raised in the session have been heard by the counsellor and accepted by the client.
6. Action Plan - the development of a condition specific exercise programme.

7.2.2 Assessing PARS officer MI competence (MITI)

As seen in Chapter 2, and the systematic review of PA counselling in Chapter 4, the assessment of competence is pivotal to examining the effects of a valid and reliable intervention as highlighted in the behaviour change consortium treatment fidelity framework (BCC; Bellg et al., 2004; Resnick et al., 2005). To that end the MITI was applied for consistency and comparability to the previous study in Chapter 5. The individual whose competence in MI was to be assessed was lead officer for the East Riding of Yorkshire Council (ERYC) PA referral scheme (PARS) and worked daily with patients who reflected similar illness referral, age, socioeconomic and gender categories of the main intervention presented in Chapter 6. In order to test the effectiveness of PA counselling training (based on principles and techniques of MI) to this PA professional (who had little or no formal counselling training or experience), the equivalent of a two day MI programme was delivered. While there are no minimum hours recommended by the MI network of trainers (MINT,

www.motivationalinterview.org) surveys of the trainers revealed the modal delivery to be at least a 2-day workshop (Baer et al., 2004). Even with the advent of internet-based and self-study training programmes in counselling, face-to-face workshops of this length consisting of lectures, discussion and role-play are most common (Walters et al., 2005). Ongoing supervision (both face-to-face and telephone-based over the following 3 months) was provided to the MI trainee in order to enhance the skills development and to encourage greater autonomy and reflective learning. This in turn provided a greater opportunity for the trainee to understand and embed the spirit and client-centred aspect of MI. The competence that resulted was assessed using MITI (see Section 5.3.1).

In line with the BCC guidelines, the practitioner delivering the intervention to patients in a 'real-world' setting was assessed to ensure that client *receipt* of intervention was consistent with the PARS officer *training* received on the 2-day MI programme. See Chapter 3 (sub-Section 3.5) for details on MITI and its scoring rubric. The follow-up assessment was carried out 2 months post training in line with previous studies (e.g., Baer et al., 2004). A randomly selected ten minute segment of audio taped client interaction was independently coded in line with the intervention delivered in Chapter 5. The coded segment ran from 07.31 to 17.31. The complete transcript (verbatim) is included in Appendix 7.1. MITI coding was carried out on the sample intervention based on brief negotiation lasting 30 minutes. The MITI coding assessed the PARS officer in terms of an MI *global score* (a 7-point scale representing total interaction) in empathy and MI spirit and a *behaviour count* (a frequency count of MI behaviour throughout the session) that produced summary scores (% MI Adherent, % Open Questions, Ratio of complex to simple reflections and % Talk time).

7.2.3 Recruitment of PARS patients to the intervention

When a general practice identifies a patient eligible for the scheme (access onto an ERYC PARS requires the patient to be referred for a recognised medical condition[15]), the patient completed a confidential record form and sent it to their nearest participating leisure centre. Invitational letters, detailing a timetable of

[15] These conditions include hypokinetic diseases such as coronary obstructive pulmonary disease (COPD), hypertension and coronary heart disease and specified within the NQAF ERS (DoH, 2001a).

activities, are sent to groups of patients (from an established waiting list) two weeks prior to a new course start date. Following an initial group-based introduction session, all ERYC PARS run 2-days per week over a 10 week period and all patients received individually designed condition-specific exercise programmes. Information was collated by each participating leisure site on 172 patients (with varying chronic diseases) referred onto ERYC GP referral schemes over the chosen 6 month time period. Following the referral to the PARS, patients were randomly allocated by the lead PARS officer (who received the MI training and delivered the MI intervention) into either a treatment (n = 30 (male = 30%)) or control group (n = 43 (male = 40%)). The lower ratio of male to female participants in both groups reflected the lower number of males referred and/or attending the PARS scheme in line with other such UK schemes (Morgan, 2005). The treatment group received a single MI session lasting approximately 45 minutes and then followed the existing PARS baseline assessment and prescription and the control group moved straight into the PARS baseline assessment and subsequent prescriptions. The delivery of the PA programming (within the 12 week PARS) to both the control and treatment groups was not by the officer who had delivered the MI intervention in order to avoid contamination across groups.

7.2.4 Instruments and measures: PARS patients

The effects of the MI based PA counselling on patients within the scheme was assessed using a variety of measures. These replicated common elements of PARS and also replicated the measures applied in Study 3 (Chapter 6) in order to provide a comparison between patients receiving MI from a trainer and those receiving the intervention from an MI trainee (in the current study). The following measures were applied.

7.2.4.1 Referral pathway data and patient characteristics

Descriptive data was collected with regards to pathway results (e.g., those dropping out and those adhering at different stages. Patient characteristics were measured at baseline in order to ensure homogeneity at baseline for treatment and control groups with regards to age, gender and exercise motives. This was carried out to increase confidence in main effect results which were taken as adherence and

programme compliance. Those formalising membership at the LC was also assessed as standard by the PARS and is included here.

7.2.4.2 Exercise motivation (EMI-2)

In order to provide comparable data to the MI trainer intervention (Chapter 6), exercise motives were recorded using the Exercise Motivation Inventory version 2 (EMI-2; Markland & Ingledew, 1997) for 72 participants (n=30 treatment receiving MI, n=42 control receiving PARS only). The data did not meet assumptions for parametric analysis (homogeneity of variance, normality and interval/ratio level data) as a result, Mann Whitney U test was used to analyse between group differences. Participants indicated on a Likert scale (0-5) ranging from 'not at all true for me' to 'very true for me', their motives for exercising. The EMI-2 was completed by referral patients (n=73) to explore differences in gender (male/female) and age (><50 years), with motivation for exercise. The internal consistency of each EMI-2 scale recorded during the current intervention was tested using Cronbach's alpha (Cronbach, 1951).

7.2.4.3 Readiness rulers

The MI intervention groups were assessed for a possible correlation between 'readiness to change' (the 'readiness ruler') and subsequent exercise adherence. Readiness rulers map 'stages of change' (Prochaska & DiClemente, 1983) onto a linear 1-10 Likert scale. Three questions were put to patients in the MI intervention group; 1) How motivated are you to improve your health? 2) How important do you see the role of exercise? 3) How confident are you of completing the course? Data was compared for between group differences using Mann Whitney U due to the non-parametric nature of the data. The results will first consider practitioner competence before

7.2.4.4 Programme adherence

Prior to examining the effectiveness of the intervention baseline participant recruitment and selection analyses were applied. These are presented in Section 7.3.4.1. Evaluation of the efficacy in employing MI was based on assessing the increased likelihood that an individual will a) complete the referral course and b) adhere to exercise post-course completion. Following an assessment of practitioner competence, the main outcome measure of this study was to evaluate PARS

adherence rates from patients receiving MI compared with the traditional PARS intervention. Therefore patients (n=30) from each interventions were followed in blocks of 6-week (over a 6-month period), to ascertain visits made to ERYC leisure facilities post-course completion. Further descriptive statistics highlighted differences between the two interventions with comparisons including *completers* - patients who completed their referral programme (defined as minimum 80% attendance), and *post-course membership sales*- the commitment participants gave to the funding organisation (ERYC) after course completion. At 6-week intervals (over a 6-month period) exercise adherence rates from the sample population (n=140) were assessed to establish at what point visits to the ERYC leisure facilities altered (evaluated using Wilcoxon signed-rank test). At 6-week intervals (over a 6-month period) both the intervention group and control group were individually assessed regarding rates of exercise adherence (using Wilcoxon signed-rank test). Comparisons were then made highlighting differences (in exercise adherence) between the two groups at 6-week intervals (using Mann Whitney U test).

7.3 Results

As outlined in Section 7.1 practitioner competence is first assessed following an evaluation of the impact of this intervention across control and treatment groups in the PARS.

7.3.1 Practitioner competency (MITI coding results)

The MI treatment Integrity (MITI; Moyers et al., 2003b) denotes a typical score for proficiency as 4 with competency being taken as 6 and above (see Chapter 5, Table 5.2). The coding results for the current client-PARS officer sessions using MITI indicated mean global scores for the coded sample of 3 for empathy / understanding and 3 for spirit (Table 5.1 and Figure 5.2). The score of 0 for the category 'giving information' was based on providing client advice and guidance in an MI style by asking permission. Advice and information that was provided was not prefaced in this way and therefore could not be scored.

Figure 7.1 illustrates the dominance of MI-adherent behaviour for the PA professional as compared to MI non-adherent behaviours as assessed with MITI (although the percentage of the former was below threshold levels as indicated in

Table 7.2). However, there was a high percentage of closed questions as opposed to open questions and where reflections have been used within the interaction they appear more often as simple rather than complex reflections.

Table 7.1 MITI global scores and behaviour counts for the MI trained PARS officer.

Global scores	*PARS officer*
Empathy/Understanding	3
Spirit	3
Behaviour counts	
Giving information	0
MI adherent	17
MI Non-adherent	3
Closed questions	21
Open questions	4
Simple reflections	11
Complex reflections	2

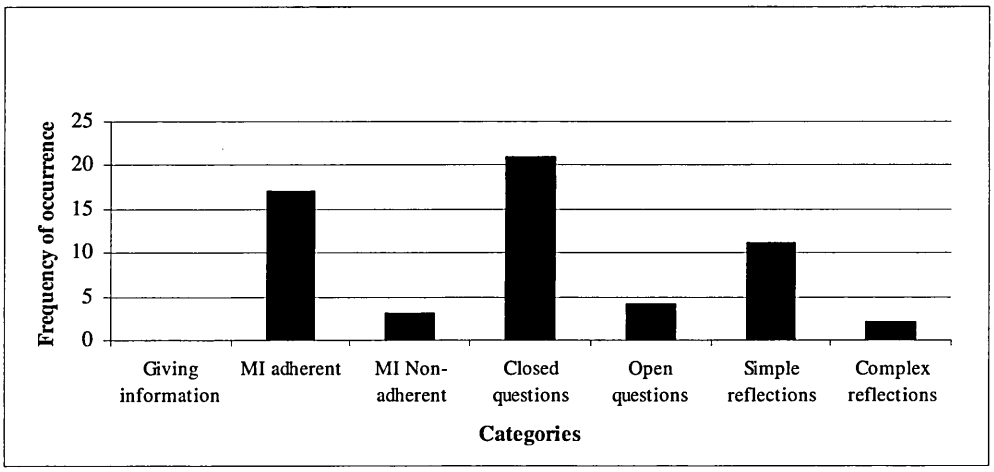

Figure 7.1 MITI frequency counts of practitioner utterances in a randomly selected 10 minute client MI interaction (PARS officer).

The 'ideal' and 'minimum threshold' values for the audio-taped session are provided in Table 7.2. Results illustrated here confirmed that while the percentage talk time by the PA professional was acceptable (below 50% of the total conversation) the global therapist rating value of 3 was below both the threshold and ideal levels. Further, the reflection to question ratio (0.52), percentage of open questions (16%) and percentage of complex reflections (15%) fell short of the MITI minimum

threshold and ideal levels. However, even though the percentage of MI-adherent behaviours fell just short of the 90% threshold, the score was still high (85%).

Table 7.2 MI Treatment Integrity (MITI) 'ideal', 'minimum threshold' and 'PARS officer (practitioner)' summary scores.

Behaviour count summary threshold	*Ideal*	*Threshold*	*PARS officer*
Global therapist rating	>6	>5	3
% Therapist talk time	<50%	<60%	48.3%
Reflection to Question ratio (R:Q)	>2	>1	0.52
Percent Open Questions (%OQ)	>70%	>50%	16%
Percent Complex Reflections (%Rc)	>50%	>40%	15%
Percent MI-Adherent (%MiA)	100%	90%	85%

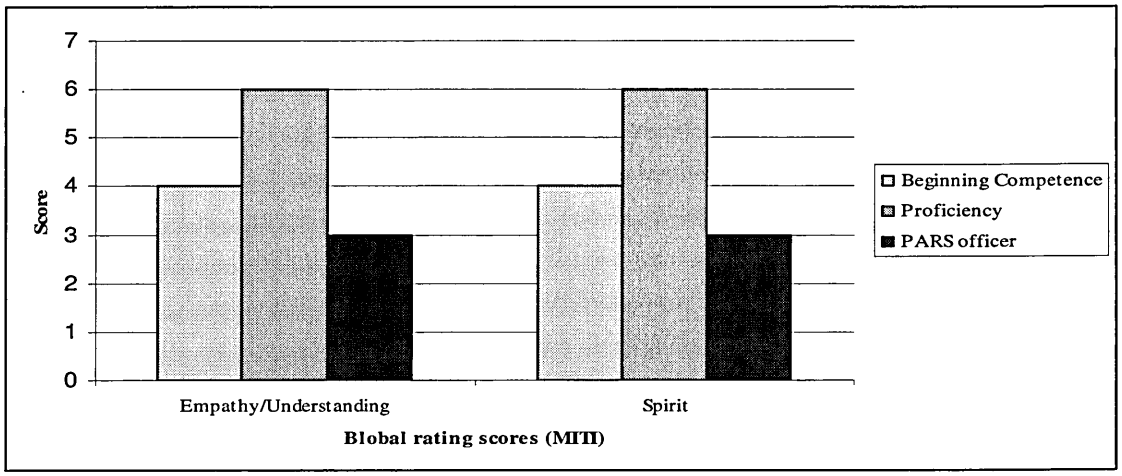

Figure 7.2 MITI global rating scores of PARS officer against beginning competence and proficiency levels.

7.3.2 Exercise motivation (EMI-2)

Exercise motives (assessed using the EMI-2) were assessed across gender, PARS completion rates, treatment vs. control and age. Baseline EMI-2 analyses between treatment and control groups indicated homogeneity with the exception of *Affiliation* which was higher for the control than the treatment group (p=0.009). In order to assess internal reliability of the EMI-2 scales Cronbach's alpha reliability coefficients were calculated. These figures together with means and standard deviations are shown in Table 7.3. Alpha values above 0.71, indicate a satisfactory level of reproducibility (Cronbach 1951). Results revealed that the reliability of only four of the EMI-2 scales reached an acceptable level (*Stress management*, *Revitalisation*, *Challenge* and *Social recognition*)[16]. Results from gender-specific

[16] Categories falling below a Cronbach score of 0.71 may impact on the internal reliability of the scores.

motives to exercise found that women scored significantly higher on *Stress* related motives for exercise ($p<0.05$), whilst *Social* motives were higher for men ($p<0.05$). Men also scored higher on both *Competition* and *Strength* related motives, although their alpha values were <0.71. The impact of exercise motives on completion rates and programme adherence indicated significant differences in motive categories of *Stress* (U = 321.5, P=0.25), *Health* (U = 285.6, p = 0.006) and *Nimbleness* (U = 331.5, p = 0.034) between those that completed and those that dropped out. Comparisons between treatment and control (using Mann-Whitney U) revealed that only *Affiliation* differed significantly as a motive (U= 414.5, p = 0.009).

Table 7.3. Mean, standard deviation and alpha reliability coefficients for the EMI subscales (for the PARS population (n=73)) by gender, completion rate and treatment v. control group.

	Gender			PARS completion		Intervention		
EMI-2 Score	Male (n=26)	Female (n=47)	Total (n=73)	dropped-out (n=18)	completed (n=55)	MI + PARS (Treatment, n= 30)	PARS only (Control, n=43)	Cronbach's alpha
Stress management	1.3 (0.5)	1.7 (1.0)	1.7 (1.0)	2.1 (1.1)	1.6 (1.0)	2.1 (1.3)	1.5 (0.7)	0.71
Revitalisation	2.6 (2.6)	2.8 (0.8)	2.8 (0.8)	3.1 (0.8)	2.7 (0.8)	2.9 (0.9)	2.7 (0.7)	0.71
Enjoyment	2.2 (0.7)	2.1 (1.0)	2.1 (1.0)	2.5 (1.2)	2.0 (0.9)	2.3 (1.1)	2.0 (0.9)	0.62
Challenge	2.2 (0.8)	2.2 (0.9)	2.2 (0.9)	2.5 (0.9)	2.1 (0.9)	2.3 (1.1)	2.2 (0.8)	0.73
Social	1.0 (0.6)	0.9 (0.8)	0.9 (0.8)	1.1 (1.0)	0.9 (0.8)	1.1 (1.0)	0.8 (0.7)	0.74
Affiliation	1.9 (0.8)	2.0 (1.0)	2.0 (1.0)	2.1 (1.1)	2.0 (0.9)	1.7 (1.1)	2.2 (0.8)	0.49
Competition	1.3 (0.9)	1.0 (1.0)	1.0 (1.0)	1.2 (1.1)	1.0 (1.0)	1.1 (1.1)	1.0 (0.9)	0.55
Health pressures	3.3 (1.1)	3.4 (1.1)	3.4 (1.1)	2.9 (1.3)	3.5 (1.0)	3.3 (1.1)	3.4 (1.1)	0.05
Ill-health avoidance	4.1 (0.8)	4.2 (0.7)	4.2 (0.7)	4.2 (0.7)	4.2 (0.7)	4.4 (0.5)	4.1 (0.8)	0.34
Positive health	4.2 (0.4)	4.3 (0.6)	4.3 (0.6)	4.4 (0.6)	4.3 (0.7)	4.2 (0.6)	4.3 (0.5)	0.35
Weight management	3.7 (0.8)	3.9 (0.8)	3.9 (0.8)	3.7 (1.1)	4.0 (0.6)	4.0 (0.8)	3.9 (0.7)	0.34
Appearance	2.8 (0.9)	2.9 (1.0)	3.0 (1.0)	3.2 (1.0)	2.9 (0.9)	3.1 (1.0)	2.8 (0.9)	0.20
Strength & endurance	3.5 (0.7)	3.2 (0.7)	3.2 (0.7)	3.5 (0.8)	3.2 (0.7)	3.3 (0.9)	3.2 (0.6)	0.63
Nimbleness	2.5 (0.9)	2.7 (1.2)	2.7 (1.2)	3.2 (1.1)	2.5 (1.2)	2.7 (1.3)	2.7 (1.1)	0.46

In addition to the main analyses, findings from age-specific motives to exercise, revealed that the 50+ age group scored significantly higher on *Health Pressures* ($p< 0.05$), whereas *Weight Management* motives were significantly higher in the < 50 age group ($p< 0.05$). However both of these EMI-2 scales produced alpha values <0.71. The highest mean across all gender, age and treatment groups were the EMI-2 categories of *Ill-health avoidance* and *Positive health*. These were the only scores with a mean of 4 or higher across all categories.

7.3.3 Readiness rulers

Similar to the readiness rulers applied in Study 3 (Chapter 6), scores were taken as part of the MI intervention therefore data applies to the treatment group only. Two readiness ruler scores were taken within the MI session. These were 'confidence to start' and 'motivation to maintain'. Analysis of programme completion (using Wilcoxon signed ranks) by readiness ruler indicated that both readiness ruler 'confidence to start' ($z = 4.821$, $p = 0.000$) and readiness ruler 'motivation to maintain' ($z = 4.809$, $p = 0.000$) predicted an increased likelihood for participant programme completion. Mean values for 'confidence to start' was 8.43 and 'motivation to maintain' was 7.73. An example of the readiness ruler is included in Appendix 6.2.

7.3.4 Programme recruitment, adherence and completion

Baseline analyses of treatment and control groups indicated no difference by age, gender and referral condition. The two groups were therefore assumed to be homogenous across these domains. While a sample of patients ($n = 73$) was taken for direct comparison between control and treatment, for the analyses highlighted previously, the wider referral sample ($n = 140$) was taken by the scheme to assess adherence and pathway characteristics more generally.

7.3.4.1 Participant recruitment

Supplemental pathway attendances were taken (Figure 7.3) for all participants (MI and non-MI interventions) highlighting those referred on the PARS and subsequent adherence rates (over the study period). Following the initial referral of 172 patients by PCT staff (e.g., GP's and practice nurses), 18.6% (n=32) failed to attend the initial assessment while a further 25% (n=43) withdrew post initial

assessment. The final number progressing through the 12 week scheme to the final assessment was 56% (n=97).

One measure of PARS success (by ERYC operators) was the uptake of memberships by participant's post-12 week programme completion. Following course completion only 20% of the participants committed themselves to the leisure provider through which the PARS was delivered (through sunlight membership), although almost 50% of those attending the initial assessment automatically became casual members as shown in Table 7.4.

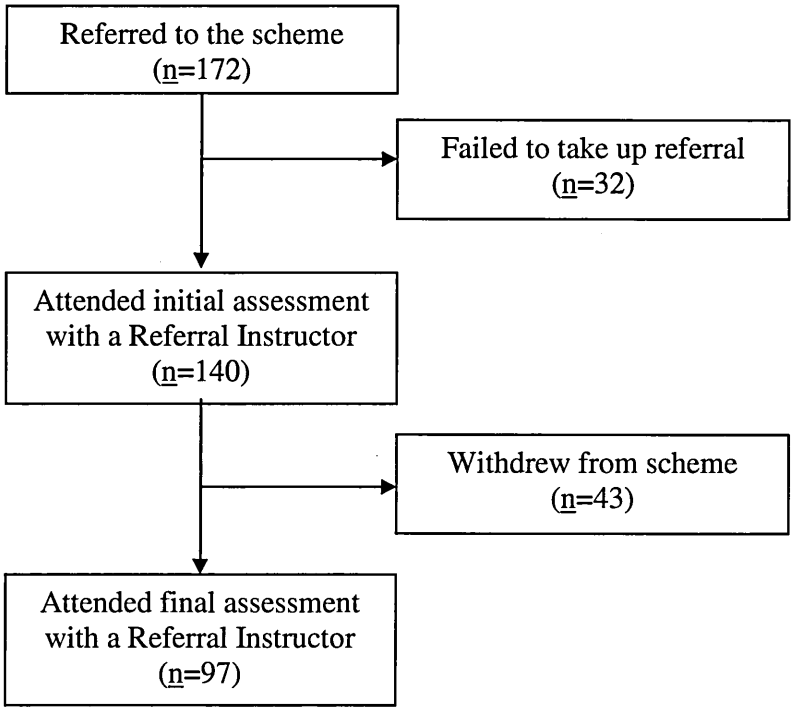

Figure 7.3 Adherence and attendance pathway for all referral scheme patients (MI and non-MI).

Table 7.4. Participants and subsequent post-course membership

Memberships	Premier	0
	Sunlight	28
	Casual	69
	None	43
	Total	140

Premier - Seven day access to the leisure facility
Sunlight - Five day access (restricted 9am-4pm / Mon-Fri)
Casual - Pay as you visit

The patient referral conditions were also recorded as part of the baseline assessment in order to gauge the range and mode of hypokinetic diseases for which primary care referrers such as GP's were using the treatment pathway. Figure 7.4 illustrates ten categories with the dominant referral illnesses being hypertension and obesity.

