ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

Language Training in the E.S.N.(S). Child

Judith Wright

A thesis submitted to the
Council for National Academic Awards
in partial fulfilment of the requirements
for the degree of Master of Philosophy

Department of Communication Studies
Sheffield City Polytechnic

Collaborating Establishment
Sheffield Local Education Authority

April 1986

Volume 1

Acknowledgements

Grateful thanks are expressed to my supervisor, Asher Cashdan, who could always find time to give guidance, encouragement and much-needed criticism throughout the conduct of this research and to Pauline Oldfield-Cherry, child care assistant, colleague and indeed co-researcher for her professionalism, interest and enthusiasm, without whom the field work would not have been possible.

In addition I would like to thank the children who were often both difficult and exasperating, but always immensely interesting and marvellous to work with. Acknowledgement is also given to colleagues at Norfolk Park School and to the LEA for the provision of facilities and materials. Finally, I would like to express special appreciation to my Mother, Ankie Hoogveldt and Margaret Mallallah for their friendship, help and support throughout the study and last, but by no means least, to my son Jeremy for putting up with it all.

Volume 1

Contents

(Appendices D-H constitute Volume 2 of the Thesis)

LANGUAGE TRAINING IN THE E.S.N.(S) CHILD

JUDITH WRIGHT

A behavioural language training programme was implemented with a group of nine children with severe language and learning difficulties in a local authority day school in Sheffield. The study was conducted over a period of four and a half school terms. Detailed data and results are presented on five of the nine children.

The language training programme focussed on the development of syntax and was organised into three categories; 1) pre-language training, 2) language training and 3) video training. One-to-one teaching strategies, combined with the techniques of imitation and reinforcement were used in each dimension of the programme. Systematic teaching procedures were also developed for training the generalisation of new syntax in non-training settings within the school. The child care assistant functioned as a second trainer.

Significant improvements occurred in the language behaviour of each of the five children. Functional speech and language was established in one child who was non-verbal at baseline. The utterances of the four other children were extended in both length and structural complexity. Generalisation occurred in a range of settings with both familiar and unfamiliar adults. A teaching approach integrating a structured language training curriculum and one-to-one teaching strategies in an ordinary classroom setting combined with training for generalisation in non-training contexts within a school environment, proved both possible and successful in shaping effective communication in a group of children with severe learning difficulties.

April 1986

List of Figures Appearing in Volume 1

The Figures referring to each case study appear at the end of the relevant Chapter (e.g. Steven's Figures are at the end of Chapter 5, pp 175-183)

CHAPTER ONE

In teaching the mentally handicapped there are divergences of opinion between 1) "enrichment" approaches, 2) methods dominated by preoccupations with maturation and stages of development and 3) highly structured prescriptive teaching approaches specifying clearly defined learning and behavioural objectives. For those committed to helping severely subnormal children overcome their language deficiencies, the first two of these may present a number of practical difficulties.

Fenn (1977) has pointed out that verbally stimulating environments may be important for some severely subnormal children. But it is undeniable that for children who have never spoken, or whose language is at best rudimentary (despite rich and linguistically diverse environmental modelling), learning experiences which involve more linguistic variation may not always be beneficial.

> "...it seems possible that for some children too much linguistic variety constitutes a source of confusion and provides a barrier rather than an aid to linguistic inference. If this is the case "more of the same" and "bombardment" with speech will not improve matters." (p 1)

Again, educational methods influenced by the maturational theories of Lenneberg (1967) and Piagetian stage-learning analysis of language and cognition generate a "wait and see" approach to development such that more time is spent waiting for language to "emerge" or a particular stage to

"occur" than in actively facilitating language learning through planned intervention.

It seems likely, therefore, that there are periods with children when didactic, prescriptive teaching, even to the point of a Skinner-derived direct teaching model, is essential in moving a child from one stage of language learning to another, or in moving a child who has become "fixed" at a particular stage of linguistic development. (In reality, of course, the issues are more complicated than the apparently simple choices implied here; the different positions and their implications will be analysed in detail in Chapter 2.)

As a class teacher, the present writer was faced with a group of severely subnormal children of vastly different personalities and capabilities, whose language and communicative skills gave particular cause for concern. Accordingly, there was little scope for group work and it seemed that a behavioural approach of highly structured one-to-one teaching strategies combined with the systematic use of contingencies of reinforcement would prove the most efficient way of accelerating language learning in these children.

However, given that individual teaching is expensive in terms of teacher time relative to the conflicting demands of the individual needs of children and the educational needs and management of the group, it seemed useful to

demonstrate that this might be feasible in an ongoing classroom situation for a 'teacher/researcher'. Not untypically, the author's situation had both favourable and unfavourable features. Favourable, in that a care assistant was available in the classroom for most of the school day and the author had virtually complete control over the timetable. Unfavourable, in that the classroom was lacking in appropriate equipment and materials and the school's ethos was inexplicit, relatively undeveloped and hostile to behavioural methods. (This is discussed more fully in Chapter 3.)

In this context, the author had become inspired by the work of Lovaas and his colleagues (1966; 1968), Risley and Wolf (1967; 1968) and Sloane, Johnston and Harris (1968); and the research study began with simultaneous exploration of the extensive literature and an analysis of the necessary principles of a language remediation programme, including the choice between a syntactic or semantically-based approach. (Again, these issues are discussed in detail in Chapter 2.)

At the same time as focusing on the development of a language training programme, subsidiary ideas and objectives were introduced. These included: 1) the use of the care assistant as a trainer, 2) the use of video as a training technique with or without an attending adult, 3) the design and execution of a cartoon series for language training purposes. Unfortunately, despite the offer of

funding from a charity, the exigencies of time and lack of personnel resulted in the cancellation of the cartoon project.

Finally, given the time and effort required in teaching language in one-to-one training settings, it is important to ensure that maximal results are obtained in increasing children's language usage in both training and non-training environments (Rogers-Warren and Warren, 1980). Shortly after the commencement of the study, therefore, the generalisation of trained language skills became an additional focus and specific training strategies were introduced to facilitate and promote the display of new language learning in natural settings. These are discussed in detail in Chapter 3.

The purpose of this introduction has been to discuss briefly the background to the experimental study. The language and video training programmes are described in detail in Chapter 3; the conduct of the study and its methods of evaluation are explained in Chapter 4.

CHAPTER TWO

Review of the Literature

1 Intellectual and linguistic development in subnormality

2 Is a normal child language acquisition model different from a language intervention model?

3 Cognition and language training

4 Receptive language versus language production in language training

5 Semantics versus syntax in language intervention

6 Operant procedures in language training

7 Training for generalisation

8 Implications for the present study

CHAPTER TWO

Language may not be as clear cut a discriminator between animals and humans as has been claimed; nevertheless, there can be no doubt that language is a major support system of thought and action. One of the most severely handicapping aspects of the severely subnormal is their language limitations; it is therefore incontestable that educational efforts to improve their language must be central to all schooling provided for them. What is much less clear is which kinds of instruction, stimulus, exposure and environment are helpful and which are less so. One of the main purposes of this review is to discuss the distinctions and the alternatives implied in this analysis.

1 Intellectual and linguistic development in subnormality

Language intervention for the remediation of limited language in severely subnormal children is a relatively recent phenomenon. A major reason for this was that the medical profession, teachers, speech therapists and parents were primarily concerned with identifying the underlying causes of deficient language and speech, resulting in an emphasis on etiology rather than on the development of appropriate instructional methods.

Etiological concerns gave rise to the categorisation of children evidencing atypical language development according to clinical categories, eg deafness, aphasia or dysphasia, autism or schizophrenia and mental retardation (Bloom and Lahey, 1978).

In addition to impaired intellectual and linguistic functioning, there is general agreement that maladaptive social behaviour is a distinctive feature of severe subnormality, often characterised by stereotyped behaviour such as rocking, finger flicking, headbanging etc and by communication with the social environment restricted to crying, screaming, gesturing and inappropriate vocalisations (See Jordan, 1967; Schiefelbusch, Copeland and Smith, 1967; Buddenhagen, 1971).

Etiological perspectives on atypical development therefore assume that deficient language, low IQ, and inappropriate

social behaviour are inextricably linked and, by definition, are congenital and inherently determined. Moreover, a theoretical model attributing intellectual and linguistic development to inherent factors also assumes that deficiences in either are irreversible or very resistant to change. Lenneberg (1967) observed that language is dependent on "a 'natural language learning strategy' that cannot be altered by training programmes" (p 326). Therefore, unless a child reaches a certain level of maturational "readiness", the learning of appropriate language will fail to occur.

Consequently, the provision of opportunities for learning new conceptual and linguistic skills was not encouraged and the development of distinctive remedial speech and language programmes did not appear on the educational agenda for severely subnormal children, resulting in what Gray and Ryan (1973) succinctly describe as:

> "...educational disenfranchisement in addition to other problems commensurate with the lack of language." (p.8)

During the 1950s and 1960s, Soviet psychology, British empiricist and American behaviourist psychology began to pioneer alternative theoretical perspectives emphasising the critical role of social, environmental and contextual factors on the intellectual and linguistic development of the moderately and severely subnormal.

The Soviet scientist Luria (1958), acknowledging the

theories of Vygotsky, argued that what were traditionally regarded as "inborn abilities" such as complex perception, intelligent memorisation, voluntary attention and logical thinking, actually represented "complex functional systems" formed during the long and elaborate process of the child's development and interaction with the cultural and social environment. It was therefore thoughtless to assume that retardation or behavioural deficits were directly caused by inborn deficiencies in abstract thought. Luria proposed, instead, a "causal-dynamic" approach to abnormal child development entailing a genetic analysis of neuro-physiological defects and an examination of their functional consequences, such that "appropriate, corrective pedagogical methods" could be found to act upon the consequences of the defect rather than upon the defect itself.

British and American psychologists also directed their research efforts toward qualitative analyses of the learning and behaviour of subnormal children and adults. Their findings indicated that the moderately and severely subnormal suffer from deficits in attention and cue selection and from auditory and visual perceptual impairments. (See, in particular, O'Connor and Hermelin, 1962.) Moreover, Zigler (1966) found that differences in performance on concept-switching tasks between normal and retarded children matched on MA were a result of individual differences arising from diverse experiential histories.

Zigler hypothesised that subnormal children are conditioned by prolonged exposure to experiences of failure, in contrast to the experiences of their normal peers whose life experiences are characterised so much more consistently by success; adding credibility to the view that the behaviour of moderately and severely subnormal persons is complex and multiply determined by environmental and social factors (see Clarke and Clarke, 1954; 1959; Tizard, 1960). Furthermore, the propensity of the subnormal to learn under appropriate conditions of reinforcement had been noted by the behaviourists (Spradlin and Girardeau, 1966; Zigler, 1966), leading to the conclusion that the intellectual and behavioural potential of moderately and severely subnormal children and adults would be maximally realised if behavioural principles and techniques were consistently applied in their educational and living environments. (Major studies include those of Ayllon and Azrin, 1964; Ayllon and Michael, 1959; Birnbrauer, Bijou, Wolf and Kidder, 1965; Birnbrauer and Lawler, 1964; Spradlin and Girardeau, 1966.)

Qualitative analyses of the language of subnormal children have produced interesting if somewhat contradictory findings. In 1959, Luria reported that in the oligophrenic (severely subnormal) child, the neurological processes underlying speech are severely impaired, such that the verbal mediation of thought and behaviour is

greatly reduced. In the 1959 publication Luria gives no indication that the linguistic deficits of the severely subnormal are modifiable, in contrast to his 1958 recommendation for a "causal dynamic" approach to abnormal child development. The difference in the later paper is presumably attributable to its focus on brain damage or to the newness of the "causal dynamic" approach.

Studies on the use of language as a mediating function have indicated that the ability of severely subnormal children to label objects verbally is impaired as a result of over-attending to the object itself. When they are forced to verbalise, however, differences between severely subnormal and normal children disappear, suggesting that unless verbal labelling is introduced, severely subnormal children suffer from restrictions of attention (see Bryant, 1965; 1967). These findings indicate that severely subnormal children differ from normal children in the uses to which they put their language.

Some studies of language growth in subnormal children have revealed developmental sequences similar to those of normal children but at a slower pace (as in the work of Lenneberg, Nichols and Rosenberger, 1964; O'Connor and Hermelin, 1962). One of the most detailed studies of the language behaviour of subnormal children was conducted by Lackner (1968). The experimental group resided in the MIT research centre for eight weeks where their spontaneous speech was recorded three times per day. Lackner randomly

selected 1000 sentences for each child and wrote the transformational phrase structure grammars for all five subnormal children.

The results indicated that there were no striking differences in sentence length measured in words, between the subnormal children of a given mental age and normal children of that chronological age. Both groups followed similar developmental structural sequences in relation to the emergence of sentence types, consistent with increase in mental age. Children of lower mental age had "lower-level grammars" lacking in specificity and contextual sensitivity. The grammars of children of a higher mental age were more differentiated and had a wider range of applicability characteristic of normal adult usage. Lackner concluded that the grammars of subnormal children were sub-sets of the adult grammar and that there were no qualitative differences between the language of normal and subnormal children. Both groups follow similar developmental sequences; however, the most severely subnormal children had become arrested in their development and remained at a lower level of language growth.

On the other hand, Menyuk (1964, 1969) studied the spontaneous speech of a group of children aged 3;0 - 5;11 whose use of language was described as "infantile". In addition, their responses on a repetition task were compared with the responses of normal children on the same

repetition task. Menyuk found that the syntactic structures used by the "infantile" language group were deviant rather than delayed. There were also significant differences between the groups on the repetition task. Structure, rather than sentence length, determined successful repetition of a sentence in the normally-speaking children. For the language deviant groups, however, sentence length was an important factor in determining correct repetition. These children omitted the first part of the sentences but correctly repeated the most recently heard sentence elements. Menyuk noted that the language deviant children had poorer auditory memory than the normal speakers, since they were able to repeat utterances of only three to five morphemes in length. Menyuk concluded that severe limitations in short term memory would result in limited language development and the formulation of qualitatively different linguistic rules and structures.

Similarly, Lee (1966) in a study of children described as "language delayed" found that these children were not merely following normal developmental sequences at a slower rate. Lee reported that even at the two-word level, the language-deviant children failed to produce the linguistic generalisations upon which the development of syntax depends.

O'Connor and Hermelin (1962) suggest that the language deficits of the subnormal are not attributable to

deficiencies in the comprehension and production of syntax but are more directly related to limitations in vocabulary acquisition resulting from attentional deficits.

Other researchers have stressed the potentially critical role of environmental factors on the language and speech development of subnormal children. Behaviourists have suggested that language is one of the functional attributes of subnormal children which may fluctuate as a consequence of circumstance. Consistent with this view is the finding that the limited language of the subnormal is partially, at least, the result of restricting environments, which fail to support the development and use of language in these groups (O'Connor and Hermelin, 1962).

Lyle's (1960) study is of interest here; an experimental group of severely subnormal children were withdrawn from an institution to a "child-centred" residential unit where they demonstrated significantly greater language growth than the control group who had remained in the institution. Lyle found, in addition, that children who were nonverbal on entry to the institution experienced greater difficulty in developing verbal skills within the institutional setting than those children who had acquired speech prior to institutionalisation. However, the children who were verbal on entry were retarded linguistically by comparison with similar children who had never experienced institutional environments, indicating,

therefore, retarding effects within the institution itself. Lyle concluded that reduced learning opportunities and disincentives to communicate, typical of many institutional social environments, may be determinants of subnormality. (See also Cashdan and Jeffree, 1966.)

Studies of communicative dyads with severely subnormal children have revealed that the language of the subnormal affects and is affected by the language of adults with whom they share their environments (Siegel and Harkins, 1963). These and similar findings prompted Schiefelbusch, Copeland and Smith (1967) to speculate that the poor communicative behaviour of subnormal children may equally be the result of "punishing interpersonal experiences" as of impaired verbal and listening skills and inadequate cognitive functioning.

Similarly, Schlanger (1967) convincingly argues that inappropriate social responding and self-stimulatory behaviours typically associated wih mental subnormality are, in fact, correlates of limited communication skill, which, in turn, strengthens the social stigma attached to the subnormal, such that they are subjected to negative attitudes and discriminatory practices in accordance with their status as a minority group. Moreover, such attitudes are not confined to lay persons but are prevalent among professional groups working with subnormal children.

Schlanger raises important questions concerning the prejudicial effects of discrimination on the behaviour of professionals insofar as their practices may exacerbate rather than enhance the learning and communication skills of their handicapped pupils. Schlanger's observations appear to strengthen the view that the availability of reinforcement systems operating within interpersonal situations between adult and child are clearly determined by adults. Fundamental adjustments in the reinforcement contingencies may lead to significant modifications in the adaptive and communicative behaviour of the child (Schiefelbusch et al, 1967).

The notion that limited speech and language are the "natural" sequelae of mental subnormality innately located in the child, is seriously challenged here, by assertions that offer a more positive view of the linguistic capabilities and achievements of subnormal children. Given the provision of productive environments within which reinforcement is contingent upon the emission of appropriate communicative behaviours on the part of the child, educational intervention becomes a distinct possibility rather than "a well intentioned but futile gesture" (Bricker, 1972).

In summary, the classic earlier studies of the intellectual and linguistic development of severely subnormal children suggest deficits in attention,

perception, and verbal mediation. Research evidence indicating that the speech and language of severely subnormal children is arrested at the earlier stages of acquisition evidenced in normal children has been inconclusive; language growth in severely subnormal children may assume qualitatively different developmental trends in form and function. There have been suggestions that inadequacies in the learning, behaviour and language of these children cannot be explained merely on the basis of an inherent deficiency; in particular, the language of subnormal children is complex and multifaceted; it both shapes and is shaped by socio-cultural attitudes and expectations as well as by the contingencies of reinforcement operating within the natural environment. As this review continues, it will be apparent that these conflicting findings are still largely unresolved.

For the purposes of this study, a particular view of language training has been adopted and within that view certain sub-decisions have had to be made also. To set these decisions in context, it will be necessary to go through some relevant positions and studies. This will not take the form of a comprehensive review of language acquisition, an impossibly large task. Instead it will be approached by raising and answering (or at any rate commenting upon) a selection of relevant questions.

2 Is a normal child language acquisition model different from a language intervention model?

It is now generally recognised that while limited language is not a definition of mental subnormality it is, nevertheless, closely associated with it. Moreover, it is an indisputed fact that speech and language share certain inviolable characteristics relative to the social demands made on the severely subnormal child. Although normal linguistic functioning may be disrupted by handicapping conditions, the conventions, demands and expectations of the speech and language community remain.

Guess, Sailor and Baer (1974, p 529) have noted:

> "The outside world operates with a heavy reliance on spoken and written words. While it can make some allowances for persons not well skilled in the use of words, it will not make many allowances or extensive ones."

Language is a system of rules and symbols through which ideas, meaning and intentions are communicated in given social contexts. The effective participation of the severely subnormal in this shared social system is essential if they are to improve their behavioural and social status, and if they are to lead fuller and richer lives in the speech and language community. Accordingly, much of the research of the last two decades has aimed at the development of teaching programmes focusing on the specifics of the verbal behaviour to be trained and the strategies through which productive language may be acquired by subnormal children with limited language and

by children who have never spoken.

Inspired by Skinner's (1957) theoretical analysis of verbal behaviour, the early research studies of the applied behaviour analysts demonstrated unequivocally that many aspects of the speech and language system can be taught to severely subnormal, language deficient children. They employed the systematic manipulation of environmental antecedents and consequences, establishing operant conditioning as a powerful teaching technology within the field of language intervention research (Guess, Sailor and Baer, 1978).

During the same period, developmental psycholinguistic research, dominated by complex and rapidly changing theoretical constructs of language and its development in young children, produced a plethora of richly descriptive, if somewhat diverse accounts of language acquisition in normal children. In recent years, these descriptions have contributed increasingly to the theoretical and conceptual bases of language intervention programmes such that, while there is a broad consensus concerning how to teach, there are fundamental differences on what to teach in relation to:

> "...which elements should be taught in what order, for maximal results from minimal teaching" (Guess, Sailor and Baer, 1978 p 103)

Miller and Yoder (1974, p 511) proposed that:

> "The content for language training for retarded

children should be taken from the data available in language development in normal children."

The adoption of this principle in the design of remedial programmes is predicated on two fundamental assumptions. First, that language development in subnormal children is similar to that of normal children, but is slower in onset and rate. Second, that the study of normal child development will provide information on the linguistic forms, structures and functions learnt during the acquisition process and also on the necessary conditions in which language learning is facilitated.

There are theoretical and practical problems implicit in both of these assumptions. As stated earlier, research has failed to demonstrate conclusively that language development in subnormal children is merely a slowed down version of normal acquisition. Furthermore, the social and experiential histories of severely subnormal children may not necessarily share the interactive relationships that are the necessary antecedent influences for normal development.

Cromer (1974) argues that older subnormal children may acquire very different language abilities from younger, normally developing children. Thirty one subnormal adolescents, aged 14, 15 and 16 years, with a mean IQ of 65, participated in a learning experiment in which nonsense adjectives were used in sentences of the form "The duck is glad to bite" and "The duck is fun to bite".

The majority of the adolescents used the "primitive rule strategy" to interpret the meaning of the test sentences. That is, they always showed the named animal as performer of the action. Cromer points out that younger, normal children begin by using the same strategy but increasingly develop greater use of the "0 - strategy" that is, always showing the non-named animals as performer of the action before finally achieving adult competence in the categorisation of adjectives at chronological ages 9 or 10.

Of interest here, is that experiments in which normal adults were presented with nonsense adjectives within sentence structures of the same type, revealed that no adult ever made use of the "0 - strategy". Instead, their response strategies were restricted to the "primitive strategy" of always showing the named animal as performing the action. The subnormal adolescents, therefore, performed like normal adults in that they did not make use of the type of strategy ("0 - strategy") which Cromer hypothesises may be important in normal child language acquisition. Cromer further suggests that both normal adults and subnormal adolescents may have passed "beyond the critical period for language acquisition" when they are likely to use abilities and strategies specific to the processes of language learning and development.

However, the absence of these strategies did not prevent the subnormal children from acquiring the structure. When

normal adjectives were used, the children learnt to comprehend the sentence forms in the adult fashion at ages 15 and 16, suggesting that language delay may result in older, subnormal children utilising different processes and strategies in their acquisition of language "after a critical period".

Furthermore, Guess, Sailor and Baer (1978, pp 105-106) point out:

> "...children being taught language relatively late in their lives, because they have failed to acquire it adequately in their earlier experiences, no longer possess the same collection of abilities and deficits that normal children have when they begin to acquire language. Instead the usual recipient of systematic, experimental language training will be a retarded child, well past the second-year level of motor development, possessed of a certain deviant means of interacting with peers and adults and securing some service from them, and with some acquaintance with the physical ecology of the world and its mechanics - all deficient, all oddly sorted and conditioned by years of institutional life or the sheltering a home-based retardate receives, but none of it any longer representative of the concatenation of knowledge and ignorance, ability and inability of the 18-month-old normal child."

Cromer's (1974) findings and the observations of Guess, Sailor and Baer (1978) suggest that failure in the normal language acquisition process may result in the emergence of different linguistic strategies and developmental patterns in subnormal children.

It seems questionable to assume, therefore, that the utilisation of normal developmental sequences in language intervention programmes is the most effective way of

teaching language to language deficient severely subnormal children who have clearly failed to acquire language normally during the course of their development.

3 Cognition and language training

Normal child language acquisition research is dominated by rapidly fluctuating theoretical trends. The predominant influence of the 1960s was the nativist view which held that human language capacity and acquisition are determined by mechanisms that are language specific, innate and genetically determined (Chomsky, 1957, 1965; Lenneberg, 1967). An "innateness hypothesis" of language acquisition assumes that children lacking in language are deficient biologically and genetically, such that language learning cannot be considered as a realistic or programmable goal.

Language acquisition theorists have since turned their attention to the theoretical analyses of Piaget. Piagetian theory hypothesises that the developing child is capable of major cognitive achievements independent of language and that language acquisition is dependent on prior cognitive development (see Bloom, 1973; Clark, 1974; Nelson, 1973, 1974; Schlesinger, 1971; Slobin, 1973).

Much of the recent work on the relationship between linguistic development and cognition has been concerned with establishing whether or not the use of first words and the onset of word combinations are temporally related and dependent on the achievement of cognitive milestones relevant to Piagetian theory. The cognitive achievements of the sensorimotor period are frequently cited as the

primary prerequisites for language development, being manifest in a number of different skills such as object permanence, symbolic play, deferred imitation and scribbling (Morehead and Morehead, 1974). Object permanence in particular is regarded as being a major indicator of mental representation synchronous with the development of the referential use of language (see Bloom, 1973; Brown, 1973).

Other research studies, however, have shown that object permanence is not a predictor of language development in that it is rarely correlated with pre-verbal or verbal communication (Bates et al, 1977). These findings clearly challenge the notion that there is an ontogenetic relationship between object permanence and the development of language (Morehead and Morehead, 1974). More recently, investigations comparing children's performance on cognitive tasks designed to measure Piagetian structures such as object permanence, means-end or symbolic play with their performance on language skills found that the alleged cognitive precursors of language development did not always precede words or word combinations (see Bates, 1979; Corrigan, 1978; Siegel, 1981). Moreover, Crystal, Fletcher and Garman (1976) cast doubts on the validity of the cognition hypothesis in relation to the development of certain syntactic structures such as concord rules, collocational rules, negative placement and question inversion, which they argue share only an indirect relationship with cognition.

Not surprisingly, a number of investigators have argued that the primacy of concept development has been overstated, as there is growing evidence that language interacts with cognition in ways that cannot be entirely explained by the view that language is acquired and determined by prior cognitive development (Blank, 1974; Wells, 1975; Bowerman, 1976, 1977). Moreover, there have been suggestions that cognition is anchored by language rather than the other way around (Schlesinger, 1982), a view consistent with Miller's (1981) finding that the linguistic ability of severely subnormal children sometimes exceeds their cognitive functioning.

Despite such diverse and confusing interpretations of the cognition-language relationship, language interventionists have asserted that cognitive achievements are necessary for language development (Bricker and Bricker, 1974; Miller and Yoder, 1974). In particular, the achievements of the sensorimotor period are considered crucial (Bricker and Bricker, 1974; Morehead and Morehead, 1974). Language training, it is argued, must be combined with strategies designed to raise the level of cognitive functioning in language deficient children (Ruder and Smith, 1974). The implications for remedial practice with severely subnormal language deficient children are that cognitive training must be implemented prior to any direct language intervention.

Crystal, Fletcher and Garman (1976), however, rightly argue that this reflects the view that language deficiency is a consequence of some other defect, resulting in a concentration on the non-linguistic impairment to the exclusion of the linguistic disability, a practice they and the present writer observe regularly in schools.

Moreover, given that our knowledge of cognitive development is less than our knowledge of linguistic functioning, the remediation of cognition is unlikely to be of practical value other than in relation to the development of very general processes. Crystal et al propose instead the notion of an "independent language disability", the remediation of which must occur within a specifically linguistic framework that focuses on "an exhaustive account" of the speech actually produced by both teacher and pupil rather than upon inferred mental processes which supposedly determine the language behaviour of the child.

The intention here is not to suggest that cognition is unimportant in child development. However, psycho-linguistic models of the relationship between language and cognition continue to be insufficiently developed to determine the validity of cognitive training in language intervention. It seems, therefore, that an independent linguistic analysis of the overt, observable language behaviour of language deficient children in communicative

contexts should provide a language intervention model more capable of producing Guess, Sailor and Baer's (1978) "maximal results from minimal teaching".

4 Receptive language versus language production in language training

A major controversy in developmental psycholinguistics concerns the relationship between receptive language (comprehension) and productive language (expression), which in language intervention work re-emerges in the question, "should receptive language skills be taught prior to the training of expressive language?".

Remedial language programmes that emphasise the teaching of receptive language before establishing goals for expressive language training (such as those of Kent, Klein, Falk and Guenther, 1972; Kent, 1974; Miller and Yoder, 1974; Bricker and Bricker, 1974) are based on an acceptance of the widely held view in child language acquisition research that the emergence of "comprehension ahead of production is a linguistic universal of acquisition" (Ingram, 1974). The studies of Vincent-Smith and Chatelenat (1973) and of Bricker and Dennison (1973, cited in Brinker and Bricker, 1980) support this position. Their findings indicated that the performances of young subnormal children on the selection of named objects were significantly better than their productive labelling of the objects.

Nevertheless, the primacy of comprehension in child language development has been challenged from within the field of developmental psycholinguistics. Bloom (1973) suggests that the ability of young children to understand

and respond to the speech they hear is facilitated by the nonlinguistic context in which the speech is heard. For example, speech is often paired with the ongoing activity of the child and adults commonly provide cues of repetition, exaggeration, pointing and gesture as a means of assisting the child to extract meaning from the language they hear. Talking about environmental events, by contrast, requires learning the syntactic-semantic relations of the language system.

Understanding and speaking therefore appear to represent different mental capacities which may not share the temporal relationship implicit in the assumption that comprehension develops before production (see Bloom, 1974).

Operant analyses of the relationship between receptive and expressive language have also challenged the view that comprehension is a necessary prerequisite for production in language learning. Guess (1969) trained two adolescent boys with Down's syndrome to discriminate receptively between plural and singular words. Both were able to generalise singular and plural grammatical rules at the receptive auditory level, but this failed to generalise to their productive speech. The two boys were then trained in the productive use of the plural by adding /s/ or /z/ to a singular label when shown pairs of identical objects. Training was then reversed and each was taught to respond to a singular object when the plural form was produced and

to pairs of objects when the singular form was produced. This training did not affect their productive use of the plural morpheme in either subject. Guess concluded that the comprehension and production of language are independent classes of behaviour, but that production may be more facilitative of the development of receptive language than had generally been assumed, particularly in relation to the learning of grammatical rules.

In a later study, Guess and Baer (1973) trained pluralisation rules in four severely subnormal children by concurrently training the receptive and productive use of the plural inflections /s/ and /es/. Two children were trained in the productive use of /s/ and the receptive usage of /es/. Training was reversed in the other two, who received training in the production of /es/ and in the comprehension of /s/. Generative rule-governed usage occurred within both receptive and productive modalities. However, generalisation across modalities was the exception rather than the rule, occurring strongly in only one child. Guess and Baer concluded that receptive and productive language are functionally independent behaviours, suggesting that language training for severely subnormal children should be concerned with training in both receptive and productive modalities.

More recently, Siegel and Vogt (1984), in an interesting study, trained four subnormal children in the comprehension and production of the plural by adding the

plural inflection /s/ to object labels. Half the children were initially taught to comprehend the plural by pointing to single objects and groups of objects followed by training in the production of the plural. For the remaining two children, training was reversed such that production was trained before comprehension. Facilitation in the productive use of plurals was shown by one child who began with comprehension training. In another child, understanding of the plural was facilitated by prior training in production. The remaining two children were brought to relatively high performance levels in both production and comprehension.

In these children, however, training in one modality did not facilitate acquisition in the other. Siegel and Vogt conclude that although training in one modality facilitates acquisition in the other, at least for some children, initial training in either production or comprehension appears to have no significant advantage. This indicates that there is little reason to expect that comprehension and production will share a linear relationship in all aspects of language learning. Siegel and Vogt further point out that the data do not conflict with the findings of Guess (1969), that instruction should begin by training in production, since it appears that instruction stressing the learning and acquisition of rules is effective, irrespective of the modality in which it is presented.

A few studies concerned with training receptive language skills have focused on teaching receptive syntax through non-verbal action reponses to specific verbal instructions. Whitman, Zakaros and Chardos (1971) taught two severely retarded children to respond to a variety of verbal instructions through the application of positive reinforcement, physical prompting and fading procedures. Extensive generalisation occurred in both subjects on untrained items that were never reinforced, leading them to conclude that instruction-following behaviour can be trained and maintained in severely subnormal children almost entirely deficient in expressive language skills, even when instruction-following behaviour was absent prior to training.

In a similar study, Striefel and Wetherby (1973) used techniques of positive reinforcement, physical prompting and fading of physical prompts, to teach an 11 year old, non-verbal, severely subnormal boy to follow two to four word commands ("drop ball", "blow on feather", "rub cheek with washcloth"). Generalisation was measured by combining a verb from one training item with a noun from a different training item. Generalisation failed to occur on the untrained combinations, because the child always performed the action associated with the noun on training items.

For example, during training the child was taught to "blow on feather" and "drop ball", in contrast to "drop feather"

and "blow on ball" required of the child in the generalisation probes. When the subject was instructed to "drop feather" he would blow on the feather, and when instructed to "blow on ball" he would drop the ball. Striefel and Wetherby concluded that specific instruction-following responses had been acquired by the child in the presence of specific verbal stimuli, but that this was not sufficient to facilitate the development of generalised instruction-following skills.

A subsequent study by Striefel, Bryan and Aikens (1974) in which three severely subnormal adolescents were taught specific instruction-following behaviours in response to specific verbal instructions, also found that generalisation did not occur in the presence of untrained items. Both the Whitman and the Striefel studies suggest that training in comprehension skills does not necessarily result in the development and acquisition of receptive language.

It is clear from the evidence presented so far, that hypotheses concerning the relationship between comprehension and production and the relative merits of training one over the other, are at present contradictory and provide little help in planning language training sequences that will be both efficient and economical. Moreover, as Siegel and Spradlin (1978) point out, laboratory-based studies of the type reviewed here may produce findings that are not typical of the development

of receptive and productive language in natural settings, wherein, they hypothesise, it is likely that comprehension and production share a mutual interrelationship throughout the course of a child's social development.

> "The child learns a limited meaning of the word; he uses the word in a number of contexts, sometimes inappropriately; through the use of the word the child is taught new meanings; now his reception has grown and he uses the word more appropriately. This sets the stage for more receptive learning." (Siegel and Spradlin, 1978, p 388)

Research into the acquisition of receptive language in natural settings has revealed that parents scaffold children's linguistic misinterpretations through consistencies in their language use in conversational routines and the provision of feedback and additional prompting to direct the child's attention to relevant contextual information. Contextual cues are faded out gradually, in response to children's changing linguistic needs, resulting in what appears to be a shift in stimulus control. Thus children become increasingly proficient in the interpretation of linguistic messages when parental cues and extra-linguistic context are unavailable (see Goldstein and Wetherby, 1984).

On the basis of these findings it could be argued that "...meaning is not a property of behaviour as such but of the conditions under which behaviour occurs" (Skinner, 1957, pp 13-14). If, as seems likely, this is the case, and if comprehension and production develop as Siegel and Spradlin (1978) appear to suggest, that is, as a result of

the child's use of emerging language in social contexts, there seems little reason to assume that building productive language repertoires in language deficient children must be preceded by elaborate comprehension training using non-verbal responses (a practice frequently observed in schools) - or to assume that a teaching approach emphasising the primacy of productive skills will not, by definition, result in or facilitate the acquisition of a receptive repertoire.

Indeed, there are convincing arguments for a production approach to language intervention for severely subnormal children with limited verbal skills. Buddenhagen (1971) argues that the acquisition of expressive language is critical to the development of adaptive behaviour in severely subnormal children. In so far as speech directs the behaviour of other human beings, it is important to teach verbal responses which have a high utility in the environment in which the child resides.

Guess, Sailor and Baer (1978) make two important points consistent with this view. First, language training programmes must begin by emphasising the environment-controlling potential of language. If the child is first to experience control rather than being controlled, then the training of productive language skills must have precedence over the training of receptive language which, it is argued, is the means through which the child is controlled by others in the social environment. The second

point relates to the process of discourse, which by definition assumes the active participation of speakers as well as hearers. Here, an exclusively receptive repertoire is less likely to produce the reinforcing consequences necessary for the acquisition of more language, generated by the child's initiatives and interactions with the verbal community.

This is not to suggest that the development of receptive language is disregarded in a language training approach which emphasises the development of productive skills. Clearly, the acquisition of a receptive repertoire is critically important if the child is to function as an adequate communicator. The issue is not, therefore, the contribution of comprehension to effective language learning but whether or not the acquisition of an extensive receptive repertoire is a necessary precondition for training in productive skills.

Developmental approaches in language intervention assume that the prerequisite for language production is language comprehension, in contrast to a production approach which assumes that training in productive language should facilitate he acquisition of receptive skills. Gray and Ryan (1973) observe that within a production approach, children learn to understand and produce meaningful sentences in contexts in which actions, objects and pictures are continuously paired with targetted utterances. Furthermore, most verbal language training

programmes use operant techniques of shaping and verbal imitation training for the development of speech and language, at all stages of the programme. Verbal imitation is a skill requiring the receptive discrimination and processing of verbal stimuli, such that any child accomplished in vocal imitation, already has the necessary prerequisite behaviours for language learning (see Gray and Ryan, 1973; Guess, Sailor and Baer, 1978). Remedial programmes emphasising productive language do not entirely, therefore, contradict the notion that receptive language is the precursor of language production.

Finally, older subnormal children in particular may know more than they can say. That is, they already have adequate experience and knowledge of nonlinguistic concepts. It is hypothesised, therefore, that for these children, a remedial programme emphasising the development of productive skills is more likely to result in the achievement of spoken language than an elaborate programme of instruction in receptive discriminations.

5 Semantics versus syntax in language intervention

The reductionism of Chomsky's (1957, 1965) view that linguistic structure is independent of meaning and that the acquisition of syntax is dependent upon the child's "innate" knowledge of the "deep structure" and "surface structure" of the grammar, led to what Luria (1974/1975) has described as a "philosophical dead end" for modern linguistic theory.

> "The idea of "deep structures" and "linguistic competence" constitute the basic problem...since the origin and historical development of these phenomena would require careful scrutiny.
>
> Furthermore, to assume that deep structures are "innate" makes a postulate out of a problem and this in itself means that all further study in the area can lead us nowhere." (Luria, 1974/1975, p 382)

The rejection of transformational grammar and the developing interest in the relationship between cognition and language resulted in a shift in psycholinguistic perspectives, away from a syntactically-based model of language acquisition towards a semantically-based one. Bloom's (1970) analysis of the semantic content of children's utterances was derived from observations of the context in which they occurred. She suggested that children talk about the relationship between people, objects, actions and events in contexts of the here and now, which in turn influence the child's production of syntactic word-order rules. Thus, the development of syntax in children emerges from the interaction between cognitive functioning and experience. On the basis of

these findings, Bloom proposed the semantic categories of existence, nonexistence and recurrence of objects and things; the possession, attribution and location of objects, people and events and the three categories of negation: nonexistence, rejection and denial.

Schlesinger (1974) also argues that the relational concepts underlying children's utterances are semantic and reflect the child's perception and ideas about the world. Learning the grammar, Schlesinger suggests, occurs by observing how adults express these relations in situations the adult talks about, which are perceived by the child in terms of semantic categories. In other words, the grammar itself is semantic rather than syntactic. A semantically-based model of child language acquisition assumes therefore, that language "maps" existing knowledge about people, objects events and relationships, functionally and formally such that "new forms first express old functions, and new functions are expressed by old forms" (Slobin, 1973).

Consequently, a transformational grammar model was viewed increasingly as an "adult reality" of language and language acquisition which has little bearing on the psychological reality of the language-learning child (see McLean and Snyder-McLean, 1978, p 40). The case grammars of Fillmore (1968) and Chafe (1971) by contrast produced theoretical analyses capable of accommodating the notion that semantic representations are mapped onto syntactic

structure. Moreover, Brown (1973) claims that accounts of emerging language in normal children indicate that case grammars provide a more accurate methodology for analysing children's language.

Such data generated parallel trends in language intervention research, providing the theoretical basis for the semantically-based approaches of Horstmeister and McDonald (1978), McDonald and Blott (1974) and Miller and Yoder (1974).

Miller and Yoder (1974) stated that since semantic concepts are the basis of normal language development, then the content of remedial programmes for subnormal children should be concerned with the semantic functions apparent in the emerging language of normally developing children. Miller and Yoder proposed an intervention programme for the 'pre-syntax' child, the content of which is representative of their Stage I language development in normal children (mean length of utterance, 1.0-2.0).

Their programme employs instructional sequences of semantic functions initially expressed by single word utterances. These include recurrence ("more"), disappearance ("gone") and nonexistence ("no") which are prerequisites for the later development and training of relational concepts such as agent-action ("Daddy hit"), agent-object ("Mommy milk") and three-term relations such as agent-action-object ("Adam hit ball").

Miller and Yoder suggest that through their construction of a programme according to developmental sequences of semantic concepts and corresponding linguistic forms "a functional and creative communication system will result", regardless of the level at which the severely subnormal child ceases to learn or acquire language. For example, teaching semantic concepts enables the child to communicate several functions through the use of a single word. Miller and Yoder report that a child in their programme was taught the semantic function: action, "mapped" by the utterance "eat". The child produced "eat" in the presence of food to be eaten, as a label for utensils with which food is eaten; to describe the act of eating and also to indicate hunger and the desire to eat. The child was, therefore, using a single word to express multiple functions, which Miller and Yoder point out were differentiated according to their context.

Clearly, the development of semantically rich one and two word utterances provides an appropriate communication model for early intervention. However, if in fact the listener in the communicative situation must rely on saliencies in the immediate context to interpret the child's semantic intentions, it seems questionable to assume that a semantic model will prove relevant for the remediation of limited language in older severely subnormal children.

Blank and Milewski (undated, p 2) point out:

> "...The near-exclusive reliance on a narrow segment of semantics leaves the child with a severely fragmented and greatly restricted language system. While one and two word formulations do provide some communicative power, they are usually insufficient to meet the demands of even relatively simple communication situations."

If, as Miller and Yoder (1974) suggest, the primary goal of language intervention is the development of a functional language system which the child can use for effective communication in the social environment, it seems reasonable to assume that a functional language must therefore, by definition, fulfill the linguistic conventions and expectations of the speech and language community of the child.

It is an inescapable fact that the communication of semantic intentions within the verbal community is through the use and manipulation of sentence structure and word order rules. Kiernan (1981) points out:

> "Syntax does not "emerge". It is learned by the child because it serves a critical function in his adjustment to society." (p 3)

It seems questionable to assume, therefore, that the development of single word utterances and agent-action-object combinations in older subnormal children can be justified as an ecologically valid intervention goal in relation to the linguistic expectations and conventions of the speech and language community.

An additional problem inherent in a semantic approach, emphasising, as it does, normal developmenal sequences and a rigid distinction between child and adult language, is the nature of adult linguistic input to the child. Miller and Yoder (1974) argue that, in intervention, language presented to the child by adults should be only one step ahead of the child's present level of language production as measured by MLU. Adult input in the Miller and Yoder programme consists, therefore, for the most part, of a substantial proportion of one, two and three word utterances in which function words in particular are omitted. Thus, even at the adult level, the communication model lacks congruence with the speech and language of the social community.

Fenn's (1977) observations are of interest here. She noted that the linguistic impairments of the 5-13 year old severely subnormal children in her study originated in the structural organisation of sentences rather than in the domain of semantic intent. Furthermore, the omission of articles in sentences presented by adults caused confusion in the children, several of whom found telegraphic speech from an adult rather strange, despite the restricted nature of their own utterances.

Fenn concludes:

> "To present a child with a model substantially different from that with which he is normally surrounded and which he may have either wholly or partly internalised at a receptive level, may only serve to confuse him at an expressive level, and the appropriateness of a telegraphic input in a remedial context remains a matter for experimental investigation" (p ii).

Consistent with this view, Crystal et al (1976) suggest that intervention strategies emphasising distinctions between adult and child syntax will give rise to a number of practical difficulties, not least of which will be disruption in the continuity of linguistic development between child and adult. Therefore, as Ruder and Smith (1974) point out, while a case grammar model may be relevant for the study of emerging language in normally developing children it may not necessarily be the most appropriate model for language training (or certainly not in all children).

Nevertheless, the question remains of how the non-speaking child or the child with minimal language can be moved to a stage at which fully grammatical sentence usage becomes the means through which effective communication with the social environment is achieved.

Waryas and Stremel-Campbell (1978) argue that the regularities of syntactic rules permit extension from a limited set of structures to an unlimited set of sentences. The goal of language intervention is,

therefore, to provide the child with the means of behaving as if s/he "knew the rules" such that semantic and communicative intents can be expressed in a sructured form.

The language training programme of Blank and Milewski (undated) is of interest here. The programme is designed for young autistic children and is based on Maratsos' work on the development and function of morphemes in normal acquisition, in particular the noun-verb distinction, which it is argued occurs as a result of the child's learning of a finite set of recurring morphemes (eg the, in, ed, s and is). Moreover, the distinction is enhanced by the child's perception of regularities in the relationship between morphemes such as /ed/, /ing/ with verbs and /the/, /a/, /this/ with nouns.

On the basis of this work, Blank and Milewski constructed a sequence of grammatical morphemes categorised according to their "combinatorial properties" and "semantic properties" within sentence structure. The "combinatorial properties" of morphemes refers to the way in which /the/, /that/, /these/, and the plural inflection /s/ combine with nouns and /is/, /was/, /ing/ combine with verbs, in contrast to "semantic properties" which determine meanings within and between sentences, such that /is/ signifies present tense and /was/ signifies past tense etc. Blank and Milewski argue that by teaching a child to attend to a restricted number of recurring

morphemes the child will learn to distinguish between nouns and verbs, which in turn will enable him/her to comprehend and produce an unlimited set of simple, grammatically correct sentences.

Similarly, Carrier (1974) noted the mutually interchangeable structural patterns of interrogative and declarative sentences. For example, although the interrogative "Is the boy going?" is marked by a question indicator, the sentence contains the same constituents as the declarative "The boy is going". Whilst word order rules determine the distinction between the two sentence types, the lexical and inflectional elements remain unchanged; that is, the subject noun precedes the verb, the article precedes the noun, and the present participle /ing/ inflects the verb.

Carrier (1974, 1976) suggests that the training of interrogative and declarative sentence structures teaches the child "critical tactics for rule acquisition" which serve an important "long-term function" in the learning and acquisition of a functional linguistic communication system.

In addition, Fenn (1977) has observed that sentence structure is hierarchical in nature allowing for the development of training procedures through which sentences can be trained in a right to left progression rather than from left to right, such that each new stage of sentence

structure contains elements of the previous stage.

For example:

Noun
Det - Noun
Adj - Noun
Prep - Det - Noun
Prep - Det - Adj - Noun

Fenn suggests that the right to left progression enables the gradual acquisition of sentences which in turn permits the development of communicative interchange between adult and child.

The foregoing hypotheses are consonant with Crystal et al's (1976) notion of plotting "the optimum route" through the grammar. Moreover, it seems clear from the evidence presented that an "optimum route" is critically important to the task of developing both language and the strategies for language learning in language deficient children. In language intervention, however, there is no single "optimum route", through the grammar. The choices are between approaches emphasising the stages of syntactic development in normal childen or programmes based on the functional analysis of behaviour which follow 'logical' rather than normal sequences. The central question remains, therefore, what route is capable of delivering the most success?

Crystal et al (1976) argue that the remediation of syntax must allow for comparison with normal development at every

stage. Moreover, the model must incorporate and focus on a full grammar of the adult language for both teacher and child. Crystal et al's Language Assessment and Remedial Screening Procedure (LARSP) is a structural analysis of sentences into patterns of clause structure (S-V-O), phrase structure (NP, VP) and word structure corresponding with seven stages of syntactic development evidenced in normal children aged 0;9 - 4;6. The procedure is comprehensive, beginning at Stage I with initial single word utterances, progressing to word combinations and simple phrase structure and terminating in the development of discourse structure at Stage VII. Furthermore, the sequence of inflectional endings described in Stages III and IV of the procedure are derived from Brown's (1973) data on the development of inflections in normal acquisition. Crystal et al point out, however, that the procedure is not intended for subnormal children with severe communication impairments.

Nevertheless, if the adoption of normal developmental sequences is indeed a necessary condition for language intervention, then the syntactic stages described should provide useful guidelines for the development of syntax in severely subnormal children who already posses the rudiments of speech. Moreover, normal developmental sequences are utilised as a basis for developing syntax in moderately and severely subnormal children, in the language training programme of Stremel and Waryas (1974) and Waryas and Stremel-Campbell (1978).

Gray and Ryan (1973) argue, however, that normal developmental sequences in remedial contexts are valid only in so far as they are relevant to "the problem of teaching language" and do not conflict with the development of an instructional plan.

Consequently, the grammatical forms and structures of Gray and Ryan's training programme are organised according to their "teaching value", such that:

> "When a child has learned form(1) the next logical form is one which combines form(1) with another form, form(2) , and so on until we have "chained" together all the forms which seem to fit with each other. Although this does not always follow the "natural" sequence of learning it does appear to be a sound approach in programming technology" (Gray and Ryan, 1973, p 73)

The "remedial logic" of Guess, Sailor and Baer (1978) also rejects the notion of a developmental hierarchy of prerequisite skills. "Remedial logic" by contrast assumes a sequence of instruction designed to produce optimal behaviour change from minimal teaching effort, such that children will learn first, the language responses that are functionally useful in achieving reinforcing consequences within both the teaching and natural environments. Initial target behaviours are operationally defined as a function of their antecedents (tacts) or consequences (mands), consistent with Skinner's (1957) theoretical analysis of verbal operants.

Language form, therefore, is analysed and described

according to its function of reference and control of the environment. The teaching of productive and receptive mands predominates, beginning with single element labels serving the dual function of naming and requesting objects, of high reinforcement value for the child, leading to progressively more complex forms such as requesting "I want (thing)", "I want (action)" and "I want (action) with (thing)" etc. (See Guess, Sailor and Baer 1974.)

Guess, Sailor and Baer (1978, p 107) state that:

> "...unlike the logic of normal development, remedial logic suggests that there may be many alternate sequences of instruction, any of which could well embody the experience of control by language, the motivation to control by language, and the skills of acquiring more language to extend and elaborate that control."

Nevertheless, the differences between developmental and logical sequences may be fewer than their similarities. After all, both models begin by teaching simple forms leading to the development of progressively more sophisticated structures. Moreover, Gray and Ryan (1973) suggest that it seems unlikely that a normal developmental sequence will be totally lacking in function within the social environment. Carrier (1974) puts it another way, by pointing out that while logical and developmental models suggest similar sequences, when differences occur "the logical model appears to have higher probability of improving overall language functions", certainly in the case of language deficient severely subnormal children.

Siegel and Spradlin (1978) make two critically important points relevant to this discussion. First, that although consistencies in specific structures and functions occur within language development (eg inflectional endings (Brown, 1973), and negation first expressed by denial, then rejection followed by nonexistence (Bloom, 1970), this does not explain the interdependencies and complexities of such developments across categories of form and function which structurally and functionally are too diverse to be organised according to a single developmental continuum. The assumption then, that language intervention programmes can be developed from a normal acquisition base, is to some extent predicated on the misconception that there is a single developmental progression within language and language learning for all children.

Second, remedial language programmes must, by definition, vary in relation to the groups of children for whom they are intended. Programmes designed for children showing some linguistic structure in their productive speech will differ from approaches constructed for children who are mute on entry to the training programme. Moreover, approaches concerned with the development of "intermediate" utterances such as "No want cookie" or "No boy hit girl" (see Ruder and Smith, 1974) may be more appropriate for younger mentally handicapped children than for older severely subnormal pupils, for whom the

development of fully grammatical sentence usage must remain an important intervention goal. Language intervention programmes "are not interchangeable" (Siegel and Spradlin, 1978).

Finally, the practice of language intervention requires the manipulation of observable behaviours, of which language structure is an observable parameter in educational and natural settings. It is hypothesised, therefore, that a syntax training programme, incorporating logical sequences and a full grammar of the adult linguistic system is on balance more likely to produce age appropriate, functional sentence usage in older subnormal children with minimal communication skills, than a semantic model concerned with linguistic representations of the psychological reality of the child.

6 Operant procedures in language training

The comprehensive functional speech and language training programmes reviewed in the previous section evolved from a series of experimental studies which demonstrated the effectiveness of operant procedures in establishing speech and language in non-verbal or minimally verbal, severely subnormal children.

Several studies have successfully applied operant techniques in the training of grammatical forms, surface structure rules and the production of complete sentences. Guess, Sailor, Rutherford and Baer (1968) established generative pluralisation rules in a severely subnormal girl, linguistically deficient in plural usage prior to training. (See also Guess, 1969; Guess and Baer, 1973; Siegel and Vogt, 1984)

In a similar study, Schumaker and Sherman (1970) trained three adolescents in the productive use of present and past tense regular verb inflections. Prepositional usage was developed in three autistic children, who were trained to use the prepositions "in" and "on" (Sailor and Taman, 1972). Similarly, Lee (1978) trained receptive and productive prepositional discriminations (behind-front) in two subnormal children and Guralnick (1976) developed receptive prepositional motor responses in three severely handicapped pre-school children. Twardosz and Baer (1973) trained two severely subnormal adolescents to use simple

questions. Garcia, Guess and Byrnes (1973) developed fully grammatical declarative sentence structures in a group of subnormal children initially lacking in sentence responses. In addition, Garcia (1973) trained two nonverbal children to use a conversational sequence of interrogative, declarative and affirmative sentences (eg "What is that?", "It's a (label)", "Yes I do")

These studies are clearly indicative of the validity of grammatical training in severely subnormal children as much as they are demonstrations ofan operantanalysis of syntax. Furthermore, they exemplify the operant language intervention research paradigm which typically emphasises 1) shaping and imitation training for the development of expressive language, 2) reinforcement of appropriate verbal or vocal responses, 3) fading in of new stimuli and fading out of manual and/or verbal prompts, 4) extinction and time out from positive reinforcement contingent upon the emission of inappropriate responses combined with differential reinforcement of appropriate behaviours, together with 5) step-by-step task analyses of the teaching/learning sequences. (See Guess, Sailor and Baer, 1978; Risley and Wolf, 1967, 1968.)

An important area in this field is that of imitation training. Peterson (1968) suggests that an imitative behavioural repertoire is "a necessary condition" for language acquisition; a claim vehemently disputed by the psycholinguists, who argue that imitation contributes

little to the language learning of the normally developing child. Nevertheless, in language intervention, the development of verbal imitation is critically important in teaching functional language to mute or minimally verbal children. Furthermore, Peterson (1968) points out that the use of imitation as a teaching techniques reduces the time and effort normally required in the development of new behaviours.

> "The model's behaviour becomes equivalent to a set of instructions that programme the behaviour of the observer." (Peterson, 1968, p62)

Operant research has frequently utilised two techniques for the development of verbal imitation skills in mute, non-imitative children.

1) Some studies have emphasised the training of motor imitations prior to the training of vocal imitations. The rationale for this strategy is that motor imitations are topographically simpler than vocal discriminations, so that initial training in motor imitations should facilitate the training and acquisition of imitative vocal responses.

Motor imitation training typically includes clapping, throwing, tapping, arm raising etc in response to a verbal instruction "Do this", paired with an imitative response model of the desired motor response. Reinforcement is delivered contingent upon correct responses. However, if the child fails to imitate the model correctly, then the

trainer physically manipulates the child's arms, hands etc through the response ('putting-through') combined with reinforcement of all prompted matching responses. Physical prompts are gradually faded until the child is able to produce the desired behaviour independently. Precise responding is, therefore, developed by reinforcing successively closer approximations to the model resulting from the systematic application of shaping and fading techniques.

Using similar procedures, Baer, Peterson and Sherman (1967) trained over one hundred motor imitations of varying complexity in three non-verbal, non-imitative, severely subnormal children. As training progressed, the children began to imitate other untrained motor responses. Baer et al concluded that motor imitation training had resulted in the acquisition of a generalised imitative skill which could be applied to the development of vocal imitation.

Hewett (1965) trained a 4 year old autistic boy to imitate simple hand movements such as clapping and touching ears, nose, mouth, etc in response to models presented by the trainer. During training the child was heard humming fragments of a tune used as music reinforcement. The first notes of this tune were then modelled by the teacher as a humming vocalisation. The child was reinforced for imitating the humming and his spontaneous humming vocalisations were brought under imitative control.

Hewett subsequently developed a 32-word imitative vocabulary in this child.

Sloane, Johnston and Harris (1968) established vocal imitation skills in six severely subnormal children, all of whom were non-verbal and non-imitative prior to training. The children were initially trained to imitate a series of gross motor movements such as clapping and head-shaking followed by a second stage of training in which the children were taught to imitate fine motor movements located on the mouth. Imitative responses included opening and shutting the mouth, placing the teeth on the lower lip and different movements of the tongue. Physical manipulations of the child's mouth, tongue and lips were applied if the child failed to reproduce the desired response.

Sloane et al noted that it was sometimes necessary to provide additional prompts such as touching a child's chin or lips or modelling the thumb and forefinger in such a way as to prompt an open-mouth response. Reliable responding in this stage of training was followed by modelling a vocalisation combined with the "mouth-teeth-tongue-lips" placement necessary for the production of the particular speech sound.

Similarly, Buddenhagen (1971) established vocal imitations in a severely subnormal girl by presenting imitative response models of pursing the lips and blowing up a

balloon followed by blowing into a microphone paired with the vocalisation "ooh".

2) Other researchers, however, have not utilised motor imitation training as an initial strategy in developing verbal imitation skills in mute non-imitative children. Lovaas et al (1966) developed a four-step training sequence in which the child was initially reinforced for all vocalisaions and for visually attending to the trainer's mouth. In the second step, reinforcement was delivered for vocalisations occurring within six seconds of the adult's model. In step three, only correct imitations of the adult's model were reinforced. Step four of training was identical with step three, but incorporated the presentation of new sounds requiring increasingly fine discriminations by the child.

Vocal sounds were selected on the basis of visual saliency, eg "m" and open-mouth vowels such as "a" and those sounds which could be prompted relatively easily, eg "b". Training "b" proceeded from presentations of the model at the same time as prompting the child by holding its lips closed. The prompt was immediately removed when the child exhaled. Prompting was gradually faded by slowly moving the fingers away from the child's mouth to the cheek and then to the jaw, resulting finally in unprompted, imitative vocal responses.

Risley and Wolf (1967) also established verbal imitations

in autistic children without prior training in motor discriminations. These children were, however, echolalic; that is, they emitted speech sounds but did so inappropriately. Imitative control was established by presenting a given word every 4-5 seconds. Reinforcement of spoonfuls of food or sweets was contingent upon correct imitations of the words within a few seconds of the trainer's model.

When vocal imitation is a consistent and reliable response, the next training step is the development of expressive speech. Risley and Wolf (1968) presented a detailed series of step-by-step procedures for shifting stimulus control from imitative response modelling to the control of appropriate stimuli such as pictures and objects. The trainer holds up an object and asks "What is this?". When the child attends to the object, the trainer presents a verbal prompt (object label) and reinforcement is delivered contingent upon correct imitation of the verbal prompt. This is followed by gradually delaying the presentation of the prompt. Failure to respond results in a partial prompt being given. If a correct response does not occur, a full prompt is presented. Correct responses are reinforced by social consequences such as "good" or "right" and the partial prompt is immediately re-presented. Primary reinforcement is contingent upon correct responses to partial prompts.

Partial prompts are faded by gradual reductions in voice

pitch until the teacher silently "mouths" the partial prompt. This in turn is faded until the child correctly labels the object in response to the question "What is this?". Risley and Wolf reported that the application of these teaching procedures resulted in one child acquiring a small labelling vocabulary within three training sessions. Sloane, Johnston and Harris (1968) established a labelling repertoire in nonverbal, severely subnormal children. The children were taught to 'tact' objects which were later used as mands, by training the labels of reinforcers which were delivered contingent upon the labelling response. Similarly, the children were trained to name objects such as 'door' and then to use the label as a request for adult assistance in opening the door.

Once functional labelling vocabularies are established, word chains (see Sloane et al 1968), question-answer routines, functional sentences incorporating grammatical features such as verbal auxiliaries, articles and pronouns etc can be developed using esentially the same procedures. Furthermore, the studies reviewed here clearly demonstrate that the acquisition of an imitative repertoire enables the recombination of verbal behavioural units into new linguistic response chains.

Risley and Wolf (1968) point out, however, that the presence or absence of echolalia and/or rudimentary speech forms is an important prognostic indicator of the ease with which initial words and functional sentence usage may

be established in a child. In addition, Guess, Sailor and Baer (1978) noted that "of all entry level skills, verbal imitation is consistently the most significantly predictive of success in training" (p111). Moreover, motor imitation training in mute, non-imitative children is complex and time_consuming. Furthermore, Peterson (1968) suggests that the transition from motor to verbal imitation is by no means smooth. Harris (1975) also points out that the contribution of nonverbal imitation training to the development of language skills in mute, non-imitative subjects "has been more a clinical assumption than an empirical fact".

Garcia et al (1971), in a multiple baseline study, trained four non-imitative severely subnormal children to imitate motor and vocal responses which were divided into four topographical types (small motor, large motor, short vocal, and long vocal responses). Generalised imitations of untrained responses within topographical classes occurred in each subject. However, generalisation across responses (motor to vocal) failed to occur. In addition, Garcia et al found striking differences in the rate of acquisition between motor and vocal responses. One subject reached criterion on the first pair of imitative motor responses in approximately 100 trials, in contrast to the initial pair of vocal responses which required 3000 trials to criterion.

A similar observation is made by Guess, Sailor and Baer

(1978) who report that of the nonverbal, non-imitative children participating in their functional speech and language programme, only 60% progressed to the speech and language training sequences; and almost two years of imitation training was necessary for the acquisition of generalised verbal imitation skills in these children.

Therefore, although the systematic application of imitation-training procedures results in the successful development of verbal imitation skills in many children, a significant proportion fail to benefit from these techniques.

Finally, the problems of generalisation across response classes are not exclusive to the motor behavioural domain. An operant teaching technology undoubtedly exists for the development of both imitative and non-imitative expressive verbal repertoires, in highly structured, one-to-one teaching environments. However, it is by no means certain that the subjects so trained will actually produce and maintain the trained language skills in communicative interactions within diverse social contexts.

7 Training for generalisation

In recent years, language intervention research has become increasingly concerned with the problem of teaching language skills which will generalise "across subjects, settings, people, behaviours and/or time" (Stokes and Baer, 1977). This concern has arisen from the failure of language intervention programming to demonstrate the degree to which the spontaneous use of language can be trained (see Guess, Keogh and Sailor, 1978; Harris, 1975). Furthermore, Costello (1984) observes that of 32 language training studies conducted during the last 18 years only five yielded data on the generalisation of the trained language skills.

Stokes and Baer (1977) suggest that the relatively casual treatment of generalisation within operant language research, is in major respects attributable to the notion of generalisation as a naturally occurring adjunct of discrimination learning: "a passive phenomenon" that just happens, rather than as "something produced by procedures specific to it" (p77). By contrast, Stokes and Baer argue that the generalisation of behaviour must be actively programmed within remedial contexts. Consistent with this view, they propose a technology of generalisation incorporating several tactics, including the training of "sufficient exemplars" and the "use of indiscriminable contingencies" (ie, intermittent schedules of re-inforcement) in training situations. Subsequently, the

child encounters the "natural maintaining contingencies" of the social environment.

Siegel and Spradlin (1978) argue that the training of sufficient exemplars is potentially one of the most important strategies for the facilitation of generalisation. The procedure includes increasing the number of response exemplars until a generative response class is established. Schumaker and Sherman (1970) using modelling and differential reinforcement procedures trained three subnormal children to produce present and past tense regular verb inflections. The present progressive inflection "ing" was selected for training in the present tense and four types of inflectional endings were selected for training in the past tense. Each inflection corresponded with verb stems ending in voiceless phonemes requiring /t/ (eg baked), voiced phonemes requiring /d/ (eg rained) and verb stems ending in "t" or "d" requiring /ed/ (eg painted and graded).

Past and present tenses were concurrently trained in a single verb in the training sessions followed by probe sessions in which the presentation of trained verb forms was interspersed with untrained forms. Correct responses to untrained verbs were never reinforced, while correct responses to trained verbs continued to be reinforced. The procedure of alternating training sessions with probe sessions continued for all four classes of verb inflections across a multiple baseline design. The

results demonstrated that all three subjects learned to produce both trained and untrained (unreinforced) past and present tense verb forms. Furthermore, as training progressed, two of the three subjects evidenced more rapid rates of learning individual words. Schumaker and Sherman concluded that the generative use of past and present tense verb inflections had been established in the language repertoires of all three subjects (see also the studies of Baer and Guess, 1973; Guess, 1969; Guess, Sailor, Rutherford and Baer, 1968; Wheeler and Sulzer, 1970).

Training sufficient exemplars also includes programming the generalisation of stimulus conditions, in particular teachers and settings. Garcia (1974), using imitation and differential reinforcement, trained two subnormal children to use a conversational unit of three sequences. Each sequence consisted of a three-word sentence evoked by a picture and verbal stimuli presented by the trainer. After each sentence response was learnt, three experimenters probed the subjects' responses in settings different from the one in which training took place.

The first experimenter (male) saw each child in a small soundproof room, the second experimenter (female) saw each subject individually in their bedrooms and the third experimenter (female) saw each subject individually in a playroom. Two types of generalisation sessions (probes) were used. In the first type of probe, 10 pictures not

used in training were presented to each child and reinforcement was delivered non-contingently on an average of once each minute. In the second type of probe, 'intermixed' sessions were conducted in which 10 nontraining pictures were presented with a picture used in training. Correct responses to the training picture were reinforced on a VR3 schedule.

Training resulted in the learning of sentences in both subjects. However, generalisation was low in the general probe sessions conducted by all three experimenters. Generalisation occurred in both children with one experimenter, after that experimenter had conducted an intermixed probe. A second experimenter then conducted intermixed probes which resulted in the generalisation of responses with a third experimenter who had not participated in intermixed probe sessions.

Similar results were obtained by Stokes, Baer and Jackson (1974) who trained a greeting response (waving) in four subnormal children. Training sessions were initially conducted by one experimenter in four settings: a small room, dormitory, playroom and courtyard. Generalisation probes were conducted at intervals throughout the day by between 4 and 14 different persons. Generalisation failed to occur in three of the four subjects as a result of training with a single experimenter. A second experimenter then conducted training sessions in parallel with the first experimenter, resulting in extensive

generalisation of the waving response in all three children.

The results of these studies clearly indicate that training a sufficient number of stimulus exemplars produces generalisation across nontraining persons and settings. Furthermore, as Stokes and Baer (1977, p356) point out:

> "...frequently a sufficient number of exemplars is a small number of exemplars. Frequently it is no more than two. In particular, there may well be reason to suspect that the use of two trainers will yield excellent results in terms of generalisation."

Another important issue in language intervention relates to the types and ratios of reinforcement commonly used in training sessions. The initial development of elementary verbal skills frequently requires the continuous dispensation of powerful reinforcers. Ferster (1971) rightly argues that there are considerable difficulties attached to the programmed use of arbitrary reinforcers relative to the contingencies of reinforcement operating through the social environment. For example, the child who continuously receives chocolate for producing speech, will cease to do so the moment the chocolate is unavailable or withheld, in contrast to the natural environment wherein verbal behaviour is typically maintained by intermittent contingencies of adult attention and reciprocal interchange. Stokes and Baer (1977) have also pointed out that intermittent schedules of reinforcement are demonstrably more resistant to

extinction than continuous schedules and are therefore a critical variable in the maintenance of behaviour.

> "The essential feature of intermittent schedules may be their unpredictability - the impossibility of discriminating reinforcement occasions from non-reinforcement occasions until after the fact." (Stokes and Baer, 1977 p358)

Programming for generalisation to the natural environment must, by implication, include the application of "indiscriminable contingencies" in the training environment (ie contingencies which are wholly unpredictable; Stokes and Baer, 1977). While this may be a desirable strategy for the specific objectives of generalisation, the operant paradigm has demonstrated unequivocally the critical role of discriminable contingencies in the development of <u>initial</u> language skills in language deficient children. Indeed, Hart (in Costello, 1984) has pointed out that it is only high levels of verbal responding which are resistant to extinction in the natural environment. The establishment of reliable response rates across linguistic categories is therefore a necessary precondition for exposure to the intermittent contingencies of the verbal community.

It seems clear, in this light, that there are fundamental contradictions between language intervention models of reinforcement and the contingencies of natural settings.

A potential solution to the problem is proposed by Snyder, Lovitt and Smith (1975) who suggest that the practice of

gradually fading from continuous to variable ratios of reinforcement in the one-to-one training environment may facilitate the development of cross-setting generalisation and the maintenance of behaviour over time. Consistent with this view, Koegel and Rincover (1977) in a study of autistic children found that behaviour established on FR5 schedules was maintained indefinitely after the contingencies were removed, in contrast to behaviour acquired on FR2 schedules which was not. Furthermore, Garcia's (1977) application of a VR3 schedule in the training of a conversational speech form, seemed to be a critical variable in the maintenance of language responses, if not in the generalisation of behaviour across people and settings.

It seems likely, therefore, that although intermittent schedules are of little practical value in the development of new behaviour, they do constitute an effective procedure for the maintenance of behaviour change. Moreover, the systematic programming of indiscriminable contingencies in remedial contexts may provide an essential stepping-stone in the transition from language use in one-to-one training environments to functional communication in natural settings.

The reinforcement procedures applied in the Garcia (1974) and Koegel and Rincover (1977) studies are representative of scheduling adjustments in the contingencies of one-to-one training environments which act as an initial step in

the promotion of generalisation of trained behaviours to natural settings. At issue nevertheless is how natural environmental contingencies of reinforcement may be systematically programmed to produce a shift in stimulus control from the one-to-one teaching environment to the linguistic diversities of natural social contexts.

Guess, Keogh and Sailor (1978) argue that access to natural contingencies can only be achieved by training responses that are maximally functional for the child in the social environment. The problems of generalisation inherent in imitation training methodology may be attributable to training responses of limited utility and reinforcement value for the child. For example, motor imitation training sequences typically include responses such as clap hands, touch head, stand up etc, which Guess Keogh and Sailor argue are rarely required in social settings other than as part of a larger response chain. By contrast, training responses such as flicking a light switch to produce light, pressing a button on a television set to view a programme are useful and intrinsically reinforcing behaviours (see Guess, Sailor and Baer, 1974). Similarly, responses such as "cup" to request a cup of juice (see Goetz, Schuler and Sailor, 1979) or the sentence structure "can I have a ball please?" to gain access to a ball, have functional and social validity in

the natural environment and are therefore more likely to be maintained by naturally occurring contingencies.

> "Environmental programming must include responses that can be reinforcing to the child as a natural consequence of the child's engagement in that behaviour and in the absence of reinforcers that are non-specific to the response." (Guess, Keogh and Sailor, 1978, p391)

While it is likely that functional responses have a greater potential for generalisation to natural settings than responses of low environmental utility, it cannot be assumed that severely subnormal children will use these responses with the same frequency in their daily environments, as in highly structured settings of one-to-one training (see Rogers-Warren and Warren, 1980).

Hart and Rogers-Warren (1978) point out:

> "to ensure functional usage of newly trained skills, the training technology must be complemented by and integrated with a technology for teaching talking." (p196)

A "technology for teaching talking" clearly demands that language skills developed under the stringent conditions of one-to-one training be shaped, prompted and reinforced in natural contexts of social communication, such that language as a response class is established across people and settings (see Hart and Risley, 1980; Hart and Rogers-Warren, 1978). Furthermore, "environmental programming" for generalisation must incorporate a fundamental restructuring of natural settings to provide a practice system in which the child displays and experiments with

trained language behaviours and discovers why, when and how language works as a means of obtaining access to natural environment reinforcers such as attention, materials and events.

Learning that language has natural consequences is a function of increased opportunities for verbal behaviour and constitutes a critical shift in stimulus control from adult prompting systems to contextual and environmental cues. For example, Risley and Wolf (1968) trained an autistic child to emit the verbal response "out the door" to gain access to the natural consequence of an attending adult opening a door. Verbal prompting was gradually faded until the experimenter merely held the door and waited for the child to produce the desired response. Once the child had emitted the response non-imitatively, the door was opened only when the child verbalised "out the door", resulting in a shift in stimulus control from adult verbal prompts to natural environmental stimuli.

More recently, Halle, Marshall and Spradlin (1979) used similar procedures to increase verbal responding in six institutionalised children. During mealtimes, adults either withheld food trays for 15 seconds before prompting the request for food ("tray, please"), or waited until the child presented the desired response. They found that the application of the delay procedure resulted in all subjects requesting food without delays across mealtimes and institution staff, providing that the response was

already in the child's repertoire and under appropriate stimulus control.

In addition, the facilitative effects of time delay were assessed in two different contexts, requiring different verbal responses. For example, withholding a dessert at lunchtime for 15 seconds evoked responses such as "I want cake", and "cake please" and a 15 second delay in the presentation of a comb or popcorn during free play produced responses such as "I want comb" or "Popcorn please", demonstrating the generalised use of verbal requests across behaviours and settings.

Halle et al concluded that time delay procedures are potentially useful as initial strategies in training for generalisation in natural settings. Moreover:

> "A time delay is a simple yet powerful method of manipulating the environment to increase opportunities for verbal responding." (Halle, Marshall and Spradlin, 1979, p439)

Hart and Rogers-Warren (1978) have stressed the critical role of providing opportunities for talk in the child's learning and acquisition of the communicative functions of language in social contexts. Furthermore, Halle, Alpert and Anderson (1984, p39) state:

> "The social and physical environment must set the occasion for communicative performances (ie increase their probability of occurrence) and reinforce them when they occur."

Hart and Risley (1968) observe that the failure of pre-

school children to use newly trained language skills in pre-school settings is a function of teacher assumptions that "what is 'known' will be 'used'", combined with an over-reliance on unsystematic, verbally enriched environments to generate functional usage of newly learnt language behaviours. By contrast, Hart and Risley (1980) argue that educational settings must be deliberately arranged such that trained language skills are used to gain access to the natural reinforcers of classroom environments. In addition, the environment must be systematically structured to accommodate brief episodes of one-to-one teaching contacts with individual children throughout the day.

> "Only in such an environment can in vivo teaching of language occur naturally and often." (Hart and Risley, 1980, p408)

Such in vivo, or 'incidental' teaching, typically requires the deliberate arrangement of classroom settings in which a range of materials of high reinforcement value to a child, are displayed and arranged slightly out of reach. Access to reinforcers is contingent upon the child initiating an interaction with an adult by verbally or non-verbally requesting a selected reinforcer. Prior to delivery of the reinforcer, the adult attends to the child and models or instructs an appropriate response.

The child's language behaviour is confirmed by verbal reinforcement from the adult and delivery of the requested reinforcer. Thus, the child's initiations are manipulated

by the adult to occasion the display of language skills and to teach more sophisticated structures in different contexts, under a variety of stimulus conditions discriminated by the child as reinforcing.

In a study of disadvantaged pre-school children, Hart and Risley (1968) applied incidental teaching procedures to increase the use of adjective-noun combinations in the spontaneous language of the children in contexts of free play. By making access to pre-school materials contingent on the use of adjective-noun request forms, significant increases in the use of such requests occurred in the spontaneous language of all subjects.

More recently, Hart and Risley (1980) examined the effects of incidental teaching on the non-targetted language behaviours of a group of disadvantaged pre-school children. The overall effects of incidental teaching on the language of the disadvantaged children was compared with the language use of middle class children of college parents and of another group of disadvantaged children. Changes in the language of the comparison groups of children were insignificant compared with the increases in language use shown in the children who had received incidental teaching.

Furthermore, increases in vocabulary and the use of elaborated sentences were proportionate with the increase in language use and were similar to the more complex

language usage of the comparison middle class group. Hart and Risley concluded that incidental teaching procedures, using intermittent schedules of adult attention contingent upon children's initiations specifying selected reinforcers, resulted in increases in language use. These in turn produced significant increases in the use of elaborated sentence structures in the spontaneous language of all subjects.

These studies clearly demonstrate that 'incidental' teaching is a powerful procedure for increasing spontaneous language use in natural settings. However, in vivo intervention has been developed primarily for use with disadvantaged pre-school children and experimental validation has not been extended to work with more severely handicapped children.

Furthermore, communicative interactions between adult and child are controlled by the child, who initiates by specifying a selected reinforcer. A necessary pre-condition, therefore, is a child already possessing moderate levels of spontaneous language which can be targetted and modified within specific contexts in natural settings. Unfortunately, severely subnormal children frequently demonstrate meagre levels of spontaneous language, despite intensive one-to-one training and are typically low rate initiators in the social environment (see Rogers-Warren and Warren, 1980). So incidental teaching, as an initial strategy, is unlikely to

facilitate the generalisation of newly trained language in such non-initiating or low-initiating children.

Rogers-Warren and Warren (1980) argue that for these children additional adult prompting may be necessary to bridge the gap between one-to-one training and natural settings. The "mand-model" technique developed by Rogers-Warren and Warren, is a modified version of Hart and Risley's incidental teaching model. Communication between adult and child is controlled and initiated by the adult, who elicits verbalisations from the child to request or describe selected reinforcers of play materials. The child's language is prompted, modelled and reinforced in the natural setting much as in one-to-one language training.

Rogers-Warren and Warren (1980), in a multiple baseline design, applied mand-model techniques with three moderately to severely language delayed pre-school children, all of whom had participated in one-to-one language training prior to the study. The pre-school class teachers were trained to use mands, models and praise contingent upon appropriate responding and to increase the number of adult-child interactions through which the child could practise and use in the classroom, the language skills initially developed in one-to-one language training.

The results of the study demonstrated significant

increases in the functional usage of newly trained forms in the classroom setting. In addition, there were marked increases in vocabulary as well as in the structural complexity of utterances, in all subjects. Rogers-Warren and Warren conclude that mand-modelling is a productive technique for the development of higher rates of responding in children who are low-rate initiators in natural settings. Moreover, the strategy may be particularly useful in facilitating the generalisation of new language behaviours in severely subnormal children.

In their discussion, Rogers-Warren and Warren make two important points. First, changes in teacher behaviour "comprised a sufficient environmental alteration" to promote increases in children's verbalisations of newly trained forms. Second, increased child responsiveness to adult verbal cues strongly suggested that adult attention had a high reinforcement value for the children, enabling the adult to structure additional language learning opportunities through which the children increasingly came to realise the critical role of language in manipulating and controlling the environment.

Halle (1982), however, points out that, taken individually, the natural environment intervention strategies of Halle et al (1979), Hart and Risley (1968; 1980) and Rogers-Warren and Warren (1980) are incapable of producing verbal fluency in severely subnormal children in natural settings. Nevertheless, an "integrative model"

comprising mand-modelling, time delay and incidental teaching suggests a general strategy for introducing language deficient children to "natural maintaining contingencies" (Stokes and Baer, 1977) and for training the generalisation of functional speech and language in natural settings.

This is not to suggest that natural environment intervention should displace one-to-one language training. Quite clearly, as Hart and Risley (1980) rightly point out, for some children one-to-one language training is crucial for establishing an initial linguistic repertoire and the basic communicative functions of joint attention, turn-taking and responding to verbal and contextual cues. Equally, however, "teaching talking" in natural settings through which language use and elaborated language is developed and maintained, should complement and parallel one-to-one interventions.

Guess, Keogh and Sailor (1978, p391) state:

> "The extent to which a child generalises is as much a function of the socioecological environment in which the child resides as it is of the child's language abilities."

Clearly, the socioecological environment necessary for an effective technology of generalisation is not an enriching but a responsive environment, incorporating the systematic arrangement of antecedents and consequences and a qualitative restructuring of adult behaviour such that newly learnt linguistic skills are supported, reinforced

and elaborated in increasingly diverse environmental conditions.

Finally, the adoption of a combined operant technology of one-to-one language training and natural environment intervention in the educational environments of severely subnormal children may provide a technology for generalisation, functionally equivalent to Soviet psychology's "transforming experiment" through which we discover "not how the child came to be what he is, but how he can become what he not yet is." (A N Leontiev, in Bronfenbrenner 1977, p 528)

8 Implications for the present study

It should be clear from the arguments presented in this chapter, together with the brief summaries concluding each section, that both practical and theoretical considerations led to the design and implementation of a language training programme, which may be summarised as emphasising the following principles:

1 The development of generalised vocal imitation skills and a functional syntax based upon the adult model of language.

2 The training and facilitation of expressive language over receptive language skills.

3 The implementation of one-to-one teaching strategies combined with operant techniques of imitation and reinforcement.

4 Programming the generalisation of trained language skills in non-training settings within a school environment.

It is hoped that the discussion of the programme, together with an examination of its results in the following chapters, will reveal the extent to which these principles have been applied.

CHAPTER THREE

THE DESIGN OF THE STUDY AND ITS SETTING

1 The design

2 The setting

3 The subjects

4 The classroom environment

5 The study in operation

6 The language programme

i) pre-language training
ii) language training
iii) video language training

7 Generalisation

8 Observations

1 The design

A research paradigm incorporating experimental and control subject groups was rejected at the outset owing to the obvious difficulties of obtaining a control group of children whose handicaps and etiologies matched those of the experimental group. For the purposes of this study, therefore, it was decided to adopt a within-subject experimental research design across nine subjects.

2 The setting

The study was conducted at Norfolk Park School, Sheffield, a group 7(S), LEA non-residential school for severely subnormal pupils of age range 3-19 years. The school was spacious and modern and was organised across six units comprising 1) a nursery unit for 3-6 year old ambulant and non-ambulant, profoundly handicapped children; 2) an infant unit of three classes of 6-8 year old ambulant and semi-ambulant children; 3) a junior unit comprising three classes of 8-12 year old ambulant and semi-ambulant children; 4) a bridging unit consisting of a small group of pupils of mixed age range, categorised as severely behaviourally disordered and who were segregated from their peers in classes throughout the school; 5) a special care unit of three classes of profoundly handicapped

children and adolescents aged from 6 to 19 years; 6) an adolescent unit of one class of 13-19 year olds, with a range of moderate physical handicaps.

The majority of the children at Norfolk Park School transferred at age 12 to a nearby secondary school for severely subnormal pupils. As this school did not provide educational facilities for profoundly handicapped children or for mentally handicapped pupils with moderate physical handicaps, some children remained at Norfolk Park where their needs were catered for in the special care and adolescent units.

At Norfolk Park there was a teaching staff of 17 including the headteacher and deputy head. Allocation of scale posts included a senior master (scale 4S) who fulfilled the role of deputy to the deputy head. Two members of staff held scale 3(S) posts of responsibility for i) the administration and organisation of the special care and adolescent units and ii) language and communication work in the nursery and infants unit. Six members of staff held scale 2(S) posts of responsibility for curriculum development in the infant, junior and bridging units and for art and display, music and PE throughout the school. There were six scale 1(S) teachers, three of whom were unqualified but who had been employed as teachers of the mentally handicapped during the pre-1971 period when the educational supervision and training of the severely subnormal had been the responsibility of the Health

Authorities. In addition there was an ancillary staff of twelve child care assistants, four of whom were qualified nursery nurses (NNEB). A physiotherapist was attached to the school on a full-time basis, a speech therapist was in attendance for approximately one and a half days per week and psychologists from the LEA psychological service frequently visited the school. The school was therefore, adequately staffed and received considerable additional assistance from external services.

Notwithstanding the high investment in professional resources and a substantial allocation of scale posts with responsibility for specific areas of the curriculum, a consistent policy for curriculum planning and development throughout the school was noticeably absent. The ethos of the school was dominated by the view that child development and learning are determined by innate, maturational factors and mental age. Notions of "readiness" and stage-learning permeated approaches to teaching and determined the content, type and provision of learning opportunities.

Classroom environments were unstructured and unsystematically arranged, with a proliferation of jigsaw puzzles, formboards, threading beads, sand trays etc, which the children were encouraged to use. Much less clear was the function and relevance of these materials to the chronological age, learning and potential of the children for whom they were intended. Group teaching

practices predominated in which teacher/child interactions were brief and unconsolidated. Furthermore, the designated role of child care staff was that of caregiver, (toiletting, washing etc,) rather than as constructive participant in the education and development of the children. Adult intervention between a child and the learning and social environment was therefore predictably low.

Speech therapy within the school was limited to the diagnosis and treatment of disordered articulation and did not extend to the assessment and remediation of language disabilities. Moreover, children evidencing mildly disordered speech were more likely to be treated than children whose speech handicaps were severe. Efforts by the headteacher to develop language and communication throughout the school were well-intentioned but uninformed.

Curriculum planning was from a general perspective of language development rather than towards a theoretical analysis of language intervention and the practical formulation of specific language objectives and appropriate intructional methods. Consequently, children's language was described (rather than assessed) by checklist (PIP Language Development Charts) and "developed" by language kit (eg the Peabody Language Development Kit) or alternatively through "talk" and verbal enrichment, during which scant attention was given

to matching teacher input to the linguistic competencies of individual children.

In general, however, language development was sporadic and inconsistently pursued by individual class teachers. Moreover, curriculum content and classroom environments were typical of mainstream nursery and of infant school reception classes.

The emphasis of the present research study on didactic one-to-one teaching methods and systematic individualised programme development based on an operant analysis of language learning was, therefore, ideologically at odds with the philosophy and practices of the school.

3 The Subjects

The subjects were nine severely subnormal children (eight male and one female) who were the class group of the author who had been teaching at the school for two years prior to the commencement of the study.

The children were of mixed etiologies. Three children had Down's syndrome and the remaining six were categorised under the general classification of mental retardation. The chronological age range was 9-13 years. Mental age as measured by the Columbia Mental Maturity Scales (Burgmeister, Blum and Large, 1972) ranged from 2;0 - 3;2

for six subjects; two subjects scored a zero rating and one subject had refused to co-operate. The language ages as measured on the Reynell Developmental Scales (verbal comprehension) ranged from 1;00 - 3;1 and on the English Picture Vocabulary Test the test ages ranged from 1;10 - 5;00.

Six children participated throughout the duration of the study. Two children left the school at the end of the Summer Term in 1979 and one child died in May 1979.

At baseline, the children presented a number of problem behaviours, eg head slapping, self mutilation, screaming, withdrawal, bizarre stereotypic posturing, aggression towards adults and peers with whom they shared their environment, and "obsessive", fixational behaviour in relation to people or objects. Not surprisingly, most of the children in the group had bad reputations throughout the school and were viewed by the teaching and ancillary staff from a perspective of low expectations, predicated on a failure to recognise that the maladaptive behaviours of the children were the behavioural manifestations of impaired language functioning and a limited capability for useful interchange with the social environment.

On entry to the programme, three children were non-verbal, two of whom were also non-imitative. There were six verbal children, one of whom was able to produce moderately complex sentences. However, he was usually

unwilling to communicate and spent much of each school day in silence. The remaining five children produced rudimentary language and speech, characterised by utterances of 1 - 4 words in length.

However, three and four word combinations were infrequently produced and did not include the consistent and reliable emission of subject-verb-object sentence constructions. Their two-word utterances comprised subject-verb, verb-object, verb-verb and noun-noun combinations.

Overall, the most stable unit of production was the single word. The children appeared to comprehend basic semantic relations although these were not fluently expressed in their speech. The productive language of the children was therefore limited in length and structural complexity and clearly indicated an inability to formulate fully grammatical sentence structures.

At the time of the study, none of the children were receiving speech therapy, nor had any done so in the past. One child had been in a class where the teacher had used the Peabody Language Development Kit and five of the children had been involved with the present writer in a structured language training programme conducted during the summer term prior to the commencement of the study.

4 The classroom environment

The setting for the study was a classroom located in the junior unit of the school. The room was spacious, contained standard classroom furniture and was well-equipped with art materials. It was not, however, adequately equipped with play and learning materials of a general kind appropriate for the educational needs of the children. Neither was there a supply of materials suitable for language teaching purposes; these had to be borrowed and adapted from resources available elsewhere within the school and from an LEA language resources centre. Furthermore, as the study progresed it became increasingly necessary to borrow play materials, in particular, from an LEA teachers' centre.

Language training was conducted in a corner of the classroom partitioned off by a folding bookcase and three makeshift canvas screens, previously used for art display purposes in the school hall. The area contained two chairs, one for an adult and one for a child; a rectangular table of appropriate height and width for adult and child; and a small, circular table upon which teaching materials and reinforcers were arranged during the training sessions.

The classroom was staffed by two adults, one of whom, the present writer, was both class teacher and experimenter

for the duration of the study. The second adult was the child care assistant, who supervised the video language training programme throughout the study.

In major respects, the design and methodology of the study attempted to emulate the psychology laboratory research paradigm of distraction-free experimental conditions in which the researcher need only attend to one child at a time and concentrate on the teaching technology and the measurement of behaviour change within the programme (cf Lovaas et al, 1966; Risley and Wolf, 1966; 1968).

However, the classroom setting was one in which the focus of teacher/researcher attention was on the language, cognition and behaviour of nine children requiring direction, development and modification. Hardly a distraction-free experimental setting! An important organisational issue for the classroom and the implementation of the study was, therefore, the learning and behavioural management of eight other children when teacher/experimenter time was taken up in language training with one child. This was accomplished through highly structured classroom organisation.

Furniture and materials were systematically arranged to enable child progress and learning in other areas of the curriculum to take place and to allow the child care assistant to prompt and cue appropriate on-task behaviour with those children who were not involved in language

training at any one time during the school day. The organisation was reversed during periods when the child care assistant was engaged in video training. At such times the teacher/experimenter would supervise the children on cognitive tasks and would carry out the normal duties of the CCA.

Although it was certainly the case that the teacher/experimenter designed the learning programmes of each individual child in the experimental group and determined the direction of change in their linguistic and communicative behaviours, as the study progressed the roles of teacher, researcher and child care assistant became to some extent interchangeable. The participation of the child care assistant in the language programme and the ongoing educational process of the classroom was a critical factor both in the successful implementation of the study and in enhancing child language learning and the generalisation of new language skills.

5 The study in operation

The study took place during a period of four and a half school terms, ie from the beginning of the Autumn term of 1978 until the end of February in the Spring term of 1980.

Formal and informal testing was conducted as follows: pre-intervention during the first 6-7 weeks of the Autumn term of 1978; mid-intervention for a period of 18 days during

June and July of the Summer term of 1979 and for two days during September 1979; post-intervention for 6 weeks during November and December of the Autumn term of 1979 and for a further 7 weeks from the beginning of January until the end of February in the Spring term of 1980.

Language training and training by video were conducted with individual children. Language training commenced at the beginning of October 1978 and continued until the end of the Autumn term of 1979. Video training was scheduled to begin at the end of January 1979, but owing to a number of technical difficulties was deferred until mid-March 1979, and continued thereafter until the beginning of December 1979.

Training sessions were conducted over a total period of approximately 40 weeks and 3 days, excluding school holidays, time taken up with testing procedures, days lost through experimenter or child care assistant absences, Christmas preparations in the school during 1978, and severe weather conditions during February 1979.

The intention at the outset was that each child would receive language training for 20-25 minutes per day. However it became increasingly apparent during the initial 7-8 weeks of training that this was impracticable.

The exigencies of the school timetable and the demands of disruptive child behaviour on teacher and care asistant

time, resulted in an average of only 1-2 sessions per week per child. Accordingly, alterations were made to the training schedule such that sessions were of 10 and 15 minutes duration in the Spring and Summer terms of 1979, and of 15 minutes duration throughout the Autumn term of 1979, resulting in approximately four sessions per week, per child, across three school terms.

Each verbal child in the programme was scheduled for one session of video training per week. However, during the Spring term of 1979 training proceeded irregularly as a result of a series of break-downs in the video equipment, such that the training target of one session per child per week was rarely achieved during this phase of the study. The technical problems were resolved by the Autumn term of 1979 during which each child received 1-2 weekly sessions of video training. The length of the sessions varied from a minimum of 14 minutes to a maximum of 30 minutes, depending on the rate of child progress within the language programme and the time available during the school day.

The total number of language training and video training sessions per child varied in relation to absences from school and the length of time each child participated in the programme.

The initial phase of the study in the Autumn term of 1978 was beset by a number of unanticipated practical

difficulties which disturbed the continuity and progress of the language training programme. There were delays in filming the first videoed observations of language training owing to difficulties in obtaining a technician. In addition, the child care assistant was withdrawn from the classroom at the end of October 1978, and was not replaced until the end of the first week in November, such that, with the exception of one day, there was no additional adult support in the classroom during this period, which meant that language training could not proceed. Furthermore, the change in care staff exacerbated the behavioural difficulties of some of the children and there were days when the management and control of child behaviour prevented or reduced the time available for language training.

6 The language programme

The programme was designed to remediate the linguistic and communicative deficits of the children in the experimental group. The content of the programme, the sequences and structures trained, were developed throughout the study in parallel with the language learning and progress of each child within the programme.

The programme was therefore intended to provide an instructional curriculum for the development of generalised vocal imitation skills and functional syntax

in the non-speech child and children with very low levels of language development.

The programme was organised in three categories: 1) pre-language training; 2) language training; 3) video training. The training sequences in each category represent a general progression through the programme. However, children entered the programme at different levels such that not every child followed the complete progression of training steps, nor did every child follow the same sequences. Some children were trained on some sequences while other children were not.

1 Pre-language training

Consistent with the theoretical orientation of the programme, it was hypothesised that the development of an imitative repertoire is a necessary condition for the acquisition of language. Thus, the pre-language training dimension of the programme was designed to establish the skills of vocal imitation in non-speaking non-imitative children.

The motor imitation training sequences of the programme were designed for two children who at baseline did not emit vocal sounds other than crying or screaming and in whom imitative behaviour generally was totally lacking. Thus, it seemed unlikely that the development of vocal sound imitation as an <u>initial</u> training strategy would

result in the acquisition of imitative vocal skills.

It was hoped, therefore, that a training sequence of topographically simple motor imitations would establish an imitative behavioural repertoire in both children and ultimately facilitate the development of imitative vocal behaviour. The motor imitation training sequences were constructed to include responses progressively shaped towards the proximity of the mouth and tongue, and finally in combination with the presentation of a short vocal sound. Several of the teaching steps in the motor imitation training programme were adapted from the work of Garcia et al (1971).

The second teaching step of vocal sound imitation training was intended 1) to increase the type and frequency of imitative vocal responses established in the previous stage of the programme, 2) to shape vocal sounds in non-verbal children who at baseline showed fully developed imitative behavioural repertoires and 3) to bring the spontaneous vocalisations of children who were otherwise non-verbal under stimulus control, so that their vocalisations would be produced in the presence of a model.

The subsequent teaching steps in the pre-language phase of the programme focused on the development of vocal sound chains and on the shaping of new, and more functionally useful, single word responses. However, the children

often experienced considerable difficulty in producing syllabically complex words and phrases.

This was particularly true of children who were beginning to imitate words for the first time. Two and three syllable words were therefore systematically introduced into the training sequence in order to gradually extend the syllabic structure of single word imitations and to prepare a child for entry to the syntax training sequences of the language training programme.

2 Language training

The language training dimension of the programme emphasised the development of fully grammatical sentence usage through the learning and acquisition of grammatical rules, such that a single word, elliptical response became a matter of communicative choice for a mentally handicapped child rather than a consequence of structural limitations.

The language training sequences represented a series of logical steps through the grammar. That is, no attempt was made to integrate instructional sequences derived from data on the development of syntax in normal children. As far as possible, all structures trained were based upon the adult model of language to ensure sentence production which conformed to the speech and language conventions of

the "normal", language community. Exceptions to this rule were the specific structures verb+ing+object/ subject+verb+ing /subject+verb+ing+object / which were distinctively trained in two children in whom articulation impairments and perception and recall of sentences were such that initial training in well-formed, more elaborate sentence structures would have been premature.

The focus of the programme was on the development of productive speech. Teaching steps for the development of corresponding receptive skills were therefore omitted. Meaning was conveyed through the systematic provision of salient supporting contexts in which children were trained to attend to relevant contextual cues, formulate appropriate syntactic relations and produce contextually related sentence responses.

The teaching sequences were systematically designed to develop sentence structures from a basic core of grammatical constituents with content words and additional syntactic relations gradually added and incorporated. Utterances were progressively expanded in length and structural complexity from a base level of single words to sentence structures of seven and eight word combinations. Sentences were built on the basic sentence constituents of noun, verb+ing, the plural and singular forms of the uncontracted and contracted copula (is 's, are, 're), the determiner a, the uncontracted and contracted verbal auxiliaries (is, 's, are, 're, am, 'm), the plural

morpheme s and the uncontracted and contracted negative (not, n't).

These basic elements were then systematically integrated and combined with prepositions, the replacive pronouns (it/they), first, second and third person pronouns (I/you, he/she), possessives (my/mine, your, his/her/hers), the possessive morpheme 's, question markers wh? can? will? and additional verb forms.

Syntactic constituents were therefore, combined and re-combined throughout the training sequences, such that each stage of sentence construction contained elements of the previous stage. Sentence development was therefore hierarchical as in the example given below. In a series of training steps, the sentence constituents - noun and verb+ing were gradually combined with the contracted copula and the determiner a, to which was added a pronoun element, it.

Step 1 - noun

Step 2 - verb+ing

Step 3 - pron+cop'+det+noun
it's a+noun

Step 4 - pron+cop'+det+(subject)noun+verb+ing
it's a+subject+verb+ing

Step 5 - pron+cop'+det+(subject)noun+verb+ing+det+noun
it's a +subject+verb+ing+a+noun

Similarly, in the second example given below, the sentence constituents - singular and plural forms of the uncontracted and contracted copula is, 's, are, 're, noun

and the plural morpheme 's' are combined with the uncontracted and contracted negatives not, n't, and additional singular and plural pronoun elements, it and they.

Step 1 - pron+cop'+det+noun
it's a (noun)

Step 2 - pron+cop+noun+plural
they're (nouns)

Step 3 - no+pron+copula+neg'+pron+cop'+det+noun
no it isn't + it's a (noun)

Step 4 - no+pron+copula+neg'/negative+pron+cop'+
noun+plural
no they aren't/are not, + they're (nouns)

The systematic integration and re-integration of basic constituents within and between sentence structures resulted in the consistent re-emergence of sentence elements throughout the teaching sequences.

For example, the singular and plural yes/no constituents featured above were combined and re-combined in a total of seven structures which were progressively trained at different points within the programme. By developing sentences in this way, that is through the repeated combination and re-combination of basic sentence constituents as the programme developed, children were increasingly able to supply part of each new sentence structure without adult prompting. This in turn enabled each child to exert an increasing measure of control over their own language learning.

A critical issue in language training is the way in which teacher language cues and structures the child's response. A child can say almost anything or nothing at all in response to a question. Therefore, the same grammatical logic was used to determine the structure of teacher language. The basic constituents of sentence responses were interwoven into the syntactic structures of the verbal stimulus presentations such that the constituent elements of the stimulus elicited and cued elements in the response. Examples are given below.

stimulus	response
what?	noun
what's this? what is it?	it's+a+noun
what are they? what are these?	they're+noun+s they+are+noun+s

A similar morphological rule pattern emerged in relation to verb+ing.

stimulus	reponse
what+ing?	verb+ing
what's happening?	it's+a+subject+verb+ing
what are you doing?	I am verb+ing

In addition, the last example demonstrates the interrelationship between are+verb+ing in the stimulus and am+verb+ing in the response. Similarly, as the children progressed through the programme they increasingly learned that you in a stimulus presentation signals I in a response and vice versa.

The structural interrelationships between the stimulus

presentations and responses were intended to provide a "built in" prompting and cueing system through which the child would learn to attend to the consistencies of the morphological rule systems of sentences, and would therefore also learn to use grammatical constituents in appropriate formations (eg, saying a with a noun, 's/is +ing with a verb, I with am +verb+ing, you with are+verb+ing, etc).

Thus, while the stimulus presentations were in general similar in meaning and in structure to specific responses, they were nevertheless syntactically distinctive and varied enough to demonstrate a specific rule or relation. The intention of this was to minimise the occurrence of rote learning and stimulus over-selectivity in the mentally handicapped child's responses and use of sentences in natural settings. The teaching sequences were therefore intended to provide a practice system of recurring syntactic themes, through which children would be trained to produce and combine previous elements of grammatical learning with new elements and to transform existing structures into others.

The programme was designed to emphasise grammatical rule learning and the development of appropriate sentence production. However, grammatical structure only has form if it has function. Of equal focus therefore was the functional utility of the grammatical structures trained, for a child's effective communication with the social

environment. In social contexts, children are typically required to produce words and sentences that refer to and describe environmental objects, actions and events, to initiate speech specific to their needs and to request information for the acquisition of new learning. Without such skills, a child is unable to initiate and maintain successful social interactions, nor are they able effectively to control and manipulate their living environments.

It was planned therefore that speech and language training would begin by establishing an initial verbal repertoire of a basic set of sentence structures which would enable each child to label environmental events, to answer questions and also to ask questions about the social environment. Sentence structures were therefore organised into two general training categories of labelling and requesting.

i) Labelling

Labelling was developed initially by training children to point verbally to objects using a single word (noun) response and later to produce the sentence structure (it's a (noun)/they're/they are (nouns); to refer to themselves and their own actions (verb+ing)/(Iam/I'm verb+ing) as well as to the actions of others (verb+ing), (it's a (subject) verb+ing). Later in training, utterances were shaped into sentences of seven words to refer to and

describe persons/actions and things (it's a (subject) verb+ing a +(object)) and these were later combined with third person pronouns (he/she's/is verb+ing a +(object)/(preposition)).

The development of labelling also included teaching a child the important skill of identifying ownership of personal possessions (it's mine/they're mine) and also the possessions of others (it's person's, it's his/hers, they're person's, they're his/hers).

Labelling was further expanded by teaching the children to extend object discriminations, such that the identity of an object was affirmed or denied (yes it is/no it isn't, it's a (noun)/(yes they are/ no they aren't/are not, they're (nouns)). Later, in the training sequences children were also trained to confirm or deny personal identity (yes I am/no I'm not, I'm (name)), personal actions (yes I am, no I'm not, I'm verb+ing), the actions of others (yes, he/she is, no he/she isn't, he/she's verb+ing+a(object)) and ownership (yes it is/no it isn't/it's mine, yes they are/no they aren't/are not, they're mine).

ii) Requesting

Requesting was taught to give the children the critical skills of environmental control by emphasising that language is a means through which goods can be obtained (I want a/some noun(s)/can I have a/some/my noun(s) please?)

and through which access to preferred activities and events can be gained (can I verb a /some(objects)· / (preposition) ?). In addition, the children were taught to use question forms to gain information about the needs of adults and peers with whom they shared their environment (what do you want?), to obtain information about their activities (what are you doing?) and to request adult help and assistance (will you verb me a/some (objects)?/will you verb a/some for me?).

At this point in the programme the above skills were trained within dialogue routines between adult and child in which the child was taught to request information (what do you want?/what are you doing?), to deliver the requested item and/or to repeat the information received (you are verb+ing a/some (nouns)) such that the child learnt to verbally manipulate the rapidly shifting reference of person deixis (I/you) and to acquire the skills of conversational turn-taking, which are critical for the establishment and maintenance of interpersonal interaction.

(3) Video language training

The video training dimension of the programme was designed to provide a language training support system through which children could practise and therefore maintain the grammatical structures previously acquired in "live" language training. It was intended also that by presenting functional language models through a video

training medium, a child's exposure to appropriate linguistic stimuli would be effectively increased (see Striefel,1972).

No additional demand on trainer time was required, as the supervision of training would be undertaken by care staff so that children not involved in 'live' language training could nevertheless continue with their language learning. Five video programmes were produced through which children could practise labelling objects (it's a (noun)/they're/they are (nouns), persons, actions and things (it's a (subject) verb+ing a+(object) /(preposition)) and yes/no discriminations of objects in the negative singular and plural forms (no it isn't, it's a (noun)/no they aren't,they're (nouns)).

Later in the study a sixth video programme was made for the training and development of prepositional usage (in/on, under/over, in front/behind, next to/over there). This programme was used as a language training medium in its own right without prior input from the 'live' language training sessions.

In all programmes, the trainer's voice enunciated a sequence of verbal models of the target syntactic structures, through which children engaged in stimulus-response dialogue routines with the monitor screen. The prepositional training programme featured a sequence of verbal presentations of appropriate syntactic forms,

paired with a series of object manipulations involving a lorry and a box which visually demonstrated the relational/locational concepts that the children were expected to learn. Throughout the programmes, the syntactic interrelationships between stimulus presentations and verbal responses featured in the language training sequences were preserved and maintained. However, the visual referents presented in the 'practice' video programmes were different from those used in the language training sequences. (See Appendix B for details of the video programme.)

7 Generalisation

During the early stages of the study it became clear that criterion learning in the structured training sessions was not predictive of a child's display of language skills in other settings. That is, the children were not readily using the language they had learned. Given the demands of one-to-one training in terms of adult attention and teaching time it was essential that supplementary teaching strategies be devised and implemented so that the generalisation of language skills could be directly trained, and the effects of one-to-one training optimised. The classroom environment was therefore systematically "engineered" so that child language was supported and maintained during periods when children were not directly involved in one-to-one language training or video training.

Throughout the duration of the study, sentence structures were consistently elicited in a variety of classroom-based activities by both teacher/experimenter and care assistant. Children were approached and requested to label any item that was close at hand ("what is it?", "what's this?").

If a child produced the appropriate verbal response, then the child was verbally reinforced and, if desired, given the object described. If the child did not respond or produced an approximation of the desired response, then the adult (1) modelled the response for the child to imitate, (2) partially prompted the child, ie supplied part of the response, (3) cued the child to produce a complete sentence ("what do you say?") or requested the sentence ("say it properly", "say it all").

The same general strategy was used with children who had been trained to produce requests. Access to materials and activities was contingent on the emission of appropriate requesting behaviour, that is the production of fully grammatical sentence structures (eg "can I have a/some (nouns)?", "can I (verb)?", I want a/some (nouns) please?) If a child requested an item non-verbally (eg pointing) or used an ungrammatical utterance (eg, "want chocolate") then the item was withheld until the child either correctly imitated the adult's modelled response or responded correctly to a partial prompt or a cue/request

for the complete sentence.

Children who did not readily indicate their needs were systematically presented with materials of high reinforcement value, across a range of activities in which the appropriate request forms were elicited ("what do you want?" "If you want this you must ask"), modelled, prompted or cued and the material delivered contingent upon an appropriate response. If a child was at the one word stage in language training then a single-word utterance was considered an appropriate request.

As training progressed, modelling and prompting procedures were gradually delayed. The adult would establish eye-contact with the child, look questioningly and wait for the desired response; if a child did not respond then a prompt was given. This strategy was particularly effective in the dining hall, where the delivery of food was delayed for several seconds to elicit appropriate request forms ("Can I have some more (noun) please?" etc). These general strategies were used rigorously in all settings involving teacher/child interactions. If an inappropriate response was given, everything would stop for the ten seconds or so it would take to elicit, prompt, cue and reinforce a correct verbal response. Similarly, all correct verbal responses and initiations were greeted with enthusiasm and always verbally reinforced.

As the children acquired more structures in one-to-one

training and became more proficient in their use of language in less structured contexts within the classroom, generalisation training was extended to other settings within the school. Initially, this involved only the teacher/experimenter and the care assistant. However, as the children's skill levels and confidence increased, other adults were gradually introduced. The children were prompted to approach non-trainer adults, to request items and give appropriate answers in response to questions. Furthermore, a select group of care staff and teaching staff were briefed about the language levels of the children and given details of the syntactic structures trained, such that specific responses were elicited, prompted and reinforced in an increasing number of contexts including the playground, dining hall, PE, music etc.

8 Observations

During the initial stages of the study, the training sessions were frequently disrupted by tantrums and 'difficult' child behaviour, a consequence of limited attention and a general disinclination to engage in any situation requiring listening, speaking or understanding. However, as the study built up, tantrums declined sharply and attending behaviour was significantly extended. Furthermore, the children became increasingly motivated to participate in the sessions. At the end of a session with

a child, other children would present themselves to 'remind' the teacher/experimenter it was their turn for language training.

Similar developments were observed in the video training programme. Two children in particular seemed to find video training highly reinforcing and would often 'work' with the tapes without adult supervision. The training programme was not immediately effective, in that the communicative behaviours of the children showed little change. Verbal responses were produced in clipped, "automaton-like" tones, eye contact was sporadic and social relationships were poor. However, after training in two or three structures, children began to listen to language more and to acquire additional syntactic structures outside the training sessions.

The first structure to be "incidentally" acquired was 'where?'. Upon arrival in school in the morning children would notice the absence of a peer and began to say the child's name in a rising tone, indicating a question. The teacher/experimenter or the care assistant would model the question (eg, "Where's Steven?") for the child to imitate and would supply the requested information contingent upon a correct imitative response from the child. Modelling procedures were gradually faded and in a relatively short period of time the children were spontaneously producing 'where?' in appropriate contexts. Moreover, this trend was consistently repeated as children increasingly sought

adult cues and assistance in their efforts to produce grammatically appropriate utterances in non-training settings.

At the beginning of the study, child/child interactions were low and only one child engaged in functional play. The rest of the children seemed not to know how to play: construction toys, vehicles etc were either mouthed, thrown or disregarded. Throughout the training period, no attempt was made on the part of the teacher/experimenter or the care assistant to develop or teach play behaviour in the children. However, during May 1979, the children began to engage in self-initiated domestic play routines within which they improvised with plasticine and a variety of art materials, developed the skills of role play and verbally interacted with each other. This was an unanticipated development but one which was nevertheless part of a steadily emerging pattern of more effective communication with the social environment.

Finally, child performance in other curriculum areas showed consistent improvement. During the Summer term of 1979, two children were introduced to a reading programme broadly based on a Breakthrough to Literacy approach, in which they learnt to read and construct sentences in a left to right progression, which were similar structurally to those taught in the training sessions. Furthermore, one child who was non-verbal on entry to the programme, developed some simple reading and number skills.

CHAPTER FOUR

THE IMPLEMENTATION OF THE PROGRAMME

1 Norm-referenced testing

2 Pre-intervention assessment - verbal and non-verbal behaviour

3 Mid-intervention assessment - Post-test 1
generalisation probes

4 Mid-intervention assessment - Post-test 2
generalisation probes

5 Post-intervention assessment - Post-test 3
generalisation probes

6 The teaching sessions

i) methods of observational recording
ii) initial generalisation probes
iii) criterion learning
iv) reinforcement
v) behavioural management procedures

7 Pre-language and language training procedures

i) motor imitation training
ii) vocal sound imitation training and the development of single word utterances
iii) training sentence structure
iv) initial generalisation probes

8 Video-training

The previous chapter has discussed in some detail the setting of the experimental study and the rationale and content of the language intervention programme. This chapter will describe the teaching methods and also the assessment procedures used to determine a) the baseline, pre-intervention language behaviour of each child and b) the generalisation of language skills acquired in one-to-one teaching settings, across stimuli, people and contexts.

1 Norm-referenced testing

The Columbia Mental Maturity Scales, the Reynell Developmental Language Scales (verbal comprehension test) and the English Picture Vocabulary Test were administered to each child by psychologists from the LEA psychological service. The tests were conducted pre-intervention during the first fortnight in September 1978, to determine at baseline the mental age and language age of each subject as compared with those of normally developing children. The tests were repeated, mid-intervention, during July 1979 and post-intervention at the end of January 1980, to monitor changes in the mental and language ages of the children (as measured by norm-referenced tests during and after their participation in the intervention programme).

In addition, the Edinburgh Articulation Test (Anthony, Bogle, Ingram and McIsaac, 1971) was administered (pre-intervention) to each verbal child by a speech therapist from the Area Health Authority Speech Therapy Services. The purpose of this was to obtain a profile of each child's articulation impairments, as it had been originally intended to include articulation training sequences in the language training programme. This was however abandoned as it was decided to focus all intervention efforts on the remediation of syntax. For this reason, therefore, the test was not repeated in the mid-intervention and post-intervention phases of the study.

2 Pre-intervention assessment - verbal and non-verbal behaviour

Although norm-referenced tests give a gross indication of a child's intellectual and linguistic development they do not provide much information which is either relevant or useful in the intervention process. Establishing the language age or mental age of a child neither indicates what a child does or does not know about language nor what a child needs to know about language. The norm-referenced test data did not therefore influence or determine the content of the pre-language or language training sequences. The goals of intervention were determined at baseline by data obtained from samples of the language and speech of all the verbal children in the experimental group and behavioural observations of each non-verbal

child.

On entry to the programme, the children did not play or interact verbally to any significant degree with peers or adults in the school environment. It was not considered feasible or practical therefore to attempt to obtain language samples from child/child interactions or adult/child interactions in contexts of free play. Instead, pre-intervention data was obtained from adult/child interactions in the highly structured setting of the language training area, within which the teacher-experimenter presented a series of questions designed to elicit specific syntactic responses from the child in response to a variety of pictorial and action referents. Two sessions of approximately 15 minutes' duration were conducted with each verbal child. One session was audio tape recorded and one session was video taped. The tapes were subsequently transcribed and each child's responses were compared, categorised and scored in relation to the syntactic structures targetted in the sessions.

The pre-intervention assessment of the three non-verbal children comprised one 20-minute video taped session per child. Each non-verbal, non-imitative child was presented with a series of large and small motor imitative response model demonstrations, to elicit appropriate matched motor responses. The third non-verbal child was presented with pictures of everyday objects etc and requested to label each referent. In addition, some target responses were

modelled by the teacher-experimenter to elicit verbal imitations from the child. The video tapes were transcribed and child responses compared with the targetted categories of motor and language behaviours.

3 Mid-intervention assessment - Post-test 1 generalisation probes

The post-test 1 generalisation probes were conducted with six children, over a period of four weeks, from mid-June to mid-July 1979. The tests were designed to establish whether or not verbal responses developed in the highly structured one-to-one training sessions would initially generalise in structured and semi-structured classroom contexts in response to unfamiliar referents (objects, pictures, actions) and familiar and unfamiliar adults. The generalisation of non-verbal imitative motor behaviours was not probed in this phase of the study.

Three adults participated in the tests, 1) the teacher-experimenter (trainer 1), 2) the child care assistant (trainer 2), 3) a trainee from a youth opportunities scheme (non-trainer) who was unfamiliar to the children pre-test. The tests were conducted in two conditions, test condition A, and test condition B. Testing was conducted with each child individually in sessions lasting from 10-20 minutes, depending on child behaviour and classroom conditions. The children were tested once in condition A and twice in condition B by the teacher

experimenter (trainer 1), and twice in condition A and twice in condition B by each of the other adults. Trainer 2 and the non-trainer were given lists of questions specific to the forms and structures acquired by each child in the training sessions. The stimulus questions were identical to those used in training with the exception of two additional questions designed to elicit the request 'I want a (noun)'.

The number of stimulus presentations per session varied in relation to the number and type of responses each child had acquired in the training programme, and although the number of trials per structure was determined prior to the administration of the tests, some errors were made by the adult experimenters during the sessions.

In condition A, the teacher-experimenter (trainer 1) conducted one session with each child in the language training area of the classroom. Adult and child faced each other at a table and verbal responses were elicited through the presentation of stimulus questions accompanied by a variety of objects, pictures and actions not previously used in training. All other sessions in condition A were conducted in a quiet part of the classroom, different from the language training setting. Adult and child were seated next to each other, facing away from the general classroom area and verbal response generalisations were elicited in response to familiar stimulus questions and unfamiliar referents.

In condition B, experimenter and child were seated at a table in the normal setting of the child within the classroom. The adult systematically presented the child with non-training objects, pictures and actions and elicited verbal generalisations through the use of the same stimulus questions used in condition A. The test situation was carefully structured in that each child attended only to test materials and questions presented by the adult. Nevertheless, each child was required to produce sentence structures in a context of busy, ongoing classroom activities and numerous distractions provided by other children.

Observational recording was by audio and video tape. Each child was video recorded in condition A with the teacher-experimenter (trainer 1). In addition, one child was videoed in condition B with the teacher-experimenter, two children were filmed in condition A with the care-assistant (trainer 2) and the non-trainer, and one child was filmed in both condition A and condition B with the non-trainer. All remaining sessions were audio taped. The audio tapes and video tapes were transcribed; correct responses were scored according to the criteria of the training sessions; that is, each response had to be fully grammatical. However, allowances were made for regional dialectal variations. Furthermore, sentence responses omitting the determiner a preceding the direct object in the structure - It's a+subject+verb+ing+a+(obj), were not

penalised.

Unelicited, spontaneous utterances produced in the sessions, were categorised into two response types, 1) trained forms, 2) combinations. Trained forms were responses developed in the training sessions and were scored according to the same criteria as elicited generalisations. Combinations were "novel" utterances in which trained syntactic structures and morphological rules were combined with untrained syntactic elements. The context of the utterances, that is where (test condition) and with whom (experimenter) the responses were produced, was also recorded. No explicit reinforcement was delivered during the tests other than normal communicative behaviour such as smiling.

Unfortunately, some of the audio tapes and one video tape were lost, so that only 75% of this aspect of the data is presented in volume 2.

4 Mid-intervention assessment - Post-test 2 generalisation probes

Post-test 2 generalisation probes were condutcted with six children during the second week of the Autumn term of 1979. The procedures were designed not only to test the generalisation of learned language skills but also the maintenance of new language behaviours over the six week Summer vacation. Two identical tests of 20 minutes

duration, (sub-tests I and II) were conducted on two separate occasions and involved one adult (teacher-experimenter) and each individual child. The context and location of the sessions were identical to Post-test 1, Condition A (trainer 1). That is, experimenter and child sat facing each other in the language training area of the classroom. Previously learned sentence responses were elicited in response to unfamiliar materials and actions referents and stimulus presentations identical to those used in training. Each sub-test was audio recorded and these were subsequently transcribed and scored according to the criteria of Post-test 1. Spontaneous utterances were also categorised and scored by the methods used in Post-test 1.

The maintenance of non-verbal imitative motor behaviour was also assessed in Post-test 2. Imitative responses in each motor response category was tested twice. The sessions were of 20-25 minutes duration; each child was presented with response model demonstrations used in training. Correct responses were never reinforced and were scored on record charts used in the language training sessions.

5 Post-intervention assessment - Post-test 3 generalisation probes

The major focus of Post-test 3 was to evaluate the generalisation of trained language responses in natural

settings. Testing began during the first week in November 1979 and continued until the end of February 1980. Four children were tested throughout this period. Language training continued during the first six weeks of the tests, until the end of the Autumn term. This was to experimentally develop and extend the teaching sequences relative to the learning and development of each child.

Three adults participated in the tests, 1) the teacher-experimenter (trainer 1), 2) the child care assistant (trainer 2), 3) a student (non-trainer) from a local college of FE who was seconded to the school for one afternoon per week, and who was not known to the children prior to the commencement of the tests.

The generalisation of language skills was measured in the four contexts given below:

1 classroom-based cognitive activities undertaken in the morning session.

2 classroom based art activities during the afternoon

3 free play within the classroom

4 other activities in the classroom (clearing up etc) and in three contexts elsewhere within the school; eg home economics, the playground, assisting the care assistant with general duties in the junior unit, etc.

Generalisation probes were conducted in each of these contexts by targetting each child for a period of between 30 and 40 minutes during which the child would be engaged in any one of the activities listed above. Typically, an adult would approach the child, establish joint activity

with the child and elicit contextually related verbal responses through the presentation of questions used in the training sessions and also questions never used in training. Verbatim accounts of elicited and spontaneous (unelicited) generalisations were written and scored on charts specifically designed for the purpose (a sample chart is given in Appendix C). One audio tape recording of approximately three minutes was made of each child with each adult during the sessions. One video tape recording of one child per adult was also made, again lasting approximately three minutes. Transcriptions were made of each recording.

Scoring procedures were the same as for Post-tests 1 and 2. However, contextually appropriate permutations of each syntactic response were also scored correct. For example, the prepositional sentence structure - it's in the (noun) is the trained fully grammatical response to the stimulus question - where's the (noun). Equally, in the (noun)/ and int'(noun)/(regional dialectical variation) are appropriate structural variants, acceptable in the speech and language community. In addition, omission of the definite article, 'the' in prepositional sentences was not penalised. While this is grammatically inappropriate relative to linguistic social conventions, nonetheless the form and function of the sentence is essentially determined by the appropriate use of the preposition. For this reason, therefore, responses of this type were scored correct. Spontaneous unelicited utterances were

categorised and scored by the methods used in Post-tests 1 and 2.

Finally, one formal highly structured test of 20 minutes duration was conducted by the teacher-experimenter with each child during the third week in December 1979. The test format was the same as in Post-test 1, condition A (trainer 1) and Post-test 2. Previously acquired verbal responses were elicited through the presentation of unfamiliar objects, actions etc and verbal stimuli used in the training sessions. Verbal responses were scored accordingly. The generalisation of motor imitative behaviour in the two non-speaking children was also probed in this test. Six unfamiliar motor response demonstrations of each type were presented to each child to produce generalised, unreinforced, imitative motor responses. The test sessions were videotape recorded and each recording was later transcribed.

Verbal responses were scored according to the criteria previously described and motor responses were scored according to the criteria of the training sessions.

6 The Teaching Sessions

i) Methods of observational recording

Quantitative measures of child language behaviour in the pre-language training, language training and video

training dimensions of the programme were systematically obtained from, i) observational record charts, ii) audio tape recordings, iii) video tape recordings.

Each child's progress from baseline within the programme was charted on a daily basis through the use of observational charts which were completed by the teacher-experimenter during the training sessions. The charts were intended to provide data on the following:

1) the date, time and duration of the session

2) training category (ie motor imitations, vocal sound imitations, sentence structures etc)

3) number of imitative response model presentations (trials)

4) number of non-imitative stimulus presentations (trials)

5) number of correct responses or acceptable approximations of correct responses, number of incorrect responses, number of no responses

6) number of adult prompts and partial prompts given to the child

7) number of elicited generalisations obtained during a training session or during a generalisation probe session

The charts were used in combination with the coding system shown below:

imitative response model stimulus presentation (stimulus presentations + imitative response model)	•
stimulus presentation (stimulus presentations - imitative response model)	•
correct imitation correct trained response	✓
incorrect imitation incorrect response	△
no response	o
approximation (imitation) approximation (response)	✓
prompt	—
partial prompt	—
elicited generalisations	✓

Also included on the right of the chart was a section which was used for the purpose of scoring the total number of trials, responses, adult prompts etc from which criterion learning was measured and percentage conversions of correct response ratios were calculated.

A 'comments' section was included in each chart to provide brief, written descriptions of other relevant child behaviours. These included attending behaviour, the frequency and duration of tantrums, latencies in child response rates and idiosyncratic learning patterns in relation to specific syntactic or imitative responses. In addition, further information on teacher behaviour within

the sessions was noted; for example, the nature of the prompting systems used within the session in relation to the specific components of an imitative response or elements of sentence structure requiring additional adult cues; the application of intonational emphasis within or between words; whether or not prompts/partial prompts were presented audibly or silently in the form of a visually exaggerated, mouth cue etc.

Brief details of the frequency and duration of time-out procedures and also the reinforcement contingencies operational for each child within the sessions at each stage of the training programme, were also given in the comments section of the charts.

A completed record chart, giving examples of the coding system used, the stimulus/response categories coded, additional written comments and total scores in terms of trials, responses, prompts etc is given in Appendix C.

Johnston and Harris (1968) rightly emphasise that the observation and recording of child behaviour during training sessions provides only a "gross index" of a child's responses to specific discriminative stimuli, as the method of recording necessitates the division of adult attention between child and recording chart, and this in turn may affect the objective measurement of child behaviour within the programme. For this reason audio tape and video tape recordings of the training sessions

were conducted to supplement the daily record charts.

Audio tape recordings were made at fortnightly intervals and were intended to provide more precise and detailed observations of the verbal behaviour of each child in relation to specific syntactic response categories, voice pitch and intonational emphasis as well as on the salience of teacher prompts and cues. The recordings also provided useful information on changes and improvements in the speech and articulation of individual children throughout the training programme. The tape recordings of the verbal pre-language and language training sessions were transcribed in traditional orthography although symbols from the International Phonetic Alphabet were occasionally used. The transcriptions were subsequently analysed, coded and scored according to the criteria of the observational record charts. For obvious reasons, the motor imitation training sequences involving non-speech children were not recorded on audio tape.

The video taped observations of the pre-language, language training and video training sessions were recorded at three monthly intervals to provide an objective, unbiased, visual record of the language behaviours of adult and child in the experimental setting and also to yield more detailed information about the paralinguistic behaviour of each child including attention to adult directions, prompts and cues and the display of contextually appropriate communicative behaviours such as smiling,

gesturing, turn-taking etc. The observations proved useful also in monitoring the teaching approach and in revealing consistencies and inconsistencies in teacher-experimenter behaviour.

The major disadvantage attached to the use of audio and video recordings as observation systems is the time-consuming nature of transcription work. For this reason, the video observations of the motor imitation training and language training sessions were not transcribed. Instead, each observation tape was viewed and brief written reports made of each child's response rates and attending behaviours etc. These reports were then compared with record chart data scored in training sessions during the week before and after the video recording was made.

ii) Initial generalisation probes

Generalisations of matched motor responses and verbal responses elicited in the initial probe sessions were scored on the observational record charts used in the training sessions. Audio tape and video tape recordings were not used for the observation of child behaviour during these sessions.

The large amount of data collected during the study was such that it was not possible to analyse the record charts, audio tapes and video tape recordings used to observe child progress in the video training dimension of the programme. For this reason also, the data for only

five children were analysed in full. These are discussed and described in the individual case studies of each child in Chapters 5 - 9 and presented in detail in Volume 2.

iii) Criterion learning

Throughout the study, six items (objects, pictures, actions) were usually used as referents for each grammatical structure. During the initial stages of training, each stimulus item was presented six times (six trials per item). Later in the programme, however, some structures were trained by presenting each item only once (one trial per item across six items). Criterion learning was calculated on a correct response ratio of 83% correct per structure (ie not more than one error in six).

Some structures were trained slightly differently. For example, four stimulus items were sometimes used, with each item being presented three times (three trials per item) giving a total of 12 trials per response. Criterion learning was therefore calculated as 10/12 correct responses, or 83% correct. As far as possible, therefore, the number of trials per structure, per session, are divisible by 6, such that throughout the programme criterion learning was calculated as not less than 83% correct.

The total number of trials per session was determined by, a) the duration of the session, b) each child's response rate within the session, c) the number of structures

trained. The number of trials across sessions was therefore variable.

Training sessions for which the recorded number of trials is not divisible by six are examples of teacher experimenter scoring errors during the sessions. Furthermore, errors were occasionally made in the calculation of criterion learning at the end of sessions.

Teacher-experimenter scoring errors were further exacerbated by difficult child behaviour within some sessions and interruptions from children not involved in training or from members of the adult staff. This particular difficulty was partially remedied by scoring interruptions on the charts each time they occurred. Clearly, the observation and recording of child behaviour in one-to-one teaching contexts is a skill that is learnt over time. Consequently, as training continued the types and frequency of scoring errors steadily declined.

iv) Reinforcement

Throughout the study, reinforcement was contingent upon the emission of correct verbal or imitative responses and acceptable approximations of desired responses.

During the initial stages of training, primary reinforcement (chocolate buttons) was used with some children. Two children however refused to "work" for edible reinforcers. For these children, permission to

pursue a desired activity was contingent upon the emission of an appropriate response. One child was given access to picture cards of his choice and the other child was allowed to blow a paper trumpet after each correct response or approximation. Primary reinforcement was delivered in combination with "physical reinforcement" (hair-stroking, face stroking, hand squeezing) and social reinforcement of verbal praise ("very good, that's right" etc). In addition, reinforcing consequences specific to a verbal response were incorporated into some of the later language training steps (eg, "Can I have some chocolate please?"/"Can I have my shoe back please?").

In the early stages of training, each correct response and satisfactory approximation was continuously reinforced. Primary reinforcement was faded rapidly from a fixed ratio (FR1) to a variable ratio of 1 (VR1), to a variable ratio of 3 (VR3) and finally to a variable ratio of 6 (VR6), before being withdrawn completely. Physical reinforcement was faded from FR1 to VR3. Social reinforcement of verbal praise remained on a continuous ratio; that is, every correct verbal response or acceptable approximation was always verbally reinforced.

During the first weeks of training, most of the children presented high levels of distractible behaviour such that appropriate attending behaviour had to be trained in parallel with new language behaviours within the training sessions. Each child was instructed to 'look' at the

teacher-experimenter and "sit up" or "sit properly". Attending behaviour was additionally cued by "finger snapping" at the eye level of the child and/or manually prompting the child's head into a face-to-face position with the teacher-experimenter.

Appropriate sitting behaviour was also manually prompted. Verbal reinforcement was delivered for each successive approximation of appropriate 'looking' and sitting' behaviour such that attending behaviour became a consistently reliable response in a short period of time.

Incorrect responses were never reinforced. However, while it is undoubtedly essential that children know when they are being reinforced, it is equally necessary that they also know when their responses are incorrect. For this reason, therefore, particularly in the later stages of training a response, the children were usually told when a response was incorrect by the teacher-experimenter who would say "No", "No that's wrong" or "No let's try it again", followed by the presentation of a prompt or re-presentation of the stimulus item.

v) Behavioural management procedures

"Silly" behaviour (eg, laughing, humming, refusal to respond verbally) was "punished" through the application of time-out procedures during which the teacher-experimenter would remain silent, assume a blank facial expression, look away from the child and count slowly and

silently up to 10 or to 20 depending on the duration of the behaviour. The presentation of appropriate behaviour was immediately reinforced by teacher attention, verbal praise and/or presentation of the next stimulus item.

Tantrums and aggressive behaviours were controlled by firmly positioning the child between the table and the classroom wall, followed by holding the child's wrists and hands down onto the table and gripping the child's legs between the knees of the teacher-experimenter. In addition, the child would either be "talked through" the behaviour or verbally reprimanded (shouting). These strategies were also used to prevent children from prematurely leaving the sessions (see Lovaas et al, 1966). Sessions were never terminated as a result of negative child behaviour. The policy was to "sit it out", opportunities for the emission of appropriate verbal or imitative responses being continually provided and reinforcing consequences consistently obtained. Similarly, time-out procedures requiring either the departure of the adult from the session or the removal of the child were also never used.

7 Pre-language and language training procedures

i) Motor imitation training

A sequence of ten large motor imitations and twelve small motor imitations were trained in two children. (Details

of the responses taught and the order in which they were trained are given in Appendix A.)

The first two responses of each type were trained individually. This was followed by training imitations in pairs. That is, two responses of the same type were presented alternately during each training session. Shaping and fading procedures were used to train the motor responses. Child attention (eye contact) was gained by finger-snapping accompanied by the verbal instruction "Look at me". With one child, this also included holding the edible reinforcer at eye level and slowly moving it towards the adult's face. This was followed by a demonstration of the imitative response accompanied by the verbal instruction "Do this" (Sloane, Johnston and Harris, 1968). Neither of the children showed any imitative behaviour at baseline. It was necessary therefore to physically guide the child's arms, hands etc through the topography of the response. All prompted imitations were reinforced.

Physical guidance was systematically faded and each successive approximation was reinforced until the child was able to produce matching responses independently. Training small motor imitations located on and around the mouth involved lengthy and elaborate shaping procedures in which 'added stimuli' (Sloane, Johnston and Harris, 1968) were also used to facilitate response discrimination. For example, shaping tongue protrusion in one child initially

included touching the child's tongue and prompting the child to touch the teacher-experimenter's tongue. In the other child, the response demonstration was accompanied by "tapping" the child's lips with a plastic spoon. The spoon was then held at the tip of the child's tongue and moved slowly away to prompt tongue protrusion. The spoon was gradually faded further and further away from the child's mouth until the response was produced in the presence of the model without the added stimulus.

In the final training step, the imitative response was paired with the presentation of a short vocal sound ('ah'). The teacher-experimenter demonstrated the motor imitation followed by the verbal response "Say ah". The instruction "Do this" was not presented in this step.

All the responses were modelled in serial presentations of six trials which were repeated for the duration of the training sessions.

ii) Vocal sound imitation training and the development of single word utterances

Vocal sound imitations were developed in response to "Say" or alternatively by modelling the vocal response followed by the verbal instruction "You say it". Vocal sounds were gradually chained into single words which were familiar to the child, eg mu-mmy, da-ddy, ba-by. Reinforcement was delivered contingent upon each successive approximation of the desired response. Pictures of everyday objects were introduced into the sessions and served as referents for

the single word imitative response models.

Modelling procedures were gradually faded until the child produced a single word non-imitative noun response in the presence of a pictorial referent and the verbal stimulus "What's this?"/"What is it?". A total of 50 picture cards selected from the Peabody Language Development Kit, were used as referents for 24 one-syllable single word (noun) responses, 20 two-syllable single word (noun) responses and 6 three-syllable single word (noun) responses. Between twelve and eighteen pictures were selected for each training session. The pictures were presented serially in groups of six within which one, two and three syllable words were intermixed.

iii) Training sentence structure

During the training sessions, adult and child sat facing each other at a table. The table was used for the display of stimulus items required in each step of the programme. Initially, pictures were used in preference to objects owing to the distractible and difficult behaviour of the children, some of whom demonstrated considerable "skill" in throwing objects. Later in training a variety of functional objects was introduced to teach request forms and the possessive pronouns mine/his/hers. In addition, verb+ing was trained by pairing the verbal response with a sequence of actions performed by the child.

All sentence structures were developed and trained within

a framework of structural pattern drills, some of which were adapted from the EFL (English as a Foreign Language) drills of Wakeman (1970; 1974). Details of syntactic structures, structural drills, stimulus items and materials are given in Appendix B.

The teaching procedures used for the development of sentence structure were essentially the same as those used for training generalised vocal imitation and the production of single-word utterances. That is, each sentence response was developed by the presentation of a stimulus question (eg, "What's this?") followed by a modelled response ("It's a train." "You say it."). Imitative response model presentations were gradually faded into a series of prompts and partial prompts through which grammatical elements were systematically chained and recombined into sentence structures.

Intricate, finely sequenced prompting and cueing systems were critical strategies for the production of sentence responses and the acquisition of grammatical rule learning. A prompt constituted the re-presentation of a complete target sentence structure. Partial prompts were delivered for part of each sentence. Typically, this would initially include the presentation of two or more words, eg, It's a -/. As training progressed, the partial prompts were faded to only one word in the sentence, eg, It's -/, and faded yet again such that only the first letter of the first word was presented, eg, i -/, before

finally fading to a silent, visually exaggerated mouth cue.

It should be noted, however, that the right-to-left progression of the partial prompting and fading technique described here was only one of several strategies used to develop sentence productions.

Longer, more elaborate sentence structures were developed somewhat differently. Initially, a full imitative reponse model was presented for the child to hear and then modelled in a sequence of smaller segments which were systematically chained into larger combinations. An example is given below.

Response model 1 - Can I have my shoe back please/
You say it

Response model 2 - Can/I/have/my/shoe/back/please/

Response model 3 - Can I/have/my/shoe back/please/

Response model 4 - Can I/have my/shoe back/please/

Response model 5 - Can I have/my shoe back/please/

Response model 6 - Can I have my shoe/back please/

Response model 7 - Can I have my shoe back please

The procedure was then reversed by fading firstly single words and then word combinations from the adult imitative response model until the child was able to formulate the request independently.

Contracted verbal auxiliaries and the contracted copula

were consistently emphasised throughout the training programme as they occur more frequently in the speech of adults than equivalent uncontracted forms. However, it became increasingly clear during the early stages of training that some of the children were not auditorily perceiving contracted forms within sentences. This was overcome by presenting the uncontracted auxiliary first followed by the presentation of the contracted form. Similarly, it was also evident that children did not hear the indefinite article. This was because 'a' was presented within sentences as it is normally articulated in adult speech, ie "it's ə (noun)" in which ə is barely discernible because it is almost subsumed within the 's' morpheme. The 'it's a (noun)' response was subsequently taught by prompting the indefinite article with an open-mouthed 'a' and additional intonational stress.

Intonational emphasis was also used with some children to cue the elicitation of grammatical constituents within specific responses.

For example, when a verb+ing response was required, stress was placed on the verb stem and the inflection in both the stimulus question and the imitative response model, eg, "what are you dóing?" - "Drawing". "You say it.".

Similarly, in training the yes/no discrimination, the singular plural distinction was cued by stressing the following constituents:

Stimulus presentation	imitative response
Is this a ball/ Is it a ball/	yes it is/ - you say it/
Are they apples/ Are these apples/	No they aren't/are not/ they're oranges/

Clearly, as children became more proficient in morphological rule learning and the production of sentences, intonational stress and other "unnatural" language training "props" were systematically faded into the patterns of normal speech.

Occasionally, in the later stages of training a sentence structure, Forced Alternative (FA) questions (Crystal et al, 1976) were used to partially prompt an appropriate response. Forced Alternative questions are intended to provide the structural clues necessary for a particular syntactic response, such that the child has to choose the appropriate alternative and use his/her knowledge of grammatical structure (Crystal et al, 1976). The questions were usually used to elicit nouns; eg, is it a box or is it a ball?/ or verb+ing; eg, is it a boy jumping or is it a boy running?/.

In order to eliminate the possibility of a child producing the desired response through rote repetition of the second alternative, correct responses were always presented in

the first alternative.

Lastly, it must be emphasised that, for the most part, prompting, chaining and fading strategies were used in relation to the learning patterns of individual children. Prompts and cues were delivered for any grammatical constituent or element of sentence structure causing difficulty for a child and which was, therefore, likely to be omitted in the production of a sentence response.

A two-trainer system was adopted to train the first and second person pronouns I/you (person deixis) (see Guess, Sailor and Baer, 1974, 1976, 1978). For mentally handicapped children who have habitually referred to themselves and to others by using proper nouns, the concept and acquisition of person deixis is both difficult and confusing.

In conversational dialogue, I refers to the speaker and you refers to the hearer. Thus speaker-hearer roles continually shift rapidly back and forth and the deictic pronouns become increasingly interchangeable. In the sessions, the teacher-experimenter modelled and prompted the verbal responses appropriate to the roles of speaker-hearer and the care assistant engaged in dialogue with the child by modelling corresponding speaker-hearer roles. In addition, gestural (pointing) cues and prompts were extensively used to aid response differentiation and to mediate the desired response.

An example is given below:

Trainer 1	Ask (person) what she wants / what do you want / you say it	points to trainer 2 simultaneous with emission of second person pronoun
Child	What do you want/	Trainer manually prompts child to point to trainer 2 simultaneous with production of second person pronoun
Trainer 2	I want a (object) / What do I want /	
Trainer 1	You want a (object) you say it	repeats pointing response
Child	You want a (object)	Trainer 1 repeats manual prompting of pointing
Trainer 1	Give person (object)	
Child	Gives requested object	
Trainer 2	Thank you (Receives object)	

Grammatical training began with all children by training a single structure exemplifying a particular grammatical rule. Six training items (pictures/actions) were used and each item was presented six times. Thus repetition within the sessions was high and the levels of variability were low. This was done to reduce the level of demand on the children who were required to imitate and produce utterances which were longer and syntactically more complex than their spontaneous productions and also to develop understanding from contextual referents. However, rote learning and the mere parrotting of structures had to be guarded against.

Moreover, it was essential that children attended to the morphological rules and syntactic interrelationships of the stimulus and the response. For this reason two distinct question forms were always presented to elicit a single grammatical response. Furthermore, after initial training in a structure, other syntactic forms were introduced and trained concurrently in the same training session. Therefore, as the programme developed, the level of difficulty within the sessions was gradually increased; sentence length was expanded and exposure to different elements or combinations of elements was more varied.

Finally, the mass trials of imitative response modelling which were a dominant feature of the early development of new responses, significantly decreased over time. This was a result of the grammatical consistencies operating between one sentence or structure and another. So, as training progressed, the ability of each child to produce part of each new response meant that the development of new forms increasingly relied on the systematic provision of adult prompts and partial prompts rather than on direct imitative response modelling.

iv Initial generalisation probes

Initial generalisation probes were conducted each time a child achieved criterion learning in a grammatical structure. The probe sessions were of approximately ten minutes duration and were conducted in the language

training setting and the natural setting of the classroom. Generalisations were elicited in response to unfamiliar objects, pictures and actions. Verbal stimulus presentations were identical to those used in the training sessions. The number of trials per response type per session varied, and was determined by child response rate within the session and classroom conditions. Adult prompts and cues were withheld and correct responses were never reinforced.

The intention at the outset was to conduct two probe sessions per child. If, however, child responding was slow or hesitant, the sessions were repeated. Examples in the data showing one probe session per syntactic structure are entirely attributable to teacher-experimenter error. Probe sessions were in general not conducted immediately prior to the mid-intervention (Post-test 1) and post-intervention tests (Post-test 3).

Finally, initial probes were also conducted to measure the generalisation of imitative motor responses. Large motor and fine motor imitative response generalisation was measured after criterion learning was achieved in all imitations within each motor response category.

8 Video training

In the video training dimension of the programme, sentence

structures were auditorily presented to the children on a video monitor accompanied by monochrome visual presentations of stimulus materials. Six programmes were produced, five of which were designed to enable children to practise labelling responses previously acquired in the language training programme. The remaining programme was designed to train prepositional usage from baseline.

The response categories, sentence structures, training and replay times were as follows:

1 Labelling objects (singular) - it's+a+(noun) - (7 minutes)

2 Labelling objects (plural) - they're+(nouns) - (7 minutes)

3 Labelling persons/actions/things - it's+a+subject+ verb+ing+a(object)/(preposition) - (7 minutes)

4 Yes/no discrimination - objects - singular no+it+isn't+it's+a+(noun) - (7 minutes)

5 Yes/no discrimination - objects - plural no+they+aren't. They're+(nouns) - (7 minutes)

6 prepositional usage
it's in/on the (object)
it's under/over the (object)
it's in front/behind the (object)
it's next to the (object) it's over there
(7 minutes)

The verbal stimulus-response routines of the language training pattern drills were reproduced in the video programme presentations. Verbal responses were evoked from the children by sequential presentations of imitative verbal response models and non-imitative verbal stimulus discriminations. With the exception of the prepositional training sequences, question forms specific to each response were identical to those used in the language

training dimension of the programme.

Visual displays were of common objects (table, clock, sweets etc) and also included referents filmed "on location" in local environmental settings. For example, buses in the central bus station, cars in city car parks, trees against a backcloth of tower blocks and flowers in a city park. Video replays for the development of labelling persons/actions/things consisted of an adult performing a sequence of action routines matched by the verbal presentations of the audio soundtrack. Visual referents for prepositional training comprised teacher-experimenter manipulations of two objects, a lorry and a box, in demonstrations of each locational concept.

The verbal presentation formats of the labelling and yes/no discrimination training sequences comprised serial presentations of stimulus questions and modelled responses interspersed with 10 second intervals to give each child time to produce the desired response.

An example is given below:

Stimulus presentations
what's this/what is it/
it's a clock

what is it/
it's a clock/
you say it/

(10 sec interval)

what is it?/

(10 sec interval)

it's a clock

Each programme concluded with a "rapid fire" review of visual displays of each stimulus item accompanied by stimulus questions presented in alternation. The prepositional training programme followed a similar progression, except that a rapid review occurred after the presentation of each pair of prepositions. Here again, 10 second intervals occurred for the emission of appropriate responses. Details of the pattern drills and stimulus items are given in Appendix B.

During the early stages of prepositional training, the children were only required to respond verbally to each video display. However, it soon became apparent that the children's verbal responses were often at variance with the visual displays, indicating a developing tendency towards rote repetition of each sentence structure. This was remedied by introducing an identical lorry and box into the sessions, such that in addition to producing appropriate prepositional sentence responses, the child had to manipulate the objects in co-ordination with each video replay demonstration.

The number of programmes viewed by each child in the training sessions was determined by the number of sentence structures acquired in language training. In general, however, the children watched three to four programmes per session, resulting in approximately 21-28 minutes of video training.

The teaching sessions were conducted in a part of the classroom away from the language training area. Care assistant and child sat facing a 12" monitor connected to the video tape recorder. The care assistant would prompt appropriate verbal and non-verbal responses in the child and also visual attendance to the screen. Finally, it should be noted that although the 'labelling' programmes were used as a practice system with most of the children, two children in the experimental group learnt some of the structures from baseline by viewing the programmes.

CHAPTER 5

CASE STUDY 1 - STEVEN

1 The child and his environment

2 Pre-intervention assessment - Results

3 Progress and learning in language and video training

4 Generalisation and training for generalisation - Observations

5 Mid-intervention and post-intervention generalisation probes and norm-referenced testing - Results

6 Discussion

Figures referred to in this Chapter are to be found on pages 175-183, before the Supplementary (generalisation data) pages

1 The Child and his environment

Steven was a non-verbal child with Down's Syndrome who was aged 10 years 3 months at the commencement of the study. He was a pleasant, well cared for child from a working class family in which he was the eldest of three children. His father, a bus driver, was a caring, stable person who accepted most of the responsibility for Steven's welfare. Steven's mother, however, was a housewife who at the time of the study was said to be suffering from agoraphobia. There were suggestions in the medical case history report that she was initially unable to accept Steven's handicap and that from birth to approximately age 3, Steven had suffered intermittently from periods of maternal rejection.

Prior to the study, Steven was classified as an elective mute throughout his schooling. This was as a result of references in the medical report to the emergence of his first words at age four and also to parental assertions that he communicated verbally at home. Furthermore, while the educational reports consistently emphasised Steven's lack of speech development, there were references to rare occasions, when in the company of peers he had been heard to sing, albeit in a monotone, and to utter single words.

Steven had been a pupil in the teacher-experimenter's

class group during the academic year prior to the study, throughout which he had consistently failed to produce speech in contexts of adult/child or child/child interaction. Finally, an audiometric test conducted in the same period, revealed considerable hearing loss in one ear, apparently resulting from a build up of fluid in the inner ear. This was undoubtedly an additional factor in Steven's expressive language difficulties.

In all other respects, Steven's adaptive social behaviours were adequate. He was the only child in the experimental group who knew how to play and although he rarely initiated social interactions, particularly with adults, he reliably responded with appropriate smiling and gestural behaviour and was able to carry out simple verbal instructions. Furthermore, his observational learning was such that when video training was introduced he spontaneously undertook to assemble and dismantle the video equipment each day, having casually observed the teacher-experimenter doing this.

2 Pre-intervention assessment - Results

At baseline, Steven's test results (raw scores) were as follows: 17 (Columbia Mental Maturity Scales); 2 (Reynell Developmental Language Scales, Verbal Comprehension Test) and 3 (English Picture Vocabulary Test). During the 20-minute language assessment conducted pre-intervention by

the teacher-experimenter, Steven consistently demonstrated appropriate attending behaviour and indicated his verbal comprehension by pointing to pictorial referents. He did not, however, produce utterances or vocal sounds, and adult imitative response modelling failed to elicit any verbal imitations.

3 Progress and learning in language and video training

An initial and major step in Steven's language training, therefore, was to establish imitative verbal behaviour. This had been attempted repeatedly but without success during the Summer term of the previous academic year and was further complicated by Steven's disinclination to "work" for edible reinforcers (eg, sweets) even though he liked them. Buddenhagen's (1971) initial strategy of inflating and deflating a balloon to evoke imitative behaviour in a non-verbal Down's Syndrome girl provided some inspiration, and prompted a search for balloons during which the teacher-experimenter opened a long-locked cupboard (of the type to be found in the corridors of all schools) revealing no balloons but a treasure trove (as it turned out) of golden paper trumpets.

Vocal sound imitation training began therefore with the teacher-experimenter blowing a golden paper trumpet and presenting it for Steven to imitate. This he did correctly. In the next step, the trumpet was turned back to front followed by the teacher-experimenter blowing into

the open end. This too was correctly imitated and was immediately reinforced by allowing Steven to pursue the preferred activity of blowing into the mouthpiece of the trumpet, accompanied by the delivery of "physical" reinforcement and verbal praise. This was followed by vocal sound imitative response modelling, again emitted into the open end of the trumpet, which produced the desired imitative response.

Thereafter, indeed in the same session, progress was rapid and was followed by fading in the imitation of single word (noun) responses and non-imitative stimulus presentations, many of which were also spoken into the open end of the trumpet. As the session continued, Steven became increasingly exuberant and was obviously delighted by his production of speech. The trumpet reinforcer was subsequently faded step-by-step in the following progression.

1) Fixed ratio of 1 (FR1)

2) Variable ratio of 1 (VR1)

3) Variable ratio of 3 (VR3)

4) Placed within reach on the table such that Steven could reinforce himself if and when he chose to do so, contingent upon the emission of an appropriate response.

5) Placed out of reach but within view

6) Placed out of reach and partially hidden

7) Withdrawn from training sessions

Fading procedures were completed by the beginning of the

Spring term of 1979. Verbal responses were maintained thereafter by the delivery of physical and verbal reinforcement.

Steven's early language training was designed to develop non-imitative single word responses as rapidly as possible. For this reason, therefore, vocal sound imitations and imitative and non-imitative single word responses were trained concurrently in the first three training sessions, after which vocal sound imitative response modelling was terminated. Throughout training, one, two and three syllable words were intermixed and randomly presented in the sessions such that performance levels in each syllabic category were not systematically recorded.

Criterion learning over 29 sessions was erratic and inconsistently achieved in both imitative and non-imitative single word response categories, as shown in figure 5-1 and figure 5-2 (more detail is provided in tables 5-1 and 5-2 in Volume 2, Appendix D). Initial generalisation probes were subsequently conducted in which the production of one syllable words was differentiated from two and three syllable words. Figure 5-2 shows a higher correct response ratio in the generalisation of one syllable words than in two and three syllable words, clearly demonstrating Steven's difficulties in articulating syllabically complex words.

Steven's difficulties were observed by the teacher-experimenter in the first weeks of training, during which repeated trials of imitative response modelling were not producing significant improvements in his articulation of multi-syllable words. In an attempt to enhance the development of more syllabically complex utterances, the decision was taken to incorporate an additional training sequence in which two separate words (my+noun) were presented. Six body-oriented stimulus items were selected for training (my nose, my mouth, my hair, my ears, my eyes, my hands) and additional stimuli (gestural cues) were used to facilitate word discrimination.

During training, gestural cues (pointing) were systematically presented simultaneously with the production of the pronoun and the noun. Steven was manually prompted to point to himself on the emission of 'my', followed by the teacher-experimenter touching or pointing to each body part paired with the production of each noun. Imitative response models and gestural cues were faded to silent, visually exaggerated mouth cues, which were also gradually faded out. By this time Steven was able to produce two-word, non-imitative responses reliably and independently.

It became very clear during training that Steven had particular problems in the auditory perception of similar sounding words and of individual speech sounds. For example, the sequential presentation of 'my hair' and 'my

eyes' invariably caused error and confusion in Steven's verbal responses.

It was during this phase in training that Steven began to produce whispered responses, a pattern of behaviour that continued intermittently throughout the training programme and which seemed to occur as a result of, 1) auditory misperception (as above), 2) high levels of demand within the sessions, 3) cararrhal infections. Whispering behaviour within the sessions was subsequently managed by adult requests for audible speech followed by the delivery of verbal reinforcement (Good, that's right, I can hear you), contingent upon the emission of "heard" responses.

The training of two-word (my+nouns) utterances and the training of one, two and three syllable single words overlapped for a period of approximately six weeks, whereupon the training of single word utterances was terminated. It should be noted, however, that while the training sequences temporarily overlapped, each response category was trained distinctively in separate sessions. My+noun training began with imitative response model presentations which were discontinued after a total of 27 sessions. Four weeks after the commencement of training, non-imitative stimulus presentations were introduced; these were terminated after a total of 15 sessions. Criterion learning was reliably achieved in both imitative and non-imitative response categories over a total of 33 sessions during a period of approximately 12 weeks (see

table 5-3, figure 5-3; table 5-4, figure 5-4 in Volume 2, Appendix D).

Finally, it must be emphasised that my+noun was trained exclusively as a mediating response to expedite Steven's production of multi-syllabic utterances so that he could proceed through the programme to the grammatical training sequences. Throughout, no attempt was made to teach the form or function of possession. The sequence therefore, represented a special strategy for the remediation of an idiosyncratic learning pattern. For this reason, no other child in the experimental group received training in this step.

In the next training step, Steven was taught to label personal actions (verb-ing/prep). Six actions were used to teach the response (sitting down, standing up, drawing, clapping, jumping, walking). However, in the first ten sessions only three actions were presented (standing up, sitting down, drawing).

Teaching began with modelled demonstrations of each action by the teacher-experimenter paired with the stimulus question, "what am I doing?" followed by an imitative response model presentation of the verbal response. This was then followed by verbally requesting Steven to perform the action accompanied by the stimulus question "what are you doing?", and a repetition of the imitative response model. Intonational stress was placed on the verb stem

and the present participle. Action demonstrations were faded followed by fading out the imitative response model presentations.

Initially, Steven's non-imitative responses comprised the emission of the verb stem only; this was remediated by partially prompting the verb inflection. Steven also had particular difficulties in producing verb-ing+preposition constructions (sitting down, standing up). This was overcome by the presentation of inflectional voice cues on the present participle and the preposition accompanied by a gestural cue of an upward or downward movement of the hand appropriate to each prepositional phrase. Voiced prompting of each response element was gradually faded to silent visually exaggerated mouth cues which in turn were faded out. Gestural cueing was continued and then also gradually faded, by which time Steven was able to produce the responses independently.

Steven's auditory impairments initially caused confusion in the perception of the phoneme w such that for a while he articulated the verb, walking as "dalkin'" or "galkin'". In addition, he sometimes produced phonemic reversals within words; for example, the verbal response "clapping" was articulated as "palling". These difficulties were gradually overcome by modelling each phoneme or consonantal blend in a more exaggerated form than would normally occur in everyday speech, followed by fading in the usual way.

The pronoun I and the uncontracted and contracted verbal auxiliary (am, 'm) were combined with verb-ing and introduced during the eighth training session and continued thereafter for a total of five sessions. Figure 5-3 shows that Steven achieved a high ratio of correct imitations in this structure. However, whispering behaviour also substantially increased during the sessions. It was decided to abandon the addition of the pronoun and verbal auxiliary and concentrate instead on the development of the elliptical verb-ing response. The termination of pronoun training resulted in some reduction in whispered responses. Nevertheless, the behaviour continued throughout the duration of training action labelling.

Imitative responses and non-imitative responses were trained concurrently in a total of 14 sessions. Steven's development of imitative responses is shown in figure 5-3. In addition it should be noted that imitative response modelling in sessions 17 and 18 was presented to prompt the emission of audible responses after verbal requests had failed to produce the desired response. Non-imitative responses were trained exclusively from the eighteenth session during which criterion learning was frequently achieved (see figure 5-4). However, because a significant proportion of correct responses were whispered, training was continued until criterion learning was achieved with clearly audible responses. This occurred in the two final

training sessions. Audible responding was sustained in the initial generalisation probes during which Steven successfully generalised trained responses to unfamiliar action referents (see figure 5-4). (Further details of the development of imitative and non-imitative responses are given in tables 5-5 and 5-6 in Volume 2, Appendix D.)

Steven was next taught to label person and actions (subject+verb-ing). During the first training session, imitative responses were trained exclusively followed by two further training sessions in which imitative responses were trained concurrently with non-imitative responses. Criterion learning in this sequence was achieved in the sixth training session over a total period of 10 days (see table 5-7, figure 5-7 in Volume 2, Appendix D).

The final step in Steven's language training was a continuation of the development of labelling persons and actions with the addition of the determiner 'a' (a+subject+verb-ing) (see table 5-7, figure 5-7 in Volume 2). Training was terminated before completion owing to the fact that the language training section of the study was finished. It is worth noting, however, that repeated trials of imitative response modelling were substantially reduced in these final training steps. Moreover, Steven's learning and acquisition of the labelling persons and actions construction was more rapid than that of other forms at any other time in training.

Overall, these developments cannot be separated from the potential effects of video training on Steven's language learning. Steven began in video training by practising object labelling in the singular form (it's a noun) during which he was required only to produce single word (noun) responses. In addition he received video training in the plural form (they're nouns).

Here again, he was required only to verbalise a single word (noun) plural response. At the beginning of the Autumn term he was introduced to the persons/actions/things training programme. This however, was intended to provide him with additional exposure and practice in the production of verb-ing, action labels. He was not therefore required to produce fully grammatical sentence structures. Nevertheless, exposure to repeated video presentation of the sentence structure - it's a subject+verb-ing, may well have contributed to his apparent ease in learning the subject+verb-ing response.

4 Generalisation and training for generalisation - Observations

Training for generalisation began at the beginning of February in the Spring term of 1979, by which time Steven was still being taught single word object labelling and had recently started learning two word (my+noun) utterances. Although he was still having difficulty in articulating multi-syllable words, he was at this time

reliably producing monosyllabic object labels.

Steven's production of single words was however strictly confined to the highly structured context of the training sessions. It was necessary therefore to supplement his language training with additional strategies which would facilitate classroom usage of one-word labelling responses. Attempts were made to elicit the requisite responses by presenting unfamiliar objects accompanied by familiar stimulus questions. However, these were met with total silence. The tactic was changed so that imitative response models only were presented. This strategy succeeded in obtaining imitative responses from Steven.

The care assistant then began to approach him and to model appropriate labelling responses. Again, Steven responded with his customary silence. However, prolonged persistence on the part of the care assistant eventually succeeded and Steven began to produce matched verbal responses. Imitative response modelling was faded over time and was succeeded by the presentation of stimulus questions only. As Steven's language training progressed, each new structure was gradually elicited in the natural setting of the classroom so that generalisation training increasingly paralleled language training; that is, responses were progressively shaped and elicited in the classroom setting before criterion learning was achieved in the training sessions.

Here again, this may well have contributed to Steven's enhanced learning and acquisition of labelling persons and actions (subject+verb-ing).

Steven's tendency not to respond to requests from adults for specific verbal response meant that his progress in generalisation training was slow and very gradual and it was some time before he had sufficient confidence to initiate interaction with adults and peers. This, however, started to happen towards the end of the Summer term in 1979. Steven began to call adults and peers by name and to use imperatives (eg, come here). Furthermore, his parents unexpectedly arrived in school one morning and in contrast to their previous assertions delightedly announced that Steven had spoken; that is, he had replied affirmatively ('yes') upon hearing his name and he had also used single words to label and request objects.

5 Mid-intervention and post-intervention generalisation probes and norm-referenced testing - Results

In the generalisation test probes, object labelling (single word (noun) utterances) and two-word utterances were tested in post-test 1 and re-tested in post-test 2. The maintenance of learning action labelling (personal actions) (verb-ing) was also tested in post-test 2.

In post-test 3 the generalisation of object labelling was again tested and included the production of singular and

plural noun forms. In addition, testing was conducted for the generalisation of labelling responses to untrained forms (proper nouns) for naming adults and peers in the environment. It should be noted that owing to experimenter error this structure was not tested in the high structure test conducted by the teacher-experimenter.

Generalisation of action labelling to describe personal actions, the actions of others (verb-ing) and persons and actions (subject+verb-ing) was also tested in this phase of the probes. Two word utterances of the my+noun type were not included in post-test 3, since by this time Steven was producing multisyllabic words and had entered the grammatical sequences of the training programme. The production of my+noun was therefore no longer relevant to Steven's development and use of expressive language.

Figure 5-5 shows that Steven's generalisation of single-word (noun) labelling responses in post-test 1 was higher with trainers 1 and 2 in the high structure setting of condition A than in the semi-structured setting of condition B. Furthermore, maximum levels of generalisation in condition A were obtained with the teacher-experimenter (trainer 1) and minimum levels were obtained with the non-trainer. Paradoxically, however, Steven's highest generalisation scores in condition B were obtained with the non-trainer and although this occurred in July, by which time this experimenter had become familiar to Steven, this result nevertheless represented a

positive development (more detail is given in table 5-9, in Volume 2, Appendix D).

Steven's generalisation of two-word utterances (my+noun) in post-test 1 was significantly lower (less than 40%) across all experimenters in each test condition, lowest scores being obtained with the non-trainer (see table 5-9, figure 5-9 in Volume 2, Appendix D). Overall, the low level of generalisation in this form was characterised by a high frequency of no responses rather than resulting from incorrect verbal responses.

In post-test 2 (figure 5-6; see also table 5-9 in Volume 2), Steven's generalisation of object labelling in sub-test I, was lower than in condition A, post-test 1 with the teacher-experimenter (T.1) and the care assistant (T.2), suggesting a slight fall in Steven's responding over the six-week Summer vacation period. However, the improvement in Steven's response rate in sub-test II, five days later, gives some indication of the facilitating effects of exposure to a classroom environment in which language responses were obligatory rather than optional.

Steven's retention of action labelling (verb-ing) over the Summer holiday was tested in post-test 2 through presentation of response items used in the training sessions. Inappropriate responses were not however prompted and correct responses were unreinforced. Figure 5-6 shows that Steven's response rate was stable across

sub-tests I and II, indicating that his learning of verb-ing responses had been reasonably maintained over the school holiday.

In the highly structured test of post-test 3 (figure 5-7) conducted by the teacher-experimenter (T.1) Steven's generalisation of noun (singular) object labels was substantially higher than in post-test 1, condition A and post-test 2. Furthermore, figure 5-8 shows that the high levels of generalisation obtained in the highly structured setting with trainer 1, were maintained with trainers 1 and 2 in the natural settings of the classroom and the school environment. Moreover, although Steven did not initially respond well with the non-trainer in the early stages of testing, his responding improved dramatically thereafter. Furthermore, Steven's generalisation with this experimenter was higher than with the non-trainer in condition B on post-test 1.

Steven's ability to label objects also generalised to the plural form. Moderate levels of generalisation occurred in the highly structured setting (see table 5-11, figure 5-11 in Volume 2, Appendix D), and also in the classroom setting across experimenters (see table 5-13, figure 5-13 in Volume 2, Appendix D), although this was lower than his production of the singular. In addition, Steven showed that he was capable of generalising noun labelling responses to the use of proper nouns (see table 5-14, figure 5-14 in Volume 2, Appendix D). Interestingly,

Steven's generalisation of this form was higher than the plural in which he had received video training. However, labelling persons had frequently been elicited in generalisation training and Steven's ability to use this form was clearly a result of that.

Action labelling (verb-ing/prep) of personal actions was generalised less in the highly structured test than descriptions of the actions of others (see figure 5-7). For scoring purposes, these response categories were subsumed in testing for generalisation in low structured settings. However, figure 5-9 shows a general trend towards high levels of generalisation across experimenters. In addition, Steven demonstrated his ability to generalise labelling of persons and actions (subject+verb-ing) which at the time of post-test 3 was a new addition to his learning.

Moderate generalisation occurred in the structured test (see table 5-11, figure 5-11 in Volume 2, Appendix D) and although high levels of generalisation were initially achieved with trainer 1 and the non-trainer in natural contexts, in the later stages of testing this was sustained only with the teacher-experimenter. Steven's responding progressively declined with the care assistant (T.2) and decreased to zero with the non-trainer (see table 5-16, figure 5-16 in Volume 2, Appendix D). The reasons for this are unclear. However, it seems reasonable to assume that Steven's learning was

insufficiently consolidated, so that as the post-intervention period extended his ability to generalise correspondingly declined.

Throughout the tests Steven reliably demonstrated his ability to produce noun labelling responses of more than one syllable. Furthermore, during the post-test 3 period he began to combine the determiner a with the noun in object labelling. It is interesting to note that this occurred in December after the commencement of language training in the sentence structure a+subject+verb-ing/(prep).

In addition, he had practised object and action labelling in video training in which he had received repeated exposure to video language models of the sentence structures, it's+a+noun and it's+a+subject+verb-ing (object)(prep). The facilitating effects of video training may also account for Steven's production of the elaborated untrained sentence forms, it's+a+subject+verb-ing+object and a+subject+verb-ing on which criterion learning had not been achieved. A list of elicited a+noun combinations and elaborated forms is given on pp 184-185. Spontaneous utterances are also shown.

Finally, no significant changes occurred in Steven's mid-intervention and post-intervention norm-referenced test scores as compared with his baseline levels. Mid-intervention, he obtained a raw score of 18 on the

Columbia Mental Maturity Scales, 15 on the Reynell verbal comprehension test and 7 on the EPVT. Post-intervention, his scores were 17 on the CMMS, 21 on the Reynell and 3 on the EPVT.

6 Discussion

The foregoing account clearly indicates that operant techniques of imitation, reinforcement, shaping and fading were successful in establishing functional speech in Steven, who at baseline was functionally non-verbal.

Moreover, the implementation of special teaching strategies which deviated from the intended teaching sequence in the early stages of the programme were successful in eliminating Steven's initial difficulties in producing more syllabically complex utterances.

The provision of a classroom environment in which one-to-one language teaching, video training and the elicition of trained language responses in a variety of contexts continually interacted, gradually resulted in accelerating Steven's learning and production of new forms and undoubtedly accounted for his performance in the generalisation probe tests. Initially, Steven's generalisation of trained responses was higher in contexts that approximated the highly structured conditions of the training setting. In post-test 3, however, Steven was generalising utterances in response to stimulus questions

presented in situations in which he was usually engaged in a variety of activities and in which he would often be interacting with another child. Furthermore, he was also beginning to produce spoken language spontaneously.

At the close of the intervention programme, the form and function of Steven's language was still restricted in nature. Nevertheless, over a total period of sixteen months, he had moved from a baseline level of no speech to a point at which he was consistently and reliably producing one and two word utterances in a variety of contexts with a variety of people. There was still a great deal more language teaching and learning to be done; but in a relatively short period of time, Steven had become more assertive, more confident and was verbally communicating with a social environment in which hitherto he had remained a silent observer.

Fig.5-1

Steven - Language Training
Progress in Learning the imitation of Vocal Sounds and Single Words
(single-word utterances) - NOUN

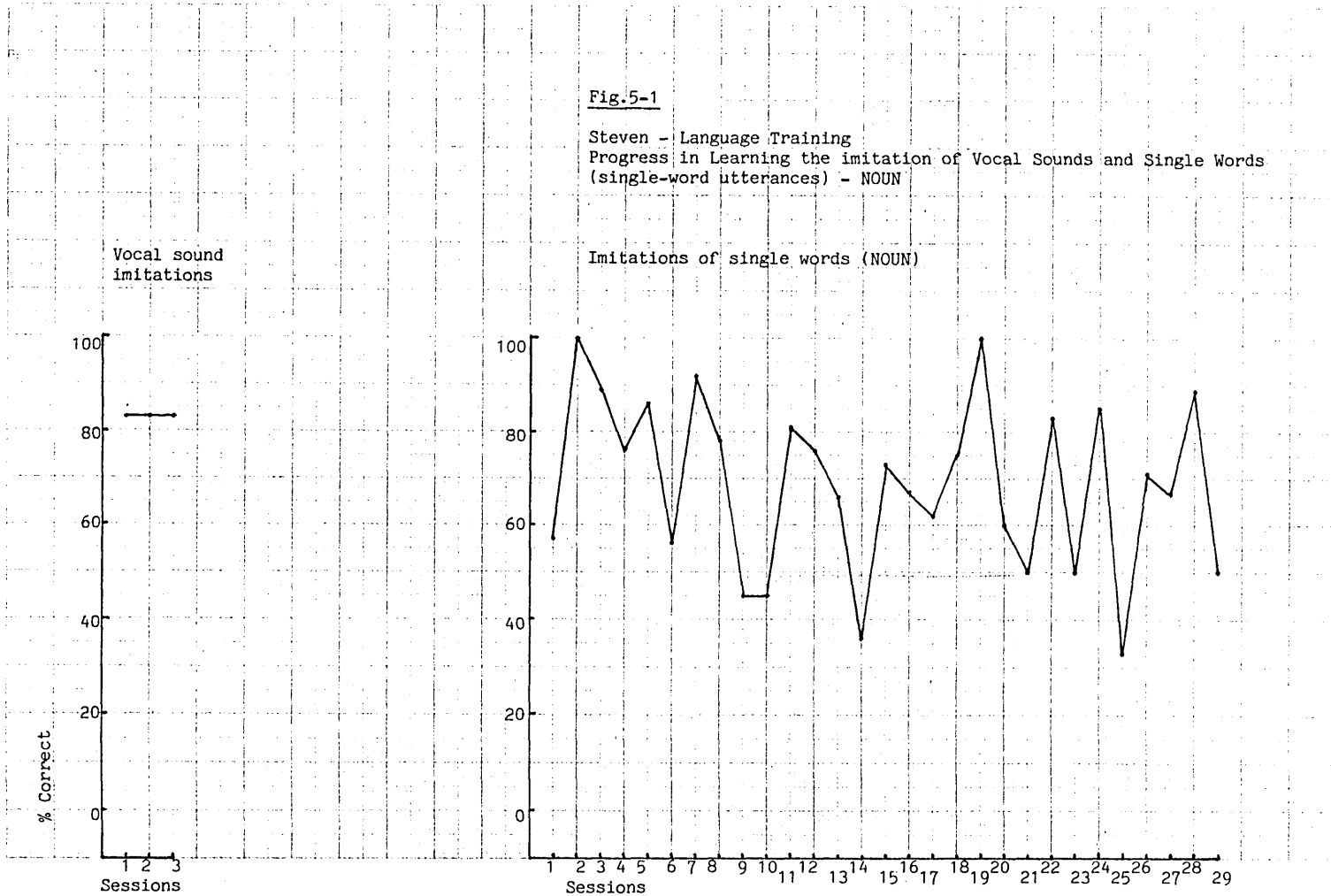


Fig. 5-2

Steven - Language Training
Progress in Learning Labelling - Objects (Singular)
STRUCTURE - NOUN

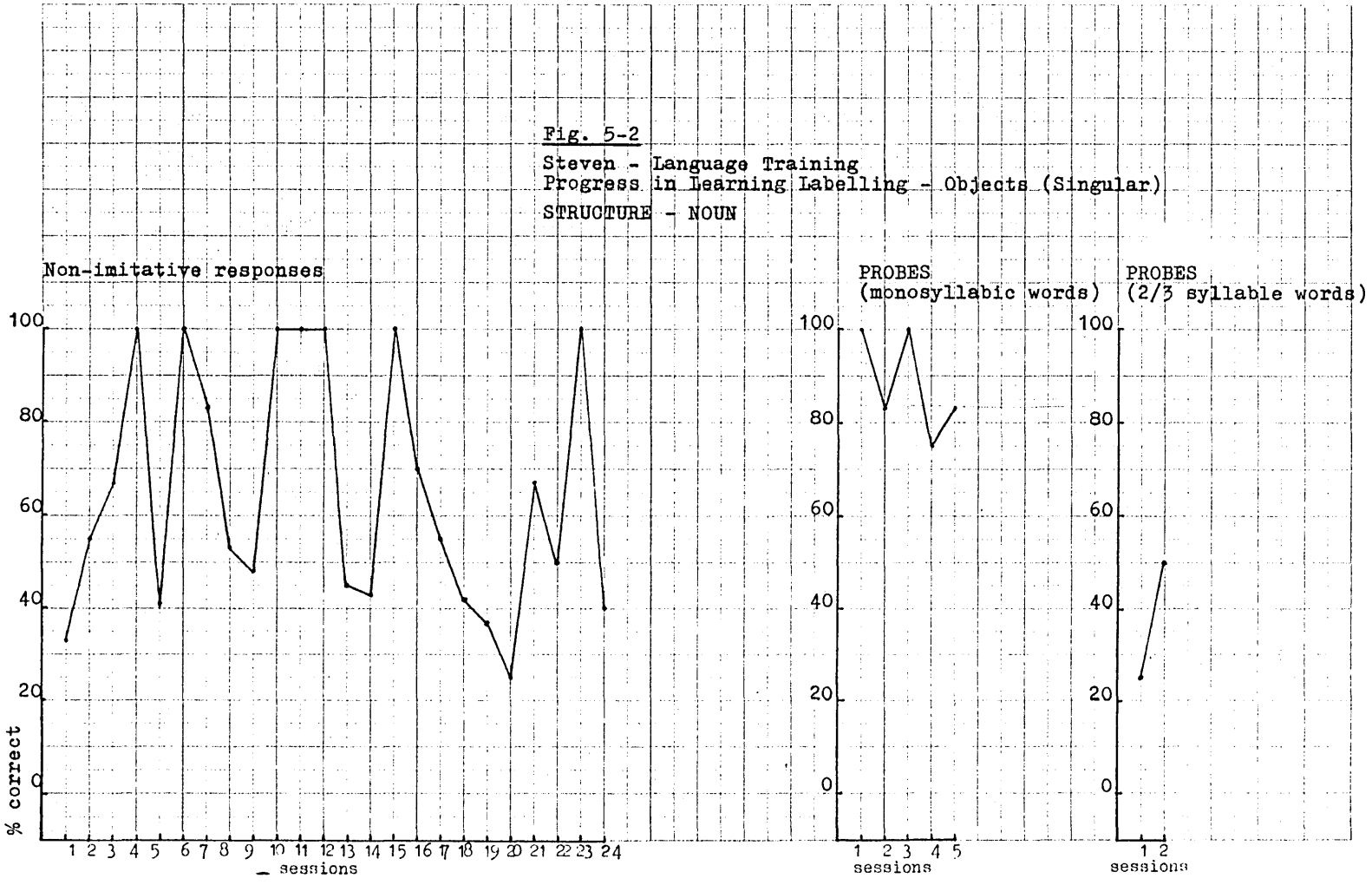


Fig.5-3

Steven - Language Training - Progress in Learning
Labelling - Actions (Personal)
STRUCTURE - VERB-ING (PREP)/I AM/I'M VERB-ING

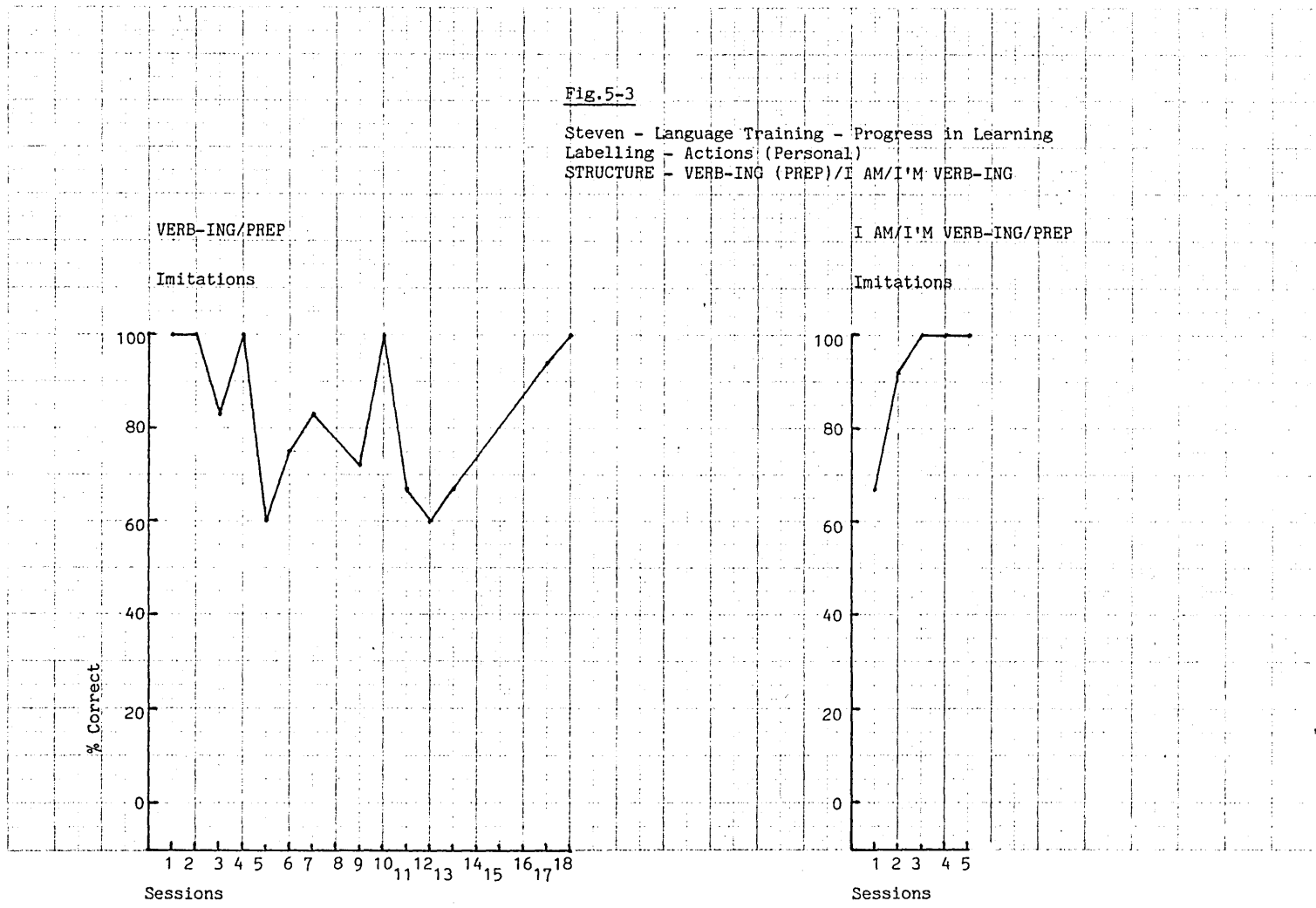


Fig.5-4

Steven - Language Training - Progress in Learning Labelling - Actions (Personal)

STRUCTURE - VERB-ING /(PREP)

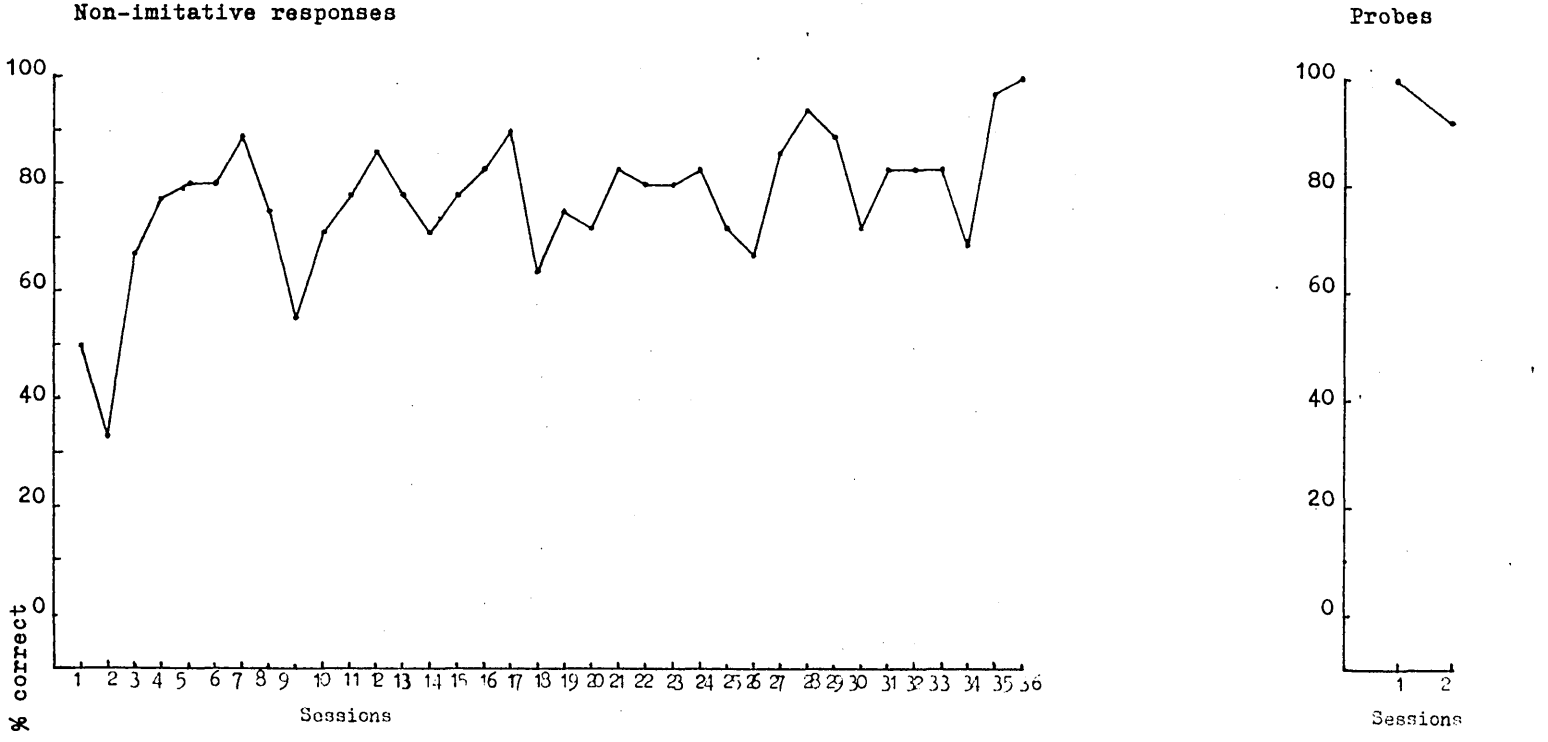


Fig.5-5

Steven - POST-TEST 1 - Generalisation Probes
Training Category - Labelling - Objects (Singular)
STRUCTURE - NOUN
Generalisations in Test Conditions A and B

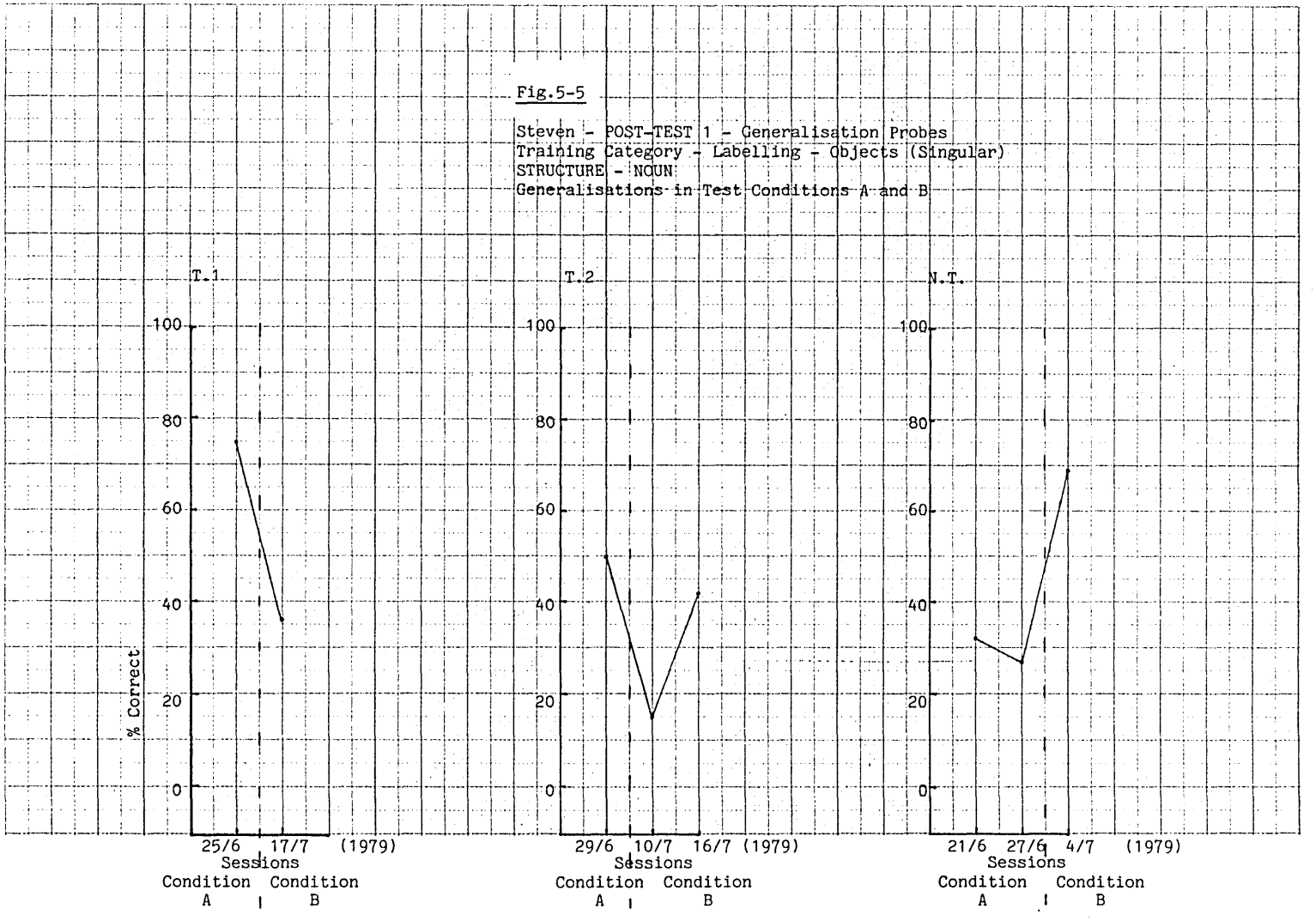


Fig.5-6

Steven - POST-TEST 2 - Generalisation Probes
Training Category - Labelling Objects (Singular) Labelling Actions (Personal)
Generalisations in Sub-tests I and II