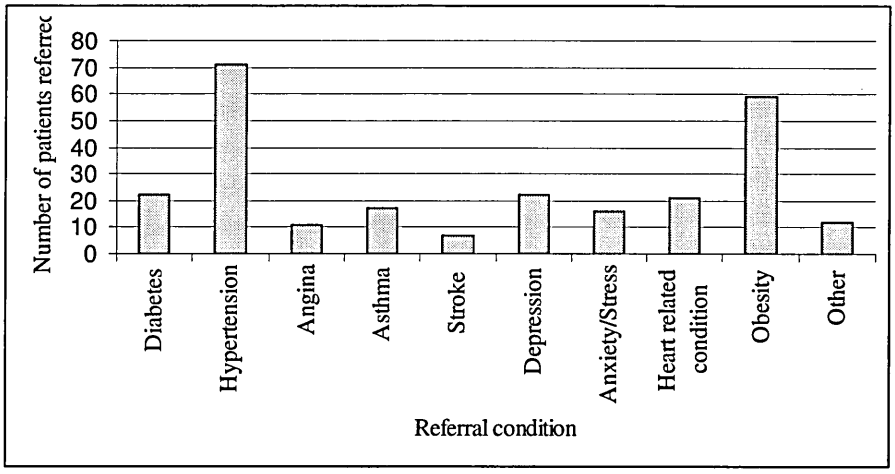

Figure 7.4 Referral conditions at point of entry onto the physical activity referral scheme.

Figure 7.5 illustrates that the largest numbers of patients who participated on the referral scheme were in the 60+ age range. Entry onto the scheme requires the patient to be at least 18 years old, in this study less than 15% of the population were under 50 years of age.

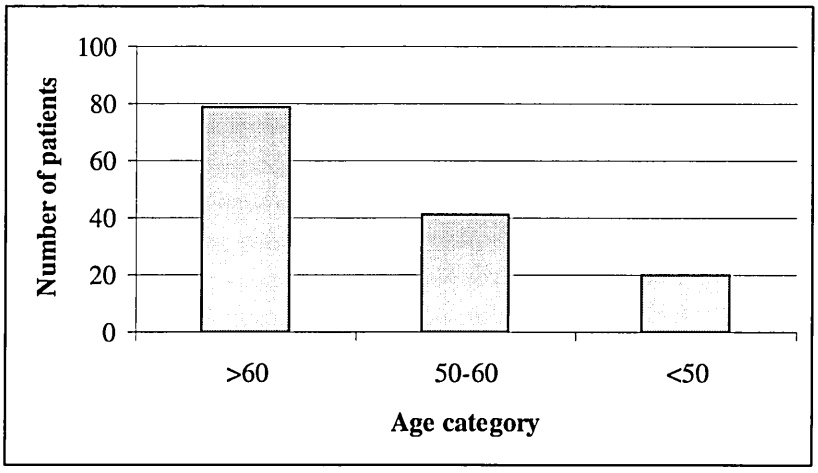

Figure 7.5 Age range of patients participating in the PARS (larger sample, n = 140)

7.3.3.2 PARS adherence and completion rates

Completion rates were separated into those that completed the 12 week PARS programme or not. Completion rates by treatment (MI plus PARS, n=30) vs. control (PARS only, n=42) indicated that no significant differences were found between the two groups regardless of the intervention (MI or non-MI). See Table 7.5 for descriptive data on the effect of the intervention on PARS attendance and ongoing centre attendance.

Table 7.5. The effects on PARS programme completion from the MI intervention as compared to the control.

Treatment	PARS Completion (n=73)	
	Yes	No
MI + PARS	23	7
PARS only	32	11
Total	55	18

For the wider scheme analysis of those attending the initial session (*n*= 140) results indicated that for the present study, those in the age category <50 years old (*n*=20) over 60% were non-completers with 70% of the 50-60 year olds (n=41) falling into the same category. However, less than 30% of the >60 year olds (n=79) failed to complete the referral programme (see Figure 7.6 and Table 7.6). The level of programme completion by age category was found to be significant (χ^2 (2), p = 0.045) for the >60 age group.

Table 7.6 PARS completion data by gender for whole sample (*n* = 140)

Age category	Completed	Dropped out	Total
<50	12	8	20
50-60	24	17	41
>60	62*	17	79

* Sig. at 95% CI

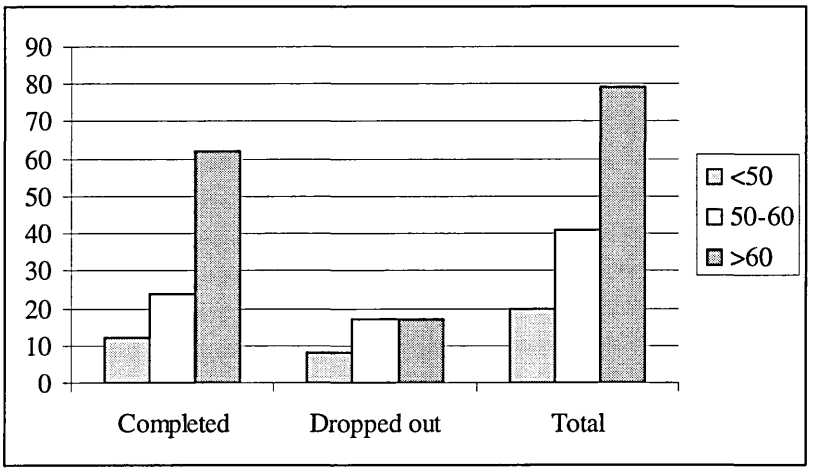

Figure 7.6. Age range and PARS completion

7.4 Discussion

The results of the current study supports previous findings suggesting that the evidence base for the effects of an MI training workshop of a 2- or 3-day duration, in terms of the longevity and magnitude of changes in therapist behaviour, is still modest (Baer et al., 2004). The third aim of the thesis was to assess the trainability of PA professionals. Indeed, the current study highlighted that the PARS officer had not reached a level of competence based on MITI findings and could not therefore be considered to be delivering an MI intervention. However, it was still worth examining the impact of this officer in terms of client PARS adherence since there was a dominance of MI-adherent behaviours (as compared to non-MI adherent) and some reflections (although predominantly simple reflections). While the officer was coded as falling below the MI competence levels on MITI the style applied did appear action-orientated using 'solutioneering' (see Appendix 7.1), itself worth considering due to the action-orientated patient group based on readiness rulers and EMI-2. It may then be that approaches such as MI are not suitable in this setting although adaptations such as behaviour change counselling (Rollnick et al., 1999) as the underpinning 'style' are applied with content based on exercise consultations (Loughlan & Mutrie, 1995). The current findings do appear equivocal with regards to whether MI is effective in this setting and certainly suggests further examinations of such settings and such health professionals is required.

Issues of accuracy arise with regards to how best to evaluate changes in therapist behaviours following training (Miller & Mount, 2001). The current analysis of PARS officer competence reflects low levels of MI non-adherent behaviours as compared to MI adherent behaviour. However, global rating scores (using MITI) comparing minimum competence and proficiency against observed scores of empathy/understanding and 'spirit' of MI showed scores below the required levels. Similarly, behaviour counts compared poorly to those in Chapter 5 (Figure 5.2) although these sessions were delivered by an MI trainer which should demonstrate greater competence.

The current assessment of the MI training programme on therapist behaviours in a real-world setting did have an impact toward MI adherent behaviours. However, the spirit and skills such as open questions and complex reflections illustrated a fairly superficial competence following the 2-day training. This does raise questions over the efficacy of a 2 day workshop and suggests support for the use of more ongoing supervised training using coaching and mentoring and feedback of audio taped sessions (Ory et al., 2002).

The impact on programme adherence and completion rates of the PARS officer trained in MI, were equivocal. There was no significant improvement in adherence between the treatment receiving the traditional 12 week PARS plus 45-60 minutes of MI (at initial induction) and the control receiving PARS only. It is unclear whether these findings are the result of the lower competence (based on MIT scores) of the PARS officer in delivering the MI intervention or whether the impact of the intervention is immersed by the effect of the PARS intervention. As suggested in Chapter 2 (Section 2.4.2) inconsistency across PARS schemes has been commonly cited (e.g., Dugdill, Graham & McNair, 2005) and it is difficult to consider the effectiveness of adjunct therapies and interventions such as PA counselling while such vagaries exist.

The predictive value of readiness rulers was of interest regarding adherence as was the comparison of age determinants of completion and participation. When compared to the results of Study 3 similarities did exist in the demographics of the PARS population and those likely to adhere. Like-for-like comparisons were difficult

however between the schemes due to inconsistent approaches, measures taken, length of intervention and outcome measures of attendance and adherence. This reflects concerns of poor programme monitoring and evaluation inadequate procedural controls of many UK PARS (Johnston et al., 2005). However, what appears clear from findings of Study 3 and 4 is that the 'action-orientated' nature of those attending PARS is a key factor and should be measured and interventions (including PA counselling) should reflect this apparent readiness and provide a more action focussed content which will assist the client in moving quickly toward a change plan. While the PARS officer appeared more action orientated than the intervention delivered in the previous section the exploration of factors such as decisional balance (ambivalence) may not have suited the stage of the patient.

7.4.1 Author reflection of Study 4

Study 4 was similar to 3 in so far as it was robust regarding the pre-assessment of the practitioner delivering the PA counselling (MI) component. The benefits were twofold. First, it mapped well against the BCC treatment fidelity framework in demonstrating the level of competence of the PA professional in delivering the counselling element to patient. Second, it enabled the MI training to be assessed in such a way as to glean adaptations for future delivery. Indeed, it is the effectiveness of MI training that has come more and more to the surface within the thesis and raised important questions with regards to the content, duration and suitability. Studies such as Bennett et al. (2006) have begun to assess this issue although again PA settings are no where near this level of analysis for its practitioners. In attempting to ensure that the study was ecologically valid, and that results have direct relevance to the setting, some concessions were inevitably made with regards to study design and robustness. One of the main issues was the accuracy of the RCT procedures since (similar to Study 3) the PARS officer has control over the allocation of patients. While the officer had been given instruction on the processes to follow the author cannot be completely satisfied of the rigour and accuracy of the process from the PARS perspective. The population groups from which the samples were drawn were selected for homogeneity for Study 3 vs. 4. However, it would appear that some differences did result and that future studies should attempt a larger single centre analysis with participants drawn from similar catchments.

Chapter 8: General discussion, conclusions and recommendations

The three main aims of the thesis were to:

1. assess the effectiveness of PA counselling in a PARS setting,
2. measure patient readiness to change, exercise motives and the uptake of the programme through adherence rates, and
3. develop support mechanisms through existing programmes such as PARS and assess the efficacy of MI training for PA specialists using competence assessments.

This discussion will synthesise points from the thesis and will consider the aims as a framework for this discussion. It will also consider the context, within which the interventions were applied, the implications for policy and practice and outline the limitations before stating conclusions and recommendations for future research.

8.1 PA counselling in a PARS setting

While approaches such as MI have shown benefit in areas such as addictions (Britt, et al., 2004; Burke et al., 2002) its application as a behaviour change technique in settings such as PARS is limited. Indeed, the findings from Study 3 and 4 challenged the primary hypothesis of the thesis that (PA) behaviour change counselling (based on MI) would elicit improved adherence by referred patients to a PARS. Further, Study 3 considered MI delivered by a competent MI therapist (as assessed by validated coding instruments) and found that in fact the control group showed greater likelihood to adhere to the PARS. When considering the impact of the MI trainer against the impact of the PA professional (that received 2-days of MI training) the programme adherence rates for the treatment group delivered by the PA professional were slightly higher. Having assessed the MI skill level of the PA professional the results indicated a level slightly below competency and proficiency with an emphasis on action planning (see Chapter 7). However, while the settings were similar (both local authority PARS), differences in completion and adherence rates between the two programmes may well have been due to the quality of the programme rather than the compounding effects of MI and its deliverer. Indeed reviews of schemes such as Thurston and Green (2004) have suggested a disparity in

the content and focus of interventions as well as the '*thin*' (p.389) evidence base as to their effectiveness. This raises questions as to whether the apparent in-effect of MI was due to the context, the content of the MI intervention or the MI interventionist (in this case the researcher). Further, questions are considered here regarding the appropriateness of the intervention based on the client's readiness which will be addressed specifically in Section 8.2 as well as the design of the study and the randomisation of patients into treatment and control groups.

8.1.1 The context of the intervention

Very little empirical research has assessed the impact of MI in PA settings. Section 5.4.1 illustrated that to date only studies such as Harland et al. (1999), Hillsdon et al. (2002) and Scales and Miller (2003) have considered MI as a primary or secondary PA intervention with often equivocal results. While other studies such as Brodie and Inoue (2005) were more positive, and incorporated MI, the main focus was PA as rehabilitation from cardiac disease. The current thesis is one of the first examples of MI having been applied in PARS having first demonstrated interventionist competence (Section 7.3) in line with a treatment fidelity approach (Bellg et al., 2004). Therefore the equivocal findings may be as much to do with the inconsistent delivery of MI as the PA setting. However, the current thesis findings suggest that, even with an apparently competent MI intervention, MI did not demonstrate increased efficacy with regards to programme adherence by patients. This indicates that the context within which the MI intervention itself is being delivered may be the compounding variable. While some reviews have encouraged the potential for MI in such health care settings (e.g., Britt et al., 2004; Knight et al., 2006) other health behaviour change settings such as smoking cessation have found similar limitations to MI's effectiveness suggesting it to be effective only as an adjunct to other therapies (Hettema et al., 2005). Steinberg, Ziedonis, Krejci and Brandon (2004) reported that while there may be effects due to the nature of the smoking addiction, often the smoking cessation intervention itself was not effective for either the MI or non-MI group suggesting that until the baseline intervention was improved MI could not be accurately measured. Steinberg and colleagues therefore reported that equivocal results in smoking settings may not be purely due to the technique (or its brief adaptations popular in health care settings) but rather the design,

setting and effectiveness of the intervention. For PA settings then, there may be similar questions over the appropriateness of PARS for promoting the adoption and maintenance of (effortful by its very nature) PA behaviour change. Thurston and Green (2004) recommended that the PARS context in many schemes does not meet the demands of those older adults typically requiring increased PA. The authors suggest that the ineffectiveness of the setting may be a reflection of a centre-based 'exercise' context rather than a home-based 'lifestyle adaptation' context. Therefore, expecting patients to adapt to unfamiliar settings, whilst changing a variety of lifestyle factors (e.g., alcohol consumption, diet and smoking), may undermine the effectiveness of pastoral support such as PA counselling. The context and setting may also be used ineffectively by referring health professionals. Johnston et al. (2005) reported a prevalence of 'inappropriate referrals' due to either medical (not appropriate for treatment within PARS) or psychosocial (personal choice barriers such as time, cost or transport) factors. Findings from Study 3 and 4 reflected a patient group referred for mental health reasons into a setting which may not be appropriate since drop-out was common between initial referral (by the G.P) and initial induction (by the PARS staff). Therefore the current thesis (and previous research) suggests a more appropriate settings and context within which the PA counselling is delivered.

While issues of poor adherence to PARS were highlighted throughout the thesis (and particularly Chapter 2), it appears that measures focussing primarily on centre-based activities may negate the potential effect of supporting home-based activities. Results from Study 3 (more than Study 4) indicated low programme adherence based on Leisure centre attendance only. However, no record was taken of lifestyle adaptations beyond the scheme and its 'prescribed' activities. Both schemes (Studies 3 and 4) failed to evaluate for example changes to travel patterns (walking rather than driving short distances), increases in stair use and cycling which may have occurred as a consequence of eliciting change talk within the interventions.

This highlighted three issues within the context. First, that PARS are idiosyncratic and inconsistent in their procedures which threatens their effectiveness. Second, that an assessment of behaviour change should account for changes made away from the referral scheme setting as well as within it, and third, that the integration of behaviour change counselling (such as AMI's) could be within

supported home-based activities away from environments such as leisure centres. This may facilitate greater autonomy and 'choice' and an increased likelihood of sustained behaviour adoption (Salmon, Owen, Bauman, Schmitz & Booth, 2000).

8.1.2 The content of the intervention

Steinberg et al. (2004) described an often ineffective context for smoking and MI, although findings from studies such as Johnston et al. (2005) have cited patient *psychological readiness* as a similarly important contributor which, when combined with the new and challenging context may create a barrier to patient change. The findings of the current thesis have supported the view by Johnston and colleagues that the content of the intervention must address client psychological readiness by considering perceived '*importance*' and encouraging '*self-efficacy*' (p.65). Chapter 2 indicated that health care professionals are becoming increasingly aware of the need to move away from an expert-driven, prescriptive model, of intervention where the client is rendered passive in the behaviour change process (Tulloch et al., 2006). The result of this encounter is that the client will become resistant or that existing resistance will increase (Miller & Rollnick, 2002). The alternative, client-centred, approach has been shown to create a greater level of self-efficacy and engage the client in the process of their own behaviour change (Britt et al. 2004). Moreover, the process of a client taking responsibility for the process of their own change is fundamental to generating self-efficacy and moving through the stages of change from pre-contemplation to action and thus reducing the temptation to relapse into the risk behaviour (Scales & Miller, 2003).

Little evidence is currently available to underpin the effect of MI versus AMI's in PARS although evidence in other healthcare settings does indicate its potential (Dunn & Rollnick, 2003).Therefore, adaptations through AMI's such as brief negotiation and behaviour change counselling (Rollnick et al., 1999) may provide key skills that are appropriate yet realistic for PA professionals. Key skills within brief negotiation would include reflective listening, rolling with resistance and exploring ambivalence. While not exclusive they may form the bedrock for future skills development in counselling and communication through 'guiding' and supporting patients rather than convincing and educating (Dunn & Rollnick, 2003). However,

what is apparent from Study 3 and 4 is that (even though motives at baseline were different between treatment and control groups) the MI intervention was not effective. This may be due to the time available in a PA or exercise setting (typically 30-45 minutes) for counselling. Clinical applications of MI have demonstrated that effectiveness varies based on the duration and frequency of encounters. Rubak et al. (2006) reported an effect in 81% of MI intervention studies with 60 minutes or more contact whereas this dropped to 64% where the contact was 20 minutes or less. Further, the likelihood of an effect rose with the number of encounters with one encounter representing an effect in just 40% of studies whereas more than five encounters resulted in an effect for 87% of studies. In clinical settings Rubak and colleagues also reported follow-up as common which also had a positive effect. It appears then that while content and style of delivery is important, the frequency and duration of MI interventions requires greater consideration in PARS. Only once the mode and frequency of MI in PARS compares to addiction settings research can true evaluations of its [MI] effectiveness be made. The current thesis did demonstrate competence of the MI deliverer in Study 2 (prior to the subsequent intervention in Study 3) although it appears hamstrung by the duration and frequency of encounters. The study also reflected typical encounter durations and frequencies in current PARS although it is difficult to imagine many UK programmes having the capacity to embed an increase in patient sessions.

8.1.3 The interventionist

Study 2 applied two validated techniques for assessing MI competence and proficiency (MITI and MISC). Results of the assessment indicated researcher proficiency in applying MI consistent behaviour and the use of techniques such as reflective listening. While multiple client sessions could have been coded to demonstrate further validity the sample did appear sufficient in MI adherent behaviour. Studies such as Bennett et al., (2006) have assessed MI competence using similar tools (e.g., MITI) within training environments and reported its usefulness in clinical and research settings. While this research applied a simulated patient (for reliability purposes) the main conclusions supported the appropriateness of MITI across multiple coded sessions. As stated in Section 8.1.1, the context does appear to have played a part in the results. However, lessons learnt from applying a test of counselling competence such as MITI suggest that it would be beneficial for PA

counselling to apply such tests. Based on the findings of the systematic review (Study 1), studies reporting a PA counselling component do not currently apply a coherent and thorough test of counsellor competence. The interventionist is a fundamental part of the didactic and yet their effectiveness is rarely tested. Additionally, variations between schemes with regards to processes, monitoring and evaluation would make comparisons between schemes, of adjunct interventions such as MI or AMI's, troublesome. The inconsistent design and operations of schemes was highlighted as a key issue in Chapter 2 and has to be addressed, or not least be observed as a limiting factor, when interventions such as PA counselling are applied. With due consideration given to the design of the intervention the content and approach is without doubt pivotal.

8.2 Patient characteristics, readiness to change, motives and adherence

The PARS setting did elicit clients who appeared more ready to change by virtue of activating choice to enrol on the PARS in the first place. This was further supported by readiness ruler scores in both Study 3 and 4 (Section 6.3.3 and Section 7.3.4 respectively). As reported by Tobin (2003), PARS individuals may already be in the action stage with subsequently reduced ambivalence and require phase two MI to assist in the transition to action planning. This potential mismatch between the MI 'preparation' approach of examining motives, barriers, ambivalence and attitudes (delivered by the investigator) as compared to an 'action' approach (delivered by the PARS officer) whose orientation may have met the high readiness of participants measured in both interventions studies. By assisting the client to examine the implications of PA lifestyle change, as opposed to a status quo (through tools such as decisional balance), this may have heightened their concerns and reluctance to change by examining the longer term impact this may have on them and the dramatic changes required. As a result the opposite may occur in the short-term (i.e., lower PA adoption rates) indicating less effect of approaches such as MI. Research such as Hettema et al. (2005) has suggested that as compared to treatment as usual (TAU), MI often displays 'sleeper effects' whereby the immediate effect is not significantly different immediately post-intervention although increases the likelihood to change over a longer period. The authors go on to suggest that the process of exploring ambivalence and elicitation of change talk increases self-efficacy and greater self determination.

The dearth of long-term studies of such PA behaviour adaptations (as highlighted in Chapter 2) does not however currently allow for an accurate examination of this hypothesis.

Vansteenkiste and Sheldon (2006) suggested that MI can promote treatment motivation although perhaps more specifically among those patients in the earlier stages of change. When considering results from Study 3 (Section 6.3.4 and Table 6.2), 'exercise motives' were different at baseline between the treatment and control groups suggesting the control group to be more motivated and therefore ready to make lifestyle changes. While attempts were made to create random allocation in the design and implementation it is clear that the resulting differences do require consideration and that motives at baseline may have impacted on the general effects of the intervention. However, the main effect between the two groups can be considered independently (Field, 2005) and in both cases the pre- to post- results were not significantly different. While results in the present study suggested equivocal benefits for MI, Miller and Rollnick (2002) have reported that MI may be more effective for those more ambivalent or indeed resistant or pre-contemplative individuals. This suggests that for those in a state of readiness to change MI may not be as effective as a sole therapy. MI may then be more appropriately applied within primary care settings where individuals are less action-orientated and more ambivalent. This will require greater use of primary care settings (Johnston et al., 2005), greater training of primary care professionals to apply PA counselling (Tulloch et al., 2006) and increased research across both domains to assess its effectiveness.

8.3 MI training to PA professionals

The thesis highlighted evidence such as Nawaz et al. (2000) and Pinto et al. (1998) suggesting that less than half of health professionals are using the opportunity to promote health behaviours through counselling even though they have been found to be effective (Anis et al., 2004; Ortega-Sanchez et al., 2004). As illustrated in Chapter 2, PA counselling training for PARS and allied health professionals is inadequate and their own confidence to deliver this form of intervention is low (Kennedy & Meeuwisse, 2003). Despite these barriers, it was evident in Chapter 4 that PA counselling is popular and increasing in prevalence (Section 4.6.1) yet the duration, frequency and content varies hugely. Of even greater concern is the paucity

of competence testing of those delivering counselling even in research studies which would normally be expected to account for such variance. Studies reviewed in Study 1 (such as Kirk et al., 2003) exemplify this dearth of fidelity testing and underpin the inconsistent application of techniques under a variety of headers which include 'exercise guidelines', 'exercise consultations', 'exercise information' and 'counselling'. These issues were examined in Section 2.4 prior to the systematic review in Chapter 4. Organisations responsible for training staff in PARS such as The Wright Foundation (http://www.wrightfoundation.com) provide PARS training although the depth of training in counselling and communication does not appear sufficient and is based solely on the Stages of Change. While such organisations have begun to provide specialist courses in areas such as Mental Health the lack of competence assurance in controlled settings (RCT based studies) does suggest a lack of awareness of its importance. Indeed, Laitakari and Asikainen (1998) suggested that there is a great need to develop PA promotion models that include individual counselling since most interventions are being applied for the facilitation of short-term behaviour.

Until further research of PARS officers applying PA counselling (having demonstrated competence) has been carried out it is difficult to state whether increased adherence is likely. It is clear however that for patients referred for overweight (and obese) or mental health conditions lack of confidence and psychological barriers may impact on their confidence to maintain change (Johnston et al., 2005). The content of PA counselling in PARS must then embed content and strategies that increase self-efficacy and autonomy in the PA setting. Training must then reflect this and develop a skills base that will enable a client-centred approach emphasising autonomy and self-efficacy which is perhaps why MI appears so intuitively attractive. Moreover, training should allow for the development of counselling and communication skills which are client-centred and appropriate for this health-care setting. A positive finding of this thesis (Chapter 7 specifically) was that, even though problems exist with the PARS setting and consistency of the intervention, a 2-day workshop is not sufficient to develop complex skills such as reflective listening. Therefore training should be embedded into a longer term programme for PA and allied health professionals with mentoring and ongoing support rather than a discrete one-off diet of training (Walters et al., 2005).

Throughout the thesis it has been shown that PARS are positivistic in programme design and outcome measurement and training of PARS reflects this. In order to encourage a greater appreciation of the cognitive and emotional affect of behaviour change, the training approach of content and style of delivery appears paramount.

8.4 PA referral schemes

The context within which the interventions of the current thesis were delivered was PARS. Evidence (e.g., Harrison et al., 2005) suggests that with regards to clear procedures, monitoring and evaluation these schemes are at best in a state of early development and at worst ineffective and inept. Even though a quality assurance framework for such schemes was produced (NQAF; DoH, 2001a) it appears that many schemes are idiosyncratic with regards to programme design and practice and have not embedded its principles and procedures into their everyday operation. Moreover, whilst providing a patient pathway from clinical into community settings, they appear to be failing to reach all sectors of the population. Evidence discussed in Chapter 2 (such as Dugdill & Graham, 2004; Morgan, 2005) together with the findings of Studies 3 and 4 suggest that a very limited strata of the UK demographic (e.g., white, action-orientated and older) has access to, or approaches, such schemes raising questions as to their efficacy as a cross-population health strategy. The thesis surmised evidence such as Morgan (2005) that illustrated specific characteristics such as women rather than men, older adults rather than younger adults and low numbers of ethnic groups have been reported to be using the schemes. While the current thesis did not attempt to critically examine the effectiveness of PARS *per se*, it cannot be ignored that there are many reported issues of quality of service provided to patients. As highlighted in Chapter 2, Morgan (2005) has questioned the cost-effectiveness of such schemes in targeting wide population groups although when targeted at those 'almost-active', PARS may present a health intervention opportunity. Studies 3 and 4 reflected these issues of the gender and age population groups attracted to such schemes (e.g., typically female, white and over 50 years of age) although readiness ruler results, in both studies, indicated an 'almost-active' population. Thurston and Green (2004) recommend that PARS embed 'lifestyle programming' into such schemes incorporating recreational activities, allowing for a wide sample and choice,

applying social opportunities, allowing for increased home-based sessions and using the social relationships to engender motivation and vicarious experiences.

Finally, evaluations of PARS have been sparse (as discussed in Chapter 2) although where they have occurred, have been dominated by RCT's which do not necessarily reflect 'real-world' settings (Dugdill et al., 2005). Studies such as Chambers, Chambers and Campbell (2000) and Hillsdon et al. (2002) carried out controlled or randomised controlled trials which it has been suggested by Gidlow (2006) demonstrate common methodological weaknesses. These include the predominance of retrospective accounts of PA levels and self-report measures which often result in over-estimations of PA and which are not reflected by actual heart rates (Sims, Smith & Duffy, 1999). Further, the effect of control group contamination is likely to have an impact on outcome results where, in most PARS settings, it is uncommon for exercisers to have separate exercise environments and are likely to interact with one another. Indeed research such as Lowther et al. (2002) found increases in activity levels at follow-up due to controls being exposed to more than just the baseline measure during the lifespan of the evaluation (i.e., to other participants in control and treatment groups). As discussed previously, authors such as Morgan (2005) have reported the ethnographic coverage of PARS suggesting the 'worried well' are more likely to be white, middle-aged and 'action-orientated'. A point supported by Hillsdon, Foster and Thorogood (2005) who suggest that a fundamental flaw of RCT's (of PARS) is the reliance on data from patients who are attracted to such schemes and are the most motivated and compliant individuals. Dugdill et al., (2005) support the need for evaluating PARS but in doing so have stressed the limitations of current evaluations that have favoured physiological outcomes at the expense psychological and environmental markers. This supports the views of Hillsdon et al. (2005) who have suggested that relying on physiological data (whilst negating the social or cognitive contribution) does not replicate real life and over simplifies findings, again, challenging the benefit of RCT only evaluations. This diminishes the amount that can be known about those individuals that drop-out or do not attend sessions who, within and RCT, would be excluded from future analyses. Indeed it is these people whom it appears are essential to understand since they are more likely to represent the 'hard-to-reach' population. While Section 2.6.2 encouraged a greater use of treatment fidelity framework such as that of Bellg et al.

(2004), it appears that fundamental flaws such as the use of self-report only within RCT designs in such studies will undermine these advances. While the NQAF (DoH, 2001a) does provide an outline for evaluation it is limited (Dugdill et al., 2005) as too are RCT only analyses that negate the 'human' analysis of facets such as environment and cognitions toward behaviour change.

8.5 Limitations

The environment within which the MI interventions were delivered is, by its very nature, extraneous and lacks controllability. For example, the PARS vary greatly and comparing MI (delivered by an MI trainer) in one PARS against MI (delivered by a PARS officer following 2 days training) in another PARS is difficult. Not least comparisons are less robust due to the variability in monitoring and evaluation and general quality assurance applied between schemes (Gidlow et al, 2005). Moreover, the variability between participants in such facets as motivation, readiness, referral condition, support structures, social networks and PA history makes for an extremely diverse group within and between treatment and control groups. The current thesis did appear to suffer from the vagaries of PARS in attempting to assess the impact of the PA counselling intervention. This made a 'clean' comparison between trainer and trainee problematic although greater control of interventions would have threatened the ecological validity of the intervention. A smaller scale comparison in a single PARS with specific population groups may help to account for this variability.

Participant data collection and recruitment resulted in the imbalance between those attending sessions having been randomly allocated into treatment or control which undermines the random nature of the content (Study 3 and 4). This impacted on the reliability and inference from results. Controlling for this attrition and subsequent imbalance needs to be addressed in future research. The ability for PARS in the UK to apply longitudinal analyses of adherence through follow-up is also compromised by inaccurate and incomplete recording systems and a lack of attendance to the NQAF (DoH, 2001a). The data available for follow-up (at 12 months) was also incomplete. This was however due to a combination of incomplete PARS information and participants moving, changing numbers and not providing authorisation to be contacted.

The extent to which comparisons could be made between an experienced MI practitioner and a PA professional having received a 2-day training workshop on MI was problematic. While the coding and assessment of competence was independent and robust (Section 7.2.3), the assessment of training to more than one PARS officer would be more suitable in order to account for individual subjectivity and ability. However, this would have been expensive and logistically challenging to have competence tests applied using coding instruments for all PARS officers in both schemes. Furthermore, baseline assessments could have been applied (Pre) as to their counselling style followed by the post-MI training assessment of competence. Again, this was not possible given the nature of the setting and costs involved although future analyses of PA counselling interventions in PARS will need to account for this. It was also not possible (although again a methodological ideal) to control for training competence and variability. However, a consistent set of principles were applied based on MI (Miller & Rollnick, 2002) although subsequent guidelines for training MI (e.g., Miller & Moyers, 2006) were not available at the time of the PARS officer intervention. Therefore variability undoubtedly existed with the content and style of training. The only measure of training quality was the subsequent competence of the single PARS officer which again may have been subject to their past experience and techniques and ability to adapt as much as the training. Assessing a group of say 10 PARS officers pre- and post training would have offered a more substantive assessment of training effectiveness.

Within the PARS, the client readiness to change (motivation to start and confidence to maintain) was measured by both MI treatment groups (trainer and trainee) and provided an interesting measure of client readiness. However, this stage-measurement could not be collected for either control group since it was recorded within the MI session. Comparisons could not therefore be made between all four groups and subsequently reduced the predictive qualities of the tool (in terms of programme adherence) across all groups. Other measures such as EMI-2 were applied to all participants irrespective of allocated group although some samples were spoilt and thus had to be eliminated. Those spoilt samples were predominantly within the control groups where completion could not be ensured by the investigator or MI trained PARS officer. EMI-2 results were screened for Cronbach reliability in line with existing research (Markland & Ingledew, 1997). Across Study 3 and 4 results for

all fourteen subscales were not above the recommended 0.65 acceptability threshold making inferences less robust and reliable. However, little could have been done to allow for this and is a consequence of Likert-based inventories.

Finally, the range of patient referral conditions provides a challenge for clinicians and researchers alike. In the present thesis 14 conditions were reported as the primary reason for referral although many patients suffered a combination of symptoms. This has serious ramifications for PARS officers for intervention programming and in the current thesis the predictive effect of adherence from specific illnesses is difficult to measure.

8.6 Implications for PA policy

Evidence such as Johnston et al. (2005) and Morgan (2005) has highlighted that current schemes are inconsistent with regards to the standards set in the NQAF (DoH, 2001a) and are providing a healthcare pathway that does not prove effective for a broad enough proportion of the population or range of illnesses. Therefore it seems reasonable that, while appropriate standards for PARS programme design and operation exist, NICE (or relevant funding bodies responsible for PARS at a local level) insist on the mandatory application of the NQAF framework. Dugdill et al., (2005) go further and suggest that the existing evaluation guidelines of the NQAF should be improved to detail the types of methodological approach required and that training for practitioners should make explicit that *"health impact can be measured in many more ways than just changes in blood pressure"* (p.1397). Moreover, Dugdill and colleagues suggested that PARS should be made more comprehensive to account for a more diverse population which would include younger people and women. It appears from research such as Morgan (2005) that PARS do not attract those who would most benefit from such interventions and support. Such schemes should therefore take steps to actively engage with a wider demographic in order to provide a more effective and accessible patient pathway.

Those stakeholders involved in the delivery of the PA message (e.g., practice nurses, PARS officers and G.P's) should be expected to take part in PA training

(which would include behaviour change counselling at its core). This holistic approach should also begin to develop a national framework and policy rather than the current piecemeal approach which lacks coherence and a strategic focus. The policy makers at a local level should ensure that all those involved in PARS as a patient pathway be held to account for the ongoing development, monitoring and support for a wider range of skills than the current positivistic and reductionist health outcomes (e.g., physiological). This should therefore encourage reflective practice as a standard rather than exception accounting for all aspects of a client-centred PA intervention.

8.7 Implications for practice

The current thesis has praised the approach of Bellg et al (2004) and attempted to embrace their treatment fidelity framework within all studies development and implementation. This has been a key finding and process for the both the studies and the professional development of the investigator. However, it is important not to ignore the concerns of authors such as Leventhal & Friedman (2004) with regards to the implementation of such a framework in any thing other than research settings. Indeed, they suggest that the "*rigid implementation will in many ways hinders the science and practice of behavioral health interventions*" (p.453). In order to avoid this potential stifling of the 'real-world' practices required in settings such as PARS (and indeed not to contradict the issues raised in Section 8.4 regarding RCT's) it is essential that practitioners be mindful of the pro's and cons of applying such a framework. However, the process of absorbing and understanding this debate should in itself increase the awareness of practitioners of the need to demonstrate reliable and consistent interventions through training and ensuring competence. If this is all that is 'cherry-picked' from Bellg et al. (2004) by those delivering PA counselling interventions (in clinical or research settings), then the problems highlighted in Study 1 with regards to inconsistent and unreliable interventions may be reduced.

Having emphasised the need to ensure a robust and appropriate *style* of PA counselling the *content* of that intervention has been examined. It is clear that guidelines toward exercise consultations (Loughlan & Mutrie, 1995) do provide a sound content base although very little toward *how* best to deliver the content. It does

appear that these guidelines address many PA and health behaviour change issues (such as exercise history, decisional balance and exploration of perceived barriers) and when delivered in a client-centred style may demonstrate far more efficacy and consistency than was found in Study 1. Future training (and practice thereof) should not eliminate the content highlighted by Loughlan and Mutrie's guidelines. However, it appears timely to re-appraise the way in which they are delivered by PA and allied health professionals.

In order to examine the appropriate interaction of those delivering the PA intervention with regards to both the *style* and the *content* suggested already in this section, an appropriate test of competence is required. For practitioners this assessment must provide clear and concise feedback in a style that reflects the environment (again to ensure ecological validity). The current thesis encourages the use of reflective practice in PA counselling where a dearth currently exists. In order to support reflections of behaviour change counsellor competence measures such as MITI or BECCI may prove beneficial in PA settings. While dominated by research output extolling their effectiveness, there is little doubt that the reflective nature of assessing competence in an objective fashion is beneficial compared to the current paucity of evidence of competence. Study 4 demonstrated the potential for these measures whilst highlighting the challenge required to become competent in approaches such as MI.

Phase 1 of MI has been found to be effective when used earlier in the change process which indicates that contact and the delivery of PA counselling be applied in primary settings as much as in community programmes such as PARS. Phase 2 MI (action planning) does appear effective in a variety of settings although limited in PA studies and interventions. Behaviour change counselling may then provide an effective health-care alternative and findings of the current thesis would suggest that time restraints must be appreciated for future interventions. Indeed, the thesis highlighted that the evidence in support of MI correlated with increased sessions and duration of patient contact. These opportunities are scarcer in PARS and the focus should therefore be on relapse-prevention strategies and the development of patient self-efficacy and interventions that encourage greater self-determination (independence and autonomy). Interventions and, therefore evaluations, should focus

on home based as well as centre based PA and lifestyle modifications. A combination of objective measures should be used to collect robust data and qualitative approaches used to explore narrative accounts of where people are fitting PA into their lives.

Chapter 3 considered the practical implications of measuring client's levels of self-determination as a facet of a PA change intervention. The support for using SDT (Deci & Ryan, 2002) rather than TTM (Prochaska & DiClemente, 1983), or its derivates, is increasing and appears popular in conjunction with approaches such as MI (Markland et al., 2005; Vansteenkiste & Sheldon, 2006). While in its infancy, the promotion of practical tools for PA practitioners such as BREQ-2 (Markland & Tobin, 2004) does warrant further examination to ensure relevance and appropriateness for practitioners for 'matching' subsequent PA interventions for patients.

8.8 Implications for future research

The implications that have been gleaned from this thesis can be divided into three overlapping segments. First, those interventions intending to provide a behaviour change intervention should be underpinned by a treatment fidelity framework in order to ensure a theoretical framework, sound design and assessment of competence for those delivering the intervention. Without this research is likely to be weakened by a lack of internal validity (Ory et al., 2002). Indeed, these recommendations would apply well to PARS which lack robust evidence to date. The benefits of applying a fidelity framework, such as that proposed by Bellg et al. (2004), appear substantive in light of inconsistencies highlighted in Study 1 of current PA counselling research. However, researchers must be mindful of concerns raised by Leventhal & Friedman to ensure that embedding such frameworks does not restrict innovation and autonomy of exploration. Second, that further research is carried out with regards to the application of PA counselling and guidelines for PA and exercise. This can only be carried out with reliable and appropriate training of PA officers and allied-health professionals which will use appropriate skills such as reflective listening in a client-centred style that encourages change-talk and increases the likelihood of patient self-efficacy toward change. Current training for such health professionals is positivistic in nature (emphasising physiological outcomes predominantly) and neglects the huge impact of cognitive processes, environmental

factors and social-cultural influences. Research assessing the training effects of approaches such as MI (or AMI's) should demonstrate techniques that are transferable in real world settings and accommodate concerns regarding RCT dominant designs.

Third, that the intervention should account for behaviour adaptations that occur away from the research centre setting such as home-based activity. This would need to assess the accuracy of self-report measures but would provide more robust client information to enable longitudinal analysis of behaviour change beyond the typical 12-16 week PARS intervention. This should even reflect lifestyle adaptations made beyond 12 months. To that end, the design for PARS should incorporate a longer term intervention or follow-up of 6 months rather than 3 months with follow-up the norm (Dugdill et al., 2005).

8.9 Conclusions and recommendations

Findings from the current thesis indicated that empirical research is required to evaluate fully the effectiveness of PA counselling (such as AMI's) in PARS over the longer term. While patient-centeredness has been suggested as a proxy for high quality interpersonal care, there is a dearth of empirical evidence to support this approach (Mead & Bower, 2000). Further, research should also focus on the aetiology of illness and its effects on programme adherence and should begin to appreciate the challenge that greater numbers of diverse conditions (such as mental health) will threaten the ability of PARS officers to respond effectively. However, similar to the suggestions by Steinberg et al. (2004) (regarding smoking cessation interventions) until the intervention itself is robust and consistent the effectiveness of interventions such as MI cannot be truly assessed. Therefore evaluations of PARS and similar interventions should be a priority for funding bodies and should consider the appropriateness of an RCT only approach. It is also clear that no national policy for PA exists in the UK and as a result such PA schemes and targets are embedded into other Government policies (e.g., National Service Framework for CHD; DoH, 2000) (Dugdill et al., 2005). While the evidence in support of interventions such as MI in PA intervention settings is in its infancy there are increasing calls for its further evaluation in settings such as PARS (Brodie & Inoue, 2005; Dugdill et al., 2005;

Scales & Miller, 2003) using theoretical frameworks such as SDT (Markland et al., 2005). Indeed, once the inconsistency surrounding PARS themselves has begun to be resolved this may provide a more robust setting within which MI (or its adaptations) can demonstrate its effectiveness.

References

Aittasalo, M., Miilunpalo, S., Kukkonen-Harjula, K. & Pasanen, M. (2006) A randomized intervention of physical activity promotion and patient self-monitoring in primary health care. *Preventative Medicine*, 42, 40-60.

Allied Dunbar National Fitness Survey (1992) *A report on activity patterns and fitness levels*. London: Sports Council and Health Education Authority.

Amrhein, P. C. (2004) How does motivational interviewing work? What client talk reveals. *Journal of Cognitive Psychotherapy*, 18 (4), 323-336.

Amrhein, P. C., Miller, W. R., Yahne, C. E., Palmer, M., & Fulcher, L. (2003). Client Commitment Language During Motivational Interviewing Predicts Drug Use Outcomes. *Journal of Consulting and Clinical Psychology,* 71 (5), 862-878.

Anis, N. A., Lee, R. E., Ellerbeck, E. F., Nazir, N., Greiner, K. A. & Ahluwalia, J. S. (2004) Direct observation of physician counseling on dietary habits and exercise: Patient, physician, and office correlates. *Preventive Medicine*, 38, 198-202.

Anshel, M. H. (2006) *Applied Exercise Psychology: A practitioner's guide to improving client health and fitness.* New York: Springer.

Baer, J. S., Rosengren, D. B., Dunn, C. W., Wells, E. A., Ogle, R. L., & Hartzler, B. (2004). An evaluation of workshop training in motivational interviewing for addiction and mental health clinicians. *Drug and Alcohol Dependence*, 73(1), 99-106.

Bakker, F. C., Whiting, H. T. A., & van der Brug, H. (1997). *Sport psychology: Concepts and applications.* London: Wiley.

Bandura, A. (1977) Self-efficacy: Toward a unifying theory of behaviour change. *Psychological Review*, 84, 191-215.

Bellg, A. J., Borrelli, B., DeFrancesco, C., Breger, R., Hecht, J., Sharp, D. L., Levesque, C., Orwig, D., Ernst, D., Ogedegbe, G. & Czajkowski, S. (2005) Examples of implementation and evaluation of treatment fidelity in the BCC studies: Where we are and where we need to go. *Annals of Behavioral Medicine*, 29, 46-54.

Bellg, A. J., Borrelli, B., Resnick, B., Hecht, J., Minicucci, D. S.,Ory, M., Ogedegbe, G., Orwig, D., Ernst, D. & Czajkowski, S. (2004) Enhancing treatment fidelity in health behavior change studies: Best practices and recommendations from the NIH behavior change consortium. *Health Psychology,* 23 (5), 443-451.

Bennett, G. A., Roberts, H. A., Vaughan, T. E., Gibbons, J. A. & Rouse, L. (2006) Evaluating a method of assessing competence in motivational interviewing: A study using simulated patients in the United Kingdom. *Addictive Behaviors*, 32(1), 69-79.

Berg-Smith, S., Stevens, V. J., Brown, K. M., Van Horn, L., Gernhofer, N., Peters, N., Greenberg, R., Snetselaar, L., Ahrens, L. & Smith, K. (1999) A brief motivational intervention to improve dietary adherence in adolescents. The Dietary Intervention Study in Children (DISC) research group. *Health Education Research*, 14, 399-410.

Biddle, S. J. H, Fox, K. R. & Boutcher, S. H. (2000) Physical Activity and Psychological Well-Being. London: Routledge.

Biddle, S. J. H & Mutrie, N. (2001). *Psychology of physical activity: Determinants, well-being and interventions*. London: Routledge.

Bien, T., Miller, W. R. & Burroughs, J. M (1993) Motivational interviewing with alcohol outpatients. *Behavioural and Cognitive Psychotherapy,* 21(4), 347-356.

Blair, S. N., Cheng, Y. & Holder, J. S. (2001) Is physical activity or physical fitness more important in defining health benefits? *Medicine and Science in Sports and Exercise*, 33(6) Supplement: S379-S399.

Blamey, A. & Mutrie, N. (2004) Changing the individual to promote health-enhancing physical activity: the difficulties of producing evidence and translating it into practice. *Journal of Sports Sciences*, 22, 741-754.

Booth, M. L., Macaskill, P., Owen, N., Oldenburg, B., Marcus, B. H., & Bauman, A. (1993) Population Prevalence and Correlates of Stages of Change in Physical Activity. *Health Education Quarterly,* 20(3), 431-440.

Bosanquet, N. & Franks, P. (1998) *Stroke care: reducing the burden of disease.* London: Stroke Association.