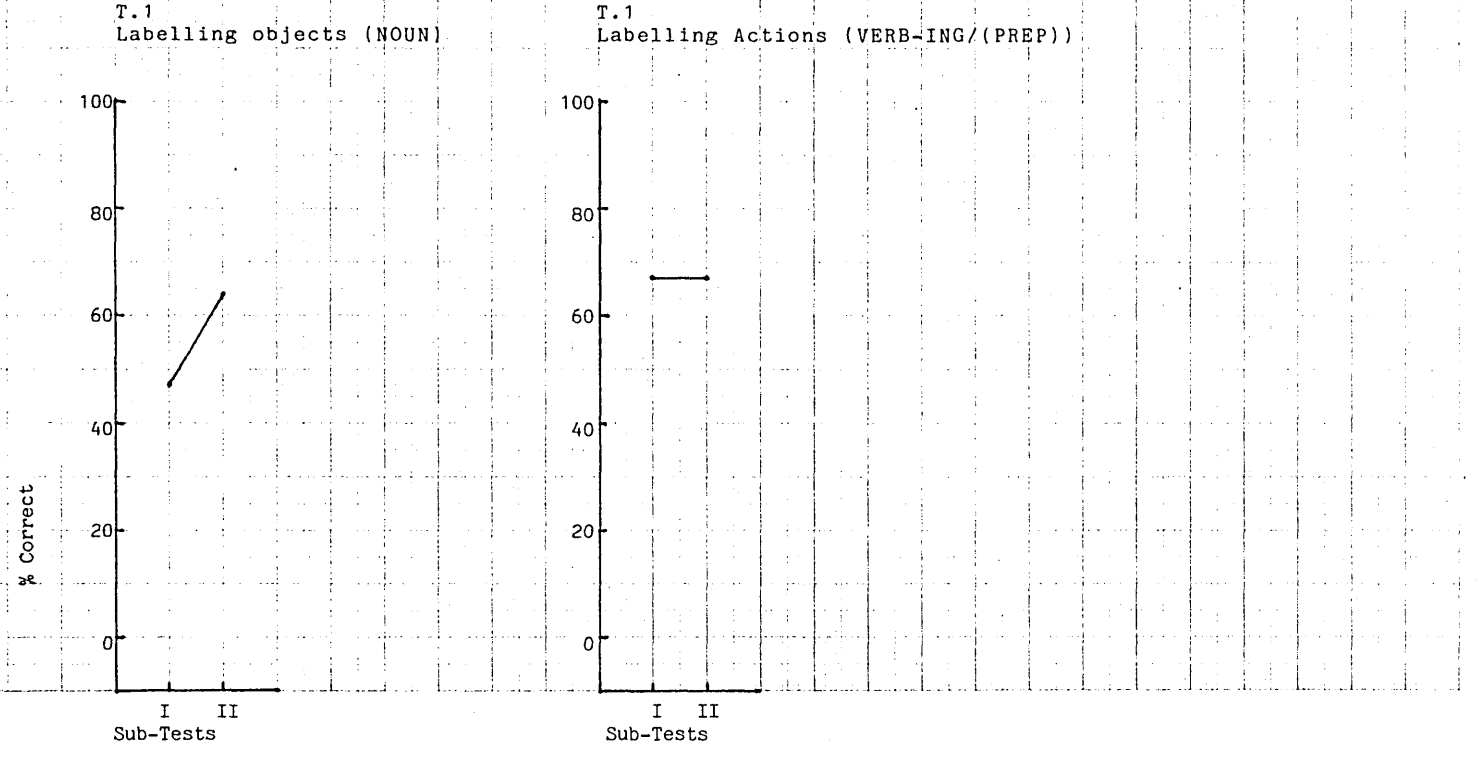


Fig. 5-7

Steven - POST-TEST 3 - Generalisation Probes - (High Structure) Generalisations

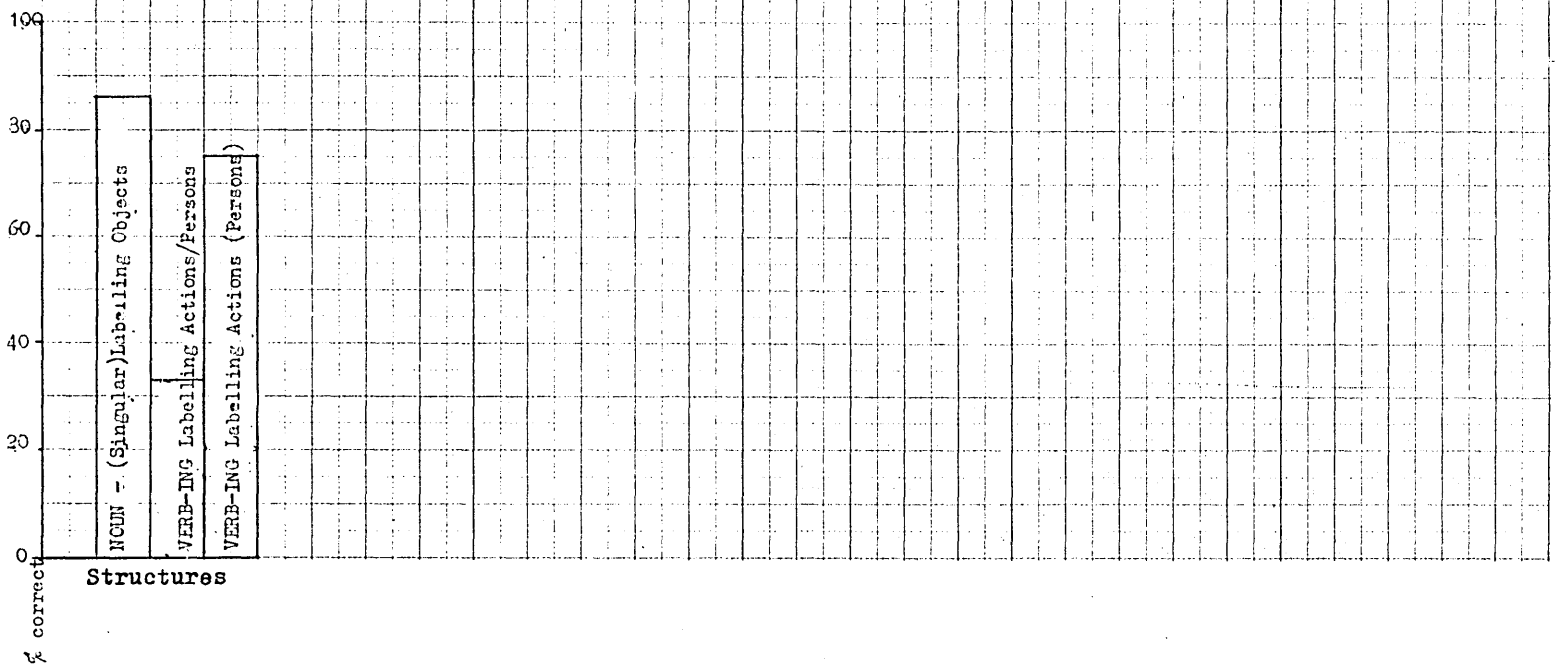


Fig.5-8

Steven - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Labelling Objects (Singular)
STRUCTURE - NOUN

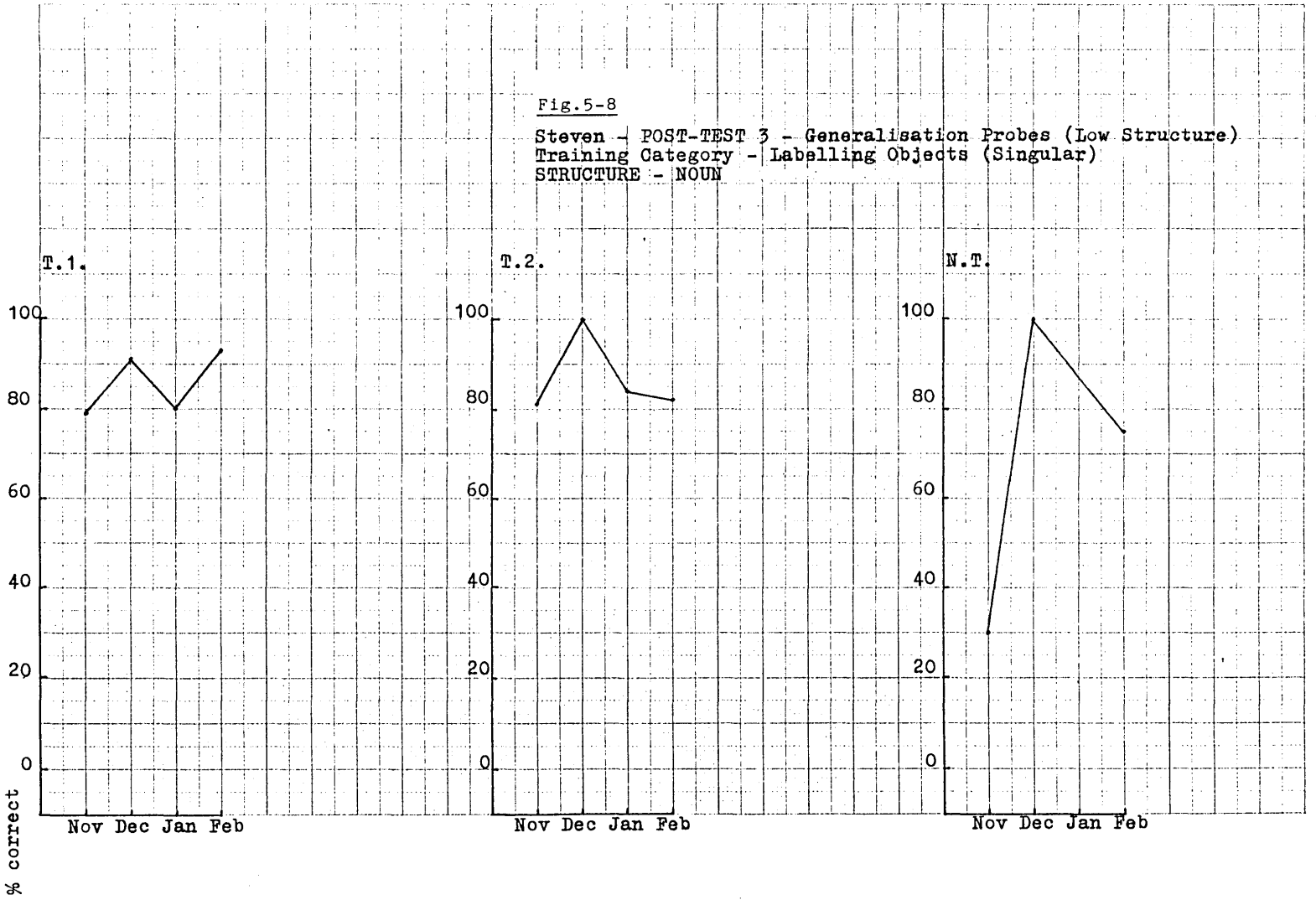
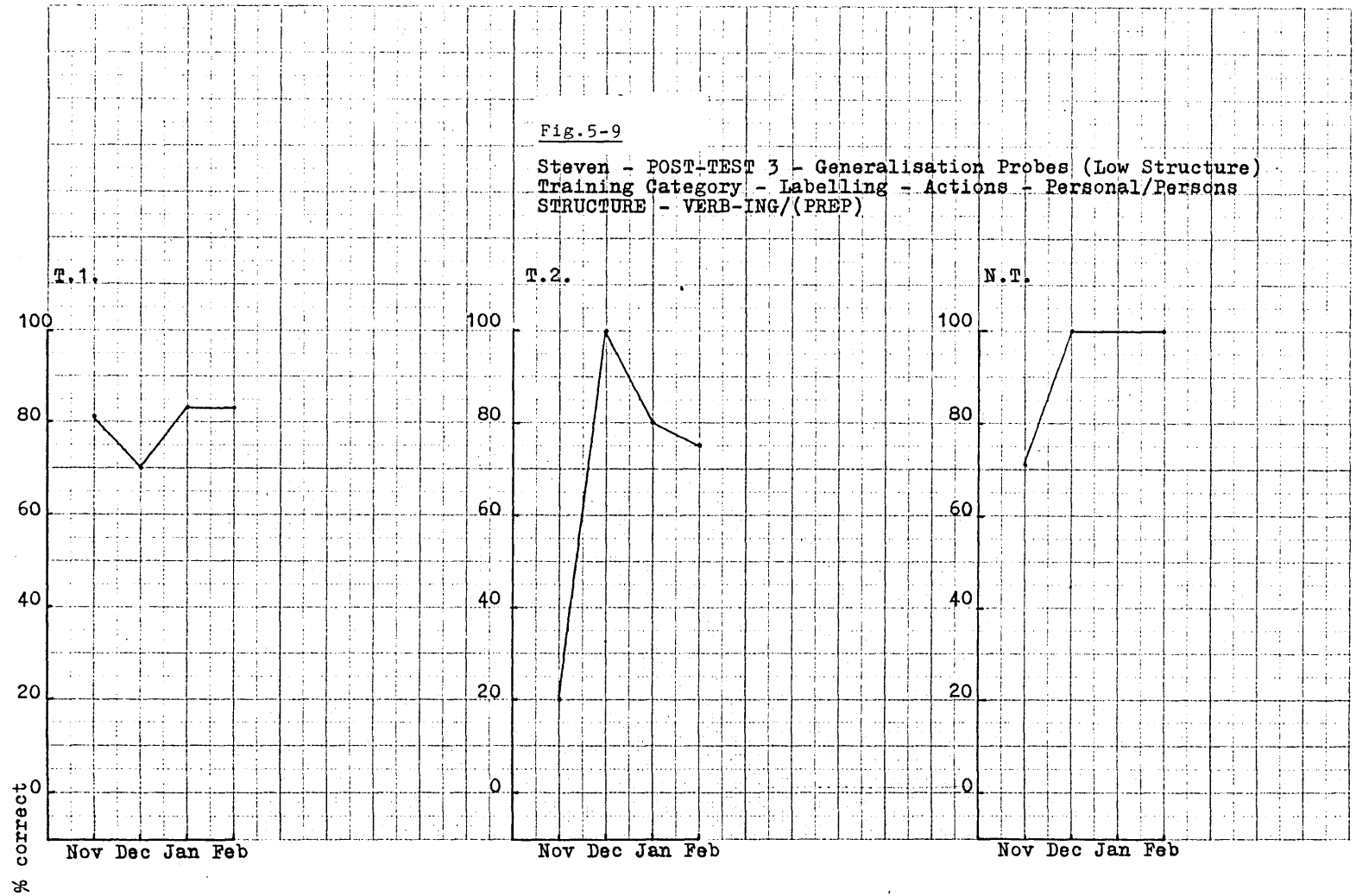


Fig.5-9

Steven - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Labelling - Actions - Personal/Persons
STRUCTURE - VERB-ING/(PREP)



Steven - Generalisations

POST-TEST 3

Determiner 'a': Generalisation to Labelling Objects
in elicited responses

A + NOUN	Date	Adult	Context
a car	4/12/79	T.1.	3/4
a house	14/12/79	T.2.	3
a nose	8/1/80	T.2.	2
a pen a watch a spoon	10/1/80	T.1.	2
a nose	15/1/80	T.2.	1
a coat a book a shoe a nose	17/1/80	T.1.	1
a nose	17/1/80	T.2.	2
a coat a book a book a hat a sock	24/1/80	T.1.	1
a shoe	28/1/80	T.2.	3
a nose	29/1/80	T.2.	1
a book a house a tree a horse	1/2/80	T.1.	2
a book a bag a nose a door	6/2/80	T.2.	1
a boy a book a dog a car a lorry a clock a ball a toothbrush a telephone	7/2/80	T.1.	3

Steven - Generalisations

POST-TEST 3 - Trained Forms

Determiner 'a': Generalisation to Labelling Objects
in elicited responses

A + NOUN	Date	Adult	Context
a nose	11/2/80	T.2.	2
a bowl	13/2/80	N.T.	3
a hat a shoe	27/2/80	T.1.	3
a pen a nose a bun a floor	29/2/80	T.2.	2
a bag	undated	T.2	3
elaborated forms - (elicited)			
a man throwing a ball	27/2/80	T.1.	3
a girl reading a book it's a man drink a milk	29/2/80	T.2.	2
untrained forms - (unelicited)			
here, Mrs Wright (indicating television)	7/11/79	T.1.	2/4
Nicola here line here here/here here draw (utterances directed to a peer drawing) shoes here	9/11/79	T.1.	2/3

CHAPTER SIX

CASE STUDY 2 - JAMIE

1 The child and his environment

2 Pre-intervention assessment - Results

3 Progress and learning in language and video training

4 Generalisation and training for generalisation - Observations

5 Mid-intervention and post-intervention generalisation probes and norm-referenced testing - Results

6 Discussion

Figures referred to in this Chapter are to be found on pages 213-226, before the Supplementary (generalisation data) pages

CHAPTER SIX

1 The child and his environment

Jamie was a 10 year old child with Down's Syndrome who was the youngest of four children in a single parent, working class West Indian family. At the age of six he was admitted to a children's hospital for the severely subnormal and after two and a half years was transferred to a local authority residential unit for severely subnormal children, where he continued to live throughout the course of the study. For a time, Jamie often returned home at weekends. Unfortunately, his mother then moved to the Midlands and contact between Jamie and his family became less frequent and had virtually ceased by the commencement of the study.

Medical and educational reports of Jamie's development recorded a history of speech and language difficulties and the onset of behaviour problems after his admission to institutional care. His articulation was severely impaired such that for the most part his attempts at verbal communication were almost unintelligible. This resulted in a tendency to communicate through the emission of symbolic noises accompanied by gesture or mime. His comprehension was adequate and was demonstrated by his

ability to respond to simple verbal instructions.

Jamie entered the teacher-experimenter's class group at the beginning of the Summer term in 1978 prior to which he was in a class in which the Peabody Language Development Kit had been used. The class teacher reported that while Jamie appeared to enjoy the teaching sessions and had demonstrated a liking for the Peabody puppets, his responses for the most part were gestural only, although he had occasionally attempted to articulate single words to label objects and pictures. During the final weeks of the Summer term, using operant techniques of imitation and reinforcement, the teacher-experimenter conducted one-to-one teaching sessions with Jamie to shape the production of single word object labels as a consistent and reliable response. It should be noted that the objective was not to teach new vocabulary but to establish the articulation of single words already existing in Jamie's receptive language repertoire.

Jamie's social relationships were poor, characterised by aggressive and at times violent behaviour. For example, he would frequently respond to adult or child interactions by kicking or attempting to kick the adult or child concerned. On other occasions he would "clamber up" the adult as if he were climbing a tree and inflict scratches to the adult's face and arms, and if glasses were worn these would be snatched and thrown to the ground. Peers were similarly assaulted, as a result of which they would

sustain scratches to the face and hands. Moreover, he was prone to throwing objects at children and adult staff without observable or undue provocation.

In addition, Jamie adapted with difficulty to adjustments or changes in his immediate social environment; the presence of an unfamiliar adult in the classroom or changes of staff at the children's home or in the classroom environment, all occasioned increases in the behaviours described and a variety of other tantrumous and aversive behaviours which invariably resulted in disruptions in the classroom routine.

Finally, Jamie's ability to participate in representational play was also severely impaired. He did not manipulate play materials functionally or symbolically. Instead, he would empty equipment trays which he then waved in the air, banged repeatedly on the floor or placed in his mouth. As a consequence of the combined behaviours of defective articulation, physical aggression and inability to play, he was a solitary child who was unpopular with children and adults throughout the school.

2 Pre-intervention assessment - Results

At the commencement of the study, Jamie was aged 10 years and seven months. He had a score of 6 on the Columbia Mental Maturity Scales, 29 on the Reynell Verbal

Comprehension Test and 9 on the English Picture Vocabulary Test.

During the pre-intervention assessment sessions, Jamie was unusually co-operative and showed appropriate attending behaviour throughout. His speech consisted predominantly of single-word utterances and in general his response to stimulus questions and pictures was to name the objects represented. His use of prepositions was restricted to the production of 'here' or 'there' accompanied by a pointing response indicating the location of the object.

Moreover, his replies to wh+ing questions requiring the use of the present progressive verb tense also consisted primarily of single-word (noun) utterances. However, Jamie did produce a total of five two-word utterances in response to questions of this type, which demonstrated his ability to produce verb-object ("eat dinner", "hold glass", "drink milk"), subject-verb ("man go") and verb-adverbial ("go bath") relations. Furthermore, he produced two additional utterances comprising the use of the present progressive verb inflection. The first was in response to the question what is the girl doing? to which he replied "doin' that" accompanied by a demonstration of the action depicted in the picture card. However, the second response, "sitting down" was inappropriately produced in response to a picture of a man asleep in a bed.

All other utterances incorporating verb-ing sentence elements and grammatically more complex structures of two or more words were partial repetitions of preceding adult utterances. These were frequently produced when Jamie was unable to supply a verbal response. For example, in response to questions such as "what is the man doing?" he produced verbal repetitions of the two final words (eg, "man doin"). In addition, he was particularly confused by forced alternative questions requiring the production of verb-ing in the response. To questions of this type he invariably produced the second, last heard alternative, irrespective of whether or not it was appropriate.

In summary, Jamie's speech at baseline demonstrated deficiencies in the production of present progressive verb forms and utterances of two or more words. Nevertheless, his partial repetitions of adult utterances demonstrated that, in spite of his articulation impairments, Jamie was capable of imitating structural forms not yet fluently realised in his expressive language repertoire.

3 Progress and learning in language and video training

In the early stages of language training, Jamie showed distractible and restless behaviour. He had a short attention span and was extremely sensitive to failure and to misunderstandings arising from his articulation defects. Incorrect verbal responding and inability to

articulate elements of sentence structure were the antecedents for the onset of "silly behaviours" which included foot stamping, laughter in place of verbal responses, followed by spitting at the teacher-experimenter and attempts to leave the teaching sessions. Spitting behaviour and departures from the sessions were prevented by the teacher-experimenter according to the methods described in Chapter four whilst laughter and foot stamping were controlled through the application of time-out from positive reinforcement.

As training progressed, Jamie attempted to leave the sessions less frequently and other manifestations of "silly behaviour" correspondingly declined as Jamie became increasingly successful in his learning and production of new language forms. Initially, primary (chocolate buttons), "physical" and verbal reinforcement was delivered on a continuous ratio contingent upon each correct response or appropriate approximation. Edible reinforcers were faded during the first weeks of training but were delivered for a time thereafter at the end of each session, contingent upon appropriate verbal behaviour during the session. Physical reinforcement was gradually faded to a variable ratio of three and verbal reinforcement was continued for each correct response or successful approximation.

Given the nature and extent of Jamie's language deficits, pre-intervention language training was designed to

establish an action labelling repertoire and the production and use of extended fully grammatical utterances. However, the severity of Jamie's articulation defects was such that the development of sentence usage necessitated that training commence at a base level of one and two word utterances, followed by systematic training in the gradual addition of individual sentence elements and grammatical constituents. For this reason, the following progression was built into Jamie's early language training programme:

1 .Labelling personal actions

VERB-ING/(PREPOSITION)

2 Labelling actions/things - pictorial referents

VERB-ING/(OBJECT)/(A OBJECT)/(PREPOSITION)

3 Labelling personal actions + the pronoun - I

IAM/I'M VERB-ING(OBJ)/(A OBJ)/(PREP)

4 Labelling persons/actions - pictorial stimuli

SUBJECT+VERB-ING

5 Labelling person/actions/things - pictorial stimuli

SUBJECT+VERB-ING(OBJ)/(A OBJ)/(PREP)

The first two sequences were trained concurrently (although not always in the same sessions) over a period of approximately three months. Six actions were selected for training personal action labels, which in Jamie's case were SITTING DOWN, STANDING UP, DRAWING, WRITING, CLAPPING, WALKING, and six items were used for training action discriminations in response to pictorial referents. Each item was presented six times.

During this period (ie, at the end of November 1978) an attempt was made to introduce the addition of the first person pronoun into the personal action labelling sequence. This however was premature and resulted in confusing Jamie rather than enhancing his production of the response. Training was therefore discontinued and re-introduced during January in the Spring term of 1979, whereupon Jamie rapidly achieved criterion learning.

It should also be noted that during this training period the addition of the object (I AM VERB-ING+OBJECT) was introduced to the training sequence. The action items were therefore adjusted such that CLAPPING was removed from the sequence and replaced by the response. I AM/I'M READING A BOOK. The fourth training step was also introduced during this period. Jamie's progress in learning this structure was however erratic and as training continued his responding along with his behaviour steadily declined. The teacher-experimenter had observed however that during the sessions Jamie was becoming increasingly bored with the pictorial referents used to train the response. This was hardly surprising, since these same six pictures had been repeatedly presented in the second training step.

In an attempt to establish the validity of these observations it was decided to proceed with initial generalisation probes. Four probe sessions were conducted

in which Jamie's responses to unfamiliar referents were consistently above the criterion for learning of 83%, clearly indicating therefore that his declining response rate in the training sessions was a result of boredom rather than of an inability to acquire the response.

The fifth structure was faded into the teaching programme at the end of January 1979 and was trained concurrently with step four over a period of approximately four weeks at which point training in step four was discontinued for a further two weeks. Six different picture cards were used to teach this structure from the outset; Jamie's progress in learning this response was consistently good and steadily improved throughout training. In the initial generalisation probes conducted towards the end of March 1979, he successfully demonstrated his ability to generalise the response to unfamiliar referents. Jamie's progress and learning in the structures described thus far is shown in tables 6-1 to 6-5; figures 6-1 to 6-5 in Volume 2, Appendix E.

In the next teaching step, Jamie was taught to produce the fully grammatical sentence structure, IT'S+A+SUBJECT+VERB-ING+(OBJ)/(PREPOSITION). Here again, six pictures were used to train the response and each item was presented six times. During the final stages of training in Step 5 the additional grammatical constituents (IT'S+A) were faded in by incorporating the response into the verbal reinforcement contingencies for the emission of

subject+verb-ing+object/preposition. This was done by verbally reinforcing Jamie for correctly producing the desired response ("very good, that's right") followed by the presentation of, for example, "yes it's a boy drinking milk"; so that, while Jamie was not yet required to produce the additional sentence elements, he was nevertheless hearing them as a preparation for entry into the next training sequence.

Even so, when training began, Jamie experienced considerable difficulty in correctly producing the extra words and syllables required in the response. Interestingly, however, he did not omit the syllables but instead began by repetitively adding them to IT'S+A (eg, it's-a-a-a) and to the verb stem or present participle (eg, drink-e, drink-e-drink-e-in' milk") or (drink'-kin'-kin' milk etc). This was overcome by prompting it's+a in a louder, more exaggerated form, followed by modelling verb-ing as two separate response segments which were then gradually recombined.

As training progressed, Jamie began to correct his own errors and subsequently achieved criterion learning in the tenth session as shown in figure 6-1. (Additional details are given in table 6-6 in Volume 2, Appendix E.) Unfortunately, however, Jamie failed to generalise the response to unfamiliar referents successfully during the initial probe sessions, and fig 6-1 shows a substantial deterioration in his response rate.

However, it should be noted that five of the probes were conducted immediately prior to Jamie falling ill, resulting in his absence from school in the final week of the school term before the Whitsuntide holiday.

The sixth probe session was conducted during the first week of the new term, during which his response rate deteriorated further. Training was resumed and criterion learning was rapidly re-established as shown in figure 6-2, Retraining 1. Furthermore, Jamie successfully generalised his learning to unfamiliar referents in the following probe sessions. (Retraining 2 is discussed later in the Chapter.)

In the next teaching step, starting in mid-September 1979, Jamie was taught the YES/NO discrimination between objects in the singular (YES IT IS, NO IT ISN'T, IT'S A (NOUN) and plural forms (YES THEY ARE/NO THEY AREN'T/ARE NOT, THEY'RE (NOUNS)). In each discrimination, one set of six pictures was used to teach the singular form and another set of six pictures for teaching the plural form. Each training item was presented once, and all structures were trained concurrently in the same session.

Teaching Jamie to produce YES/NO discriminations was a time consuming and arduous process, which as training progressed necessitated adjustments in the sequence presentations and also systematic elaborations of the prompting and cueing systems used.

During the initial sessions, it was readily apparent that Jamie was finding the production of each discrimination and of the plural forms in particular, difficult to achieve. It was decided therefore to segment imitative response models in each discrimination into smaller response units, for example, yes/they are/, no/they are/n't/they're (nouns).

While some improvements were achieved in Jamie's imitation of the plural forms, there was little corresponding improvement in response differentiation in the negative form across structures. In a previous stage of training (video), Jamie had successfully learnt singular and plural object labelling; in an attempt to enhance response discrimination it was decided therefore to incorporate object labelling in the singular and plural into each drill presentation of the negative form. In addition, this was a strategy intended to build success into the sequences by putting Jamie on firm ground at the beginning of each drill presentation. The stimulus presentations were organised in the following progression:

Teacher	what's this/ what is it/
Response	it's a (noun)/
Teacher	is it a (noun)/
Response	No it isn't, it's a (noun)

Furthermore, partial prompting and intonational stress

were placed on the emission of NO and the contracted and uncontracted negative (n't, not). Nevertheless, after four weeks of training, when asked if a train was a house or if glasses were shoes etc, Jamie continued to respond in the affirmative, indicating that the negative discrimination was not established either conceptually or linguistically. In an attempt to further delineate the distinction, the drills were again adjusted in the following way:

Teacher	what's this/ what is it/
child	it's a (noun)/
Teacher/child	Yes it is/
Teacher	is it a (noun)/
child	No it isn't, it's a (noun)/

Jamie's progress in learning the YES discrimination steadily improved and criterion was reached in both the singular and plural before training was completed. Training was however continued as an integral part of teaching the negative discriminations and was followed by a short period during which he became confused between the singular and plural positive discrimination. However, as training continued, he began increasingly to self-correct and criterion in the positive singular was finally and consistently achieved from the thirty-second session, as shown in figure 6-3 (see also table 6-8 in Volume 2, Appendix E) and in the plural positive from the 33rd session as shown in figure 6-4 (see also table 6-10 in

Volume 2, Appendix E).

However, Jamie's learning and production of the negative continued inconsistently. Figure 6-5 shows that criterion was achieved in the singular on two occasions but was not sustained, while figure 6-6 shows that criterion was never reached in the plural form. (Additional detail is given in tables 6-9 and 6-11 in Volume 2, Appendix E).

Throughout training, Jamie consistently failed to produce the contracted and uncontracted negative reliably. In the later stages of training, however, he eventually began to produce "No they're...", or "No it..." followed by a questioning look at the teacher-experimenter. If prompts were withheld, he would complete the response with the appropriate object label. For example, "No they're (nouns)" or "No it's a (noun)". These responses were therefore functionally appropriate, although they were scored incorrect in the sessions as a result of the omission of the contracted and uncontracted negative.

Jamie's video training programme commenced in March 1979. Object labelling in the singular and plural form (IT'S A (NOUN)/THEY'RE (NOUNS)) was trained from baseline. In addition Jamie received practice in labelling persons/actions/things (IT'S A SUBJECT VERB-ING (OBJ)/(A OBJ)/(PREP)). It should be noted however that Jamie was not required to produce 'IT'S+A' in his verbal responses until training was resumed in the Autumn term,

by which time criterion learning in this structure had been achieved in the "live" language training sessions.

Preposition training from baseline was begun in September 1979. In addition, Jamie's difficulties in learning YES/NO discriminations in "live" language training prompted the decision to supplement the language training session with additional video training exposure and practice in negative singular and plural object discriminations. Throughout the Autumn term, therefore, video training parallelled "live" training in this particular response.

It was very clear from the outset that video training had a high reinforcement value for Jamie; he was always keen to participate in the training sessions and it was sometimes difficult to persuade him to leave the sessions for other children to take their turn. Video training was therefore frequently used as a secondary reinforcer for correct verbal responding and appropriate behaviour in the language training sessions. Jamie was provided with opportunities for "working" with the video programmes without adult supervision.

It is emphasised however that this was not a strategy of convenience for the purpose of "keeping him quiet". Rather, it was assumed that additional exposure to videoed presentations of functional language models, albeit without adult supervision, would, in the long term, be

beneficial to Jamie's progress and development in language learning within the programme. Regular checks were therefore made by the teacher experimenter or the care assistant, throughout each unsupervised session, to ensure that Jamie was producing or attempting to produce appropriate verbal responses to the video presentations.

The checking procedures invariably revealed consistent visual attendance to the screen and the reliable emission of correct responses or verbal approximations. From March to December 1979, Jamie received a total of 33 supervised video training sessions across structures. Unfortunately, it is not possible to give a precise estimate of the total number of unsupervised sessions he received during the study. All that can be said with certainty is that, in general, Jamie was allowed to use the programmes without supervision whenever the video equipment was in use in the classroom.

4 Generalisation and training for generalisation - Observations

Training for generalisation with Jamie began during the Easter term of 1979. Initially, the elicitation of trained language skills was restricted to the classroom setting and was then gradually extended to other areas within the junior unit and elsewhere within the school during the Summer term. From the outset, Jamie responded positively. He began by responding predominantly in

single-word utterances. However, as language training progressed, and as he became more confident, his attempts to communicate verbally increased correspondingly. In addition, his verbalisations increased in structural complexity.

Moreover, Jamie clearly enjoyed the brief interactions between himself, the teacher experimenter and the care assistant - not least because social communication with an attentive, responsive adult who elicited, prompted and reinforced his verbal behaviour in a variety of contexts was a new and hitherto rare experience.

By the middle of the Summer term, Jamie's aggressive, antisocial behaviours had ceased. Instead he was attempting to respond with appropriate speech to initiations from children and adult staff within the classroom setting and the junior unit as a whole. Furthermore, also during this period, he had begun to participate in domestic play routines with other children and was manipulating play materials purposefully.

During the Autumn term, further positive developments were observed. In December he began to play "the video game" in which he practised the preposition training routines of the video training programmes. Typically, he would sit on the floor of the classroom equipped with the lorry and box used in the training sessions and repeat the language

drills as follows:

Lorry/
Box/
Put the lorry in box/
Where's the lorry?/
It's in the box/ etc

He would accompany the 'drills' with appropriate manipulations of the objects. He also began to initiate role play of the language and video training sessions with Steven (Chapter 5), in which he assumed the teacher's role and presented Steven with picture cards and stimulus questions, eg, "what's this"/"what is it?" followed by the presentation of the appropriate imitative response model, "it's a (noun)" etc.

Of interest here was Jamie's ability to generalise spontaneously both the forms and structures trained within the programme and also the wh. questions and verbal directives of the adult stimulus presentations, which he had never been required to produce in the sessions.

5 Mid-intervention and post-intervention generalisation probes and norm-referenced testing - Results

In the generalisation probes of post-tests 1,2 and 3 Jamie was tested for generalisation in the following structures:

1 Object labelling in the singular and plural forms (IT'S A (NOUN)/THEY'RE (NOUNS))

2 Labelling persons - (IT'S PERSON(NAME)). It should be noted that this structure was not directly trained in the language training or video training dimensions of the programme. It was, however, frequently elicited in training for generalisation.

3 Labelling actions - (personal - (I'M/I AM VERB-ING/(OBJ)/(A OBJ)/(PREP).

4 Labelling actions - (persons) - (VERB-ING/ (OBJ)/ (A OBJ)/(PREP).

This response was developed exclusively in relation to pictorial referents. The purpose of testing therefore was to establish whether or not Jamie would generalise the response from pictorial referents to the actions of children and adults with whom he shared his environment.

5 Labelling persons/actions/things - (IT'S A SUBJECT+VERB-ING (OBJ)/(A OBJ)/(PREP)

6 YES/NO discrimination between objects in the singular and plural form (tested only in post-test 3)

7 Prepositional usage (tested only in post-test 3).

Space considerations do not permit detailed discussion and examination of Jamie's test results in all the above structures. For this reason, only the generalisation of labelling persons and actions and things and the yes/no discrimination in the singular and plural forms are examined in detail below. Generalisation test data in all structures is shown in tables 6-12 to 6-46, with accompanying figures 6-12 to 6-46, in Volume 2, Appendix E. In addition, utterances comprising trained forms and structural combinations of trained syntactic structures with untrained syntactic forms, spontaneously produced during the test probes are listed on pp 227-229.

In post-test 1 Jamie demonstrated his ability to label persons/actions/things in response to a variety of unfamiliar referents in test conditions A and B. Figure 6-7 shows that generalisation was consistently high with

the teacher-experimenter (T1) and only slightly lower with the care assistant (T2) in both test conditions. The most erratic scores were obtained with the non-trainer in the highly structured context of condition A (additional details are given in table 6-17 in Volume 2, Appendix E).

Of interest here, however, is that Jamie's scores with the non-trainer in condition B were equivalent to those obtained with trainers 1 and 2 in the same condition. This particular score represented a positive development in Jamie's learning and use of new structural forms. Furthermore, whilst Jamie's verbal responding with the non-trainer was in general poor in condition A, his social behaviour towards her was appropriate from the outset.

Jamie's generalisation of other structures in post-test 1 was comparable with those obtained in labelling persons, actions and things. Predictably, generalisation of structures trained to criterion in the television training dimension of the programme (labelling objects in the singular and plural form) was most successful with the care assistant (T2). Furthermore, the generalisation of structures developed more casually in training for generalisation (it's person (name)) was consistently higher with trainer 1 and 2 in condition B than in condition A. Indeed, the most interesting feature of the test data across all structural forms was that higher levels of generalisation were in general obtained in condition B across experimenters than in the controlled

settings of condition A.

In post-test 2, sub-tests I and II (see figure 6-8), Jamie's ability to generalise in labelling persons/ actions/things had substantially declined as compared with the scores obtained during the previous term in the similar highly structured setting of condition A and also in the semi-structured context of condition B (see table 6-19 in Volume 2, Appendix E).

For this reason, training in IT'S+A+SUBJECT+VERB-ING+(OBJ)/(A OBJ)/(PREP) was resumed and figure 6-2 (re-training 2) shows that Jamie rapidly achieved criterion learning and successfully generalised his responses to unfamiliar referents in the subsequent probes. In general, however, Jamie's scores in all other structures tested in post-test 2 had increased in comparison with scores obtained with the teacher-experimenter in post-test 1 in condition A, and were maintained at the levels achieved with the care assistant in condition A.

In the highly structured test conducted by the teacher-experimenter in post-test 3 (see fig 6-9), Jamie's ability to generalise labelling persons/actions/things had substantially increased in comparison with the scores obtained with the teacher-experimenter in condition A in post-test 1 and in sub-tests I and II, post-test 2. Furthermore, his results were also an improvement on those obtained across experimenters in each condition in post-

test 1. Figure 6-10 shows that generalisation, in the natural settings of post-test 3, was consistently high with trainers 1 and 2 and, furthermore, was higher than in the context of condition B in post-test 1 (see figure 6-7).

Moderate generalisation occurred with the non-trainer and while this represented a slight decrease in Jamie's performance with the non-trainer in condition B in post-test 1, the natural contexts of post-test 3 were linguistically more varied and diverse so that his results here with the non-trainer were arguably an improvement on his previous performance in condition B in post-test 1. (Additional detail is given in tables 6-20 and 6-26 in Volume 2, Appendix E.)

Testing for the generalisation of the YES/NO discrimination commenced in December, 1979. As a result of Jamie's continuing problems with the production of the negative singular and plural forms, it was decided to attempt to elicit the generalisation of the shorter sentence structures, No, it's a (noun)/, No they're (nouns)/ which he had begun to produce consistently in the training sessions. Figure 6-9 shows Jamie's generalisation of these forms, in the highly structured probe of post-test 3.

His results were disappointing; interestingly, however, higher scores were achieved in the plural form in each

discrimination than in the singular form, in which generalisation was minimal (additional details are given in table 6-20 in Volume 2, Appendix E). In the natural settings of post-test 3, Jamie's generalisation of the singular and plural positive discrimination was consistently higher than in the structured probe conducted by the teacher-experimenter. Figure 6-11 shows that generalisation in the singular YES response was higher with trainer 1 than with trainer 2, lowest scores being obtained with the non-trainer. Nevertheless, the level of generalisation achieved with this experimenter was encouraging. (Further details are given in table 6-27 in Volume 2, Appendix E.)

Figure 6-12 shows Jamie's generalisation of the plural positive form in which generalisation was most successful with the care assistant (T2). However, it should be noted that the moderate levels of generalisation achieved with the non-trainer in this structure were commensurate with the scores obtained in the structured probe with the teacher experimenter. Overall, generalisation in the positive discrimination was lower in the plural form than in the singular. (Additional details are shown in table 6-29, Volume 2, Appendix E.) It is worth noting that in addition to the trained form, YES THEY ARE, Jamie's generalisations combined the YES discrimination with the labelling response THEY'RE (NOUNS) previously developed in video training.

Jamie's generalisation of both the singular and plural negative forms was less successful than in the positive discrimination. Figures 6-13 and 6-14 show that generalisation was higher with the teacher experimenter (T1) and the care assistant (T2) than with the non-trainer. Furthermore, as testing continued, generalisation correspondingly declined across experimenters in all but the negative singular in which generalisation was consistently maintained with the teacher-experimenter (T1). (See also tables 6-28 and 6-29 in Volume 2, Appendix E.)

For the most part, Jamie's erratic generalisation of these structures was a result of the re-emergence of his failure to transfer verbally from the singular to the plural, rather than of any difficulty in the verbal differentiation of 'Yes' and 'No'. However, it is interesting to note that Jamie's generalisation of object labelling in the singular and plural was, in general, consistently high across experimenters in post-test 3, suggesting that errors in the production of the singular and plural were specific to the negative discrimination.

While there was variability in Jamie's production and generalisation of some structures tested in post-test 3, the general trend across structural forms was towards high levels of generalisation with the teacher-experimenter (T1) and care assistant (T2) and towards moderate to high levels of generalisation with the non-trainer. Moreover,

his generalisation in post-test 3 was in general higher, across settings and experimenters, than in post tests 1 and 2.

Finally, during the study, Jamie's scores on the Columbia Mental Maturity Scales increased slightly from baseline. Mid-intervention, he achieved a raw score of 14, and a raw score of 16 post-intervention, compared with a baseline raw score of 6. However, raw scores on the Reynell verbal comprehension test decreased from a baseline value of 29 to 24 and 22, mid-intervention and post-intervention respectively. His scores on the EPVT also showed a slight decrease from a baseline score of 9 to a score of 8 mid-intervention and 7 post-intervention.

6 Discussion

Throughout the study, Jamie's learning and acquisition of new structural forms within each dimension of the programme was impressive. Teaching the YES/NO discrimination was however long and difficult, and despite repeated modification in the sequential presentations of the structural drills and supplementary video training, Jamie failed to achieve criterion learning in the negative discrimination after three months of training. Furthermore, his inability in post-test 3 to transfer successfully from the negative singular and plural was further evidence of his difficulties in learning the discrimination. It seems reasonable to conclude that the

introduction of the YES/NO discrimination at this stage in Jamie's language learning was premature.

During a period of sixteen months, Jamie progressed from a baseline in which his verbal communication was restricted to a labelling vocabulary of single word utterances consisting predominantly of nouns, to the production and use of appropriate phrases and fully grammatical sentence structures in a variety of contexts with a variety of people. Furthermore, his deviant, anti-social behaviours which at baseline were a constant feature of his interactions with the social environment were replaced by appropriate verbal communication and an ability to engage in joint activities with adults and co-operative play routines with peers.

Finally, although Jamie's articulation remained defective at the termination of the teaching programme, this also had shown significant improvements during training. Jamie had indeed come a long way, in a relatively short period of time.

Fig.6-1

Jamie - Language Training - Progress in Learning Labelling - Persons/Actions/Things
STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)(AOBJ/(PREP)

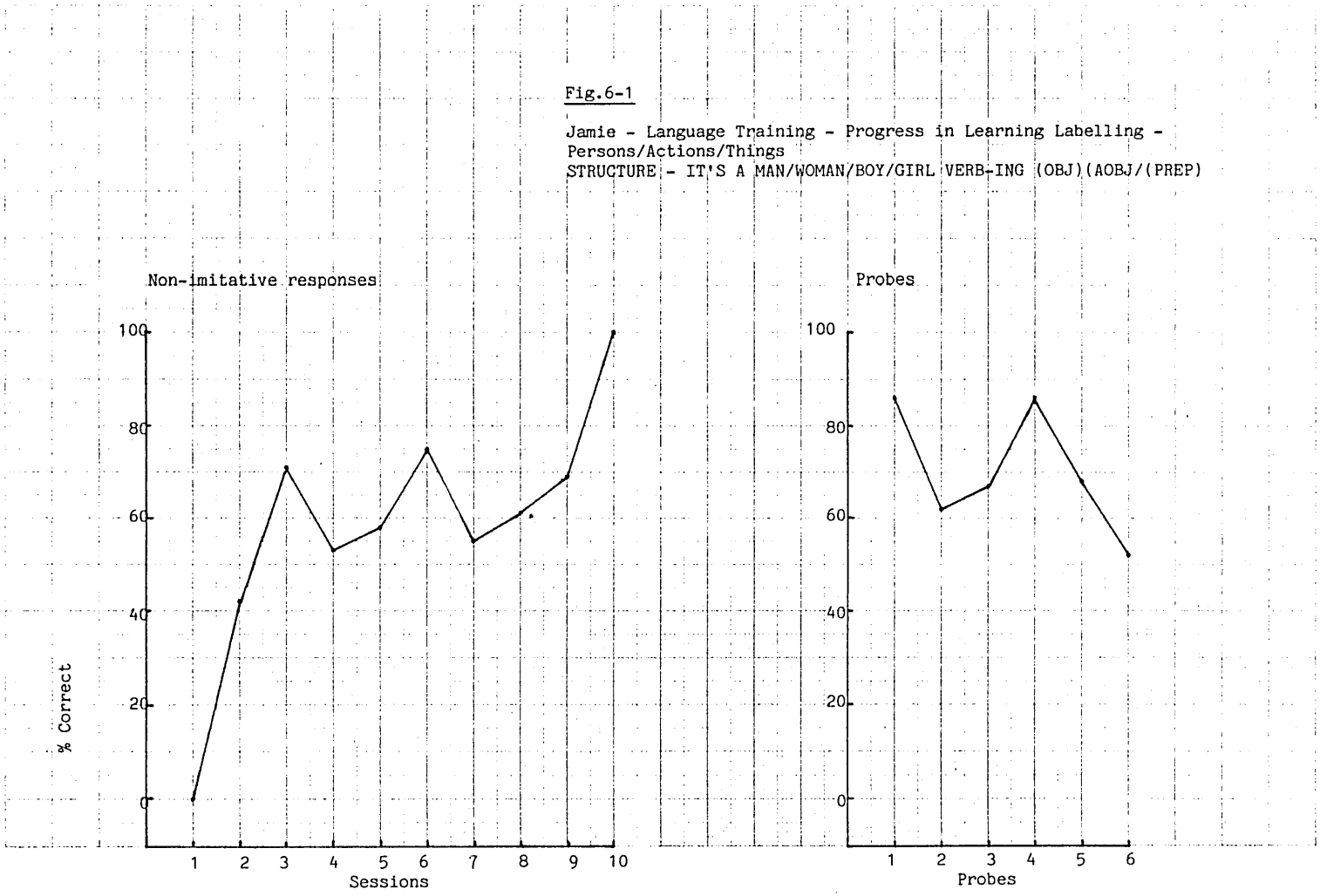


Fig.6-2

Jamie - Language Training - progress in Learning Labelling - Persons/Actions/Things - (Re-training)
STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(AOBJ)/(PREP)

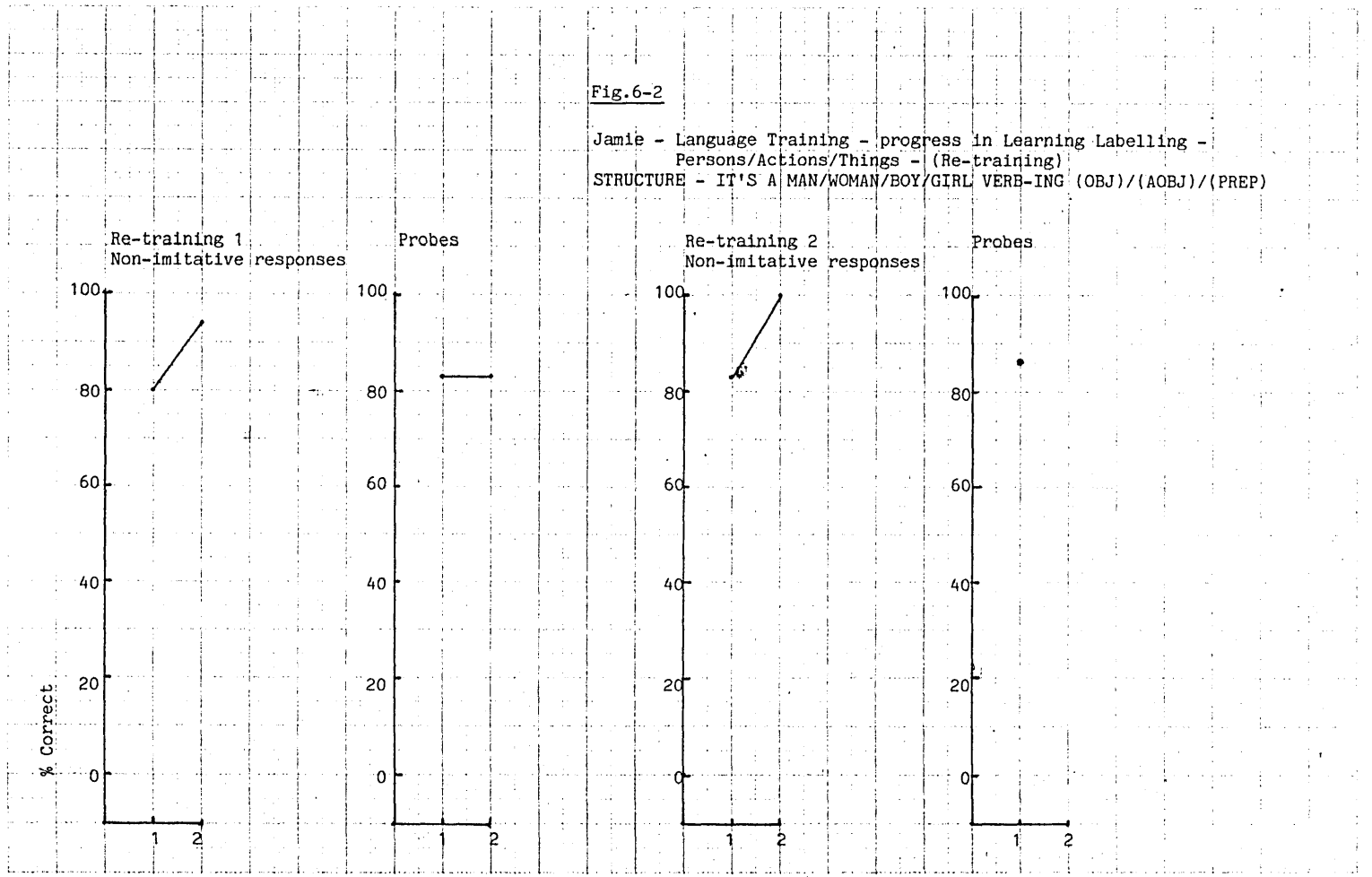


Fig.6-3

Jamie - Language Training - Progress in Learning -
YES/NO Discrimination - (Objects)(Singular)
STRUCTURE - YES IT IS

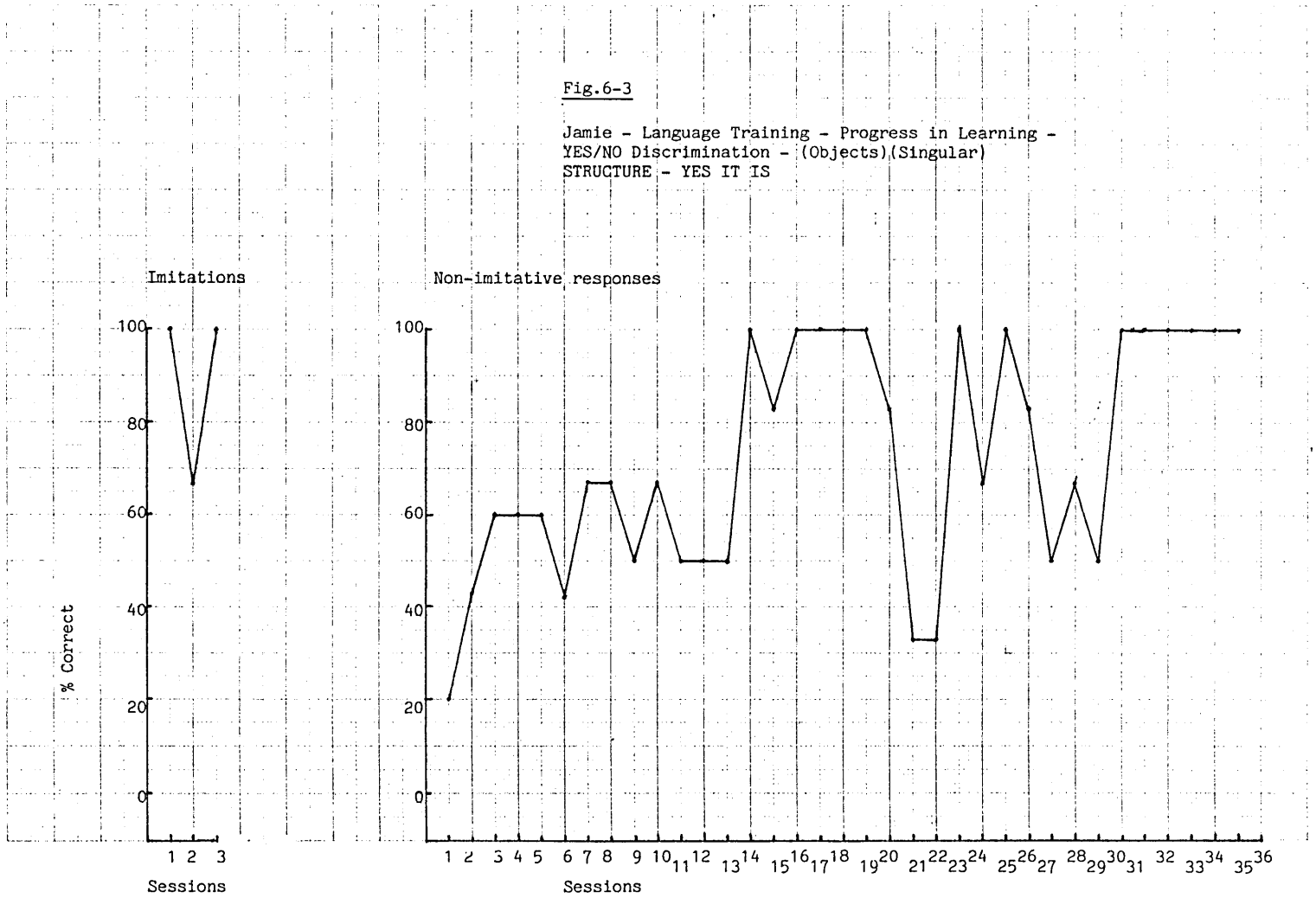
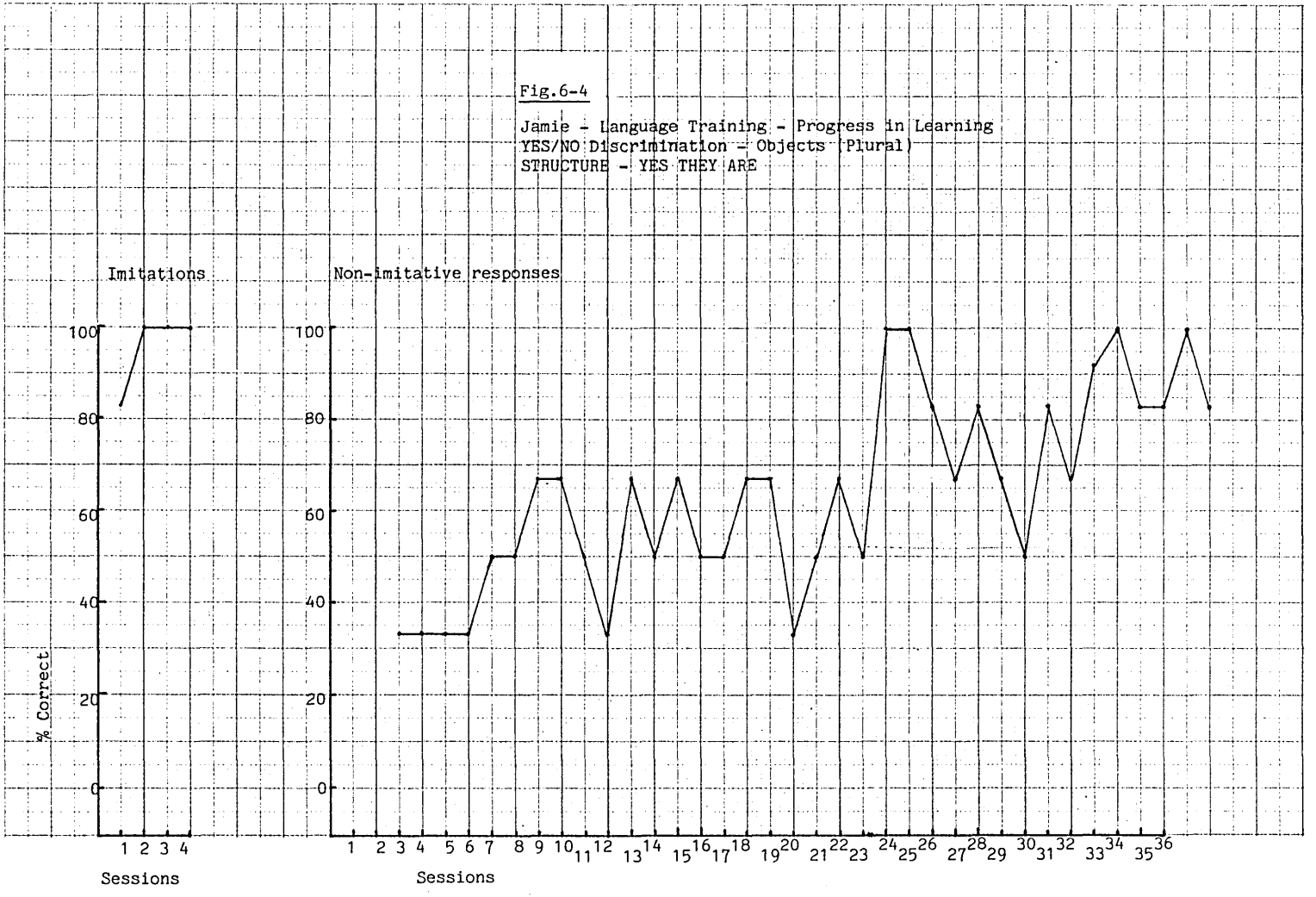


Fig.6-4

Jamie - Language Training - Progress in Learning
YES/NO Discrimination - Objects (Plural)
STRUCTURE - YES THEY ARE



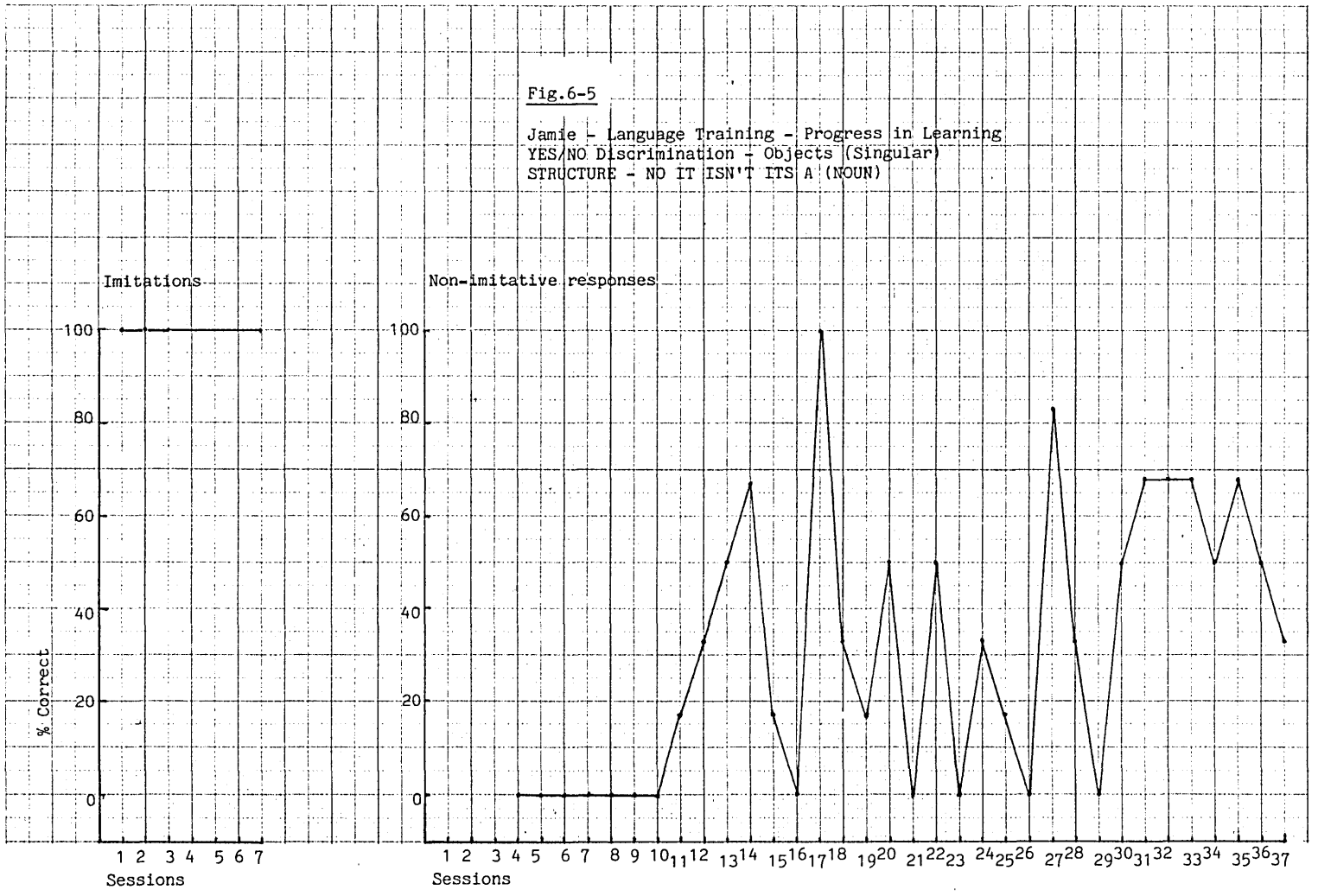


Fig.6-5
Jamie - Language Training - Progress in Learning
YES/NO Discrimination - Objects (Singular)
STRUCTURE - NO IT ISN'T ITS A (NOUN)
Imitations
Non-imitative responses
% Correct
100
80
60
40
20
0
1 2 3 4 5 6 7
Sessions
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
Sessions

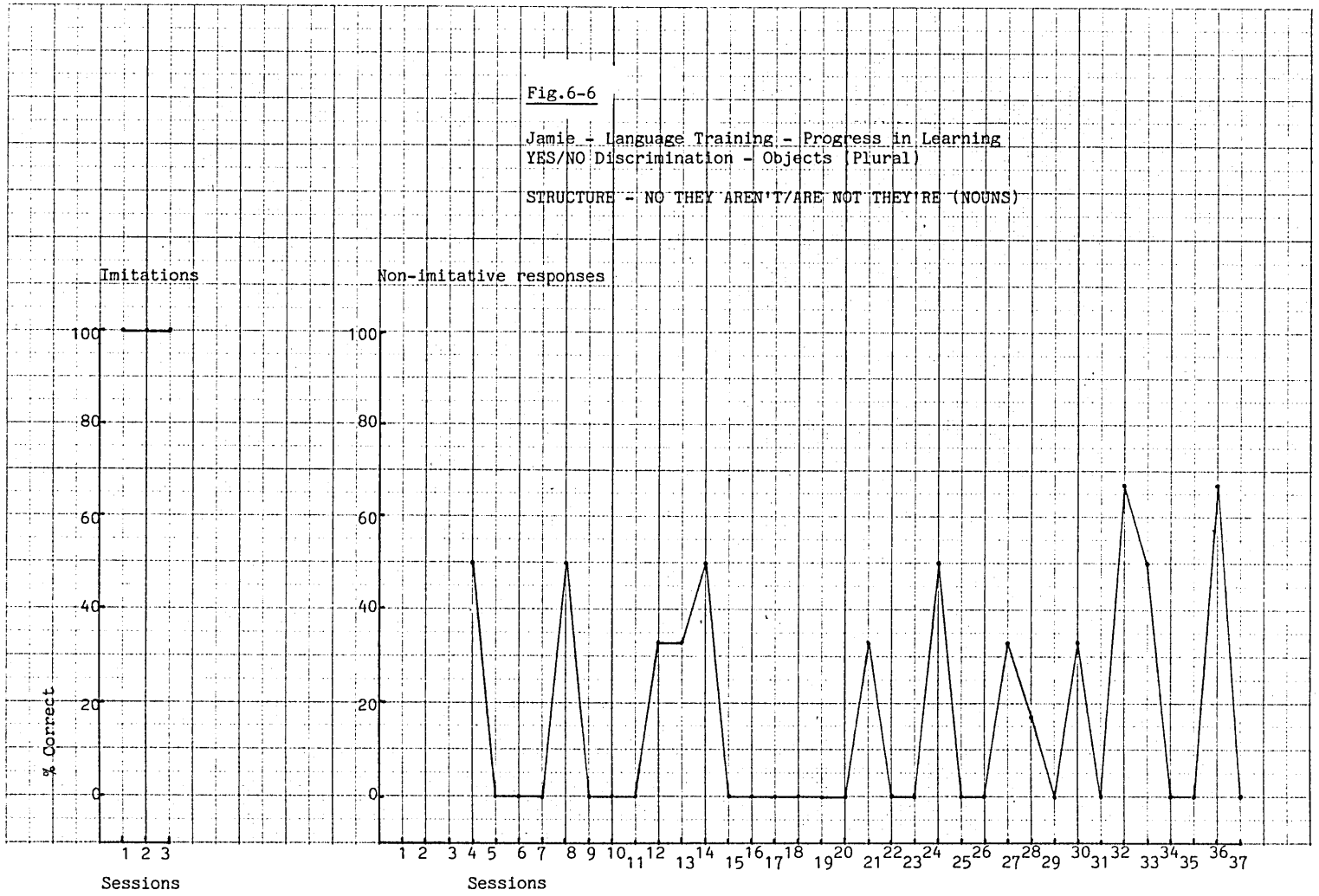


Fig.6-6
Jamie - Language Training - Progress in Learning
YES/NO Discrimination - Objects (Plural)
STRUCTURE - NO THEY AREN'T/ARE NOT THEY'RE (NOUNS)
Imitations
Non-imitative responses
% Correct
100
80
60
40
20
0
1 2 3
Sessions
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
Sessions

Fig.6-7
Jamie - POST-TEST 1 - Generalisation Probes
Training Category - Labelling Persons/Actions/Things
STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(AOBJ)/(PREP)
Generalisations in Test Conditions A and B

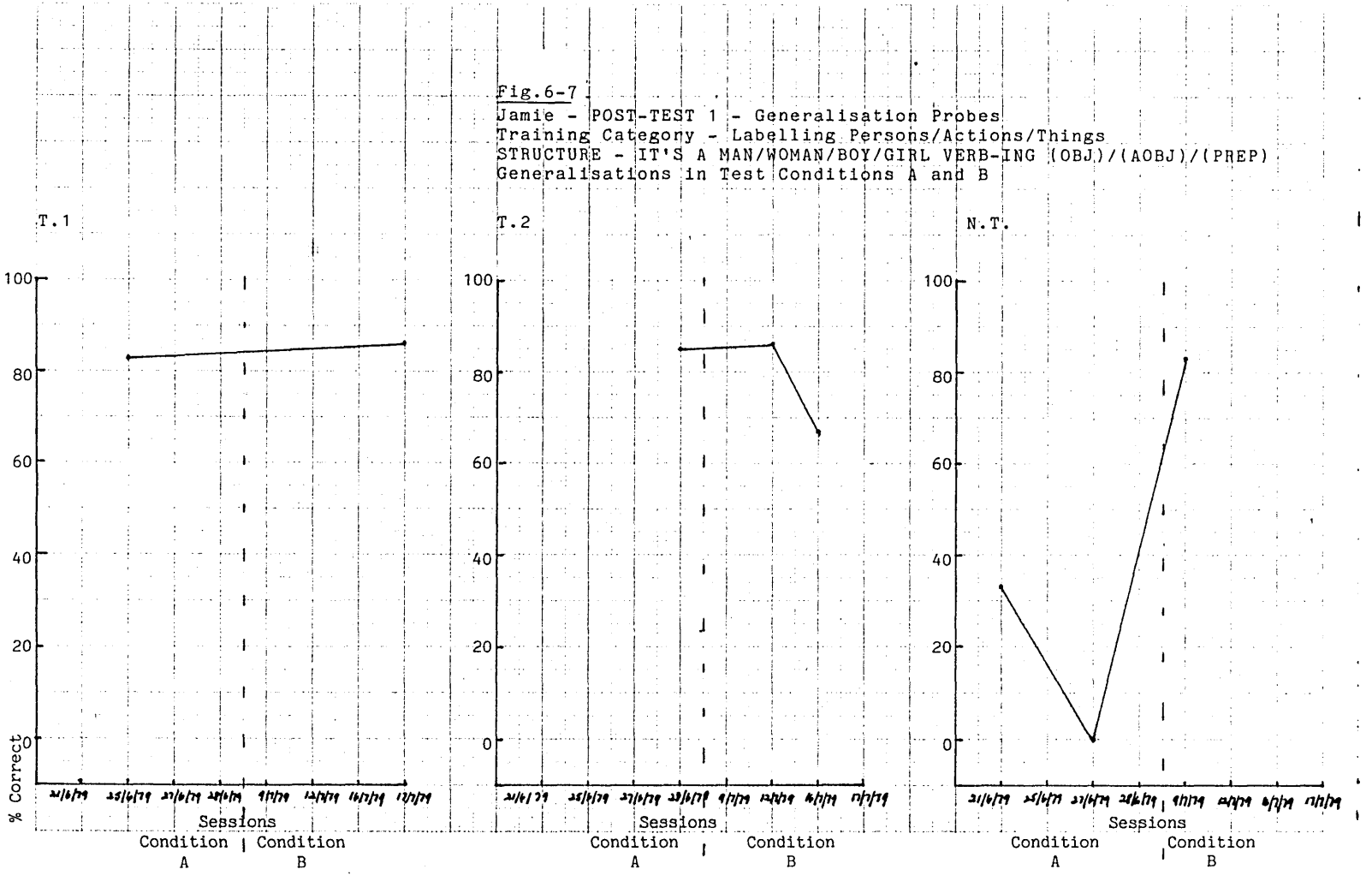


Fig.6-8

Jamie - POST-TEST 2 - Generalisation Probes (High Structure)
Training Category - Labelling Persons/Actions/Things
Generalisations in Sub-Tests I and II

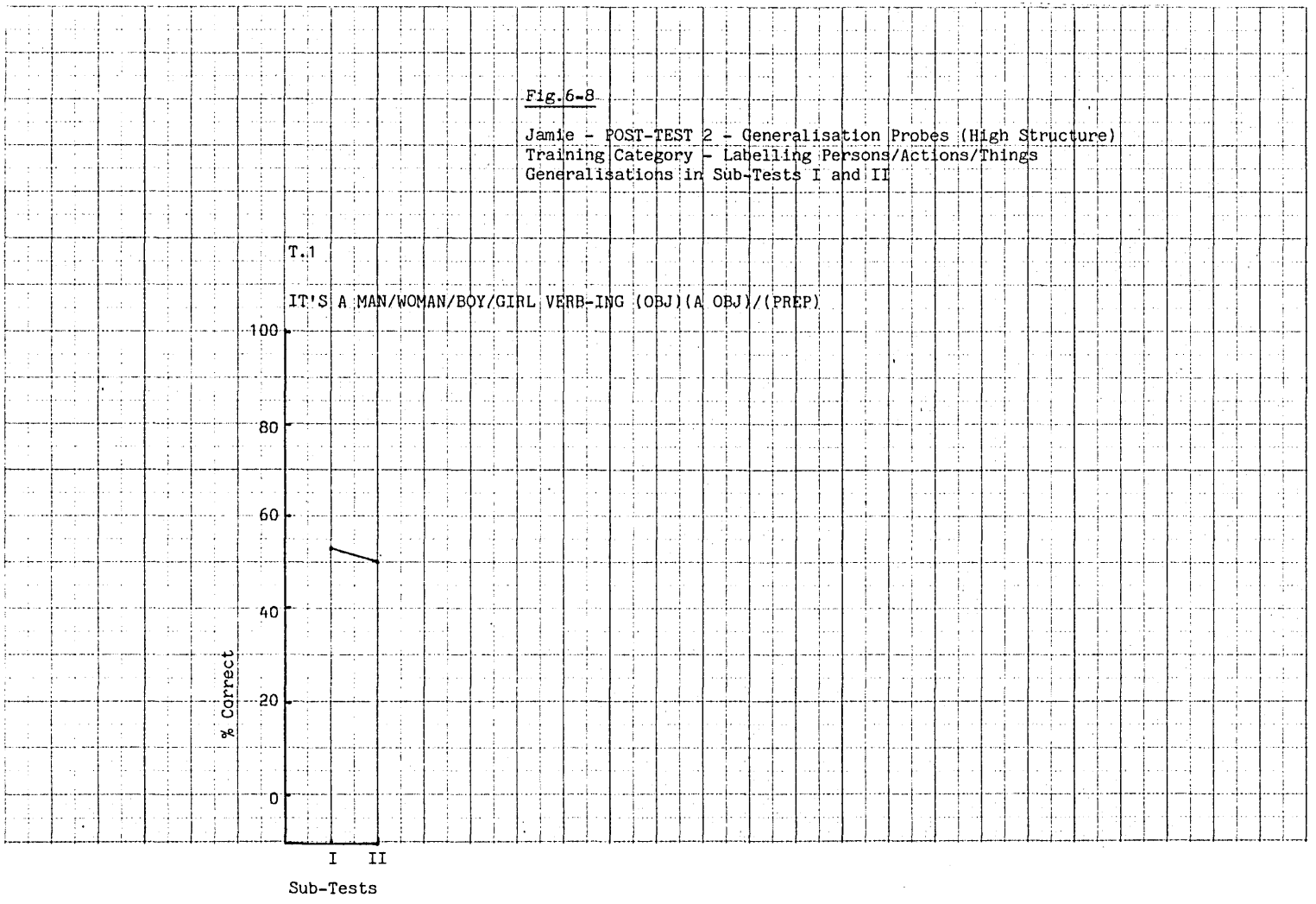


Fig.6-9

Jamie - POST-TEST 3 - Generalisation Probes - (High Structure) Generalisations

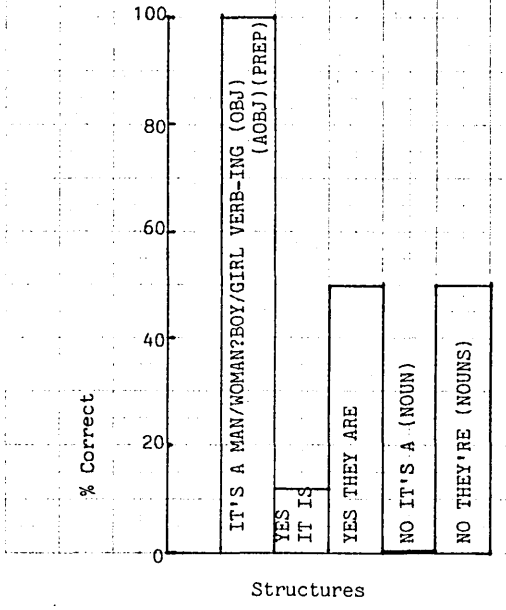


Fig.6-10

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Labelling Persons/Actions/Things
STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(A OBJ)/(PREP)

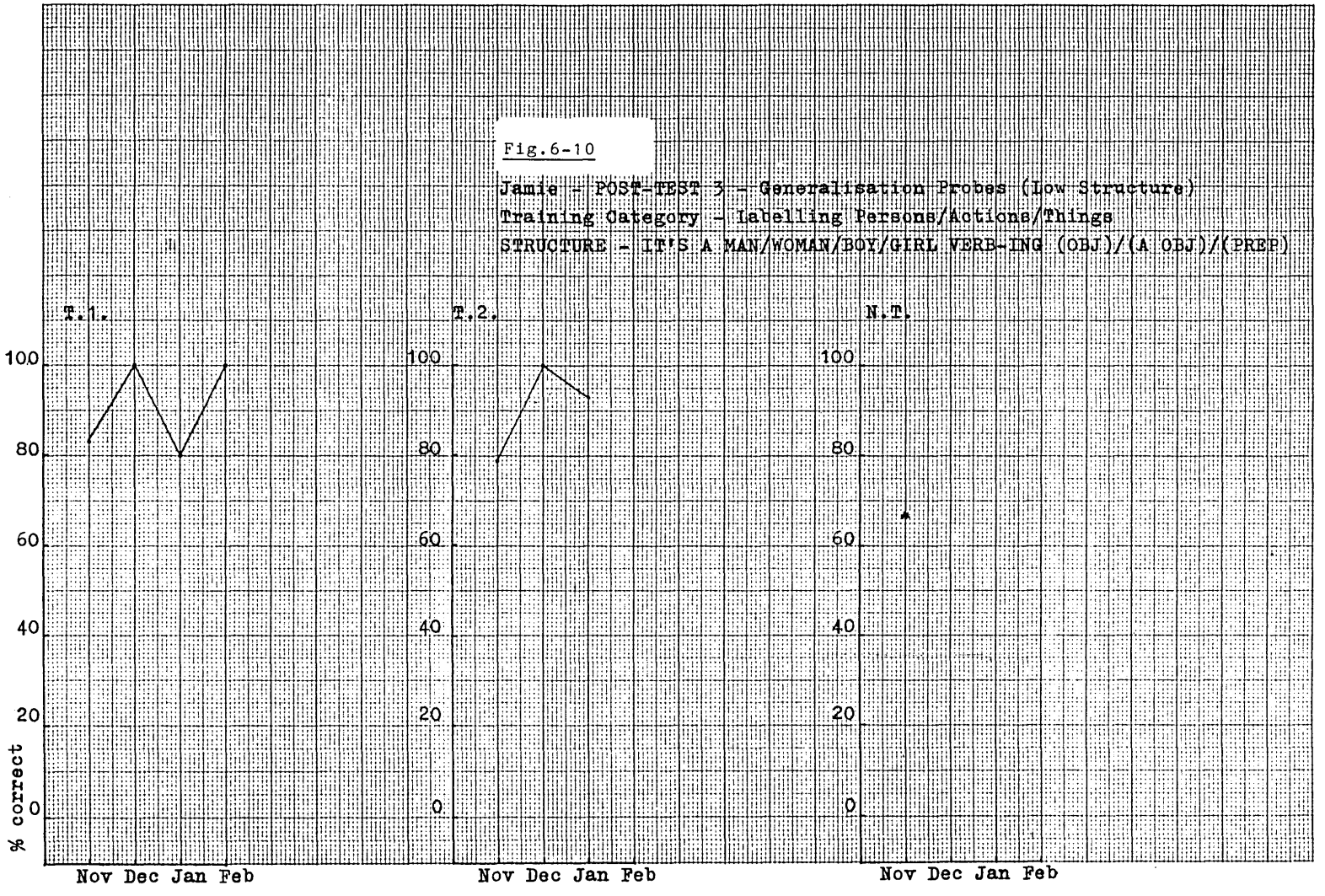


Fig.6-11

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - YES/NO Discrimination - Objects (Singular)
STRUCTURE - YES IT IS

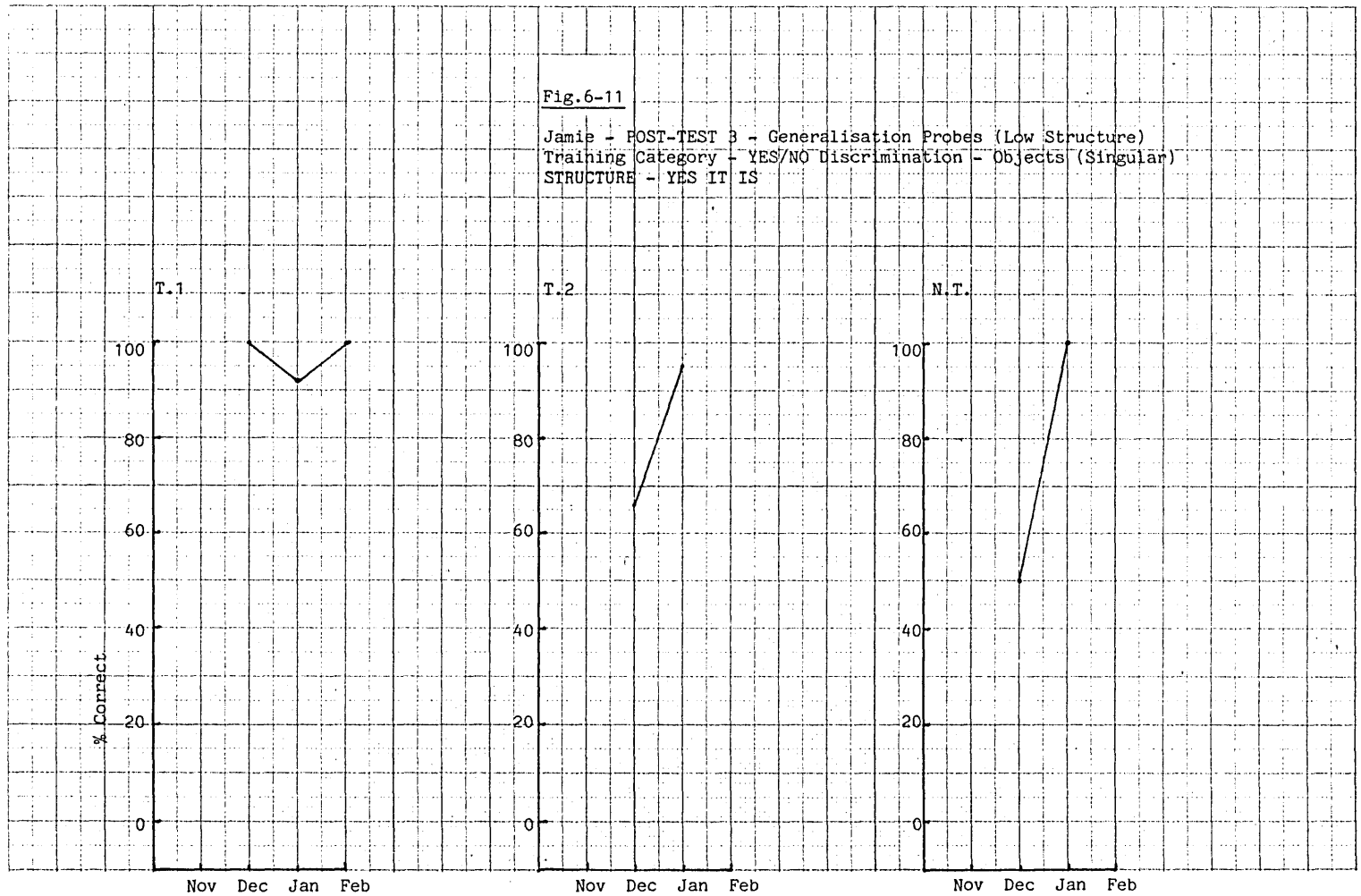
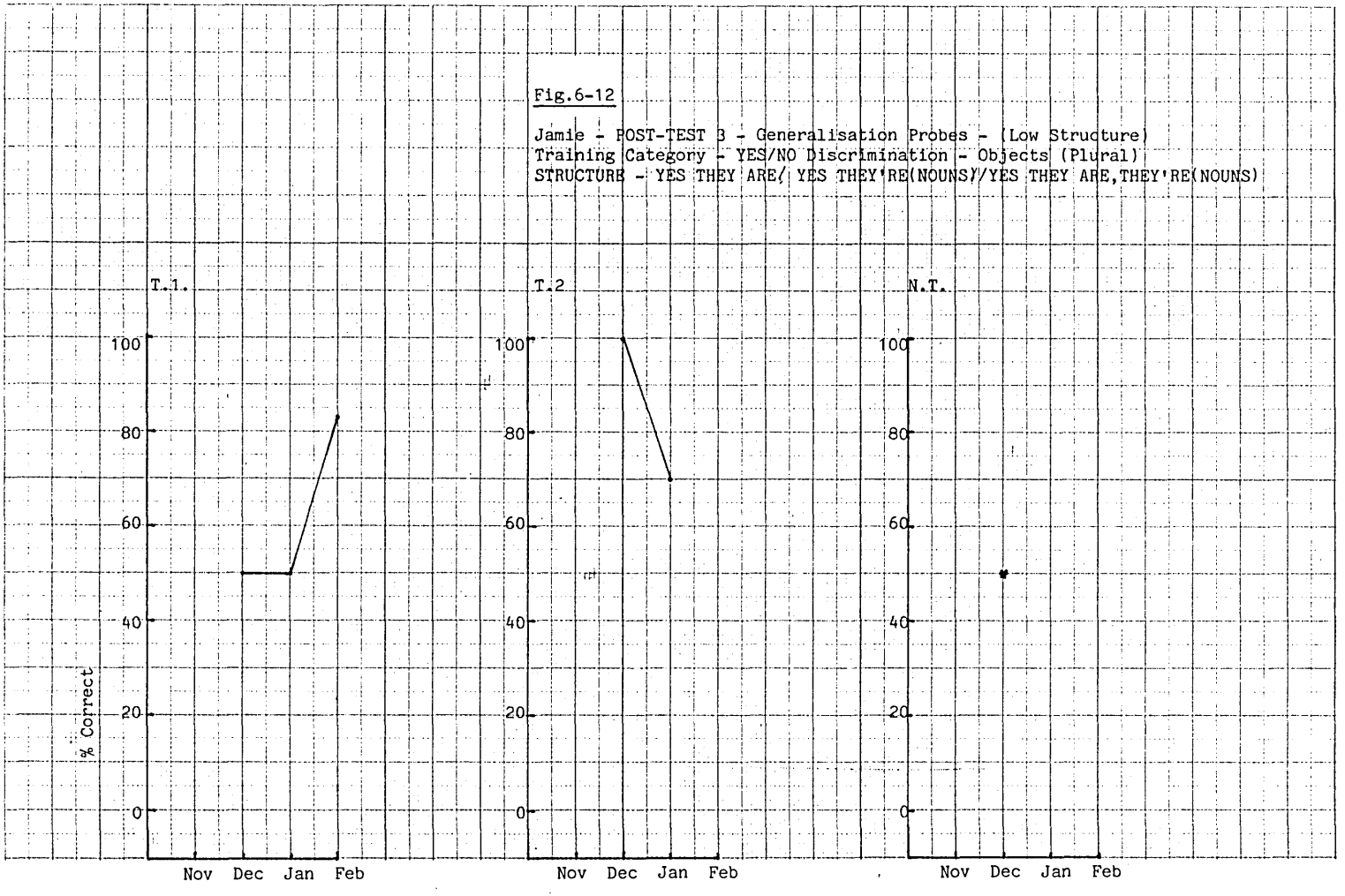


Fig.6-12

Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - YES/NO Discrimination - Objects (Plural)
STRUCTURE - YES THEY ARE/ YES THEY'RE(NOUNS)/YES THEY ARE,THEY'RE(NOUNS)



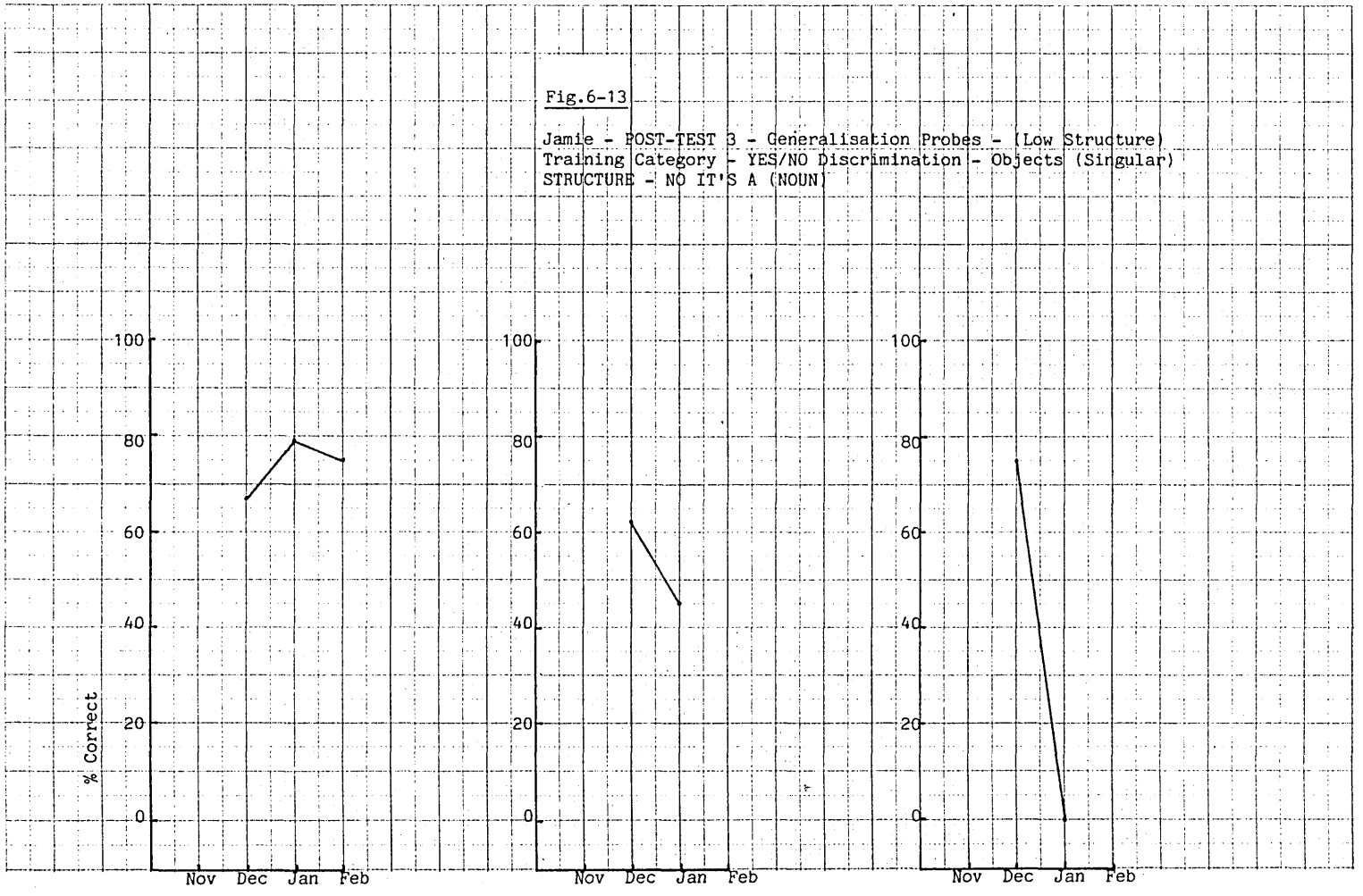
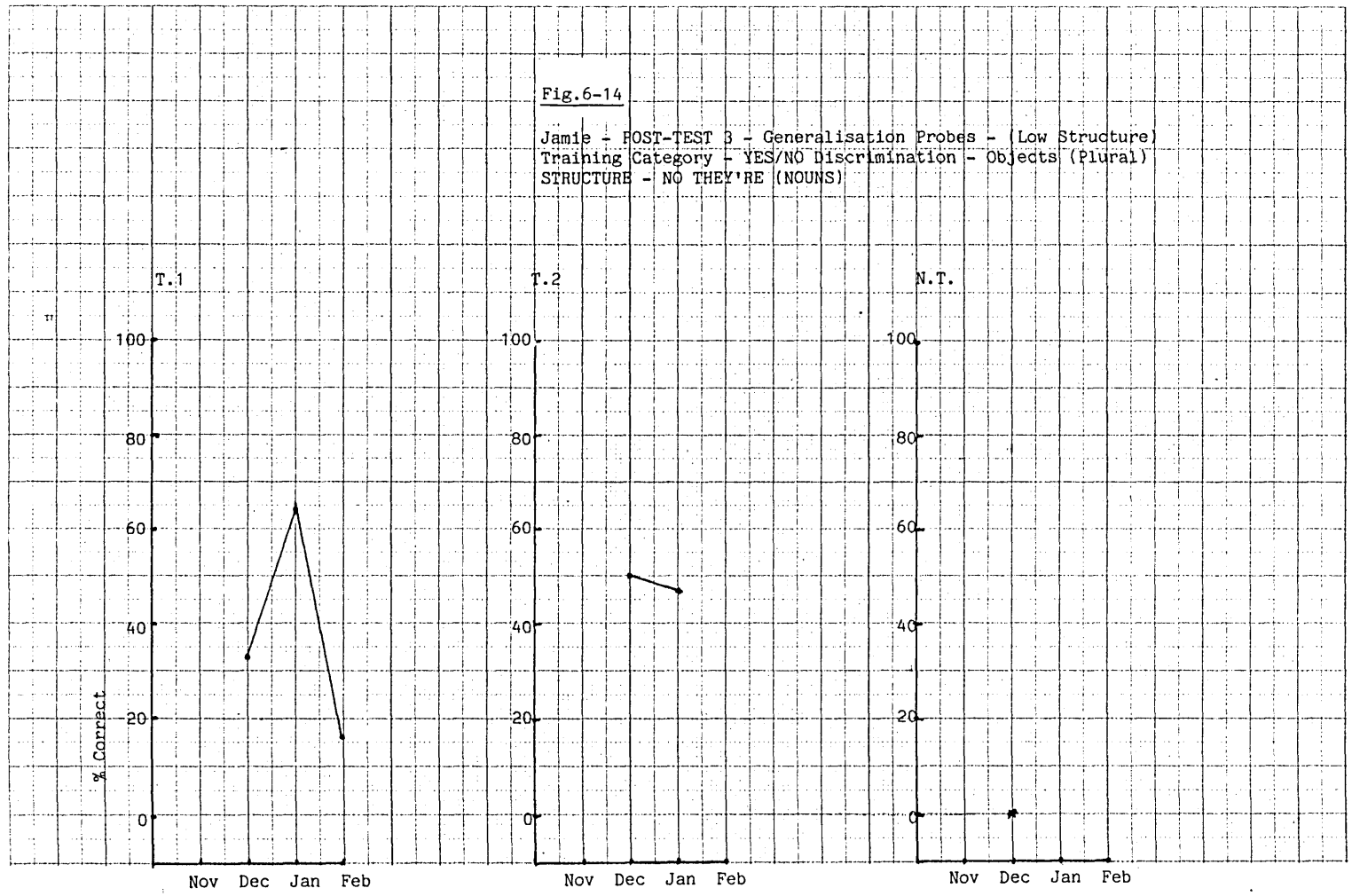


Fig.6-13

Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - YES/NO Discrimination - Objects (Singular)
STRUCTURE - NO IT'S A (NOUN)

Fig.6-14

Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - YES/NO Discrimination - Objects (Plural)
STRUCTURE - NO THEY'RE (NOUNS)



Jamie - Spontaneous Generalisations - (unelicited)-Trained Forms/Combinations

POST-TEST 1

Trained Forms

	Date	Adult	Condition
IT'S A (NOUN) - Labelling Objects (Singular)			
it's a boy	27/6/79	N.T.	A
a ball it's a . it's a man	28/6/79	T.2.	A
VERBING - Labelling Action - (persons)			
Sharpenin' a.a.pencil	28/6/79	T.2.	A
VERBING - Labelling Actions - (persons)			
bangin'	25/6/79	T.1.	A
Labelling-Persons/Actions/Things			
it's a man puttin' on shoe	28/6/79	T.2.	A
Combinations			
IT'S PERSON (NAME) + Wh?			
who's that? it's Glyn, it's Glyn	28/6/79	T.2.	A
VERBING - Labelling Actions-(persons)			
she's jumping Joanne's (VERB?)	28/6/79	T.2.	A
Labelling - Persons/Actions			
it's a baby sitting down (response to simulus question - what is it?)	12/7/79	T.2.	B

Jamie - Spontaneous Generalisations (unelicited)- Trained Forms/Combinations

POST-TEST 3

Trained Forms

	Date	Adult	Context
IT'S A (NOUN) - Labelling Objects - (Singular)			
it's a bike it's a cake	6/11/79	T.1.	3
it's a light	22/11/79	T.1	2
it's a fireman	29/11/79	N.T.	3
it's a spoon look! Mrs Wright, it's a cake it's a colour it's half a star	4/12/79	T.1.	3
it's a door it's a christmas tree it's a clock	5/12/79	T.1.	4
it's a fire engine	10/1/80	T.1.	2
THEY'RE (NOUNS) - Labelling Objects - (Plural)			
they're girls	29/11/79	N.T.	3
they're houses	4/12/79	T.1.	3
IT'S PERSON (NAME) - Labelling - Persons			
it's Sheryl	21/1/80	T.1.	1
VERBING -			
eating that	14/1/80	T.1.	4
lying down	28/1/80	T.1.	1
YES/NO (Singular)			
yes it is	6/11/79	T.1.	3

Jamie - Spontaneous Generalisations (unelicited) - Trained Forms/Combinations

POST-TEST 3

Trained Forms

	Date	Adult	Context
PREPOSITIONS			
it's in the box on the floor	5/12/79	T.1.	4
Combinations			
VERBING - Labelling actions - (Persons)			
she's drawing	30/11/79	T.2	2/4?
Nicola's drawing	13/12/79	T.1.	3/4
Nicola's writing	9/1/80	T.2.	3
QUESTIONING - (singular)			
Is it a bike?	6/11/79	T.1.	3
QUESTIONING - (plural)			
What are they?	4/12/79	T.1.	3
PREPOSITIONAL USAGE			
the man is there	28/11/79	N.T.	3
UNTRAINED (OTHER)			
like that	12/12/79	T.2.	3

CHAPTER SEVEN

CASE STUDY 3 - NICOLA

1 The child in her environment

2 Pre-intervention language assessment and norm-referenced testing - Results

3 Development and learning in language and video training

4 Generalisation and training for generalisation - Observations

5 Mid-intervention and post-intervention generalisation probes and norm-referenced testing - Results

6 Discussion

Figures referred to in this Chapter are to be found on pages 259-268, before the Supplementary (generalisation data) pages

CHAPTER SEVEN

1 The child in her environment

Nicola was the eldest of three children in a skilled working class family. Both parents were caring, supportive and keenly interested in her educational development. According to her mother, Nicola had appeared normal at birth. However, at four months it was noticed that she had a large anterior fontanelle with assymetry of the skull, although no other developmental abnormalities presented at that time. She subsequently walked late and did not produce her first words until she was four years old. By age six, however, Nicola was described in a psychologist's report as having an extensive vocabulary but that her speech was repetitive in nature.