Bostick, R. M., Luepker, R. V., Kofron, P. M. & Pirie, P. L. (1991) Changes in physician practice for the prevention of cardiovascular diseases. *Archives of International Medicine,* 151, 478-484.

Breckon, J. D. (2002) Motivational interviewing in exercise prescription. In, Lavallee, D. & Cockerill, I. (Eds.) (2002). *Counselling in sport and exercise contexts.* London: Blackwell.

British Heart Foundation (2004) Coronary heart disease statistics: BHF statistics database 2002. London: British Heart Foundation.

British Psychological Society (2000) *Regulations and syllabus for the diploma in counselling psychology.* Leicester: British Psychological Society.

Britt, E., Hudson, S. M., & Blampied, N. M. (2004) Motivational interviewing in health settings: a review. *Patient Education and Counseling,* 53, 147-155.

Britton, A. & McPherson, K. (2002) Monitoring the progress of the 2010 target for CHD mortality: Estimated consequences on CHD incidence and mortality from changing prevalence of risk factors. London: National Heart Forum.

Brodie, D. & Inoue, A. (2005) Motivational interviewing to promote physical activity for people with chronic heart failure. *Journal of Advanced Nursing*, 50 (5), 518-527.

Buckworth, J. & Dishman, R. (2002). *Exercise Psychology*. Champaign, Ill.: Human Kinetics.

Bull, F. C., Jamrozik, K. & Blanksby, B. A. (1999) Tailored advice on exercise- does it make a difference? *American Journal of Preventive Medicine,* 16(3), 230-239.

Bunton, R., Baldwin, S., Flynn, D. & Whitelaw, S. (2000) The 'stages of change' model in health promotion: Science and Ideology. *Critical Public Health,* 10(1), 55-69.

Burke, B. L., Arkowitz, H. & Dunn, C. (2002) The efficacy of motivational interviewing. In, W. R. Miller & S. Rollnick (Eds.). *Motivational Interviewing: Preparing people for change* (2nd ed.). New York: Guilford Press, pp. 217-250.

Burke, B. L., Aroids, H. & Menchola, M. (2003a) The efficacy of motivational interviewing: a meta-analysis of controlled clinical trials. *Journal of Consulting and Clinical Psychology*, 71, 843-861.

Burke, V., Giangiulio, N., Gillam, H.F., Beilin, L.J. & Houghton, S. (2003b). Physical activity and nutrition programs for couples: A randomized controlled trial. *Journal of Clinical Epidemiology*, 56, 421-432.

Calfas, K. J., Long, B. J., Sallis, J. F., Wooten, W. J., Pratt, M. P. H. & Patrick, K. (1996) A controlled trial of physician counseling to promote the adoption of physical activity. *Preventive Medicine*, 25, 225-233.

Campbell, M., Fitzpatrick, R., Haines, A., Kinmonth, A., Sandercock, P., Spiegelhalter, D. & Tyrer, P. (2000). *British Medical Journal*, 321, 694-696.

Cameron, C., Craig, C. L., Stephens, T., & Ready, T. A. (2002) *Increasing physical activity: Supporting an active workforce.* Ottawa, ON: Canadian Fitness and Lifestyle Research Institute.

Chambers, R., Chambers, C. and Campbell, I. (2000) Exercise promotion for patients with significant medical problems. *Health Education Journal,* 59, 90-98.

Chambers, J. A. & Swanson, V. (2006) A health assessment tool for multiple risk factors for obesity: Results from a pilot study with UK adults. *Patient Education and Counseling*, 62, 79-88.

Clark, M. (2006) A difference that makes a difference: Change talk and the confusion surrounding the constructs of Reason and Need. *MINT Bulletin*, 13 (1), 5-6.

Corbett, G. (2006) What the research says about MI training. *MINT Bulletin*, 13 (1), 12-14.

Corbett, G. (2004) About change talk: Part 1. *MINT Bulletin,* 11 (2), 9-10.

Cronbach, L. J. (1951) Coefficient alpha and the internal reliability structure of tests. *Psychometrika*, 16, 297-334.

Crone, D., Johnston, L. H. & Grant, T. (2004) Maintaining quality in exercise referral schemes: a case study of professional practice. *Primary Health Care Research and Development*, 5 (2). 96-103.

Crone, D., Smith, A. & Gough, B. (2005) 'I feel totally at one, totally alive and totally happy': a psycho-social explanation of the physical activity and mental health relationship. *Health Education Research*, 20 (5), 600-611.

Daley, A. J., Mutrie, N., Crank, H., Copeland, R. & Saxton, J. (2004) Exercise therapy in women who have had breast cancer: design of the Sheffield women's exercise and well-being project. *Health Education Research*, 19(6), 686-697.

de Blok, B. M. J., Greef, M. H. G., Hacken, N. H. T., Sprenger, S. R., Postema, K. & Wempe, J. B. (2006). The effects of a lifestyle physical activity counseling program with feedback of a pedometer during pulmonary rehabilitation in patients with COPD: A pilot study. *Patient Education and Counseling*, 61, 48-55.

Deci, E. L. & Ryan, R. M. (2004 & 2002) *Handbook of self-determination research.* University of Rochester press: Rochester, New York.

Deci, E. L. & Ryan, R. M. (1987) The support of autonomy and the control of behaviour. *Journal of Personality and Social Psychology*, 53, 1024-1037.

Deci, E. L. & Ryan, R. M. (1985) *Intrinsic motivation and self-determination in human behaviour*. New York: Plenum Press.

de Jonge, J. M., Schippers, G. M. & Schaap, P. D. R. (2005) The motivational interviewing skill code : Reliability and a critical appraisal. *Behavioral and Cognitive Psychotherapy*, 33, 285-298.

Department of Culture, Media and Sport (2002) *Game plan: A strategy for delivering government's sport and physical activity objectives.* London: Cabinet Office.

Department of Health (2004a) *Choosing Health: a physical activity action plan.* London: NHS.

Department of Health (2004b) *Delivering Choosing Health: making healthier choices easier.* London: NHS.

Department of Health (2004c) *At least five a week: Evidence on the impact of physical activity and its relationship to health.* A report from the Chief Medical Officer, London: The Stationary Office.

Department of Health (2004d) *Mainstreaming action on health inequalities - linking evidence, policy and practice.* Secretary of State for Health, Health Development Agency National Conference. London: Department of Health.

Department of Health (2003) *Health Survey for England 2003.* London: Department of Health.

Department of Health (2001a) *Exercise Referral Systems: a National Quality Assurance Framework.* London: Department of Health.

Department of Health (2000) *National Service Frameworks: Coronary Heart Disease.* London: Department of Health Publications.

Department of Transport (2004) *Transport trends.* London: DfT.

Devlin, M. J., Yanovski, S. Z. & Wilson, G. T. (2000) Obesity: What mental health professionals need to know. *American Journal of Psychiatry*, 157 (6), 854-866.

Dishman, R. K. & Buckworth, J. (1996) Increasing physical activity: a quantitative synthesis. *Medicine & Science in Sports & Exercise*. 28(6):706-719.

Dowler, E. (2001) Inequalities in diet and physical activity in Europe. *Public Health Nutrition*, 4 (2B), 701-709.

Draycott, S. & Dabbs, A. (1998a) Cognitive Dissonance 1: An overview of the literature and its integration into theory and practice in clinical psychology. *British Journal of Clinical Psychology,* 37, 341-353.

Draycott, S. & Dabbs, A. (1998b) Cognitive Dissonance 2: A theoretical grounding of motivational interviewing. *British Journal of Clinical Psychology,* 37, 355-364.

Dugdill, L. & Graham, R. (2004) Promoting physical activity: Building sustainable interventions. *In,* J. Gormley & J. Hussey (Eds.) *Exercise in the prevention and treatment of disease.* Oxford: Blackwell.

Dugdill, L., Graham, R. C. & McNair, F. (2005) Exercise referral: the public panacea for physical activity promotion? A critical perspective of exercise referral schemes; their development and evaluation. *Ergonomics*, 48(11-14), 1390-1410.

Dunn, C., Deroo, L. & Rivara, F. P. (2001) The use of brief interventions adapted from motivational interviewing across behavioral domains: a systematic review. *Addiction*, 96, 1725-1742.

Dunn, C. & Rollnick, S. (2003) *Lifestyle Change.* London: Mosby.

Dupree-Jones, K., Burkhardt, C. S. & Bennett, J. A. (2004) Motivational interviewing may encourage exercise in persons with Fibromyalgia by enhancing self efficacy. *Arthritis & Rheumatism (Arthritis Care & Research)*, 51 (5), 864-867.

Dzewaltowski, D. (1994) Physical Activity Determinants: a social cognitive approach. *Medicine and Science in Sport and Exercise*, 26(11), 1395-1399.

Eden, K. B., Orleans, T., Mulrow, C. D., Pender, N. J. & Teutsch, S. M. (2002) Does counselling by clinicians improve physical activity? A summary of the evidence of the U.S. Preventive Health Task Force. *Annals of International Medicine.* 137, 208-15.

Elder, J. P., Ayala, G. X. & Harris, S. (1999) Theories and intervention approaches to health behavior change in primary care. *American Journal of Preventive Medicine*, 17 (4), 275-284.

Elley, C., Kerse, N., Arroll, B. & Robinson, E. (2003) Effectiveness of counselling patients on physical activity in general practice: cluster randomised controlled trial. *British Medical Journal*, 326, 793–798.

Emmons, K. M. & Rollnick, S. (2001) Motivational interviewing in health care settings: Opportunities and limitations. *American Journal of Preventive Medicine*, 20 (1), 68-74.

Farbring, C. A. (2006) Consensus on change talk. *MINT Bulletin*, 13 (1), 7-8.

Faulkner, G. E. J. & Taylor, A. H. (2005) *Exercise, health and mental health: Emerging relationships.* London: Routledge.

Field, A. (2005) *Discovering Statistics using SPSS.* London: Sage.

Fluery, J. (1992) The application of motivational theory to cardiovascular risk reduction. *Journal of Nursing Scholarship*, 24, 229-239.

Foote, J., DeLuca, A., Magura, S., Warner, A., Grand, A., Rosenblum, A., et al. (1999) A group motivational treatment for chemical dependency. *Journal of Substance Misuse*, 17, 181-192.

Foster, C., Hillsdon, M., Cavill, N., Allender, S. & Cowburn, G. (2005) *Understanding participation in sport: A systematic review.* Sport England and University of Oxford British Heart Foundation Health Promotion Research Group, Oxford, UK.

Foster, C. & Hillsdon, M. (2004) Changing the environment to promote health-enhancing physical activity. *Journal of Sport Sciences*, 22(8), 755-769.

Fox, K. R. (2000) The effects of exercise on self-perceptions and self-esteem. In, S. J. H. Biddle, K. R. Fox and S. H. Boutcher (Eds.). *Physical activity and psychological well-being* (pp.88-117). London: Routledge.

Fox, K. R. (2001) Foreword. In, S. J. H. Biddle & N. Mutrie (2001) *Psychology of physical activity.* London: Routledge.

Fox, K. R., Boutcher, S. H, Faulkner, G. E. & Biddle, S. J. H. (2000) The case for exercise in the promotion of mental health and psychological well-being. In S. J. H. Biddle, K. R. Fox & S. H. Boutcher (Eds.), *Physical activity and psychological well-being.* London: Routledge (pp. 1-9).

Fox, K., Biddle, S. Edmunds, L., Bowler, I. & Killoran, A. (1997) Physical activity promotion through primary health care in England. *British Journal of General Practice*, 47, 367-369.

Francis, K. (2000) Status of the year 2000 health goals for physical activity and fitness. *Physical Therapy*, 79, 405-414.

Frederick-Rescascino, C. M. (2002) Self-determination theory and participation motivation research in the sport and exercise domain. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 277-294). Rochester, NY: University of Rochester Press.

Gard, M. & Wright, J. (2005) *The Obesity Epidemic: Science, mortality and ideology.* Oxon: Routledge.

Gerber, S. & Basham, A. (1999) Responsive Therapy and Motivational Interviewing: Postmodernist Paradigms. *Journal of Counseling & Development.* 77, 418-422

Gidlow, C. (2006) *Physical Activity Referral Schemes: socio-demographic patterning of exposure, uptake and attendance.* Unpublished doctoral dissertation. Sheffield Hallam University, Sheffield, UK.

Gidlow, C., Johnston, L., Crone, D. and James, D. (2005) Attendance of exercise referral schemes in the UK: a systematic review. *Health Education Journal,* **64,** 168-186.

Ginsberg, J. I. D., Mann, R. E., Rotgers, F. & Weekes, J. R. (2002) Motivational interviewing with criminal justice populations. In W. R. Miller & S. Rollnick (Eds.), *Motivational interviewing: Preparing people for change* (2nd ed., 333-347). New York: Guilford.

Goldstein, M., DePue, J., Monroe, A., Willey Lesne, C., Rakowski, W., Prokhorov, A., Niaura, R. & Dube, C. (1998) A population-based survey of smoking cessation counseling practices. *Preventive Medicine.* 27, 72-729.

Gollwitzer, P. M. (1999) Implementation intentions: Simple effects of simple plans. *American Psychologist*, 54, 493-503.

Gollwitzer, P. M. (1990) Action phases and mindsets. In, E. T. Higgins & J. R. M. Sorrentino (Eds.) *The Handbook of Motivation and Cognition*, Vol. 2. New York: Guilford, 53-92.

Gordon, T. (1970) *Parent effectiveness training.* New York: Wyden.

Gould, M. M., Thorogood, M., Illfe, S. & Morris, J. N. (1995) Promoting physical activity in primary care: Measuring the knowledge gap. *Health Education Journal*, 54, 304-311.

Graham, R. C., Dugdill, L. & Cable, N. T. (2005) Health professionals' perspectives in exercise referral: implications for the referral process. *Ergonomics*, 48 (11-14), 1411-1422.

Green, L. W. & Kreuter, M. W. (1991) *Health promotion planning: An educational and environmental approach.* London: Mayfield.

Grol, R., de Maeseneer, J., Whitfield, M., & Mokkink, H. (1990) Disease-centred versus patient-centred attitudes: comparison of general practitioners in Belgium, Britain and the Netherlands. *Family Practice,* 7: 100.

Hardman, A. E. & Stensel, D. J. (2003) Physical Activity and Health: The Evidence Explained. London: Routledge.

Harland, J., White, M., Drinkwater, C., Chinn, D., Farr, L., & Howel, D. (1999) The Newcastle exercise project: A randomised controlled trial of methods to promote physical activity in primary care. *British Medical Journal,* 319, 828-833.

Harrison, R. A., Roberts, C. & Elton, P. J. (2005) Does primary care referral to an exercise programme increase physical activity 1 year later? A randomized controlled trial. *Journal of Public Health*, 27(1), 25-32.

Heather, N. (2005) Motivational interviewing: Is it all our patients need? *Addiction Research and Therapy.* 13(1), 1-18.

Hecht, J., Borrelli, B., Breger, R. K. R., DeFrancesco, C., Ernst, D. & Resnicow, K. (2005) Motivational interviewing in community-based research: Experiences from the field. Annals of Behavioral Medicine, 29 (Supplement), 29-34.

Hellman, E. A. (1997) Use of the Stages of Change in Exercise Adherence Model Among Older Adults with a Cardiac Diagnosis. *Journal of Cardiopulmonary Rehabilitation,* 17, 145-155.

Hettema, J. Steele, J., & Miller, W. R. (2005) A meta-analysis of research on motivational interviewing treatment effectiveness (MARMITE). *Annual Review of Clinical Psychology.* 1, 91-111.

Hillsdon, M., Foster, C., Cavill, N., Crombie, H. & Naidoo, B. (2005) *The effectiveness of public health interventions for increasing physical activity among adults: a review of reviews.* Evidence Briefing (2nd edition). London: Health Development Agency.

Hillsdon, M., Foster, C. and Thorogood, M. (2005) Interventions for promoting physical activity. *The Cochrane Database of Systematic Reviews,* Issue 1. Art. No.: CD003180.pub2. DOI: 10.1002/14651858.CD003180.pub2.

Hillsdon, M., Thorogood, M., White, I. & Foster, C. (2002) Advising people to take more exercise is ineffective: a randomized controlled trial of physical activity promotion in primary care. *International Journal of Epidemiology,* 31, 808-815.

Hoenig, & Heisey (2001) The abuse of power: The pervasive fallacy of power calculations for data analysis. *The American Statistician*, 55(1), 1-6.

Hughes, A. R., Gillies, F., Kirk, A. F., Mutrie, N., Hillis, W. S. & MacIntyre, P. D. (2002) Exercise consultation improves short-term adherence to exercise during phase IV cardiac rehabilitation. *Journal of Cardiopulmonary Rehabilitation*, 22, 421-425.

Hunt, P. & Hillsdon, M. (1996) *Changing eating and exercise behaviour.* Oxford: Blackwell.

Ingledew, D. K, Markland, D., & Medley, A. R. (1998). Exercise motives and stages of change. *Journal of Health Psychology,* 3 (4), 477-489.

Ingledew, D. K., Markland, D., & Sheppard, K. E. (2004) Personality and self-determination of exercise behaviour. *Personality and Individual Differences*, 36, 1921-1932.

Ingledew, D. K. & Sullivan, G. (2002) Effects of body mass and body image on exercise motives in adolescence. *Psychology of Sport & Exercise,* 3, 323-338

James, A. D. & Johnston, L. H. (2004) The emerging role of the physical activity promoter within health promotion. *Health Education*, 104 (2), 77-89.

Johnston, L. H., Warwick, J., De Ste Croix, Crone, D. & Sidford, A. (2005) The nature of all 'inappropriate referrals' made to a countrywide physical activity referral scheme. *Health Education Journal*, 64 (1), 58-69.

Joint Health Surveys Unit (2004) *Health Survey for England 2003: Trends Commentary.* London: The Stationary Office.

Jones, J., Kirby, K. & Thurston, M. (2001) *An evaluation of the 'Activity for Life' programme: an exercise referral scheme.* Unpublished manuscript, Centre for Public Health Research, Chester College, Chester.

Kahn, E., Ramsey, L., Brownson, R., Health, G., Howze, E., Powell, K., Stone, E., Rajab, M. & Corso, P. (2002) The effectiveness of interventions to increase physical activity. *American Journal of Preventive Medicine*, 22, 73-107.

Keller, D. S. & Dermatis, H. (1999) Current status of professional training in the addictions. *Substance Abuse*, 20, 123-140.

Kennedy, M. F., & Meeuwisse, W. H. (2003) Exercise counseling by family physicians in Canada. *Preventive Medicine,* 37, 226-232.

Kerse, N., Elley, C. R., Robinson, E. & Arroll, B. (2005). Is physical activity counseling effective for older people. A cluster randomized, controlled trial in primary care. *Journal of American Geriatrics Society*, 53- 1951-1956.

Kerse, & Walker, (2000) Conclusions are misleading: Responses to Harland et al. (1999) The Newcastle Exercise Project. *British Medical Journal,* 320, 1470 (27 May).

Khan, K. S., Daya, S. & Jadad, A. (1996) The importance of quality of primary studies in producing unbiased systematic reviews. *Archives of Internal Medicine*, 156(6), 661-666.

King, A. C., Blair, S. N., Bild, D. E., Dishman, R. K., Dubbert, P. M., Marcus, B. H., Oldridge, N. B., Paffenberger, R. S., Powell, K. E. & Yeager, K. K. (1992) Determinants of physical activity and interventions in adults. *Medicine and Science in Sports and Exercise,* 24 (6: supplement S221-S236).

Kirk, A., Higgins, L. A., Hughes, A. R., Fisher, B. M., Mutrie, N., Hillis, S. & MacIntyre, P. D. (2001) A randomized, control trial to study the effect of exercise consultation on the promotion of physical activity on people with type 2 diabetes: a pilot study. *Diabetic Medicine*, 18, 877-882.

Kirk, A., MacIntyre, P., Mutrie, N. & Fisher, M. (2003) Increasing physical activity in people with type 2 diabetes. *Diabetes Care*, 26 (4), 1186-1192.

Kirk, A. F., Mutrie, N., MacIntyre, P. D. & Fisher, M. B. (2004a). Promoting and maintaining physical activity in people with type 2 diabetes. *American Journal of Preventive Medicine*, 27, 289-296.

Kirk, A., Mutrie, N., MacIntyre, P. & Fisher, M. (2004b). Effects of a 12 month physical activity counselling intervention on glycaemic control and on status of cardiovascular risk factors in people with type 2 diabetes. *Diabetologia*, 47, 821-832.

Klein, R. (1999) The war against obesity: attacking a new front. *American Journal of Clinical Nutrition,* 69 (6), 1061-1063.

Knight, K. M., McGowan, L., Dickens, C. & Bundy, C. (2006) A systematic review of motivational interviewing in physical health care settings. *British Journal of Health Psychology*, 11, 319-332.

Kretchmar, R. S. (2005) *Practical philosophy of sport and physical activity.* Champaign; Ill.: Human Kinetics.

Koestner, R. & Losier, G. F. (2004) Distinguishing three ways of being internally motivated: A closer look at introjection, identification, and intrinsic. *In*, E. L. Deci & R. M. Ryan (Eds.) *Handbook of Self-Determination Research* (p.101-121). Rochester, NY: The University of Rochester Press.

Kreman, R., Yates, B. C., Agrawal, S., Fiandt, K., Briner, W. & Shurmur, S. (2006) The effects of motivational interviewing on physiological outcomes. *Applied Nursing Research*, 19, 167-170.

Kreuter, M. W., Chheda, S. G. & Bull, F. C. (2000) How does physician advice influence patient behaviour? *Archives of Family Medicine*, 9, 426-433.

Lamb, S., Bartlett, H., Ashley, A. & Bird, W. (2002) Can lay-led walking programmes increase physical activity in middle-aged adults? *Journal of Epidemiology and Community Health*, 56, 445-452.

Lane, C., Huws-Thomas, M., Hood, K., Rollnick, S., Edwards, K., & Robling, M. (2005) Measuring adaptations of motivational interviewing: the development and validation of the behavior change counseling index (BECCI). *Patient Education and Counseling*, 56, 166-173.

Lavallee, D., Kremer, J., Moran, A. P. & Williams, M. (2004) *Sport Psychology: contemporary themes.* Hampshire, UK: Palgrave MacMillan.

Lawendowski, L. A. (1998). A motivational intervention for adolescent smokers. *Preventive Medicine*, 27, 39-46.

Lawlor, D. & Hanratty, B. (2001) The effect of physical activity advice given in routine primary care consultations: a systematic review. *Journal of Public Health Medicine*, 23, 219–226.

Lin, S. X., Hyman, D. & Larson, E. (2005) Provision of health counseling in office-based practices and hospital outpatient clinics. *Preventive Medicine*, 40, 542-546.

Lipkin, M., Quill, T. E., & Napodano, J. (1984). The medical interview: a core curriculum for residencies in internal medicine. *Annals of International Medicine.* 100:277.

Liu, J. L. Y., Maniadakis, N., Gray, A. & Rayner, M. (2002) The economic burden of coronary heart disease in the UK. *Heart*, 88, 597-603.