Within the school environment, Nicola's spoken language was restricted to repetitive verbal requests consisting of 1-3 word utterances (eg, 'draw'/'want paper'/'want draw Matthew'/) spoken in a loud, deep voice with a heavy, falling/rising/falling intonational contour. For the most part, her interactions with the social environment were bizarre. Typically, she would walk about the school and playground repeatedly shouting a series of demands. Whenever she approached an adult with the intention of fulfilling her "shouted" requests, she in turn was met with shouting, her requests were usually rejected outright and she was invariably instructed to go away, whereupon

she would hastily retreat (still shouting). In addition, she demonstrated a variety of fixational, "manic" behaviours provoked by pre-occupations with the visual properties of objects and people.

Unfortunately, the gratification of these "obsessions" usually resulted in behaviour which deviated markedly from social conventions and, as a consequence, generated hostility from adult staff throughout the school. Finally, in common with most of the children in the experimental group, Nicola did not participate in play or other forms of socially interactive behaviour with peers.

2 Pre-intervention assessment and norm-referenced testing - Results

At the commencement of the study, Nicola was aged nine years eight months. Her raw score on the Columbia Mental Maturity Scales was 8; on the Reynell verbal comprehension test she scored 28 and on the English Picture Vocabulary Test, 12.

Nicola's comprehension of basic wh. questions such as Who's this/ What's this? etc, was demonstrated by her ability to produce appropriate single word (noun) responses. In addition she produced a few verb-object, verb-adverbial and subject-verb-object constructions (eg, buy bucket, go swimmin' pool, Nicola buy shorts). She was unable to respond to Wh. questions such as What are you

doing? What is the girl doing? etc. Questions of this type produced silence or the emission of the last word or final two words of the question (eg, doin'/girl doin'/).

Similarly, forced alternative questions requiring structural responses in the present progressive verb tense evoked partial repetitions of the second alternative irrespective of whether this was appropriate. Moreover, some repetitions were structurally incorrect; for example, in rsponse to the question "What have you been doing in school today?" Nicola replied "Been do day".

She also had difficulty in answering Where? questions. Her use of prepositions was restricted to the production of 'there' and 'on' accompanied by pointing to the location of the object or person. Failing this, she simply repeated the question, omitting the uncontracted or contracted copula from her responses (eg, "Where Glyn?") and in the case of object referents, the definite article was also omitted (eg, "Where box?").

Throughout the assessment, Nicola consistently failed to produce the first and second person pronouns and the genitive pronouns he/she/they. Instead, she referred to herself and to others by name. Furthermore, proper nouns were also used as possessive pronoun substitutions (eg, "Mrs Wright hair"). Moreover, as the example shows, she also omitted the possessive 's' morpheme from utterances coding possession. Nevertheless, verbal comprehension of

possessive pronouns was demonstrated by her ability to correctly imitate adult verbal models, which she produced simultaneously with the presentation of appropriate, spontaneous pointing.

3 Development and learning in language and video training

The major problem in the early stages of the teaching programme was the effective control and reduction of Nicola's severe attentional deficits produced by the combined effects of her fixational, "obsessive" behaviours and her lack of responsiveness in communicative interactions with adults. During the initial sessions, Nicola readily imitated the teacher-experimenter's imitative response models. Her responses, however, were delivered in automaton-like tones, interspersed by shouting behaviour or periods of silence, as a result of which it was extremely difficult to redirect her attention to verbal or pictorial stimuli. In addition, the application of time-out procedures at this time did not result in a reduction or cessation of either behaviour.

Furthermore, additional problems emerged which were specifically related to the use of primary (edible) reinforcers. While the delivery of chocolate buttons increased the occurrence of correct verbal responses, this also served as the antecedent of new 'shouting' behaviour (want sweetie!) accompanied by high-pitched giggles.

Edible reinforcement was therefore withdrawn and this resulted in a reduction in Nicola's verbal demands for chocolate during the sessions, although shouting behaviours continued in general. For the most part, Nicola's shouted requests were verbal expressions of her desire to draw the visual phenomena of her fixations. It seemed logical, therefore, in addition to the social and physical reinforcement delivered during the sessions, that at the end of each session she should be allowed to pursue the preferred activity of drawing contingent upon appropriate verbal behaviour, including the omission of shouted requests during language training.

This strategy successfully reduced shouting in the sessions. Moreover, commensurate increases in Nicola's attending behaviour and responsiveness also occurred, such that by the end of January 1979 it was no longer necessary to allow "drawing time" at the end of each session. It should be noted, however, that this is not to suggest that Nicola's manic behaviours had been extinguished. Her fixations continued and although her shouting had diminished, the intensity of her "obsessions" on some days was such that her responding in the sessions was inconsistent.

The first task in language training was to extend Nicola's labelling vocabulary of single word utterances to the production of fully grammatical sentence structures. During the Autumn term of 1978, teaching was therefore

concerned with the development of object labelling in the singular and plural form (IT'S A (NOUN)/THEY'RE/THEY ARE (NOUNS)) and labelling persons (IT'S PERSON (NAME)). Initially, object labelling in the singular and naming adults and children in the classroom environment were taught concurrently in the same sessions.

Object labelling in the plural form was subsequently introduced and also trained in the same sessions. Nicola's progress in learning each structural response was rapid, so that by the beginning of the Easter term in 1979 she was ready to move on to the next sequence in the programme. (Detailed data on Nicola's progress and learning in labelling objects and persons are given in tables 7-1 to 7-3 and figures 7-1 to 7-3, in Volume 2, Appendix F.)

In the next step, teaching focused on the development of labelling person and actions (IT'S A SUBJECT VERB-ING), person/actions/things (IT'S A SUBJECT VERB-ING OBJECT/AOBJECT/PREPOSITION) and personal actions incorporating training in the first person pronoun I (I AM/I'M VERB-ING/(PREP)). Nicola made little progress in this stage of the programme. She achieved criterion learning in labelling her own actions but failed to repeat her success in labelling persons and actions and person, actions/things. (See tables 7-4 to 7-6; figures 7-4 to 7-6 in Volume 2, Appendix F.)

Initially, this was attributable to her difficulties in producing sentence structures which were both grammatically and syllabically more complex than the sentences she had been taught to produce in the earlier stages of the programme. However, as time passed it became very clear that Nicola was not interested in either the pictorial referents used or in producing (and therefore learning) the responses.

The teaching sessions increasingly developed into "wars of attrition" in which the teacher-experimenter was determined that Nicola would learn the new sentence structures while Nicola's response rates were indicative of her declining motivation to do so. Clearly, the major reason for her lack of progress at this point in training was that the labelling responses were not sufficiently functional relative to her immediate communicative need which was to experience effective control of her environment.

It was obvious, therefore, that if she was to develop and extend her skills in language learning and progressively continue within the programme, then changes in the teaching sequences were necessary. For this reason, training in labelling persons and actions and persons/actions/things was terminated. (Practice sessions were however conducted in the video training dimension of the programme.)

In the next step, the objective was therefore to teach fully grammatical, functional responses which would enable Nicola to exert more effective verbal control over her environment. Nicola was taught the request form, CAN I HAVE A/MY/SOME/MY(NOUN(S))? in response to the stimulus presentation, if you want /a/some/your(noun(s)) then ask (me) for it.

In addition, the intention was to consolidate her use of the first person pronoun and to integrate the possessive pronoun 'my' into her expressive language repertoire. Initially, three request items (shoe, glasses, chocolate buttons) were selected for teaching the following responses, CAN I HAVE MY SHOES BACK PLEASE?/CAN I HAVE MY GLASSES BACK PLEASE?/CAN I HAVE SOME CHOCOLATE PLEASE?/. After a total of five teaching sessions, three additional response items were introduced to the sequence, CAN I HAVE A CRAYON PLEASE?/CAN I HAVE A PENCIL PLEASE?/CAN I HAVE A PEN PLEASE? The requested objects were delivered contingent upon each correct response or successive approximation.

The structural complexity of the responses constituted a high level of conceptual and linguistic demand at this particular stage in Nicola's language learning. Verbal repetition was therefore correspondingly high; that is, each response item was presented six times. It was also necessary to segment the imitative response models into shorter response units which were then re-combined and

chained into progressively longer components until the full sentence structure was presented for imitation. The prompting and cueing systems were organised according to the same logic in reverse. That is, longer response chains were prompted in the earlier stages of training and were then systematically faded into shorter structural components (eg, CAN I HAVE MY SH...CAN I HAVE...CAN I etc).

At first, Nicola had considerable difficulty in articulating the requests. The sentence elements most frequently omitted from her responses were HAVE, A, SOME, and MY. The omission of the determiner a, however, was surprising given that Nicola had received prior training in this form. Her difficulties were subsequently overcome by the presentation of systematic prompting which was gradually faded to silently mouthed cues. At this point, Nicola began to self-correct her errors whereupon prompting was faded altogether.

Initially, the sentence element "PLEASE" was not included in the training sequence. However, after six sessions of fairly intensive training in which Nicola was taught to request the return of her possessions she began to articulate each request form with the additional sentence element 'BACK' (eg, Can I have a crayon back?). 'PLEASE' was then incorporated into the sentence structures as a strategy to eliminate the response. This required that 'PLEASE' was prompted immediately Nicola had articulated

the final word of each request.

The strategy was successful, and Nicola's subsequent use of the form was restricted to requesting the return of her shoe and glasses. Training was conducted over a period of approximately two months (excluding the Easter holiday). Figure 7-1 shows that Nicola achieved criterion learning in the eleventh teaching session; her responses were, however, hesitantly delivered.

Teaching was continued and her responses in the next session declined substantially as a result of the omission of the determiners 'a' and 'some' and the possessive pronoun'my'. Criterion was again achieved over two sessions followed by a decline in response rates, although at this point in training the decrease was less substantial. Imitative response modelling was reintroduced in the 21st session as a result of a fall in Nicola's responding produced by poor attentional behaviour.

Criterion learning was achieved after two further sessions of training and was sustained in all but the second initial probe. Again, this was not as a result of Nicola's failure to learn the response adequately, but was entirely attributable to the re-emergence of 'manic', distractible behaviour.

During the last week of training, Nicola spontaneously

generalised her responses to appropriate requests for chocolate. Furthermore, the care assistant and dining hall staff reported that she was appropriately using the requests to obtain drinks and food items during the lunch periods. (Additional data is presented in table 7-7 in Volume 2, Appendix F.)

Moreover, it should be noted that in the next teaching step, in which Nicola was taught to request permission to pursue functionally useful activities (CAN I VERB A/MY(OBJECT)/(PREPOSITION)), criterion learning was achieved after only ten teaching sessions (see table 7-8; figure 7-8 in Volume 2, Appendix F).

During the Autumn term of 1979, training requesting was extended to include teaching Nicola to ask questions which would assist her in identifying the material needs and actions of others (eg, WHAT DO YOU WANT?/WHAT ARE YOU DOING?). In addition, the training sequences were designed to teach the second person pronoun YOU and the appropriate discrimination between the first and second person pronouns I/YOU and the possessive pronouns MY/YOUR.

Training was conducted in the context of brief, conversational dialogues with a second adult (the care assistant) who modelled appropriate replies to Nicola's questions (eg I WANT A/SOME/MY(NOUN(S))/I AM VERB-ING A/MY(OBJECT)/(PREPOSITION)) which Nicola was then required to listen to, remember and repeat (eg, YOU WANT

A/SOME/YOUR(NOUN(S))/YOU ARE VERB-ING A/YOUR(OBJECT)/(PREPOSITION)) in response to questions presented by the adult (eg, WHAT DO I WANT?/WHAT AM I DOING?).

The teacher-experimenter modelled, prompted and cued Nicola's responses during the sessions. Verbal reinforcement, contingent upon each correct response or successful approximation, was delivered by both adults. The response forms were trained together in the same sessions; six objects and six actions were used as stimulus items. Each item was presented once only. Grammatical complexity and levels of variability within and between structures were therefore higher than at any other point in Nicola's training programme. Moreover, verbal repetion was lower than at any other time in training.

At first, Nicola found the production of the sentence elements DO and YOU very difficult to articulate together within the request form WHAT DO YOU WANT? Typically, she would omit the verb (eg, WHAT YOU WANT?). This particular response presented something of a dilemma for the teacher-experimenter, since the structure was an appropriate dialectal variation, acceptable throughout the South Yorkshire area.

However, it was decided to continue teaching the fully grammatical sentence structure, so that for the purposes of training, the dialectal response was scored incorrect.

Moreover, systematic prompting of the verb overcame Nicola's tendency to omit it from her responses. A major problem in teaching YOU WANT A (NOUN) etc, emerged when Nicola began to integrate 'PLEASE' into the sentences (eg, YOU WANT A (NOUN) PLEASE).

It was unclear whether this was a perseveration of the response from the previous training sequence or whether Nicola was merely imitating the care assistant's responses (eg, I WANT A (NOUN) PLEASE, NICOLA). The difficulty was finally overcome by prompting Nicola to produce the care-assistant's name in place of PLEASE.

Training was conducted over a period of approximately two months. Figure 7-2 shows that Nicola achieved criterion learning in the production of WHAT DO YOU WANT? in the eighteenth session, which she then sustained throughout the nine teaching sessions that followed. Furthermore, her responding was sustained at high levels during the initial probes. (See also table 7-10 in Volume 2, Appendix F.) Figure 7-3 shows that Nicola's acquisition of YOU WANT A/SOME/YOUR(NOUN(S)) etc, was slower and less consistent than her learning of the question form and although criterion was achieved and sustained during the last three sessions, her response rate declined again in the second probe.

It was decided, however, not to continue with training, since by this time the response was being tested in the

post-test 3 generalisation probes. Furthermore, Nicola had successfully produced the form in other contexts in response to elicitations by the teacher-experimenter and the care assistant. It is interesting to note that a similar pattern emerged in Nicola's learning of WHAT ARE YOU DOING?/YOU ARE VERBING A/YOUR(OBJECT)/PREPOSITION; that is, criterion learning was more rapidly and consistently achieved in the question form than in the declarative response. Throughout the training period, it was very clear that Nicola thoroughly enjoyed the dialogue routines and, indeed, the opportunity of interacting with two attentive and responsive adults.

In the next teaching step, Nicola began to learn to request specific action responses from adults, eg, WILL YOU VERB ME A/SOME/YOUR(NOUN(S)) etc, and to repeat her requests in an alternative form, eg, I WANT YOU TO (VERB) ME A/SOME/YOUR(NOUN(S)) etc. Training was terminated before completion, at the end of the study in December 1979. (See tables 7-13 and 7-14; figures 7-13 and 7-14 in Volume 2, Appendix F.)

In the video training dimension of the programme, Nicola received practice sessions in labelling objects in the singular and plural form and in labelling persons/actions and things (as previously stated). She was also trained from baseline in the use of the prepositions in/on, under/over, in front/behind, next to/over there. Nicola's responding in the video training programme was not as

encouraging as in "live" training. Throughout the video sessions her attention was difficult to maintain and unlike Jamie (Chapter 6) she was never interested in participating in unsupervised sessions. During the study, Nicola received a total of 44 sessions across structures.

4 Generalisation and training for generalisation - Observations

The facilitation of new language skills in the classroom setting commenced at the end of January in the Spring term of 1979. Initially, Nicola did not readily display the language forms she had acquired in the teaching sessions.

For the most part this was a manifestation of her low motivation to participate in communication with adults. This was not entirely surprising, since responsive dialogue with an attentive reinforcing adult in natural settings within the school environment was a relatively rare experience for her. The problem was exacerbated by her disinclination to produce action labels (verb-ing) in particular, in both training and non-training contexts. Nevertheless, as the teaching programme gathered momentum and functional request forms were introduced, Nicola's responsiveness to teacher-experimenter /care assistant elicitations, prompts and cues progressively increased and resulted in corresponding rises in her classroom usage of new syntax.

By the end of the Summer term of 1979, Nicola was listening much more to spoken language within the classroom and school environments. A particularly interesting feature of her developing competence was her apparent use of self-cueing strategies through which she made systematic use of the surface grammar rules of stimulus questions to prompt appropriate rule selection for the required response. Typically, she would repeat the relevant grammatical constituents of the adult's question (eg, is it?/are they?) followed by a brief pause, whereupon she would produce the corresponding sentence structure (eg, it's a (noun)/they're/they are nouns).

As Nicola's learning and generalisation of new response forms increasingly interrelated, her use of self-cueing gradually declined. During this period, she also began to experiment with the production of new language forms in combination with trained structures. For example, she spontaneously began to produce the stimulus questions of the teaching sessions (eg, what is it?/what are they? and to combine what? with the contracted copula (trained form) in the production of alternative forms such as what's that? and where's (person) which resulted in the independent acquisition of new learning. Furthermore, she made quite a nuisance of herself on some days by spontaneously imitating verbal response models presented during teaching sessions with another child.

Nicola's rapidly developing skills for independent

language learning proceeded still further during the Autumn term. She began to imitate interactions with the teacher-experimenter and the care assistant, during which she attempted to produce sentence structures in which she was currently receiving training and additional structural forms (untrained) which were not a part of her existing verbal repertoire but which were essential for effective communication of her immediate needs and intentions.

Typically, she would vocalise a partial response followed by waiting, with a questioning look, for the adult to supply the necessary prompt or fully modelled response; alternatively, she would "try out" specific responses in new contexts in anticipation of the delivery of appropriate structural forms by the adult.

For example, the response forms WILL YOU VERB FOR ME/I WANT YOU TO VERB etc, were originally modelled in the classroom setting during October 1979, in response to Nicola's initiations, before integration with additional permutations into the teaching sequences. Here again, as with Steven (Chapter 5) and Jamie (Chapter 6) the elicitation and shaping of linguistic structures in natural settings increasingly parallelled one-to-one language training.

Furthermore, in common with Jamie, Nicola began to engage spontaneously in the "language training game" in which she would practise, among other forms, the I/you training

routines, in which she appropriately adopted the shifting roles and reference of person deixis. During the Autumn term it was also possible to introduce Nicola to a reading programme in which she was taught to construct sentences comprising trained forms, stimulus questions and structural combinations.

Finally, Nicola made progress in areas other than those taught to her directly within the training programme. During the Autumn term of 1979 Nicola began to regulate her own obsessive behaviours through self-initiated verbal controls. Moreover, she was conversing appropriately with adults and was verbally participating in social interactions with classroom peers.

5 Mid-intervention and post-intervention generalisation probes and norm-referenced testing - Results

In the mid-intervention and post-intervention generalisation probes of post-tests 1, 2 and 3, Nicola was tested for generalisation in the following structures:

a) Object labelling in the singular and plural (IT'S A (NOUN)/THEY ARE/THEY'RE NOUNS) and labelling persons (IT'S PERSON (NAME).

b) Labelling persons/actions/things (IT'S A SUBJECT VERB-ING (OBJ)/ (AOBJ)/ (PREPOSITION); labelling personal actions (IAM/I'M VERB-ING (OBJ)/ (AOBJ)/ PREP); labelling actions (persons) (VERB-ING (OBJ)/ (AOBJ)/(PREP). It should be noted that labelling the actions of children and adults in the classroom environment was not directly trained within the programme. The purpose of testing, therefore, was to establish both response and stimulus generalisation of the present progressive verb tense.

c) Request forms incorporating the use of the first

person pronoun I (CAN I HAVE A/ SOME/ MY(NOUN(S))/ CAN I VERB (A/MY OBJ)/(PREP).

The following structures were tested in Post-test 3 only:

d) Requests integrating the use of the second person pronoun (WHAT DO YOU WANT?/WHAT ARE YOU DOING?) and the corresponding response forms (YOU WANT A/SOME/YOUR (NOUN(S)/YOU ARE VERB-ING (OBJ)/(A/YOUR OBJECT(S))/ (PREP)).

e) Prepositional usage, (IN/ON, UNDER/OVER, IN FRONT/BEHIND, NEXT TO/OVER THERE).

The results are given in 42 figures, each with an accompanying table, in Volume 2, Appendix F. Each structure is followed through individually in figures 7-15 to 7-23 in post-test 1; figures 7-24 to 7-26 in post-test 2 and figures 7-27 to 7-56 in post-test 3. Nicola's spontaneous utterances comprising trained forms and combinations, in which trained sentence elements were re-combined with untrained sentence elements are listed on pp 269-281.

Considerations of space do not permit a detailed examination of Nicola's results in each structure. These are therefore discussed in a summary way and Nicola's generalisation of the request forms CAN I HAVE A/SOME/MY (NOUN(S)?/WHAT DO YOU WANT? and the response form YOU WANT A/SOME/YOUR (NOUN(S)) are discussed in some detail.

In post-test 1 the request form, CAN I HAVE? was elicited in response to the verbal stimulus used in the training sessions (eg, IF YOU WANT A/SOME/YOUR (NOUN(S)) THEN ASK (ME)FOR IT. In addition, an alternative stimulus question

(WHAT DO YOU WANT?) was presented to assess Nicola's ability to generalise requests in response to unfamiliar verbal stimulus presentations.

Nicola's generalisation of requesting in response to the stimulus presentations used in training is shown in figure 7-4. In test condition A, the highest levels of generalisation were achieved with the teacher-experimenter (T.1) and the care assistant (T.2) while low to moderate levels occurred with the non-trainer. In the semi-structured contexts of condition B, generalisation was most successful with the teacher-experimenter.

However, Nicola's responding with the non-trainer was particularly encouraging. Generalisation with this experimenter was higher than with trainer 2 and only marginally lower than with the teacher-experimenter. Overall, generalisation was higher in the semi-structured contexts of condition B across experimenters, than in the highly structured settings of condition A.

Generalisation in response to the alternative (non-training) stimulus question is shown in figure 7-5. The levels of generalisation achieved across experimenters in test conditions A and B were, in general, lower than in response to the verbal stimulus presentations used in the teaching sessions. Interestingly, however, Nicola's generalisation scores with the care assistant in condition B were higher than in response to familiar verbal stimuli

in the same condition with this experimenter.

Overall, the general trend was similar to the pattern of generalisation established in response to the verbal stimulus presentations used in training. That is, generalisation was higher across experimenters in test condition B than in test condition A. Moreover, generalisation in response to both the familiar and alternative verbal presentations in condition A was consistently lower with the non-trainer. (See also tables 7-21 and 7-22 in Volume 2, Appendix F.)

In post-test 1, high levels of generalisation were achieved across experimenters in object labelling in the plural form (THEY'RE/THEY ARE (NOUNS)) and in labelling persons (IT'S PERSON (NAME)). Moderate to low levels of generalisation were achieved across experimenters in all other response forms. A particularly disappointing result was Nicola's failure to generalise object labelling successfully in the singular form. Her responses were characterised by a single word (noun) response and the omission of the determiner a from her production of the sentence structure (eg, IT'S (NOUN)).

The general trend across structures was towards marginally higher levels of generalisation with the teacher-experimenter. Generalisation across experimenters was higher in test condition B than in test condition A. In general, the lowest levels of generalisation were achieved

across test conditions with the non-trainer.

Figure 7-6 shows the generalisation of requesting (CAN I HAVE?) in post-test 2. Nicola's ability to generalise the response form in response to the verbal stimulus presentations of the training sessions was at a high level in sub-tests I and II. Moreover, generalisation had increased on the levels achieved in condition A in post-test 1 with the teacher-experimenter and was higher than with the care assistant and the non-trainer in the same test condition.

Generalisation in response to the non-training stimulus question was lower in sub-test I than in sub-test II. As in post-test 1, generalisation was not as successful as in response to the verbal stimulus used in the teaching sessions. Nevertheless, generalisation was maintained at the levels achieved with the teacher-experimenter and the care assistant in condition A and were higher than with the non-trainer in the same condition (see table 7-26 in Volume 2, Appendix F).

The general trend across structures was towards higher levels of generalisation in sub-test II than in sub-test I. Furthermore, generalisation was higher than in condition A with the teacher-experimenter in all response forms other than action labelling (persons) which had decreased on the scores achieved in condition A with this experimenter. The most significant increase in

generalisation from the scores achieved in post-test 1, was in the request form CAN I (VERB)? Nicola's generalisation of the response was substantially higher than in test condition A with the teacher-experimenter (T.1) and was marginally higher than with the care assistant (T.2) in the same test condition. Generalisation of object labelling in the singular form remained lower than the generalisation of object labelling in the plural.

Generalisation of the request form CAN I HAVE? in the high structure test of Post-test 3 is shown in figure 7-7. Nicola's generalisations in response to the verbal stimulus of the training sessions were equivalent to the levels achieved in sub-tests I and II in post-test 2 and were higher than in condition A in post-test 1. Generalisation in response to the alternative stimulus question had increased in comparison to the levels achieved in sub-test I and was substantially higher than in condition A with the teacher-experimenter in post-test 1.

In the low structure settings of post-test 3, the verbal stimulus IF YOU WOULD LIKE THIS THEN ASK FOR IT was presented in addition to the stimulus presentations used in post-tests 1 and 2. It should be noted also, that in natural contexts, in addition to the response form CAN I HAVE?, Nicola spontaneously began to produce I WANT A/SOME/MY/(NOUN(S)) in response to the stimulus

presentations. The response was scored correct and is included in the generalisation scores charted in figure 7-7 and in table 7-34 in Volume 2, Appendix F.

Figure 7-8 shows that throughout post-test 3 Nicola's generalisation of requests in natural settings was consistently high with the care assistant (T.2) and the non-trainer (N.T.). Moreover, generalisation had increased in comparison with levels achieved with trainer 2 in condition B in post-test 1 and was substantially higher than with the non-trainer in the same condition. A surprising, indeed unanticipated, result was that the lowest levels of generalisation occurred with the teacher-experimenter.

Furthermore, generalisation with this experimenter was lower than in the highly structured test of post-test 3 and was less than in the semi-structured context of condition B in post-test 1. This was attributable to the sudden emergence of the response form CAN I WANT A /SOME/MY(NOUN(S)) which for the most part Nicola produced in natural settings during interactions with the teacher-experimenter.

The precise reasons for this development were however unclear, other than that confusion may have arisen as a result of training in the response form WHAT DO YOU WANT?/YOU WANT A NOUN etc, during which the trainer-experimenter had repeatedly modelled and prompted the

responses, hence the inappropriate "overgeneralisation" of the sentence element (want) with the trainer.

Generalisation of the response forms WHAT DO YOU WANT?/YOU WANT A/SOME/YOUR(NOUN(S)) in the highly structured test of post-test 3 is shown in figure 7-7. (Additional detail is given in table 7-27 in Volume 2, Appendix F.) A high level of generalisation occurred in the use of the question form, whereas generalisation of the reply response was minimal. Figure 7-9 shows that in the natural settings of post-test 3, generalisation of the question form was consistently high across experimenters throughout the testing period and was sustained at the levels achieved in the highly structured test.

Figure 7-10 shows that Nicola's ability to generalise YOU WANT A/SOME/YOUR(NOUN(S)) substantially improved in natural settings. Her scores in the natural environment were considerably higher than in the highly structured test. An interesting feature of Nicola's generalisation of the response was that lower levels were achieved across experimenters in November and December, rising to consistently high levels in January and February. Nevertheless, generalisation across experimenters was less consistent than in the question form. A similar generalisation pattern occurred in the response forms WHAT ARE YOU DOING?/YOU ARE VERB-ING(OBJ etc). That is, generalisation of the question form was consistently higher across settings and experimenters than in the

declarative response, YOU ARE VERBING (OBJ etc).

The general trend across most structures in post-test 3 was towards moderate to high levels of generalisation. Moreover, generalisation was higher in the low structure settings of natural contexts than in the structured test. Although there was some variability in levels achieved within and between structures across experimenters, generalisation was higher in both the structured test and natural settings than in test conditions A and B in post-test 1 and in sub-tests I and II in post-test 2. For example, Nicola's generalisation of object labelling in the singular form increased substantially over the levels achieved in the previous post-tests. Generalisation of newly acquired response forms tested only in post-test 3 was encouraging. Moderate to high levels were achieved across response forms and across experimenters.

Nicola's spontaneous utterances produced during the post-tests also substantially increased in post-test 3 as compared with post-tests 1 and 2. While her sentence structures were not always grammatically appropriate, her expressive language in post-test 3 displayed the integration of structurally diverse sentence elements and grammatical constituents.

An interesting development was Nicola's spontaneous production of WILL YOU? and of verbal infinitives during December, January and February, particularly since

training in the response forms WILL YOU VERB ME/FOR ME etc, and I WANT YOU TO VERB etc, was incomplete. Nicola's ability to produce elements of each response spontaneously was entirely attributable to the cumulative effects of adult prompting in natural contexts in response to her initiations throughout each school day, which had originally begun in October.

Finally, Nicola's test scores, mid-intervention and post-intervention, were as follows. Mid-intervention, Nicola scored 13 on the Columbia Mental Maturity Scales; her language score on the Reynell Developmental Language Scales was 32 and on the EPVT was 8. Post-intervention, Nicola's CMMS test was unscored as a result of her failure to co-operate in the test. Her language scores on the Reynell and EPVT were 32 and 8 respectively.

6 Discussion

The foregoing account clearly indicates that systematic language intervention was successful in developing functional, grammatically appropriate sentence structures in Nicola's verbal repertoire. Initially, the variability within and between grammatical constituents and sentence structures was relatively low and verbal repetition in the sessions was high. However, as the programme continued, verbal repetition was reduced and the presentation of structurally variable sentence responses was progressively

increased. Modifications in the teaching sequences marked by the introduction of functional request forms, resulted in the enhancement of Nicola's language learning and progress within the programme.

In addition, procedural changes in teaching tactics successfully eliminated perseverated sentence elements from trained responses. Further, the combined inputs of highly structured one-to-one language training and the facilitation of trained structures, functional question forms and untrained sentence responses in non-training contexts, resulted in the development of self-initiated independent language learning through which Nicola increasingly came to control the quality, quantity and direction of her own language acquisition.

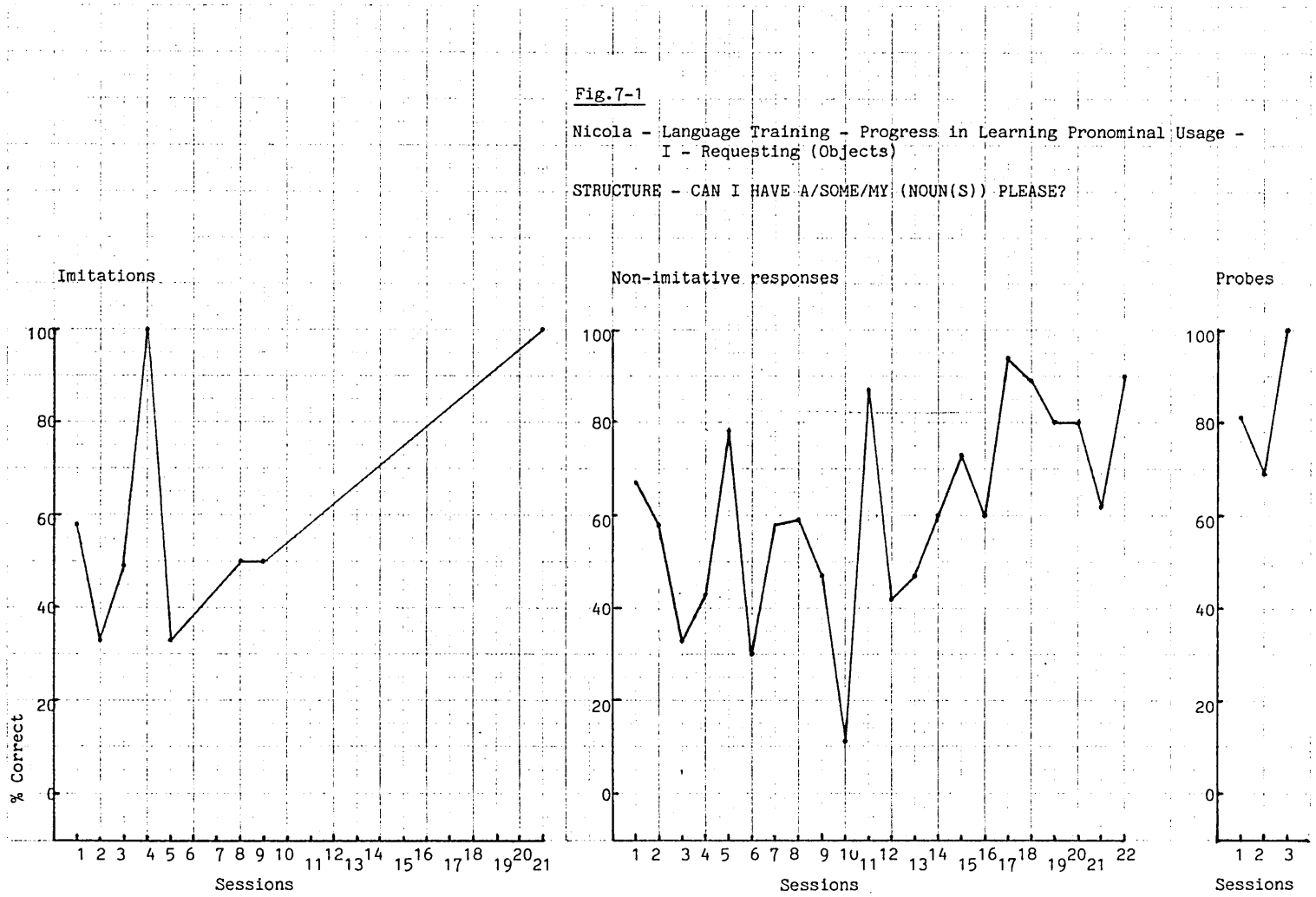
Moreover, generalisation of trained forms progressively increased from post-test 1 to post-test 3 in which moderate to optimal generalisation was achieved. Similar developments were observed in Nicola's spontaneous utterances produced during testing.

Over a total period of sixteen months, Nicola's expressive language increased from a maximum of three-word utterances at baseline to structurally complex utterances of approximately seven words in length, which were produced in a variety of interactions with different people in variable contexts. Moreover, qualitative improvements occurred in Nicola's social and adaptive behaviour with both adults and peers.

Fig.7-1

Nicola - Language Training - Progress in Learning Pronominal Usage - I - Requesting (Objects)

STRUCTURE - CAN I HAVE A/SOME/MY (NOUN(S)) PLEASE?



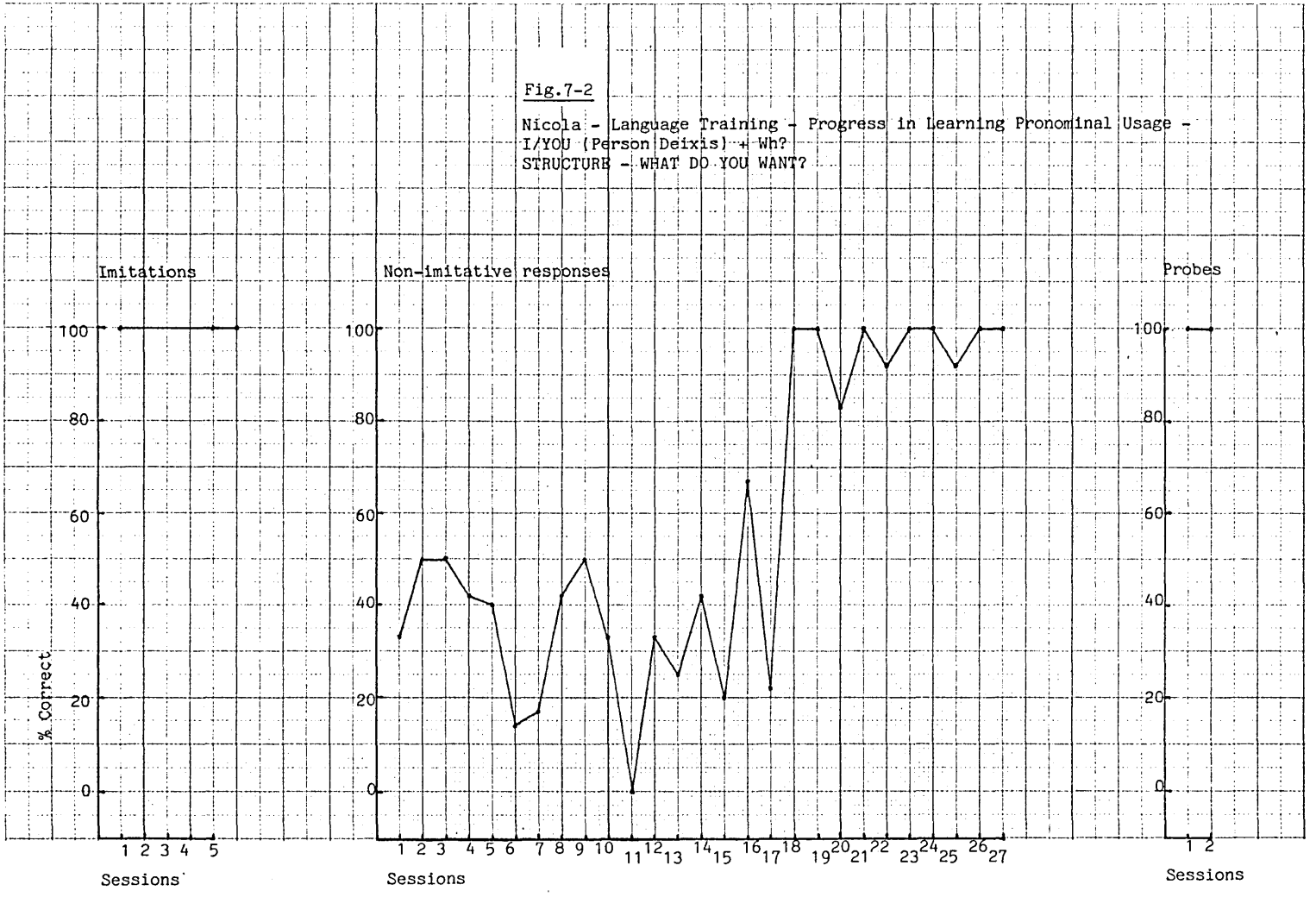


Fig.7-2

Nicola - Language Training - Progress in Learning Pronominal Usage -
I/YOU (Person Deixis) + Wh?
STRUCTURE - WHAT DO YOU WANT?

Fig.7-3

Nicola - Language Training - Progress in Learning
Pronominal Usage - I/You (Person Deixis)

STRUCTURE - YOU WANT A/SOME/YOUR (NOUN(S))

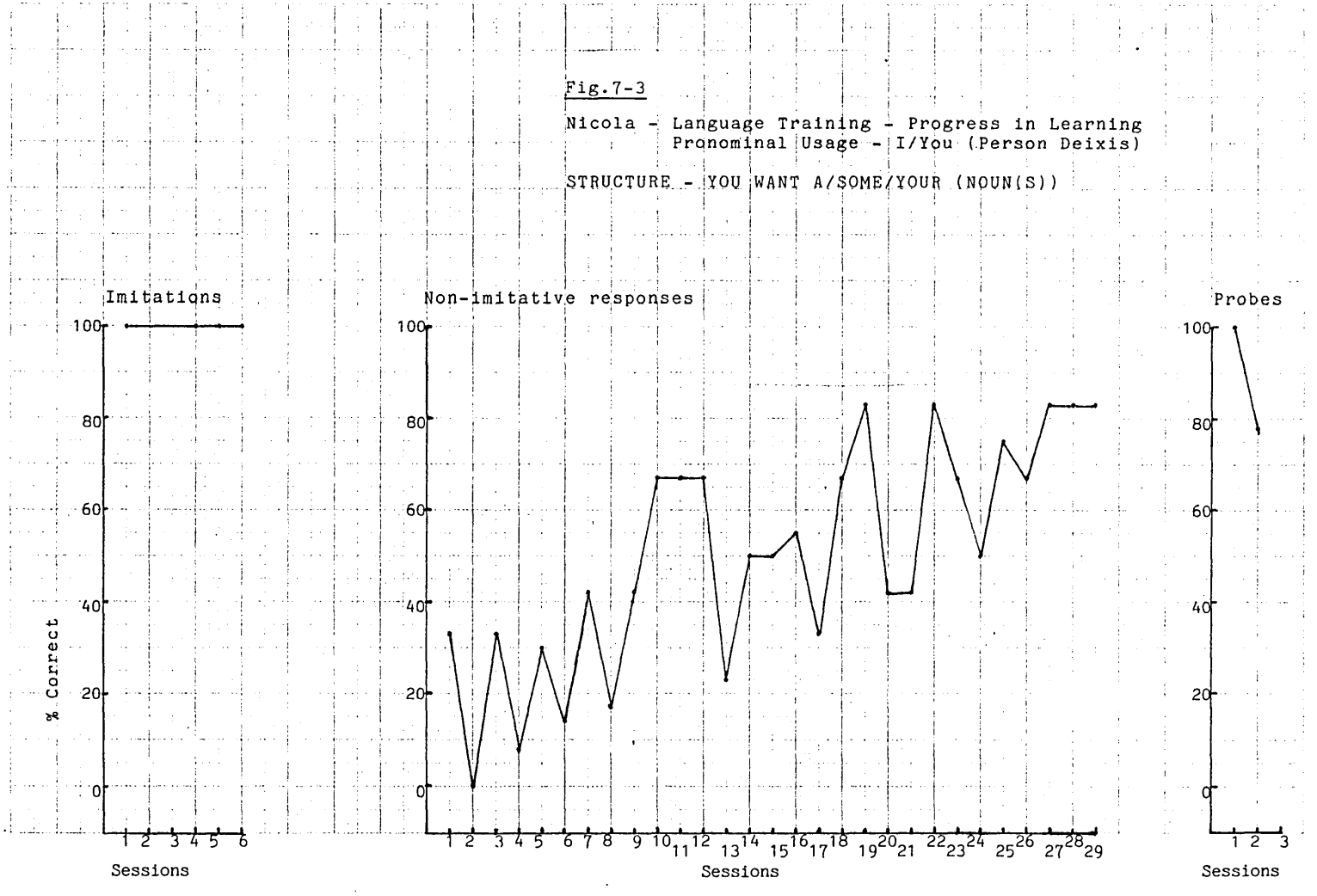


Fig.7-4

Nicola -POST-TEST 1 - Generalisation Probes
Training Category - Pronominal Usage - I + Requesting - (Objects)
STRUCTURE - CAN I HAVE A/MY/SOME (NOUN(S))?
Stimulus Question - IF YOU WANT A/SOME/YOUR NOUN(S) THEN ASK(ME) FOR IT
Generalisations in Test Conditions A and B

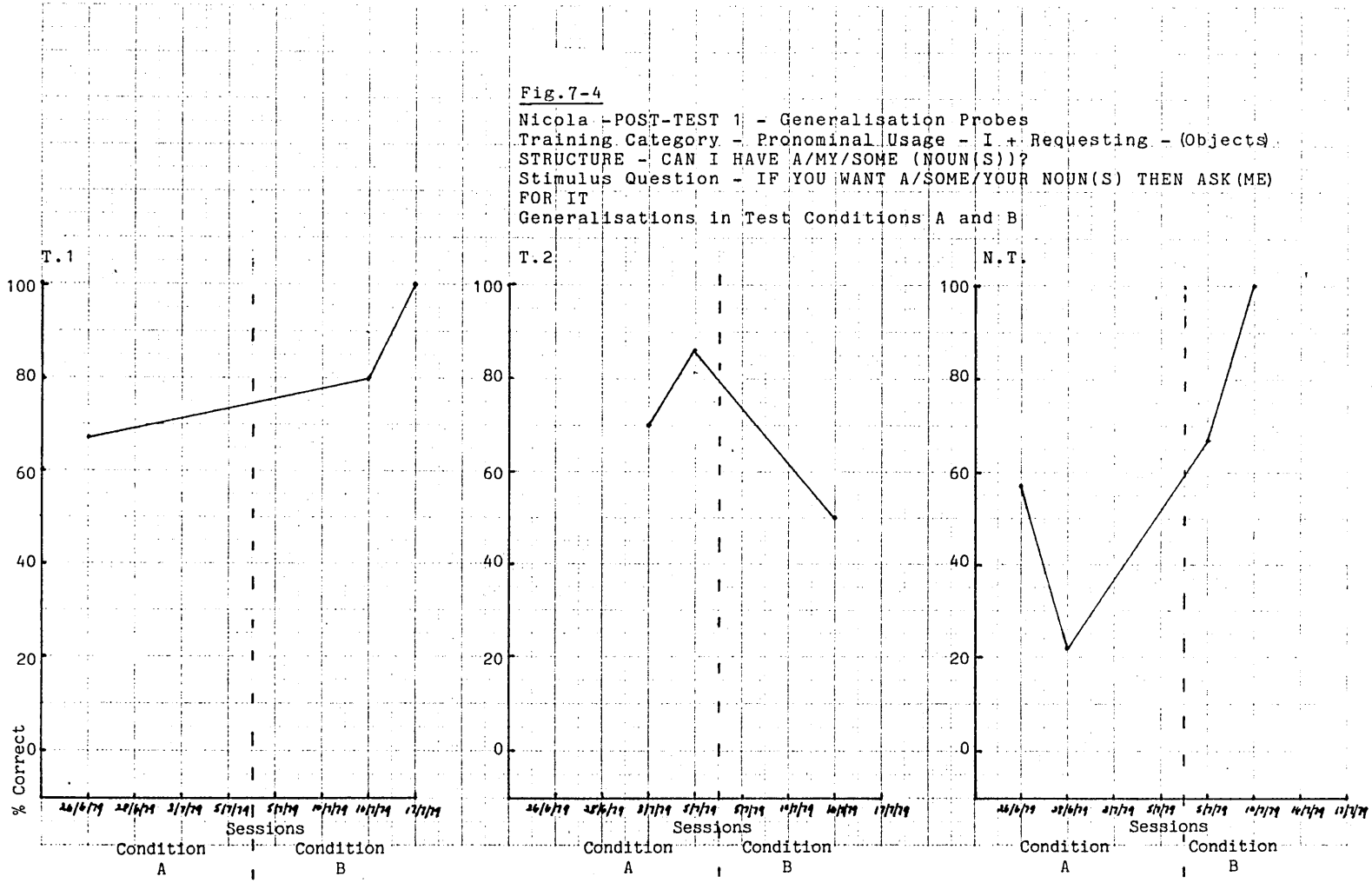


Fig.7-5

Nicola - POST-TEST 1 - Generalisation Probes

Training Category - Pronominal Usage - I + Requesting (Objects)
STRUCTURE - CAN I HAVE A/SOME/MY (NOUN(S))?

Stimulus - WH. DO YOU WANT?
Generalisations in Test Conditions A and B

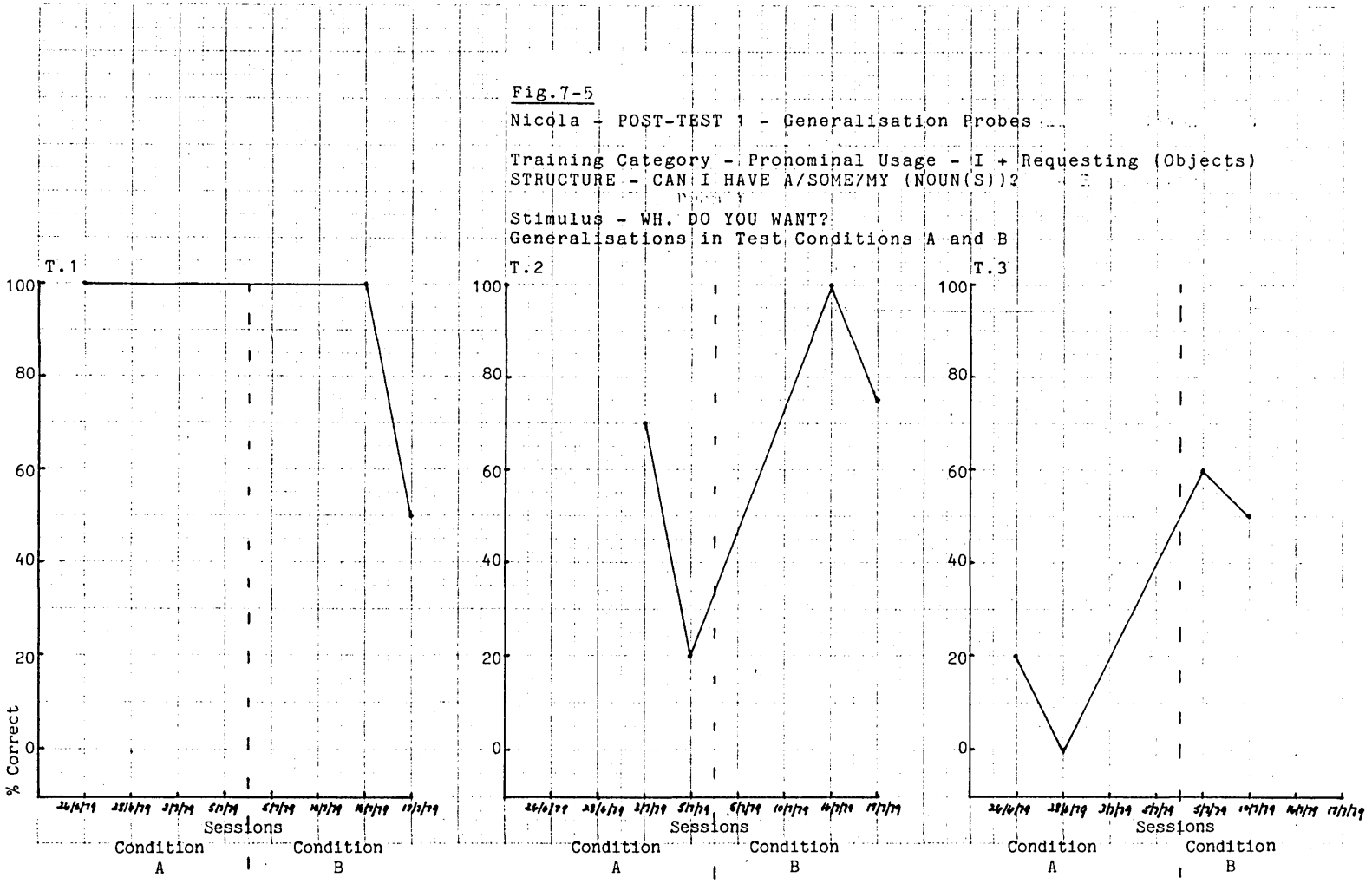


Fig.7-6

Nicola - POST-TEST 2 - Generalisation Probes (High Structure)
Training Category - Pronominal Usage - I + Requesting (Objects)
Generalisations in Sub-Tests I and II

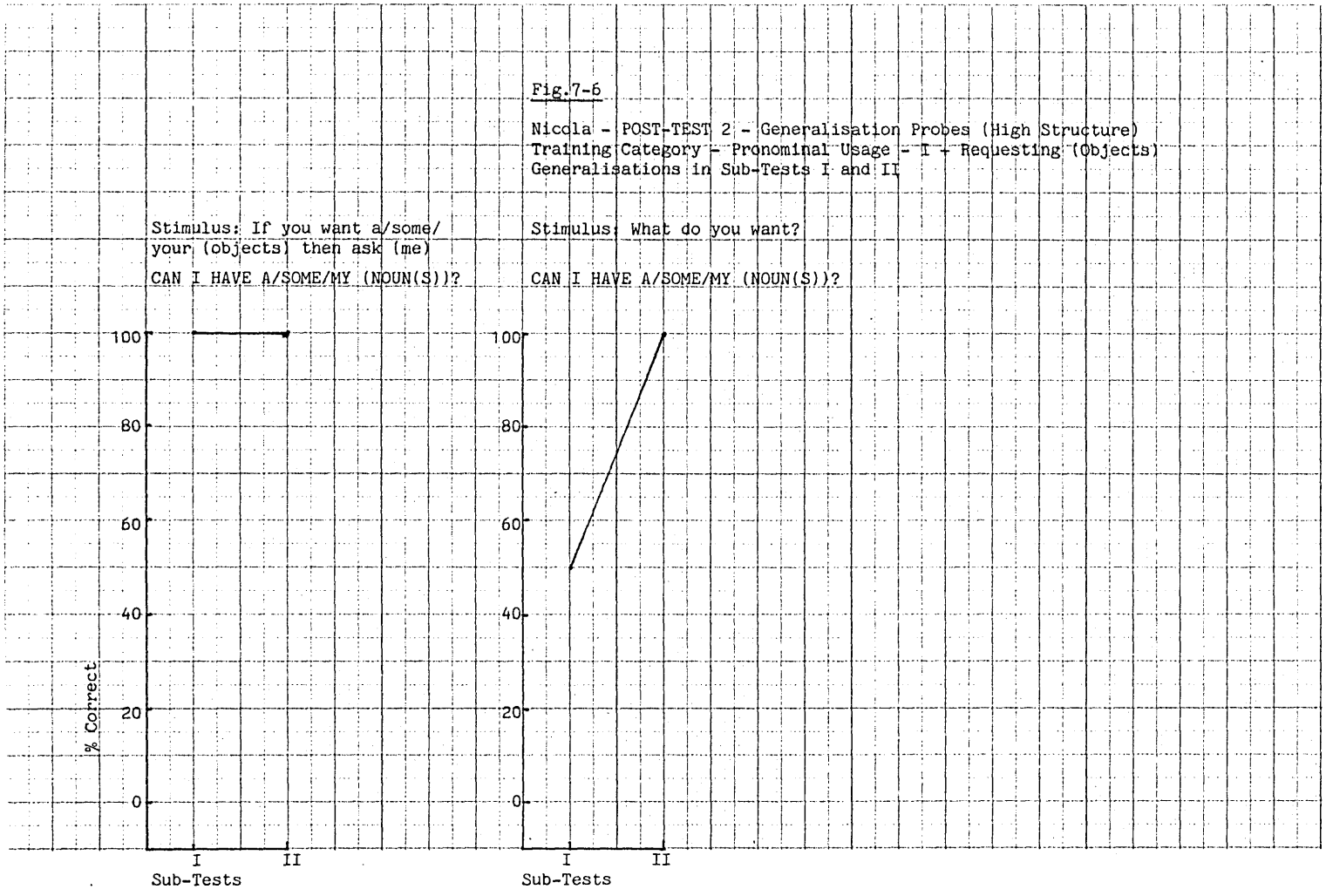


Fig.7-7
Nicola - POST-TEST 3 - Generalisation Probes - (High Structure)
Generalisations
T.1
% Correct
100
80
60
40
20
0
CAN I HAVE A/SOME/MY (NOUN(S))?
Stimulus - If you want a/some/your (noun(s)) then ask (me) for it
CAN I HAVE A/SOME/MY (NOUNS)?
Stimulus - What do you want?
WHAT DO YOU WANT?
YOU WANT A/SOME?YOUR (NOUNS)
Structures

Fig.7-8

Nicola - POST-TEST 3 - Generalisation Probes (low structure)
Training Category - Pronominal Usage - I + Requesting(Objects)
STRUCTURE - CAN I HAVE A/SOME/MY NOUN(S)
I WANT A/SOME/MY NOUN(S)

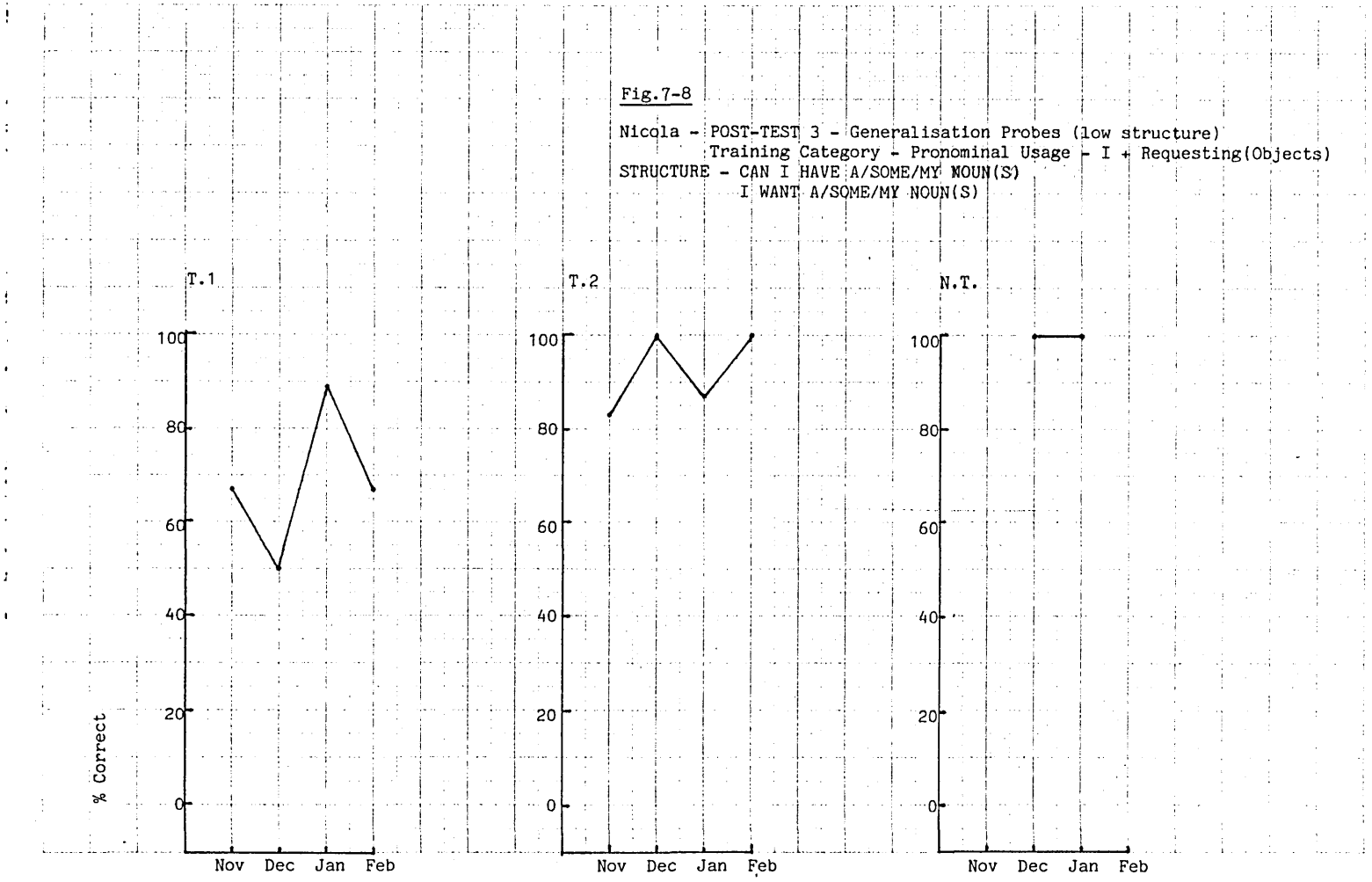


Fig.7-9

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Pronominal Usage - I/YOU (Person Deixis) + Wh?
STRUCTURE - WHAT DO YOU WANT?

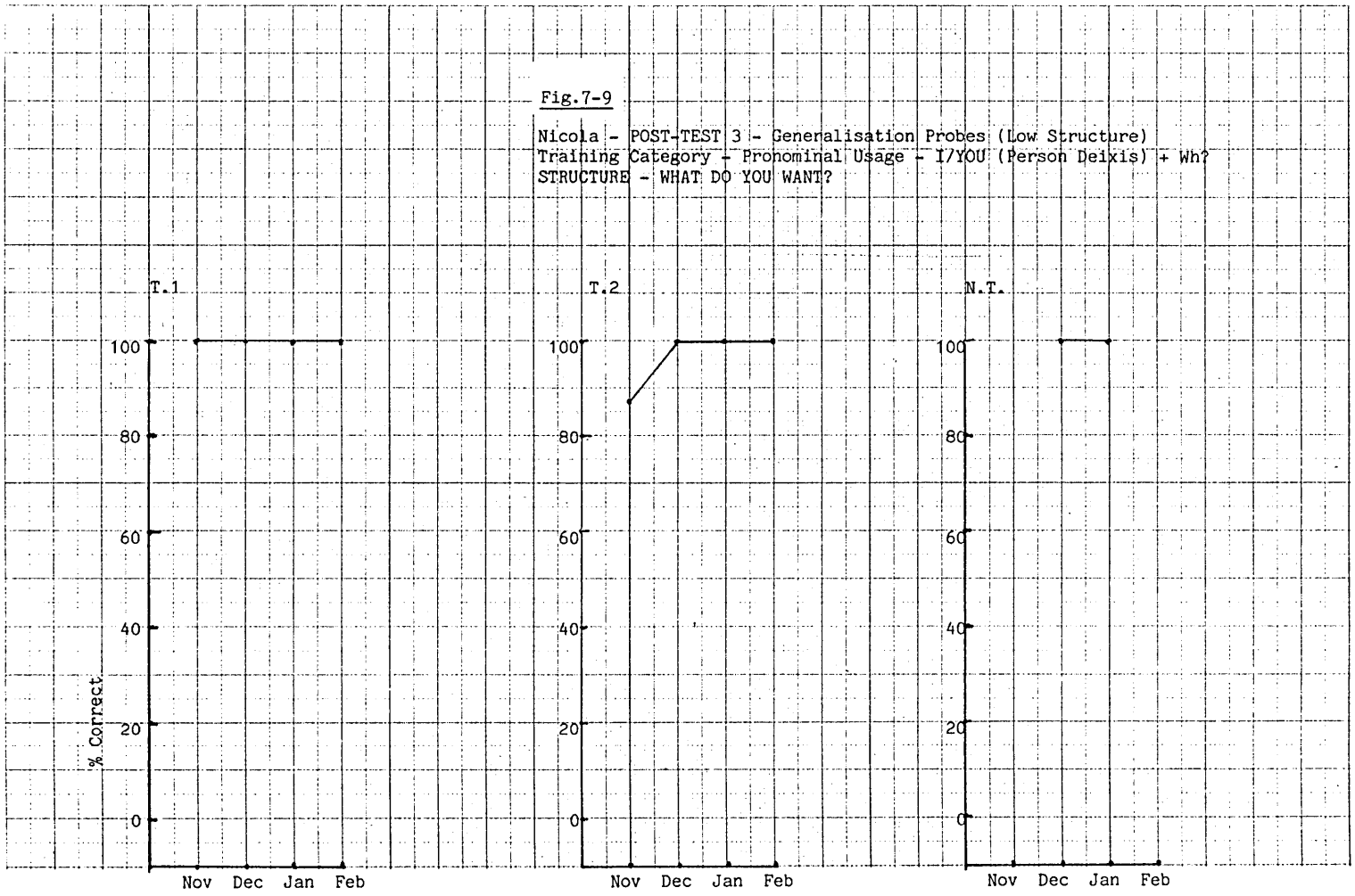
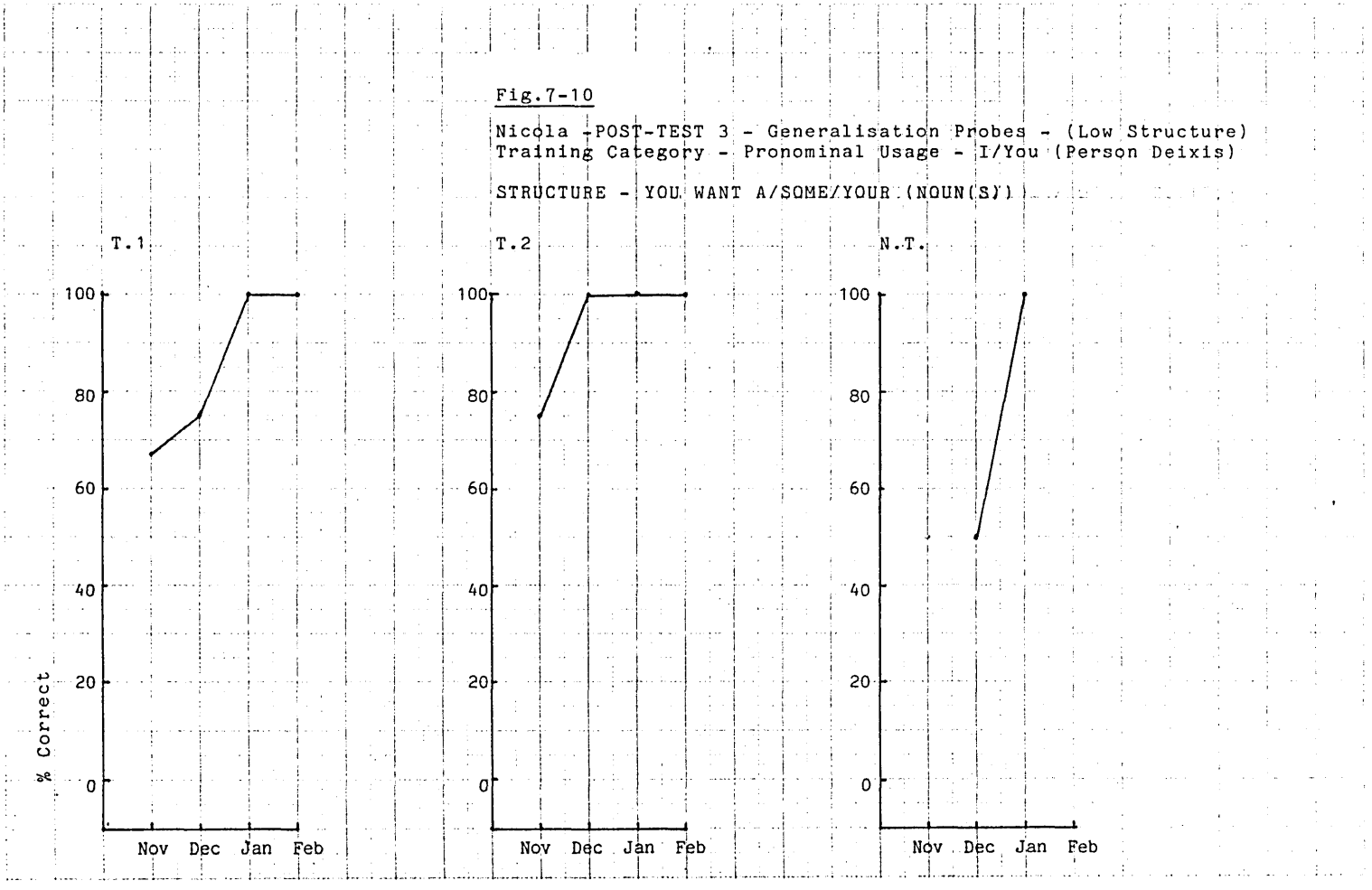


Fig.7-10

Nicola -POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Pronominal Usage - I/You (Person Deixis)

STRUCTURE - YOU WANT A/SOME/YOUR (NOUN(S))



Nicola - Spontaneous Generalisations (unelicited) - Trained Forms/Combinations

POST-TEST 1

Trained Forms

	Date	Adult	Condition
IT'S A (NOUN) - Labelling-objects-(singular)			
it's cup	3/7/79	T.2.	A
it's a book	3/7/79	T.2.	A
it's balloon	5/7/79	T.2.	A
it's a comb	5/7/79	T.2.	A
it's a skirt	16/7/79	T.1.	B
it's a red -/(utterance interrupted by adult)	16/7/79	T.2.	B
IT'S PERSON (NAME)			
it's Lee	28/6/79	N.T.	A
Labelling Persons/Actions/Things			
it's Nicola Tomlinson combin' hair	26/6/79	N.T.	A
I AM VERBING (OBJ/PREP) - Labelling-actions-(personal)			
I am closing book	16/7/79	T.2.	B
CAN I HAVE A/SOME (NOUN(S)) - Requesting-(Objects)			
Can I have sharpener? x 2	3/7/79	T.2.	A
Can I have a drink - water (please)? x 3	3/7/79	T.2.	A
CAN I VERB(OBJECT)/(PREPOSITION)? - Requesting - (Actions)			
Can I colourin' skirt in? Can I cut it please? 'n I draw Susan? Can I draw Susan Mrs Wright?	26/6/79	T.1.	A

Nicola - Spontaneous Generalisations (unelicited)-Trained Forms/Combinations

POST-TEST 1

Trained Forms

	Date	Adult	Condition
CAN I VERB (OBJECT)/(PREPOSITION) - Requesting - (Actions)			
Can I comb my hair?	3/7/79	T.2.	A
Can I draw this? Can I draw Susan? x 3 Can I?	5/7/79	T.2.	A
Can I draw Susan? x 2 Can I rub my hand?	10/7/79	T.2.	B
Can I put black skirt on?	10/7/79	N.T.	B
Can I draw Susan?	16/7/79	T.1.	B
Can I draw Susan?	17/7/79	T.1.	B

Nicola - Spontaneous Generalisations (unelicited) - Trained Forms/Combinations

POST-TEST 1

Combinations	Date	Adult	Condition
Labelling Persons			
that's Jamie x 2	3/7/79	T.2.	A
Requesting (information) - Objects			
what's that?	3/7/79	T.2.	A
what's that?	16/7/79	T.1.	B
Requesting (information) - persons			
who is it? x 2	28/6/79	N.T.	A
who's that? x 2	3/7/79	T.2.	A
who's that? x 2	5/7/79	T.2.	A
Requesting (information) - persons/actions			
what's that man doin'?	5/7/79	T.2.	A
Requesting			
Mrs Wright, fasten it	16/7/79	T.1.	A
Requesting			
when can I draw Susan?	5/7/79	T.2.	A
Requesting			
I want draw Susan	5/7/79	T.2.	A
Pron. I + negative (not)			
I am not Glyn	28/6/79	N.T.	A

Nicola - Spontaneous Generalisations (unelicited) - Trained Forms/Combinations

POST-TEST 2

Trained Forms

	Date	Adult	Sub-Test
IT'S A (NOUN) - Labelling objects - (Singular)			
it's a skirt	6/9/79	T.l.	1
CAN I HAVE A/SOME(NOUN(S))? - Requesting + pron. I			
Can I have some chocolate please? x 3	10/9/79	T.l.	2
CAN I VERB (OBJECT)/(PREPOSITION)? - Requesting + pron. I			
Can I put black skirt on? x 2 Can I take home big drawin'? Can I put my shoe on please?	6/7/79	T.l.	1

Combinations

Requesting (information) - Objects			
What's that Mrs Wright?	6/9/79	T.l.	1
"What is it? - (pointing to own skirt)	6/9/79	T.l.	1
(it's a skirt)"			
Subject + cop' + verb-ing			
Stan's comin'	6/9/79	T.l.	1

Nicola - Spontaneous Generalisations (unelicited) - Trained Forms/Combinations

POST-TEST 3

Trained Forms

	Date	Adult	Context
IT'S A (NOUN) - Labelling objects - (Singular)			
it's a cup of tea all over - (pointing to tea spilt on table)	3/1/80	T.2.	2
it's a lot Mrs Wright - (pointing to large expanse of background she was colouring in her drawing	3/12/79	T.1.	2
THEY ARE (NOUNS) - Labelling objects - (Plural)			
they're boots	9/11/79	T.1.	2
they are denim jeans	28/1/80	T.1.	1
I AM VERBING(OBJECT)/(PREPOSITION) - Labelling actions (personal)			
I am drawin' a long coat	9/11/79	T.1.	2
I am colourin' red skirt I am drawin' shoes	21/11/79	T.1.	2
I am cleaning the sink I am cleanin' sink out	15/1/80	T.1.	3
I am cleanin' sink	13/2/80	T.2.	3
CAN I HAVE A/SOME/MY (NOUN(S)) - Requesting + Pron. I (objects)			
Can I have paint please? Can I have more paint?	8/11/79	T.1.	2
Can I have a black crayon? Can I have a black crayon please?	9/11/79	T.1.	2
Can I have my shoes back please? (Another child had taken her shoes)	12/11/79	T.1.	1
Can I have more paper please?	21/11/79	T.1.	2
Can I have more Vim on table?	23/11/79	T.1.	2 + 3
Can I have some more paper?	23/11/79	T.1.	2 + 3

Nicola - Spontaneous Generalisations (unelicited) - Trained Forms/Combinations

POST-TEST 3

Trained Forms

	Date	Adult	Context
CAN I HAVE A/SOME/MY (NOUN(S)) - Requesting + Pron. I (objects)			
Can I have a blue crayon? Can I have more paper?	3/12/79	T.1.	2
Can I have piece a cake? x 10	14/12/79	T.1.	1
Can I have the crayon?	5/2/80	T.2.	2
Can I have some custard?	28/2/80	T.1.	1
CAN I VERB (OBJECT)/(PREPOSITION)? - Requesting + pron. I			
Can I draw yellow? Can I paint yellow? Can I draw me? Can I draw fireworks?	8/11/79	T.1.	2
Can I paint blue jumper?	8/11/79	T.1.	2
Can I draw black boots? Can I colour in red coat?	9/11/79	T.1.	2
Can I try them on? Can I put corduroy skirt on? Can I go to the toilet? Can I draw me?	12/11/79	T.1.	1
Can I go the toilet?	15/11/79	T.2.	1
Can I draw Alexia? x 2 Can I draw blue shoes Mrs Wright? Can I go the toilet?	21/11/79	T.1.	2
Can I draw Jamie? Can I draw Susan Mrs Wright? Can I draw me? x 5 (separate occasions) Mrs Wright can I draw Susan? x 10 (separate occasions) Can I take it home? Can I draw me Mrs Wright? Can I put them on?	23/11/79	T.1.	2 + 3
Can I draw Susan? Can I draw me Mrs Wright? Can I draw other one king?	3/12/79	T.1.	2

Nicola - Spontaneous Generalisations (unelicited) Trained Forms/Combinations

POST-TEST 3

Trained Forms

	Date	Adult	Context
CAN I VERB (OBJECT)/(PREPOSITION) - Requesting + pron. I			
Can I draw Father Christmas?	3/12/79	T.1.	2
Can I draw me? x 3 Can I draw blue corduroy skirt? x 2 Can I draw long skirt? Can I mend the paper?	11/12/79	T.2.	2
Can I go the toilet? x 4 Can I draw Susan?	14/12/79	T.1.	1
Can I go toilet?	3/1/80	T.2.	2
Can I draw Lesley? Can I draw Susan? Can I draw Stan? Can I draw long skirt?	9/1/80	T.1.	1
Can I draw Glyn Elliott? Can I go the toilet?	15/1/80	T.1.	1
Can I draw Sister?	23/1/80	T.2.	3
Can I go to toilet?	29/1/80	T.2.	1
Can I draw Jamie?	28/2/80	T.1.	1
Can I draw me? x 5 Can I draw legs? x 3 Can I get some more paper?	No Date	T.2.	1
WHAT DO YOU WANT? - Person Deixis - I/you + Requesting			
What do you want?	28/11/79	T.2.	3
WHAT ARE YOU DOING - Person Deixis - I/You + Requesting			
What are you doing Andrew Martin?	15/11/79	T.2.	1
What are you doing?	23/11/79	T.1.	3

Nicola - Spontaneous Generalisations (unelicited) -
Trained Forms/Combinations

POST-TEST 3

Trained Forms

	Date	Adult	Context
WILL YOU VERB (FOR ME)? - Person Deixis - I/You + Requesting			
Will you Mrs Cherry put corduroy skirt on?	12/11/79	T.1.	1
Will you draw fringe?	5/12/79	N.T.	2
Will you put blue corduroy skirt on?	10/1/80	T.2.	1
Will you put corduroy skirt on? x 4			
Will you draw neck?	16/1/80	N.T.	2
Will you want a blue corduroy skirt?	28/1/80	T.1.	1
Will you find the black skirt?	21/1/80	T.2.	1
Will you draw shaped eyes?	5/2/80	T.2.	2
Will you crossing legs?	28/2/80	T.1.	1
IT'S IN THE (OBJECT) - Prepositional usage			
it's in the wardrobe, Mrs Cherry's wardrobe	14/12/79	T.1.	1

Nicola - Spontaneous Generalisations - (unelicited) -
Trained Forms/Combinations

POST-TEST 3

Combinations	Date	Adult	Context
IT'S - pron. + cop'			
it's hard	23/1/80	T.2.	3
IT'S/THAT'S (pronoun + cop') + NOT (negative)			
it's not corduroy jeans that's not black corduroy skirt	14/12/79	T.1.	1
Pronoun-I + auxiliary + VERB-ING (object)/ (preposition) + NOT (negative)			
I'm not taking it home	8/11/79	T.1.	2
I am not doing red face I am not drawing orange tights I am not drawing black skirt I am not drawing long skirt	21/11/79	T.1.	2
I am not doing background	3/12/79	T.1.	2
I am not drawing long skirt I am not drawing brown skirt x 2	11/12/79	T.2.	2
I am not wearing white pants	14/12/79	T.1.	1
I am not drawing black skirt	9/1/80	T.1.	1
I am not put hole in the red tights	15/1/80	T.1.	1
I'm not going in 't barrel	13/2/80	T.2.	2
I am not going Bessie I am not having dinner in classroom	28/2/80	T.2.	1
Other Forms negative - NOT			
do not make noise	28/2/80	T.1.	1
not what's happening	No Date	T.2.	1

Nicola - Spontaneous Generalisations (unelicited) -
Trained Forms/Combinations

POST-TEST 3

Combinations

	Date	Adult	Context
Pronoun - I + want			
I want some more Vim on table	23/11/79	T.1.	3
I want some chocolate	3/12/79	T.1.	2
I want some custard	28/2/80	T.1.	1
Pronoun - I + Want + Verb			
I want kiss table	12/11/79	T.1.	1
I want draw Susan I want mend/sharpen pencil Mrs Wright I want draw Susan	23/11/79	T.1.	2
I want do it	3/12/79	T.1.	2
I want colour it in	5/12/79	N.T.	2
I want put black skirt on I want go toilet I want take home little me drawing Susan I want go in park I want go to Bessie	9/1/80	T.1.	1
I want to take it home	10/1/80	T.2.	1
I want have a look I want put black skirt on	15/1/80	T.1.	1
I want draw legs I want sharpen pencil	10/1/80	N.T.	2
I want to try'em on, can I? I want to try'em on, sandals I want to draw Sister	23/1/80	T.2.	3
I want to buy some new shoes	28/1/80	T.1.	1
I want to put the black skirt on I want blue jeans	29/1/80	T.2.	1

Nicola - Spontaneous Generalisations (unelicited) -
Trained Forms/Combinations

POST-TEST 3

Combinations

	Date	Adult	Context
Pronoun - I + want + Verb			
I want do zip I want put black skirt on I want to go toilet			
I want to go to the toilet	13/2/80	T.2.	2
I want to put black skirt on I want to kiss Alan	28/2/80	T.1.	1
WILL + PERSON(NAME)+ VERB(OBJECT)/(PREPOSITION)			
will Mrs Cherry put corduroy skirt on?	12/11/79	T.1.	1
will Mrs Cherry put corduroy skirt on?	23/11/79	T.1.	3 + 2
will mummy buy black corduroy skirt? will Mrs Cherry put corduroy skirt on?	14/12/79	T.1.	1
will Mrs Cherry put corduroy skirt on? x 4 will mummy buy black skirt?	9/1/80	T.1.	1
will Nan-Nan buy some red tights birthday?	15/1/80	T.1.	1
will mummy buy a corduroy skirt?	28/2/80	T.1.	1
Pronouns - WE/SHE			
We are comin' to school tomorrow	23/11/79	T.1.	2
We are comin' school tomorrow	14/12/79	T.1.	1
she's poorly	13/2/80	T.2.	3
where is he, Alan? we are not comin' to school tomorrow	28/2/80	T.1.	1

Nicola - Spontaneous Generalisations (unelicited) -
Trained Forms/Combinations

POST-TEST 3

Combinations

	Date	Adult	Context
Requesting (information) - Wh?			
what's them?	/11/79	T.1.	2
what is it?	11/12/79	T.2.	2
what is it? what's that? what are they? where's Mrs Cherry's corduroy skirt? what is it?	14/12/79	T.1.	1
where's Mr Youdan?	15/1/80 23/1/80	T.1. T.2.	1 2
what is it? when can I draw Mrs Cherry?	28/1/80	T.1.	1
when can I?	29/1/80	T.2.	1
where's Mrs Wright?	13/2/80	T.2.	2
what's them? where is he, Alan?	28/2/80	T.1.	1
Requesting (information) - IS/ARE?			
is that a corduroy skirt?	9/1/80	T.1.	1
is that blue corduroy skirt? is that corduroy skirt x 3	10/1/80	T.2.	1
is Glyn Elliott comin'? is Mrs Wright goin' Crucible? (addressed to care assistant)	15/1/80	T.1.	1
is Stan comin'? are they white jeans?	13/2/80	T.2.	3

Nicola - Spontaneous Generalisations (unelicited) -
Trained Forms/Combinations

POST-TEST 3

Combinations

	Date	Adult	Context
Role Play - "Language - training game" - (self initiated)			
what are you doing? (not pointing to self) I am wipin' tables (pointing to self) what am I doing? (pointing to self) I am wipin' tables (pointing to self)	23/11/79	T.1.	3
what do you want Nicola Tomlinson? what are you doing Nicola Tomlinson? I am jumpin'	13/2/80	T.2.	3

CHAPTER EIGHT

CASE STUDY 4 - GLYN

1 The child in his environment

2 Pre-intervention language assessment and norm-referenced testing - Results

3 Development and learning in language and video training

4 Generalisation and training for generalisation - Observations

5 Mid-intervention and post-intervention generalisation probes and norm-referenced testing - Results

6 Discussion

Figures referred to in this Chapter are to be found on pages 302-313, before the Supplementary (generalisation data) pages

1 The child in his environment

Glyn was an eleven year old child who was the youngest of two children in a skilled working class family. His father was a retired steel worker and his mother was an ancillary worker in a local authority old people's home. Glyn's home environment was stable and supportive. His mother was an active member of the parent teacher's association, and was always willing to discuss Glyn's progress.

Clinical reports stated that developmental abnormalities were not indicated at birth, other than that Glyn was "very blue" and had difficulties in feeding. He attended mainstream nursery and primary schools but was referred at age six to an LEA assessment unit where he was found to have impaired learning abilities and defective speech and language. A clinical assessment conducted two years later confirmed mental retardation and emphasised limited language development characterised by an expressive language repertoire of only one and two word utterances. Moreover, the school reports consistently referred to a lack of progress in Glyn's language development throughout his attendance at Norfolk Park School. According to his mother, however, Glyn used a large spontaneous vocabulary at home and frequently asked questions.

Nevertheless, Glyn's verbal communication within the school environment was minimal. He was a solitary child who rarely initiated interaction with either adults or peers. His responses to adult initiations alternated between silence and the emission of one and two word utterances of limited form and function, spoken in a clipped, high pitched tone. He was 'hyperlexic' and could read material even when it was presented upside down. Much less clear, however was his verbal comprehension of text. Prior to the study, he had never been observed in play and although he was not an aggressive child, he was disinclined to socialise with his peers.

2 Pre-intervention language assessment and norm-referenced testing - Results

At the commencement of the study, Glyn was aged 11 years 6 months. His score on the Columbia Mental Maturity Scales was 19; and his scores on the Reynell Verbal Comprehension Test and the EPVT were 49 and 29 respectively.

Throughout the pre-intervention sessions, the quality and quantity of Glyn's expressive language was very different from his verbal behaviour in other contexts within the school. He demonstrated a wide labelling vocabulary of single word utterances, including object labelling in the singular and plural. Moreover, several of his responses to questions of the wh+ing type comprised verb-object, subject-verb, verb-adverbial and subject-verb-object

constructions, some of which included the use of the present progressive verb tense (eg, "holdin' fork"/"man sittin' down").

For the most part, however, Glyn's use of verbs was limited to the simple present form (eg, "hold bag"/"lady wash pots"). In addition, he produced a small number of utterances in which the definite article and the conjunction 'and' were integrated (eg, "shirt and trousers"/"read the book"/"man in the swim"/. The indefinite article, however, was omitted from all utterances in which it was obligatory.

Other notable omissions from Glyn's expressive language were possessive pronouns and the possessive 's' morpheme. Possession was coded by proper nouns in combination with the noun phrase (eg, "Judith hand"/"Glyn jumper"). Predictably, first, second and third person pronouns were also replaced by proper noun substitutions. Glyn's responses to Where? questions were limited to the production of in/on, here/there; other prepositional forms produced during the sessions were repetitions of prior adult utterances. Finally, he tended to respond affirmatively to questions requiring appropriate yes/no discriminations.

3 Development and learning in language and video training

Glyn's participation in the study extended over a period of ten months, from September 1978 until July 1979. The main structures taught during this period are given in 18 tables, each with an accompanying figure (tables 8-1 to 8-18, figures 8-1 to 8-18, in Volume 2, Appendix G). Considerations of space do not permit a detailed examination of all structures trained. Therefore, Glyn's general progress within the programme is summarily described and his acquisition of the YES/NO discrimination (objects) in the singular and plural form and functional request forms, integrating training in the first person pronoun and the I/you discrimination (person deixis) (I WANT A/MY(NOUN)/WHAT DO YOU WANT?) are discussed in some detail.

A positive working relationship was rapidly established in the teaching sessions. Initially, Glyn's attentional behaviour was sporadic. However, as intervention continued, his attentional deficits showed steady improvement. He was obviously highly motivated, and delighted in both the interaction and the individual attention. Time-out procedures were never applied and from the very beginning new language behaviour was shaped and maintained by verbal and physical reinforcement. Predictably, however, the teaching sessions were not entirely problem-free.

During the first weeks of the programme it became increasingly evident that Glyn had excellent, short-term retention, which in his case resulted in a strong tendency towards rote learning, such that criterion learning was rapidly, if somewhat prematurely achieved. Moreover, although correct response ratios were high, Glyn's rate of responding was often slow and halting. In general, therefore, training was systematically continued after initial criterion learning, as a precautionary measure against the rote acquisition of trained forms and to facilitate fluency in the production of verbal responses.

The first task in language training was to establish the present progressive tense of the verb as a reliable response within syntactically appropriate sentence structures. Intervention began by teaching Glyn to label persons/actions/things (IT'S A (SUBJECT) VERB-ING OBJ/AOBJ/PREP). After only six sessions he was able to produce the sentence structure in response to familiar and unfamiliar pictorial referents.

In the next step, Glyn was taught the YES/NO discrimination between objects in the singular and plural form. Six pictures were used to teach each discrimination in the singular and another set of six pictures was used to teach the discriminations in the plural. Each stimulus item was presented once only. Training began with the presentation of the singular form followed by the introduction of the plural in the second session.

Thereafter, both response categories in each discrimination were trained together in the same sessions. The response forms were introduced by the simultaneous presentation of two stimulus questions, What's this? Is it a (noun)? for the elicitation of the singular and What are these? Are they (nouns)? for responses in the plural form. These were then followed by stimulus presentations omitting the Wh question.

Figure 8-1 shows Glyn's progress in learning the YES discrimination in the singular form (YES IT IS). Figure 8-2 shows his learning of the negative singular discrimination (NO IT ISN'T, IT'S A (NOUN)). Despite the high ratio of correct responses, Glyn's rate of responding in the negative form was markedly slower than in the YES discrimination (singular). The problem was overcome by verbally reinforcing Glyn mid-response; that is, reinforcement was delivered immediately following production of the initial part of the response (eg, NO IT IS'NT) and prior to the emission of IT'S A (NOUN).

Although Glyn's responding in the positive singular was consistently more fluent than in the negative, training in the YES discrimination continued to parallel training in the negative response as a strategy for enhancing appropriate YES/NO differentiation. (More detail is given in tables 8-2 and 8-3 in Volume 2, Appendix G.)

Mid-response reinforcement was hardly used in shaping the negative plural (NO THEY AREN'T/ARE NOT, THEY'RE (NOUN(S)). This was somewhat surprising, given that the length and structural complexity of the plural negative discrimination was equivalent to the negative singular form. Moreover, Glyn's learning and rate of responding in the plural form in each discrimination (YES THEY ARE/NO THEY AREN'T etc) was more rapid than in the singular. Figures 8-3 and 8-4 show that only five teaching sessions were required in each response category. Furthermore, responding was maintained at high levels in the initial probes. (More detail is given in tables 8-4 and 8-5 in Volume 2, Appendix G.)

A further positive development to emerge during training, was Glyn's spontaneous production of "THEY'RE NOUNS" in response to the visual respresentations of objects used in the sessions and to objects in the classroom. Moreover, Glyn's use of the response in appropriate contexts clearly indicated that rote learning had not occurred.

During the following three months of training, the YES/NO discrimination was integrated into the development of new structures; in particular, training in the pronoun I and the possessive pronoun MINE. Glyn was first taught to identify himself (I AM (Glyn)), his own actions (I AM/I', VERB-ING(OBJ)/(AOBJ)/(PREP)), his possessions (IT'S MINE/THEY'RE MINE) and to discriminate between his

personal identity and actions (YES I AM (Glyn)/YES I AM (verb-ing) and the identity and actions of others (NO I'M NOT I'M GLYN/NO I'M NOT I AM/I'M VERB-ING(OBJ)/(AOBJ)/(PREP)) and to affirm possession (YES IT IS (mine)/YES THEY ARE (mine)).

Glyn was next taught to discriminate between the first and second person pronouns I/YOU (person deixis), within which training in the possessive pronoun MY was interwoven. In Glyn's case, the responses trained were the functional request form, I WANT A/MY (NOUN) and the question form WHAT DO YOU WANT? The objects used in teaching each response category were pencil, pen, book, chair, coat, cup. After initial training in requesting (1 session only) both structures were trained concurrently in the same sessions during which the request form was presented first followed by the elicitation of the wh question.

Figure 8-5 shows Glyn's progress in learning the request form. Initially, he was taught to produce the request in response to the stimulus question what do you want? accompanied by the presentation of an object and the forced alternative question "Do you want a (noun) or do you want a/your (noun)?" paired with the presentation of two stimulus objects. In the fifth teaching session, two additional stimulus presentations were introduced. The first, "Tell me what you want", was presented in combination with three or four training items; the second, "Is there anything else you want?" was presented with five

or six objects accompanied by rapid, sequential pointing to each item, to cue object selection and the appropriate verbal response.

The systematic increase in variability between verbal stimulus and object presentations was a deliberate strategy, intended to minimise rote repetition of responses and to facilitate stimulus generalisation and use of the request form in natural contexts. Figure 8-5 also shows that the increased level of demand in the fifth session produced only a slight decrease in Glyn's responding in comparison with his response ratios in the previous session, in which two verbal stimulus presentations were used.

Moreover, his ability to produce the structure in response to four different stimulus types steadily improved to optimal levels and although this was followed by decreases in his responding, successful generalisation occurred in the initial probes. (More detail is given in table 8-15 in Volume 2, Appendix G.)

Figure 8-6 shows Glyn's progress in learning WHAT DO YOU WANT? A two trainer system was used in teaching the question form. Initially, teaching was conducted in the context of dialogue routines between Glyn and the care assistant during which verbal responses and appropriate delivery of requested objects were modelled and prompted by the teacher-experimenter. In the third session, the

roles of the teacher-experimenter and care assistant were interchanged alternately and Glyn was required to articulate the question in response to two adults rather than one.

This tactic was intended to facilitate generalised use of the structure and to counter the occurrence of rote learning. Initially, Glyn was confused. However, he was also highly motivated and obviously delighted in the rare opportunity of engagement in reciprocal dialogue with two attentive, reinforcing adults. Not surprisingly, his learning improved rapidly and after a total number of fourteen sessions he was able to produce the responses fluently with adults and peers in the natural classroom setting, as shown by his performance in the initial generalisation probes.

Another problem encountered in the early stages of teaching, was Glyn's tendency to omit the verb form from the sentence structure (eg, what you want?) which, as stated earlier, raised fundamental questions concerning the remedial principle of teaching the grammar versus the legitimate usage of "ungrammatical" dialectal variations in the social environment. However, remedial considerations prevailed and the response was scored incorrect for training purposes.

Finally, during the closing stages of training it occurred to the teacher-experimenter that a more logical way of

teaching appropriate I/you differentiations would be to integrate the response form, YOU WANT A /SOME/YOUR (NOUN(S)) into the dialogue routines so that WHAT DO YOU WANT and YOU WANT A/SOME/YOUR (NOUN(S)) would be taught simultaneously in the same session. The strategy was subsequently adopted in Nicola's programme (Chapter 7). Moreover, in the next and final teaching sequence of Glyn's programme, he was taught to ask the question WHAT ARE YOU DOING? in combination with the verbal response YOU ARE VERB-ING A/YOUR (OBJ)/ (PREP).

In the video training dimension of the programme, Glyn received a total of 24 practice sessions in labelling objects in the singular and plural form (IT'S A (NOUN)/THEY'RE (NOUNS)) and in labelling persons/ actions/ things. He seemed less motivated in video training than in "live" teaching sessions, which he clearly preferred and was generally disinclined to participate in unsupervised video training sessions. Nevertheless, despite his strong preference for "live" language training, he enjoyed the involvement of the care assistant in the video sessions and his verbal responses were consistently appropriate.

4 Generalisation and training for generalisation - Observations

During the first months of the study, Glyn was as uncommunicative in the classroom setting as he was

elsewhere within the school. Not surprisingly, the elicitation of trained language forms in non-training contexts was difficult work. However, as Glyn became progressively successful in the teaching sessions, his confidence and desire to communicate increased. He became more verbally responsive to adult elicitations, prompts and cues in natural settings. He began to repeat specific elements of adult stimulus questions to cue appropriate rule selections for the necessary structural response forms. Self-cueing strategies of this nature progressively declined as his learning of new structures increasingly consolidated. Glyn also began to present himself for "talk" with the teacher-experimenter and care assistant.

Furthermore, he was the first child in the experimental group to initiate interactions with the teacher-experimenter through which new language forms were acquired more casually in natural settings. The first occasion was when he approached the teacher-experimenter and in a rising tone spoke the name of an absent classmate (eg, Steven). Thereupon, the teacher-experimenter modelled the question, "Where's Steven?", followed by the delivery of the requested information, contingent upon correct imitation of the question form. In addition, he began to produce stimulus questions spontaneously during the teaching sessions. For example, he was taught to produce the sentence structure, YES I AM (Glyn) in response to the stimulus question "Are you Glyn?". In the

later phases of training he often reversed pupil/teacher roles by delightedly presenting the question "Are you Mrs Wright?". Role reversal also occurred in the classroom context with the care assistant, with whom he would play the "language training game" and practise the structural drills of the training sessions.

During the Easter term, Glyn's language learning was consolidated further by systematically extending his reading abilities to include the construction of stimulus questions and sentence structures trained in the programme.

Towards the end of May 1979, Glyn began to participate in play routines and to initiate verbal interactions with peers in a range of contexts throughout the school. Furthermore, his mother arrived in the classroom one day and reported that he was "talking much more" and using "proper sentences" at home.

5 Mid-intervention and post-intervention generalisation probes and norm-referenced testing - Results

Glyn's departure from the study at the end of the Summer term in 1979 resulted in his participating in post-test 1 only. Again, considerations of space do not permit a detailed examination of Glyn's generalisation of each individual sentence structure. For these results, the reader is referred to figures 8-19 to 8-39 and tables 8-19

to 8-39 in Volume 2. Glyn's spontaneous productions of trained forms and combinations in post-test 1 are listed on pp 314-315.

For the purposes of continuity, the above results are summarily discussed, and generalisation of the YES/NO discrimination between objects in the singular and plural form and the first and second person pronouns I/YOU in the request forms I WANT A/MY/ (NOUNS)/WHAT DO YOU WANT? is discussed in detail.

It should be noted that audio tape and video tape recordings of Glyn's generalisations of the above response forms during interactions with the teacher-experimenter in test condition B were unfortunately lost. Each figure presented in the following section, therefore, shows results obtained only in condition A with this experimenter.

In post-test 1, Glyn's generalisation of the YES/NO discrimination was encouraging. Generalisation of the positive singular response (YES IT IS) is shown in figure 8-7. Optimal generalisation occurred in interactions with the teacher experimenter (T.1) and the care assistant (T.2) in the highly structured context of condition A and was only marginally lower with the non-trainer (N.T.) in the same condition. Moreover, Glyn's generalisation with the non-trainer in the semi-structured settings of condition B was higher than with the care assistant (T.2).

Generalisation of the singular negative form (NO IT ISN'T, IT'S A (NOUN)) is shown in figure 8-8. In condition A, Glyn's generalisation of the response was lower with the care assistant (T.2) and the non-trainer (N.T.) than in the singular YES discrimination. However, generalisation was high in condition B and was comparable with levels achieved in the positive singular.

Glyn's generalisation of the positive discrimination in the plural form was of a similar pattern to generalisation of the singular (YES IT IS). Figure 8-9 shows that high levels of generalisation occurred across experimenters in each test condition. Generalisation of the plural negative (NO THEY AREN'T/ARE NOT, THEY ARE/THEY'RE (NOUNS)) is shown in figure 8-10. Glyn's ability to produce the structure was demonstrated in the high scores achieved across experimenters and test conditions in all but the second session with the care assistant (T.2) in condition B, in which moderate generalisation occurred.

Glyn's generalisation of the request forms I WANT A/MY (NOUN) and WHAT DO YOU WANT? was less consistent than in the YES/NO discrimination. Even so, the general trend in both structures was towards successful generalisation. Figure 8-11 shows generalisation of the request form I WANT A/MY (NOUN). In condition A, lower scores were achieved during interactions with the teacher-experimenter (T.1) and the non-trainer (N.T.) than with the care assistant with whom generalisation was at a maximum.

However, in condition B, Glyn's generalisation of the response was higher with the non-trainer than with the care assistant (T.2). (Additional detail is shown in table 8-36 in Volume 2, Appendix G.)

Figure 8-12 shows generalisation of the second person pronoun and of the question form WHAT DO YOU WANT? It should be noted, that in the tests, the dialectal version of the response (WHAT YOU WANT?) merited a correct score on the grounds that in natural settings within the local community the structure shared equal validity with the fully grammatical form.

Moreover, it must be emphasised that Glyn's generalisations included the production of both dialectal and non-dialectal response forms. Generalisation was high across experimenters in condition A. Furthermore, optimal levels were maintained with the non-trainer in condition B. Despite fluctuations in responding with the care assistant (T.2) in condition B, Glyn's generalisation of the question form and the second person pronoun was high overall. (Additional details are given in table 8-37 in Volume 2, Appendix G.)

Glyn's ability to generalise other sentence structures trained within the programme, was demonstrated in the high to optimal levels he achieved in the majority of structures. Generalisation of labelling personal actions (I AM/I'M VERB-ING (OBJ)/(AOBJ)/(PREP)) and the second

person pronoun in the response form (YOU ARE VERB-ING A/YOUR(OBJ)/(PREP) was less consistent and varied from high to low levels across experimenters and test conditions.

The most disappointing result was in the question form WHAT ARE YOU DOING? Generalisation was zero across test conditions and experimenters with the exception of a single score of 42% obtained with the care assistant in condition B. Throughout testing, Glyn consistently omitted all sentence elements other than the present progressive verb (eg, DOIN?). The result was therefore a clear indication that Glyn required further teaching and more time to consolidate his learning of the response.

Glyn's spontaneous utterances in post-test 1 demonstrated his developing ability to manipulate grammatical rules in the production of appropriate sentence structures. Furthermore, his utterances showed qualitative changes in both length and structural complexity as compared with his expressive language at baseline.

Glyn's score on the Columbia Mental Maturity Scales was 13. His scores on the Reynell Verbal Comprehension Test and the English Picture Vocabulary Test were 48 and 37 respectively.

6 Discussion

Over a period of approximately eight months, Glyn received systematic instruction in a total of 18 individual sentence structures. As a result, he was able to answer requests to label objects, actions and events in his immediate social environment and to exert further control over that environment through his ability to request functionally useful items and to ask questions about the needs and activities of others.

Procedural adaptations such as the continuation of training after initial criterion learning, mid-response reinforcement and increased levels of structural variation between stimulus presentations facilitated fluency in the production of verbal responses and minimised rote repetition of sentence structures.

The programme was successful in increasing Glyn's motivation to learn structural forms directly trained within the programme and to learn additional language from ongoing interactions in both training and non-training contexts, as exemplified in his use of adult stimulus presentations in the teaching sessions and the acquisition of Where questions in the classroom environment. Moreover, Glyn's acquisition of object labelling in the plural form (THEY'RE NOUNS) during training in YES/NO discriminations, indicated that systematic training in a limited set of surface grammar rules generated development

and learning in other structural forms.

The combined inputs of one-to-one language and video training, the elicitation of trained forms in natural settings and responsive reinforcing adult behaviour, all effectively reduced the mismatch between Glyn's pre-intervention verbal behaviour in structured interactions with an adult, and his low level verbal communication in natural settings.

In post-test 1, extensive generalisation of sentence structures trained within the programme occurred across test conditions and experimenters in all but a few response forms. Furthermore, Glyn's spontaneous utterances demonstrated his developing ability to combine trained forms with untrained forms in his verbal communication in structured and semi-structured contexts.

At the time of his departure from the study, Glyn was no longer the quiet sullen child who had entered the programme some ten months earlier. By contrast, he was a responsive, smiling, communicative child who was initiating and engaging in verbal interactions with adults and peers in a gradually extending range of contexts.

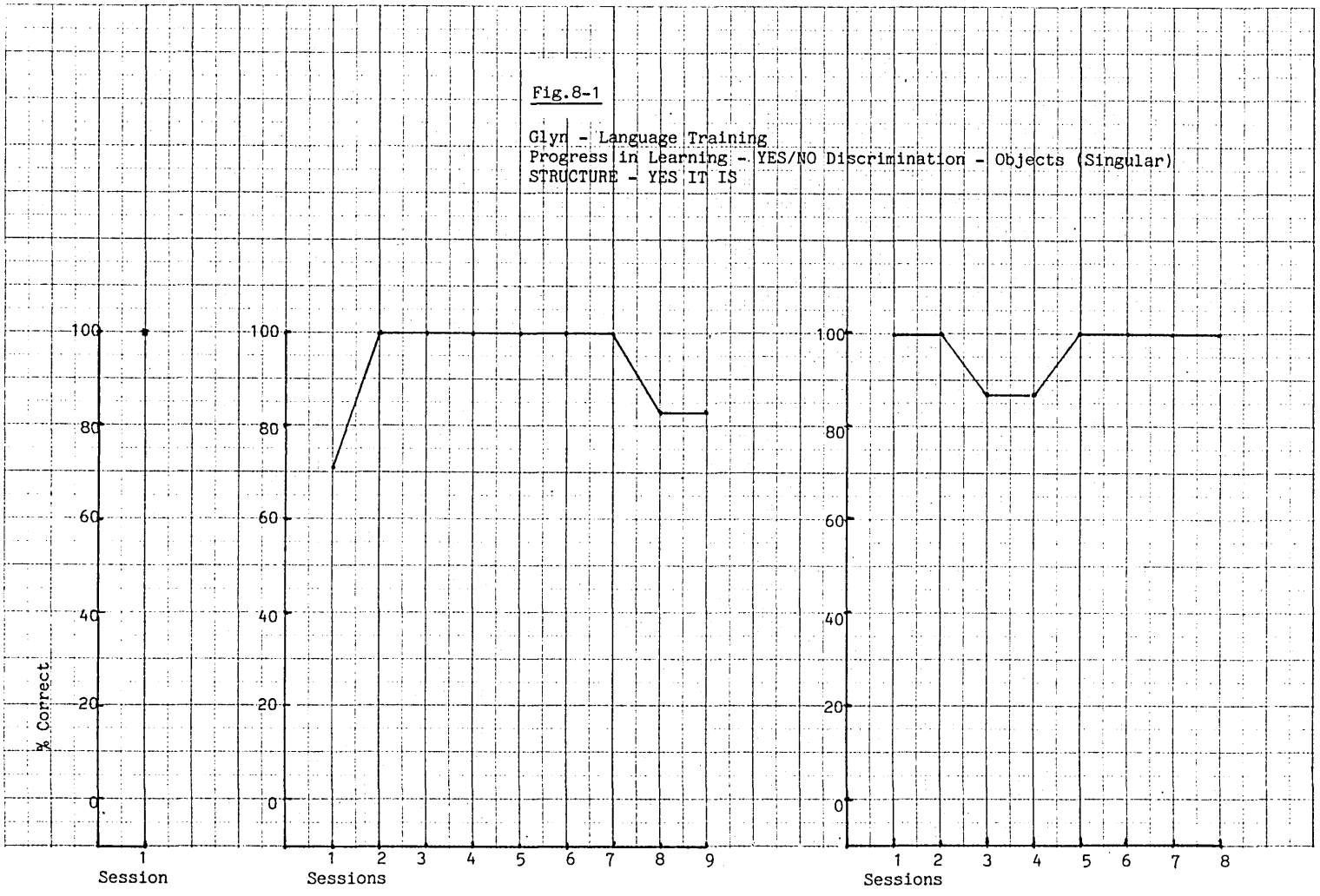


Fig.8-1
Glyn - Language Training
Progress in Learning - YES/NO Discrimination - Objects (Singular)
STRUCTURE - YES IT IS
% Correct
100
80
60
40
20
0
1
Session
1 2 3 4 5 6 7 8 9
Sessions
1 2 3 4 5 6 7 8
Sessions

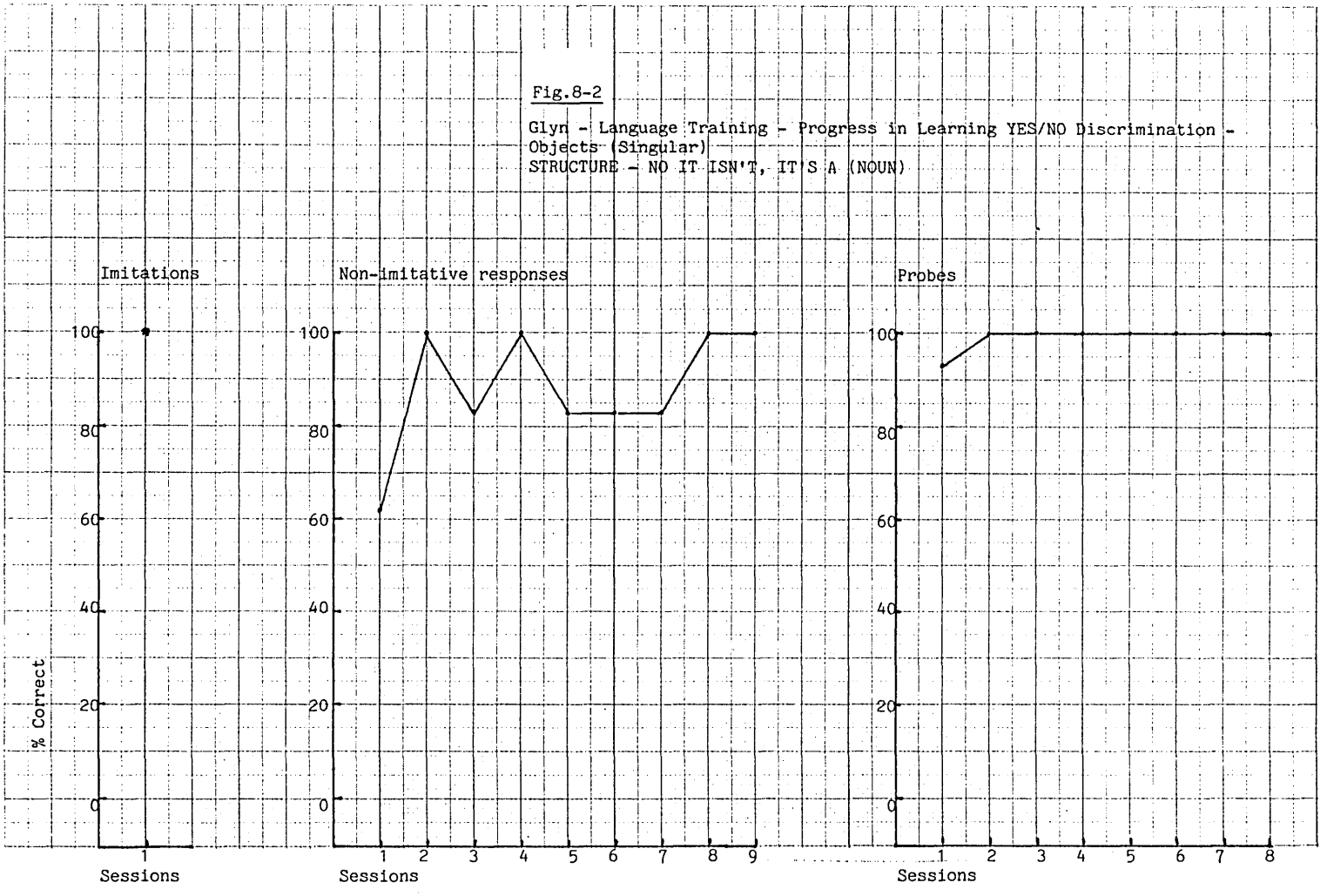


Fig.8-2

Glyn - Language Training - Progress in Learning YES/NO Discrimination - Objects (Singular)
STRUCTURE - NO IT ISN'T, IT'S A (NOUN)

Fig.8-3

Glyn - Language Training - Progress in Learning YES/NO Discrimination - Objects (Plural) STRUCTURE - YES THEY ARE

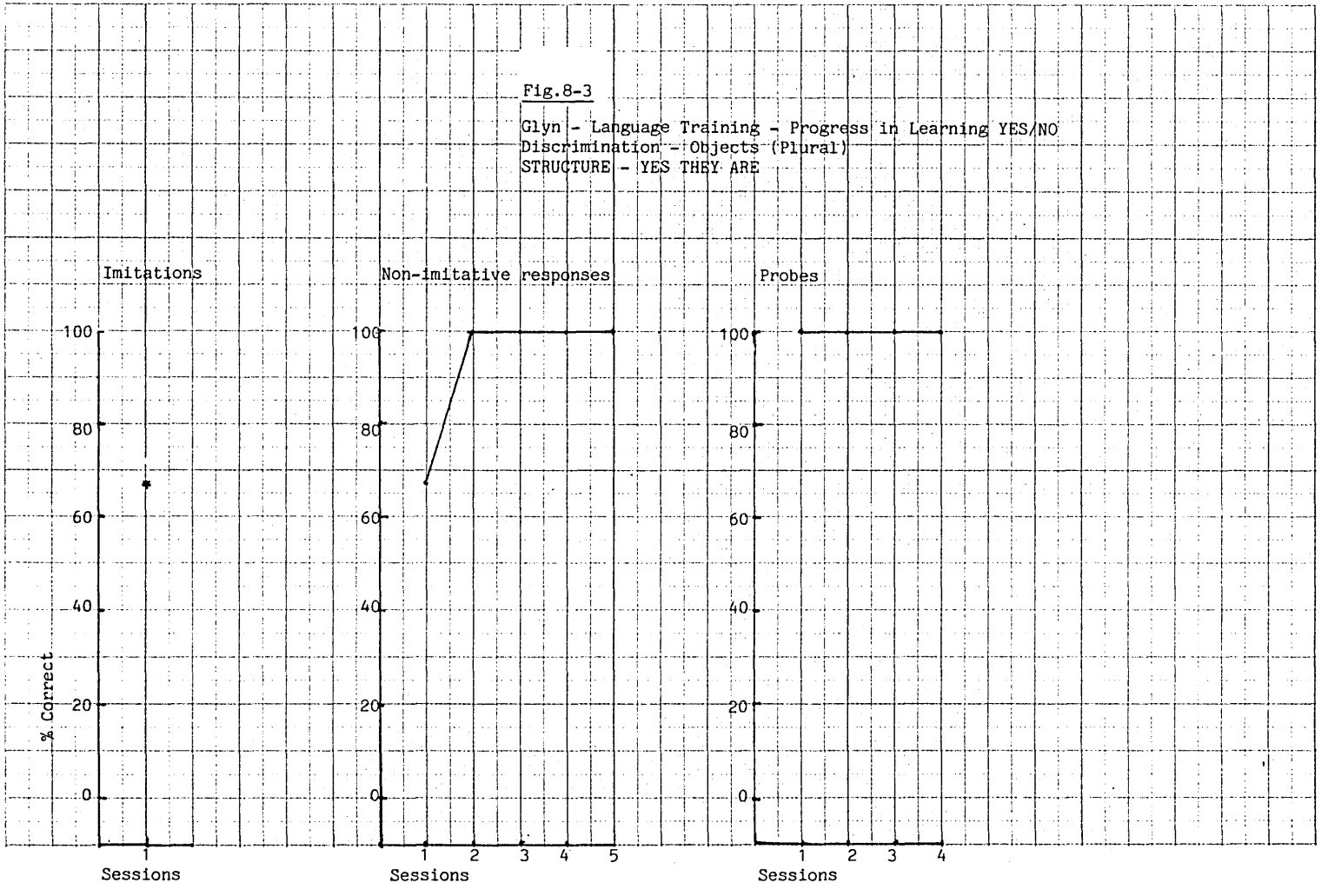


Fig.8-4

Glyn - Language Training - Progress in Learning YES/NO Discrimination - Objects (Plural)
STRUCTURE - NO THEY AREN'T/ARE NOT, THEY'RE (NOUNS)

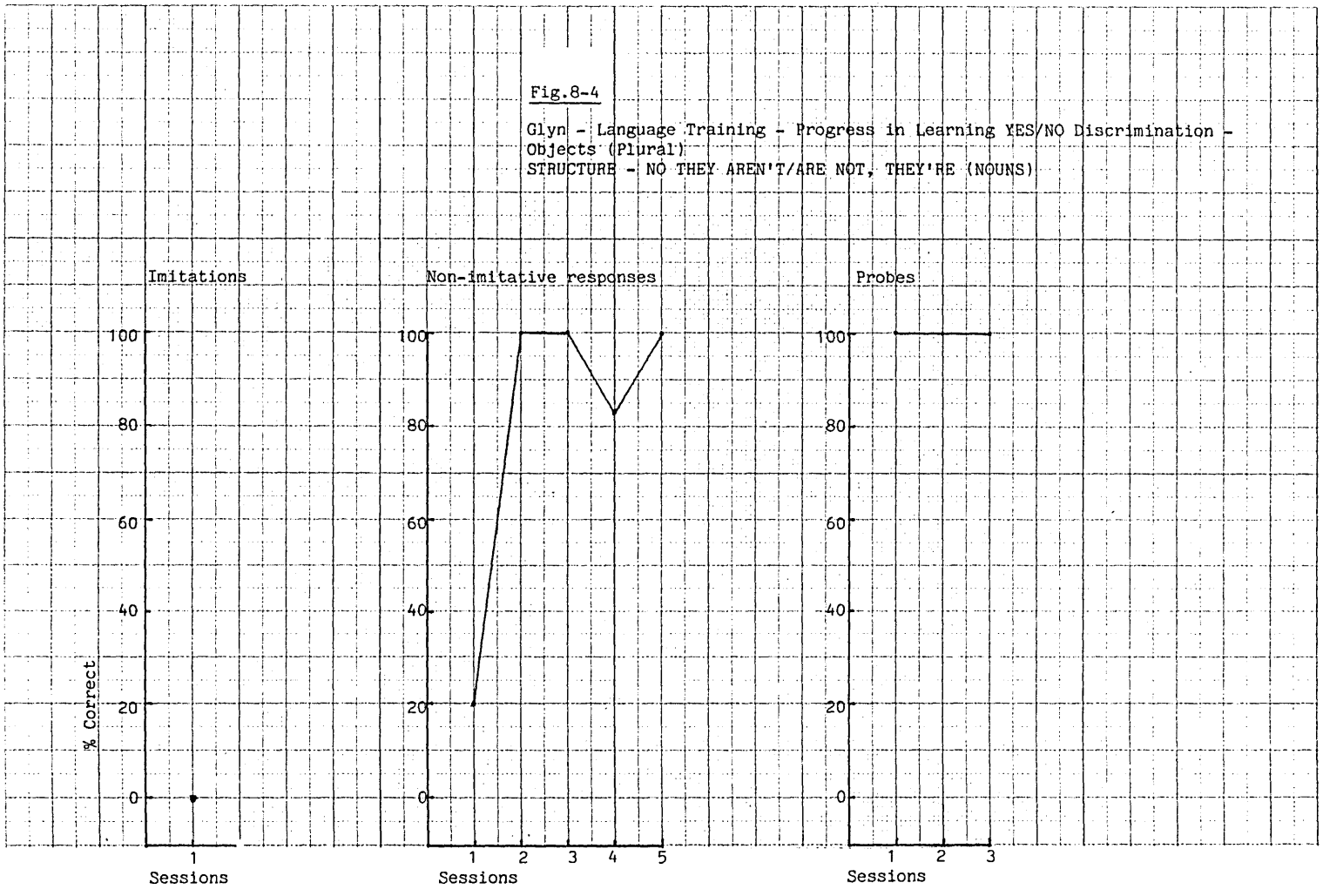
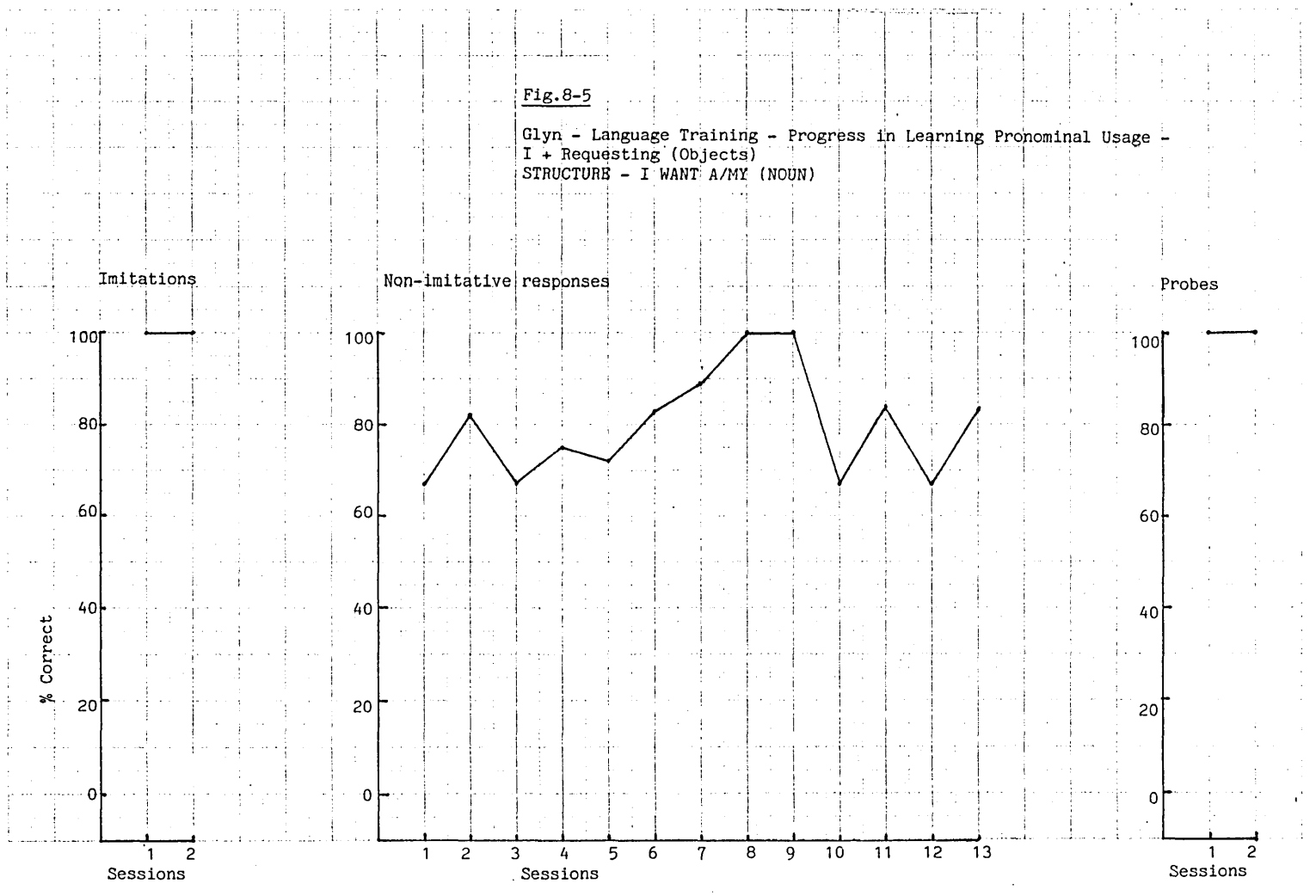


Fig.8-5

Glyn - Language Training - Progress in Learning Pronominal Usage -
I + Requesting (Objects)
STRUCTURE - I WANT A/MY (NOUN)



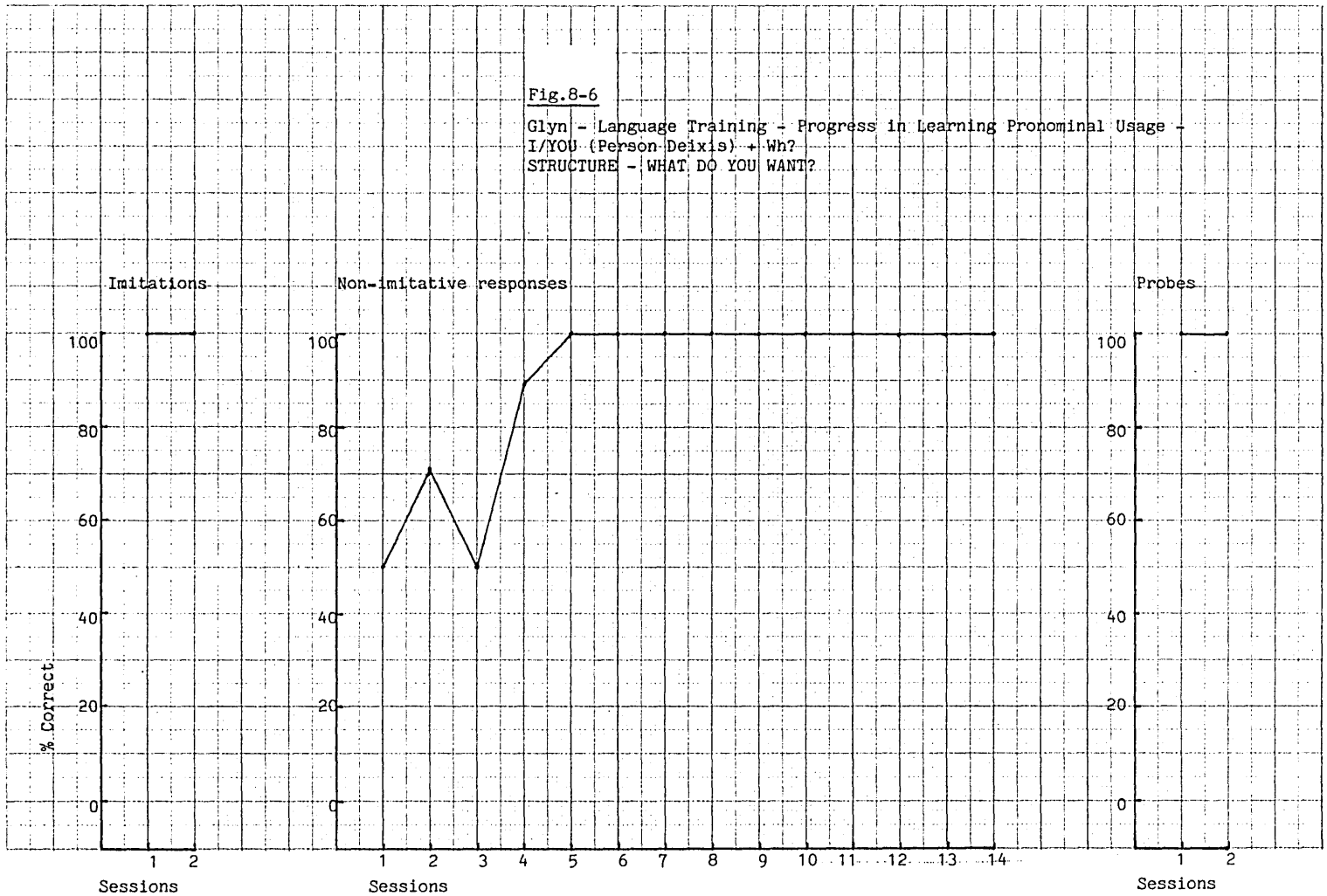


Fig.8-6

Glyn - Language Training - Progress in Learning Pronominal Usage - I/YOU (Person Deixis) + Wh?
STRUCTURE - WHAT DO YOU WANT?

Fig.8-7

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects (Singular)
STRUCTURE - YES IT IS
Generalisations in Test Conditions A and B

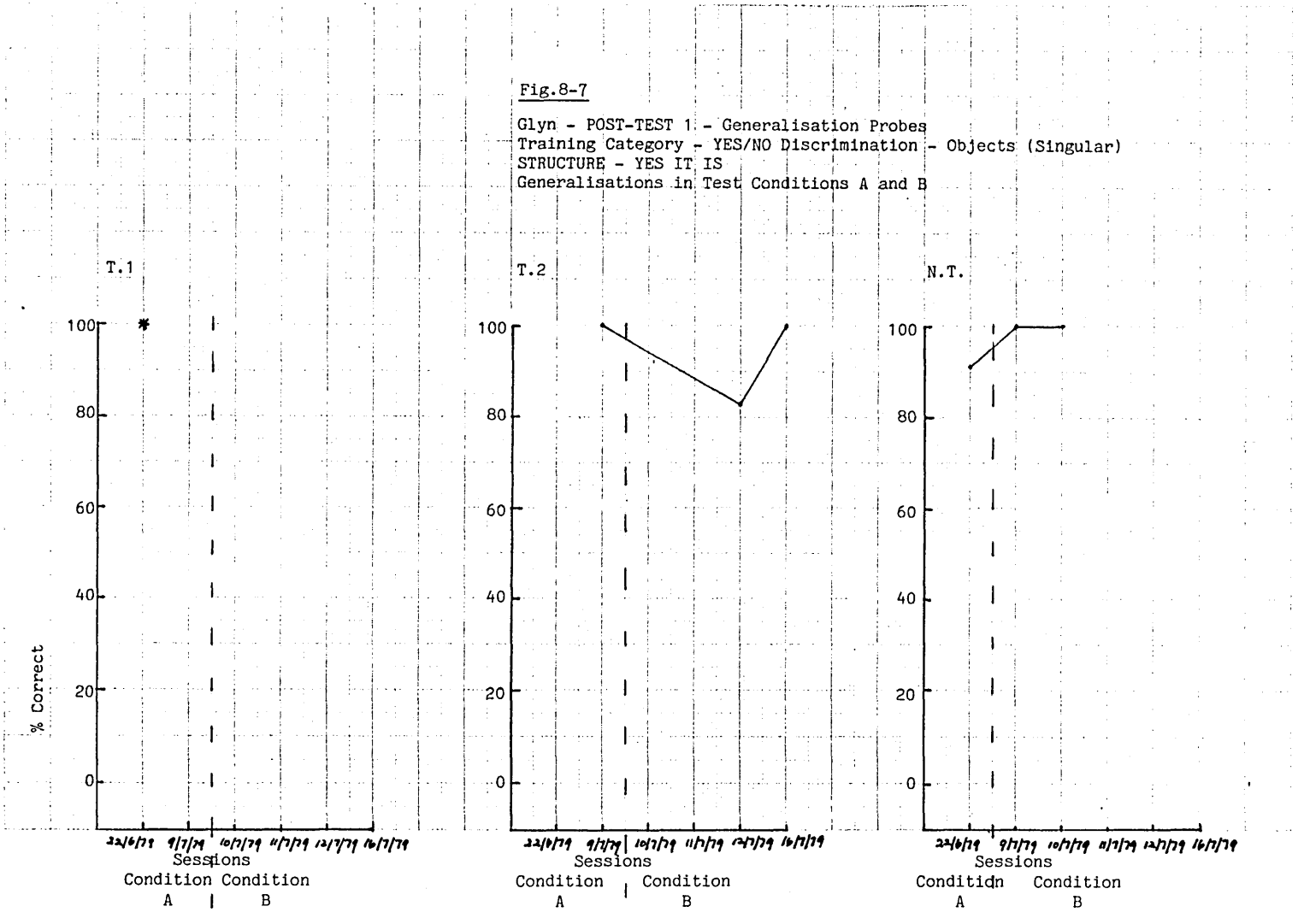
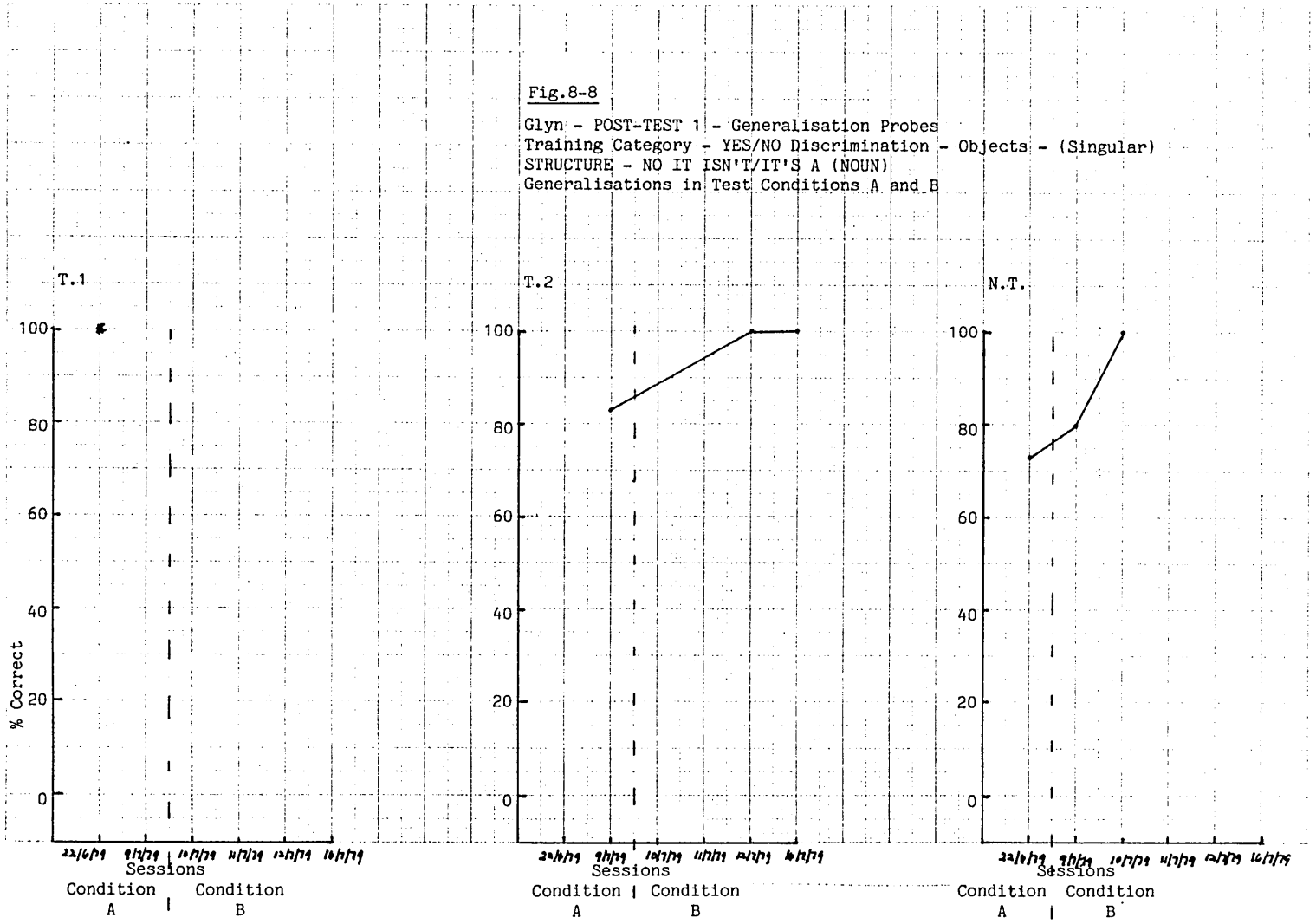


Fig.8-8

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects - (Singular)
STRUCTURE - NO IT ISN'T/IT'S A (NOUN)
Generalisations in Test Conditions A and B



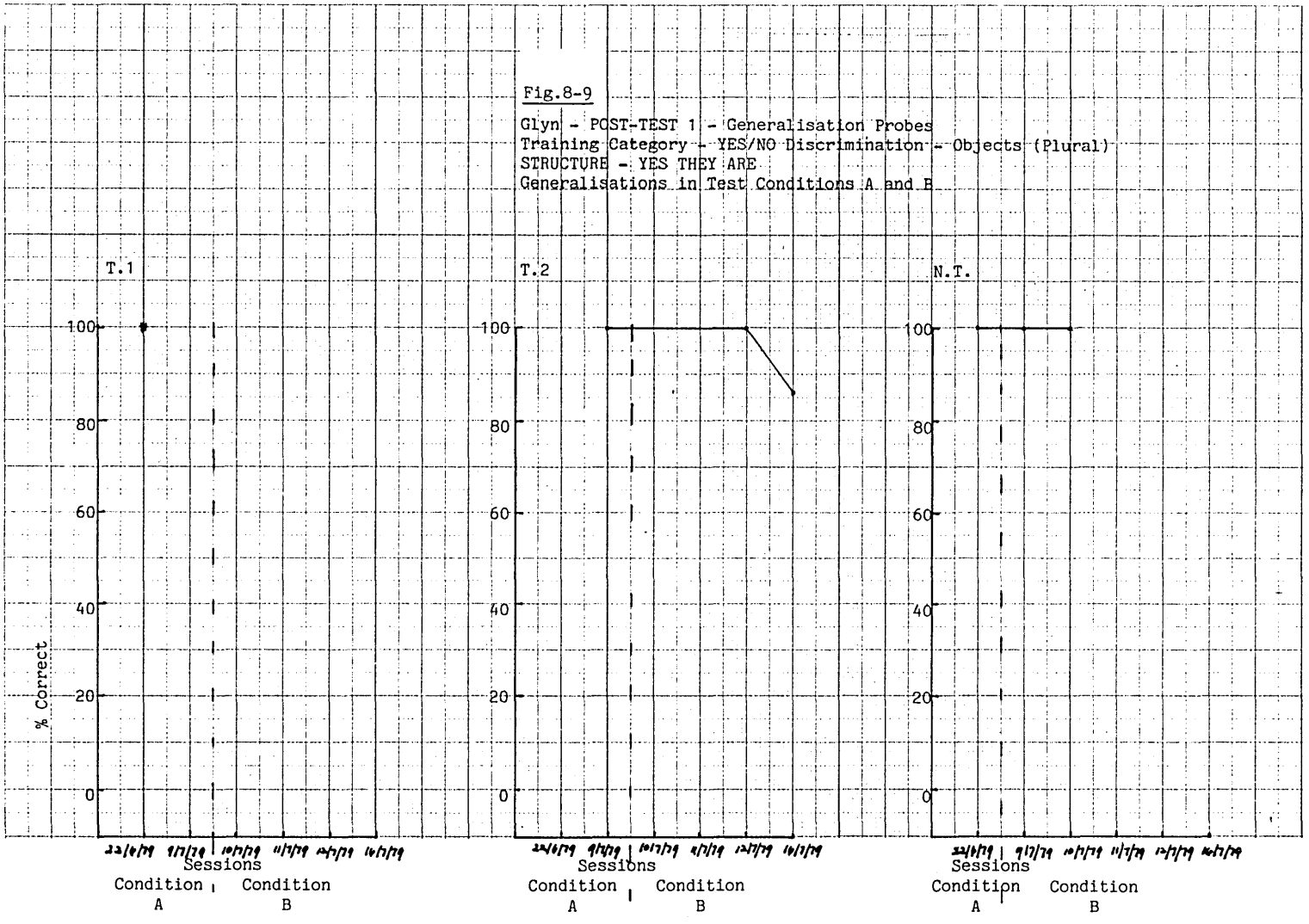


Fig.8-9

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects (Plural)
STRUCTURE - YES THEY ARE
Generalisations in Test Conditions A and B

Fig.8-10

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects (Plural)
STRUCTURE - NO THEY AREN'T/ARE NOT, THEY'RE (NOUNS)
Generalisations in Test Conditions A and B

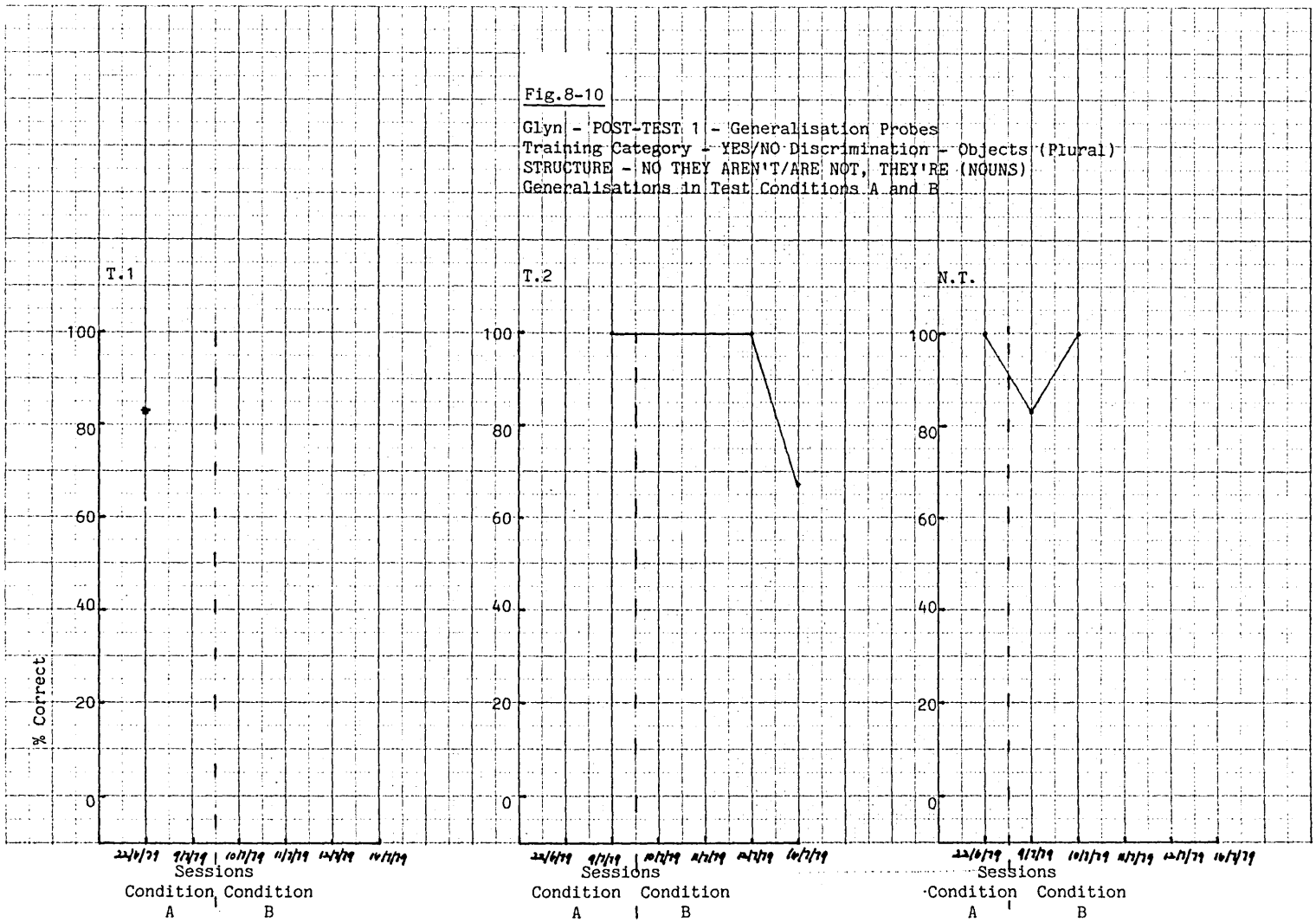


Fig.8-11

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - Pronominal Usage I + Requesting
STRUCTURE - I WANT A/MY (NOUN)
Generalisations in Test Conditions A and B

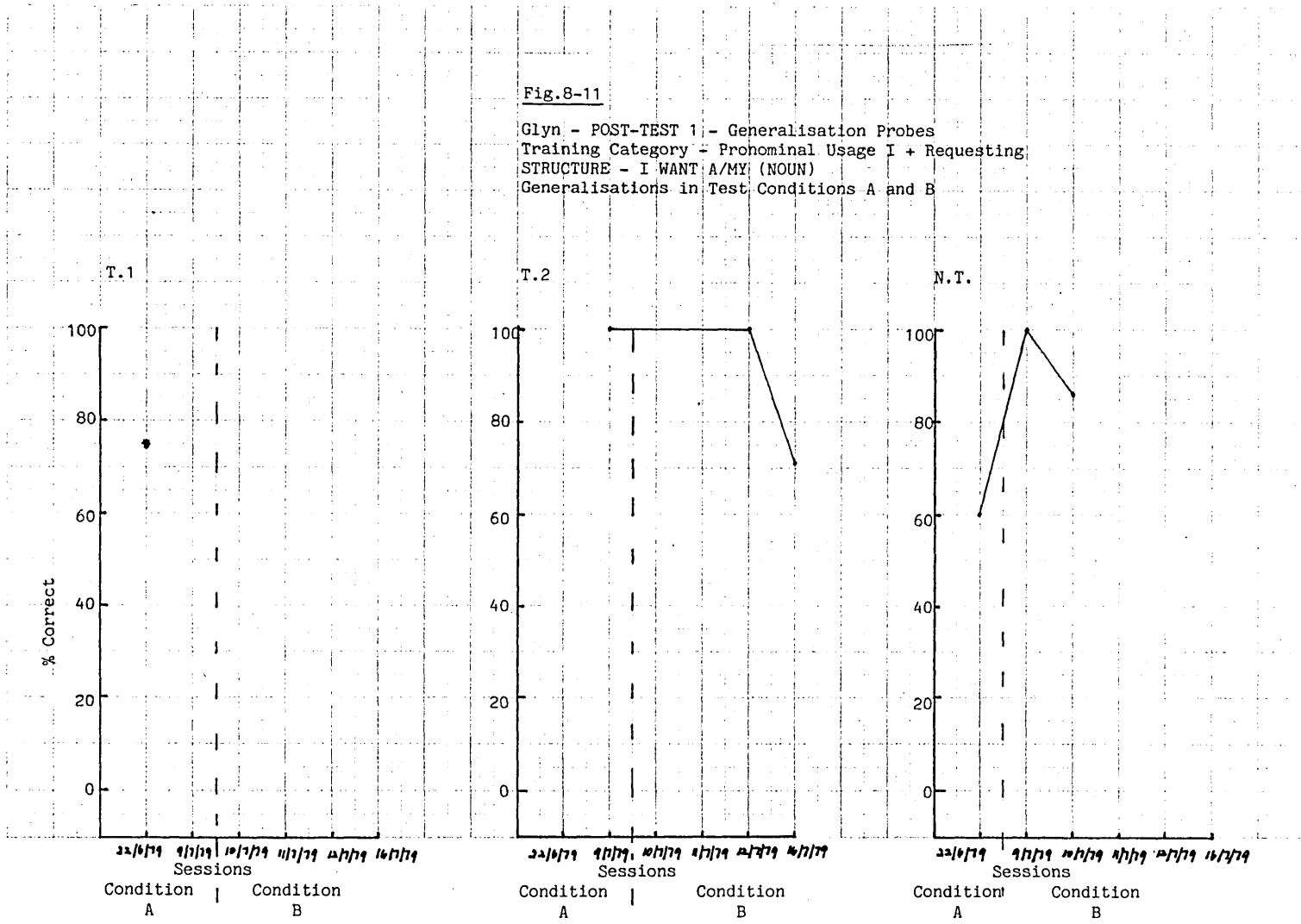
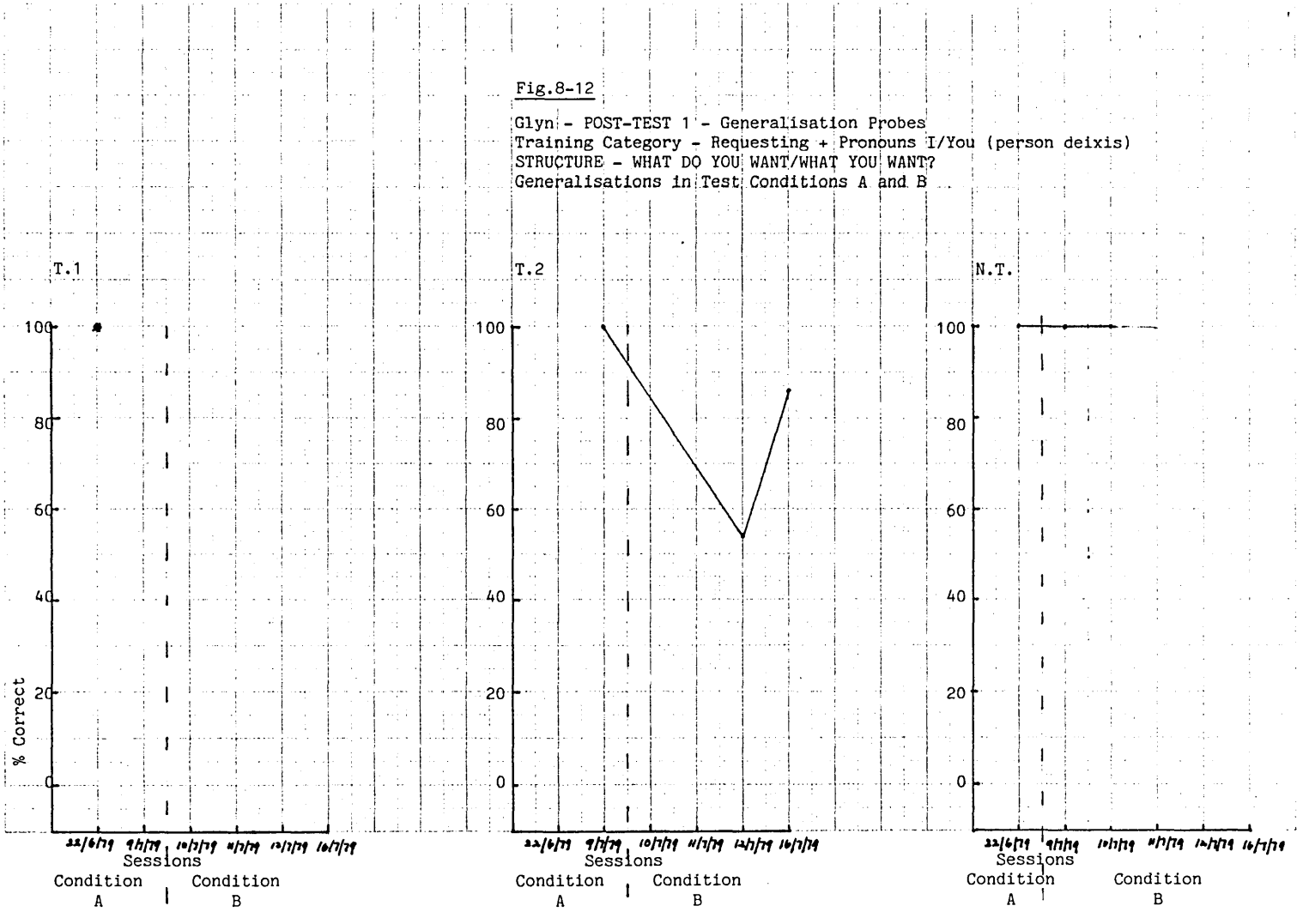


Fig.8-12

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - Requesting + Pronouns I/You (person deixis)
STRUCTURE - WHAT DO YOU WANT/WHAT YOU WANT?
Generalisations in Test Conditions A and B



Glyn - Spontaneous Generalisations - (unelicited) - Trained Forms/Combinations

POST-TEST 1

Trained Forms

	Date	Adult	Condition
STRUCTURE - IT'S A (NOUN) - Labelling Objects - (Singular)			
it's a boat	12/7/79	T.2.	B
STRUCTURE - THEY'RE (NOUNS) - Labelling Objects - (Plural)			
they're ice skates	12/7/79	T.2.	B
STRUCTURE - IT'S PERSON (NAME)			
it's Lee	22/6/79	T.1.	A
STRUCTURE - determiner - a			
drawin' a house	9/7/79	T.2.	B
it's a boy hold a train	9/7/79	T.2.	B
Joanne, get a book (addressed to the non-trainer experimenter)	22/6/79	T.1.	A
STRUCTURE - possessive pronoun - My			
I'm cuttin' my picture	9/7/79	T.2.	B
STRUCTURE - YOU'RE VERBING - Person deixis - Pronoun - You			
you're drawin'	12/7/79	T.2.	B

Glyn - Spontaneous Generalisations - (unelicited) - Trained Forms/Combinations

POST-TEST 1

Combinations

	Date	Adult	Condition
STRUCTURE - Contracted auxiliary			
Stan's gluein' paper	22/6/79	T.1.	A
contracted copula (cop') + possessive morpheme 's			
It's Steve's comb	22/6/79	T.1.	A
Wh.question - WHERE'S?			
Where's Joanne?	22/6/79	T.1.	A
Wh.question - WHERE?			
Where Mrs Cherry?	22/6/79	T.1.	A
Person Deixis - Pronoun - YOU + question form - ARE?			
are you Lee Smith?	22/6/79	T.1.	A
are you Joanne?	22/6/79	T.1.	A
are you Trevor?	22/6/79	T.1.	A
are you are you Steven Morton?	22/6/79	T.1.	A
Person Deixis - Pronoun - You + question form - DO?			
do you want a comb?	9/7/79	T.2.	A
do you want a water?	9/7/79	T.2.	A
do you want a cup?	9/7/79	T.2.	A
Untrained Forms - (other)			
that one?	12/7/79	T.2.	B

CHAPTER NINE

CASE STUDY 5 - LEE

1 The child in his environment

2 Pre-intervention language assessment and norm-referenced testing - Results

3 Development and progress in language and video training

4 Generalisation and training for generalisation - Observations

5 Mid-intervention and post-intervention generalisation probes and norm-referenced testing - Results

6 Discussion

Figures referred to in this Chapter are to be found on pages 337-345, before the Supplementary (generalisation data) pages

1 The child in his environment

Lee was a ten year old boy who was the first of two children in an unskilled working class family. He walked with the aid of crutches and calipers. He was prone to chest infections and was frequently absent from school. At the time of the study, Lee's parents were separated and he was living with his father.

According to medical records, Lee appeared normal at birth. Normal milestones were not, however, achieved and clinical investigations confirmed a diagnosis of mental retardation with hypotonia of the lower limbs. Little reference was made to Lee's speech and language development other than that his mother had reported his use of sentences at home.

Lee was a pleasant, happy child. In the school environment his expressive language consisted of single word utterances only. He readily responded to the communications of adults in particular, but rarely initiated interactions. His previous class teacher reported that he was disinclined to participate in group activities and play routines with other children. Instead, he remained on the periphery as a passive observer.

2 Pre-intervention language assessment and norm-referenced testing - Results

At the commencement of the study, Lee was aged 10 years 7 months. His score on the Columbia Mental Maturity Scales was 15 and on the Reynell Verbal Comprehension Test and the English Picture Vocabulary Test he scored 35 and 23 respectively.

It was established that Lee had a wide vocabulary of single word utterances. He was able to label individual objects but omitted the 's' morpheme from responses requiring the production of the plural. His responses to questions such as 'what's happening?' 'what's the man doing?' etc, were also predominantly one-word utterances. However, he produced a few verb-object constructions in which he used the simple present and present progressive verb forms (eg, "wash pot", "paintin' window"). He understood the question 'where?' although his replies were restricted to 'up', 'down' and 'there', accompanied by pointing.

Lee referred to himself interchangeably as 'me' or 'Lee'. He was obviously confused by questions requiring the production of first, second and third person pronouns, although comprehension was indicated by appropriate pointing. He was able to differentiate between Yes and No, although here again his utterances were restricted to single words. He did not articulate the contracted or

uncontracted negative form. Other omissions included the contracted and uncontracted copula and verbal auxiliaries, and the determiners a and the. Despite the syntactic and structural limitations of Lee's spontaneous language, he was able to imitate utterances of up to four words in length.

3 Development and learning in language and video training

Space considerations do not permit a detailed discussion of Lee's progress and learning in all the structures in which he was trained. Details of the main structures taught during the period October 1978 to December 1979, are given in tables 9-1 to 9-24 and figures 9-1 to 9-24 in Volume 2, Appendix H. For the purposes of this chapter, therefore, these results are discussed in a summary way and Lee's progress in learning the negative singular form of YES/NO object discriminations (NO IT ISN'T/IT'S A (NOUN)) and the third person pronouns HE/SHE in the sentence structures HE/SHE IS/HE/SHE'S VERB-ING(AOBJ)/(PREP), NO HE/SHE ISN'T/HE/SHE'S/VERB-ING(AOBJ)/(PREP) is examined in detail.

A good relationship was quickly established in the sessions. Lee did not present problem behaviour other than attentional deficits, and primary reinforcement was not required to establish new verbal responses. Initially, verbal praise and 'physical' reinforcement were

delivered on a continuous ratio. 'Physical' reinforcement was then thinned out on VR1 to VR3 schedules. Time-out procedures were applied contingent upon poor attending behaviour. Although Lee's attentional behaviour improved during the experimental period, the problem was never entirely resolved. He was often tired during the school day as a result of perpetual late nights at home.

The first task in language training was to extend Lee's existing vocabulary of object and action labels into appropriate sentence structures. Lee began therefore by learning object labelling in the singular form (IT'S A NOUN) in response to pictures of simple objects. Teaching commenced in October 1978, and was almost immediately interrupted by a long period during which Lee was absent from school. He resumed at the end of November, at which point object labelling in the plural (THEY'RE NOUNS) and labelling persons (IT'S PERSON (NAME)) were trained in the same sessions as object labelling in the singular. At the beginning of Easter term, teaching was again interrupted; this time by a number of short absences from school. Nevertheless, Lee made rapid progress in learning each response form, such that training was terminated at the end of January. In the next teaching step, Lee was taught to label persons and actions (IT'S A MAN/WOMAN, etc, VERB-ING) and criterion learning was achieved in a total of six sessions.

Lee's rapid progress was undoubtedly a result of prior

training in IT'S A (NOUN), so that in labelling persons and actions, all that was required was the addition of the action label which was already established in Lee's existing verbal repertoire, pre-intervention. A similar pattern of learning emerged in the next teaching sequence in which Lee was taught to label person/actions/things (IT'S A MAN/WOMAN, etc, VERB-ING (OBJ)/(AOBJ)/(PREP). Here again, the majority of sentence elements had been learnt in previous teaching steps, so that new response acquisition required the production of only one (object or preposition) or two (a-object) additional sentence constituents.

At the end of the Easter term, after training in labelling, Lee was taught singular and plural YES/NO discriminations between objects. Two sets of six pictures were used to teach the singular and plural in each discrimination. Each picture was presented once only, in sequential presentations of each response category. Singular and plural response forms were introduced with the presentation of two stimulus questions What's this? Is it a (noun)?/What are these? Are they (nouns)? followed by subsequent presentations from which the Wh questions were omitted.

Lee's progress in learning singular and plural YES discriminations was very smooth and criterion learning was rapidly achieved; this advanced more quickly than his learning of the negative. Figure 9-1 shows Lee's progress

in learning the singular negative form (see also table 9-8 in Volume 2, Appendix H).

Throughout training, Lee's ability to produce the response varied considerably from session to session. Initially, this was because he had difficulty in articulating the full sentence structure. Partial prompts were therefore organised into two structural components (eg, NO IT ISN'T /IT'S A NOUN) followed by fading the number of sentence element presentations in each partial prompt.

Lee soon began to articulate the full response and criterion was achieved in the third session. However, his difficulties re-emerged and it soon became apparent that responses including object labels of three syllables in particular, were the source of his problems and frequently resulted in the omission of one or two sentence elements from the sentence structure (eg, "No it isn't (noun)"). Partial prompting on the object label causing difficulty and/or the omitted constituents resulted in gradual improvements in Lee's responding, even though his correct response ratios continued to vary almost from day to day.

In addition, Lee was very sensitive to the slightest failure and his recurring difficulties began to affect his rate of responding, which became increasingly slow and laboured. Mid-response reinforcement was, therefore, delivered immediately following the emission of 'NO IT ISN'T' and prior to the production of 'IT'S A NOUN' and

was successful in boosting Lee's confidence in his ability to produce the sentence structure; this in turn resulted in greater speed and fluency in his delivery of responses. Mid-response reinforcement was faded in the usual way and criterion learning was consistently achieved in the last two of 21 sessions of training.

Lee's learning of the plural negative (NO THEY AREN'T/ARE NOT, THEY'RE (NOUNS)) was equally slow, although the major difficulty here was inconsistent verbal transfer from the singular to the plural form (eg, "No they isn't, they're nouns", "No they aren't, it's a (noun)"). Criterion was finally and consistently achieved in the last three of twenty sessions of training. Initial generalisation probes were not conducted in YES/NO discriminations, as training was finished in mid-June, immediately prior to the commencement of testing for generalisation in post-test 1.

In the Autumn term, Lee was taught to use the first pronoun I (I AM (Lee))/I AM/I'M VERB-ING (OBJ)/(AOBJ)/(PREP)) followed by the integration of YES/NO into each response form (YES I AM (Lee)/NO I'M NOT/I'M LEE) (YES I AM (VERB-ING)/NO I'M NOT I'M VERB-ING (OBJ)/(AOBJ)/(PREP)). Lee's progress in learning each sentence structure was rapid and training was completed after approximately four weeks. It is interesting to note also that, during the teaching sessions, Lee began spontaneously and appropriately to produce the second

person pronoun YOU; this meant that adjustments had to be made to the intended progression of the programme, since training in the second person pronoun and I/you differentiations was no longer relevant. As a result, Lee was next taught the third person pronoun HE/SHE.

Each pronoun was developed within a structural drill integrating the previously acquired skills of labelling persons/actions/things and the YES/NO discrimination. The utilisation of "old" language learning was part of the general strategy of providing, where appropriate, a practice system for previously acquired rules and structures. In addition, however, labelling persons/actions/things was specifically included as a means of facilitating noun-pronoun gender differentiations (eg, man/boy/HE, woman/girl/SHE). Accordingly, the drill was organised and presented in the following sequence:

Stimulus presentation	-	what's happening in the picture?
Response	-	IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (AOBJ)/(PREP)
Stimulus presentation	-	What's the man/boy/woman/girl doing?
Response	-	HE/SHE IS/HE/SHE'S VERB-ING (AOBJ)/(PREP)
Stimulus presentation	-	Is he/she verb-ing (aobj)/(prep)?
Response	-	YES HE/SHE IS
Stimulus presentation	-	Is he/she verb-ing (aobj)/(prep)?
Response	-	NO HE/SHE ISN'T/HE/SHE'S/ VERB-ING (AOBJ)/(PREP)

Six pictures were used (three for each pronoun), each picture being presented once only, and variability between stimulus questions and verbal responses was high. Lee's responding in labelling persons/actions/things was predictably high. Furthermore, he made rapid progress in learning YES HE/SHE IS and criterion was achieved almost immediately. Training was however continued as a strategy for enhancing learning in the negative responses. Lee's progress in learning HE/SHE IS/HE/SHE'S/VERB-ING (AOBJ)/(PREP) is shown in figure 9-2. (More detail is given in table 9-18 in Volume 2, Appendix H.) Lee experienced little trouble in learning the sentence structure. Here again, all that was required was the addition of the pronouns to an "old" response form (VERB-ING (AOBJ)/(PREP)).

By the fifth session, he was already beginning to correct his own errors and criterion learning was achieved after only eight sessions and was sustained throughout the three sessions that followed. Moreover, his ability to generalise the response to unfamiliar referents was demonstrated in the consistently high scores he obtained in the initial probes. Lee's learning of the negative sentence form was slower than his learning of HE/SHE IS/HE/SHE'S VERB-ING(AOBJ)/(PREP). Even so, he made steady progress throughout the training period and achieved criterion learning after only eleven sessions; that is, in approximately half the number of sessions needed to train negative discriminations in object labelling. Lee's

progress in learning NO HE/SHE ISN'T HE/SHE'S/IS VERB-ING (AOBJ)/(PREP) is shown in figure 9-3. (See also table 9-19 in Volume 2, Appendix H.)

In the next sequence, teaching began in possessive pronoun usage (HIS/HER). Unfortunately, the experimental period terminated before training in these forms could be completed.

During language training in YES/NO discriminations between objects, Lee was introduced to the video training dimension of the programme. He began by practising his recent learning of object labelling (IT'S A NOUN/THEY'RE NOUNS) and labelling persons/action/things. In the Autumn term this was continued with the addition of practice sessions in the YES/NO discrimination of objects in the singular and plural forms and training from baseline in the use of prepositions. Lee enjoyed both the video presentations and interactions with the care assistant and was highly motivated throughout. Not surprisingly, his responding was consistently good and he made excellent progress in preposition training. He was also very keen to work with the video without an attending adult. Unfortunately, however, after three unsupervised sessions it became apparent that after initial responding in the first minutes of the programmes, Lee quickly lapsed into merely "watching television" during which his verbal responses dropped to zero. Unsupervised video training was therefore discontinued. During the experimental

period, Lee received a total of thirty seven supervised sessions of video training.

4 Generalisation and training for generalisation - Observations

Lee readily responded to interactions from the teacher-experimenter and the care assistant in both the classroom environment and other contexts in the school. He clearly enjoyed the adult attention and verbal reinforcement in non-training settings. As language training progressed, in common with other children in the experimental group, Lee began to use self-cueing strategies (in natural settings) in which he repeated sentence elements incorporating a particular surface grammar rule to prompt retrieval of the appropriate verbal response forms.

As time went on, and his language learning progressively strengthened, Lee resorted less frequently to self-cueing and the repetition of sentence elements prior to verbal responding gradually decreased. He first began to spontaneously combine trained forms with untrained forms in self-corrections in the teaching sessions. For example, he would often say "It's wrong" or "that's wrong" combining his learning of it and the contracted copula 's with new sentence elements "that" and "wrong".

Lee's baseline tendency of responding to communication rather than initiating interactions persisted into the

Spring term of 1979. He began to initiate conversation during post-test 1, albeit infrequently. However, during the Autumn term his initiations gradually increased. Furthermore, he was interacting verbally with peers in group activities and play routines using sentence structures rather than the monosyllabic utterances characteristic of his verbal behaviour at baseline. Also during the Autumn term, Lee was introduced to a reading programme in which he learnt to construct stimulus questions and sentence structures trained within the programme.

5 Mid-intervention and post-intervention generalisation probes and norm-referenced testing - Results

Space considerations do not permit a detailed analysis of Lee's results in each sentence structure tested in the generalisation probes of Post-tests 1, 2 and 3. For this material the reader is referred to tables 9-25 to 9-69 and figures 9-25 to 9-69 in Volume 2, Appendix H. Before discussing the above in a summary way, Lee's generalisation of the negative singular (NO IT ISN'T IT'S A (NOUN)) and his use of the third person pronouns HE/SHE in the sentence structure HE/SHE IS HE/SHE'S VERB-ING (AOBJ)/(PREP) and in combination with the negative (NO HE/SHE ISN'T HE/SHE IS HE/SHE'S VERB-ING (AOBJ)/(PREP) is discussed in detail. It should be noted that generalisation of the negative singular form was tested in post-tests 1, 2 and 3 and Lee's use of the third person

pronouns was tested only in post-test 3. Lee's spontaneous utterances produced during interactions with experimenters in the post-tests are listed on pp 346-348.

In post-test 1, Lee's generalisation of the negative singular discrimination was inconsistent. Figure 9-4 shows that optimal generalisation occurred with the care assistant (T.2) in both the highly structured and semi-structured contexts of test conditions A and B (see also table 9-31 in Volume 2, Appendix H). Generalisation with the teacher-experimenter (T.1) was marginally higher than with the non-trainer (N.T.) in condition B. However, sharp fluctuations in the levels of generalisation occurred with both experimenters in each test condition.

A similar pattern of generalisation was observed in Lee's production of the negative plural form. Consistent generalisation in both response forms was prevented for the most part by the return of Lee's earlier difficulties in verbally transferring from the singular to the plural.

Lee's generalisation of the sentence element NO and the contracted negative was consistently reliable throughout testing. However, his responses clearly demonstrated his confusion in appropriate singular and plural rule selection of the pronouns (it/they) and the contracted and uncontracted copula (eg, "No they aren't, it's a (noun)"/"No they isn't, they're (nouns)"). As figure 9-4

indicates, there were days when Lee was able to generalise the singular rule to the necessary sentence elements, but equally, there were days when this did not occur. It is interesting to note that Lee had less difficulty in generalising the singular and plural in the YES discrimination. Generalisation of the singular was high across test conditions and experimenters. Similar scores were obtained in the plural form with the teacher experimenter (T.1) and the care assistant (T.2) in test conditions A and B although generalisation was less reliable with the non-trainer.

Lee's ability to generalise other structures learnt within the programme was demonstrated by the moderate to high levels that occurred in interactions with the teacher-experimenter and the care assistant across test conditions. Generalisation with the non-trainer was less reliable and therefore less successful than with the care assistant and the teacher-experimenter. Nevertheless, there were instances of high generalisation with the non-trainer in both test conditions. Taken as a whole, Lee's post-test 1 results were encouraging. Figure 9-5 shows that in post-test 2 Lee's generalisation of the negative singular form with the teacher-experimenter was low in the first sub-test but reached optimal levels in sub-test II; generalisation was maintained at levels similar to those obtained with the teacher-experimenter in post-test 1 (see also table 9-36 in Volume 2, Appendix H).

However, Lee's responding in post-test 2 was slow and halting in both the singular and plural forms of the negative discrimination. Furthermore, generalisation of the singular positive response (YES IT IS) was low in both sub-tests. The sentence structures were subsequently re-trained. Criterion learning was achieved over three sessions and Lee again began to respond fluently. (See table 9-10 and figure 9-10 in Volume 2, Appendix H.)

Finally, there were no significant differences in the levels of generalisation achieved across trained forms in post-test 2 and the levels obtained in post-test 1, clearly indicating that Lee had retained almost all that had previously been taught and that his ability to generalise his learning to unfamiliar referents was maintained at the levels achieved prior to the summer holiday, some seven weeks earlier.

Lee's generalisation of the negative singular discrimination and the pronouns HE/SHE in the highly structured test of post-test 3 is shown in figure 9-6. (More detail is given in table 9-37 in Volume 2, Appendix H.) Generalisation of the negative discrimination was fairly high and had improved on the scores Lee achieved in sub-test II in post-test 2. However, his generalisation of the response was lower than with the teacher-experimenter in the low-structure settings of post-test 3.

Figure 9-7 shows that in natural settings Lee's

generalisation was optimal with the non-trainer (N.T.) throughout testing and was higher than with the teacher-experimenter (T.1) and the care assistant (T.2), lowest scores being achieved during November in interactions with the teacher-experimenter. Lee's generalisation of the response was generally high across experimenters and was substantially above the levels of post-test 1 across experimenters and test conditions.

Surprisingly, generalisation of the plural negative form was minimal in the highly structured test and had decreased on the levels obtained with the teacher-experimenter in condition A in post-test 1 and in sub-tests I and II in post-test 2. Furthermore, generalisation in the low structure contexts of post-test 3 was inconsistent across experimenters, with whom moderate to minimal generalisation occurred. The problem was the same, namely unreliable verbal transfer from the ingular to the plural form (eg, "No they isn't they're (nouns)"). (Additional details are shown in table 9-41, in Volume 2, Appendix H.)

However, it is interesting to note that at this point in the study, Lee's generalisations of the singular negative form were not restricted to the production of NO IT ISN'T, IT'S A (NOUN), but also included NO IT'S NOT, IT'S A (NOUN). Similarly, generalisation of the plural positive and negative forms included YES, THEY'RE (NOUNS)/YES THEY ARE (NOUNS) and NO, THEY'RE NOT, THEY'RE (NOUNS).

Lee's generalisation of the third person pronouns HE/SHE in the sentence structure - HE/SHE IS/HE/SHE'S VERB-ING(AOBJ)/(PREP) was moderate in the highly structured test of post-test 3 and was lower than his generalisation of the negative sentence NO HE/SHE ISN'T HE/SHE'S VERB-ING (AOBJ)/(PREP) in which generalisation was at a maximum. Figure 9-8 shows that in the natural contexts of post-test 3, optimal generalisation of HE/SHE IS/ HE/SHE'S VERB-ING (AOBJ)/(PREP) occurred with the teacher-experimenter (T.1).

Generalisation in interactions with the non-trainer (N.T.) was slightly less, beginning moderately and rising to optimal levels in January and February. Surprisingly, Lee's generalisation in interactions with the care assistant during November was zero although maximum generalisation occurred with this experimenter throughout the remainder of the testing period. More details are given in table 9-51 in Volume 2, Appendix H. Figure 9-9 shows that in natural settings Lee successfully generalised his use of the third person pronouns in combination with the negative in his interactions with each experimenter throughout the duration of post-test 3. (Additional details are shown in table 9-53 in Volume 2, Appendix H.)

In post-test 3, Lee's generalisation across response forms in the highly structured test was high in the majority of

sentence structures including prepositions which were trained from baseline in the video dimension of the programme. In the low structure settings, generalisation occurred at high levels in all but a few sentence structures. Here again, Lee's ability to use prepositions in natural contexts was encouraging. Overall, generalisation in both highly structured and low-structured contexts in post-test 3 was higher across experimenters than in Test conditions A and B in post-test 1 and sub-tests I and II in post-test 2.

Similar developments occurred in Lee's spontaneous generalisations during the post-tests. In post-tests 1 and 2 Lee produced very few spontaneous utterances. Furthermore, he used only the syntactic structures he had learnt within the programme. In post-test 3, however, he was initiating interactions with greater frequency and was using a wider variety of trained forms. In addition he was using sentence structures in which trained response forms were integrated with untrained surface elements. For the most part, his utterances were fully grammatical and were substantially extended in length compared with the length of his utterances in post-tests 1 and 2 (see pages 346 to 348).

Finally, Lee's score in post-test 1 as scored on the Columbia Mental Maturity Scale was 19. His scores on the Reynell Verbal Comprehension Test and the English Picture Vocabulary Test were 36 and 11 respectively. In post-test

3 his score on the CMMS was 26; his score on the Reynell Test was unchanged and his score on the EPVT had decreased from 11 to 9.

6 Discussion

Lee's learning within the programme was rapid in all structural forms other than the YES/NO discrimination of objects. Training in the negative singular and plural forms in particular was comparatively long and protracted requiring approximately 21 sessions of training. Increased syllabic complexity within sentence structures and singular and plural rule transformations across syntactic elements resulted in slow and laborious responding and prevented consistent criterion learning in the sessions. Systematic partial prompting strategies and the application of mid-response reinforcement facilitated the production of extra syllables and reinstated fluent responding.

Nevertheless, despite the combined inputs of language and video training, and a short period of re-training and prompting and cueing in a variety of contexts within the school, Lee's results in post-tests 1,2 and 3 demonstrated that his difficulties in verbally transferring from the singular to the plural in particular, were never entirely resolved. However, the precise nature of the problem was unclear. For example, other negative sentence structures omitting the integration of the singular and plural rules

of the copula and pronouns it/they were learnt with much less difficulty and in less time. Similarly, identical singular and plural rules in the yes discrimination and in object labelling were learnt relatively easily. In addition, Lee's production of all negative sentence elements and the plural morpheme s was consistently reliable throughout training and generalisation testing.

Lee's spontaneous use of the second person pronoun during first person pronoun training suggested that systematic teaching in a specific response had facilitated the production of a related structural form he already comprehended but which hitherto was not expressed in his spoken language. Moreover, Lee's spontaneous use of trained forms in combination with untrained forms demonstrated his ability to learn from a restricted set of grammatical rules and apply those rules to new learning.

Lee had entered the programme with an expressive language repertoire of one and two word utterances and adequate receptive skills. At the close of the study he was producing a wide range of syntactic structures in sentences of up to nine words in length. Moreover, his baseline communication pattern of responding but never initiating had been gradually reversed and he was socialising with adults and peers in a variety of activities in different contexts within the school.