Long, B. J., Calfas, K. J., Wooten, W., Sallis, J. .F, Patrick, K., Goldstein, M., Marcus, B. H., Schwenk, T. L., Chenoweth, J., Carter, R., Torres, R., Palinkas, L. A. & Heath, G. (1996) A multisite field test of the acceptability of physical activity counselling in primary care: Project PACE. *American Journal of Preventive Medicine*, 12 (2), 73-81.

Long, B. C. & Haney, C. (1986) Enhancing physical activity in sedentary women: information, locus of control and attitudes. *Journal of Sports Psychology*, 8, 8-24.

Lord, J. C. & Green, F. (1995) Exercise on prescription: does it work? *Health Education Journal*, 54, 453-464.

Loughlan, C. & Mutrie, N. (1995) Conducting an exercise consultation: guidelines for health professionals. *Journal of the Institute of Health Education,* 33, 78-82.

Lowther, M., Mutrie, N. & Scott, E. M. (2002) Promoting physical activity in a socially and economically deprived community: a 12 month randomized control trial of fitness assessment and exercise consultation. *Journal of Sport Sciences,* 20, 577-588.

Mahrer, A. R., Gagnon, R., Fairweather, D. R., Boulet, D. B., & Herring, C. B. (1994) Client commitment and resolve to carry out post-session behaviors. *Journal of Consulting and Clinical Psychology*, 41, 407-414.

Maltby, J. & Day, L. (2001) The relationship between exercise motives and psychological well-being. *The Journal of Psychology*, 135 (6), 651-660.

Marcus, B. H. & Simkin, L. R. (1994) The transtheoretical model: applications to exercise behavior. *Medicine and Science in Sports and Exercise,* 26, 1400-1404.

Marcus, B. H. & Stanton, A. L. (1993) Evaluation of relapse prevention and reinforcement interventions to promote exercise adherence in sedentary females. *Research Quarterly in Sport & Exercise,* 64(4), 447-52.

Markland, D., & Ingledew, D. K. (1997) The measurement of exercise motives: Factorial validity and invariance across gender of a revised Exercise Motivations Inventory. *British Journal of Health Psychology*, 2, 361-376.

Markland, D., Ryan, R. M., Tobin, V. J. & Rollnick, S. (2005) Motivational interviewing and self-determination theory. *Journal of Social and Clinical Psychology*, 24 (6), 811-831.

Markland, D. & Tobin, V. (2004). A modification of the Behavioral Regulation in Exercise Questionnaire to include an assessment of amotivation. *Journal of Sport and Exercise Psychology,* **26**, 191-196.

Marlatt, G. A. & Gordon, J. R. (1985) *Relapse prevention: Maintenance strategies in the treatment of addictive behaviors*. New York: Guilford.

Marlatt, G. A., Parks, G. A. & Witkiewitz, K. (2002) *Clinical guidelines for implementing relapse prevention therapy.* Behavioral Health Recovery Management Project: University of Washington, IL.

Marshall, A. L., Booth, M. L. & Bauman, A. E. (2005). Promoting physical activity in Australian general practices; A randomised trial of health promotion advice versus hypertension management. *Patient Education and Counseling*, 56, 283-290.

Martin, C. & Woolf-May, K. (1999) The retrospective evaluation of a general practitioner exercise prescription programme. *Journal of Human Nutrition and Dietetics*, 12 (SUPPL. 1), 32-42.

McElroy, M. (2002) *Resistance to exercise: a social analysis of inactivity.* Champaign, Ill. Human Kinetics.

McKay, H. A., MacDonald, H., Reed, K. E. & Khan, K. M. (2003) Exercise interventions for health: time to focus on dimensions, delivery and dollars. *British Journal of Sports Medicine,* 37, 98-99.

McKenna, J., Naylor, P-J. & McDowell, N. (1998) Barriers to physical activity promotion in General Practitioners and Practice Nurses. *British Journal of Sports Medicine,* 32, 242-247.

McKenna, J. & Vernon, M. (2004) How general practitioners promote 'lifestyle' physical activity. *Patient Education and Counseling,* 54, 101-106.

Mead, N., & Bower, P. (2000) Measuring patient-centredness: a comparison of the three observation-based instruments. *Patient Education and Counseling,* 39, 71-80.

Melanson, K. J., Dell'Olio, J., Carpenter, M. R. & Angelopoulos, T. J. (2004) Changes in multiple health outcomes at 12 and 24 weeks resulting from 12 weeks of exercise counseling with or without dietary counseling in obese adults. *Nutrition*, 20 (10), 849-856.

Michie, S. & Abraham, C. (2004) Interventions to change health behaviours: evidence-based or evidence-inspired? *Psychology and Health,* 19(1), 29-49.

Miller, W. R. (2006) State of the art and science of motivational interviewing. *MINT Bulletin*, 13 (1), 16-21.

Miller, W. R. (2005) *What is Motivational Interviewing?* URL www.motivationalinterview.org/clinical/whatismi.html (last accessed 1 July, 2005) Albuquerque, USA: University of New Mexico.

Miller, W. R. (2001) 'What is Motivational Interviewing - The Spirit of MI' www.motivationalinterview.org/clinical/whatismi.html. Miller, W.R. University of New Mexico, Albuquerque, USA.

Miller, W. R. (1999) Toward a theory of motivational interviewing. *Motivational Interviewing Newsletter: Updates, education and training*, 6, 2-4.

Miller, W.R. (1996). Motivational interviewing: research, practice, and puzzles. *Addictive Behaviours,* 6, 835-842.

Miller, W.R. (1983). Motivational interviewing with problem drinkers. *Behavioural Psychotherapy*, 11, 147-172.

Miller, W. R., Meyers, R. J. & Tonigan, J. S. (1999) Engaging the unmotivated for treatment in alcohol problems: a comparison of three strategies for intervention through family members. *Journal of Consulting and Clinical Psychology*, 67, 688-697.

Miller, W. R. & Mount, K. A. (2001) A small study of training motivational interviewing: does one workshop change clinician and client behavior? *Behavioral & Cognitive Psychotherapy*, 29, 457-471.

Miller, W. R. & Moyers, T. B. (2006) Eight stages in learning motivational interviewing *Journal of Teaching in the Addictions*, 5, 3-17.

Miller, W.R ., Moyers, T. B., Ernst, D. & Amrhein, P. (2003) *The Motivational Interviewing Skills Code (MISC) Manual (version 2.0).* URL (consulted 1 July 2006): http://casaa.um.edu/download/misc.pdf

Miller, W. R., Moyers, T. B., & Rosengren, D. B. (2000) *Motivational interviewing and brief negotiation: 2000 Training new trainers (TNT) trainers resources.* University of New Mexico, Alberquerque.

Miller, W. R., & Rollnick, S. (2002). *Motivational interviewing: Preparing people for change* (2nd ed.). New York: Guilford Press.

Miller, W. R., & Rollnick, S. (1999). *Teaching motivational interviewing: Materials for trainers.* University of New Mexico, Albuquerque, USA.

Miller, W. R & Rollnick, S. (1991) *Motivational Interviewing: Preparing people for change.* New York. Guildford Press.

Miller, W. R & Sanchez, V. C (1994) Motivating young adults for treatment and lifestyle change. In G. Howard (Ed.), *Issues in alcohol use and misuse by young adults* (55-82). Notre Dame.

Miller, W. R., Sovereign, R. G., & Krege, B. (1988) Motivational Interviewing with problem drinkers: II. The Drinker's Check Up as a preventive intervention. *Behavioural Psychotherapy,* 16, 251-268.

Miller, W. R. & Wilbourne, P. L. (2002) Mesa Grande: A methodological analysis of clinical trials of treatments for alcohol use disorders. *Addiction*, 97, 265-277.

Miller, W. R., Yahne, C., Moyers, T. B., Martinez, J. & Pirritano, M. (2004) A randomized trial of methods to help clinicians learn motivational interviewing. *Journal of Consulting and Clinical Psychology*, 72 (6), 1050-1062.

Miller, W. R., Zweben, A., DiClemente, C. C. & Rychtarik, R. G. (1992) *Motivational enhancement therapy manual: A clinical research guide for therapists treating individuals with alcohol abuse and dependence* (Vol. 2, Project MATCH monograph series). Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.

Morgan, O. (2005) Approaches to increase physical activity: reviewing the evidence for exercise-referral schemes. *Public Health*, 119, 361-370.

Morris, J. (1994) Exercise in the prevention of coronary heart disease: today's best buy in public health. *Medicine and Science in Sport and Exercise*, 26 (7), 807-814.

Motivational Interviewing Network of Trainers (MINT) (2004) *Training for Trainers (TNT) Resources for Trainers*, September 2004. http://www.motivationalinterview.org/mintnet

Moyer, A., Finney, J., Swearingen, C. & Vergun, P. (2002) Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment seeking populations. *Addiction*, 97, 279-292.

Moyers, T. B. & Martin, T. (2006) Therapist influence on client language during motivational interviewing sessions. *Journal of Substance Abuse Treatment*, 30, 245-251.

Moyers, T. B., Martin, T., Catley, D., Harris, K. J. & Ahluwalia, J. S. (2003a) Assessing the integrity of motivational interviewing interventions: Reliability of the Motivational Interviewing Skills Code. *Behavioural and Cognitive Psychotherapy*, 31, 177-184.

Moyers, T. B., Martin, T., Manuel, J. K., Hendrickson, S. M. L. & Miller, W. R. (2005) Assessing competence in the use of motivational interviewing. *Journal of Substance Abuse Treatment*, 28, 19-26.

Moyers, T. B., Martin, T., Manuel, J. K. & Miller, W. R. (2003b) *The Motivational Interviewing treatment integrity (MITI) scale. Version 2.0.* Albuquerque, NM: Center on Alcoholism, Substance Abuse and Addictions, University of New Mexico.

Moyers, T. B., Miller, W. R. & Hendrickson, S. M. L. (2004) How does motivational interviewing work? Therapist interpersonal skill predicts client involvement within motivational interviewing sessions. *Journal of Consulting and Clinical Psychology*, 73 (4), 590-598.

Mullan, E., Markland, D. & Ingledew, D. K. (1997) A graded conceptualisation of self-determination in the regulation of exercise behaviour: Development of a measure of using confirmatory factor analytic procedures. *Personality and Individual Differences*, 23, 745-752.

Mulvihill, C. & Quigley, R. (2003) The management of obesity and overweight: an analysis of reviews of diet, physical activity and behavioural approaches. London: HDA.

Must, A., Spadano, J., Coakley, E. H., Field, A. E., Colditz, G. & Dietz, W. H. (1999) The disease burden associated with overweight and obesity. *Journal of the American Medical Association*, 282, 1523-1529.

Mutrie, N. & Faulkner, G. (2003) Physical activity and mental health. In, T. Everett, M. Donaghy, and S. Fever (Eds.). *Physiotherapy and occupational therapy in mental health: an evidence-based approach* (pp.82-97). Oxford: Butterworth Heinemann.

Mutrie, N. & Woods, C. (2003) How can we get people to become more active? A problem waiting to be solved. *In*, J. McKenna & C. Riddoch. McKenna (Eds.), *Perspectives in Health and Exercise*. London: Palgrave MacMillan. (p.129-148).

Najavits, L. M. & Weiss, R. D. (1994) Variations if therapist effectiveness in the treatment of patients with substance use disorders: An empirical review. *Addiction*, 89, 679-688.

National Institute for Health and Clinical Excellence (2006) *Four commonly used methods to increase physical activity: brief interventions in primary care, exercise referral schemes, pedometers and community-based exercise programmes for walking and cycling.* (March, 2006), London: National Institute for Health and Clinical Excellence.

Nawaz, H., Adams, M. L. & Katz, D. L. (2000) Physician-patient interactions regarding diet. *Preventive Medicine*, 31, 652-657.

Nelson-Jones, R. (2005) *Practical counselling and helping skills*. London: Sage.

Noonan, W. C & Moyers, T. B (1997) Motivational interviewing. *Journal of Substance Misuse,* 2, 8-16.

Norris, S., Grothaus, L., Buchner, D. & Pratt, M. (2000) Effectiveness of physician-based assessment and counseling for exercise in a staff model HMO. *Preventive Medicine*, 30, 513–523.

Office for National Statistics (2000) *The mental health of children and adolescents in Great Britain: Summary report.* London: NSO.

Office for National Statistics and Medical Research Council (2004) *National diet and nutrition survey: Adults aged 19-64 years, vol 4: nutritional status (anthropometry and blood analytes), blood pressure and physical activity.* London: TSO.

Oman, R. F., & King, A. C. (2000) The effect of life events and exercise program format on the adoption and maintenance of exercise behavior. *Health Psychology.* 19 (6), 605-612.

Orford, J. (1985) *Excessive appetites: a psychological view of addictions.* New York: Wiley.

Orleans, C. T., George, L. K., Houpt, J. L. & Brodie, K .H. (1985) Health promotion in primary care: a survey of U.S. family practitioners. Preventive Medicine, 14, 636-647.

Ory, M. G., Jordan, P. J. & Bazzarre, T. (2002) The behavior change consortium: setting the stage for a new century of health behavior-change research. *Health Education Research*, 17 (5), 500-511.

Pbert, L., Adams, A., Quirk, M., Hebert, J. R., Ockene, J. K. & Luippold, R. S. (1999) The patient exit interview as an assessment of physician-delivered smoking intervention: a validation study. *Health Psychology*, 18, 183-188.

Petrella, R. J. & Wight, D. (2000) An Office based instrument for exercise counselling and prescription in primary care. *Archives of Family Medicine*. 9, 339-44.

Phillips, E. M., Schneider, J. C. & Mercer, G. R. (2004) Motivating elders to initiate and maintain exercise. *Archives of Physical Medicine Rehabilitation*, 85 (3), S52-S57.

Pinto, B. M., Goldstein, M., Ashba, J., Sciamanna, C. & Jette, A. (2005) Randomized controlled trial of physical activity counseling for older primary care patients. *American Journal of Preventive Medicine*, 29(4), 247-255.

Pinto, B. M., Goldstein, M. G. & Marcus, B. H. (1998) Activity counseling by primary care physicians. *Preventive Medicine*, 27, 506-513.

Pinto, B. M. & Marcus, B. H. (1995) A Stages of Changes approach to understanding college students' physical activity. *JACH,* 44, 27-31.

Pi-Sunyer, F. X. (1998) NHLBI Obesity Education Initiative Expert Panel on the identification, evaluation, and treatment of overweight and obesity in adults - the evidence report. *Obesity Research*, 6 (suppl. 2), 51S-209S.

Poczwardowski, A., Sherman, C. P. & Revizza, K. (2004) Professional philosophy in the sport psychology service delivery: Building on theory and practice. *The Sport Psychologist,* 18, 445-463.

Pollard, J. (2005) *Report to the Department of Health on the development of a framework for the improved regulation of the profession of psychotherapy.* London: United Kingdom Council for Psychotherapy.

Power, C. & Matthews, S. (1997) Origins of health inequalities in a national population sample. *The Lancet*, 350 (9091), 1584-1589.

Prentice, A. M. & Jebb, S. A. (1995) Obesity in Britain: gluttony or sloth? *The British Medical Journal*, 311, 437-439.

Prochaska, J. O. & DiClemente, C. C. (1983) Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology,* 51, 390-395.

Prochaska, J. O. & Marcus, B. H. (1994) The transtheoretical model: application to exercise. In, R. K. Dishman (ed.) *Advances in exercise adherence* (161-180). Champaign, Ill.: Human Kinetics.

Prochaska, J. J. & Sallis, J. F. (2004). A randomized controlled trial of single versus multiple health behavior change: Promoting physical activity and nutrition among adolescents. *Health Psychology*, 23, 314-318.

Prochaska, J. O. & Velicer, W. F. (1997) The transtheoretical model of health behaviour change. *American Journal of Health Promotion*, 12 (1), 38-48.

Proper, K. I., Hildebrandt, V .H., Van der Beek, A. J., Twisk, J. W. R. & Van Mechelen, W. (2003) Effect of individual counseling on physical activity fitness and health. A randomized controlled trial in a workplace setting. *American Journal of Preventive Medicine,* 24 (3), 218-226.

Reed, B. D., Jensen, J. D. & Gorenflo, D. W. (1991) Physicians and exercise promotion. *American Journal of Preventive Medicine*, 7(6), 410-5.

Rejeski, W. J. (1992) *'Motivation for Exercise Behaviour: A critique of theoretical decisions'*. In, G. C. Roberts (ed.), *Motivation in sport and exercise* (pp.129-157). Champaign, Ill.: Human Kinetics.

Resnick, B., Bellg, A. J., Borrelli, B., DeFrancesco, C., Breger, R., Hecht, J., Sharp, D. L., Levesque, C., Orwig, D., Ernst, D., Ogedegbe, G. & Czajkowski, S. (2005) Examples of implementation and evaluation of treatment fidelity in the BCC studies: Where we are and where we need to go. *Annals of Behavioral Medicine*, 29, 46-54.

Resnicow, K., McCarty, F. & Baranowski, T. (2003) Are precontemplators less likely to change their dietary behaviour? A prospective analysis. *Health Education Research*, 18 (6), 693-705.

Riddoch, C. (2002) *Exercise on Prescription.* Paper presented at the 2002 Conference Getting Active Together! Promoting Good Practice in Physical Activity (Northern Ireland).

Riebe, D., Blissmer, B., Greene, G., Caldwell, M., Ruggiero, L., Stillwell, K. M. & Nigg, C. R. (2005) *Preventive Medicine*, 40, 769-778.

Riddoch, C., Puig-Ribera, A., Cooper, A. (1998) *Effectiveness of Physical Activity Promotion Schemes in Primary Care: A review.* London: Health Education Authority.

Robertson, M., Gardner, M., Devlin, N., McGee, R. & Campbell, A. (2001) Effectiveness and economic evaluation of a nurse delivered home exercise programme to prevent falls 2. controlled trials in multiple centres. *British Medical Journal*, 322, 1-5.

Rogers, C. R. (1953) *Client-centred therapy. Its current practice, implications and theory*. Boston: Houghton Mifflin.

Rogers, E. M. (1995) *Diffusion of innovations* (4th ed.). New York: The Free Press.

Rollnick, S. (1996) Behaviour change in practice: targeting individuals. *International Journal of Obesity Related Metabolic Disorders,* 20, 22-26.

Rollnick, S., Butler, C. C., McCambridge, J., Kinnersley, P., Elwyn, G. & Resnicow, K. (2005) Consultations about changing behaviour. *British Medical Journal*, 331, 961-963.

Rollnick, S., Heather, N. & Bell, A. (1992) Negotiating behaviour change in medical settings: The development of brief motivational interviewing. *Journal of Mental Health*, 1, 25-37.

Rollnick, S., Kinnersly, P., Stott, N. (1993) Methods of helping patients with behaviour change. *British Medical Journal,* 307, 188-190.

Rollnick, S., Mason, P. & Butler, C. (1999) *Health behaviour change: a guide for practitioners.* Edinburgh: Harcourt Brace.

Rollnick, S., & Miller, W. R (1995). What is Motivational Interviewing? *Behavioral & Cognitive Psychology,* 23, 325-334.

Rosal, M. C., Ebbeling, C. B., Lofgren, I., Ockene, J. K., Ockene, I. S. & Herbert, J. R. (2001) Facilitating dietary change: The patient-centred counselling model. *Perspectives in Practice: Journal of the American Dietetic Association*, 101 (3), 332-341.

Rubak, S., Sandbaek, A., Lauritzen, T., Borch-Johnsen, K. & Christensen, B. (2006) An education and training course in motivational interviewing influence: GPs' professional behaviour - ADDITION Denmark. *British Journal of General Practice.* 56, 429-436.

Rubak, S., Sandbaek, A., Lauritzen, T. & Christensen, B. (2005) Motivational Interviewing: A systematic review and meta-analysis. *British Journal of General Practice*, April, 305-312.

Rubel, E., Shepell, W., Sobell, L & Miller, W. (2000) Do continuing education workshops improve participants' skills? Effects of a motivational interviewing workshop on substance-abuse counselor's skills and knowledge. *Behavioral Therapy*, 23 (4), 73-77.

Rush, S. (2003) Exercise prescription for the treatment of medical conditions. *Current Sports Medicine Reports*, 2, 159-165.

Ryan, R. M. (1995) Psychological needs and the facilitation of integrative processes. *Journal of Personality*, 63, 397-427.

Saitz, R., Sullivan, L. M. & Samet, J. H. (2000) Training community-based clinicians in screening and brief intervention for substance abuse problems: translating evidence into practice. *Substance Abuse*, 21 (1), 21-31.

Sallis, J. F. & Owen, N. (1999) *Physical Activity and Behavioral Medicine*. London: Sage.

Salmon, J., Owen, N., Bauman, A., Schmitz, M. K. H. & Booth, M. (2000) Leisure-time, occupational, and household physical activity among professional, skilled, and less-skilled workers and homemakers. *Preventive Medicine*, 30, 191-199.

Scales, R. S., & Miller, J. H. (2003) Motivational Techniques for Improving Compliance with an Exercise Program: Skills for Primary Care Clinicians. *Current Sports Medicine Reports,* 2, 166-172.

Sciamanna, C. N., Goldstein, M. G., Marcus, B . H., Lawrence, S. K. & Pinto, B. M. (2004) Accuracy of recall of exercise counselling among primary care patients. *Preventive Medicine*, 39, 1063-1067.

Scottish Office (2000) *The Scottish health survey 1998.* Edinburgh: The Stationary Office.

Secretary of State for Health (2004) *Mainstreaming action on health inequalities - linking evidence, policy and practice.* Health Development Agency National Conference. London: Department of Health.

Sesso, H. D., Paffenbarger, R. S. & Lee, I. M. (2000) Physical activity and coronary heart disease in men: the Harvard Alumni Health Study. *Circulation,* 102 (9), 975-980.

Shaffer, H. J., & Simoneau, G. (2001). Reducing resistance and denial by exercising ambivalence during the treatment of addiction. *Journal of Substance Abuse Treatment,* 20, 99-105.

Sheldon, K. M., Joiner, T. & Williams, G. (2003) *Motivating health: Applying self-determination theory to the clinic.* Yale: Yale University Press.

Shepherd, R. J. & Bouchard, C. (1996) Associations between health behaviours and health related fitness. *British Journal of Sports Medicine*. 30, 94-101.

Sims, J., Smith, F. & Duffy, S. (1999) The vagaries of self-reports of physical activity: a problem revisited and addressed in a study of exercise promotion in the over 65s in general practice. *Family Practice,* 16 (2), 152-157.

Skelton, D. A. & McLaughlin, A. W. (1996) Training functional ability in old age. *Physiotherapy*, 82 (3), 159-167.

Skelton, D. A., Young, A., Walker, A. & Hoinville, E. (1999) *Physical activity in later life: Further analysis of the Allied Dunbar National Fitness Survey and the Health Education Authority survey of activity and health.* London: Health Education Authority.

Skinner, B. F. (1953) *Science and human behaviour.* New York: Macmillan.

Smith, P. A., Gould, M. M., Tai, S. S. & Illfe, S. (1996) Exercise as therapy? Results form group interviews with general practice teams involved in inner-London "prescription for exercise". *Health Education Journal*, 55, 439-446.