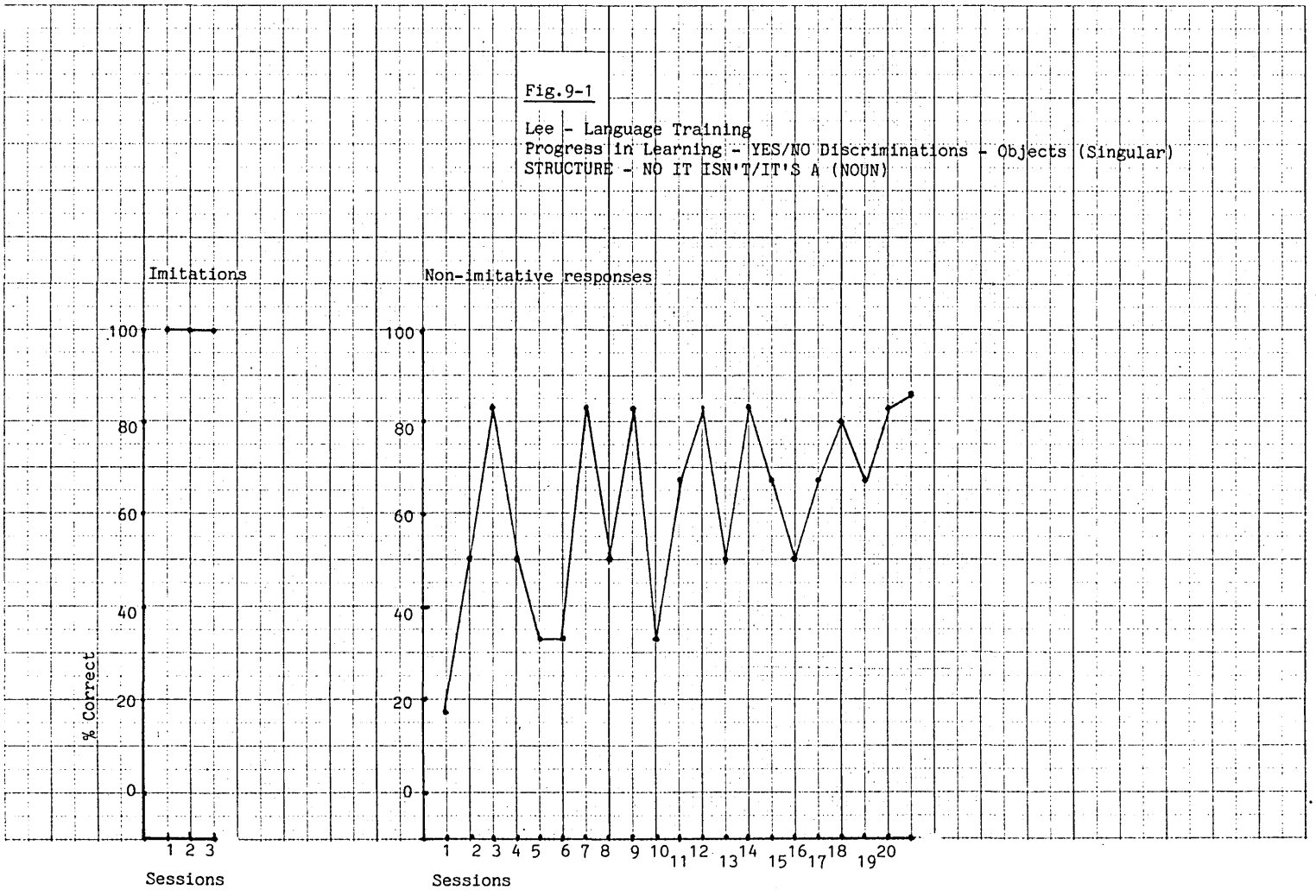


Fig.9-1
Lee - Language Training
Progress in Learning - YES/NO Discriminations - Objects (Singular)
STRUCTURE - NO IT ISN'T/IT'S A (NOUN)
Imitations
Non-imitative responses
% Correct
100
80
60
40
20
0
1 2 3
Sessions
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Sessions

Fig.9-2

Lee - Language Training - Progress in Learning Pronominal Usage -
He/She + Labelling Actions/Things
STRUCTURE - HE/SHE'S VERB-ING (A OBJ)/(PREP)-
HE IS/SHE IS VERB-ING (A OBJ)/(PREP)

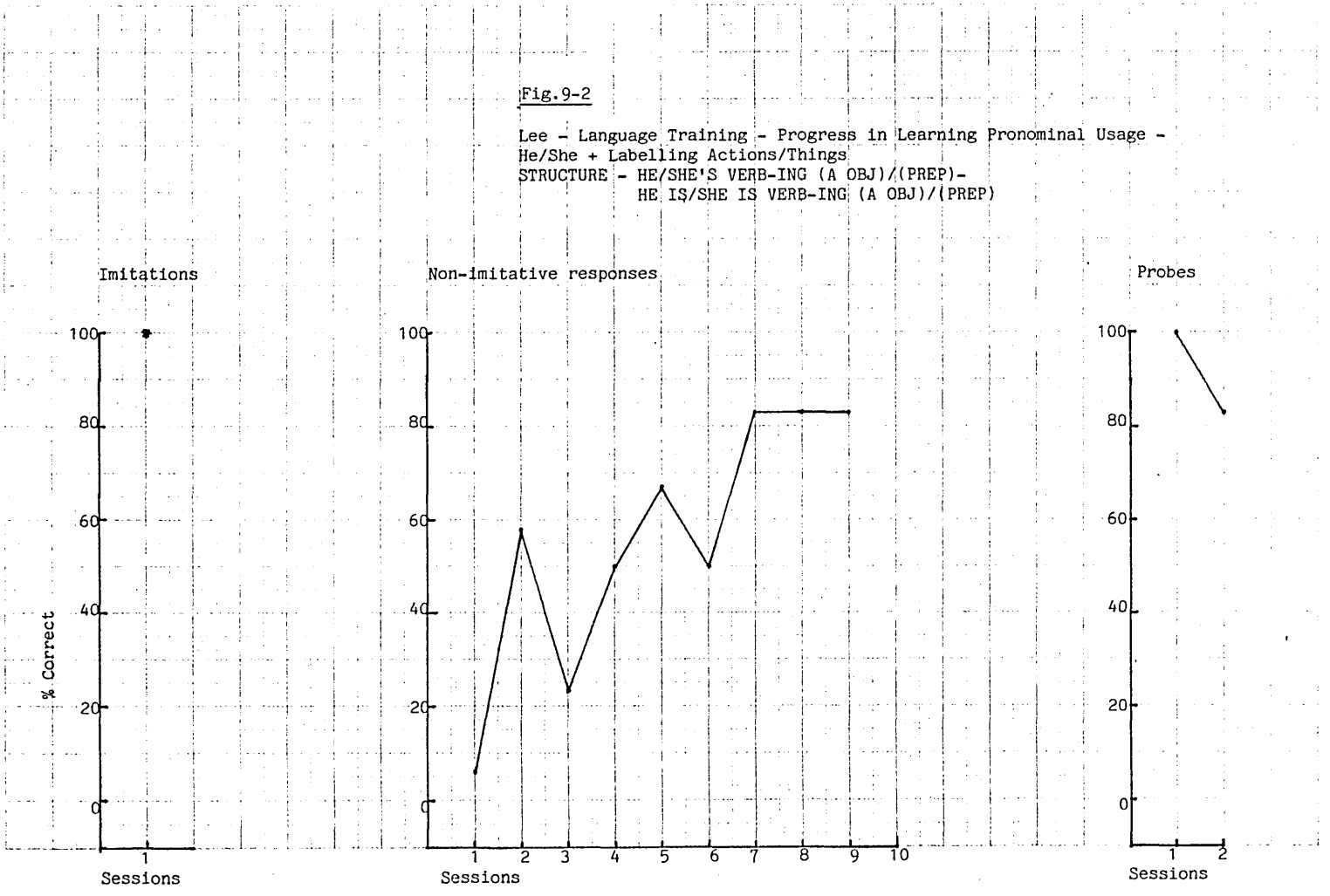


Fig.9-3

Lee - Language Training - Progress in Learning Pronominal Usage
HE/SHE + YES/NO Discrimination
STRUCTURE - NO HE/SHE ISN'T, HE/SHE'S VERB-ING (A OBJ)/(PREP)

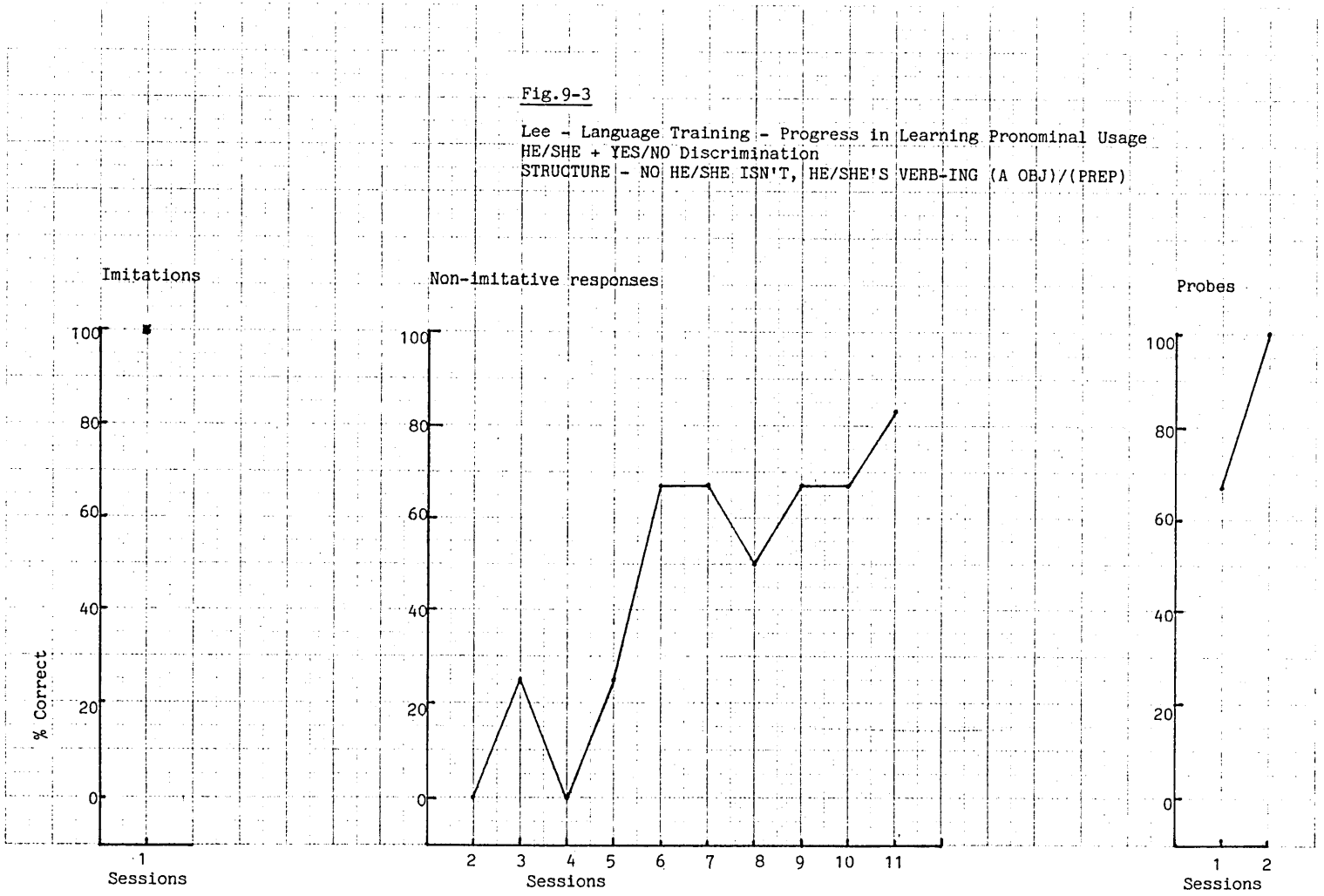


Fig.9-4

Lee - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects (Singular)
STRUCTURE - NO IT ISN'T, IT'S A (NOUN)
Generalisations in Test Conditions A and B

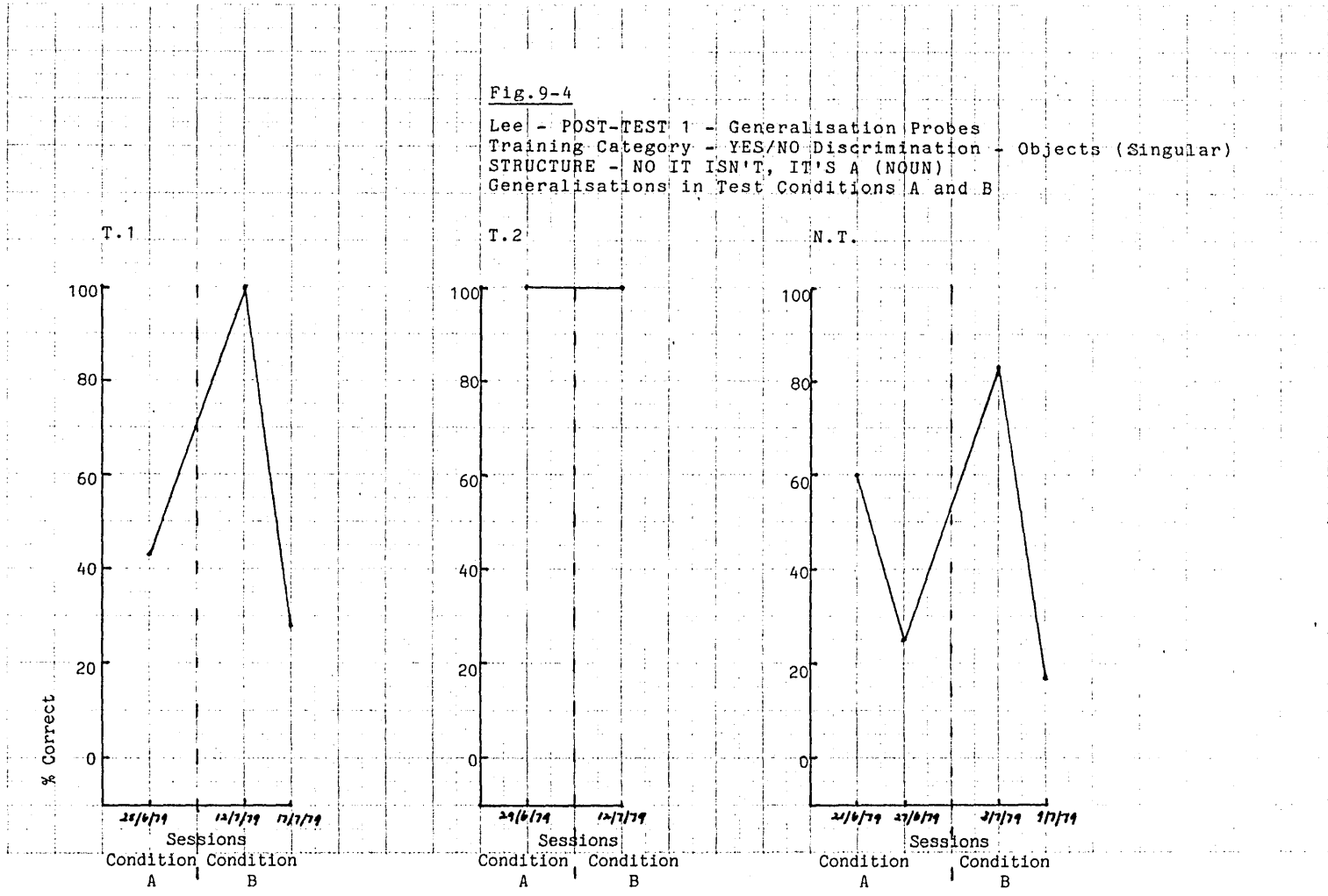


Fig.9-5

Lee - POST-TEST 2 - Generalisation Probes
Training Category - YES/NO Discriminations - Objects (Singular)
STRUCTURE - NO IT ISN'T IT'S A (NOUN)
Generalisations in Sub-Tests I and II

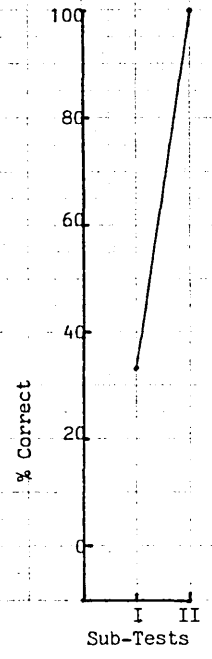


Fig.9-6

Lee - POST-TEST 3 - Generalisation Probes (High Structure)
Generalisations

Fig.9-7

Lee - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - YES/No Discrimination - Objects (Singular)
STRUCTURE - NO IT ISN'T IT'S A (NOUN)/NO IT'S NOT IT'S A (NOUN)

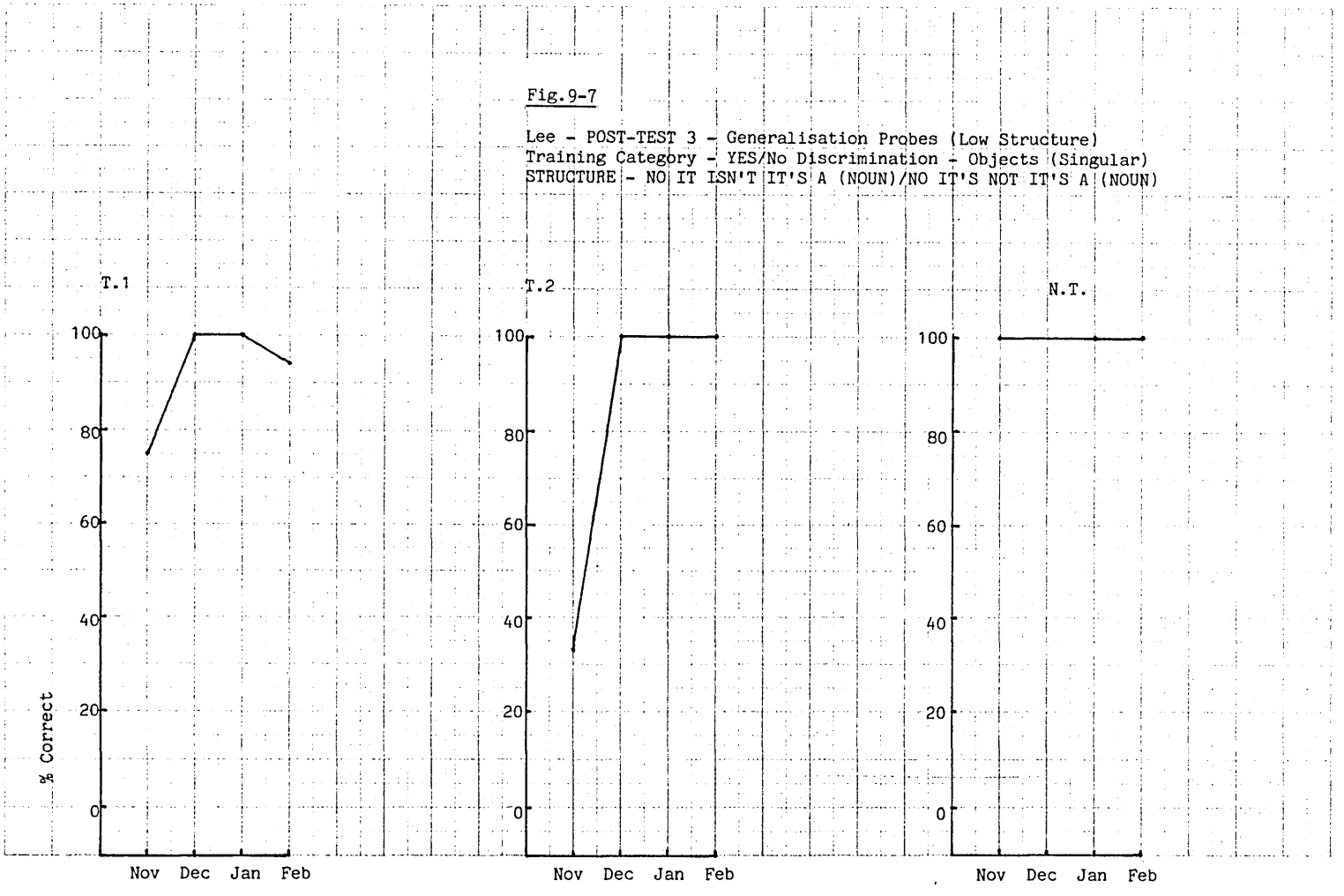


Fig.9-8

Lee - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Pronominal Usage - HE?SHE + Labelling Actions/Things
STRUCTURE - HE/SHE IS VERB-ING (OBJ)/(A OBJ)/(PREP)
HE/SHE'S VERB-ING (OBJ)/(A OBJ)/(PREP)

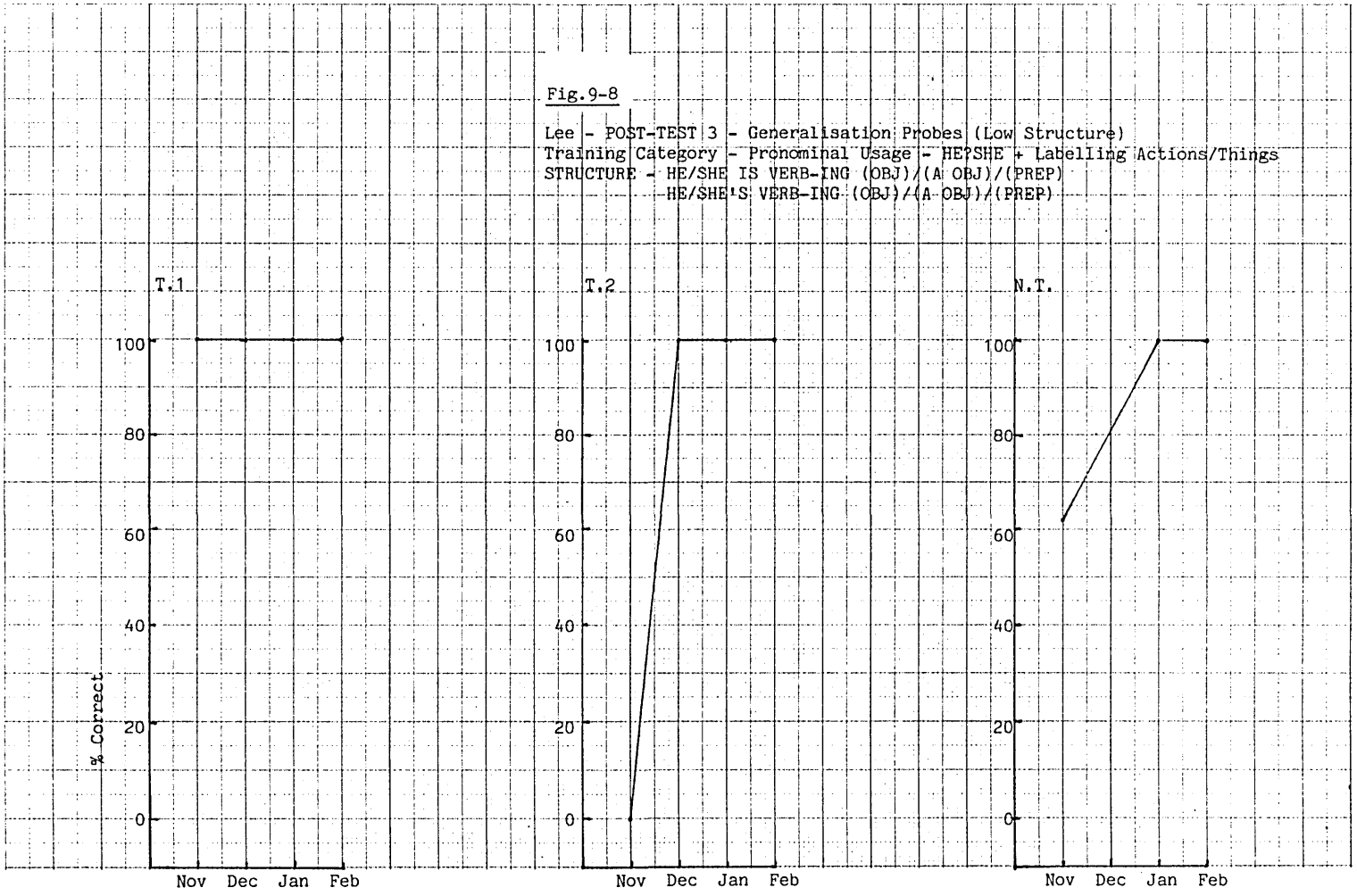
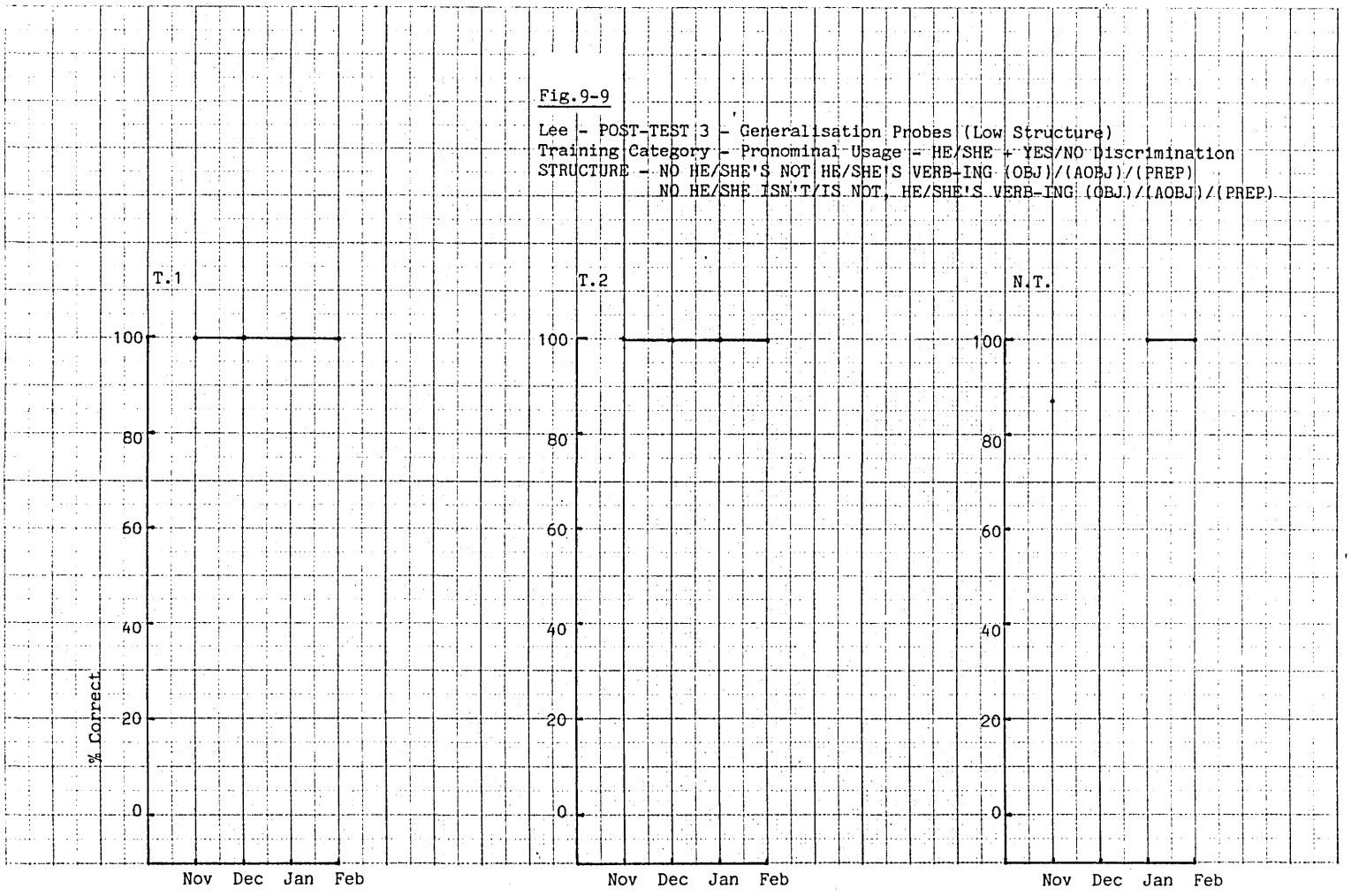


Fig.9-9

Lee - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Pronominal Usage - HE/SHE + YES/NO Discrimination
STRUCTURE - NO HE/SHE'S NOT HE/SHE'S VERB-ING (OBJ)/(AOBJ)/(PREP)
NO HE/SHE ISN'T/IS NOT, HE/SHE'S VERB-ING (OBJ)/(AOBJ)/(PREP)



Lee - Spontaneous Generalisations - (unelicited) -
Trained Forms/Combinations

POST-TEST 1

Trained Forms	Date	Adult	Condition
VERBING + contracted auxiliary			
Stephen Morton's drawing	9/7/79	N.T.	

POST-TEST 2

Trained Forms	Date	Adult	Sub-Test
IT'S A (NOUN) - Labelling Objects - (singular)			
it's orange	5/9/79	T.1.	1
VERBING - Labelling - Actions			
scrapin'	5/9/79	T.1.	1
VERBING - contracted auxiliary			
Mrs Cherry's sneezin'	10/9/79	T.1.	2

POST-TEST 3

Trained Forms	Date	Adult	Context
IT'S (pron. + cop')			
it's sunny	24/1/80	T.1.	1
it's broken	5/2/80	T.1.	1
it's Saturday tomorrow	29/2/80	T.1.	1
VERBING - Labelling Actions - (persons)			
Jamie's throwin'	5/2/80	T.1.	1

Lee - Spontaneous Generalisations - (unelicited) -
Trained Forms/Combinations

POST-TEST 3

Trained Forms

	Date	Adult	Condition
Pronouns - HE/SHE + Labelling-Actions			
he's pulling	21/11/79	T.1.	2/3
she's eatin' it, Mrs Cherry/ look, she's eatin' it/	14/12/79	T.2.	3
she's eatin' pencil	24/1/80	T.1.	1
he's sittin' down	15/1/80	T.1.	1/3
she's gettin' pencil	30/1/80	T.1.	1
he's drawing	6/2/80	N.T.	3
she's talking, Mrs Wright	6/2/80	T.2.	1
she's drawin'	14/2/80	T.2.	3
Determiner - A + untrained form - pronoun - YOU			
sit down Andrew, you're a naughty boy	26/2/80	T.1.	1
shut up you're being naughty	15/1/80	T.1.	1/3
Labelling Persons/Actions/Things			
it's a girl washin' her hands	14/2/79	T.1.	1

Combinations

STRUCTURE - VERBING + Combinations			
piece missin' (pointing to jigsaw)	9/1/80	N.T.	3
stayin' at home	29/2/80	T.1.	1
Why is Andrew Martin cryin'?	29/2/80	T.1.	1

Lee - Spontaneous Generalisations - (unelicited) -
Trained Forms/Combinations

POST-TEST 3

Combinations

	Date	Adult	Condition
STRUCTURE - Pron.I + Combinations			
am I comin' school in mornin?	29/2/80	T.1.	1
oh Nicola, shut up, I'll kick your head in	15/1/80	T.1.	1/3
STRUCTURE - Pron.HE/SHE/prepositions/verb-ing + combinations			
she is sittin' on her chair going to dinner (pointing to child in wheelchair in corridor at lunch time	24/1/80	T.1.	1
he has	21/11/79	T.1.	2/3
STRUCTURE - Generalisation of determiner the + wh + past tense of the verb			
who threw the box?	12/11/79	N.T.	3
STRUCTURE VERB-ING + imperative			
stop sharpenin' pencils Nicola	5/2/80	T.1.	1

CHAPTER TEN

DISCUSSION

1 The children's progress within the programme

2 Generalisation in successive post-tests

3 Factors facilitating generalisation within the programme

4 Other factors facilitating generalisation

5 Methodological issues

6 Conclusion

1 The children's progress within the programme

The intervention programme reported in this study was experimentally developed with a group of nine children with severe language and learning difficulties. Constraints of time and incompleteness of data prevented detailed analysis and presentation of data on each of the nine children. Instead, five children were selected for the purposes of examining progress and learning within the programme. The children were not selected randomly but were chosen because they exemplified very different levels of language ability and disability.

The observations and results show that the programme provides an instructional framework through which a set of core grammatical constituents, morphological rule relationships and fully grammatical sentence structures, can be learned and acquired.

Nonetheless, procedural changes and modifications to the teaching sequences, stimulus presentations and structural response forms were sometimes necessary to accommodate individual differences in patterns and rates of learning. For example, two children (Steven and Jamie) had difficulties in producing syllabically complex words and extra syllables within sentence structures. A change in inflectional voice cues and in Steven's case,

additionally, the inclusion of a change in the intended teaching sequence, turned out to be successful in facilitating the production of multi-syllabic responses in both children.

Three children acquired the skills of labelling persons, actions and things easily. Moreover, at the close of the study, this response was gradually being shaped in Steven and although criterion learning had not been achieved, he was making steady progress.

Poor rates of learning were, however, observed in one child (Nicola). Here again, a change in the training sequences - this time in favour of the introduction of training request forms - resulted in the resumption of her progress through the programme. Moreover, slight adjustments in the structural elements of the request form and in a specific sentence structure helped eliminate her perseveration of particular sentence elements.

Lastly, the strategy of reinforcing children mid-response was instrumental in enhancing verbal fluency in the production of extended sentence structures, in particular of the singular and plural form of the negative discrimination in the Yes/No training sequences.

As training progressed, there were clear indications that the syntactic rule interrelationships within and between verbal stimuli and response forms had generated the

acquisition of stimulus questions plus the application of trained grammatical rules to new learning.

These developments were particularly noticeable in Glyn's case by his acquisition of the question form: Are you person (Name)? during training in the first person pronoun I. It was also exemplified by his production of object labelling in the plural form during training in Yes/No discriminations. Also, Lee's production of the second person pronoun You during first person pronoun training suggested that expressive language training and perhaps also the morphological rule consistencies between response forms may have "triggered" the production of structures already comprehended but hitherto not realised in his speech.

Predictably, the children at lower levels of language learning at base line learnt fewer structures and proceeded more slowly through the programme than the children at higher levels of linguistic functioning. For example, in learning object labelling in the singular form (I's A (Noun)) Nicola required 12 sessions of training before consistently achieving criterion learning. By contrast, Lee learnt the response in a total of only six sessions. Similarly, Glyn's acquisition of person deixis and of the request form What Do You Want? was more rapid than Nicola's rate of learning. Glyn required a total of 14 sessions of training as compared with 18 sessions for Nicola.

Furthermore, in learning labelling persons actions and things - (It's A Subject Verb-ing (Obj)/(AObj)/(Prep) - Glyn needed six sessions of training to criterion, whereas Lee and Jamie learnt the response in a total of 10 sessions. However, Jamie failed to generalise the structure in the initial probes, and required a short period of additional training and therefore more time to learn the response.

It should also be noted that Lee was initially taught to label persons and actions (it's a (subject) verb-ing); Jamie required prior training in (subject) verb-ing (obj)/(a obj)/(prep). By contrast, Glyn was trained from the outset to produce the complete persons/actions/things sentence response.

Also, the children with less language at base line learnt fewer structures within the programme than the children at higher levels of language ability. Steven who was functionally non-verbal on entry to the programme received training in six structures in the language training dimension of the programme during the whole of the period under consideration. By contrast, Jamie, who presented a baseline expressive language repertoire of predominantly single word utterances and some two word combinations, was taught a total of eight structures in language training and 10 structures (eight prepositions and object labelling in the singular and plural) in video training over the

same period.

Rates of learning in Lee and Nicola were greater than in Steven and Jamie. Both these children had also produced single word utterances at base line, but they had also articulated several two and three word utterances. Nicola was trained in a total of 14 response forms in language training and eight prepositional forms in video training.

Of all the children, Glyn's progress within the programme was the most rapid. From October 1978 to mid-June 1979 (when he left the programme) he learnt a total of 18 response forms as compared with Nicola and Lee who acquired eight and nine responses respectively over the same period of time. Here again, Glyn had entered the programme with substantially greater vocabulary and syntax than other children in the experimental group.

There was some variability in patterns and rates of learning between children and not all children followed identical routes through the programme. However, where comparisons can be made, general trends suggest that object labelling in the singular and plural form, and labelling persons and verb-usage, were learnt relatively easily (6 to 12 sessions). Training in the first person pronoun in combination with action labelling took rather longer (4 to 17 sessions). There were clear indications that person training (I/You) represented an increased level of difficulty (14 to 29 sessions). Even so, there

is little doubt that the time and effort required in both teaching and learning I/You differentiations would have been much greater, had a two-trainer system not been used.

The most difficult concept to train throughout the programme was the Yes/No discrimination of objects, especially the singular and plural forms of the negative. For two children (Lee and Jamie), training in these forms required more sessions and therefore more time than any other sentence structure. Lee needed approximately 21 sessions of training to criterion, whereas Jamie, after a total of 37 sessions of training, had still not achieved criterion learning.

In retrospect, it would have been better to introduce the sequence at a later stage in each child's programme. These findings are, however, consistent with those of Guess, Sailor, and Baer (1978). In their functional speech and language training programme, Yes/No training sequences were moved from step four to step seven as a result of the difficulties experienced by some children in learning the discrimination. Moreover, Baer (in a personal communication) has commented that at lower levels in particular, Yes/No discriminations require elaborate training procedures. Here, too. Jamie's lack of progress in learning the negative forms necessitated a number of procedural adjustments, and modifications to both the structural drills and the presentation of the verbal stimuli in the training sessions.

Although training problems were encountered in the development of specific structures with some children, the data suggest that cumulative increases ocurred in rates of acquisition relative to length of participation in the programme. The number of structures trained per child in the autumn term of 1979 was in excess of the total number trained during the previous three school terms. For example, Lee was taught a total of nine response forms during the period October 1978 to mid-June 1979, in contrast to the autumn term of 1979 when he received training in 13 new sentence structures in the language training programme and eight prepositional structures in video training.

Similarly, during the same term, Nicola received language training in six structures and video training in eight prepositions as compared with a total of eight response forms trained in the previous three school terms. Jamie's rate of learning was also slower during the first three terms of the study. During this period he was taught a total of six structures in language training and learnt object labelling in the singular and plural in video training, giving a total of eight structures.

In the following autumn term, however, he learnt eight prepositions in video training and received language training in four response forms, giving a total of 12 structures overall. Steven, too, showed a gradual increase in his rate of acquisition of new forms over the

total training period. Given his non-speech behaviour at base line, his increased rate of learning in the autumn term of 1979 constituted both a gradual development in the acquisition of new forms and a significant increase in the length and morphological rule complexity of trained forms.

In addition, it should be noted that labelling persons and actions was trained to criterion in a total of six sessions only, in comparison with 29 sessions of training needed for single word object labels and 33 sessions for the mediating response (My+Noun), both of which were trained in the earlier stages of the programme. These results indicate a relative economy in training time in the development of new structures in the final weeks of his programme.

Besides increases in rates of acquisition during the final autumn term, the children were also learning a greater number of sentence structures simultaneously. With the exception of Steven, the children were learning approximately four different sentence types in language training, in parallel with learning prepositional usage from base line in video training. In short, they were receiving training in 12 new sentence structures all at once. In view of these positive results, it is a pity that Glyn had left the programme before the final autumn term. His excellent progress until then suggested that had more time been available to work with him, he would have continued to benefit from the intervention and

similar increments in rates of acquisition would undoubtedly have resulted.

It is worth noting that as the children progressed through the programme, their articulation also improved. This was despite the fact that they had not received speech therapy, either before or during the intervention. Gentle prompting on a limited set of speech sounds during the sessions, combined with continuous language training in which they were expected to produce an increasing range of well formed utterances, apparently facilitated corresponding improvements in the production of better articulated speech.

Lastly, although data have not been presented on the progress and learning of the four other children in the experimental group, some general comments about the progress of these children are nevertheless of interest. Two children were taught in the grammatical sequences of the programme: one child participated from October until May and the other child remained in the programme until the end of the summer term. Both children presented very different language behaviour at base line. One child was echolalic; the other child had an intact expressive language repertoire. Unfortunately, however, he was disinclined to use this; so this meant that prior to the intervention he was to all intents and purposes non-verbal.

Both children progressed within the programme in all structures trained, other than in the Yes/No discrimination of objects, in which training was relatively time consuming. One of the children found video training highly reinforcing and was accordingly trained from base line in two sentence structures, and frequently worked with the programmes without adult supervision.

The two remaining children were both non-imitative and non-verbal at base line. They were trained in the motor imitation training sequences for the duration of the study. Long and intensive training resulted in the establishment of an imitative motor behavioural repertoire in both children. Training did not, however, succeed in developing the skills of vocal sound imitation in either child. This finding is not untypical and is consistent with those of Guess, Sailor and Baer (1978). They report that of the children entering their programme with no vocal or verbal imitation skills a significant proportion failed to prgress to the speech and language training sequences.

In addition, it is worth noting that following completion of the experimental programme, motor imitation training was continued with both children for a further two terms. At the end of this period they were still unable to produce vocal sound imitations. The children were, however, beginning to use gestural pointing as a means of

communicating their needs. Moreover, their fine motor imitation skills were by this time sufficiently developed to have permitted acquisition of a manual non-speech communication system.

It is difficult to ascertain the precise reasons for the failure of both children to develop vocal sound imitation. The nature of their living environments mitigated against the success of any intervention programme. Nevertheless, it is undoubtedly the case (in retrospect) that the imitation training sequences did not include a sufficient number of functional responses. Teaching motor behaviours such as clap hands, raise arm, twirl round, clap thighs etc, has little relevance to a child's interactions with the social environment.

Progress might have been better facilitated, therefore, by training a series of functional motor imitations consisting of the purposeful use of objects which, by definition, would have had social validity and an intrinsic reinforcement value for the child (Guess, Sailor and Baer, 1978).

2 Generalisation in successive post-tests

In post-test 1 individual differences in patterns of generalisation were marked in relation to both context and adult-child interaction. At this point in the study, Steven's verbal behaviour was still largely dependent upon

contexts approximating one-to-one training sessions. Predictably, therefore, generalisation in his case was most successful in the highly structured context of test condition A and was higher with familiar adults, ie the teacher-experimenter and the care assistant, than with unfamiliar adults (the non-trainer).

By contrast, Lee and Glyn were able to generalise response forms equally successfully in both the highly structured and semi-structured contexts of test conditions A and B respectively. Lee's generalisations were, however, more consistent in interaction with the teacher-experimenter and the care assistant. By comparison, Glyn's generalisations in the majority of response forms was high to optimal across experimenters. This result was particularly encouraging, given that only a few months prior to the test, Glyn had initially been unresponsive to adult communication in non-training environments.

An entirely unexpected result was that levels of generalisation achieved by Nicola and Jamie were higher in the semi-structured setting of condition B Generalisation in both test conditions was more consistent with the teacher-experimenter than with either the care assistant or the non-trainer. Thus, despite a less restricted contextual pattern of generalisation, responding tended to be trainer-oriented. Also Jamie's generalisation of singular and plural object labels, trained in the video training dimension of the programme,

was notably more successful with the care assistant. This again demonstrated a "trainer specific" pattern of generalisation.

In post-test 2 the general trend across children was towards lower levels of generalisation in sub-test I than in sub-test II. However, a comparison of individual results shows that Nicola's sub-test II scores were generally higher than the scores she achieved in (the comparably structured) condition A of post-test 1.

This suggests a slight improvement in her ability to respond in highly structured test situations. Jamie's results indicated that his responding in some sentence structures had increased over the levels of generalisations obtained in post-test 1. Only in the last trained response of labelling persons/actions/things was there a significant decrease on scores obtained in post-test 1. But a short period of retraining rapidly re-established criterion learning. This means therefore that his language learning overall had been maintained during the vacation period. Lee's case, too, suggested that levels of generalisation had been maintained over the vacation.

Steven's ability to generalise object labelling in post-test 2 appeared to have declined compared with his responses in post-test 1, suggesting therefore a decrease in the effects of the intervention. However, his learning

of personal action labelling was maintained at pre-vacation levels. More importantly perhaps than variability in the production of specific forms, Steven was continuing to produce speech and had not returned to his pre-intervention behaviour of non-verbal responding.

In sum, learning in the majority of the children was maintained over the six week summer holiday period. In those cases where response rates had fallen, significant increases in responding occurred in sub-test II or were re-established after brief retraining (usually not more than three sessions).

In post-test 3, notable gains in levels of generalisation were achieved by all the children over the levels obtained in post-tests 1 and 2. Type, structure and complexity of response forms had progressively increased and were produced in response to a greater diversity of verbal and object stimuli in an extended range of contexts. Moreover, although generalisation throughout the tests was in general higher with the teacher-experimenter and the care assistant than with the non-trainers, generalisation in post-test 3 was on the whole at moderate to high levels with the non-trainer.

Differences in levels obtained between trainers one and two and the non-trainer were marginal and less noticeable than in post-test 1. The "trainer-specific" patterns of generalisation shown by Nicola and Jamie in post-test 1

were not a dominant feature of their responding in post-test 3. Nicola did however continue to generalise more fluently in natural, low-structured contexts than in highly structured test conditions, whereas the other children were doing better in all test conditions.

It is worth noting that the generalisation of prepositional forms trained in the video dimension of the programme was at similar levels to the generalisation of sentence structures developed in language training. Generalisation of some prepositions was more variable than others (for example, under/over, behind). Overall, however, generalisation of prepositional forms was at moderate to high levels in both verbal and motor response modalities.

Gradual increases in the length and structural complexity of the children's spontaneous utterances occurred from post-tests 1 and 2 to post-test 3. Utterances produced in post-test 1 for the most part consisted of sentence structures and grammatical constituents trained within the programme plus a few spontaneous additions of untrained structural combinations. Jamie, for example, began to combine action labels (verb-ing) with the untrained third person pronoun she and the contracted verbal auxiliary 's (also untrained), while Nicola was beginning to use a number of Wh. questions such as who? and what? (untrained) in combination with the contracted copula 's ("who's that?"/"what's that man doin'?").

In post-test 3, as a result of continued training the children were spontaneously producing an extended range of trained response forms in combination with an increased number of untrained forms and morphological rule variations. The production of core grammatical constituents had stabilised across the children. For example, the determiner a, the replacive pronouns it and they and the singular and plural forms of the contracted copula and verbal auxiliaries 's and 're were, in general, fluently realised in the children's expressive language repertoires. Furthermore, the children were no longer referring to themselves or to others by the use of proper nouns but were instead consistently producing appropriate first and second person pronoun (I/You) differentiations.

Those children taught prepositional usage in the video dimension of the programme were beginning to use the definite article (the) both in prepositional sentence structures and in combination with other syntactic elements. In addition, increases occurred in the use of question forms, in particular a wide range of untrained wh. questions such as why? where? when?. Although not directly trained, some stimulus presentations and question forms of the structural drills had been learnt and acquired by the children and were being spontaneously used to gain information about the nature of objects in the school environment (what is it?/what are they?) and to obtain affirmation or negation of the identity of objects (Is it a (noun)?/are they (nouns)?). Similar developments

were shown by Glyn in post-test 1, who began to ask people who they were (are you person (name)? (albeit, in a game routine)) and also to request information about their material needs (Do you want a (noun)?).

Increases in length of spontaneous utterances from post-tests 1 and 2 to post-test 3 extended from a minimum of one word (one utterance only) to a maximum of seven words in post-test 1, as compared with a minimum of two words to a maximum of nine words in post-test 3. Sentence constructions across the children averaged between three and four words in length (ie, including the contracted forms of the copula and verbal auxiliaries). In addition, the children's two-word sentence productions were syntactically appropriate elliptical responses and did not therefore comprise restricted (ungrammatical) two-word combinations such as "man kick", "hold bag", typically produced at baseline.

Of all the children in the group, Nicola's spontaneous generalisations were the most prolific. Throughout post-tests 1 and 2 she continually produced the request forms trained within the programme to gain access to a range of materials and activities. In post-test 3 this pattern of generalisation continued and, in common with the other children, her language also included the addition of untrained sentence elements and new surface grammar rules.

However, in contrast to the other children, Nicola had

rapidly become a high-rate initiator of social interactions. While this may have been as a result of personality differences, nevertheless Nicola had received considerable instruction in a set of syntactic structures of greater functional value than the sentence structures taught to some of the other children.

The acquisition of request forms through which immediate access to natural environmental reinforcers were gained, automatically increases both the frequency and occurrence of verbal responses. Here again, training functional request forms in advance of YES/NO discriminations might have yielded more rapid rates of learning in Lee and Jamie.

In addition, it is interesting to note that Baer, in a personal communication, has questioned the validity of training labelling persons/actions/things (It's a subject verb-ing (obj)/(aobj)/(prep)) on the grounds that the response has little function in the social environment. While the response may have limited relevance in an institutional environment, or in the social environment per se the ability to describe verbally people, actions and objects in response to both pictorial and non-pictorial referents is a critical skill for <u>school</u> progress and as such has both form and function in educational environments.

Moreover, although training in the response may not have

directly facilitated higher rates of verbal interactions, it was helpful in developing the production of extended sentence structures in some of the children. Also, the ability to produce the sentence elements and morphological rule relationships combined in the response were important for the generalisation of rule transfer and the production of new structural combinations as exemplified in training the third person pronouns HE/SHE.

Lowest rates of spontaneous language productions were observed in Steven. For example, in post-tests 1 and 2 he failed to produce a single unelicited utterance. In post-test 3, however, a few spontaneous two word combinations were produced during interactions with a peer. Although the improvement was less than dramatic, nevertheless he was both emitting speech and responding to interactions in contexts which were markedly dissimilar to one-to-one training settings. Moreover, in comparison with his non-verbal behaviour at baseline, these results were indeed remarkable.

Overall, the children's spontaneous utterances from post-tests 1 and 2 to post-test 3 demonstrated a developing ability in each child both to infer and apply surface grammar rules to new learning. This in turn indicated an emerging pattern of stability in their production and use of syntax.

Norm referenced test results across the children in post-

test 1 and post-test 3 showed that were some slight increases and decreases on scores obtained pre-intervention. These results clearly indicate that there was no significant correlation between language gains within the programme and mental and language age as determined by norm-referenced testing procedures. In other words, age equivalent scores were not predictive of success within the programme or a measure of the language learning potential of each child.

Lastly, the development of play skills in the children during the study seemed to be correlated with improvements in verbal functioning resulting from the intervention programme. The ability to participate in role play certainly constituted a qualitative change in their interpersonal behaviour. It seems unlikely that this improvement was wholly attributable to maturational factors. All the children had attended the school for a number of years prior to intervention and had failed to develop play skills during that time. Furthermore, play behaviour emerged in all the children at approximately the same time and seemed to be associated with corresponding improvements in social adaptive behaviour which were undoubtedly a result of gains in their ability to communicate.

In short, the development of appropriate play behaviour appeared to be part of a general pattern of enhanced communicative competence and a growing ability to engage

in social interaction with adults and peers.

3 Factors facilitating generalisation within the programme

The cumulative increases in rates of learning and levels of generalisation described in the previous section, were undoubtedly a result of specific features in both the design and implementation of the language programme. Some of these were intended from the outset, while others emerged as the study progressed.

A major feature of the teaching programme was a firm adherence to the principle of "training a sufficient number of exemplars" (Stokes and Baer, 1977). That is, teaching a number of stimulus and response exemplars which were diverse enough to prevent stimulus/response overselectivity (and therefore minimal generalisation) but which were sufficiently restricted to prevent a mismatch between level of demand within the sessions and the child's existing verbal repertoire.

As stated in Chapter Four, for the most part a restricted number of stimulus items (usually no more than six) were used to train each structure and morphological rule discrimination. However, throughout the study, the children were often concurrently trained in more than one structure at a time (eg, object labelling in the singular and plural, and labelling persons).

Moreover, when training focused on the development of a single structure, new response forms were introduced shortly before criterion learning and concurrently trained in the same sessions. In addition, structural responses were usually elicited through the presentation of two structurally similar stimulus questions (eg, what's this?/what is it?) rather than one. Also, verbal directives and stimuli were systematically varied and increased to accommodate individual patterns of learning. For example, in teaching Glyn to request objects, a total of four different question forms were used to elicit a particular sentence structure.

Throughout the study, therefore, the children were continually responding to a highly controlled set of pictorial, object or action referents. At the same time they were simultaneously required to learn and produce two or three different morphological rule discriminations in response to two or more stimulus questions.

The video training dimension of the programme also served to increase the number and diversity of exemplars. Although the structural drill presentations were for the most part consistent with those used in the language training sequences, the video presentations included visual representations of differing object and action referents. Moreover, the nature of video training required that the children both learn and respond to

language in an alternative medium, with a different trainer, in a context different from the one-to-one training setting. In major respects, therefore, video training as a practice system for structures trained to criterion in language training provided a controlled context for the initial generalisation of newly acquired language across settings, trainers and stimuli.

Furthermore, exposure to video presentations of well formed language models in addition to systematic language training, produced enhancements in the children's ability to both learn and respond to language, increasing their ability to generalise newly acquired expressive language skills. This was particularly demonstrated by Steven's production of It's a subject ver-ing (obj) in post-test 3, which was wholly attributable to exposure to the video training sequences in this form, given that he had not yet achieved criterion learning in the shorter sentence response - a subject verbing - in language training.

Also, teaching a restricted set of core grammatical constituents which were systematically integrated and re-integrated in both teacher language and verbal response forms (and also repeated from one teaching sequence to another), provided a network of syntactic rule interrelationships that increasingly enabled the children to utilise old learning and old forms to acquire new learning and new forms. In other words, previously learnt responses mediated the learning of new syntactic

relations.

This was particularly evident in the children's acquisition of the stimulus questions presented in the training sessions and also in their growing ability to combine and re-combine (and therefore generalise) the rules and structures trained within the programme into new syntactic combinations.

Lastly, although one-to-one language training was conducted in a separate area of the classroom, the distinction between the training setting and contexts for generalisation was in major respects an arbitrary one. The training setting provided an essential venue for focused, concentrated teaching in which new language skills were effectively shaped. The noise and activities of the classroom, however, constantly impinged. Furthermore, the classroom setting was a particular environment in which generalised language usage was obligatory. Training and generalisation settings were, therefore, one and the same in that both shared the same physical environmental.

4 Other factors facilitating generalisation

As indicated in Chapter Three, the strategy of training for generalisation was a critical factor in maximising the children's use of new language skills in non-training environments. The use of trained forms did not initially

occur in contexts other than the highly structured one-to-one training setting. In common with new language learning, therefore, generalisation had to be actively programmed since it was clearly not going "to fall out of the sky" or simply "emerge".

One-to-one language training clearly determined the content of language learning and was undoubtedly essential in establishing the principles of morphological rule learning and the production of sentence structures. However, cueing, prompting and reinforcing new response forms in a gradually extended range of contexts was equally necessary, both as a strategy for developing effective generalisation and also as a practice system through which the children could try out and experiment with newly acquired forms.

In addition to a systematic restructuring of the classroom environment in which snacks, materials and activities were contingent upon the emission of appropriate verbal responses, fundamental adjustments in adult behaviour were essential to support and maintain the children's language learning. Adults continually shaped the context to provide opportunities for verbal expression and to demonstrate to the children how, when and where language worked for different purposes and intentions.

Furthermore, well formed language models were presented across settings throughout the day and appropriate social

responses were given to each child's attempts to produce trained forms or structural combinations. Feedback was therefore consistently provided such that the children were aware of the effectiveness of their communication. Equally, in the event of inappropriate responding adult verbal behaviour provided the necessary linguistic "signposts" to ease the level of demand and point the way through each interaction.

It should therefore be evident, as in all aspects of this study, that the role of the care assistant was an important one. The participation of a second trainer who was familiar with both the content and structure of the training programme and also had knowledge about each child's level of language learning, ensured that in the absence of the author the elicitation and reinforcement of trained forms in other settings was continued. Similarly, the assistance of dining hall staff and other interested colleagues served to increase the rate and frequency of positive, constructive adult/child interactions within the school environment.

In sum, systematic increases in the quality and quantity of responsive, reinforcing adult behaviour was undoubtedly instrumental in generating gradual increases in the confidence of the children in displaying new syntactic forms. Conversely, the growing linguistic competence of the children also produced corresponding increases in their confidence in their own ability to communicate.

There is little doubt that successful learning in video and language training, in combination with the elicitation of trained forms in non-training contexts, increasingly enabled the children to acquire new structures more incidentally. This was particularly evident in the fourth term, when training for generalisation increasingly paralleled language training, resulting in the spontaneous emission of structures in which criterion learning was not yet achieved (eg, Nicola's production of will you (verb) etc?).

5 Methodological issues

As the study progressed, it became increasingly evident that the two roles of the teacher-researcher were by no means synonymous. For example, at the start, the experimental study was designed as a formal research investigation. In practice, however, pedagogical decisions had to be taken from time to time and these necessarily took priority. Moreover, maladaptive child behaviour in the early stages of the study, combined with the exigencies of classroom and school environments, had a negative effect on the rigour of the data collection.

There were frequent interruptions in the classroom routine and the training sessions from, among others, wandering teams of post-graduate medical students, school medical officers, children from other class groups and members of the teaching staff; all of whom served to distract both

children and trainers. It is worth noting, however, that in the later stages of the study the interruptions were more devastating to the author and the care assistant than they were to the children, who in general took them in their stride and continued with their language learning.

Lastly, given the large amount of data collected in the language and video training and the resultant labour of collation and analysis, the collection of data during adult/child interactions in training for generalisation was neither practicable nor feasible. Nevertheless, it must be emphasised that the facilitation of syntactic responses in non-training environments was an important feature of the teaching approach.

6 Conclusion

Over a period of approximately sixteen months, the children in the experimental group moved from a baseline level of minimal linguistic skill to a point at which they were producing sentence structures which in general were congruent with the expectations and conventions of the verbal community. Moreover, the learning and acquisition of syntax enabled each child to engage in "a safer and more useful interchange with a particular environment" (Skinner, 1957, p.1.).

The main conclusions to be drawn therefore are that a

logical language training curriculum combined with the implementation of didactic one-to-one teaching strategies was successful in shaping morphological rule learning and functional syntax in a group of children with severe learning difficulties. Within this framework video proved to be a useful, supplementary, language training medium, in addition to providing a practice/review system for newly acquired response forms.

The elicitation and reinforcement of trained forms in non-training contexts was essential for both developing the skills of generalisation and consolidating the effects of one-to-one language training. Furthermore, systematic adjustments in adult behaviour constituted the substantial qualitative alteration in "style of interaction" (Wells, 1985), necessary to provide impetus and support for the children's learning and use of language within the programme.

In addition, the co-operation and participation of the care assistant as a second trainer was instrumental in enhancing the consistency of the teaching approach and effectively increased each child's exposure to the intervention programme. Lastly, a structured, verbally responsive classroom environment seemed to be more conducive to the development of language learning in the experimental group than an unstructured verbally enriching one.

The findings of the study are particularly optimistic for mentally handicapped children in whom rudimentary levels of receptive and/or expressive language skills are established. It further demonstrates that individualised language instruction in an ordinary classroom environment is both possible and indeed effective in accelerating language learning.

Finally, Chomsky (1966; quoted in Wells, 1985) has argued that:

> "...principles of psychology and linguistics and research in these disciplines may supply insights useful to the language teacher. But this must be demonstrated and cannot be presumed."

The development of action-oriented, classroom-based language intervention programmes in which theory is demonstrated in practice remains in the present writer's view a productive area for future research. In addition, a potentially useful, second area of research focus, would be an analysis of the point at which language deficient children no longer require structured one-to-one language training, but can continue to learn and acquire new linguistic forms from brief (albeit systematic) adult/child interactions in a diversity of settings within the school environment.

1 The present study was concerned with the design and implementation of a behavioural language training programme with a group of children (CA 9-13 years) with severe learning difficulties in a local authority day school in Sheffield.

2 The study was conducted over a period of four and a half school terms. One child died at the beginning of the third term and two children left the school at the end of the same term. Six children participated throughout the experimental programme. Detailed data and results have been presented on five children.

3 At baseline, three children were non-verbal, two of whom were also non-imitative. One child was capable of producing relatively complex sentence structures but was reluctant to emit verbal behaviour. The expressive language of the remaining five children consisted of predominantly single word utterances with some two-word combinations.

4 The language intervention programme was organised into three categories: 1) pre-language training for the development of motor and vocal imitation skills, 2) language training for the development of syntax and fully grammatical sentence usage, 3) video language training as a supplementary language

training medium.

5 Highly structured one-to-one teaching strategies in combination with the techniques of imitation and reinforcement were used in each dimension of the programme.

6 Pre-language and language training sessions of 10-15 minutes duration were conducted daily with each child. Technical difficulties during the second and third terms prevented the regular implementation of video training. In the fourth term, however, video training was conducted once or twice per week. Sessions per child were of 21-28 minutes duration.

7 Specific teaching strategies were devised for training the generalisation of newly acquired syntax in non-training contexts in the school.

8 The role of the Care Assistant as a second trainer was a critical factor in the successful implementation of the study and served also to enhance the learning and use of language in all of the children.

9 The data presented for five of the children show that significant improvements occurred in the verbal behaviour of each child. Similar improvements were observed in the children's social, adaptive behaviour.

10 The techniques of imitation and reinforcement were successful in establishing functional speech and language in one child who was non-verbal at baseline. The utterances of the remaining four children were extended from a baseline level of predominantly single words to sentence structures of up to nine words in length.

11 As the programme progressed, cumulative increases occurred in each child's rate of acquisition, together with corresponding increases in the generalisation of learned language skills and the spontaneous production of trained forms in combination with both new and untrained structural elements.

12 These results clearly indicate that a teaching approach integrating highly structured one-to-one language training in an ordinary classroom combined with training for generalisation in non-training settings within a school environment, was both possible and successful in shaping effective communication in a range of social contexts in a group of children with severe learning difficulties.

REFERENCES

Ayllon, T., and Azrin, N.H. (1964). Reinforcement and instructions with mental patients. J. Exp.Anal.Behav. 7, 327-331.

Ayllon, T., and Michael, J.L. (1959). The psychiatric nurse as a behavioral engineer. J. Exp.Anal. Behav., 2 323-334.

Baer, D.M., Peterson, R.F., and Sherman, J.A. (1967). The development of imitation by reinforcing behavioural similarity to a model. J. Exp.Anal.Behav., 12, 701-712.

Bates, E. (1979). The Emergence of Symbols: Cognition and Communication in Infancy. Academic Press, New York.

Bates, E., Benigni, L., Bretherton, I., Camaioni, L., and Volterra, V. (1977). From gesture to the first word: on cognitive and social prerequisites. In: M. Lewis and L. Rosenblum (eds.), Interaction, Conversation and the Development of Language. John Wiley and Sons, New York.

Birnbrauer, J.S., Bijou, S.W., Wolf, M.M., and Kidder, J.D. (1965). Programmed instruction in the classroom. In: L. Ullmann and L. Krasner, (eds.), Case Studies in Behavior Modification Holt, New York.

Birnbrauer, J.S., and Lawler, J. (1964). Token reinforcement for learning. Mental Retardation, 2, 275-279.

Blank, M. (1974). Cognitive functions in the preschool years. Dev. Psychol., 10, 229-245.

Blank, M., and Milewski, J. (undated). Applying psycholinguistic research to the treatment of language disorders: the case of autism.

Bloom, L. (1970). Language Development: Form and Function in Emerging Grammars. MIT Press, Cambridge, Massachusetts.

Bloom, L. (1973). One Word at a Time: The Use of Single-Word Utterances Before Syntax. Mounton, The Hague.

Bloom, L. (1974). Talking, understanding and thinking. In: R.L. Schiefelbusch and L. Lloyd (eds.), Language Perspectives - Acquisition, Retardation and Intervention. University Park Press, Baltimore.

Bloom, L. and Lahey, M. (1978). Language Development and Language Disorders. John Wiley and Sons, New York.

Bowerman, M. (1976). Semantic factors in the acquisition of rules for word use and sentence construction. In: D. Morehead and A. Morehead (eds.), Directions in Normal and Deficient Child Language. University Park Press. Baltimore.

Bricker, W.A. (1972). A systematic approach to language training. In: R.L. Schiefelbusch (ed.), Language of the Mentally Retarded. University Park Press, Baltimore.

Bricker, W.A. and Bricker, D.D. (1974). An early language training strategy. In: R.L. Schiefelburch and L. Lloyd (eds.), Language Perspectives - Acquisition, Retardation and Intervention, University Park Press, Baltimore.

Brinker, R.P. and Bricker, D. (1980). Teaching a first language: building complex structure from simpler components. In: J. Hogg and P.J. Mittler (eds.), Advances in Mental Handicap Research, Volume I. John Wiley and Sons, New York.

Bronfenbrenner U. (1977). Toward an experimental ecology of human development. American Psychologist, July, 513-531.

Brown, R. (1973). A First Language: The Early Stages. Harvard University Press, Cambridge, Mass.

Bryant, P.E. (1965). The effects of verbal labelling on recall and recognition in severely subnormal and normal children. J. Ment. Defic. Res., 9, 229-236.

Bryant, P.E. (1967). Verbalization and immediate memory of complex stimuli in normal and severely subnormal children. Brit. J. Soc. Clin.Psychol., 6, 212-219.

Buddenhagen, R.G. (1971). Establishing Vocal Verbalizations in Mute Mongoloid Children. Reserach Press, Champaign, Illinois.

Carrier, J.K. (1974). Application of functional analysis and a non-speech response for teaching language. In: L.V. McReynolds (ed.), Developing systematic procedures for training children's language. ASHA Monogr. 18.

Carrier, J.K. (1976). Application of a non-speech language system with the severely language handicapped. In: L. Lloyd (ed.), Communication, Assessment and Intervention Strategies. University Park Press, Baltimore.

Cashdan, A., and Jeffree, D.M. (1966). The influence of home background on the development of severely subnormal children. Brit J. Med. Psychol., 39, 313-318.

Chomsky, N. (1957). Syntactic Structures, Mouton, The Hague.

Chomsky, N. (1965). Aspects of the Theory of Syntax. MIT Press, Cambridge, Massachusetts.

Clark, E. (1974). Some aspects of the conceptual basis for first language acquisition. In R.L. Schiefelbusch and L. Loyd (eds.), Language Perspectives - Acquisition, Retardation and Intervention. University Park Press, Baltimore, Maryland.

Clarke, A.D.B., and Clark, A.M. (1954) Cognitive changes in the feeble-minded. Brit. J. Psychol., 45, 173-179.

Corrigan, R. (1978). Language development as related to stage VI object permanence development. J. Child Lang., 5, 173-189.

Costello, J.M. (1984). Generalization across settings: language intervention with children. In: J. Miller, D.E. Yoder and R.L. Schiefelbursh (eds.), Contemporary issues in language intervention. ASHA Reports, 12, American Speech and Hearing Association, Rockville, Maryland.

Cromer, R.F. (1974). Receptive language in the mentally retarded: Processes and diagnostic distinctions. In: R.L. Schiefelbusch and L. Lloyd (eds.), Language Perspectives - Acquisition, Retardation and Intervention. University Park Press, Baltimore.

Crystal, D., Fletcher, P. and Garman, M. (1976). The Grammatical Analysis of Language Disability. Edward Arnold, London.

Fenn, G. (1977). The Development of Syntax in a Group of Severely Subnormal Children. Exeter Linguistic Studies, University of Exeter.

Ferster, C.B. (1972). Clinical reinforcement. Seminars in Psychiatry, 4, 101-111.

Fillmore, C. (1968). The case for case. In: E. Bach and R.T. Harms (eds.), Universals in Linguistic Theory. Holt, Rinehart and Winston.

Garcia, E. (1974). The training and generalization of a conversational speech form in nonverbal retardates. J. Appl. Behav. Anal., 7, 137-149.

Garcia, E., Baer, D.M. and Firestone, I. (1971). The development of generalized imitation within topographically determined boundaries. J. Appl. Behav. Anal., 4, 101-112.

Goetz, L., Schuler, A. and Sailor, W. (1979). Teaching functional speech to the severely handicapped: Current issues. Journal of Autism and Developmental Disorders, 9, 325-343.

Gray, B. and Ryan, B. (1973). A Language Program for the Nonlanguage Child, Research Press, Champaign, Illinois.

Guess, D. (1969). A functional analysis of receptive language and productive speech: acquisition of the plural morpheme. J. Appl. Behav. Anal., 4, 55-64.

Guess, D. and Baer, D.M. (1973). An analysis of individual differences in generalization between receptive and productive language in retarded children. J. Appl. Behav. Anal., 6, 311-331.

Guess, D., Keogh, W. and Sailor, W. (1978). Generalization of speech and language behavior: measurement and training tactics. In: R.L. Schiefelbusch (ed.). Bases of Language Intervention, University Park Press, Baltimore, Maryland.

Guess, D., Sailor, W., and Baer, D.M. (1974). To teach language to retarded children. In: R.L. Schiefelbusch and L Lloyd (eds.), Language Perspectives - Acquisition, Retardation and Intervention. University Park Press, Baltimore.

Guess, D., Sailor, W., and Baer (1976). Functional Speech and Language Training for the Severely Handicapped, Parts 1-4. H & H Enterprises, Lawrence, Kansas.

Guess, D., Sailor, W., and Baer (1978). Children with limited language. In: R.L. Schiefelbusch (ed.), Language Intervention Strategies. University Park Press. Baltimore.

Guess, D., Sailor, W., Rutherford, G. and Baer, D.M. (1968). An experimental analysis of linguistic development in the productive use of the plural morpheme. J. Appl. Behav. Anal., 1, 297-306.

Goldstein, H., and Wetherby B. (1984). Application of a functional perspective on receptive language development to early intervention. RASE., 5, 48-57.

Guralnick, . 1976). The acquisition of prepositional motor responses in handicapped children. J. Appl. Behav. Anal., 1, 297-306.

Halle, J.W. (1982). Teaching functional language to the handicapped, an integrative model of natural environment teaching techniques. The Journal of the Association for the Severely Handicapped, 7, 29-37.

Halle, J.W., Alpert, C. and Anderson, S.R. (1984). Natural environment language assessment and intervention with severely impaired preschoolers. Topics in Early Childhood Education, 4, 57-72.

Halle, J.W., Marshall, A.M. and Spradlin, J.E. (1979). Time delay: a technique to increase language use and facilitate generalization in retarded children. J. Appl. Behav. Anal., 12, 431-439.

Harris, S.L. (1975). Teaching language to nonverbal children with emphasis on problems of generalization. Psychol. Bull., 82(4) 565-580.

Hart, B. and Risley, T.R. (1968). Establishing the use of descriptive adjectives in the spontaneous speech of disadvantaged preschool children. J. Appl. Behav. Anal., 1, 109-120.

Hart, B. and Risley, T.R. (1980). In vivo language intervention: unanticipated general effects. J. Appl. Behav. Anal., 13, 407-432.

Hart, B. and Rogers-Warren, A. (1978). A milieu approach to teaching language. In: R.L. Schiefelbush (ed.), Language Intervention Strategies. University Park Press, Baltimore.

Hewett, F.M. (1965). Teaching speech to an autistic child through operant conditioning. Amer. J. Orthopsychiat., 5, 927-936.

Horstmeister, D.S. and MacDonald, J.D. (1978). The Environmental Language Intervention Program. Charles E. Merrill, Columbus, Ohio.

Ingram, D. (1974). The relationship between comprehension and production. In: R.L. Schiefelbusch and L. Lloyd (eds.), Language Perspectives - Acquisition, Retardation and Intervention. University Park Press, Baltimore.

Johnston, M. and Harris, F.R. (1968). Observation and recording of verbal bahavior in remedial speech work. In: H.N. Sloane and B.D. MacCaulay (eds.), Operant Procedures in Remedial Speech and Language Training. Houghton Mifflin, Boston.

Jordan, T.E. (1967). Language and mental retardation: A review of the literature. In R.L. Schiefelbush, R.H. Copeland and J.O. Smith (eds.), Language and Mental Retardation. Holt, Rinehart and Winston, New York.

Kent, L.R. (1974). Language Acquisition Program for the Retarded or Multiply Impaired. Research Press, Champaign, Illinois.

Kent, L.R., Klein, D., Falk, A., and Guenther, H. (1972). A language acquisition program for the retarded. In: J.E. McLean D.E. Yoder, and R.L. Schiefelbusch (eds.), Language Intervention with the Retarded. University Park Press, Baltimore.

Koegel, R.L. and Rincover, A. (1977). Research on the difference between generalization and maintenance in extra-therapy responding. J. Appl. Behav. Anal., 10, 1-12.

Kiernan, C.C. (1981). The language of the retarded: development of approaches to language remediation. Thomas Coram Reserach Institute, University of London, Institute of Education.

Lackner, J.R. (1968). A developmental study of language behavior in retarded children. Neuropsychologia. 6, 301-320.

Lee, L.L. (1966). Developmental sentence types: a method for comparing normal and deviant syntactic development. J. Speech Hear. Disord., 31, 311-330.

Lee, V.I. (1978). Teaching generalized receptive and productive behind - front discriminations to two retarded children. J. Appl. Behav. Anal., 11, 529.

Lenneberg, E.H. (1967). Biological Foundations of Language. John Wiley and Son, New York.

Lenneberg, E.H., Nichols, I.A. and Rosenberger, E.F. (1964). Primitive stages of language development in mongolism. In: D.M.K. Rioch and E.A. Weinstein (eds.), Disorders of Communication (Research Publications of the Association for Research in Nervous and Mental Disease. Vol. XLII). Williams and Wilkins, Baltimore.

Lovaas, O.I., Berberich, J.P., Perloff, B.F., Shaeffer, B. (1966). Acquisition of imitative speech by schizophrenic children. Science, 151, 705-707.

Lovaas, O.I. (1968). A program for the establishment of speech in psychotic children. In: H.N. Sloan and B.D. Macaulay (eds.), Operant Procedures in Remedial Speech and Language Training. Houghton Mifflin, Boston.

Luria, A.R. (1958). Dynamic approach to the mental development of the abnormal child. J. Ment. Defic. Res. 2, 37-52.

Luria, A.R. (1959). The directive function of speech in development and dissolution II. Word, 15, 453-464.

Luria, A.R. (1974/1975). Scientific perspectives and philosophical dead ends in modern linguistics. Cognition, 3, 377-385.

Lyle, J.G. (1960). Some factors affecting the speech development of imbecile children in an institution. J. Child Psychol. Psychiat., 2, 121-129.

MacDonald, J.D. and Blott, J.P. (1974). Environmental language intervention: the rationale for a diagnostic and training strategy through rules, context and generalization. J. Speech Hear. Disord., 38, 244-256.

McLean, J.E. and Snyder-McLean, L.K.(1978). A Transactional Approach to Early Language Training. Charles E. Merrill, Columbus, Ohio.

Menyuk, P. (1964). Comparison of grammar of children with functionally deviant and normal speech. J. Speech Hear. Res., 7, 109-121.

Menyuk, P. (1969). Sentences children use. M.I.T. Press, Cambridge, Mass.

Miller, J.F. and Yoder, D.E. (1974). An ontogenetic language teaching strategy for retarded children. In: R.L. Schiefelbusch and L. Lloyd (eds.), Language Perspectives - Acquisition, Retardation and Intervention. University Park Press, Baltimore.

Miller, J. (1981). Early psycholinguistic acquisition. In: R.L. Schiefelbush and D.D. Bricker (eds.), Early Language Acquisition and Intervention, University Park Press, Baltimore.

Morehead, D.M. and Morehead, A. (1974). From signal to sign: a Piagetian view of thought and language during the first two years. In: R.L. Schiefelbush and L. Lloyd (eds.), Language Perspectives - Acquisition, Retardation and Intervention. University Park Press, Baltimore.

Nelson, K. (1973). Structure and strategy in learning to talk. Monogr. Soc. Res. Child Dev. 38 (1-2), Serial No. 149.

Nelson, K. (1974). Concept, word and sentence: interrelations in acquisition and development. Psychol. Rev. 81, 267-285.

O'Connor, N. and Hermelin, B. (1962). Speech and Thought in Severe Subnormality. Pergamon Press, London.

Peterson, R.F. (1968). Imitation: a basic behavioral mechanism. In: H.N. Sloane and B.D. Macaulay (eds.), Operant Procedures in Remedial Speech and Language Training, Houghton Mifflin, Boston.

Risley, T. and Wolf, M. (1967). Establishing functional speech in echolalic children. Behav. Res. Ther., 5, 73-88.

Risley, T. and Wolf, M. (1967). Establishing functional speech in echolalic children. In: H.N. Sloane and B.D. Macaulay (eds.). Operant Procedures in Remedial Speech and Language Training, Houghton Mifflin, Boston.

Rogers-Warren, A. and Warren, F. (1980). Mands for verbalization: facilitating the display of newly trained language in children. Behavior Modification, 4, 361-382.

Ruder, K.F. and Smith, M.D. (1974). Issues in language training. In: R.L. Schiefelbusch and L. Lloyd (eds.), Language Perspectives - Acquisition, Retardation and Intervention. University Park Press. Baltimore.

Sailor, W. and Taman, T. (1972). Stimulus factors in the training of prepositional usage in three autistic children. J. Appl. Behav. Anal., 5, 183-190.

Schiefelbusch, R.L., Copeland, R.H. and Smith, J.O. (1967). Language and Mental Retardation, Holt, Rinehart and Winston, New York.

Schlanger, B.B. (1967). Issues for speech and language training of the mentally retarded. In: R.L. Schiefelbush, R.H. Copeland and J.O. Smith (eds.), Language and Mental Retardation. Holt, Rinehart and Winston, New York.

Schlesinger, I.M. (1971). The production of utterances and language acquisition. In: D.I. Slobin (ed.), The Ontogenesis of Grammar. Academic Press, New York.

Schlesinger, I.M. (1974). Relational concepts underlying language. In: R.L. Schiefelbush and L. Lloyd (eds.), Language Perspectives - Acquisition, Retardation and Intervention. University Park Press, Baltimore.

Schlesinger, I.M. (1982). Steps to Language: Towards a Theory of Native Language Acquisition. Erlbaum, Hillsdale, N.J.

Schumaker, J. and Sherman, J.A. (1970). Training generative verb usage by imitation and reinforcement procedures. J. Appl. Behav. Anal., 3, 273-287.

Siegel, G.M. and Harkins, J.P. (1963). Verbal behavior of adults in two conditions with institutionalized retarded children. In: R.L. Schiefelbusch (ed.), Language studies of mentally retarded children. J. Speech Hear. Disord. Monogr. Suppl. No. 10.

Siegel, G.M. and Spradlin, J.E. (1978). Programming for language and communication therapy. In: R.L. Schiefelbusch (ed.), Language Intervention Strategies, University Park Press, Baltimore.

Siegel, G.M. and Vogt, M.C. (1984). Pluralization instruction in comprehension and production. J. Speech Hear. Disord., 49, 128-135.

Siegel, L.S. (1981). Infant tests as predictors of cognitive and language development at two years. Child Dev., 52, 547-557.

Skinner, B.F. (1957). Verbal Behavior. Prentice-Hall, Eaglewood Cliffs, New Jersey.

Sloane, H.N., Johnston. M.K. and Harris, F.R. (1968). Remedial procedures for teaching verbal behavior to speech deficient or defective young children. In: H.N. Sloane and B.D. MaCaulay, (eds.), Operant Procedures in Remedial Speech and Language Training. Houghton Mifflin, Boston.

Slobin, D. (1973). Cognitive prerequisites for the development of grammar. In: C.A. Ferguson and D.I. Slobin (eds.). Studies of Child Language Development. Holt, Rinehart and Winston, New York.

Snyder, L.K., Lovitt, T.C. and Smith, J.O. (1975). Language training for the severely retarded: five years of behavior analysis research. Exceptional children, September, 7-15.

Spradlin, J.E. and Girardeau, F.L. (1966). The behavior of moderately and severely retarded persons. In: N.R. Ellis (ed.), International Review of Research in Mental Retardation, Volume 1. Academic Press, New York.

Stokes, T.F. and Baer, D.M. (1977). An implicit technology of generalization. J. Appl. Behav. Anal., 10, 347-367.

Stokes, T.F., Baer, D.M. and Jackson, R.L. (1974). Programming the generalization of a greeting response in four retarded children. J. Appl. Behav. Anal., 7, 599-610.

Stremel, K. and Waryas, C. (1974). A behavioral - psycholinguistic approach to language training. In: L.V. McReynolds (ed.), Developing systematic procedures for training children's language. ASHA Monogr. 18, 96-125.

Striefel, S. (1972). Television as a language training medium. Mental Retardation, 10, 27-29.

Striefel, S., Bryan, K.S. and Aikens, D.A. (1974). Transfer of stimulus control from motor to verbal stimuli. J. Appl. Behav. Anal., 7, 123-135.

Striefel, S. and Wetherby, B. (1973). Instruction - following behavior of a retarded child and its controlling stimuli. J. Appl. Behav. Anal., 6, 663-670.

Tizard, J. (1960). The residential care of mentally handicapped children. Proceedings of London Conference on the Scientific Aspects of Mental Deficiency. May and Baker, London.

Twardorsz, S. and Baer, D.M. (1973). Training two severely retarded adolescents to ask questions. J. Appl. Behav. Anal., 6, 655-661.

Wakeman, A. (1970). English Fast: An Integrated Range of Materials for the Teaching of English as a Foreign Language. Hart-Davis Educational, St. Albans.

Wakeman, A. (1974). English Fast: An Integrated Range of Materials for the Teaching of English as a Foreign Language. Students' Book 1. Hart-Davis Educational. St. Albans.

Waryas, C.L. and Stremel-Campbell, K. (1978). Grammatical training for the language-delayed child. In: R.L. Schiefelbusch (ed.), Language Intervention Strategies, University Park Press, Baltimore.

Wells, G. (1975). Interpersonal communication and the development of language. Paper presented at the Third International Child Language Symposium, London.

Wells, G. (1985). Language, Learning and Education, NFER/Nelson, Windsor.

Wheeler, A.J. and Sulzer, B. (1970). Operant training and generalization of a verbal response form in a speech deficient-child. J. Appl. Behav. Anal., 3, 139-147.

Whitman, T.L. Zakaros, M. and Chardos, S. (1971). Effects of reinforcement and guidance procedures on instruction - following behavior of severely retarded children. J. Appl. Behav. Anal. 4, 283-290.

Zigler, E. (1966). Research on personality structure in the retardate. In: N.R. Ellis (ed.), International Review of Research in Mental Retardation, Vol. 1. Academic Press, New York.

Pre-Language Training Sequences

Motor Imitation Training

	Large Motor	Small Motor
i)	bang on door	raise arm
ii)	open and close door	lift box from table
iii)	lift and carry paper bin across room	rub hands
	take book across room and place on table	throw paper ball
iv)	walk, clap thighs	build tower of bricks
	twirl round	touch mouth
v)	walk to table, mark piece of paper with crayon	pull sides of mouth outwards
	carry chair across room, place on floor, sit on chair	protrude tongue
vi)	raise arms above head, clap, lower arms, clap, cover face with hands.	open mouth
	Stack three bowls inside one another, lift from table, carry room, place on table, unstack	bang table/say "Ah!"

Vocal Sound Imitation Training

i) e.g. "ah", "umm", "ee", "buh", "puh", "ba" etc.

ii) chaining vocal sounds e.g. mu-mmy, da-ddy, ba-by etc.

Single-word utterances imitation training (Labelling)

1/2/3 syllable single-word imitations (nouns) e.g. ball, bucker, umbrella.

APPENDIX B

Syntactic Structures and Structural Drills

1. Syntactic Structures

2. Pre-language training and Language training - structural drills

3. Video training - structural drills

1. Syntactic Structures

Labelling Objects (single-word utterance)

Structure - NOUN

Two-word utterances (special strategy)

Structure - MY (NOUN)
poss. pronoun + noun

Labelling - Objects - (singular/plural)

Structure - IT'S A (NOUN)
pronoun + cop' + proper noun

Structure - THEY'RE (NOUNS)
pronoun + cop' + det + noun (plural)

Labelling - Persons

Structure - IT'S PERSON (NAME)
pronoun + cap' + proper noun

Labelling Actions - (personal)

Structure - VERB-ING/(PREPOSITION)
verb + present participle/(prep)

Labelling - Actions/Things

Structure - VERB-ING (OBJECT)/(A OBJECT)
verb + present participle (obj)(det + obj)

Labelling - Persons/Actions

Structure - MAN/WOMAN/BOY/GIRL VERB-ING/(PREPOSITION)
Subject + verb + present participle/(prep)

Structure - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING/
(PREPOSITION)
pronoun + cop' + det + Subject + verb +
present participle/(prep)

Labelling Persons/Actions/Things

Structure - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJECT)
(A OBJECT)/(PREPOSITION)
pronoun + cop' + det + subject + verb +
present participle (obj)/(det + obj)/(prep)

Pronominal Usage - Pronoun I
Labelling Actions + Pronoun I

Structure - I'M/I AM VERB-ING/(A OBJECT)/(PREPOSITION)
pronoun + aux + verb + present participle/(det + obj)/(prep)

YES/NO Discrimination - Objects - (Singular)

Structure - YES IT IS
Yes + pronoun + copula

Structure - NO IT ISN'T, IT'S A (NOUN)
no + pronoun + cop + neg'/ + pronoun + cop' + det + noun

YES/NO Discrimination - Objects - (Plural)

Structure - YES THEY ARE
yes + pronoun + copula

Structure - NO THEY AREN'T/ARE NOT, THEY'RE (NOUNS)
no + pronoun + copula + neg'/copula + negative + pronoun + cop' + noun (plural)

Pronominal Usage - Pronoun I - YES/NO Discrimination

Structure - I AM
pronoun + aux

Structure - YES I AM
yes + pronoun + aux

Structure - NO I'M NOT, I'M (NAME)
no + pronoun + aux + negative + pronoun + aux + proper noun

Pronoun I + YES/NO Discrimination - Labelling Actions

Structure - YES I AM (VERB-ING)
Yes + pronoun + aux

Structure - NO I'M NOT/I AM NOT, I'M VERB-ING (OBJECT)/(A OBJECT)/(PREPOSITION)
no + pronoun + aux' + negative/pronoun + aux + negative + pronoun + aux' + verb + present participle + (obj)/(det + obj)/(prep)

Structure - I AM (VERB-ING)
pronoun + aux

Pronominal Usage - possessive pronoun - mine + YES Discrimination

Structure - IT'S MINE
pronoun + cop' + poss. pronoun

Structure - YES IT IS
yes + pronoun + copula

Structure - THEY'RE MINE
pronoun + cop' + poss. pron

Structure - YES THEY ARE
Yes + pronoun + copula

Pronominal Usage - Pronoun I + verb (past tense)

Structure - I DID VERB-ING
pronoun + aux + verb + present participle

Structure - I WAS VERB-ING
pronoun + aux + verb + present participle

Pronoun Training - Pronoun I + Requesting - Objects

Structure - I WANT A/MY (NOUN)
pronoun + verb + det/poss. pronoun + noun

Structure - CAN I HAVE A/SOME/MY (NOUN(S))?
modal + pronoun + verb + det/poss. pronoun + noun (plural)

Pronominal Usage - Pronoun I + Requesting - Action

Structure - CAN I VERB MY (NOUN(S))/(PREPOSITION)/
modal + pronoun + verb + poss. pronoun + noun (plural)/(prep)

Pronominal Usage, - I/YOU - Person Deixis + Wh?

Structure - WHAT DO YOU WANT?
Wh + aux + pronoun + verb

Pronominal Usage - I/YOU - Person Deixis

Structure - YOU WANT A/SOME/YOUR (NOUN(S))
pronoun + verb + det + pronoun + noun + (plural)

Pronominal Usage - I/YOU - Person Deixis + wh?

Structure - WHAT ARE YOU DOING?
Wh + aux + pronoun + verb + present participle

Pronominal Usage - I/YOU - Person Deixis

Structure - YOU ARE VERB-ING A/YOUR (OBJECT)/(PREPOSITION)
pronoun + aux + verb + present participle + det/poss. pronoun/(obj)/(prep)

Pronominal Usage - I/YOU - Person Deixis

Structure - WILL YOU VERB/(PREPOSITION?)
model + pronoun + verb/(prep)

WILL YOU VERB A (NOUN) FOR ME?
modal + pronoun + verb + det + noun + prep + pronoun

WILL YOU VERB ME A/MY (NOUN)?
modal + pronoun + verb + pronoun + det/poss. pronoun + noun

Pronominal Usage - I/YOU - Person Deixis

Structure - I WANT YOU TO VERB/(PREPOSITION)
pronoun + verb + pronoun + infinitive + verb/(prep)

I WANT YOU TO VERB A (NOUN) FOR ME
pronoun + verb + pronoun + infinitive + verb + det + noun + pronoun

I WANT YOU TO VERB ME A/MY (NOUN)
pronoun + verb + pronoun + infinitive + verb + pronoun + det/poss. pronoun + noun

Pronominal Usage - HE/SHE

Structure - HE IS/SHE IS/ HE/SHE'S VERB-ING/ (A OBJECT)/ (PREPOSITION)
pronoun + aux + verb + present participle + (det + obj)/(prep)

Pronominal Usage - HE/SHE + YES/NO/ Discrimination

Structure - YES HE/SHE IS
yes + pronoun + aux

Structure - NO HE/SHE ISN'T, HE/SHE'S VERB-ING (A OBJECT)/(PREPOSITION)
no + pronoun + aux + neg'/
pronoun + aux + verb + present participle + (det + obj)/(prep)

Pronominal Usage - possessive pronouns - HIS/HERS + pessessive's

Structure - IT'S PERSON'S
pronoun + cop' + proper noun + possessive

Structure - IT'S HIS/HERS
pronoun + cop' + poss. pronoun

Structure - THEY'RE PERSON'S
pronoun + cop' + proper noun + possessive

Structure - THEY'RE HIS/HERS
pronoun + cop' + poss. pronoun

Prepositional Usage - (video training)

(in/on, under/over, in front/behind, next to/over there -

Structure - IT'S IN THE (OBJECT)
pronoun + cop' + preposition + det + noun

2. Pre-Language Training and Language Training - Structural Drills

Single-word utterance imitation training - Labelling

Structure - NOUN (1/2/3 Syllables)

Stimulus Presentation	Imitative Response
i) presentation of words familiar to child. (e.g. dog, house, tall, Mummy, Daddy)	
Say Mummy	Mummy
ii) pictorial stimuli + verbal stimulus discrimination	
What's this?	
Train	
You say it	Train
What is it?	
Bucket	
You say it	

Supporting context: materials - 12/18 Peabody picture cards.

Labelling Objects - (single word utterances)

Structure - NOUN - (singular)

Stimulus presentation	Goal Response
What's this? What is it?	NOUN

Supporting context: materials - Peabody picture cards. 1/3 presentations per item.

Two-word utterances - (special strategy)

Structure - MY (NOUN)

Stimulus Presentation	Goal Response
What's this? What is it?	MY (NOUN)
What are these? What are they?	MY (NOUNS)

Supporting context: training items - hair, nose, mouth, eyes, hand, ears; 3 presentations per item.

Labelling Objects - (singular/plural)
Structure - IT'S A (NOUN)/THEY'RE (NOUNS)

Stimulus Presentation	Goal Response
What's this? What is it?	IT'S A (NOUN)
What are these? What are they?	THEY'RE (NOUNS)

Supporting context: materials - 6 Peabody picture cards - singular; 6 Peabody picture cards - plural; 6 presentations per item.

Labelling - Persons
Structure - IT'S PERSON (NAME)

Stimulus Presentation	Goal Response
Who's this Who is it?	IT'S PERSON (NAME)

Supporting context: children and attending adults;
1 presentation per item

Labelling - Actions - (personal)
Structure - VERB-ING/(PREPOSITIONS)

Stimulus Presentation	Goal Response
instruct child to perform action e.g. "Stand up"	child performs action
What are you doing?	STANDING UP

Supporting contex: 6 actions (6 verbs) - Standing up, sitting down, drawing, clapping, jumping OR writing, walking; materials - paper, pen/pencil; 6 presentations per item.

Labelling - Actions/Things

Structure - VERB-ING (OBJECT)/(A OBJECT)/(PREPOSITION)

Stimulus Presentation	Goal Response
What's happening in the picture? What's happening here? What do you see?	DRINKING TEA KICKING A BALL

Supporting context: materials - Learning Development Aids - Set 1 - 6 picture cards; 6 presentations per item.

Labelling Persons/Actions

Structure - MAN/WOMAN/BOY/GIRL VERB-ING/(PREPOSITION)

Stimulus Presentation	Goal Response
What's happening in the picture? What's happening here? What do you see?	MAN RUNNING

Supporting context: materials - Learning Development Aids - Set 1 - 6 picture cards; 6 presentations per item.

Structure - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING

Stimulus Presentation	Goal Response
What's happening in the picture? What's happening here? What do you see?	

Supporting Context: materials - Learning Development Aids - Set 1 - 6 picture cards; 6 presentations per item.

Labelling Persons/Actions/Things

Structure - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJECT)/ (A OBJECT)/(PREPOSITION)

Stimulus Presentation	Goal Response
What's happening in the picture? What's happening here? What do you see?	IT'S A MAN PAINT-A WINDOW

Supporting Context: Materials - Learning Development Aids - Set 2 - 6 picture cards; 6 presentations per item.

Pronoun Training - Pronoun I
Labelling Actions + Pronoun I

Structure - I'M/I AM VERB-ING (A OBJECT)/(PREPOSITION)

Stimulus Presentation instruction for child to perform action	Goal Response
"Stand up" What are you doing?	I'M STANDING UP

Supporting Context: 6 actions (6 verbs) - standing up, sitting down, drawing, reading a book, writing, walking.

YES/NO Discrimination - Objects - (Singular)

Structure YES IT IS/NO IT ISN'T, IT'S A (NOUN)

Stimulus Presentation	Goal Response
What's this? What is it?	IT'S A (NOUN)
Is it a (noun)? Is this a (noun)?	YES IT IS
Is it a (noun)? Is this a (noun)?	NO IT ISN'T IT'S A (NOUN)

YES/NO Discrimination - Objects - (Plural)

Structure - YES THEY ARE/NO THEY AREN'T/ARE NOT, THEY'RE (NOUNS)

Stimulus Presentation	Goal Response
What are these? What are they?	THEY'RE (NOUNS)
Are they (nouns)? Are these (nouns)?	YES THEY ARE
Are they (nouns)? Are these (nouns)?	NO THEY AREN'T/ ARE NOT, THEY'RE (NOUNS)

Supporting context: Materials - Peabody picture cards - 6 cards (singular); 6 cards (plural); 1 presentation per item.

Pronominal Usage - Pronoun I + YES/NO Discrimination

Structure - I AM/YES I AM/ NO I'M NOT/I'M (NAME)

Stimulus Presentation	Goal Response
Who's person (name)? (who's Glyn?)	I AM
Are you person (name)? (are you Glyn?)	YES I AM
Are you person (name)? (are you Jamie?)	NO I'M NOT, I'M NAME

Supporting context: Trainer/child/children and adults in

classroom. 3 presentations per item

Pronominal Usage - Pronoun I + YES/NO Discrimination - Labelling personal

Structure - YES I AM/NO I'M NOT/I AM NOT, I'M VERB-ING (OBJECT)/(A OBJECT)/(ACTIONS)(PREPOSITION)

instruct child to perform action "Draw"	child performs action
Are you verb-ing (a object)? (Are you drawing a picture?)	YES I AM
Are you verb-ing? (Are you writing)	NO I'M NOT/I AM NOT, I'M DRAWING (A PICTURE)
Who's verb-ing (a object) (who's drawing a picture?)	I AM

Supporting context: 6 actions - drawing, writing, standing up, sitting down, reading a book, walking; - materials - felt tip pens, paper, 1 presentation per item.