Sniehotta, F., Scholz, U. & Schwarzer, R. (2005) Bridging the intention-behaviour gap: Planning self-efficacy and action control in the adoption and maintenance of physical exercise. *Psychology & Health*, 20(2), 143-160.

Sonstroem, R. J. (1988) *'Psychological Models'*. In, R. K. Dishman (ed.), *Advances in exercise adherence: Its impact on public health* (pp.125-153). Champaign, Ill.: Human Kinetics.

Sorensen, J. B., Skovgaard, T. & Puggaard, L. (2006) Exercise on prescription in general practice. *Scandinavian Journal of Primary Health Care*, 24, 69-74

Sproston, K. & Primatesta, P. (2003) *Health Survey for England 2002: The Health of Children and Young People.* London: The Stationary Office.

Stathi, A., Fox, K. R. & McKenna, J. (2002) Physical activity and dimensions of subjective well-being in older adults. *Journal of Aging and Physical Activity*, 10, 76-92.

Stathi, A., McKenna, J. & Fox, K. R. (2003) The experiences of older people participating in exercise referral schemes. *JRSH: The Journal of The Royal Society for the Promotion of Health*, 124(1), 18-23.

Steinberg, M. L., Ziedonis, D. M., Krejci, J. A., & Brandon, T. H. (2004). Motivational interviewing with personalized feedback: A brief intervention for motivating smokers with schizophrenia to seek treatment for tobacco dependence. *Journal of Consulting and Clinical Psychology*, 72(4), 723-728.

Stott, N. C. H. & Pill, R. M. (1990) "Advise yes, dictate no" patient's views on health promotion in consultation. *Family Practice*, 7, 125-131.

Stotts, A. L., DeLaune, K. A., Schmitz, J. M. & Grabowski, J. (2004) Impact of a motivational intervention on mechanisms of change in low-income pregnant smokers. *Addictive Behaviors*, 29, 1649-1657.

Szabo, A. (2000) Physical activity as a source of psychological dysfunction. In, S. J. H. Biddle, K. R. Fox and S. H. Boutcher (Eds.). *Physical activity and psychological well-being* (pp.130-153). London: Routledge.

Tappin, D. M., McKay, C., McIntyre, D., Gilmour, H., Cowan, S., Crawford, F. & ., Lumsden, M. A., (2000) A practical instrument to document the process of motivational interviewing. *Behavioural and Cognitive Psychotherapy,* 28, 17-32.

Taylor, A. (2003) The role of primary care in promoting physical activity. *In*, J. McKenna & C. Riddoch. McKenna (Eds.), *Perspectives in Health and Exercise*. London: Palgrave MacMillan. (p.153-180).

Taylor, A. H. (2000) Physical activity, anxiety and stress. In, S. J. H. Biddle, K. R. Fox and S. H. Boutcher (Eds.). *Physical activity and psychological well-being* (pp.10-45). London: Routledge.

Taylor, A. (1999) Adherence in Primary Health Care Exercise Promotion Schemes. In, Bull, S. (Ed.) *Adherence Issues in Sport & Exercise* (47-74). Chichester: Wiley.

Taylor, A. H. (1996) *Evaluating GP prescription schemes: findings from a randomised control trial.* Brighton: Chelsea School Research Centre, University of Brighton.

Taylor, A. H., Doust, J. & Webborn, N. (1998). Randomised controlled trial to examine the effects of a GP exercise referral programme in Hailsham, East Sussex, on modifiable coronary heart disease risk factors. *Journal of Epidemiological Community Health*, 52, 595-601.

Taylor, A. H., Cable, N. T., Faulkner, G., Hillsdon, M., Narici, M. & Van Der Bij, A. K. (2004) Physical activity and older adults: a review of health benefits and the effectiveness of interventions. *Journal of Sports Sciences*, 22, 703-725.

Thøgersen-Ntoumani, C., & Ntoumanis, N. (2006). The role of self-determined motivation to the understanding of exercise-related behaviours, cognitions and physical self-evaluations. *Journal of Sports Sciences,* 24 (4), 393-404.

Thomas, J. R. & Nelson, J. K. (2001) *Research methods in physical activity.* Champaign, Ill.: Human Kinetics.

Thurston, M. & Green, K. (2004) Adherence to exercise in later life: how can exercise on prescription programmes be made more effective? *Health Promotion International*, 19(3), 379-387.

Titze, S., Martin, B.W., Seiler, R., Stronegger, W. & Marti, B. (2001) Effects of a lifestyle physical activity intervention on stages of change and energy expenditure in sedentary employees. *Psychology of Sport and Exercise*, 2, 103-116.

Tobin, V. J. (2003) *Facilitating exercise behaviour change: A self-determination theory and motivational interviewing perspective.* Unpublished doctoral dissertation. University of Wales, Bangor.

Tomlin, K. M. & Richardson, H. (2004) *Motivational interviewing and stages of change.* Minnesota: Hazelden.

Tuckett, D., Boulton, M., Olsen, C. & Williams, A. (1985) *Meetings between experts: An approach to sharing ideas in medical consultations.* London: Tavistock.

Tulloch, H., Fortier, M. & Hogg, W. (2006) Physical activity counseling in primary care: Who has and who should be counseling? *Patient Education and Counseling*, *(in press).*

U.S. Department of Health and Human Services (1996) *Physical activity and health: A report of the Surgeon General.* Atlanta, GA: U. S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

Vansteenkiste, M. & Sheldon, K. M. (2006) There's nothing more practical than a good theory: Integrating motivational interviewing and self-determination theory. *British Journal of Clinical Psychology*, 45, 63-82.

Van Tulder, M., Furlan, A., Bombardier, C. & Bouter, L. (2003) Updated method guidelines for systematic reviews in the cochrane collaboration Back Review Group. *Spine*, 28(12), 1290-1299.

Walsh, J., Swangard, D., Davis, T. & McPhee, S. (1999) Exercise counselling by primary care physicians in the era of managed care. *American Journal of Preventive Medicine*, 16, 307-313.

Walters, S. T., Matson, S. A., Baer, J. S. & Ziedonis, D. M. (2005) Effectiveness of workshop training for psychosocial addiction treatments: A systematic review. *Journal of Abuse Treatment*, 29, 283-293.

Ward, J. & Sanson-Fisher, R. (1996) Accuracy of patient recall of opportunistic smoking cessation advice in general practice. *Tobacco Control,* 5, 110-113.

West, R. (2005) Time for change: Putting the transtheoretical (stages of change) model to rest. *Addiction*, 100 (8), 1036-1039.

Williams, G. C., Deci, E. L. & Ryan, R. M. (1998) Building health-care partnerships by supporting autonomy: Promoting maintained behavior and positive health outcomes. In, P. Hinton-Walker, A. L. Suchman & R. Botelho (Eds.), *Partnerships, power and process*: *Transforming health-care delivery* (pp. 67-88). Rochester, NY: Rochester University Press.

Williams, G. C., Minicucci, D. S., Kouides, R. W., Levesque, C. S., Chirkov, V. I., Ryan, R. M. & Deci, E. L. (2002) Self-determination, smoking, diet and health. *Health Education Research*, 17(5), 512-522.

Wilson, G. T. & Schlam, T. R. (2004) The transtheoretical model and motivational interviewing in the treatment of eating and weight disorders. *Clinical Psychology Review,* 24, 361-378.

Woolfe, R., Dryden, W. & Strawbridge, S. (2003) *Handbook of counselling psychology.* London: Sage.

World Health Organisation (2003) *Diet, nutrition and the prevention of chronic disease*. WHO technical report series, 911. Geneva: WHO.

www.motivationalinterview.org/clinical/whatismi.html. Miller, W.R. University of New Mexico, Albuquerque, USA.

Yates, B. C., Price-Fowlkes, T. & Agrawal, S. (2003) Barriers and facilitators of self-reported physical activity in cardiac patients. *Research in Nursing and Health*, 26, 459-469.

Appendix 1.1: Government white papers and policies regarding physical activity and health (based on *Health Policy Statements*, BHF Centre for Physical Activity and Health, 2006)

Policy/White paper	Description and recommendations
National Audit Office. Tackling Obesity in England (2001)	• Evidenced the main cause of rising obesity levels as less active lifestyles and changes in eating patterns • Stated that the DoH cannot and should not be expected to "cure" the problem by itself and made a series of cross Governmental recommendations. • Deplored the absence of national guidelines for SHAs on how their plans should address obesity • Found a range of methods being deployed by GPs and Nurses for managing overweight patients but there was uncertainty about which were most effective.
Game Plan - A Joint Cabinet Office/DCMS report (2002)	• Deplores England's low physical activity participation rate - only 32% of adults take 30 minutes of moderate exercise five times per week compared to 57% of Australians and 70% of Finns • Seeks significant behavioural change over a long term to create a culture of mass participation - sets a target participation rate of 70% by 2020 • Advocates a wide range of grassroots initiatives to address barriers to participation (lack of time, cost, information, motivation) and failures in current provision • Recommends that interventions focus on low participation groups including women and girls, socio economic groups D & E, young people, older people
Securing Good Health for the Whole Population - Wanless (2004)	• Advocates that Government aims at a "fully engaged" scenario where individuals take responsibility for their own health and well being through informed choice. • Identifies Obesity and Physical Activity as two of the three major risk factors in public health. • Recommends cost effective action on preventing disease, tackling wider determinants of health and reducing health inequalities. i.e. moving from a national *sickness* service to a national *health* service • Found that there is no set of objectives on the major risk factors within the NHS.
At Least Five a Week - Chief Medical Officers Report (2004)	• Compelling scientific evidence to show that physical activity contributes to wellbeing and is essential for good health • Annual cost of inactivity in England is £8.2bn. • Recommends 30 mins of physical activity five times every week for adults and at least 1 hour every day for children. • Makes recommendations for Government, the NHS, Local Authorities, Leisure and Sports Providers, Schools and Colleges, Employers and Workplaces, Parents & Families. • It has taken 50 years to halve the prevalence of smoking and calls for similar key strategies to be put in place on physical activity. • Evidences the impact of physical activity on reducing risk of major chronic diseases such as coronary heart disease, diabetes, numerous types of cancer and mental health.
Obesity - Parliamentary Health Select Committee Report	• Obesity is an astonishing epidemic and that a whole generation of young people are growing up in an obesogenic environment. • Britain has the fastest-growing obesity rate in Europe, with three-quarters of adults overweight or obese and about 10% of children "clinically obese". • Levels of obesity have risen 400 per cent in just 25 years, and could soon surpass smoking as the nation's biggest cause of premature death. • The economic cost of Obesity is £3.7bn a year with an additional £3bn resulting from being overweight.

(2004)

- Warns about the impact on future levels of diabetes, cancer and heart disease.

Public White Paper - Choosing Health (2004)

- The document set out action to make healthier choices easier for the individual by providing better information, more encouragement, help, support and services to assist in changes to lifestyle over the long-term.
- The general theme regarded tackling obesity and creating patient choice which was reflected in the 3 underlying principles (informed choice, personalisation and partnership working)
- 6 overarching priorities were highlighted as;
    1. decrease the number of smokers
    2. decrease obesity through diet and nutrition
    3. increase the number of people that exercise
    4. encourage and support sensible drinking
    5. improve sexual health
    6. improve mental health

Specific priorities relating to PA, sport and health included;

- National campaigns on obesity to promote key messages and local services
- All primary and secondary schools to be working towards health school status by 2009
- All schools are to develop as Extended schools
- There will be a PA promotion fund and the appointment of regional PAR coordinators
- There will be NHS Health Trainers to provide advice and support and to develop a personal health guide
- PCT areas are to develop a specialist obesity service
- Workplaces are to become healthier environments with the NHS being a role model employer
- Government departments are to develop 5 year health and PA plans.

Four commonly used methods for increasing physical activity: NICE (2006).

The guidance provided four methods to increase PA. These were;

Brief interventions in primary care:

- These include opportunistic advice, discussion, negotiation and encouragement. Usually delivered in areas such as health promotion and delivered by a range of primary and community care professionals. Interventions vary from basic advice to more extended, individually focussed attempts to identify and change factors that influence activity levels

Exercise referral schemes:

- The service direct patients to a service offering an assessment and development of a tailored PA programme including monitoring of progress and follow-up. They involve participation by a number of professionals and may require the individual to go to an exercise facility such as leisure centres

Pedometers:

- Pedometers are a common aid to increasing physical activity through walking. Much of the research about pedometers has involved comparing the validity and reliability of different models. The NICE guidance focussed on how effective they are at increasing people's PA

Walking and cycling schemes;

- In the context of the guidance, walking and cycling schemes were defined as organised walks or rides. Public health practitioners have increasingly become involved in these types of projects in recent years.

NICE recommendations were developed on the basis of these four methods of PA intervention, the recommendations included;

1. Primary care practitioners should take the opportunity, whenever possible, to identify inactive adults and advise them to engage with recommended levels of activity. They should use their judgement to decide on the appropriateness of individuals based on medical condition for example. They should use a validated tool to identify inactive adults (e.g., general practitioner physical activity questionnaire, GPPAQ)
2. When providing PA advice, practitioners should take into account the patients needs, preferences and circumstances. They should agree goals with them. They should also provide written information about the benefits of activity and the local opportunities to be active. They should follow them up at appropriate intervals over a 3 to 6 month period.
3. Local policy makers, commissioners and managers, together with primary care practitioners, should monitor the effectiveness of local strategies and systems to promote physical activity. They should focus, in particular, on whether or not opportunistic advice is helping to increase the physical activity levels of people from disadvantaged groups, including those with disabilities (and tackling health inequalities). They should assess how effective professionals are at raising long-term physical activity levels among these groups.
4. Local policy makers, commissioners and managers, together with primary care practitioners, should pay particular attention to the needs of hard to reach and disadvantaged communities, including ethnic groups, when developing service infrastructures to promote physical activity.
5. Practitioners, policy makers and commissioners should only endorse exercise referral schemes to promote physical activity that are part of a properly designed and controlled research study to determine effectiveness. Measures should include intermediate outcomes such as knowledge, attitudes and skills, as well as measures of physical activity levels. Individuals should only be referred to schemes that are part of such a study.
6. Practitioners, policy makers and commissioners should only endorse pedometers and walking and cycling schemes to promote physical activity that are part of a properly designed and controlled research study to determine effectiveness. Measures should include intermediate outcomes such as knowledge, attitude and skills, as well as measures pf physical activity levels.

Appendix 3.1: The relationship of brief advice, behaviour change counselling and motivational interviewing.

The relationship of brief advice, behaviour change counselling and motivational interviewing.

Skills	Brief advice	Behaviour change counselling	Motivational interviewing
Ask open-ended questions	**	**	***
Affirmations	**	**	***
Summaries	*	***	***
Ask permission	**	***	***
Encourage recipient choice and responsibility in decision making	**	***	***
Provide advice	***	**	*
Reflective listening statements	*	**	***
Directive use of reflective listening	*	*	***
Variation in depth of reflections	*	**	***
Elicit change talk	*	**	***
Roll with resistance	*	***	***
Help client to articulate deeply held values	*	*	***

Eight stages in learning motivational interviewing (adapted from Miller & Moyers, 2006).

Stage	Description	Key skills	Theoretical/Conceptual underpinning
1. The spirit of MI	Openness and non-judgemental appreciation of the client. Normally results from MI practice rather than pre-condition for training	Openness and willingness to use the client as the 'expert' in the change process.	Client-centred counselling (Rogers, 1980) and positive psychology (Snyder & Lopez, 2002).
2. OARS	Proficiency is required in 'classic' client-centred counselling skills. Within this headline is the complex skill of accurate empathy.	Reflective listening and accurate empathy is crucial to elicit client change talk (stage 3) and explore ambivalence in a respectful and supportive way.	Client-centred counselling skills (Egan, 2002; Truax & Carkhuff, 1967).
3. Recognising & reinforcing change talk	MI is directed toward specific behaviour change goals. The key process is evoking client intrinsic motives for change.	Awareness of the strength of change-talk language (DARNC) as a predictor of change. Recognition and reinforcement of 'commitment' change talk using MI skills such as reflective listening. Also use E-P-E*	Psycholinguistics of change talk (Amrhein et al., 2003) and implementation intentions predicting behaviour change (Chiasson, Park & Schwarz, 2001; Gollwitzer, 1999).
4. Eliciting and strengthening change talk	The counsellor must be able to recognise change talk but then be able to elicit and reinforce it. This intentional effort to elicit change talk differentiates MI from other approaches.	Key skills include open questions to provide change talk then using affirmations, elaboration or reflections (simplex, complex and summary) to underpin and solidify this client language based on underpinning client attitudes.	Psycholinguistics of change talk (Amrhein et al., 2003) and Eliciting self-motivational statements (Miller & Rollnick , 1991; 2002).
5. Rolling with resistance	Resistance can take many forms both verbally and behaviourally. Key to dealing with resistance is not to challenge and confront the client but rather 'roll with resistance'.	Use reflections such as simple, amplified and double-sided as well as emphasising client choice and control, reframing and 'coming alongside' empathetically.	Rolling with resistance (Miller & Rollnick, 2002). Gordon's 12 roadblocks (Gordon 1970).
6. Developing a change plan	Increasing change talk signals a readiness to progress. Statements of intent rather than just need or desire are signs.	Key skills in negotiating change plans includes goal setting, considering options and arriving at a plan all within a client-centred framework.	Clients need time to prepare for change (preparation; Prochaska, 1994). Developing a change plan (Miller & Rollnick, 1991; 2002).
7. Consolidating client commitment	Subtle differences in client utterances exist between DARN and C. It is the latter 'C' of commitment that the therapist aims for.	Listening skills and an awareness of commitment language. Amplification, reflection and goal setting are fundamental here for practitioners.	Psycholinguistics of change talk (Amrhein et al., 2003).
8. Switching between MI and other counselling methods	MI is promoted as a tool for motivational encounters and exploring ambivalence in an empathetic and respectful manner but may be less effective in action planning.	More directive cognitive therapies may be required. Not to say that a less client-centred approach is required but the skills of action planning and goal-setting may be context specific (e.g., PA and exercise programming)	Other techniques; social skills training (Monti, Abrams, Kadden & Cooney, 1989) or twelve-step facilitation (Mowinski, Baker & Carroll, 1992).

* E-P-E; Elicit-Provide-Elicit (Dunn & Rollnick, 2003)

Appendix 5.1: Motivational Interviewing Treatment Integrity (MITI; Moyers et al., 2003)

Motivational Interviewing Treatment Integrity Code (MITI)

Adapted from: The Motivational Interviewing Treatment Integrity (MITI) Code: Version 2.0
Theresa B. Moyers, Tim Martin, Jennifer K. Manuel & William R Miller
University of New Mexico, Center on Alcoholism, Substance Abuse and Addictions (CASSA)

Coding Sheet Adaptations 1/27/2005 - Revisions by Wilburn C "Dub" Wright

Tape Number

Tape Counselor

Tape Client

Tape Coder

GLOBAL RATINGS

Empathy/Understanding	1 Low	2	3	4	5	6	7	
Spirit	1	2	3	4	5	6	7 High	

BEHAVIOR COUNTS

Giving Information		
	TOTAL INFORMATION COUNTS	

MI Adherent	Asking permission, affirm, emphasize control, support	
MI Non-adherent	Advising, confronting, directing	
	TOTAL MI RELATED COMMENTS	

Questions	Closed Questions	
	Open Questions	
	TOTAL QUESTIONS	

Reflections	Simple reflections	
	Complex Reflections	
	TOTAL REFLECTIONS	

COMMENTS

Appendix 5.2: Motivational Interviewing Skill Code (MISC; Miller et al., 2003). Shortened to include examples of D(esire), A(ability), R(easons), N(eed), and C(ommitment).

Examples of DESIRE Strength Rating Codes

+5	Absolutely - I want to get off drugs for good I want to be clean and sober, period. I'm *sick* of smoking. It disgusts me
+4	I really wish I could just cut down I've just about had it with cigarettes I'm very tired of being overweight
+3	I'd like to get free of dope I wish I could just snap my fingers and lose 40 pounds I just want to wake up sober in the morning
+2	Mostly I want to quit Yeah, probably I do need to eat better. Part of me wants to exercise
+1	I guess I'd like to smoke less I sort of wish I hadn't started using coke I'm a little bit tired of the drug scene
-1	I kind of enjoy smoking I guess I'm not very motivated to exercise A little of me would miss the booze
-2	Pretty much, yes, I like drinking For the most part I enjoy eating whatever I like Probably I want to keep on smoking
-3	I just want people to mind their own business and not hassle me about using drugs I do enjoy a good Scotch I don't want to quit.
-4	I really don't want to quit. I really like pot. I'm very happy the way I am. I really like the whole ritual of doing it, you know
-5	No way. I'm not interested in quitting. Forget it. I'm definitely no teetotaler.

Examples of ABILITY Strength Rating Codes

+5	I'm positive that I could quit. Sure I can lose the weight - it's just a matter of sticking to it. Absolutely. I can quit whenever I want.
+4	Very likely, I could do it if I tried. I'm rather sure I can do it. I'm pretty positive I can do it.
+3	I can do it Yes, it's possible (for me) I could.
+2	I think I have it in me. Probably I can do it. Pretty much, yes, I think I can.
+1	I might be able to. I guess I could. I'm sort of good at sticking to things.
-1	I have a little trouble sticking to things. My guess is that I couldn't. I might not be able to.
-2	I don't think I can. No, I probably couldn't do it. I pretty much tried, and it didn't work.
-3	I just can't keep off the weight. I don't have it in me. I couldn't do it.
-4	I'm pretty sure I can't do it. Very unlikely -- I wouldn't have much of a chance. I really don't think I can.
-5	It's just impossible. There is no way I could make it without cigarettes. I don't stand a chance.

Examples of Reason Strength Rating Codes

+5	I definitely can't afford to get another DWI. There's no way I want to go back to jail because of a urine test. Something *has* to change or I'm going to lose my job. (Vocal tone emphasizes *has to*)
+4	I'll be in a lot of trouble if I turn in another positive urine. I really can't afford to get another DWI. I'm right on the brink of losing my job and my retirement.
+3	If I lose a a lot of money again, my husband is going to divorce me. I don't want to set the wrong example for my kids. It's embarrassing not to remember what I did.
+2	The reasons to quit are starting to pile up. If I lose money again, my husband is probably going to leave me. It's fairly embarrassing not to remember what I did.
+1	I'd be a little healthier if I exercised. I guess I'd be healthier if I exercised. I'm sort of embarrassed when I can't remember what I did.
-1	I guess it relaxes me some. I'd kind of miss going to the casinos. It's sort of how I meet people.
-2	Mostly I just don't see any benefits to quitting. Pretty much all my friends are gamblers. I probably would have trouble sleeping without it.
-3	Why should I give up drinking? I just don't see how my drinking is a problem. Why would I want to change? I have my reasons for what I do. Gambling gives me something to do during the day.
-4	I get very relaxed and my problems go away. It's really the only way I have to meet people and make friends. I get very depressed when I don't go to the pub.
-5	I positively can't get off heroin because my boyfriend always wants me to fix with him. There's no way I can work the streets and not do drugs. You've got to be high. I definitely can't stand the pain if I don't have the pills.