Pronominal Usage - possessive pronoun - MINE

Structure - IT'S MINE - (singular)
THEY'RE MINE - (plural)

Stimulus Presentation	Goal Response
Whose is this (noun)? Whose is it?	IT'S MINE
Whose are these (nouns)? Whose are they?	THEY'RE MINE

Supporting context: 6 objects; coat, pencil, book, shoes, crayons, socks; 2 presentations per item.

Pronominal Usage - possessive pronoun - MINE + YES Discrimination

Structure - YES IT IS (MINE) - (singular)
YES THEY ARE (MINE) - (plural)

Stimulus Presentation	Goal Response
Is this your (noun)? Is it/this yours?	YES IT IS (MINE)
Are these your (nouns)? Are they/these yours)	YES THEY ARE (MINE)

Supporting Context: 6 objects; coat, pencil, book, shoes, crayons, socks; 2 presentations per item.

Pronominal Usage - Pronoun I + Requesting - Objects

Structure - I WANT A/MY (NOUN)

Stimulus Presentation	Goal Response
What do you want?	I WANT A/MY (NOUN)

Supporting context: 6 items - pen, pencil, book, chair, coat, cup; 1 presentation per item.

Structure - CAN I HAVE A/MY/SOME (NOUNS)

Stimulus Presentation	Goal Response
If you want a/some/your (noun(s)) then ask (me) for it	CAN I HAVE A/SOME/MY/ (NOUN(S))?

Supporting context; 7 items pen, crayon, pencil, shoe, glasses, chocolate; 6 presentations per item.

Pronominal Usage - Pronoun I + Requesting - Action

Structure - CAN I VERB (A/MY OBJECT)/(PREPOSITION)

Stimulus Presentation	Goal Response
If you want to (verb)(a/your object)/ (preposition) ask (me)	CAN I VERB(A/MY (OBJECT)/(PREP-OSITION)
If you want to put your ask (me)	(CAN I PUT MY CARDIGAN ON PLEASE?)

Supporting context: 6 actions: stand up, sit down, draw, get, put, go. Materials/objects: pen, paper, book, cardigan; 6 presentations per item.

Pronominal Usage - I/YOU - (Person Deixis) + Wh?

Structures - WHAT DO YOU WANT?/YOU WANT

Stimulus Presentation	Goal Response
Trainer 1 Ask (person) what s/he wants?	WHAT DO YOU WANT

Trainer 2 I want a/my/some (noun(s)) What do I want?	YOU WANT A/YOUR/ SOME (NOUN(S)) (gives requested object(s) to Trainer 2)

Supporting context: Two trainers; 6 items: pen, book, coat, cup, pencils, chair; 1 presentation per item.

Pronominal Usage - I/YOU - (Person Deixis) + Wh

Structures - WHAT ARE YOU DOING/YOU ARE VERB-ING A/YOUR (OBJECT)/(PREPOSITION)

Stimulus Presentation	Goal Response
Trainer 1 Ask Person what s/he wants	WHAT ARE YOU DOING?
Trainer 2 I'm verb-ing (a/my object)/ (preposition) (I'm putting my coat on) What am I doing?	YOU ARE PUTTING YOUR COAT ON

Supporting context: Two trainers; 6 actions (verbs): sitting down, drawing, getting (a book), putting, standing up, going; 1 presentation per item.

Pronominal Usage - I/YOU - (Person Deixis)

Structures - WILL YOU VERB/(PREPOSITION)?
WILL YOU VERB A (NOUN) FOR ME?
WILL YOU VERB ME A/YOUR NOUN?

I WANT YOU TO (VERB)(PREPOSITION)
I WANT YOU TO VERB A (NOUN) FOR ME
I WANT YOU TO VERB ME A/YOUR (NOUN)

Stimulus Presentation	Goal Response
Trainer 1 Ask person to (verb)/(preposition) (Ask (person) to put her coat on	WILL YOU PUT YOUR COAT ON?
Ask person to verb (a (noun) for you (Ask (person) to get a book for you	WILL YOU GET A BOOK FOR ME?
Ask person to (verb) you your (noun) (Ask (person) to give you your shoe back)	WILL YOU GIVE ME MY SHOE BACK?

Trainer 2

Yes, what do you want me to do?	I WANT YOU TO PUT YOUR COAT ON I WANT YOU TO GET A BOOK FOR ME. I WANT YOU TO GIVE ME MY SHOE BACK.

Supporting context: Two trainers: 6 actions (verbs) - sit down, give, put, draw, get, write; materials - 4 objects - coat, pencil, book, shoe: 6 questions: 6 replies: 1 presentation per item.

Pronominal Usage - HE/SHE + YES/NO Discrimination

Structures - HE IS/SHE IS/HE/SHE'S VERB-ING (A OBJECT)/(PREPOSITION)
YES HE/SHE IS
NO HE/SHE ISN'T, HE/SHE'S VERB-ING (A OBJECT)/(PREPOSITION)

Stimulus Presentation	Goal Response
What's happening in the picture?	IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (A OBJECT)/(PREPOSITION)
What's the man/boy/woman/girl doing?	HE IS/SHE IS/HE/SHE'S/IS VERB-ING(A OBJECT)/(PREPOSITION)
Is he/she verb-ing (object)/(a object)/(preposition)	YES HE/SHE IS
Is he/she verb-ing (object)/(a object)/(preposition)	NO HE/SHE ISN'T/HE/SHE'S VERB-ING (AOBJ)/(PREP-OSITION)

Supporting Context: Materials - Learning Development Aids; Photo Action Cards; Action cards - Set 2; 3 picture cards - HE; 3 picture cards - SHE; 1 presentation per item.

Pronominal Usage - Possessive Pronouns - HIS/HERS + possessive's

Structure - IT'S PERSON'S/IT'S HIS/HERS
THEY'RE PERSON'S/THEY'RE HIS/HERS

Stimulus Presentation	Goal Response
This is person's (noun) (This is person's book) Whose is this book?	IT'S PERSON'S
Yes, it's person's book Whose is it?) Whose is this?)	IT'S HIS IT'S HERS
These are person's (nouns) (These are person's crayons) Whose are these crayons?	THEY'RE PERSON'S
Yes, they're person's crayons Whose are they?) Whose are these?)	THEY'RE HIS THEY'RE HERS

Supporting context: materials - objects - shoe, bag, coat, pencil, scissors, purses, crayons, books; 1 presentation per item.

3. Video Training - Structural Drills

Labelling Objects - (Singular)

Structure - IT'S A (NOUN)

Stimulus presentations

What's this?
IT'S A TABLE

What is it?
IT'S A TABLE
You say it
(10 second pause)

What is it?
(10 second pause)

IT'S A TABLE

Stimulus Objects: table, chair, cup, shoe, clock, book; 4 presentations per item - (including "rapid fire" sequence).

Labelling Objects - (Plural)

Structure - THEY'RE (NOUNS)

Stimulus presentation

What are these?
THEY'RE SWEETS

What are they?
THEY'RE SWEETS
you say it
(10 second pause)

What are they?
(10 second pause)

Stimulus Objects: sweets, keys, flowers, buses, trees, cars; 4 presentations per item (including "rapid fire" sequence).

Labelling Persons/Actions; Persons/Actions/Things

Structure - IT/S A MAN/WOMAN VERB-ING/IT'S A MAN/WOMAN VERB-ING (A OBJECT)

Stimulus presentation
What's happening?
What do you see?
IT'S A WOMAN READING A PAPER

What's happening?
IT'S A WOMAN READING A PAPER
YOU SAY IT
(10 second pause)

What's happening?
(10 second pause)

IT'S A WOMAN READING A PAPER

Stimulus actions - reading a paper, walking, jumping, kicking a ball, climbing a ladder, watching television; 4 presentations per item - (including final "rapid fire" sequence.

YES/NO Discrimination - Objects - Negative (Singular)

Stimulus presentations

What's this?
What is it?
It's a man

Is it a woman?
NO IT ISN'T, IT'S A MAN
You say it
(10 second pause)

Is this a woman?
(10 second pause)
NO IT ISN'T, IT'S A MAN

Is it a woman
(10 second pause)
NO IT ISN'T, IT'S A MAN

Stimulus Objects: man, train, television, ball, kettle, woman; 4 presentations per item (including final "rapid fire" sequence).

YES/NO Discrimination - Objects - Negative - (Plural)

Stimulus Presentations

What are these?
What are they?
They're cars

Are they buses?
NO THEY AREN'T, THEY'RE CARS
You say it
(10 second pause)
Are these buses?
(10 second pause)
NO THEY AREN'T, THEY'RE CARS

Are they buses?
(10 second pause)
NO THEY AREN'T, THEY'RE CARS

Stimulus Objects: cars, flowers, buses, sweets, trees, keys, cars; 4 presentations per item - (including final "rapid fire" sequence).

Prepositional Usage - IN/ON, UNDER/OVER, IN FRONT/BEHIND, NEXT TO/ OVER THERE

Stimulus Presentations

Look at this
What is it?
It's a lorry

Look at this
What's this?
It's a box

Box
In the box

Put the lorry in the box
Where is the lorry?
It's in the box
You say it
(10 second pause)

Where's the lorry?
(10 second pause)
It's in the box

Stimulus Objects: lorry,box; 2 presentations per item.

1. Daily Record Chart

CHILDS NAME: Jamie DATE: 12-11-79.

DURATION: 15 minutes TIME: 9.40 9.55.

TRAINING CATEGORY. ① Yes it is. ③ Yes they are
② No it isn't it's a - ④ No they aren't regular

STIMULUS PRESENTATION + IMITATIVE RESPONSE MODEL.			
CORRECT IMITATION			
INCORRECT IMITATION			
APPROXIMATION			
NO RESPONSE			
STIMULUS PRESENTATION - IMITATIVE RESPONSE MODEL	③ ..... | ④ .....| ① ..... | ②	③ – 6 ④ – 6	① – 6 ② – 6
CORRECT TRAINED RESPONSE	③ ////// | ④ | ① // | ②	③ – 6 ① – 2	
INCORRECT RESPONSE	① ΔΔ ΔΔ	① – 4	
APPROXIMATION	④ ////// | ① ② //////		④ – 6 ② – 6
NO RESPONSE			
PROMPT	④ – or | ① – – – ② –	① – 3	④ – 1 ② – 1
PARTIAL PROMPT	③ – | ④ – – – – | ① ② – – – – –	③ – 1	④ – 5 ② – 6
ELICITED GENERALISATIONS			

COMMENTS

Δ on ① = failure to transfer from plural use to singular if

Verbal Imit. only

2. Record Chart: Post-Test 3

1. NAME: Nicola

DATE: 14/12/79 EXPERIMENTER: J Wright

TIME: 9.45 – 10.25. CONTEXT: sitting at table with classwork: (writing book.)

QUESTION FORM.		RESPONSE	VERBATIMS / COMMENTS.
1 What's this?		✓	It's a book (writing book) 1.
What is it?		✓	It's watch / It's a watch.
What's that?		✓	It's a tape recorder.
What do you think this is?		✓	~~It's~~ ~~lorry~~. ~~[illegible]~~. It's lorry / It's a lorry.
I wonder what it/this is?			
Who is it?		✓	That wi(th) Steveld / It's a / no / It's Lila Steveld.
Who's this?		✓	It's Jamie
Who's that?		✓	It's Steven Martin.
Who do you think this/that is?		✓	It's Craig Wigfall.
unelicited			
2 Wh. happening in the picture?		✓	It's a girl washing hands. 2.
Wh. do you see here?		✓	It's a girl sitting swings. on swings.
Wh. happening here?		◊	It's a girl slide down a slide.
Wh. are you doing?		✓	I am sitting down.
What's (e.g. Jamie) doing?		✓	playing toys.
unelicited.			
3. Is it a + N?	(positive discrimination)		3.
Is this a + N?			
Is that a + N?			
Is that (e.g. Jamie)?			
4. Is it a + N?	(negative discrimination)		4.
Is this a + N?			
Is that a + N?			
Is that (e.g. Nicola)			
5. Are they + N + p?	(pos. discrimination)		5.
Are these + N + p?			
Are those + N + p?			
6. Are these + N + p?	(neg. discrimination)		6.
Are they + N + p?			
Are those + N + p?			
7. Who is + Child's own name?			7.
Are you + Child's own name?			
What are you doing?			
Are you + V + pp (+obj.) (positive)			
Are you + V + pp (+obj) (negative)			

Scoring code:
correct response – ✓
approximation – ◊
incorrect response – △

2. Record Chart: Post-Test 3

2. NAME: DATE: EXPERIMENTER:
TIME: CONTEXT:

QUESTION FORM.	RESPONSE	VERBATIMS / COMMENTS.
Who is V+pp?		-
I wonder who is V+pp?		
unelicited.		
8. What's the man/boy doing?		
What's he doing?		
What's the woman/girl doing?		
What's she doing?		
Is he V+pp (+obj)? (pos.)		
Is she V+pp (+obj)? (pos.)		
Is he V+pp(+obj)? (neg.)		
Is she V+pp(+obj)? (neg.)		
Who is V+pp(+obj)? (he)		
Who is V+pp(+obj)? (she)		
Is (e.g. Steven) V+pp+(obj)? } pos.		
Is (e.g. Nicola) V+pp(+obj)? } pos.		
Is (e.g. Jamie) V+pp(+obj)? } neg.		
Is (e.g. Lisa) V+pp(+obj)? } neg.		
unelicited.		
9. If you want (obj) then ask for it.	✓	Can I have pencil sharpen / the pencil sharp.
What do you want?	✓	I want pencil sharpen.
If you would like this then ask for it.	✓	Can I have pencil Mrs. Wright?
unelicited.		
10. If you want + Verb then ask.	✓	Can I wear blue jeans?
What do you want to do?	✓	I want go the toilet
Do you want+Verb or do you want+Verb?	✓	I want some chocolate please (Do you want to draw or do you want some chocolate
What would you like to do?		
unelicited.	✓	Can I draw Susan
11. Ask (person) what he/she wants.		
What do I want?		
Ask me what I want?	✓	what do you want Mrs. Wright.
What do I want?	✓	You want a scissors
Ask (person) what he/she is doing?	✓	what are you doing Mrs. Cheng
What am I doing?	✓	You are ~~Miss~~ Simon Bright trousers (I am changing Simon Bright's trou
Ask me what I'm doing?	✓	What are you doing Mrs. Wright
What am I doing?	✓	You are holding a pen paper

3. NAME: Nicola DATE: 14/12/79 EXPERIMENTER: J. Wright
TIME: 9.45 / 10.25 CONTENT: sitting at table in classroom with many books

QUESTION FORM.	RESPONSE	VERBATIMS / COMMENTS.
What do you want me to do?		12.
unelicited.		
12 Put (object) in -------	✓	Put the scissors in the drawer
Where is the (obj)?	◊	Its in drawer
Can you tell me where the (obj) is?	◊	Its in the cupboard / "drawer"
Put the (obj) on -------	✓	Put the bag on the table.
Where's the (obj)?	✓	Its on table
Can you tell me where the (obj) is?	✓	Its on the table.
Put the (obj) behind ------?	✓	Put the pencil behind the bag.
Where is (obj)?	✓	Its behind bag.
Can you tell me where the (obj) is?	✓	Its behind the bag
Put the (obj) in front of ------	✓	Put the chair in front of the door
Where's the (obj)?	✓	Its in front ~~the~~ of door.
Can you tell me where the (obj) is?	◊	Its front of door
Put the (obj) over ------	Δ	Put my coat over my bag.
Where is the (obj)?	Δ	Its over bag. (Put it near the bag)
Can you tell me where the (obj) is?		
Put the (obj) under -----	Δ	~~on~~ Put my bag under the table
Where's the (obj)?	Δ	Its in table. (put it on the table)
Can you tell me where the (obj) is?		
Put the (obj) next to ------	✓	Put the pencil
Where is the (obj)?	✓	Its next to bag
Can you tell me where the (obj) is?	Δ	Its in bag.
Put the (object) over there?	✓	~~Put my coat over my bag.~~ Put my coat over here (Put it next to bag)
Where's the (obj)?	Δ	Its ~~over bag~~. on the chair (had put coat on the chair)
Can you tell me where the (obj) is?		
unelicited.		Poor attention on this section (responsible for low score)
13. What are they?	✓	They are blue denim jeans.
What are these?	✓	Theyre laces.
What are those?	✓	Theyre straws.
What do you think they are?	✓	They are/ theyre corduroy jeans.
What do you think they are?	✓	Those are/ Theyre white tights
I wonder what those are?	✓	Theyre denim jeans.

2. Record Chart: Post-Test 3

4 NAME: Nr Tomlinson. DATE: 14/12/79 EXPERIMENTER: J. Wright
TIME: for 9.45 10.25. CONTEXT: sitting at table with history book

COMMENTS:

Where's Mrs. Cheng's corduroy skirt 2. times
Can I have piece of cake? Uncounted: 10
Will Mrs. Cheng put corduroy skirt on? - 2. times
What is it
Is not corduroy jeans?
What that?
What are they?
That not black corduroy skirt.
Can I go ~~the~~ the toilet? 4 times

I am not wearing white pants

We are some school terms.

Will Mummy buy black corduroy skirt?
It's in the wardrobe. Mrs Cheng's wardrobe.
That's not Mrs. Cheng's corduroy skirt.

Language Training in the E.S.N.(S). Child

Judith Wright

A thesis submitted to the
Council for National Academic Awards
in partial fulfilment of the requirements
for the degree of Master of Philosophy

Department of Communication Studies
Sheffield City Polytechnic

Collaborating Establishment
Sheffield Local Education Authority

April 1986

Volume 2

Volume 2

Contents

Language Training and Testing Data

Appendix D

Case Study 1 Steven

Language Training and Testing Data

Tables 5-1 to 5-7; Figures 5-1 to 5-7 - Progress in learning the main structures taught covering the period October 1978 to December 1979.

Tables 5-8 to 5-9; Figures 5-8 to 5-9 - POST-TEST 1 data showing generalisations per structure by trainer/non-trainer/child interactions in Test Conditions A and B.

Table 5-10; Figure 5-10 - POST-TEST 2 (High Structure) data showing generalisations per structure in Sub-Tests I and II.

Table 5-11; Figure 5-11 - POST-TEST 3 (High Structure) data showing generalisations per structure.

Tables 5-12 to 5-16; Figures 5-12 to 5-16 - POST-TEST 3 (Low Structure) data showing generalisations per structure by trainer/non-trainer/child interactions covering the period November 1979 to February 1980.

Steven - Language Training

Table 5-1

Summary of Progress per Structure by Sessions and Trials

Training Category - Imitation

Structure - IMITATION OF VOCAL SOUNDS

Training commenced - 10.11.78
Training terminated - 16.11.78
Number of sessions - 3

Imitations

Trials (% correct) - 12(83), 6(83), 18(83)

Training Category - Imitation - Single Words

Structure - IMITATION OF SINGLE WORDS - (Single word utterances) - NOUN

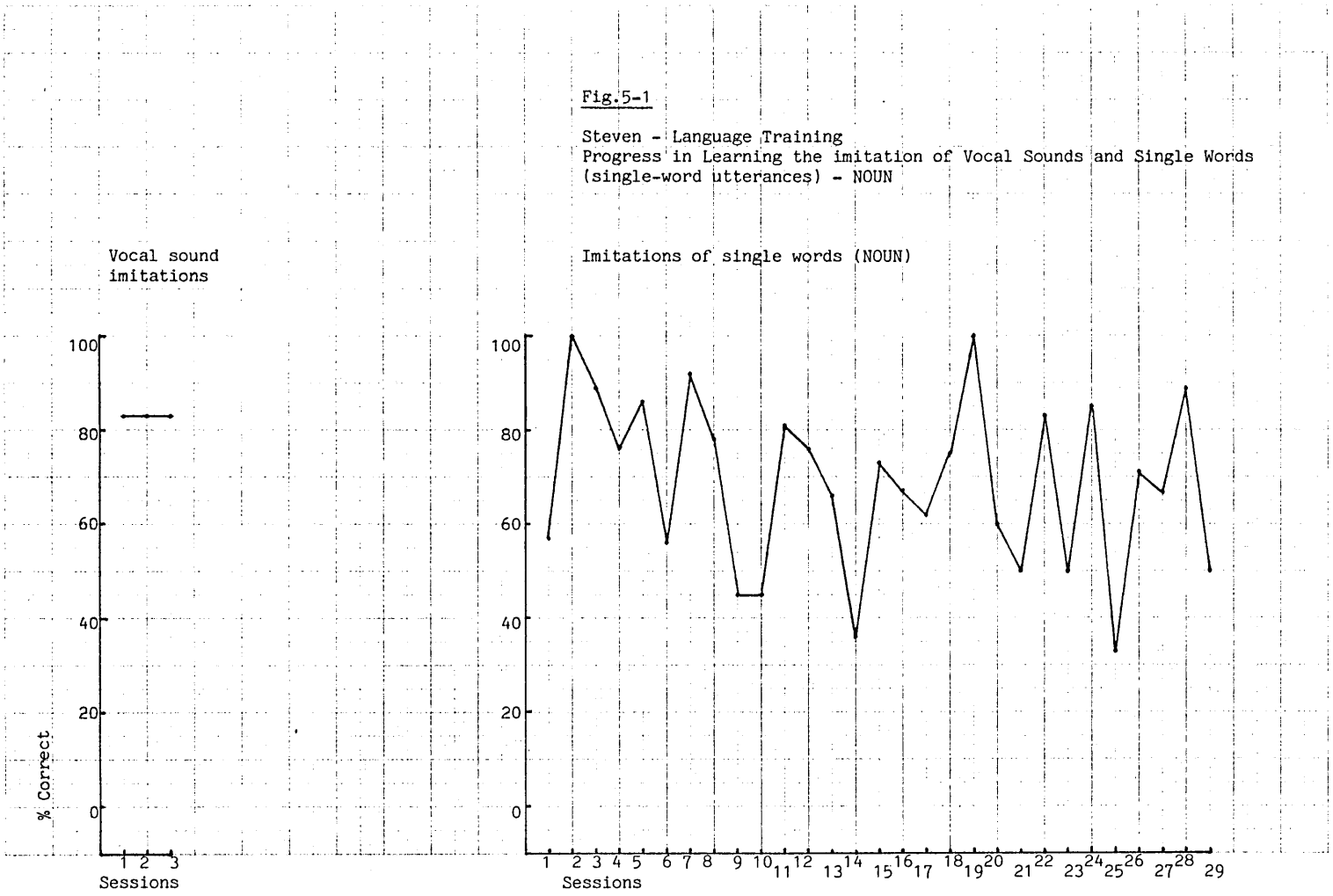
Training commenced - 10.11.78
Training terminated - 14.3.79
Number of Sessions - 30

Imitations

Trials (% correct) - 60(57), 12(100), 18(89), 54(76), 36(86)
96(56), 24(92), 42(78), 66(45), 90(45)
42(81), 42(76), 30(67), 96(36), 30(73)
42(67), 24(62), 12(75), 12(100), 20(60)
12(50), 6(83), 6(50), 12(75), 9(33)
24(71), 6(67) 9(89), 6(50)

Fig.5-1

Steven - Language Training
Progress in Learning the imitation of Vocal Sounds and Single Words
(single-word utterances) - NOUN



Steven - Language Training

Table 5-2

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Objects - (Singular)

Structure - NOUN

Training commenced - 10.11.78
Training terminated - 14.3.79
Number of sessions - 24

Trials (% correct) - 12(33), 18(55), 6(67), 6(100), 54(41), 6(100), 18(83), 30(53), 66(48), 18(100), 18(100), 18(100), 60(45), 30(43), 6(100), 30(70), 18(55), 12(42), 19(37), 12(25), 6(67), 6(50), 6(100), 10(40)

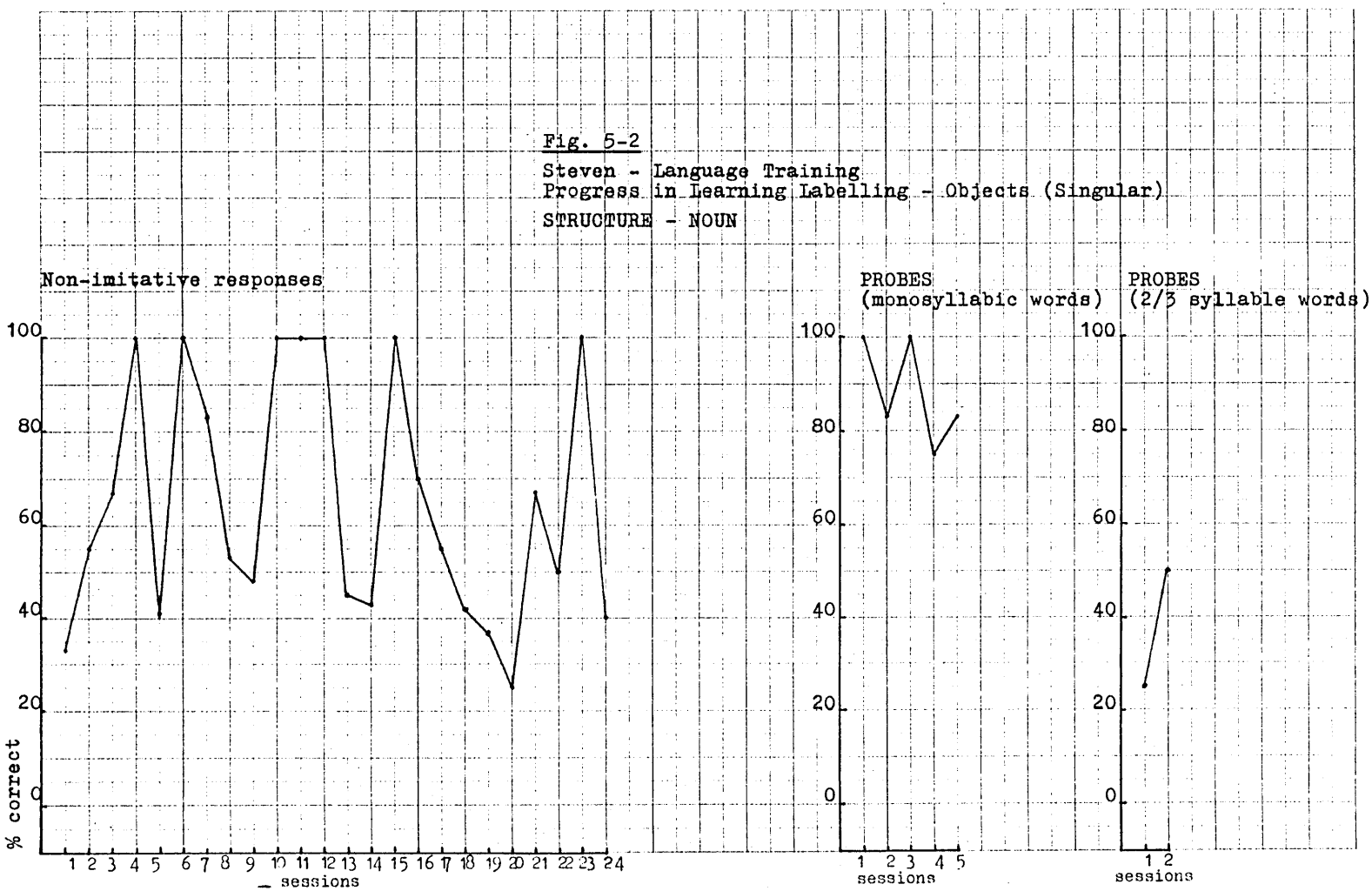
Probes

Trials (% correct) - 9(100), 3(100), 12(83), 12(75), 6(83), - monosyllabic words

12(25), 6(50), - 2-3 syllable words

Fig. 5-2

Steven - Language Training
Progress in Learning Labelling - Objects (Singular)
STRUCTURE - NOUN



Steven - Language Training

Table 5-3

Summary of Progress per Structure by Sessions and Trials

Training Category - Imitation of two-word utterances

Structure - MY (NOUN)
(poss.pron + noun)

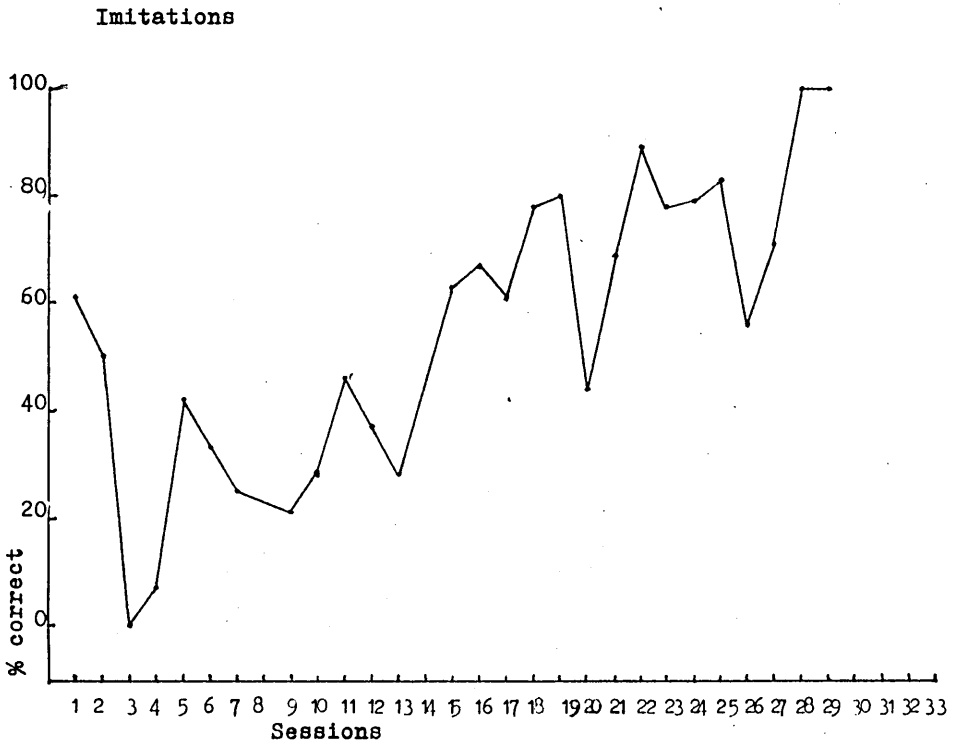
Training commenced - 30.1.79
Training terminated - 30.4.79
Number of sessions - 29

Imitations

Trials (% correct) - 36(61), 18(50), 24(0), 30(7), 12(42)
18(33), 12(25), 66(21), 18(28)
24(46), 48(37), 21(28), 30(63)
36(67), 36(61), 36(78), 30(80)
18(44), 36(69), 36(89), 36(78)
24(79), 24(83), 16(56), 14(71)
6(100), 6(100)

Fig.5-3

Steven-Language Training
Progress in Learning Imitation of two-word utterances
Structure - MY (NOUN)



Steven - Language Training

Table 5-4

Summary of Progress per Structure by Sessions and Trials

Training Category - Production of two-word utterances
(Non-imitative)

Structure - MY (NOUN)

Training commenced - 28.2.79
Training terminated - 9.5.79
Number of sessions - 15

Non-imitative responses

Trials (% correct) - 18(72), 16(31), 6(07), 6(83), 12(67),
48(67), 36(67), 24(67), 36(75), 48(79),
36(94), 24(87), 36(94), 36(89), 36(97)

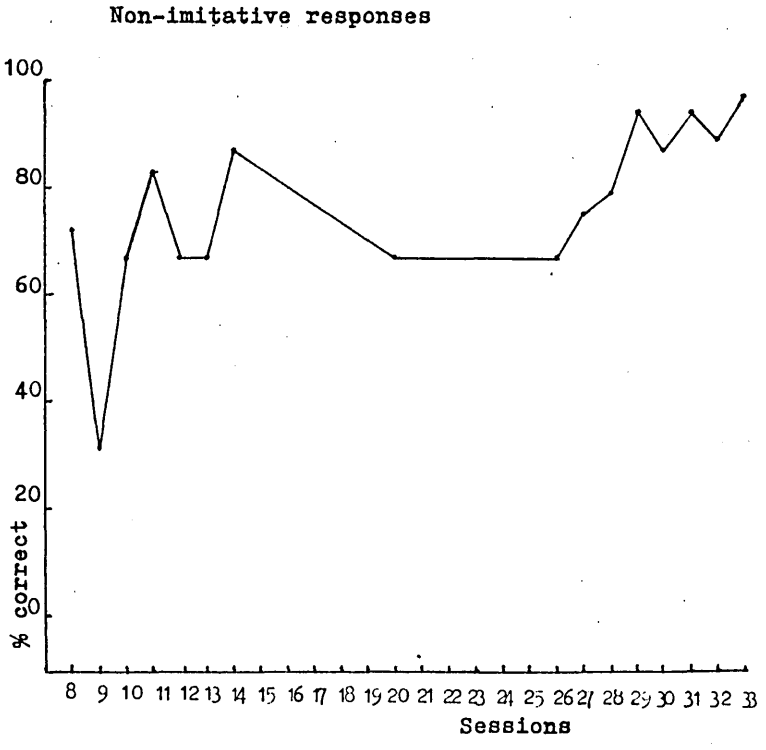


Fig.5-4

Steven - Language Training

Progress in Learning the Production of non-imitative two-word utterances

Structure - MY (NOUN)

Steven - Language Training

Table 5-5

Summary of Responses per Structure by Sessions and Trials

Training Category - Labelling - Actions(personal) + Pronominal usage

Structure - VERB-ING/(PREP)
(Verb + ing + (prep)) - (Imitation Training)

Training commenced - 10.5.79
Training terminated - 5.11.79
Number of sessions -

Imitations

Trials (% correct) - 12(100), 15(100), 22(82), 7(100), 5(60), 8(75), 6(83), 20(72), 3(100), 6(67), 16(94), 10(100)

Structure - I'M VERB-ING
(pron + aux + verb + ing)

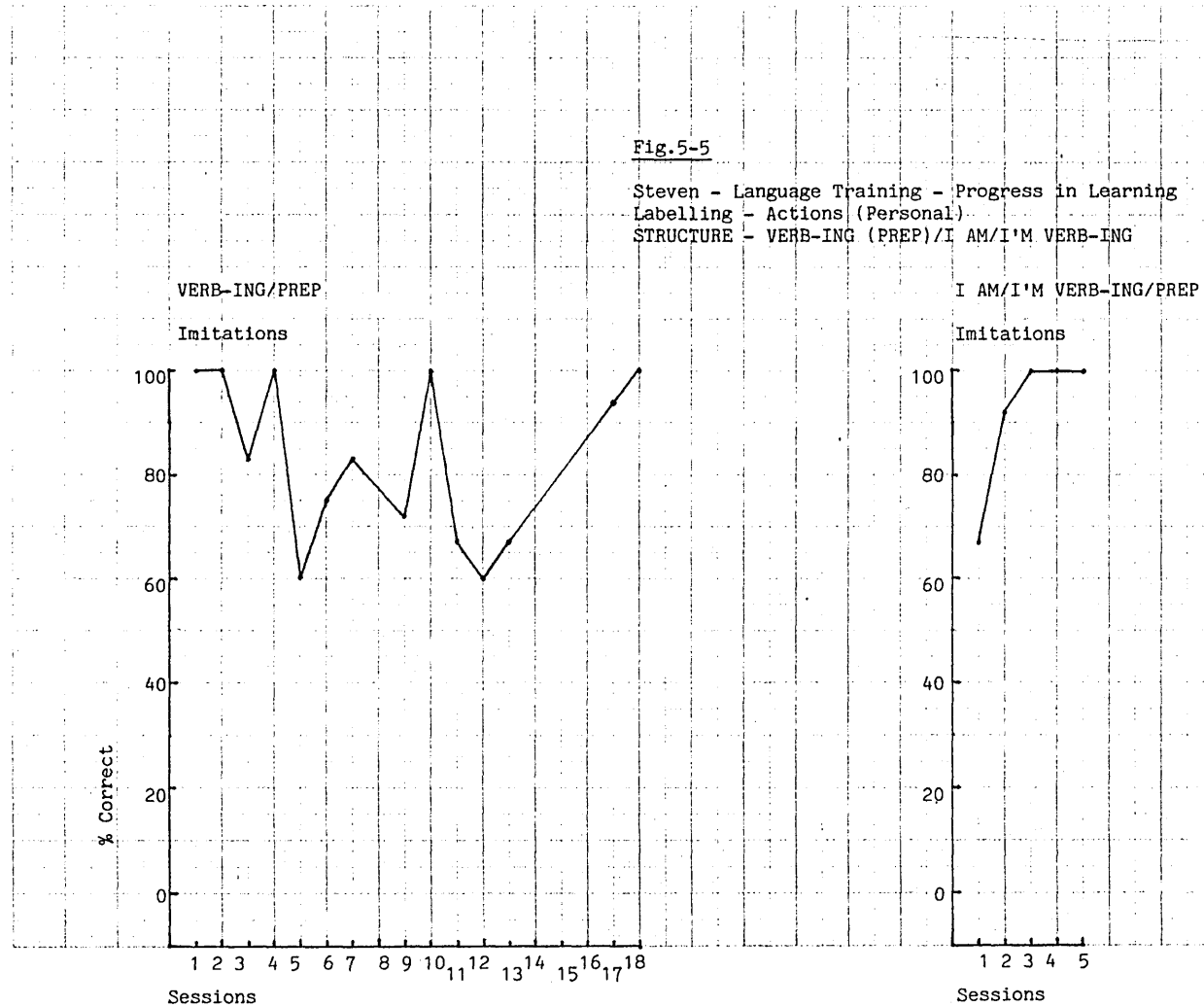
Training commenced - 25.5.79
Training terminated - 18.6.79
Number of sessions - 5

Imitations

Trials (% correct) - 12(67), 12(92), 12(100), 6(100), 6(100)

Fig.5-5

Steven - Language Training - Progress in Learning
Labelling - Actions (Personal)
STRUCTURE - VERB-ING (PREP)/I AM/I'M VERB-ING



Steven - Language Training

Table 5-6

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Actions

Structure - VERB-ING/(PREP)

Training commenced - 10.5.79
Training terminated - 5.11.79
Number of sessions - 36

Non-imitative responses

Trials (% correct) - 6(50), 3(33), 15(67), 30(77), 20(80), 40(80), 44(89), 24(75), 51(55), 21(71), 18(78), 7(86), 9(78), 21(71), 36(78), 36(83), 20(90), 28(64), 36(75), 36(72), 36(83), 36(80), 36(80), 36(83), 36(72), 36(67), 36(86), 36(94), 36(89), 36(72), 36(83), 36(83), 36(83), 36(69), 36(97), 36(100)

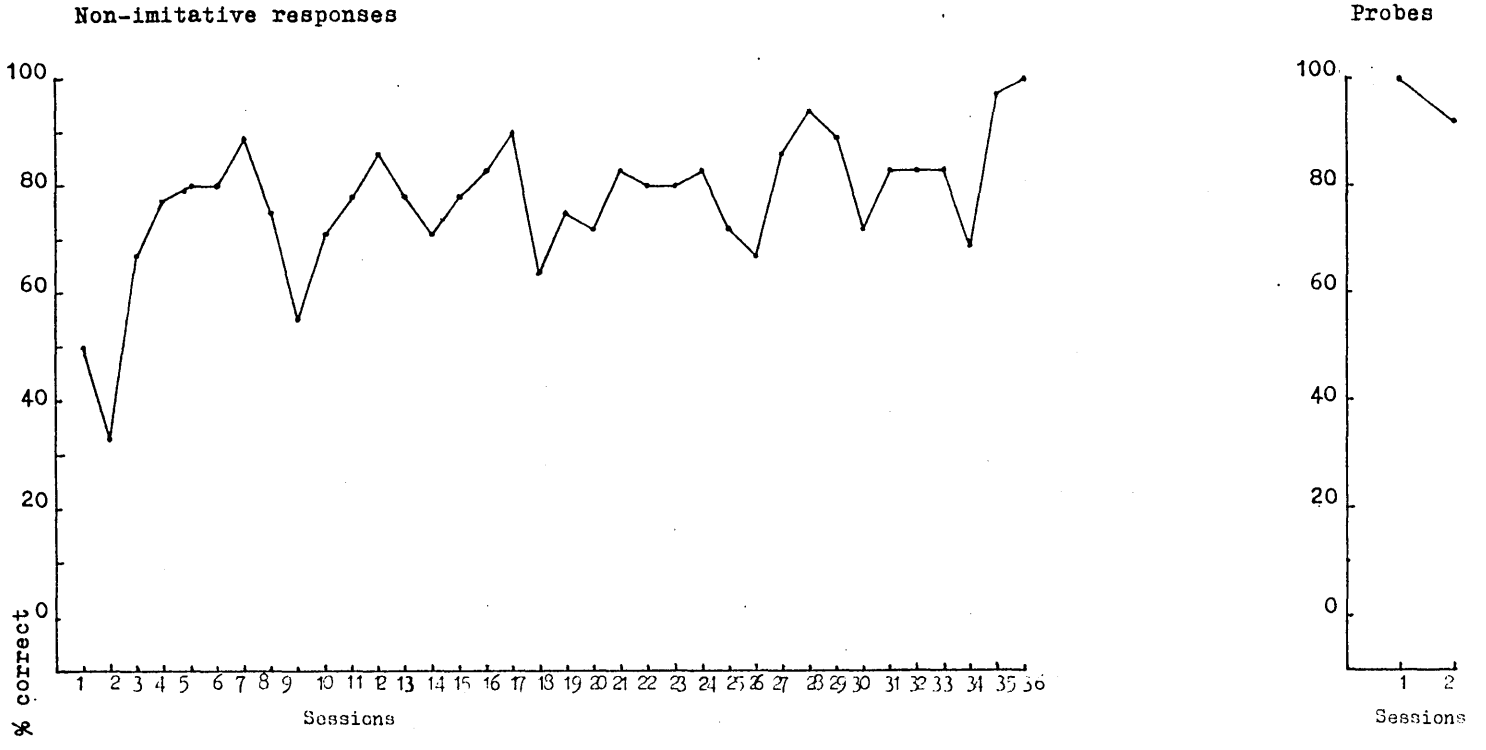
Probes

Trials (% correct) - 36(100), 36(92)

Fig. 5-6

Steven - Language Training - Progress in Learning Labelling - Actions (Personal)

STRUCTURE - VERB-ING /(PREP)



Steven - Language Training

Table 5-7

Summary of Progress per Structure by Sessions and Trials

Structure - MAN/WOMAN/BOY/GIRL VERB-ING
(subj + verb + ing)

Training commenced - 9.11.79
Training terminated - 19.11.79
Number of sessions - 6

Imitations

Trials (% correct) - 36(72), 11(45), 10(100)

Non-imitative responses

- 36(25), 36(53), 36(69), 36(61), 36(83)

Structure - A MAN/WOMAN/BOY/GIRL VERB-ING
(det + subj + verb + ing)

Training commenced - 20.11.79
Training terminated - 18.12.79
Number of sessions - 12

Imitations

Trials (% correct) - 16(44)

Non-imitative responses

Trials (% correct) - 36(42), 36(25), 36(50), 36(47), 36(61), 36(47), 36(44), 36(42), 36(39), 36(33), 36(50), 36(55)

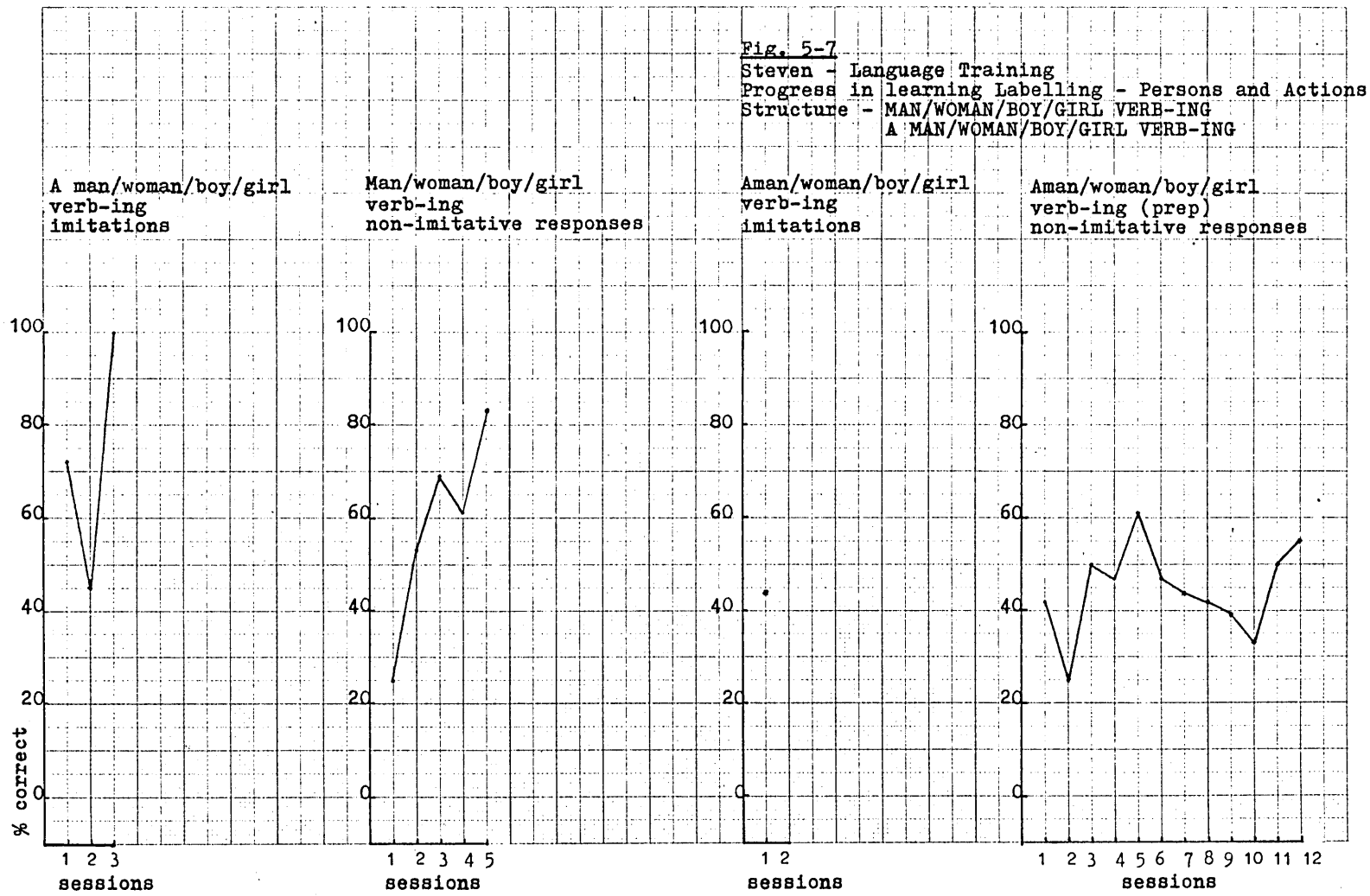


Fig. 5-7
Steven - Language Training
Progress in learning Labelling - Persons and Actions
Structure - MAN/WOMAN/BOY/GIRL VERB-ING
A MAN/WOMAN/BOY/GIRL VERB-ING

Steven - Post-Test 1-Generalisation Probes

Table 5-8

Summary of Progress per Structure by Sessions and Trials in Test Conditions A and B

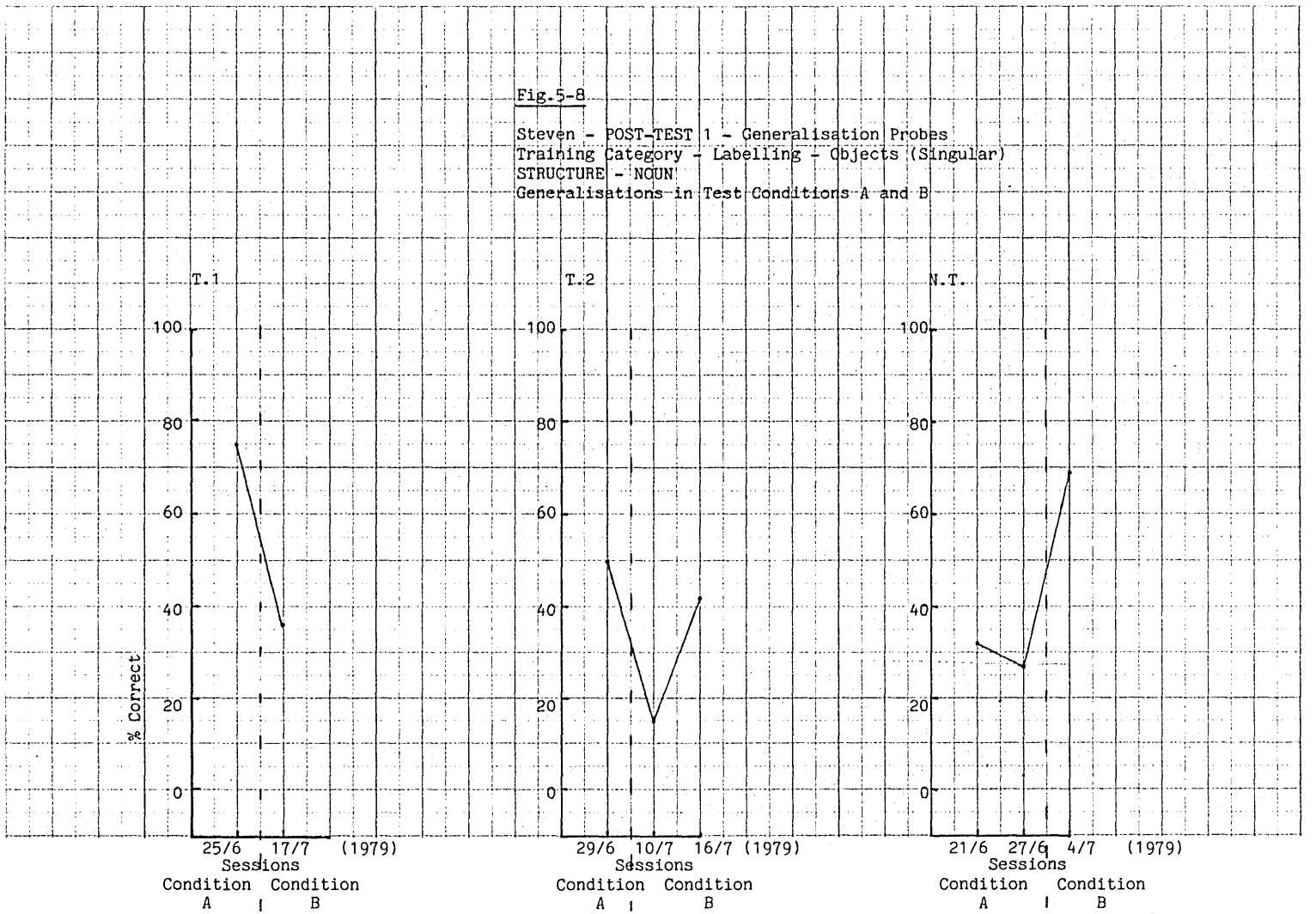
Training Category - Labelling objects (singular) - single words

Structure - NOUN (labelling objects (single word utterances)

	CONDITION A		CONDITION B	
Trainer 1				
Date -	25.6.79		17.7.79	
Trials (% correct)	12(75)		14(36)	
Trainer 2				
Date -	29.6.79		10.7.79,	16.7.79
Trials (% correct)	12(50)		13(15)	12(42)
Non-Trainer				
Date -	21.6.79,	27.6.79	4.7.79	
Trials (% correct)	31(32)	15(27)	13(69)	

Fig.5-8

Steven - POST-TEST 1 - Generalisation Probes
Training Category - Labelling - Objects (Singular)
STRUCTURE - NOUN
Generalisations in Test Conditions A and B



Steven - Post-Test I - Generalisation Probes

Table 5-9

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Two-Word Utterances (non-imitative)

Structure - MY NOUN
(poss.pron + noun)

	Condition A	Condition B
i)	Trainer 1	
	Sessions 25.6.79	17.7.79
	Trials (% correct)	
	11(27)	10(30)
ii)	Trainer 2	
	Sessions 29.6.79	10.7.79, 16.7.79
	Trials (% correct)	
	22(4)	15(33) 7(28)
iii)	Non-Trainer	
	Sessions 21.6.79 27.6.79	4.7.79
	Trials (% correct)	
	19(0)	13(15) 14(14)

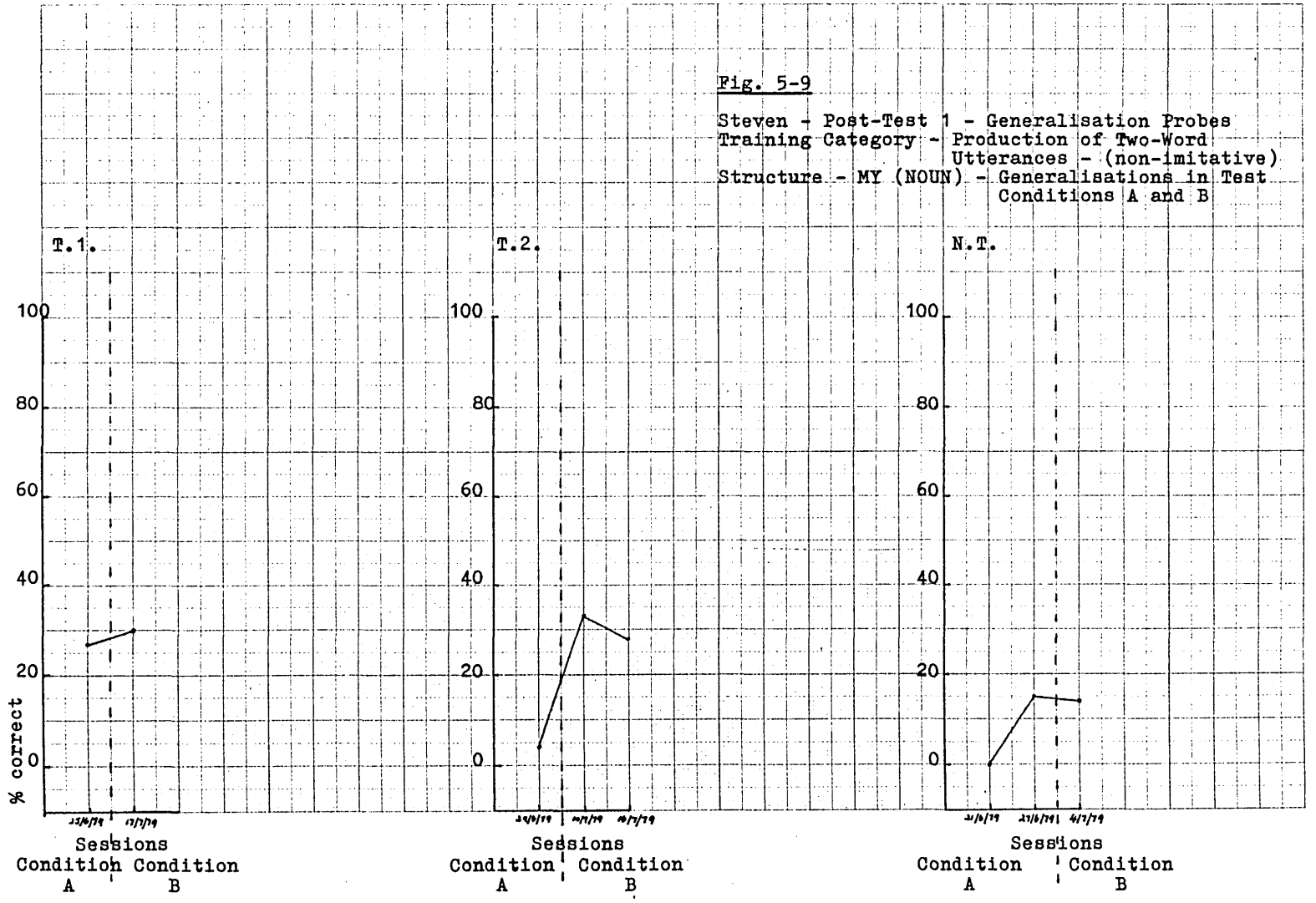


Fig. 5-9
Steven - Post-Test 1 - Generalisation Probes
Training Category - Production of Two-Word Utterances - (non-imitative)
Structure - MY (NOUN) - Generalisations in Test Conditions A and B
T.1.
T.2.
N.T.
% correct
100
80
60
40
20
0
Sessions
Condition A
Condition B

Steven - Post-test 2 - Generalisation Probes -
(High Structure)

Table 5-10

Summary of Generalization per Structure by Sessions and Trials in Sub-Tests I and II

Training Category - Labelling Objects (singular)

Structure - NOUN

Sub-Test I

Date - 5.9.79
Trials (% correct) 19(47)

Sub-Test II

Date - 10.9.79
Trials (% correct) 11(64)

Training Category - Production of Two-Word Utterances (Non-imitative)

Structure - MY (NOUN)

Sub Test I

Date - 5.9.79
Trials (% correct) 13(23)

Sub-Test II

Date - 10.9.79
Trials (% correct) 9(78)

Training category - Labelling Actions - (Personal)

Structure - VERBING/(PREP)

Sub-Test I

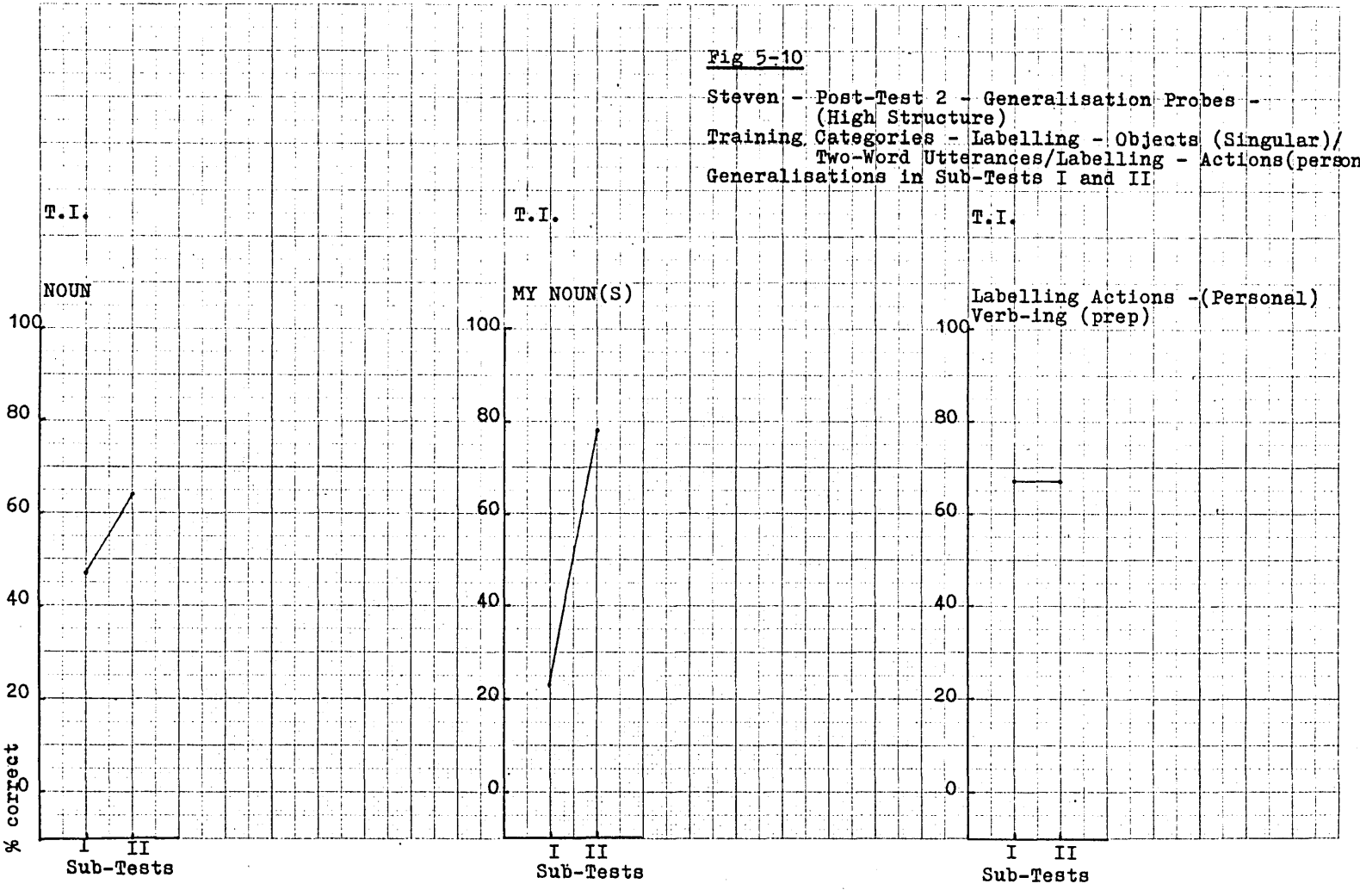
Date - 5.9.79
Trials (% correct) 3(67)

Sub-Test II

Date - 10.9.79
Trials (% correct) 6(67)

Fig 5-10

Steven - Post-Test 2 - Generalisation Probes - (High Structure)
Training Categories - Labelling - Objects (Singular)/ Two-Word Utterances/Labelling - Actions(personal
Generalisations in Sub-Tests I and II



Steven - Post-Test 3 - Generalisation Probes - (High Structure)

Table 5-11

Summary of Generalization per Structure by Sessions, Trials and Context

Training category - Labelling - Objects (Singular)

Structure - NOUN

Trainer 1

Trials (% correct) - 7(86)

Training category - Labelling - Objects (plural)

Structure - NOUNS

Trainer 1

Trials (% correct) - 8(62)

Training category - Labelling Actions (Personal)

Structure - VERBING/(PREP)

Trainer 1

Trials (% correct) - 3(33)

Training category - Labelling Actions - (Persons)

Structure - VERBING

Trainer 1

Trials (% correct) - 4(75)

Training category - Labelling Persons/Actions

Structure - MAN/WOMAN/BOY/GIRL/VERB-ING

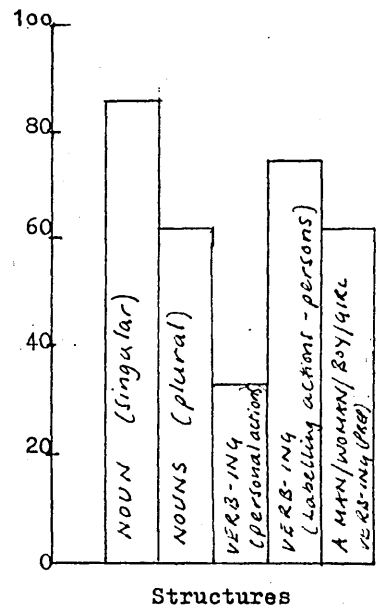
Trainer 1

Trials (% correct) - 8(62)

Fig. 5-11

Steven - Post-Test 3 - Generalisation Probes - (High Structure)

Generalisations



Steven - Post-Test 3 - Generalisation Probes - (Low Structure)

Table 5-12

Summary of Generalization per Structure by Sessions, Trials and Context

Training Category - Labelling objects - (Singular)

Structure - NOUN

Trainer 1

Date -	7.11.79,	9.11.79,	23.11.79,	4.12.79,	7.12.79
Trials (% correct)	7(100),	9(55),	6(83),	6(83),	4(100)
Context	2	2/3	1/3	1	3/4
Date -	10.1.80,	17.1.80,	24.1.80,	1.2.80,	7.2.80,
Trials (% correct)	6(67)	12(83)	10(90)	5(100)	10(100)
Context	2	1	1	2	3
Date -	27.2.80				
Trials (% correct)	5(80)				
Context	3				

Trainer 2

Date -	13.11.79,	16.11.79,	22.11.79,	26.11.79,	
Trials (% correct)	5(80)	6(83)	5(60)	4(100)	
Context	2	1	1	2	
Date -	14.12.79,	8.1.80,	15.1.80,	17.1.80,	28.1.80,
Trials (% correct)	4(100)	5(100)	5(100)	5(80)	5(60)
Context	3	2	1	2	3
Date -	29.1.80	6.2.80	11.2.80,	29/2/80,	?
Trials (% correct)	5(80)	5(100)	5(80)	5(80)	6(67)
Context	1	1	2	2	3

Non-Trainer

		(audio)		
Date -	28.11.79,	28.11.79,	5.12.79,	13.2.80
Trials (% correct)	5(60)	8(0)	5(100)	4(75)
Context	2/3	2	2	3

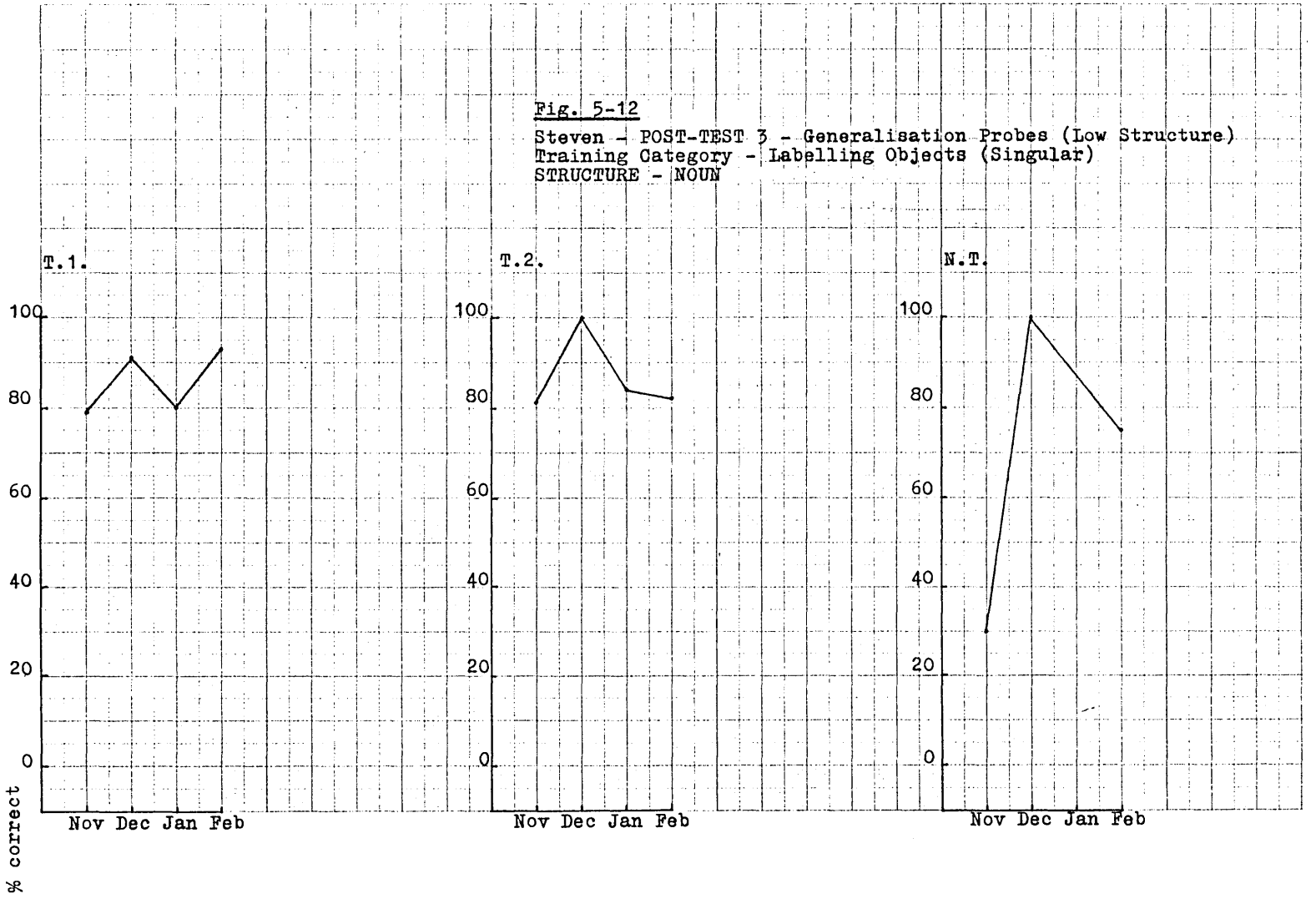


Fig. 5-12

Steven - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Labelling Objects (Singular)
STRUCTURE - NOUN

Steven - Post-Test 3 - Generalisation Probes - (Low Structure)

Table 5-13

Summary of Generalization per Structure by Sessions, Trials and Context

Training Category - Labelling objects - (Plural)

Structure - NOUNS

Trainer 1

Date -	7.11.79,	9.11.79,	23.11.79,	4.12.79,	7.12.79
Trials (% correct)	7(57),	11(54),	6(83),	-	6(33)
Context	2	2/3	1/3	1	2/4
Date -	10.1.80,	17.1.80,	24.1.80,	1.2.80,	7.2.80,
Trials (% correct)	6(50)	-	12(50)	6(83)	12(58)
Context	2	1	1	2	3
Date -	27.2.80				
Trials (% correct)	6(83)				
Context	3				

Trainer 2

Date -	13.11.79,	16.11.79,	22.11.79,	26.11.79,	
Trials (% correct)	6(100)	6(33)	6(0)	6(50)	
Context	2	1	1	2	
Date -	14.12.79,	8.1.80,	15.1.80,	17.1.80,	28.1.80,
Trials (% correct)	6(67)	5(80)	5(80)	6(67)	6(67)
Context	3	2	1	2	3
Date -	29.1.80	6.2.80	11.2.80,	29/2/80,	?
Trials (% correct)	6(67)	4(100)	6(50)	6(67)	6(50)
Context	1	1	2	2	3

Non-Trainer

		(audio)		
Date -	28.11.79,	28.11.79,	5.12.79,	13.2.80
Trials (% correct)	6(83)	-	6(50)	5(20)
Context	2/3	2	2	3

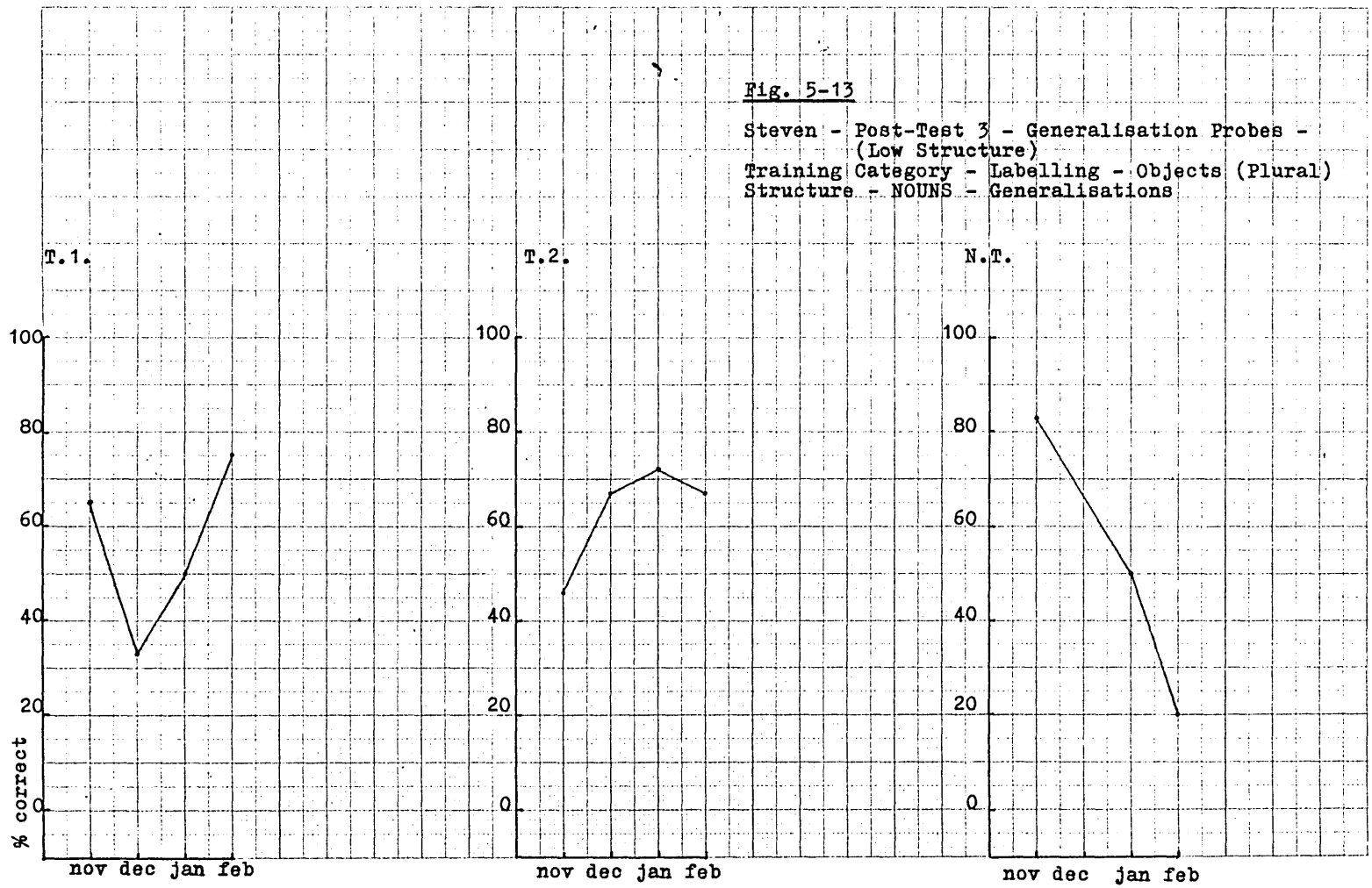


Fig. 5-13

Steven - Post-Test 3 - Generalisation Probes - (Low Structure)
Training Category - Labelling - Objects (Plural)
Structure - NOUNS - Generalisations

Steven - Post-Test 3 - Generalisation Probes - (Low Structure)

Table 5-14

Summary of Generalization per Structure by Sessions, Trials and Context

Training Category - Labelling - Persons

Structure - NOUN (Person name)
(Proper Noun)

Trainer 1

Date -	7.11.79,	9.11.79,	23.11.79,	26.11.79,	4.12.79,
Trials (% correct)	7(57),	5(100),	3(67),	3(33)	3(67)
Context	2	2/3	1/3	2	1
Date -	7.12.79,	10.1.80,	17.1.80,	24.1.80,	1.2.80,
Trials (% correct)	3(67)	3(100)	6(67)	7(100)	4(100)
Context	2/4	2	1	1	2
Date -	7.2.80,	27.2.80			
Trials (% correct)	2(50)	4(75)			
Context	3	2			

Trainer 2

Date -	13.11.79,	16.11.79,	22.11.79,		
Trials (% correct)	4(100)	3(67)	4(75)		
Context	2	1	1		
Date -	14.12.79,	8.1.80,	15.1.80,	17.1.80,	28.1.80,
Trials (% correct)	4(75)	3(33)	4(75)	4(75)	4(50)
Context	3	2	1	2	3
Date -	29.1.80	6.2.80	11.2.80,	29/2/80,	?
Trials (% correct)	4(50)	4(100)	4(50)	4(75)	3(67)
Context	1	1	2	2	2

Non-Trainer

	(audio)			
Date -	28.11.79,	28.11.79,	5.12.79,	13.2.80
Trials (% correct)	13(38)	4(25)	4(75)	3(67)
Context	3	2	2	2

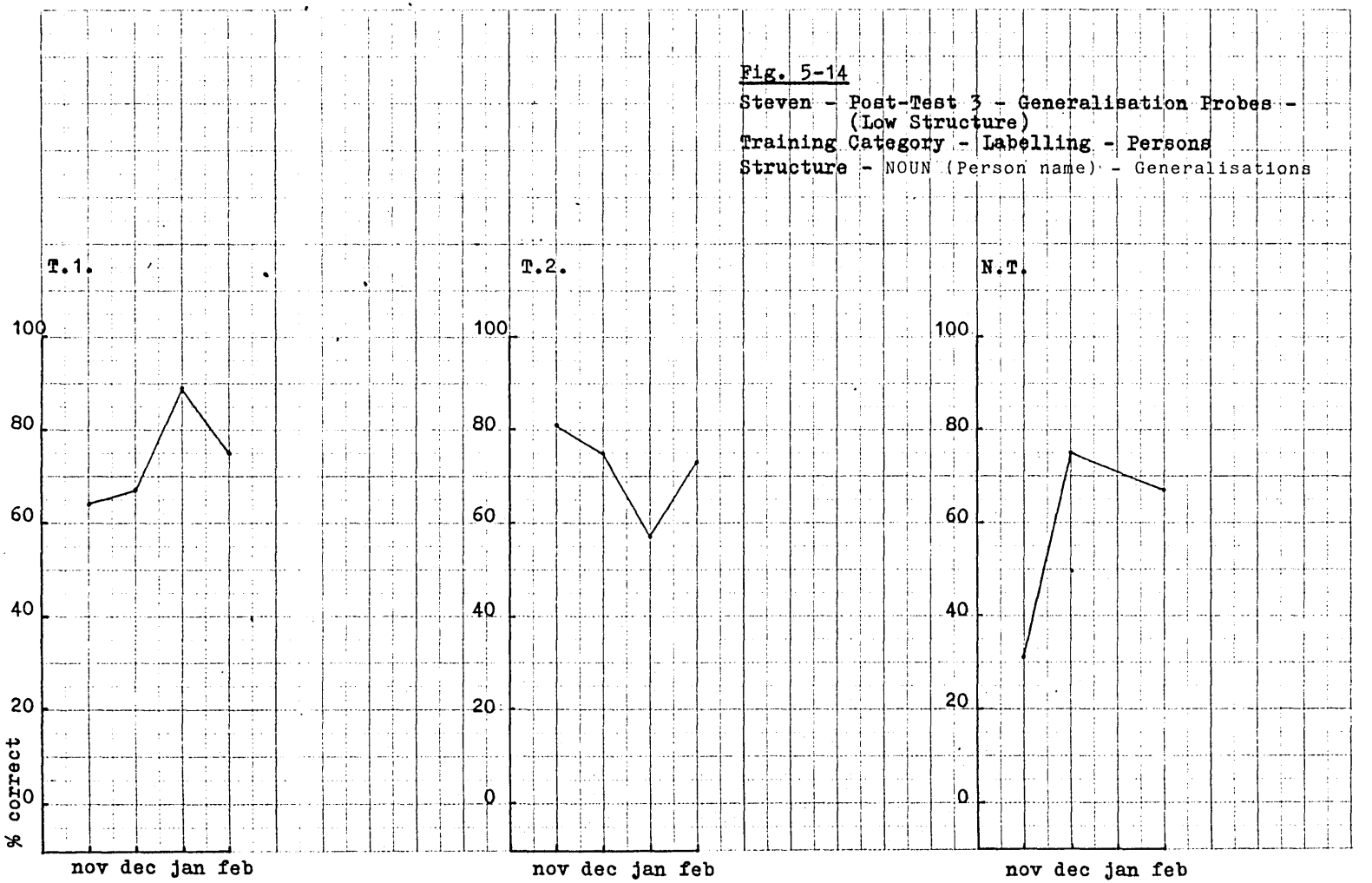


Fig. 5-14
Steven - Post-Test 3 - Generalisation Probes - (Low Structure)
Training Category - Labelling - Persons
Structure - NOUN (Person name) - Generalisations

Steven - Post-Test 3 - Generalisation Probes - (Low Structure)

Table 5-15

Summary of Generalization per Structure by Sessions, Trials and Context

Training Category - Labelling Actions - Personal/Persons

Structure - VERB-ING/(PREP)

Trainer 1

Date -	7.11.79,	9.11.79,	23.11.79,	4.12.79,	7.12.79
Trials (% correct)	4(75)),	9(67),	2(100),	5(40)	2(100)
Context	2/4	2/3	3	1	4/3
Date -	10.1.80,	17.1.80,	24.1.80,	1.2.80,	7.2.80,
Trials (% correct)	2(100)	4(75)	4(75)	2(100)	4(50)
Context	2	1	1	2	3
Date -	27.2.80				
Trials (% correct)	2(100)				
Context	3				

Trainer 2

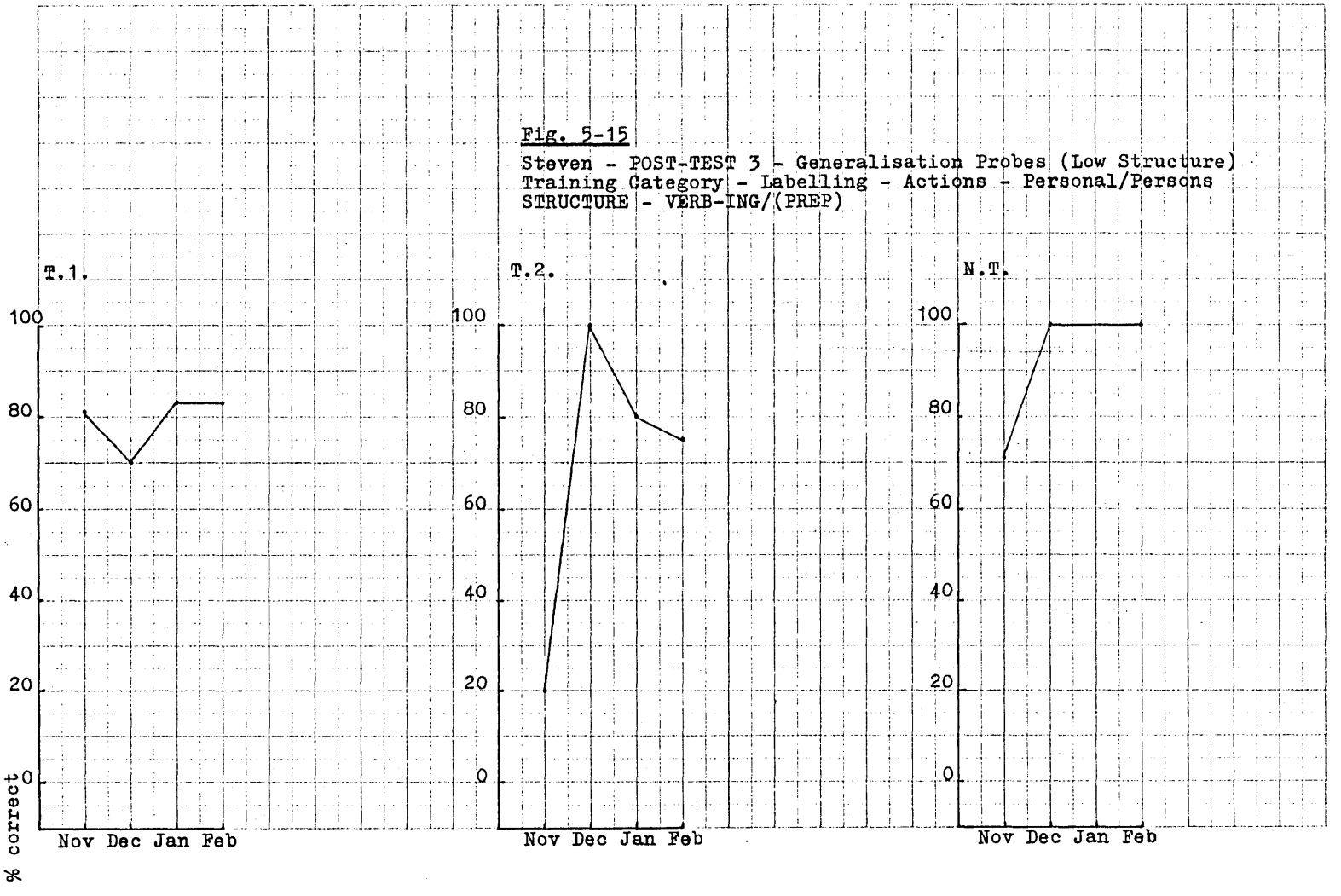
Date -	13.11.79,	16.11.79,	22.11.79,		
Trials (% correct)	5(40)	5(20)	5(0)		
Context	2	1	1		
Date -	14.12.79,	8.1.80,	15.1.80,	17.1.80,	28.1.80,
Trials (% correct)	2(100)	2(50)	2(50)	2(100)	2(100)
Context	3	2	2	2	3
Date -	29.1.80	6.2.80	11.2.80,	29/2/80,	?
Trials (% correct)	2(100)	2(100)	2(50)	2(100)	2(50)
Context	1	1	2	2	3

Non-Trainer

Date -	28.11.79,	28.11.79,	5.12.79,	13.2.80
Trials (% correct)	4(75)	3(63)	2(100)	2(100)
Context	2	2	3	3

Fig. 5-15

Steven - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Labelling - Actions - Personal/Persons
STRUCTURE - VERB-ING/(PREP)



Steven - Post-Test 3 - Generalisation Probes - (Low Structure)

Table 5-16

Summary of Generalization per Structure by Sessions, Trials and Context

Training Category - Labelling Persons/Actions/Things

Structure - MAN/WOMAN/BOY/GIRL VERB-ING/ (PREP)
(subj + verb + ing/(prep)

Trainer 1

Date -	7.11.79,	9.11.79,	23.11.79,	4.12.79,	7.12.79
Trials (% correct)	-	-	3(100)	2(50)	2(100)
Context	2/4	2/3	3	1	3/4
Date -	10.1.80,	17.1.80,	24.1.80,	1.2.80,	7.2.80,
Trials (% correct)	3(67)	6(67)	6(50)	3(100)	6(83)
Context	2	1	1	2	3
Date -	27.2.80				
Trials (% correct)	3(67)				
Context	3				

Trainer 2

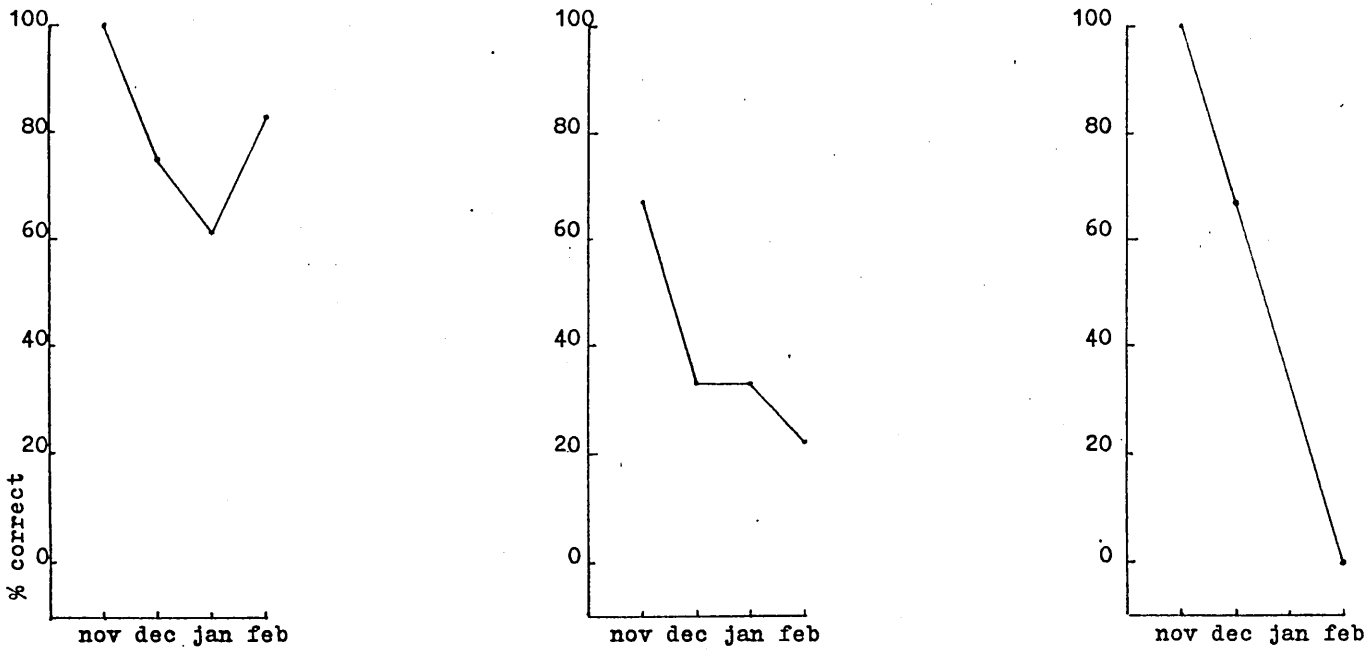
Date -	13.11.79,	16.11.79,	22.11.79,	26.11.79,	
Trials (% correct)	-	-	-	3(67)	
Context	2	1	1	2	
Date -	14.12.79,	8.1.80,	15.1.80,	17.1.80,	28.1.80,
Trials (% correct)	3(33)	3(67)	3(33)	3(0)	3(33))
Context	3	2	1	2	3
Date -	29.1.80	6.2.80	11.2.80,	29/2/80,	?
Trials (% correct)	3(33)	3(33)	3(0)	3(67)	3(0)
Context	1	1	2	2	3

Non-Trainer

Date -	28.11.79,	28.11.79,	5.12.79,	13.2.80
Trials (% correct)	3(100)	-	3(67)	3(0)
Context	2	2	2	

Fig. 5-16

Steven - Post-Test 3 - Generalisation Probes
Training Category - Labelling - Persons/Actions/Things
Structure - MAN/WOMAN/BOY/GIRL VERB-ING/(PREP)



Appendix E

Case Study 2 Jamie

Language Training and Testing Data

Tables 6-1 to 6-11; Figures 6-1 to 6-11 - Progress in learning the main structures taught covering the period November 1978 to December 1979.

Tables 6-12 to 6-17; Figures 6-12 to 6-17 - POST-TEST 1 data showing generalisations per structure by trainer/non-trainer/child interactions in Test Conditions A and B.

Tables 6-18 to 6-19; Figures 6-18 to 6-19 - POST-TEST 2 (High Structure) data showing generalisations per structure in Sub-Tests I and II.

Table 6-20; Figure 6-20 - POST-TEST 3 (High Structure) data showing generalisations per structure.

Tables 6-21 to 6-46; Figures 6-21 to 6-46 - POST-TEST 3 (Low Structure) data showing generalisations per structure by trainer/non-trainer/child interactions covering the period November 1979 to February 1980.