Examples of Need Strength Rating Codes

+5	I definitely have to get off the street. I *can't* go on crashing like this! (Vocal emphasis on *can't*) I absolutely have to lose weight.
+4	I really have to quit getting messed up like this. I need very much to be sober. It's really important for me to stop this nonsense.
+3	I can't just keep on having these one-nighters. I've got to do something about my drinking. I have to clean up my act.
+2	Mostly, I can't keep on having these one-nighters. Probably I need to do something about my drinking. It's pretty important for me to clean up my act.
+1	I guess I need to cut down. I kind of have to clean up my act. I probably need to do a little something about my drinking.
-1	I sort of have to drink. I guess I don't think I need to quit. I need a little bit of dope to live.
-2	Mostly, I have to drink. I guess I need some of this excitement in my life. I kind of have to keep dealing drugs.
-3	I can't go without cocaine. I won't make it unless I have my pills. I need to smoke.
-4	I really can't do without cocaine. It would be very hard for me to get along without my pills.. I very much need to smoke.
-5	I definitely have to have my pain pills. There's no way I can go through that withdrawal again. The last time was horrible. I need cigarettes, period!

C: Commitment

Statements of Commitment imply an agreement, intention, or obligation regarding future TBC. This can be expressed directly via a committing verb, or indirectly. For example:

"I *swear* I will stop this" "Swear"is strong committing verb, coded C+5

"Nothing is going to stop me this time" This statement has no committing verb, but it indirectly implies commitment and is also coded C+5

With Commitment speech, if a reason is given it is also coded separately whether or not there is a separating conjunction, and R does not trump the C code. For example:

I'm going to do it is coded C+3
I'm going to do it for my family is coded C+3 R+3

Strength rating codes for Commitment have to do with how committed the person is to accomplishing or maintaining TBC. There are many forms of direct verbal Commitment. In descending order of strength of Commitment, they include:

5	4	3	2	1
I guarantee	I am devoted to	I look forward to	I favor	I mean to
I will	I pledge to	I consent to	I endorse	I foresee
I promise	I agree to	I plan to	I believe	I envisage
I vow	I am prepared to	I resolve to	I accept	I assume
I shall	I intend to	I expect to	I volunteer	I bet
I give my word	I am ready to	I concede to	I aim	I hope to
I assure		I declare my	I aspire	I will risk
I dedicate myself		intention to	I propose	I will try
I know			I am predisposed	I think I will
			I anticipate	I suppose I will
			I predict	I imagine I will
			I presume	I suspect I will
				I contemplate
				I guess I will
				I wager
				I will see (about)

Commitment to status quo (coded with a negative valence) can be expressed either as a lack of commitment to change:

I don't intend to change C-4
I would predict I'm not going to quit. C-2

or as a statement of commitment to continue current behavior

Appendix 5.3: Transcript of the MI interview by the MI trainer (Study 2)

MI Transcription: Client/Subject (S); 59 year old female, Practitioner (P); lead investigator.
Duration: 35.15 minutes.

P: What we're looking at is exercise and what you think about exercise in light of the programme that you are about to do. Obviously feel free with any questions if there are areas that concern you, and I must highlight that everything is completely confidential.

S: Alright

P: So, first things first, why are you here?

S: Because the doctor suggested that I came. I want to do some exercise to try to be a bit fitter than what I am. But the concern is that I've got muscle impingement in both shoulders so I obviously can't do very much where my arms are concerned. They should be operated on but I've got a problem with anaesthetics so they're very reluctant to do anything with it.

P: So there's a couple of different issues there that have prevented you from doing things.

S: Yes. I'm not the sort of person that loves to do exercise. I've got to be perfectly honest, I'm not. Where N [husband] likes to go walking and everything I'm not an outdoor and exercise type of person. By the same token, I would like to be a little bit fitter than what I am. I find walking... I just haven't got the energy to do it as much as I used to before - when I was working I was...

P: Did you used to do exercise? or rather used to walk?

S: I used to be.. when I was working.. I packed in work a year last October and since I'm not working I don't seem to do any exercise at all. Whereas when I was working I was out and about all the time, I was walking about the office all the time I was up and down stairs and I did quite a bit of travelling round

P: In terms of the job you actually did, you were doing a lot of travelling around and on your feet all the time, did you feel different, physically, then to how you do now?

S: Yes

P: How different do you feel?

S: I feel tired because I 'm not doing anything, you know.

P: So is it that feel a little bit lethargic? lack of energy?

S: yes. I think as well you haven't got.. when you're working you've got the interest and the company where you haven't when you're not working. I think that makes a difference as well.

P: So the social.. and the challenge as well, that was important to you.

S: yes. I took a bit of adjusting to not working I've got to be honest about that.

P: right. and this.. So do you see the exercise plan as being some replacement for that loss of challenge? And possibly the social aspect as well?

S: Not really, I just want to be more fit than what I am now. I feel that I'm not fit at all and I just would like to be.. as I say.. My hips since I stopped work, I think I must have a little bit of arthritis or something in my hips, and since I've stopped work they seem to ache more than they did when I was working. Because I was moving about a lot more then, where now I'm not.

P: So a lot of the problems you've felt have been in the last 18 months or so since you finished work.

S: More so than I had before, yes.

P: right. So you've felt gradually declining in terms of fitness while the ailments if you like, the aching bones and stuff have gradually increased?

S: yes. Because I don't feel as if I'm doing anything that's keeping everything moving like I used to before.

P: So really you'd highlight the loss of work and that activity as being.. the stimulation, the challenge and having to do that was what motivated you?

S: yes, I think so
P: Fine. When you mentioned this idea of being fitter? what do you mean? Is it just physically fit or is there some mental fitness as well?
S: Physically fit I mean because I just feel as though I'm not. I mean if we come to do any walking, the least little bit of a hill and I'm out of breath you know and I'm puffing and panting to go and plus your legs ache when you do any walking where I never used to feel it as much before.
P: Does that frustrate you a little bit that you can't do that?
S: yes.
P: In the light of..you mentioned that your husband walks as well, is there any frustration there that he goes out and walks without you?
S: No, he's always walked, he's always been interested in being outdoors and I haven't. That doesn't bother me. Its his time. If he wants to go walking that's fine, I'm not bothered about that in the least.
P: So that activity...it doesn't worry you in how well your husband can do it?
S: No, we've never competed where anything like that's concerned.
P: So really it's just [your exercise programme] for you?
S: For myself really, yes. To be able to feel that I'm fitter than what I am.
P: So this motivation for yourself, the kind of fitness - to just summarise where we are. You mentioned that having left work about 18 months ago, up until that point you felt quite physically active, you could do daily tasks
S: yes
P: you also mentioned that your GP suggested the [PA referral] programme because there's some muscle impingement in your shoulders.
S: Well what he suggested it for was I was trying to lose weight as well and I did lose some of it off but it seemed to stick and it didn't get any better and he thought exercise would help the movement of my legs and everything and it would also help to get the loss of weight moving again.
P: So the real motive for your GP was the weight loss that would have a number of spin-off benefits as well that you feel would help physically, so taking some of the stress off your hips.
S: yes. The only thing that I am now concerned about is the shoulders. That was his concern as well cos he did write it on the form that he filled in.
P: So, short of having the operation, which you're keen to avoid...
S: Yes. I cannot do anything with my shoulders. The least little bit of movement I have a lot of pain.
P: So some activities that J [PARS referral officer] will look at with you have obviously to take that into account.
S: yes
P: As long as that happens you will be quite happy?
S: Oh yes. So long as I don't do anything where my shoulders is clearly hurting. I've put up with about 4 years of pain I couldn't do it again, you know.
P: So, do you see the benefits of the weight loss and the additional benefits and spin-offs of feeling better, feeling more able to go out and walk and exercise as outweighing the downside of potentially a little bit of pain in your shoulders?
S: Er.. that was my concern. Whether it would do anything that would cause pain in the shoulders. I really need to avoid that at all costs. I've done a physio with them, I've done all sorts with them, they don't get any better and, as I say, the operation is the only solution but the hospital is reluctant to..
P: That must be something that you feel frustrates you, that you.. how long sorry?

S: I must have had the.. it started with this one and that developed 3 year ago. And I worked for **** [employer] the sports people so of course we had physio and everything, and I had treatment from the physio before we discovered what it was and then I had an MRI scan last year said definitely it was impingement and there was torn muscle as well.

P: So we're looking at the last 3 years that you've had trouble?

S: That I've had pain, yes.

P: And you mentioned that has become more and more frustrating.

S: It is, yes, because it went from 1 shoulder to 2 shoulders so.. There's a lot of things you go even to reach into cupboards where I cannot reach because I daren't stretch because that's where the pain is.

P: So struggling is painful and you're struggling to do daily tasks? and that's something that annoys you.

S: yes and I think that because you don't do them as well you tend not to move in other ways.

P: And that's having an effect

S: I think so

P: A gradual downward spiral that you feel you're on.

S: yes.

P: In terms of... one thing I'm interesting in asking from this - you mentioned diet. You're on a diet at the moment and you've tried different diets.

S: oh I've tried loads of different ones but I did Weight Watchers last year and I lost 2 stone, which I was really pleased with.

P: over how long?

S: Over about 4 month. We were going on a cruise and I was really determined to lose some weight before I went. And I lost about 2 stone - just slightly under 2 stone which, as I say I was really pleased about, but then it stuck.

P: Did you stay on the diet though even when you were on the cruise?

S: Well no, on the cruise I was [....?] But I didn't go mad. Obviously, when you're on a cruise there's food every minute of every day. And we didn't, we stuck to our normal routine of eating as well as you could.

P: So although you didn't... although you plateau'd off you could see that part of the plateau could well have been that you hadn't stuck to the diet.

S: yes a little bit. But then when I came back I didn't put.. I mean.. on the cruise I only put about a pound on or 2 pound by the time I came back. And then I just sort of watched what I was eating. I didn't stick to the diet I just sort of watched what I was having. And I've found that I would say I've put nearly a stone of it back on again.

P: So you're still a lot better than before you started. You're still half of what you were before

S: But I find that I've been doing... I went back onto it again a few weeks ago and the weight just wasn't coming off and that's really frustrating when you've really tried hard, you know?

P: So by not seeing real tangible results that's been really frustrating because you've not seen an immediate effect.

S: When I mentioned it to Doctor S..... he said 'well maybe if you did some exercise' and he knows that I'm sort of not sure about exercise as you know, and that's why he suggested coming on this one and why he suggested X (husband) coming as well because he thought if he came it would encourage me to come.

P: Right. What do you think about exercising? You've said that your GP's told you you need to exercise what do you think?

S: Well, I'm not good at doing exercise.. I'm not good at doing exercises where there's lots of people because I'm always frightened that you show yourself up, you know. If, I mean for instance the physio at work gave me exercises to do, or a long time ago - because I had pains in my back - now, I've done them religiously and I do them religiously every morning, I never miss. Its the first thing I do. I get out of bed and I lie on the floor and do the exercises that he told me to do. And I'm fine doing that if I know what I've got to do and its something I'm comfortable in doing then I'll do it, it doesn't bother me at all.

P: In the comfort of your own home.

S: yes I prefer to do it in.. I said to Dr S....., I said about buying a machine, some sort of machine - a walking machine or whatever that we could use at home. And he said 'yes well but you need to know what kind of machines are suitable for you'

P: So the.. What about this self-image that you've talked about? What is it that puts you off in exercising with other people particularly?

S: I don't know. I'm just always frightened in case I look silly.

P: OK. So you mean that...

S I know I've got to do it to come into this sort of thing, I know I've got to do it to get into some sort of fitness and probably to encourage us afterwards. And also to know what machinery or whatever it would be best to have at home then I ... once I've done it I'll keep it up at home, I have that determination.

P: But there's a reluctance there to come in and....

S: yes

P: Even if it was with your husband?

S: [pause] well yes. Maybe once I got used to it I might be alright with it, its the initial doing of it..

P: So part of this...at the end we need to look at an action plan and explore this a little further if that would interest you?.. we can look at ways...

S: yes I would need to see how I felt about it as the time went on.

P: So the same as the weight. You've seen the results of the weight. Seeing the results of the weight motivated you to keep doing it, seeing the results of the fitness and how you actually found it would motivate you

S: that's right

P: So once you've got something tangible there that's what drives you on.

S: You see, the exercises that I've got to do in a morning, if I don't do them my back aches. But, and I know it does it, so because I get up on a morning and its the very first things I do I get out of bed and I either walk througfh the sitting room and lie on the floor in the sitting room and do them or on the bedroom floor, but I do them religiously because I know that it stops the pain.

P: So you are motivated to do exercise, you are already starting to exercise because you can see benefits in pain avoidance.

S: yes. I've done these now for, oh it must be about 5 years every morning.

P: So that and the diet, you've been able to maintain diets although you've moved in and out of them, when you've seen good results from them

S: I keep going.

P: You keep going. So, you've never really tried the diet and exercise together?

S: No.

P: So that might be an area that we looked at later on?

S: Yes

P: That's fine. Can you just outline for me, M [client], a typical day. What would you say was a typical day for you?

S: For me at home?
P: From the time you get up, and the kind of things you do in the morning and the afternoon...
S: Ermm..well... we get up - we don't lie in late - we're usually up by about 8 o'clock - breakfast...
P: What's a typical breakfast for you?
S: Cereal, grapefruit juice, cup of tea. And then I would normally have a bath or a shower then we sometimes go shopping early in the morning I would say maybe 3 times a week we go shopping early in the morning. Come back, do housework for maybe half hour, hour - it doesn't take that long, we've got a bungalow it doesn't take that long to keep everything right! Afternoons.. we usually have a light lunch, usually just a snack, a sandwich and a cup of coffee or a cup of tea.
P: So the mornings are fairly flexible, you do your housework and some shopping..
S: We're usually out and about either shopping or.. then come back for lunch, do bits of housework.
P: And the afternoons?
S: Afternoons.. Some afternoons I would be either doing jobs in the house or ironing and N [husband] usually goes for his walk, or other afternoons we go out in the car.
P: So you go out for trips.
S: yes, have a ride out. Get out and have a little stroll, nothing energetic, but a stroll somewhere.
P: So breaking up the day
S: So we're not sitting in the house. I would say that we're out maybe 3 afternoons a week we'd be out in the car.
P: So what we're looking at here is obviously opportunity for exercise, and typically what people in your position have found is that if it can fit into your daily life you're more likely to maintain it, whereas if you have to sacrifice something, then that can often be an expensive exercise. So you've got opportunities there then in the evening? what are the typical activities on the evening?
S: Evenings we don't do very much we're normally in the house [...?] Unless we're on babysitting duty cos we've got 2 grandchildren and my daughter works obviously.
P: How old are they?
S: 1 is 9 the other is 4.
P: So that would be something that possibly you could tie into activities anyway, taking them out..
S: well we have them, they have a child minder but if she is ill or can't have them then I'll have them. I mean I have them 2 days next week so Thursday and Friday next week I'll not get a minute because its a case of you're taking them both to school, pick the little one up from nursery then have her all afternoon then pick the other one up at half 3 so its busy.
P: So although you enjoy it its hard work.
S: Those days, I'm really worn out at the end of those days, where doing that before would never have bothered us. I'm finding that it's more tiring now.
P: Its going back to what we've said before. Is that another thing that's made you think 'hang on, I used to be able to do this'.?
S: yes. I need to be fitter than what I am.
P: And that's to enjoy the grandchildren...
S: to do things..at weekends and on a Sunday, my daughter and I go out on a Sunday afternoon. I mean, when we just go shopping or go wandering round different places, but I'm worn out by the time I do it where I didn't use to be.

P: that's the frustration?
S: yes. That's just like walking around you know. I just feel as though I need something so that my legs are stronger to get us going.
P: Its that combination of different things so that you feel that you can get going
S: [nods]

P: So for yourself, Margaret, the main aspects that we're looking at, the weight loss and some muscle impingement - the mobility.
S: yes, that's something I need to inform you of.
P: So for the weight loss and mobility - what, for you, do you think would be the benefits of change? To do more exercise, to be more physically active
S: Because I think it will make me feel better. I would feel much happier if I was able to move around more than I can now.
P: So that feeling better in yourself is happy, feeling happy?
S: yes. You're more comfortable when you're walking as well not to be sort of puffing.
P: so do you mean more able to do everyday tasks?
S: Not to feel as though everything's a burden.
P: ok. So avoiding that burden?
S: yes.
P: You mentioned before your husband in terms of his walking and the two of you doing the activities together, both retired, what other areas do you think there might be for both in terms of exercise? Do you think there will be any benefits for the two of you together?
S: If I felt more like easy walking and that then yes, probably I would go out with N [husband] sometimes and walk. If it was a nice day, a nice afternoon, then by all means I would quite often go either him for a walk.
P: So that's a long-term target and might be something for the future.
S: yes. I mean, even going on holidays, visiting somewhere where you're on banks and things, you're puffing and blowing. It takes the enjoyment out of it and it would be nice if, when you're doing it, you don't have that you know.
P: So its a case of another benefit for you, increasing the enjoyment of holidays..
S: Yes, its just daily activities. Walking around. As I say, if I could do it more easily, then, if it was a nice day I could go with Norman and have a walk out. I mean he always says 'are you sure you're not going to come?' but oh, can't be bothered.
P: that's a typical reaction? That you can't be bothered?
S: It's too much of an effort.
P: When you say you can't be bothered what do you mean? Is there something?...
S: Its because I know I'll start walking and my legs will ache or I'll be tired or..
P: Just the tiredness that puts you off?
S: yes
P: it's easier to not do it
S: that's right

S: Its because when I start walking and my legs get tired and ache
P: So its that that puts you off
S: Yes thats' right
P: Any other benefits from the changes do you think? We've got feeling better in yourself, happier and more comfortable. Is there any benefits of you both doing the exercise
S: I just think healthwise you know I would benefit

P: Just your physical and mental health, your enthusiasm. What about being honest and looking at the big picture what do you think would be the downside of an exercise programme.

S: If it did some harm to my shoulders that is my main concern

P: That is an important area of concern and that doesn't happen or as little as possible. Although there is a number of benefits that is the general concern

S: As I say I am not a fit person not by any means I would hate to do something that would mean that I had more pain anymore than I already have got you know

P: So really it is a case of the other effects of the hard work the effort it takes, do you think this was a downside of taking up exercise

S: I don't think I mind doing it as long as it doesn't spike off something else if it made my hips hurt or worse or my back hurt, I would hate to think that if it was anything I did made it worse than it already is

P: So making the illness worse is your genuine concern

S: Yes

P: What about if things change if you were to stay as you are now that is status quo if you like. What would the benefits of this be

S: I don't think there would any benefit, I would probably get stiffer and stiffer

P: So you don't think there is going to be any benefit of staying as you were

S: No I have got to do something to try and make things better than what it is I really does

P: So you think you are at a turning point where it seems you have gone so far down the line

S: I need to do something to try and make me feel better. I have watched the people on the machines

P: Did that put you off or did you think I was not far off

S: I know there are some I could do I know I could. My daughter does a lot of fitness. She is into all this kind of thing. So she encourages you know what I mean.

P: So partially you could do it, partially you couldn't. So you have got the GP and your husband and your daughter so you have no escape

S: Oh no I haven't. My daughter is ready to do it with her enthusiastic and she would take me screaming so I have to be ready to go

P: But having looked at different things in the past are you now at a point when you are ready to do it and not be under the pressures of them. Why do you think you have come to the point that you can

S : I think it is down to not working, but I just feel so unfit that I didn't feel before so now I have got to do something to try and make it better

P: So that time you have had time off work thats' made you realise. What about if you were not to change and stay as you were what would be the downside of that

S: It worries me that at a stage when I would be depressed about it. I am not at the moment but I think if it got any worse if I was really finding it hard to move around like I think I would be depressed like.

P: So the pain and the lack of independence that you mentioned earlier you can see in the future it might cause

S: I am the sort of person that needs to be able to active and to be doing things, yes.

P: So that might be a real downside of it. So that would be a downward spiral physically. Do you think that is worth putting on there that you wouldn't improve physically

S: I can't seem to see how I would improve physically if I don't do something. I have got to do something

P: So if you weren't to do anything you would still continue downward
S: Yes I think so
P: I will put down there if that' s alright with you about this downward spiral physically. Is that a fair reflection
S: Yes I would think so. I have got to the stage now that I have got to do something
P: So both the physical and the mental side is important to you if you don't change that. Is that a fair reflection of where you are
S: Yes I think so
P: So in summer you have the benefits of change feeling better in yourself, feeling happier, feeling comfortable in yourself, you avoid this burden and maintain your independence. It will increase your enjoyment of your daily activities, shopping, even just walking, increasing your health in terms of your physical and mental health, also your enthusiasm for doing different things encourage you to do things. In terms of benefits of not changing you really are confident that there aren't any.
S: No I have said that. I have got to do something to change.
P: And yet the downside of change similar to that in a way is this potential pain. Is it going to make any illness or any injuries you have got any worse and that is a concern and that is a thing that we need to be aware of as you go through it. The downside of not changing and stay as you are you can feel yourself that you might get depressed because you are on this downward spiral
S: Yes
P: That's great. In terms of where we are then. It is important that we try and do this with your husband as well just to try and find out how motivated he is at the moment. How motivated are you to go ahead and do the actual activities that are prescribed to you
S: I am motivated in so much that I have got to do something. As I said I am not a person who says they love exercising and things like that but I am motivated in so much as I know I have got to do something.
P: So it is a means to an end to you, that being the end goal. So if I were to ask you to give me a value a number for it, one being not ready and ten being yes I am already trying - where would you put yourself
S: I would say I am ready to start trying to do it because I know I have got to
P: So what value would you give me
S: I would say probably seven
P: Why seven and not as low as three or four
S: Because whereas I am not sure of myself I know I have got to do it
P: So you mentioned before that it is a turning point. OK and that's for a variety of reasons that we have highlighted before. We are also interested in helping you achieve long term effects of exercise rather than just in the sixteen weeks and we looked at the way it could fit into your daily habits and routines, you said that if you did exercise you would do these religiously, is there an opportunity to do other things, using the description you used. How confident are you that you will be exercising in a years' time with the programmes and the exercising you are given
S: It depends if I can see a result of starting to do it then that will keep me going. If I do it and I don't feel any better then obviously that will kill me off, but if I feel some sort of improvement then I will continue
P: How long will you give yourself for that?
S: I would have to see how I feel like after the fifteen weeks
P: Ok. So you are willing to give it fifteen or sixteen weeks
S: Oh yes

P: Ok. So have you done programmes in the past, so you can look ahead those fifteen weeks

S: When I came and they said it was a fifteen week course, yes by all means I would give it fifteen weeks to see how I would feel at the end of it

P: OK. So if I again held you down to a value of motivation for the long term what value would you give it?

S: I would say for the fifteen weeks I would be fully committed and motivated to do that. I would say nine or ten to do that.

P: Nine or ten for fifteen weeks. What about long term.

S: I don't know, it would depend, even if I stayed on here after the fifteen, if I knew what I could do then I would get something to do and have it home then I would do it there.

P: So you still think you are fairly confident that you would continue. What value would you give on that

S: I would say nine to ten. Yes

P: So you are quite confident that once you have done it and started it you would continue

S: If it is something I can do and it is making me feel better then I will do it

P: So you have felt better with these tangible results. OK. Therefore when we look at this we have got to look at one of the first things that you are going to notice first of all in the exercise programme

S: What I would like to notice first of all is to be able to walk around and to have motivation in my hips and my legs that's what I would really like to achieve. I think once I have done that the weight loss will happen

P: So all these spin offs will start to happen

S: Yes I think so

P: That is one of the first things you will notice is the good things, able to walk more, becoming more mobile and the spin offs will be a result of that.

S: Yes. That's what I hope to get out of it straight away.

P: What else do you think you will find then once you have found seen the results how else would it make you feel

S: I think it will make you happier in yourself, fitter, and that you will feel good about yourself as well

P: You said that there is a couple of good things you have noticed being able to walk a bit more, more independence, the spin offs losing weight from that, you also mentioned the feeling better in yourself

S: Yes it gives you more confidence

P: OK - and confidence as well. What about, is there any other benefits that you think of any good things that you might have noticed

S: If I can get to those stages I would be really happy, yes

P: What about down sides. What do you think you might notice first with exercise, again you have got to be aware of it

S: I expect to be a bit stiff. I have not done exercise in a long time.

P: There will be some stiffness in muscles essentially knowing that your body is moving and so although the long term effects are good

S: I know with the few times I have been coming the next day I am going to be stiff , I am going to be aching. I am expecting that. I did go to aerobics classes about five years ago with my daughter, we didn't do it for a long time but we did it over a space of time of several months

P: Did you get into that

S: Some of the things I found difficult. It was fine for my daughter. So that put me off

P: So that put you off because you found them too difficult. So although there was some positives and some negatives that there may be some stiffness there

S: Stiffness doesn't bother me, what put me off with the aerobics was some of the exercises I felt were really more for younger people

P: So that is something that you need to avoid. You also mentioned the weight loss being an important thing, both from yourself in terms of how you feel or the image which part of it is yourself anyway that would give you more confidence

S: And for health reasons as well obviously I am carrying too much weight and I need to get some of it off

P: OK. Does that seem a fair summary of what we have talked about. Does that touch on most things.

S: Yes it just about covers everything

P: Would you like me to give you some information on how people in your position have found exercise to help them and have found typically exercise helps them. Normally within the first stages you are in the PEP programme so that is number 1 on the action plan going through the PEP programme with the exercise programme and you mentioned your husband is with you as well and we touched on that right at the start so that is something together you can motivate each other up. You put also that people particularly found that if an activity can be fitted into your daily life you said you are only doing mobility anyway so if you can increase gradually and by that it means not pushing yourself so it hurts but the walking programmes just gradually when your husband goes walking with possibly you go out with him, it takes less time, less hills, so that you build up gradual and what might be useful other people have found is keeping a diary which is probably what Julie has talked to you about of keeping a track because what we have said in terms of diet and the exercise you have done you need tangible means to see something and to see concrete evidence, so possibly a weight chart, diet plan, diary and by looking at that that might motivate you to say well I could do a little more than I was last month and that might just be something which motivates you a little more. What do you think about that.

S: That might be something that would help.

P: So the exercise and diet is put in a diary and again it might involve your husband with that, that the two of you looking obviously you both start at different stages and work at different levels

S: He will begin wherever it will help me, he is really keen for me to be fitter than what I am as well.

P: How do you react to that does that encourage you or does it worry you that there is someone pushing you to do it.

S: It is nice that somebody is interested but as long as people don't say you have got to do that I'm fine. If it is a suggestion because it is something that will help I don't mind doing it

P: As long as it is at your own pace

S: I would hate it if they were pushing me to do something that I don't want to do

P: That is something that is in the PEP which is essential but it will only ever be at your pace.

S: My husband is backing me all the way because he wants me to feel better in myself

P: So his interests are the same as yours.

OK. Thanks very much for that M [client]. Have you got any questions or anything else

S: No, but I am interested to know how it is going to work, how will I manage

P: So you are keen to start

S: Yes, that's great. What happens with the next one.

P: J [PARS officer] will meet with you to talk about what puts people off exercise and obviously we are interested in how you feel about exercise and what effect it might have on you so that you feel the benefit

S: In time I would love to be able to just get moving, flexibility of myself rather than just sit on a chair and deteriorate

P: Since the flexibility and movement is the most important thing

S: Yes the most important thing

P: You also mention the avoidance of deteriorating

S: Well that's one of the main things

ENDS

Appendix 5.4: MISC & MITI independent coding results

SDSU
San Diego State University

Doctoral Training Facility
Psychology Annex for Research and Training
San Diego State University
6363 Alvarado Court, Suite 103
San Diego CA 92120-4913
TEL: 619-594-1689
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Motivational
Interviewing
Teaching
Institute
San Diego, Torrance, California.

Jeff Breckon
Senior Lecturer - Exercise Psychology
Sheffield Hallam University
Tel: 0114 225 4353
Email: j.breckon@shu.ac.uk

Enclosed is the invoice for the evaluations we conducted for your study.
We hope all is going well for you.
Thank you, it has been a pleasure working with you,

Patrick S Kidder MA

Appendix 6.1: Exercise Motivation Inventory (version 2) (Markland & Ingledew, 1997)

The Exercise Motivations Inventory - 2 (EMI-2)

On the following pages are a number of statements concerning the reasons people often give when asked why they exercise. *Whether you currently exercise regularly or not,* please read each statement carefully and indicate, by circling the appropriate number, whether or not each statement *is true* for you personally, *or would be true* for you personally if you did exercise. If you do not consider a statement to be true for you at all, circle the '0'. If you think that a statement is very true for you indeed, circle the '5'. If you think that a statement is partly true for you, then circle the '1', '2', '3' or '4', according to how strongly you feel that it reflects why you exercise or might exercise.

Remember, we want to know why *you personally* choose to exercise or might choose to exercise, not whether you think the statements are good reasons for *anybody* to exercise.

It helps us to have basic personal information about those who complete this questionnaire. We would be grateful for the following information:

Your age ..... years **Your gender ..... male/female**

		Not at all true for me					**Very true for me**
Personally, I exercise (or might exercise) ...							
1	To stay slim	0	1	2	3	4	5
2	To avoid ill-health	0	1	2	3	4	5
3	Because it makes me feel good	0	1	2	3	4	5
4	To help me look younger	0	1	2	3	4	5
5	To show my worth to others	0	1	2	3	4	5
6	To give me space to think	0	1	2	3	4	5
7	To have a healthy body	0	1	2	3	4	5
8	To build up my strength	0	1	2	3	4	5
9	Because I enjoy the feeling of exerting myself	0	1	2	3	4	5
10	To spend time with friends	0	1	2	3	4	5

11	Because my doctor advised me to exercise	0	1	2	3	4	5
12	Because I like trying to win in physical activities	0	1	2	3	4	5
13	To stay/become more agile	0	1	2	3	4	5
14	To give me goals to work towards	0	1	2	3	4	5
15	To lose weight	0	1	2	3	4	5
16	To prevent health problems	0	1	2	3	4	5
17	Because I find exercise invigorating	0	1	2	3	4	5
18	To have a good body	0	1	2	3	4	5
19	To compare my abilities with other peoples'	0	1	2	3	4	5
20	Because it helps to reduce tension	0	1	2	3	4	5
21	Because I want to maintain good health	0	1	2	3	4	5
22	To increase my endurance	0	1	2	3	4	5
23	Because I find exercising satisfying in and of itself	0	1	2	3	4	5
24	To enjoy the social aspects of exercising	0	1	2	3	4	5
25	To help prevent an illness that runs in my family	0	1	2	3	4	5
26	Because I enjoy competing	0	1	2	3	4	5
27	To maintain flexibility	0	1	2	3	4	5
28	To give me personal challenges to face	0	1	2	3	4	5
29	To help control my weight	0	1	2	3	4	5
30	To avoid heart disease	0	1	2	3	4	5
31	To recharge my batteries	0	1	2	3	4	5
32	To improve my appearance	0	1	2	3	4	5

33	To gain recognition for my accomplishments	0	1	2	3	4	5
34	To help manage stress	0	1	2	3	4	5
35	To feel more healthy	0	1	2	3	4	5
36	To get stronger	0	1	2	3	4	5
37	For enjoyment of the experience of exercising	0	1	2	3	4	5
38	To have fun being active with other people	0	1	2	3	4	5
39	To help recover from an illness/injury	0	1	2	3	4	5
40	Because I enjoy physical competition	0	1	2	3	4	5
41	To stay/become flexible	0	1	2	3	4	5
42	To develop personal skills	0	1	2	3	4	5
43	Because exercise helps me to burn calories	0	1	2	3	4	5
44	To look more attractive	0	1	2	3	4	5
45	To accomplish things that others are incapable of	0	1	2	3	4	5
46	To release tension	0	1	2	3	4	5
47	To develop my muscles	0	1	2	3	4	5
48	Because I feel at my best when exercising	0	1	2	3	4	5
49	To make new friends	0	1	2	3	4	5
50	Because I find physical activities fun, especially when competition is involved	0	1	2	3	4	5
51	To measure myself against personal standards	0	1	2	3	4	5

Thank you for completing this questionnaire

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The Exercise Motivations Inventory - 2 (EMI-2)

Scoring Key

Scale scores are obtained by calculating means of the appropriate items

Scale	Items			
Stress Management	6	20	34	46
Revitalisation	3	17	31	
Enjoyment	9	23	37	48
Challenge	14	28	42	51
Social Recognition	5	19	33	45
Affiliation	10	24	38	49
Competition	12	26	40	50
Health Pressures	11	25	39	
Ill-Health Avoidance	2	16	30	
Positive Health	7	21	35	
Weight Management	1	15	29	43
Appearance	4	18	32	44
Strength & Endurance	8	22	36	47
Nimbleness	13	27	41	

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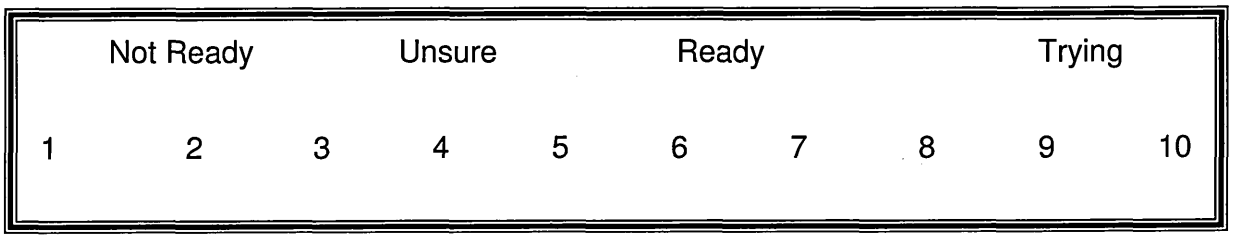
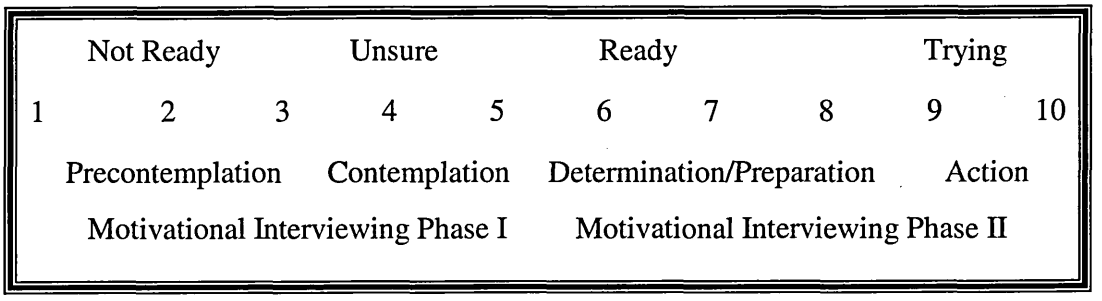
Appendix 6.3: The decisional balance grid (completed)

Appendix 6.2: Therapist version of the 'readiness ruler'

Client (seen) version



Therapist (unseen) version



Client: JB049 Age: 47 Gender: M

Client (self-report) referral reason: Weight loss and depression

T = MI therapist
P = Participant

T: "Using the above scale (Client version, 1-10), How **motivated** are you to start the referral programme and to make changes to your lifestyle?"
P: "Probably about a 5"
T: "Why a 5 and not as low as 2 or 3?"
P: "Because I do feel like I want to change"
T: "Okay".

T: "Using the same scale (Client version, 1-10), how **confident** are you that once you have started you will be able to stay with the changes?"
P: "Well.....about a 7 or 8"
T: "Again, why are you putting yourself up at 7 or 8? why not 3 or 4?"
P: "Because I need to start afresh, once I start it might be just what I need".

Appendix 6.3: Completed version of a client 'decisional balance' sheet

Patient: JB049, Age = 47 (Male) Aspect(s): Weight loss and depression

	Pro's	Con's
Change	•Regain control of life: Feels like it is passing you by a little and you aren't in charge. •Feel like exercise might increase self-esteem •Alleviate problems of the past (ill-health, relationship difficulties) by improving your feelings of self-confidence and physical appearance •Increase energy levels and fitness •You are keen to get a new interest or activity in your life •Would like to feel the buzz you used to get from exercise	•Cost: you are reluctant to spend money on new clothes and equipment or gym memberships
No Change	•None	•Important for you to avoid past (negative experiences). •Without changing your lifestyle you feel there will be a continued decline.

Appendix 7.1: Transcript of the MI interview by the PA professional (Study 4)

MI Transcription: Client/Subject (B); year old female, Practitioner (A); PA professional trained in MI by lead investigator.
Duration: 20 minutes.

A. We are going to do in today's sessions is sort and map the programme out. What we highlighted and did yesterday was a lot of people who come on to the programme is and what they are looking for but what I am looking for in this session is map it out thoroughly and then end up at the end of the time together with the programme that you will follow over for the next 10 weeks. Next week because of the bank holiday it is a Tuesday and Friday on that one, so on the Tuesday 2.30 start if that is OK.

B. I work full time but my boss says it is alright for me to come.

A. It is nice to have a boss that is understanding.

B. What we are going to end up with is a programme - we will design a programme of exercises and at the end of this we will look at it later but just as a rough guide as to where we are at, in your mind why are you are on the course, what is it on the course you are wanting to achieve.

B. I want to feel fitter and to be encouraged to exercise more - I have done 7.6 miles on my bike this morning, and I can do that when I get on the bike, I put my alarm on at 6 o'clock every morning and I am really sleepy, the next thing I know it is ten minutes to seven and it is too late. It is not that I don't like doing it, it is the timing of it, I can structure my time, is the motivation of getting out of bed. I know I feel so much better.

A. Is this a regular thing this morning exercise.

B. I would like it to be.

A. Today you have done several many miles, have you put a programme together.

B. I have been going to weight watchers, and I have been going 5 weeks and lost 1/2 stone, I am on a 5 point challenge, 1 of them is to loose 1/2 stone in that period and exercise 3 times a week, however I have been defaulting from our office to the shop which is about a mile which is my exercise 3 times a week. Well sometimes I cycle from the cycle which is about 11 miles, I can do that but it doesn't happen regularly enough. If we agree something, then I wouldn't let you down, I will do it.

A. Is there any time over the last five years when you managed to get exercise correct or you have got an exercise going.

B. No. I know a lot stems from childhood which I am still working on. I work as a social worker and it is very hard work, mornings is my best time, I peak at about 10.30 in a morning, so I have to do what I need to do in a morning. I tend to go home, make something to eat, and watch television all morning, truly and simply because I am so exhausted, partly because of my weight, and psychologically how I am feeling. But I know if I exercise I feel better for it.

A. So you know in the past exercise is a feel good factor, the typical day then, the exhaustion you have is an obvious one with that type of work, you say the morning are a better time, is that because your work is flexible time.

B. We have got flexible hours, the thing that we have to section people and that would mean that I might have to be at work at 9 and finish at 11 at night if something comes up and you would do it to however long it takes really.

A. A typical day for you would be what? How does it look on waking up

B. I tend to wake at 6 but I am finding it more difficult to get up, I have been off work for 3 months, and just gone back to work in May. I bought a bike and I enjoy that, but it gets me out of the house and on the bike.

A. You go to work at what time.

B. Sometimes 8.30, sometimes, 9.00, depends. We work at the Council, so we finish at 4.30 on Friday. Sometimes I have gone home and gone on my bike,

but sometimes if it is raining and I think I am not going in the wet. I think the overlying thing is I know I can do it, I think giving my friends who are much heavier than me, I am reasonably fit, I live on my own my own, I don't live near anybody within 25 miles of me, I have been living on my own a very long time, and I hate doing it on my own.

A. You have actually said with the bike, I am assuming you mean the indoor exercise bike and the outdoor exercise bike.

B. I haven't got an exercise bike.

A. So this morning you cycled outside for 7.1/2 miles.

B. Yes. OK.

A. So you just pop out in the morning and then you go several miles. When was the last time you did that.

B. I did it last week.

A. OK. So you do it with some consistency.

B. I don't like walking because I am on my own, it is easier to cycle on my own. Walking on my own reminds me of my loneliness. I have got a rowing machine but it not much good for my back, because I have got back problems.

A. So if the choice was there, it would be outside.

B. Without a doubt.

A. With the inside exercise you can feel in your mind you are going to get some benefit.

B. I used to work at Water World in York and obviously we used to use the gym, and that was going round on your own, not knowing anybody. It just brings up the issue of being on my own, so this idea of coming here with a group and the possibility of exercising together.

A. So to interact is important.

B. Yes.

A. Have you tried in the past with group exercise, not particularly structured groups, but walking groups or other groups.

B. I have looked at other groups but they are doing sort of like 7-9 miles. That is something I would like to do but I feel as though I need to be fitter.

A. OK. So possibly the course then would be over the ten weeks would be the development of your walking maybe contagious.

B. Yes, maybe, in small groups, just do little walks initially. I did go out with the birders, the RSPB, well I am a member anyway, and there is a birders group in Bridlington, and I joined it, but they never talked about anything but bloody birds. I went twice and I tried. But I didn't like it.

A. This type of structured exercise - any past history, anything with the environment.

What is Water world is that part of the Council.

B. Oh no, it is private, there is a gym, it is a big gym that is all round the country, they did step thing, and cycling, I used to go first thing in the morning and try and go round the machines. But again on your own, not knowing anybody, and these people who have not got an ounce of flesh on them, it irritates me to death. People in there are the least people who need to be in there.

A. It sometimes seems like that sometimes. So when we go round later you won't be intimidated.

B. No I am not I have been on rowing machines, treadles, I have done those roller machines to flatten my stomach, various pulling weights, and lifting things up with my legs, I have been shown what to do.

A. So we need to do is a variety of exercises of know more than 8 - 10 exercises on our initial programme that we will develop over the 10 weeks. I am interested in the Weight Watching side - you have joined it here at this site on Wednesdays.

B. No not this site - I didn't know there was one it was at Football Green on Tuesday nights.

A. Weight Watchers are saying 3 - 5 times a week but they are also saying about 1 hours gardening a day. I am not sure I can do that. It makes you wonder what some of these people do for a living. Or something equivalent. I did spend Saturday evening doing my ironing which I haven't done for years and then Sunday I got up at 6 o clock and got my breakfast and after that I cut the grass which is quite hard for me with my back, I have a huge lawn at the back, and strimmed it and done various things and that was my weekend but by doing those things I actually felt better.

A. You have been with Weight Watchers for 5 weeks - have you noticed results.

B. 10 lbs. I have generally done a lot more in those 5 weeks but not enough. My biggest reason I went is to improve my mood apart from my weight. If I feel better I eat less, if I eat crap I eat more.

A. So we are looking probably in 10 weeks feedback to be more in terms of how you are feeling as opposed to physiological measures or physical effects so the feedback will be on how you are at that stage, we will sit back and see how your mind is. So basically from the exercise side we can look at and recap to see if there is a significant change and we can use that.

B. There is a women's walking group in Bridlington on Wednesday nights. I know that if they walk 9 I might be turning round at 4 and walking on my own.

A. I know that is a real fear for anyone joining these groups. From my experience from these types of groups they do cater for a broad range of fitness levels and age groups therefore I think your experience over this scheme we should be able to do some good work in that. There is nothing with your lower back and there is nothing we need to account for injury wise.

B. I was off 2 years ago for 4 months with trapped sciatic nerve in my right leg and that is around at the moment, not the pain but the numbness down that leg. The other thing is I have other problems with my upper neck, if I sit in front of the computer, I have seen the physio at work about that and he is working on the muscles that go round the neck and round the shoulders. I feel as though I am pushing my neck forward.

A. So this is from the physio. So we could link some of those exercises that you have highlighted into the programme.

B. So what I really would like help with is posture, I would physically get weight off my stomach because I am very much an apple, there is a lot of weight here which can't help my back and I generally want to be fitter.

A. I think we can use cycling because you have a background of experience with the cycle, walking is another area we can put on the programme and if we can develop that then it will all be positive but you will then have to focus then on issues through the feel good factor of all that and combine that with the weight issue as well we can capsulate the full programme and design. What we will do now is go into the gym area now and finish off our chat and then we will look at our programme. We are going to look at the machines in here and look at the ones that will build up your programme but in terms of exercise itself what I would like to highlight through is peoples' mindsets in terms of what

their belief and opinion of exercise. A lot of people in the medical world get advice on exercise but doesn't carry any detailed information, if we look at on the scale of 1 - 10 how important is it in your life.

B. 3 and I know that when I feel fitter psychology it will be 8 - 9.

A. So at this moment today it is 3. Why is it not 1. Why do you say 3.

B. I think over the last fortnight I feel like as though not exactly exercised but I not been sitting more and I feel as though that is an improvement. I have worked on the house and done things last week after work. So at the weekend I could have a rest because I have deserved it and I thought no you need to keep moving and what I have actually winning to the last years I have not won that.

A. So from that you are actually saying the ball is rolling. The ball over the next 10 weeks we are going to find that it is the kick I need. Excellent. How confident then on the same scale 1 - 10 that it is going to work. 1 you are confident and 10 you are confident.

B. I am saying I am confident because I have commitment to somebody else. On one level not very good but as I say to my doctor if I have to turn up I will turn up, but when its me persuading me to turn out of bed in a morning sometimes I win and more often I loose.

A. In that sense what we are going to do then is take all the positives there and hopefully use all the information in terms of as we highlighted before the walking aspect, the cycling, because you have that background experience, taking into account the feel good factor about exercise and then looking through in terms of what we can do with measures which is one thing I am leading onto and hopefully we can put a programme for ten weeks together. Throughout the ten weeks I am with you but at the end of the ten weeks we sit back down again and we thoroughly dissect the positives and if there are any negatives we highlight them as well, so sometime in November we will sit back down again and we will go through all the programme itself and see what has gone right and gone wrong with that. What I am going to do as a base line is to use that machine over there as the only thing I am going to focus on because what we are going to do with your exercise I am going to let you follow that through so what I need is your footwear off if you will, we will take if without shoes on that one.

ENDS.