Jamie - Language Training

Table 6-1

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling Actions - Personal

STRUCTURE - VERB-ING/(PREP)

Training commenced - 2.11.78
Training terminated - 16.1.79
Number of sessions - 10

Imitations

Trials (% correct) - 12(42), 55(34), 12(67), 6(100), 26(52), 6(100)

Non-Imitative responses

Trials (% correct) - 6(100), 50(48), 30(67), 30(50), 18(83), 86(58), 6(100), 18(72), 12(100), 6(100)

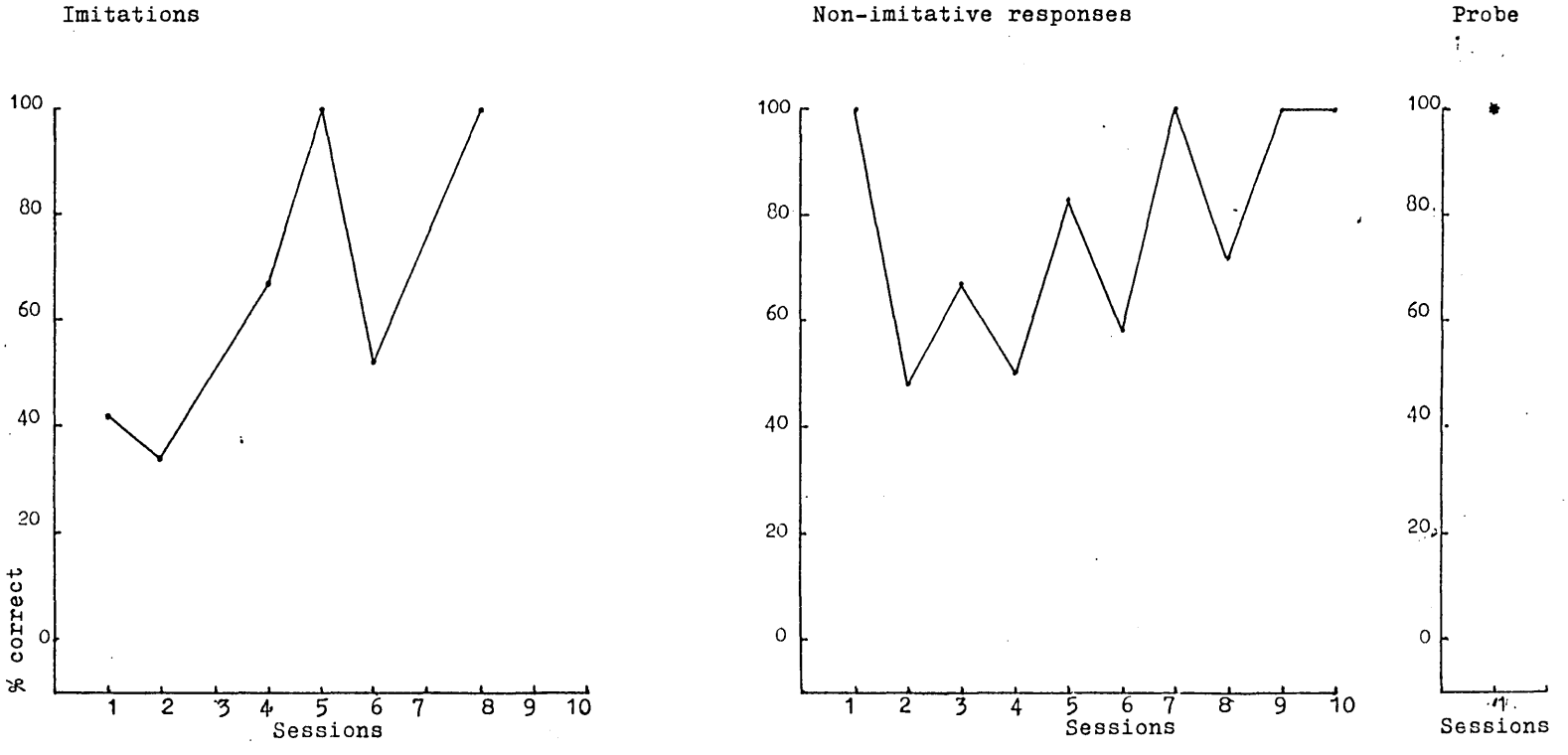
Probes

Trials (% correct) - 12(100)

Fig. 6-1

Jamie - Language Training - Progress in Learning Labelling - Actions - (Personal)

STRUCTURE - VERB-ING/(PREP)



Jamie - Language Training

Table 6-2

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling Actions/Things

STRUCTURE - VERB-ING (OBJ)/(PREP)
(verb + ing + (obj)/(prep))

Training commenced - 3.11.78
Training terminated - 20.12.78

Imitations

Trials (% correct) - 18(39), 36(46), 6(100), 12(42), 6(100)

Non-Imitative responses

Trials (% correct) - 24(42), 42(48), 18(83), 7(100), 12(58), 42(83)

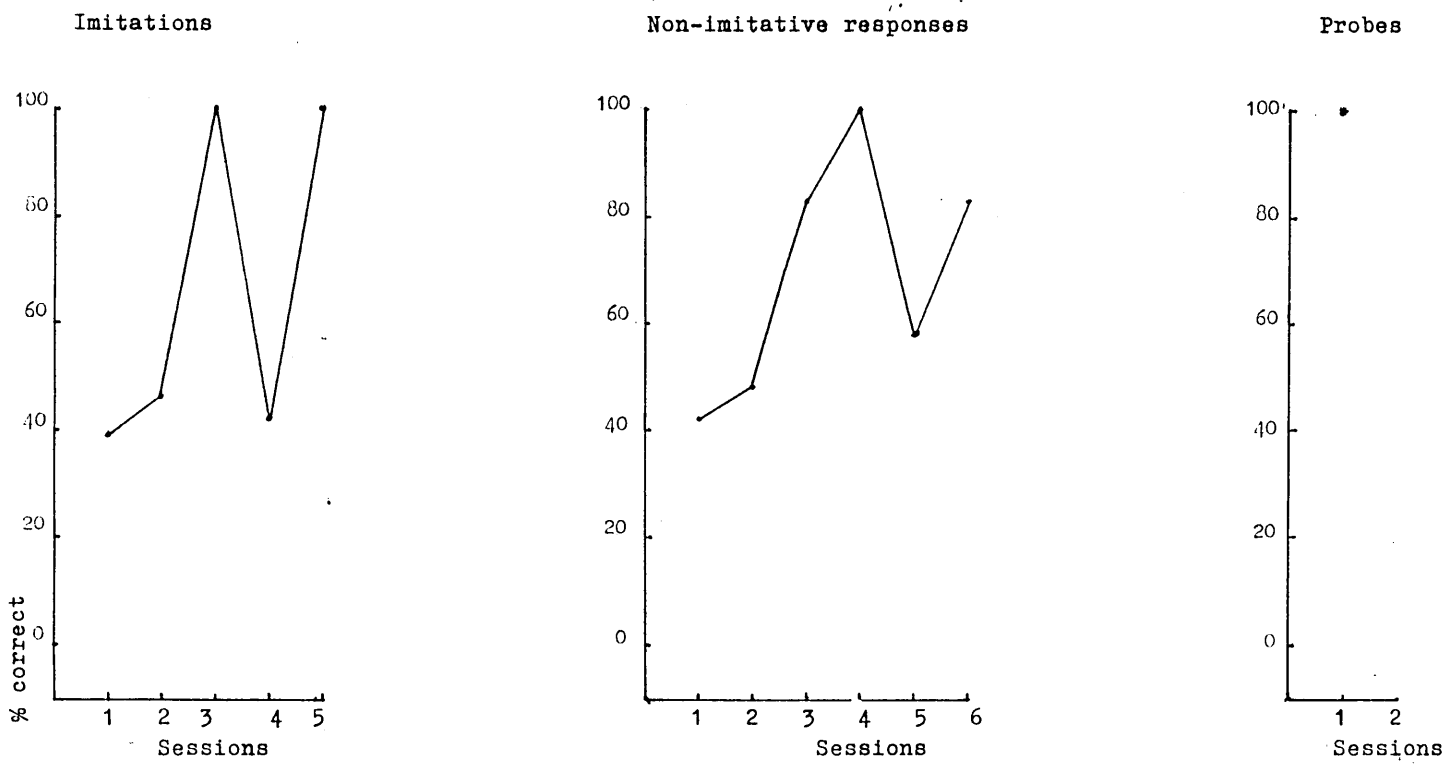
Probes

Trials (% correct) - 12(100)

Fig. 6-2

Jamie - Language Training - Progress in Learning Labelling - Actions/Things

STRUCTURE - VERB-ING (OBJ)/(PREP) - (pictorial stimuli)



Jamie - Language Training

Table 6-3

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronoun training + Labelling Actions

STRUCTURE - I AM/I'M VERBING (OBJ)/(AOBJ)/(PREP)
(pron + aux + verb + ing + (obj)/(det + obj)/
(prep)

Training commenced - 28.11.78 (one session only)
Training terminated - 16.1.79
Number of sessions - 5

Imitations

Trials (% correct) - 8(50), 6(100)

Non-imitative responses

Trials (% correct) - 10(80), 12(67), 16(75), 18(83)

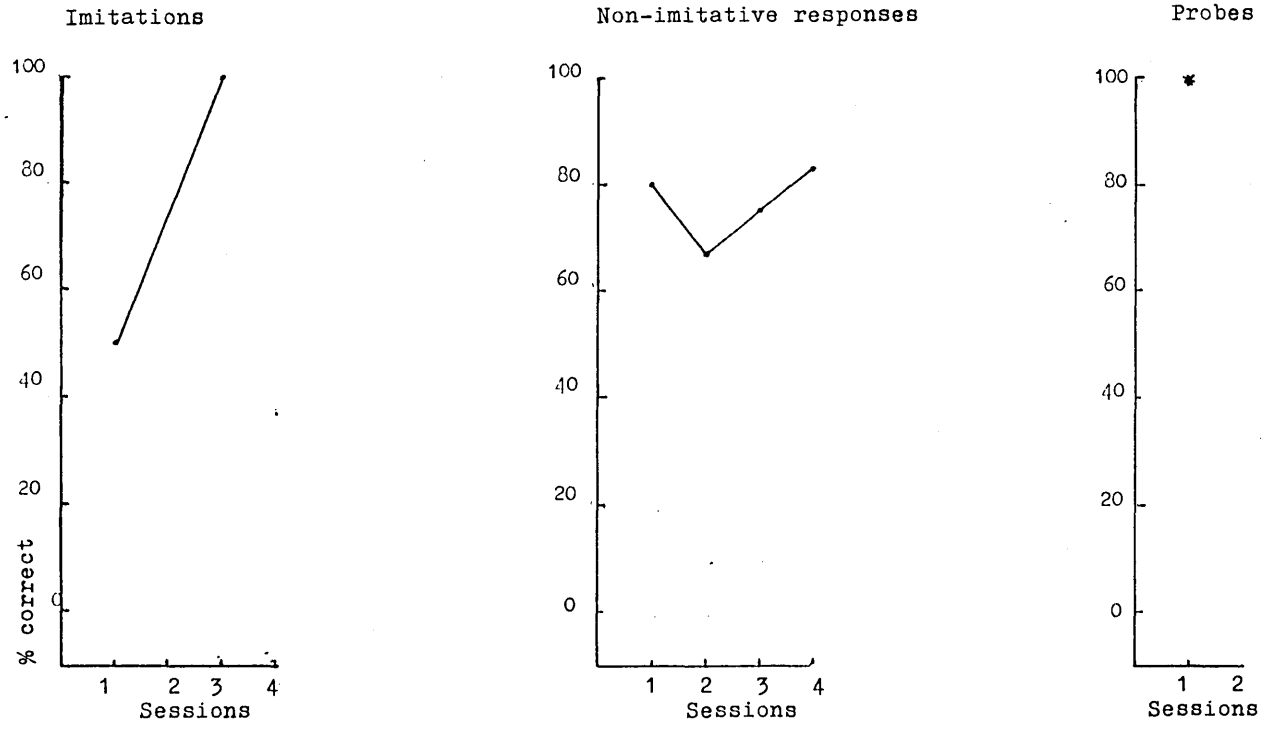
Probes

Trials (% correct) - 12(100)

Fig. 6-3

Jamie - Language Training - Progress in Learning Pronominal Usage - I + Labelling - Actions

STRUCTURE - I AM/I'M VERB-ING(OBJ)/(AOBJ)/(PREP)



Jamie - Language Training

Table 6-4

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling Persons and Actions
(Pictorial reference)

STRUCTURE - MAN/WOMAN/BOY/GIRL VERB-ING
(subject + verb + ing)

Training commenced - 10.1.79
Training terminated - 26.2.79
Number of sessions - 10

Imitations

Trials (% correct) - 10(30), 12(50), 8(100), 42(38),
13(31), 6(100)

Non-Imitative responses

Trials (% correct) - 12(75), 6(100), 26(42), 18(44)
12(83), 36(17), 12(75), 12(67)

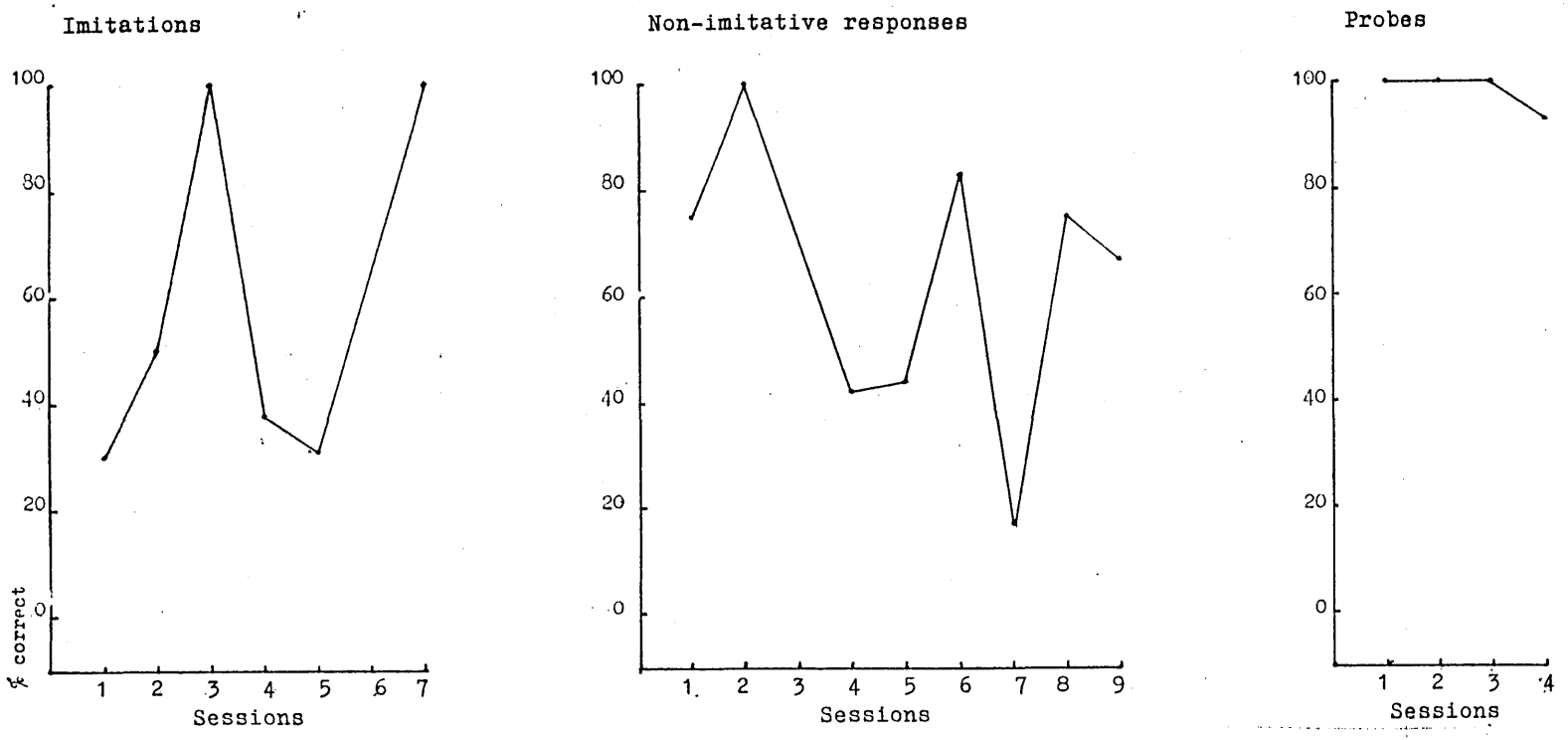
Probes

Trials (% correct) - 6(100), 8(100), 6(100), 14(93)

Fig. 6-4

Jamie - Language Training - Progress in Learning Labelling - Persons/Actions

STRUCTURE - MAN/WOMAN/BOY/GIRL VERB-ING - (pictorial stimuli)



Jamie - Language Training

Table 6-5

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling Persons/Actions/Things

STRUCTURE - MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(PREP)
(Subject + verb + ing + (obj) / (prep)

Training commenced - 30.1.79
Training terminated - 13.3.79
Number of sessions - 19

Imitations

Trials (% correct) - 6(33), 3(0)

Non-Imitative responses

Trials (% correct) - 6(33), 27(7), 18(55), 18(39), 12(58), 18(78), 72(44), 24(31), 12(83), 12(67), 60(48), 12(58), 36(78), 31(86), 36(86), 36(92), 48(69), 36(97), 36(97)

Probes

Trials (% correct) - 20(95), 6(67), 10(91), 6(100), 6(67), 6(100)

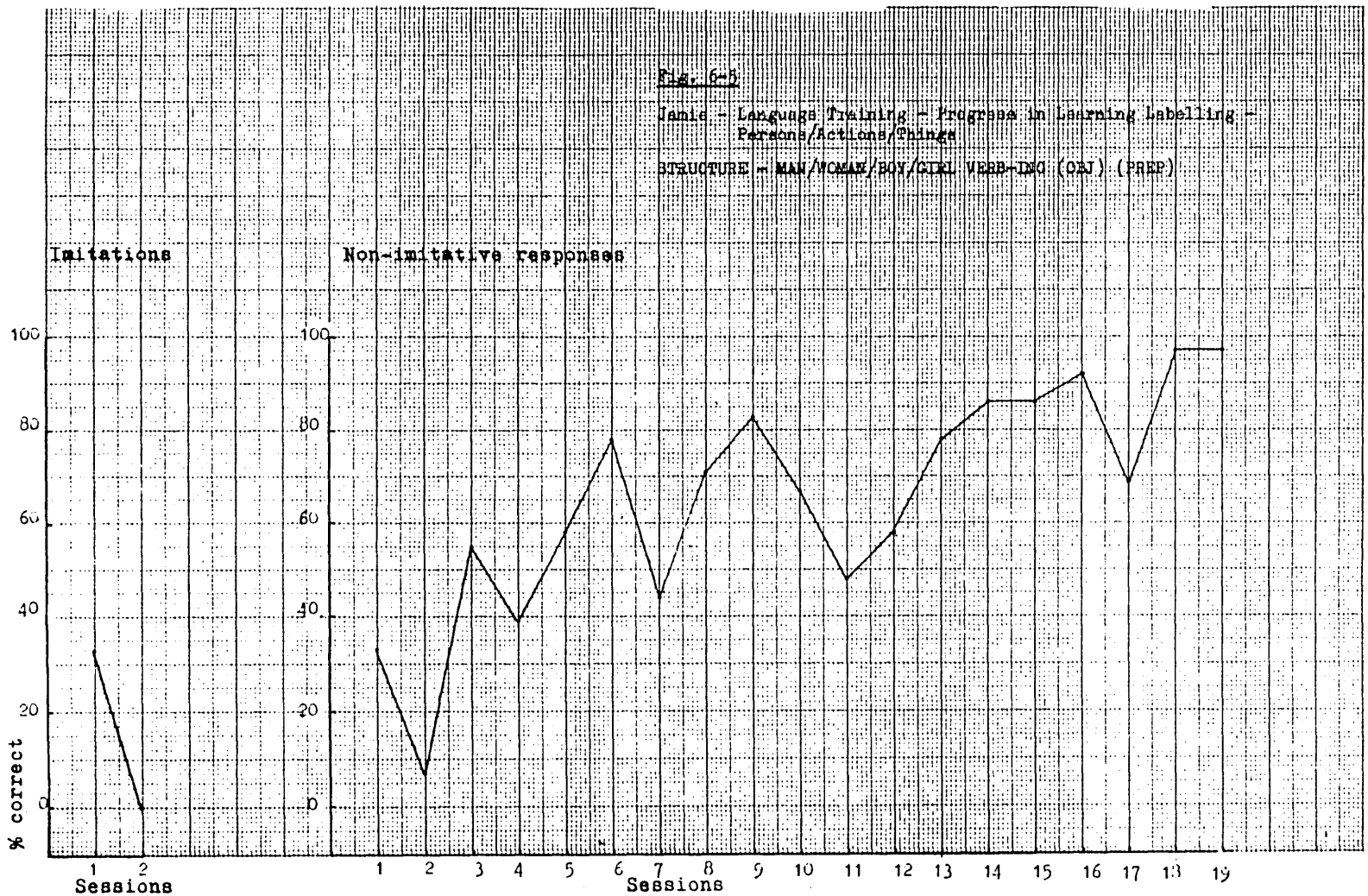


Fig. 6-5
Jamie - Language Training - Progress in Learning Labelling - Persons/Actions/Things
STRUCTURE - MAN/WOMAN/BOY/GIRL VERB-ING (OBJ) (PREP)
Imitations
Non-imitative responses
% correct
100
80
60
40
20
0
1 2
Sessions
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
Sessions

Jamie - Language Training

Table 6-6

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERBING (OBJ) (AOBJ)/(PREP)
(pron + cop + det + subj + verb + ing + (obj)/(det + obj)/(prep))

Training commenced - 28.3.79
Training terminated - 13.9.79
Number of sessions - 14

Imitations

Trials (% correct) -

Non-imitative responses

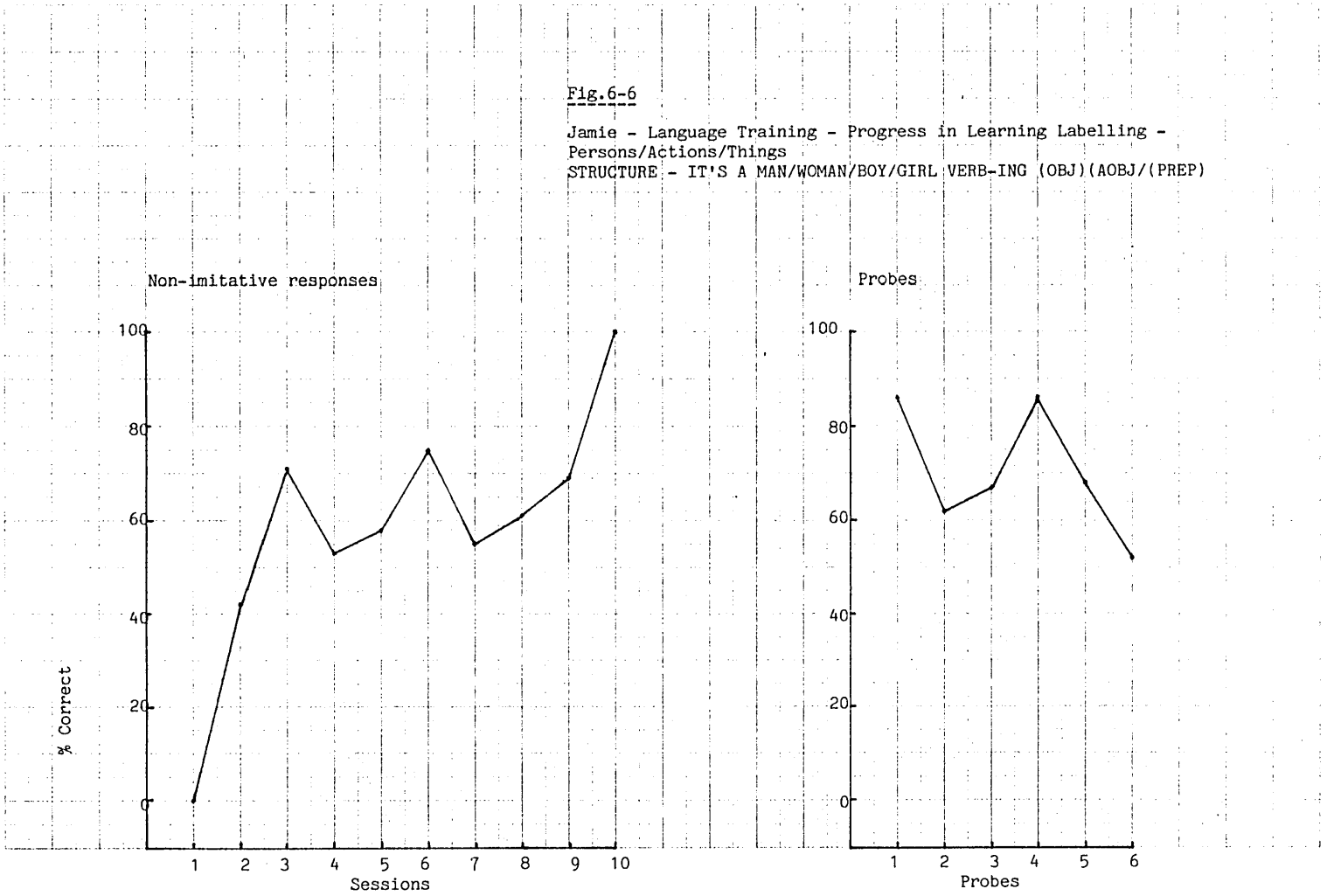
Trials (% correct) - 24(0), 36(42), 24(71), 36(58), 36(75), 18(55), 36(61), 36(69), 36(100)

Probes

Trials (% correct) - 21(86), 16(62), 18(67), 21(86), 19(68), 31(52)

Fig.6-6

Jamie - Language Training - Progress in Learning Labelling - Persons/Actions/Things
STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)(AOBJ/(PREP)



Jamie - Language Training

Table 6-7

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL/VERB-ING (OBJ)/
(AOBJ)/(PREP)
(pron + cop + det + subj + verb + ing +
(obj)/(det + obj)/(prep)

Re-training 1

Imitations

Trials (% correct) -

Non-imitative responses

Trials (% correct) - 36(80), 36(94)

Probes

Trials (% correct) - 18(83), 12(83)

Re-training 2

Imitations

Trials (% correct) -

Non-imitative responses

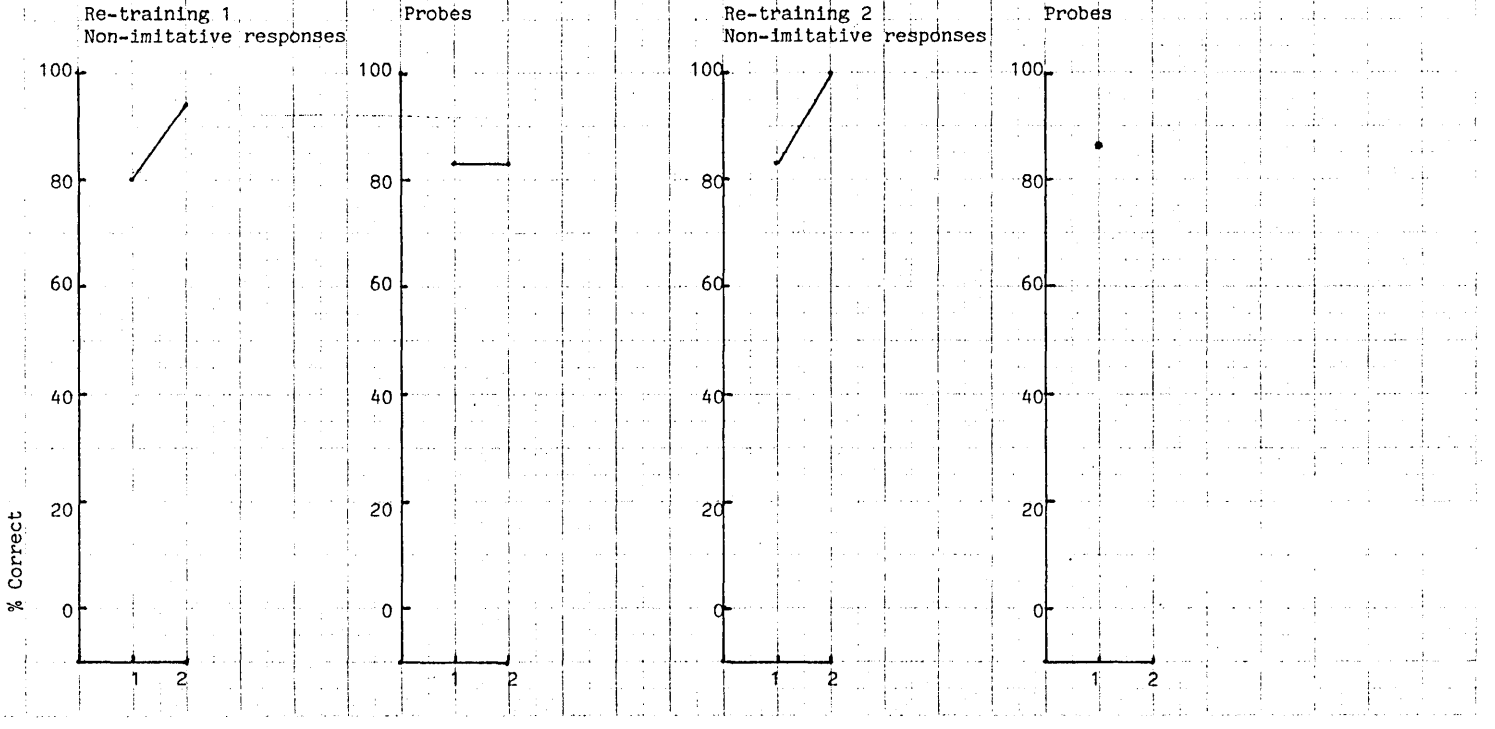
Trials (% correct) - 36(83), 36(100)

Probes

Trials (% correct) - 28(86)

Fig.6-7

Jamie - Language Training - progress in Learning Labelling -
Persons/Actions/Things - (Re-training)
STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(AOBJ)/(PREP)



Jamie - Language Training

Table 6-8

Summary of Progress per Structure by Sessions and Trials

Training Category - (YES/NO discrimination) -(Singular)

STRUCTURE - YES IT IS
(yes + pron + copula)

Training commenced - 18.9.79
Training terminated - 13.12.79
Number of sessions - 38

Imitations

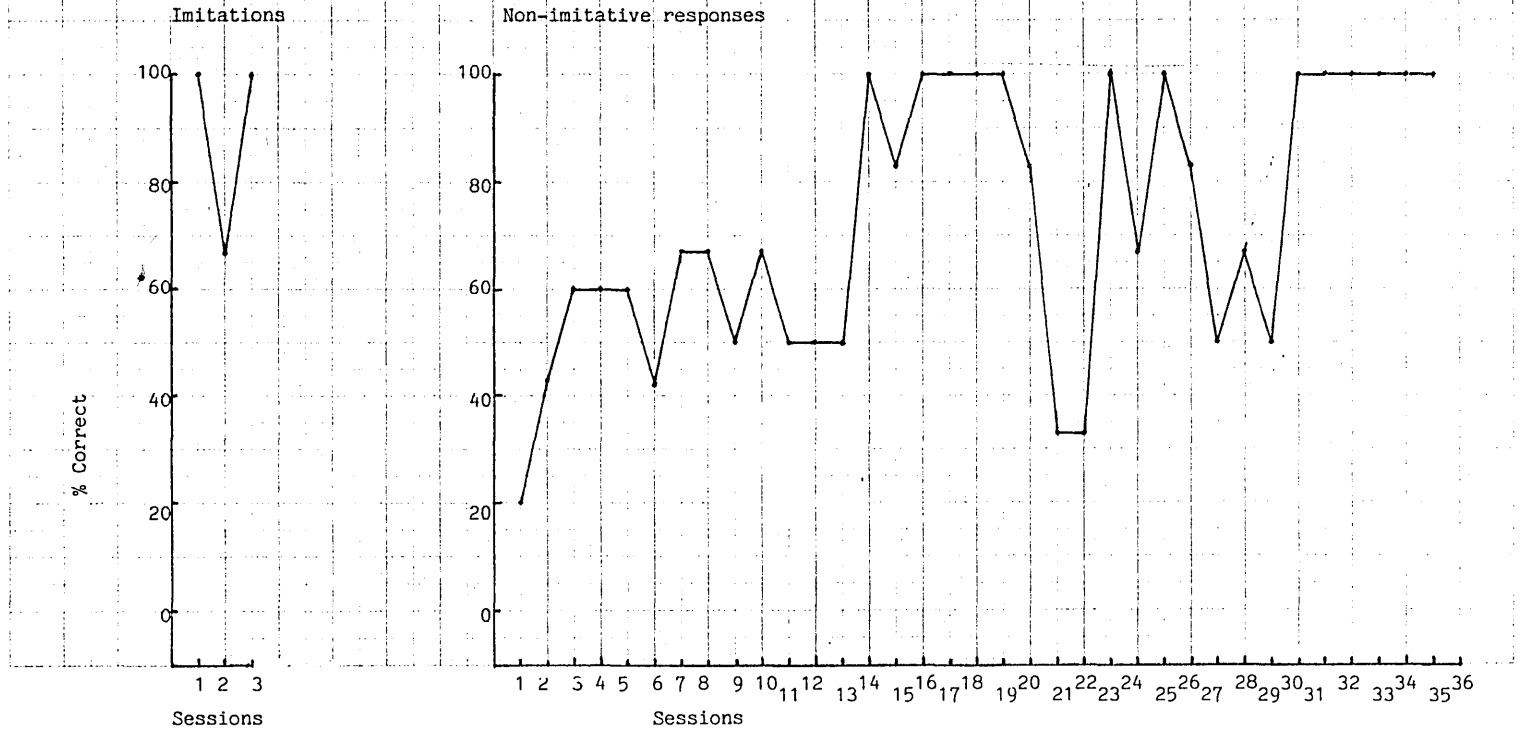
Trials (% correct) - 6(100), 6(67), 1(100)

Non-imitative responses

Trials (% correct) - 5(20), 6(33), 6(50), 6(50),
6(50), 6(33), 6(67), 6(67),
6(50), 6(67), 6(50), 6(50),
6(50), 6(100), 6(83), 6(100),
6(100), 6(100), 6(100), 6(83),
6(33), 6(33), 12(100), 6(67),
6(100), 6(83), 6(50), 6(67),
6(50), 6(100), 6(100), 6(100),
6(100), 6(100), 6(100), 6(100)

Fig.6-8

Jamie - Language Training - Progress in Learning -
YES/NO Discrimination - (Objects)(Singular)
STRUCTURE - YES IT IS



Jamie - Language Training

Table 6-9

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - Objects - (Singular)

STRUCTURE - NO IT ISN'T, IT'S A (NOUN)
(no + pron + cop' + neg' + pron + cop' + det + (noun))

Training commenced - 21.9.79
Training terminated - 18.12.79
Number of sessions - 37

Imitations

Trials (% correct) - 6(100), 6(100), 6(100), 5(100)

Non-imitative responses

Trials (% correct) - 6(0), 6(0), 6(0), 1(0), 6(0)
6(0), 6(0), 6(17), 6(33), 6(50)
6(67), 6(17), 6(0), 6(100)
6(33), 6(17), 6(50), 6(0), 6(50)
6(0), 6(33), 6(17), 6(0), 6(83)
6(33), 6(0), 6(50), 6(67), 6(67)
6(67), 6(67), 6(50), 6(67)
6(50), 6(33)

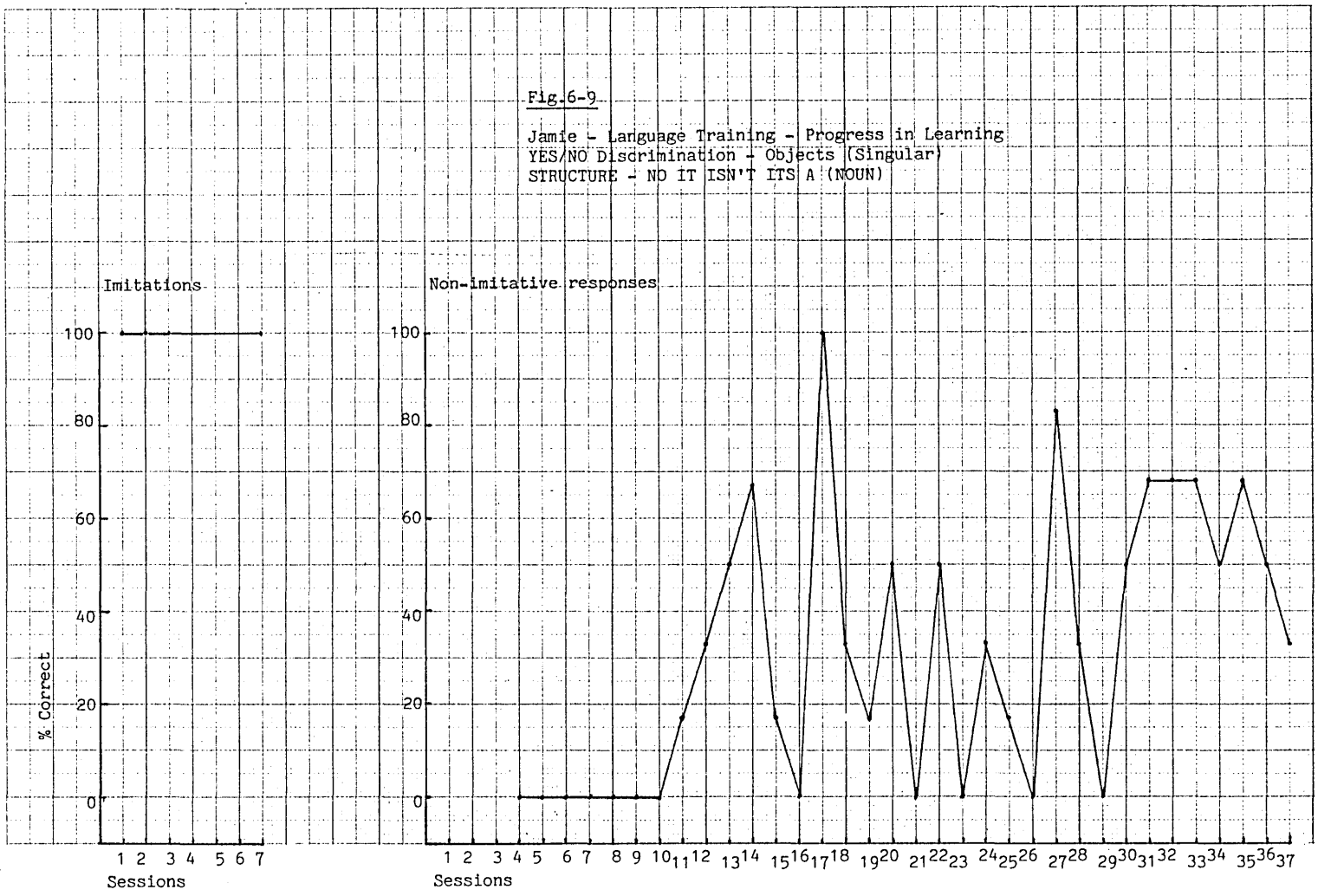


Fig.6-9
Jamie - Language Training - Progress in Learning
YES/NO Discrimination - Objects (Singular)
STRUCTURE - NO IT ISN'T ITS A (NOUN)
Imitations
Non-imitative responses
% Correct
100
80
60
40
20
0
1 2 3 4 5 6 7
Sessions
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
Sessions

Jamie - Language Training

Table 6-10

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - Objects - (Plural)

STRUCTURE - YES THEY ARE
(yes + pron + copula)

Training commenced - 18.9.79
Training terminated - 13.12.79
Number of sessions - 38

Imitations

Trials (% correct) - 6(83), 6(100), 3(100), 6(100)

Non-imitative responses

Trials (% correct) - 3(33), 6(33), 6(33), 6(50), 6(50),
6(67), 6(67), 6(50), 6(33), 6(67),
6(50), 6(67), 6(50), 6(50), 6(67),
6(67), 6(33), 6(50), 6(67), 6(50),
6(100), 10(100), 6(83), 6(67),
6(83), 6(67), 12(92), 6(100), 6(83),
6(83), 6(83), 6(100), 6(83)

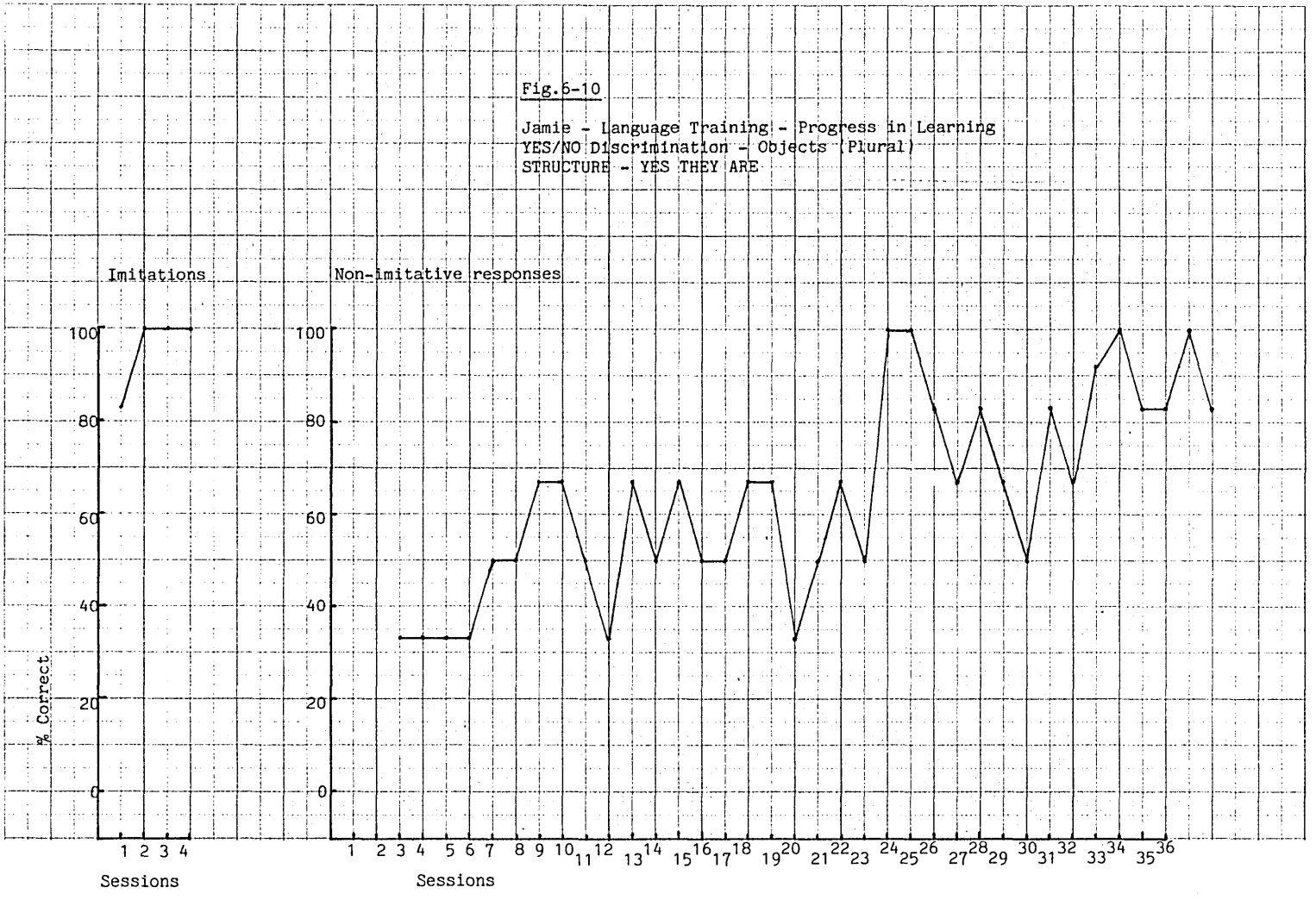


Fig.6-10
Jamie - Language Training - Progress in Learning
YES/NO Discrimination - Objects (Plural)
STRUCTURE - YES THEY ARE
Imitations
Non-imitative responses
% Correct
100
80
60
40
20
0
1 2 3 4
Sessions
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
Sessions

Jamie - Language Training

Table 6-11

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - Objects - (Plural)

STRUCTURE - NO THEY AREN'T/ARE NOT, THEY'RE NOUNS
(no + pron + copula + neg + pron + cop + noun + pl)

Training commenced - 21.9.79
Training terminated - 18.12.79
Number of sessions - 37

Imitations

Trials (% correct) - 6(100), 6(100), 6(100)

Non-imitative responses

Trials (% correct) - 6(50), 6(0), 6(0), 6(0), 6(50),
6(0), 6(0), 6(0), 6(33), 6(33),
6(50), 6(0), 6(0), 6(0), 6(0),
6(0), 6(0), 6(33), 6(0), 6(0),
6(50), 6(0), 6(0), 6(33), 6(17),
6(0), 6(33), 6(0), 6(67), 6(50),
6(0), 6(0), 6(67), 6(0)

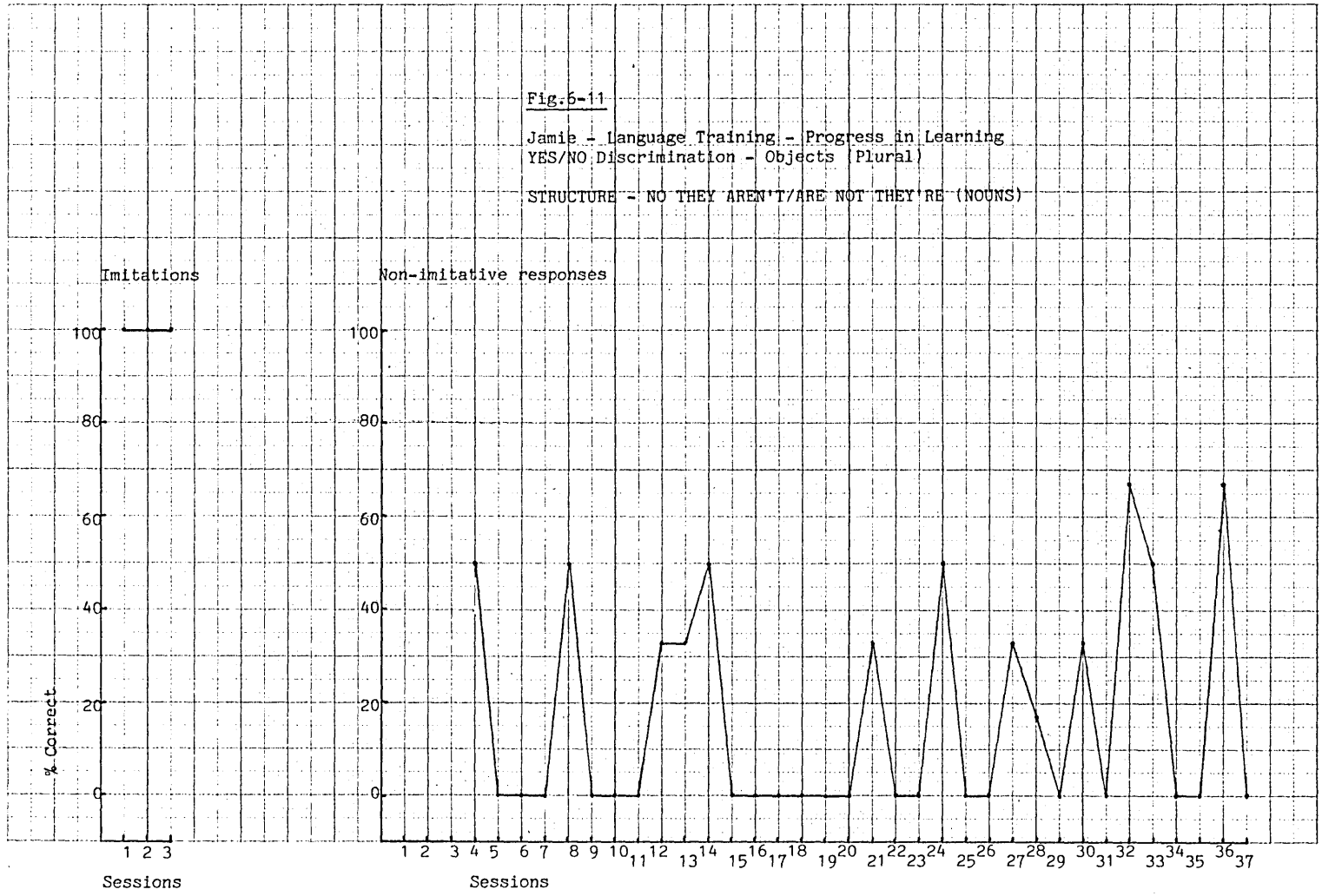


Fig.6-11
Jamie - Language Training - Progress in Learning
YES/NO Discrimination - Objects (Plural)
STRUCTURE - NO THEY AREN'T/ARE NOT THEY'RE (NOUNS)
Imitations
Non-imitative responses
% Correct
100
80
60
40
20
0
1 2 3
Sessions
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
Sessions

Jamie - Post-Test I - Generalisation Probes

Table 6-12

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - Objects (singular)

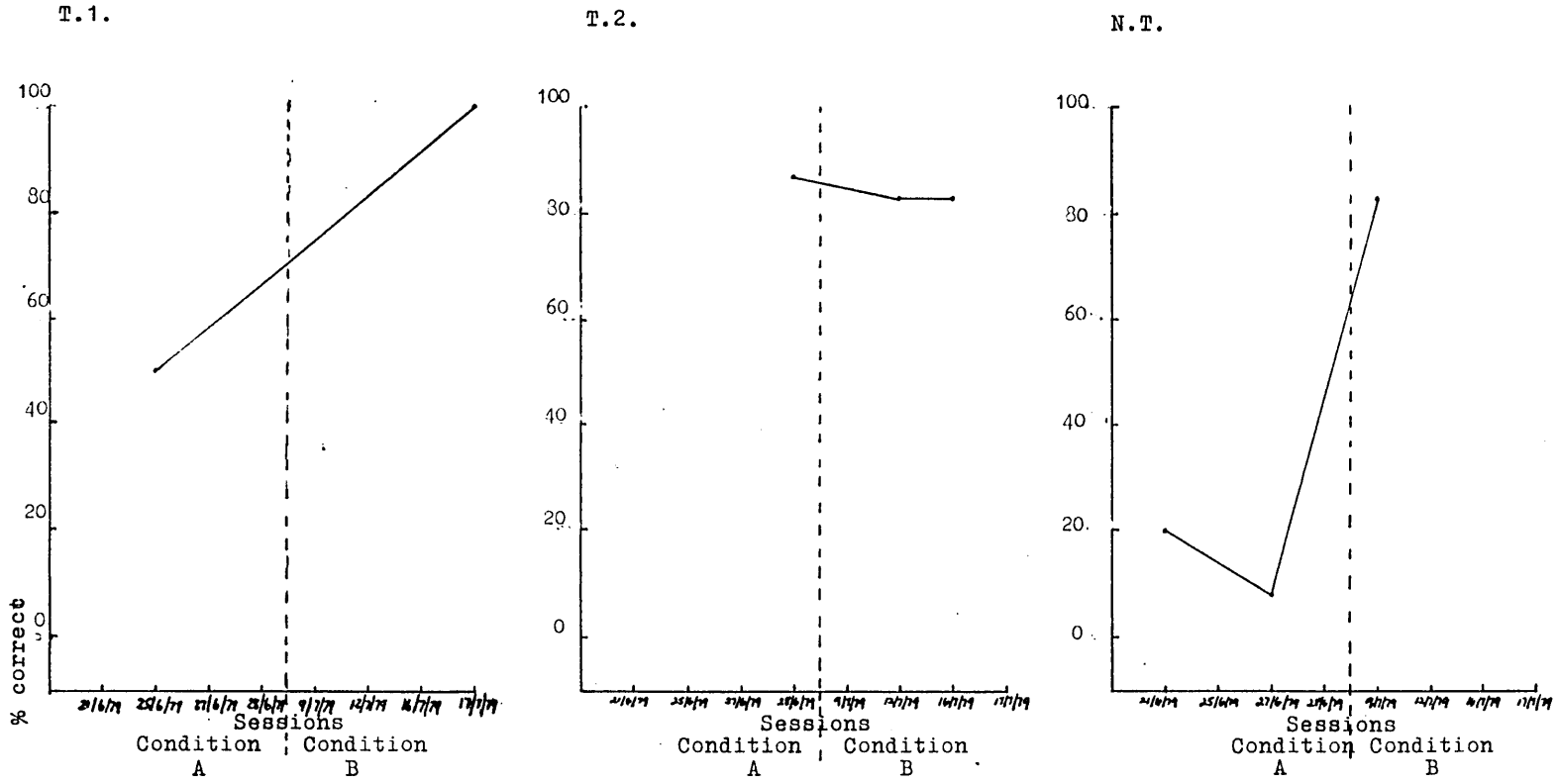
STRUCTURE - IT'S A NOUN
(pron + cop + det + noun)

	Condition A	Condition B
i)	Trainer 1	
	Sessions 25.6.79	17.7.79
	Trials (% correct)	
	12(50)	6(100)
ii)	Trainer 2	
	Sessions 28.6.79	12.7.79, 16.7.79
	Trials (% correct)	
	16(87)	6(83), 6(83)
iii)	Non-Trainer	
	Sessions 21.6.79, 27.6.79	9.7.79
	Trials (% correct)	
	5(20), 12(8)	6(83)

Fig. 6-12

Jamie - POST-TEST 1 - Generalisation Probes - Training Category - Labelling - Objects (Singular)

STRUCTURE - IT'S A (NOUN) - Generalisations in Test Conditions A and B



Jamie - Post-Test I - Generalisation Probes

Table 6-13

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - Objects (plural)

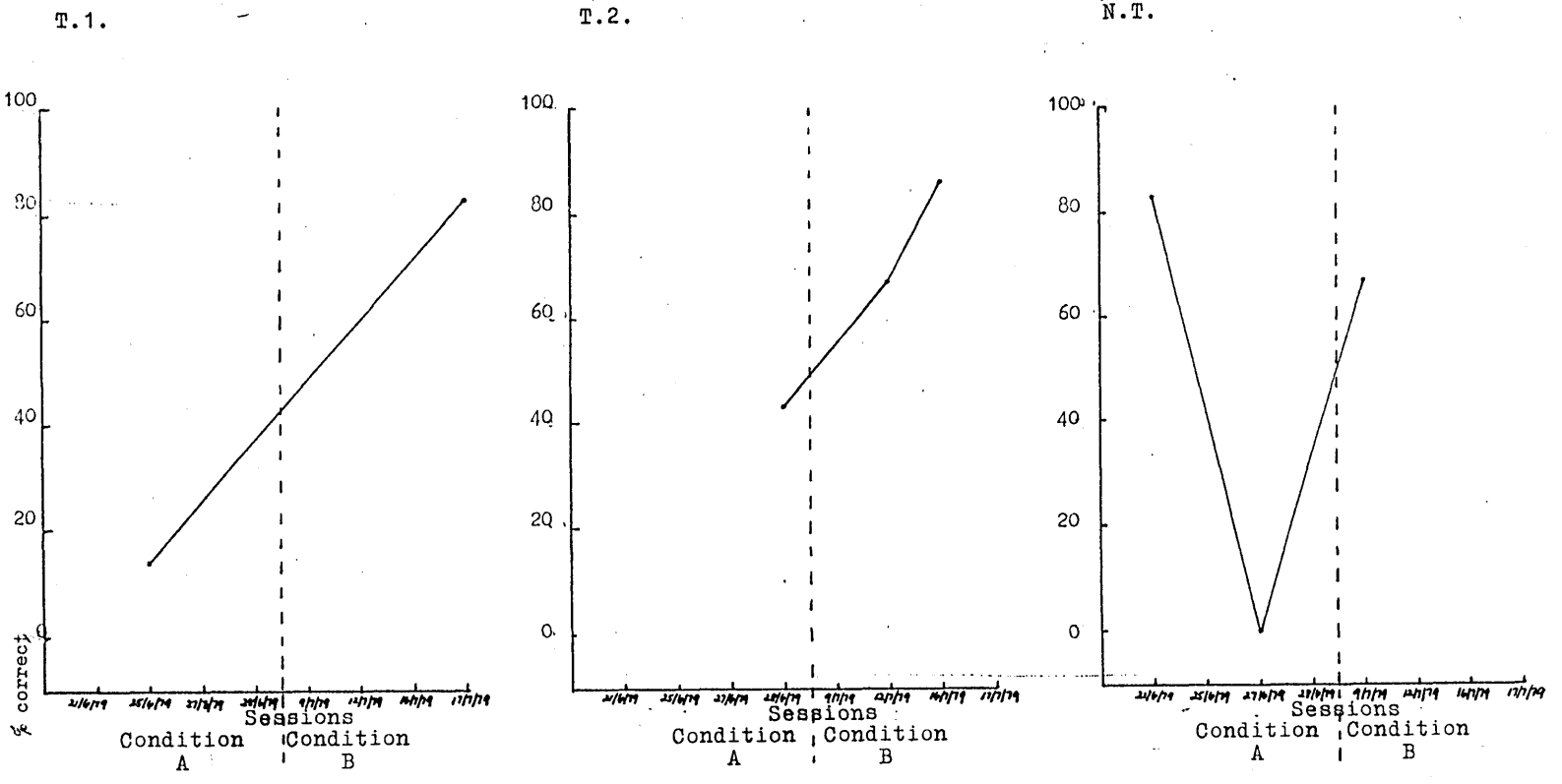
STRUCTURE - THEY'RE NOUNS
(pron + cop' + noun (pl))

	Condition A	Condition B
i)	Trainer 1	
	Sessions 25.6.79	17.7.79
	Trials (% correct)	
	7(14)	6(83)
ii)	Trainer 2	
	Sessions 28.6.79	12.7.79, 16.7.79
	Trials (% correct)	
	28(43)	6(67), 7(86)
iii)	Non-Trainer	
	Sessions 21.6.79, 27.6.79	9.7.79
	Trials (% correct)	
	6(83), 12(0)	6(67)

Fig. 6-13

Jamie - POST-TEST 1 - Generalisation Probes - Training Category Labelling Objects - (Plural)

STRUCTURE - THEY'RE/THEY ARE (NOUNS) - Generalisations in Test Conditions A and B



Jamie - Post-Test I - Generalisation Probes

Table 6-14

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - Persons

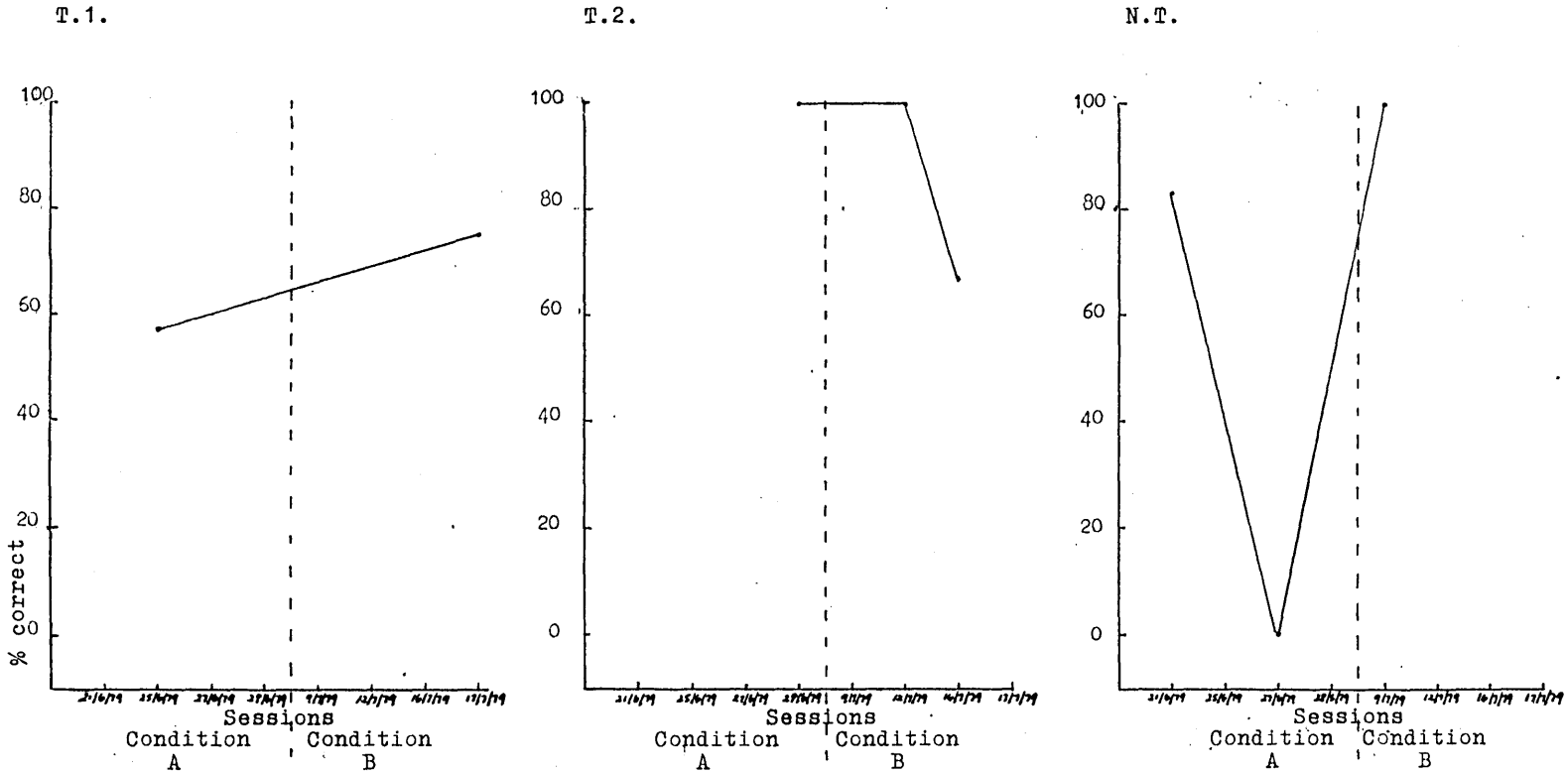
STRUCTURE - IT'S PERSON (NAME)
(pron + cop + proper noun)

	Condition A	Condition B
i)	Trainer 1	
	Sessions 25.6.79	17.7.79
	Trials (% correct)	
	7(57)	4(75)
ii)	Trainer 2	
	Sessions 28.6.79	12.7.79, 16.7.79
	Trials (% correct)	
	5(100)	3(100), 3(67)
iii)	Non-Trainer	
	Sessions 21.6.79, 27.6.79	9.7.79
	Trials (% correct)	
	12(83), 6(0)	3(100)

Fig. 6-14

Jamie - POST-TEST 1 - Generalisation Probes - Training Category - Labelling - Persons

STRUCTURE - IT'S PERSON (NAME) - Generalisations in Test Conditions A and B



Jamie - Post-Test I - Generalisation Probes

Table 6-15

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Pronominal Usage + Labelling - Actions

STRUCTURE - (I AM)/(I'M) VERB-ING (PREP)
(pron + aux + verb + ing + prep)

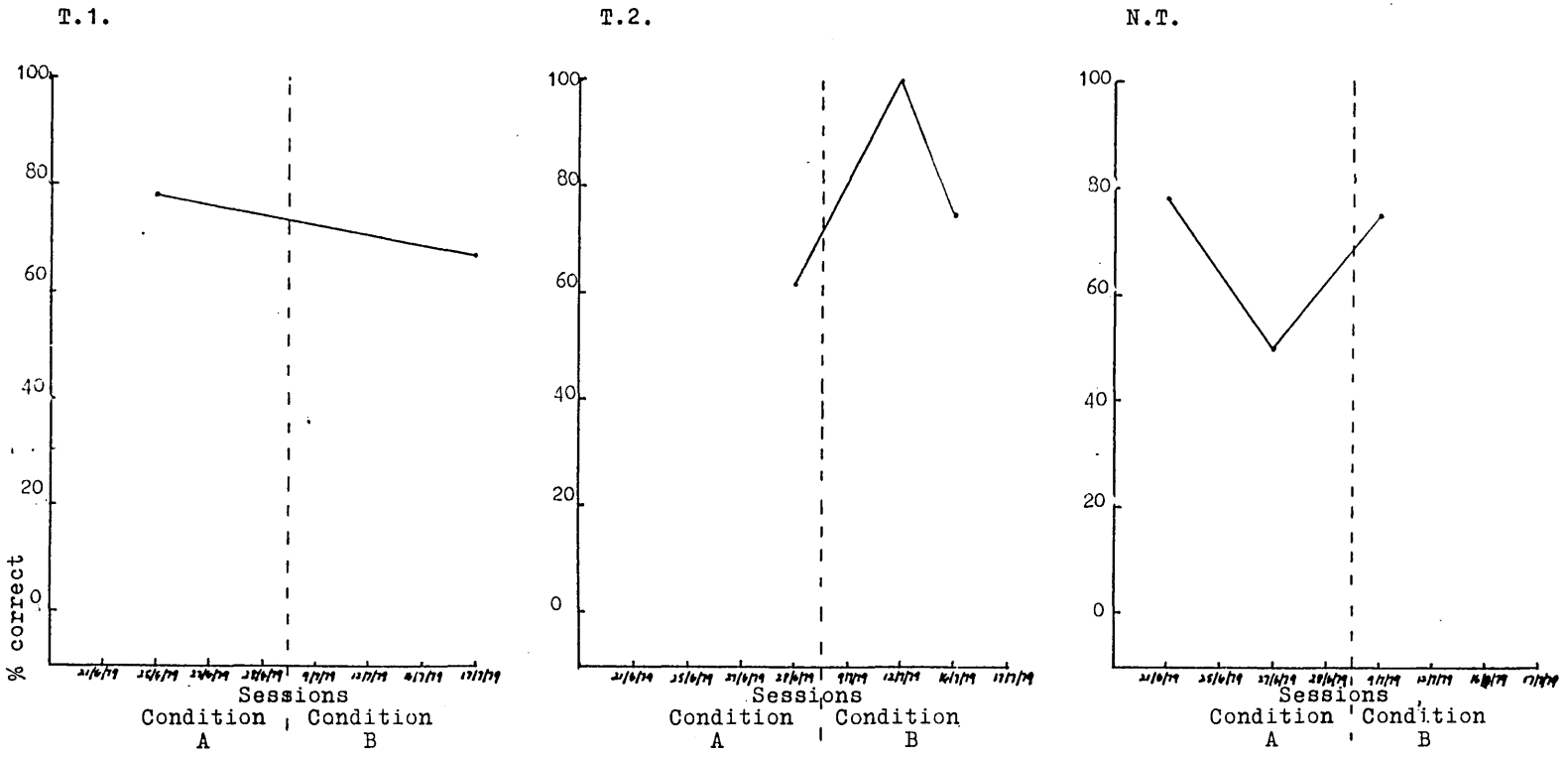
	Condition A	Condition B
i)	Trainer 1	
	Sessions 25.6.79	17.7.79
	Trials (% correct)	
	9(78)	3(67)
ii)	Trainer 2	
	Sessions 28.6.79	12.7.79, 16.7.79
	Trials (% correct)	
	8(62)	3(100), 4(75)
iii)	Non-Trainer	
	Sessions 21.6.79, 27.6.79	9.7.79
	Trials (% correct)	
	18(78), 8(50)	4(75)

Fig. 6-15

Jamie - POST-TEST 1 - Generalisation Probes - Training Category - Pronominal Usages Labelling Actions

STRUCTURE - I'M/I AM VERB-ING (PREP)

Generalisations in Test Conditions A and B



Jamie - Post-Test I - Generalisation Probes

Table 6-16

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - Actions - Persons

STRUCTURE - VERB-ING (PREP)
(verb + ing + prep)

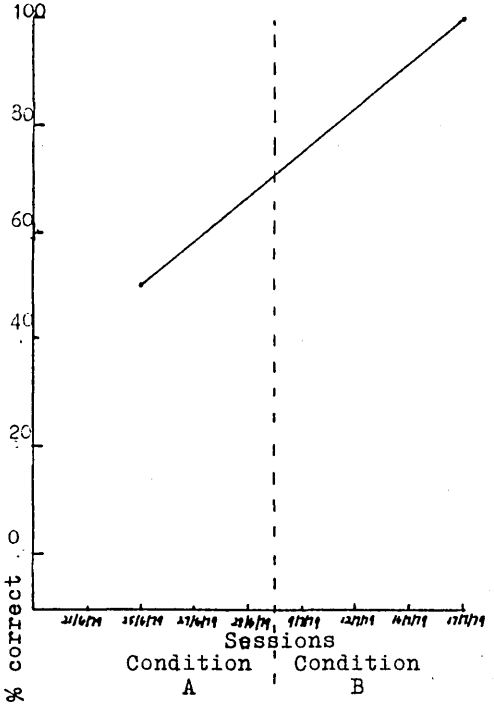
	Condition A	Condition B
i)	Trainer 1	
	Sessions 25.6.79	17.7.79
	Trials (% correct)	
	6(50)	3(100)
ii)	Trainer 2	
	Sessions 28.6.79	12.7.79, 16.7.79
	Trials (% correct)	
	10(30)	5(60), 3(100)
iii)	Non-Trainer	
	Sessions 21.6.79, 27.6.79	9.7.79
	Trials (% correct)	
	12(83), 7(71)	7(57)

Fig. 6-16

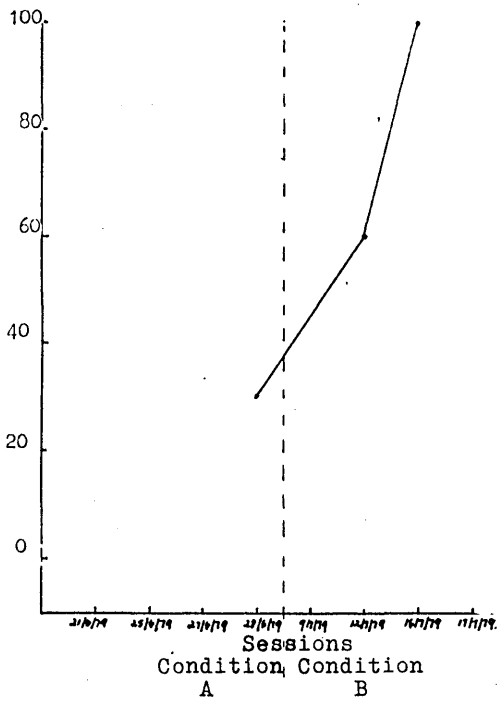
Jamie - POST-TEST 1 - Generalisation Probes - Training Category - Labelling - Actions - (Persons)

STRUCTURE - VERB-ING (PREP) - Generalisation in Test Conditions A and B

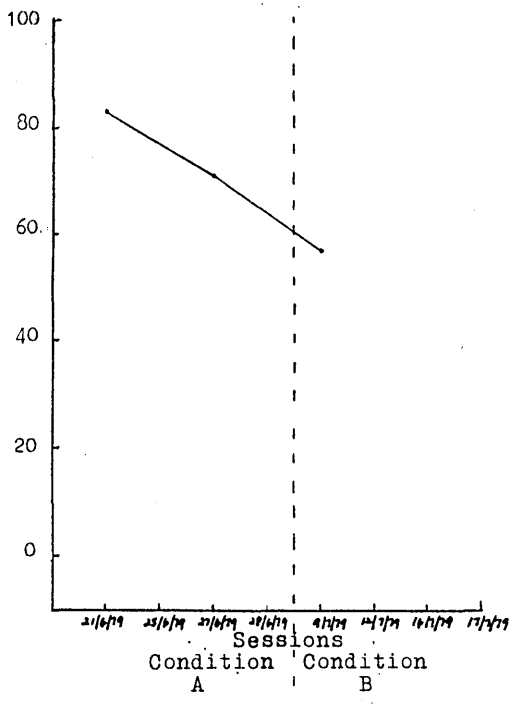
T.1.



T.2.



N.T.



Jamie - Post-Test I - Generalisation Probes

Table 6-17

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

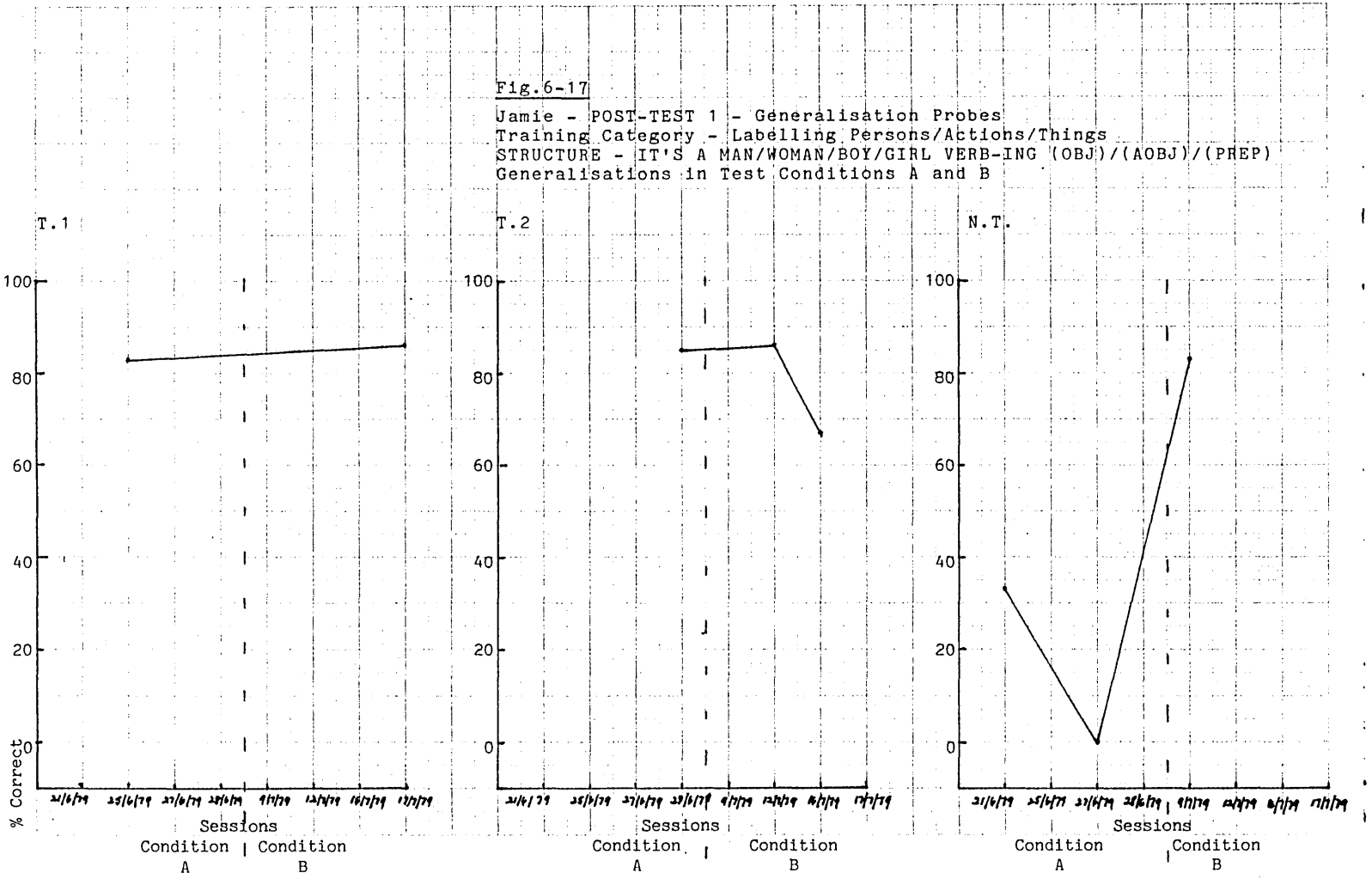
Training Category - Labelling - Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL/VERB-ING (OBJ)/(AOBJ)/(PREP)
(pron + cop + det + subj + verb + ing + (obj) + (det + obj) + (prep))

	Condition A	Condition B
i)	Trainer 1	
	Sessions 25.6.79	17.7.79
	Trials (% correct)	
	12(83)	7(86)
ii)	Trainer 2	
	Sessions 28.6.79	12.7.79, 16.7.79
	Trials (% correct)	
	13(85)	7(86), 6(67)
iii)	Non-Trainer	
	Sessions 21.6.79, 27.6.79	9.7.79
	Trials (% correct)	
	12(33), 10(0)	6(83)

Fig.6-17

Jamie - POST-TEST 1 - Generalisation Probes
Training Category - Labelling Persons/Actions/Things
STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(AOBJ)/(PREP)
Generalisations in Test Conditions A and B



Jamie - POST-TEST 2 - Generalisation Probes (High Structure)

Table 6-18

Summary of Generalisations per Structure by Trials and Sessions in Sub-Tests I and II

Training Category - Labelling Objects (singular)

STRUCTURE - IT'S A NOUN
(pron + cop + det + noun)

No of sessions - 2

Sub-Test I - 5.9.79
Trials (% correct) - 12(58)

Sub-Test II - 10.9.79
Trials (% correct) - 12(42)

Training Category - Labelling Objects (plural)

STRUCTURE - THEY'RE NOUNS
(pron + cop' + noun + pl)

No of sessions - 2

Sub-Test I - 5.9.79
Trials (% correct) - 11(45)

Sub-Test II - 10.9.79
Trials (% correct) - 12(75)

Training Category - Labelling - Persons

STRUCTURE - IT'S PERSON (NAME)
(pron + cop + proper noun)

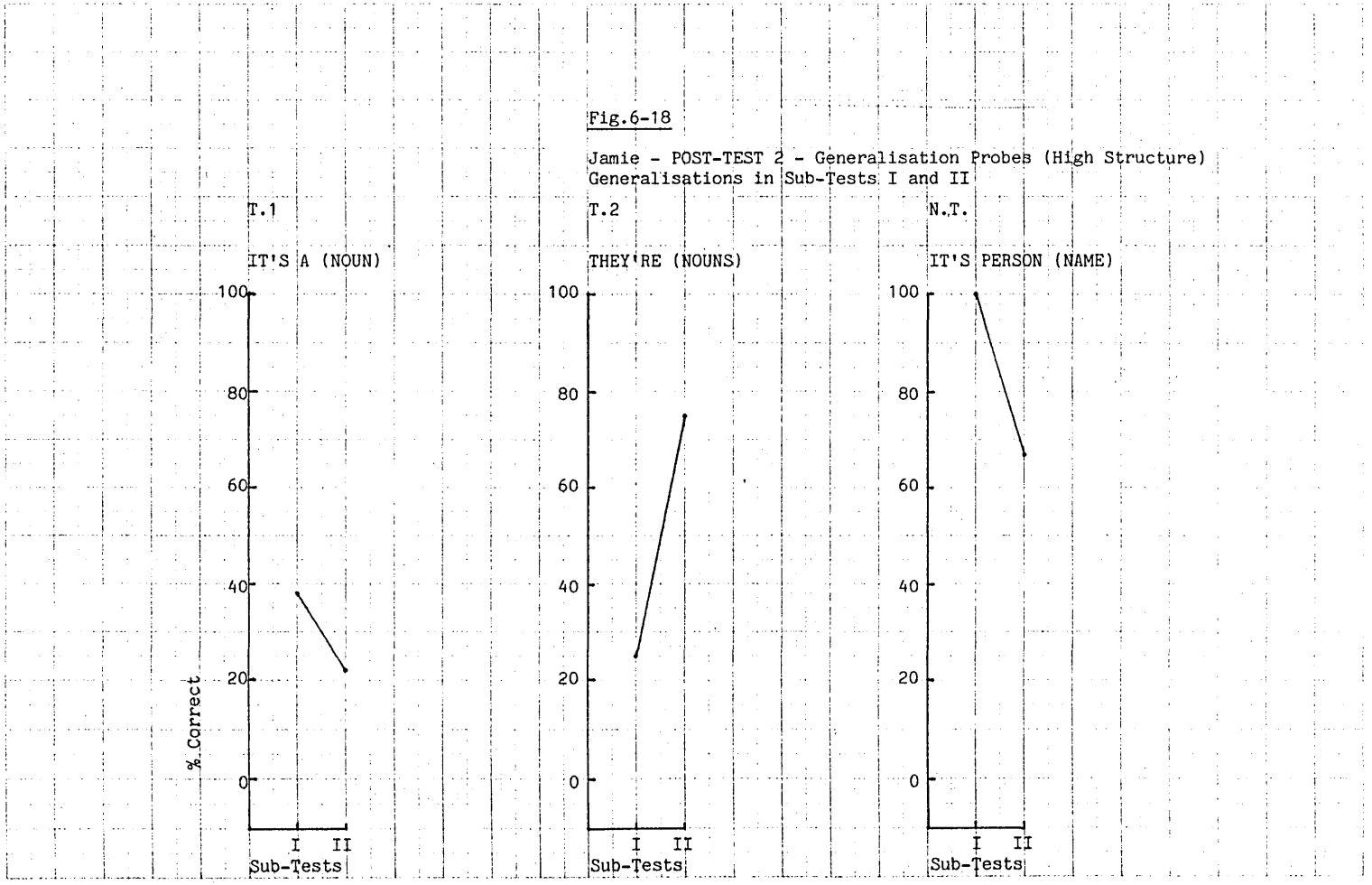
No of sessions - 2

Sub-Test I - 5.9.79
Trials (% correct) - 6(100)

Sub-Test II - 10.9.79
Trials (% correct) - 6(67)

Fig.6-18

Jamie - POST-TEST 2 - Generalisation Probes (High Structure)
Generalisations in Sub-Tests I and II



Jamie - POST-TEST 2 - Generalisation Probes (High Structure)

Table 6-19

Training Category - Labelling Actions (Persons)

STRUCTURE - VERBING (PREP)

No of sessions - 2

Sub-Test I - 5.9.79
Trials (% correct) - 9(67)

Sub-Test II - 10.9.79
Trials (% correct) - 8(62)

Training Category - Labelling Actions + Pronoun I

STRUCTURE - I'M/I AM VERB-ING/(PREP)
(pron + aux + verb + ing/(prep)

No of sessions - 2

Sub-Test I - 5.9.79
Trials (% correct) - 6(67)

Sub-Test II - 10.9.79
Trials (% correct) - 6(67)

Training Category - Labelling Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING
(OBJ)/(AOBJ)/(PREP)
(pron + cop + det + subj + verb + ing +
(obj)/(det + obj)/(prep))

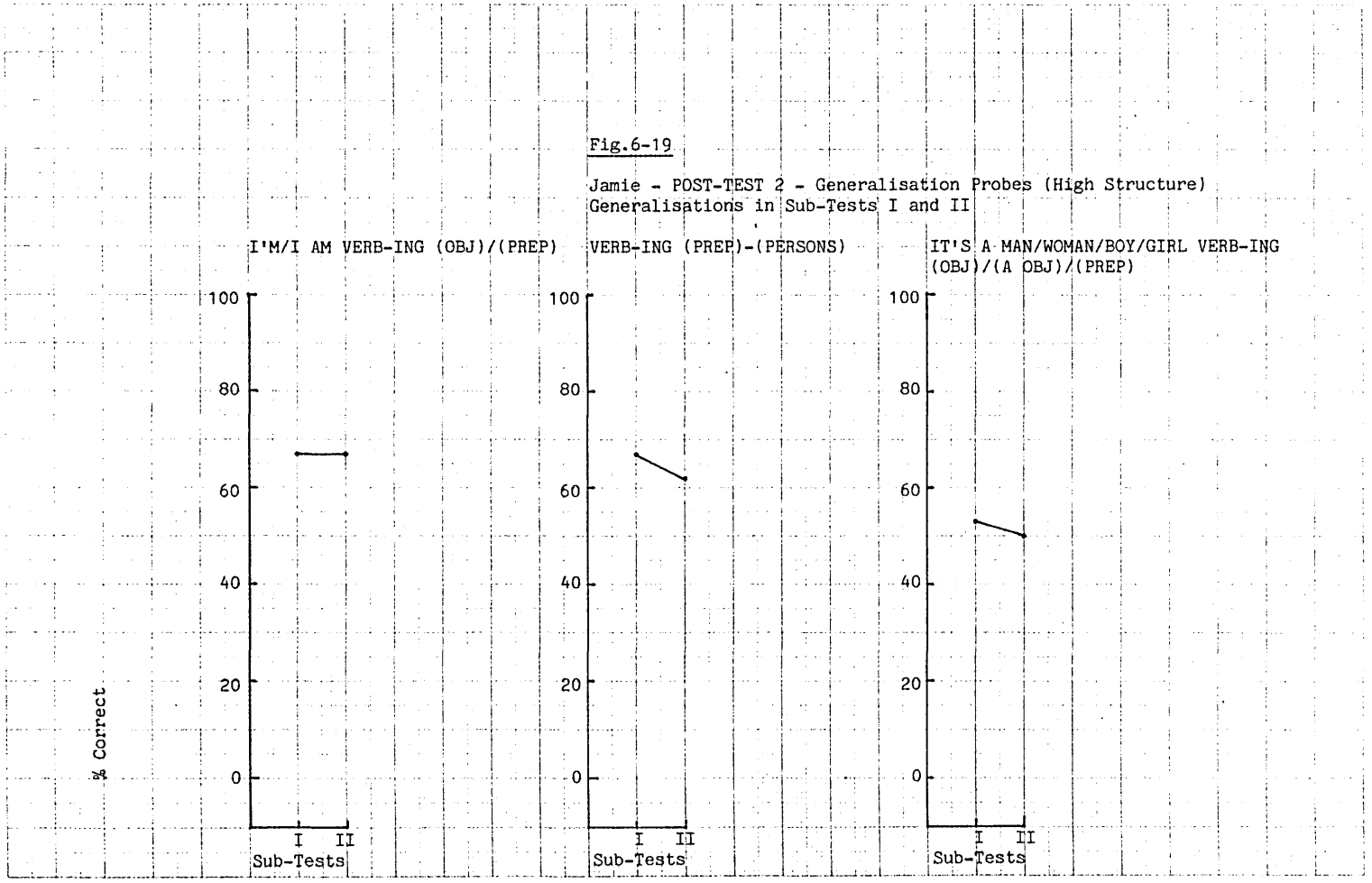
No of sessions - 2

Sub-Test I - 5.9.79
Trials (% correct) - 17(53)

Sub-Test II - 10.9.79
Trials (% correct) - 12(50)

Fig.6-19

Jamie - POST-TEST 2 - Generalisation Probes (High Structure)
Generalisations in Sub-Tests I and II



Jamie - POST-TEST 3 - Generalisation Probes (High Structure)

Table 6-20

Number of sessions - 1

Summary of Generalisations per Structure by Sessions and Trials

Training Category - Labelling Objects (singular)

STRUCTURE - IT'S A (NOUN)
(pron + cop + det + noun)

Trials (% correct) - 7(43)

Training Category - Labelling Objects (plural)

STRUCTURE - THEY'RE (NOUNS)
(pron + cop' + noun + pl)

Trials (% correct) - 5(100)

Training Category - Labelling Persons

STRUCTURE - IT'S PERSON (NAME)
(pron + cop + proper noun)

Trials (% correct) - 3(100)

Training Category - Pronoun Usage + Labelling Action (personal)

STRUCTURE - I AM/I'M VERB-ING (OBJ)/(AOBJ)/(PREP)
(pron + aux + verb-ing (obj) (det + obj) (prep))

Trials (% correct) - 3(100)

Training Category -

STRUCTURE - VERB-ING (OBJ)/(AOBJ)/(PREP)

Trials (% correct) - 3(100)

Training Category - Labelling Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING
(OBJ)/(AOBJ)/(PREP)
(pron + cop + det + subject + verb + ing
+ (obj)/(det + obj)/(prep)

Trials (% correct) - 5(100)

Training Category - YES/NO Discrimination (singular)

STRUCTURE - YES IT IS
(yes + pron + copula)

Trials (% correct) - 8(12)

Training Category - YES/NO Discrimination (plural)

STRUCTURE - YES THEY ARE
(yes + pron + copula + pl)

Trials (% correct) - 6(50)

Training Category - YES/NO Discrimination (singular)

STRUCTURE - NO IT'S A (NOUN)
(No + pron + cop + det + noun)

Trials (% correct) - 10(0)

Training Category - YES/NO Discrimination (plural)

STRUCTURE - NO THEY'RE (NOUNS)

Trials (% correct) - 6(50)

Training Category - Prepositional Usage

MOTOR RESPONSE - IN/ON, BEHIND/IN FRONT, OVER/UNDER,
NEXT TO/OVER THERE

Trials (% correct) - 9(55)

VERBAL RESPONSE - IT'S IN/ON THE (OBJECT) ETC.

Trials (% correct) - 10(60)

Fig. 6-20

Jamie - Post-Test 3 - Generalisation (High Structure) Probes

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-21

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling - Objects (singular)

STRUCTURE - IT'S A (NOUN)
(pron + cop + det + noun)

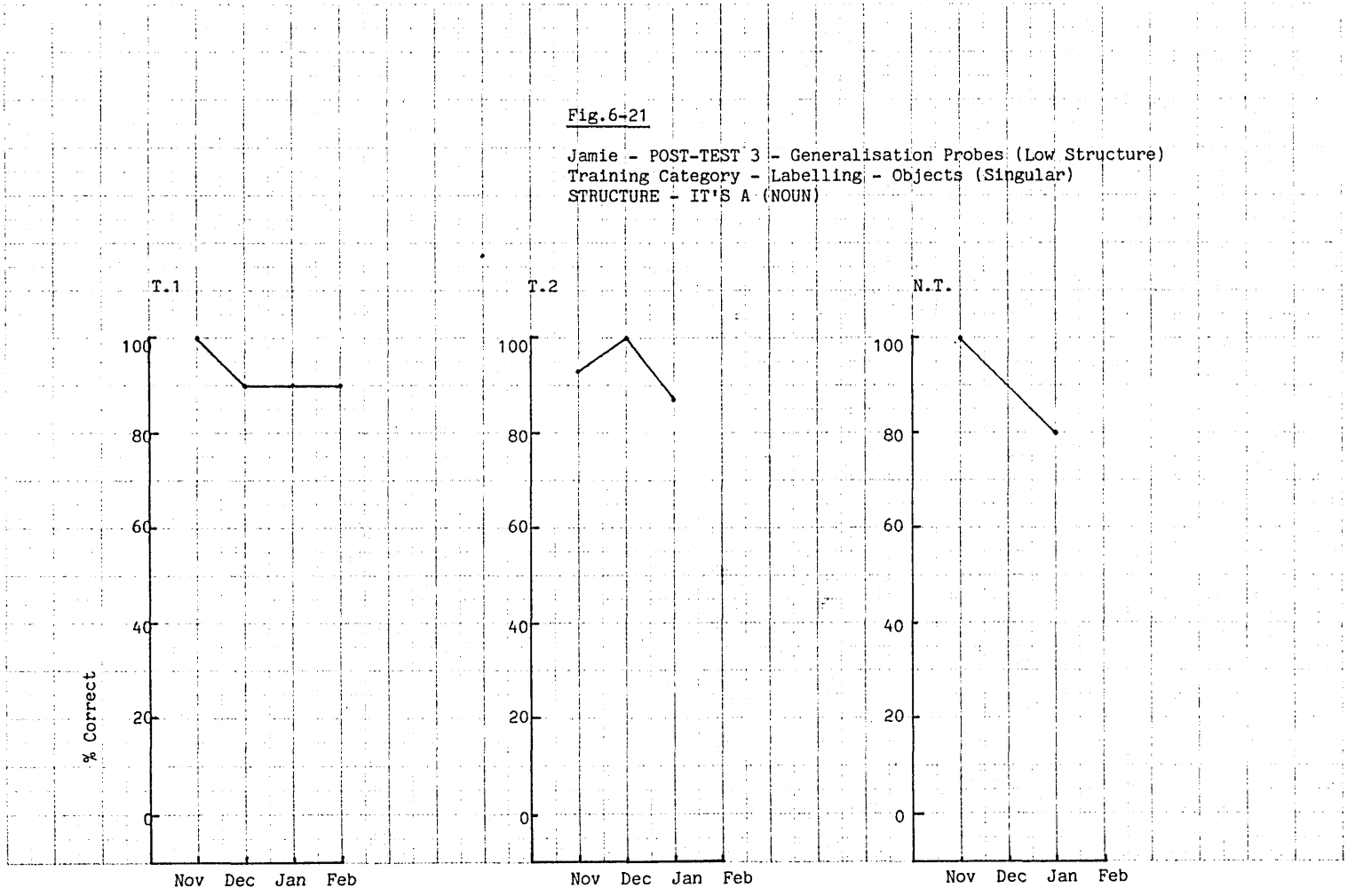
Trainer 1	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	5(100)	5(100)	5(100)	5(80)
Context	3	2	3	4
Trainer 1	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	5(100)	5(80)	5(100)	5(60)
Context	2+3	3/4	1	1
Trainer 1	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	5(100)	5(100)	5(80)	5(100)
Context	1	1	1	1

Trainer 2	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	5(100)	5(80)	4(100)	3(100)
Context	3	1	2 or 3?	3
Trainer 2	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	4(100)	5(80)	4(75)	5(80)
Context	2 + 3	3	3	1
Trainer 2	18.1.80	29.1.80		
Trials (% correct)	4(100)	5(100)		
Context	1	3		

Non-Trainer	7.11.79	29.11.79	30.1.80
Trials (% correct)	5(100)	-	5(80)
Context	3	-	3

Fig.6-21

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Labelling - Objects (Singular)
STRUCTURE - IT'S A (NOUN)



Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-22

Summary of Generalisations per Structure by Sessions, Trials and Context

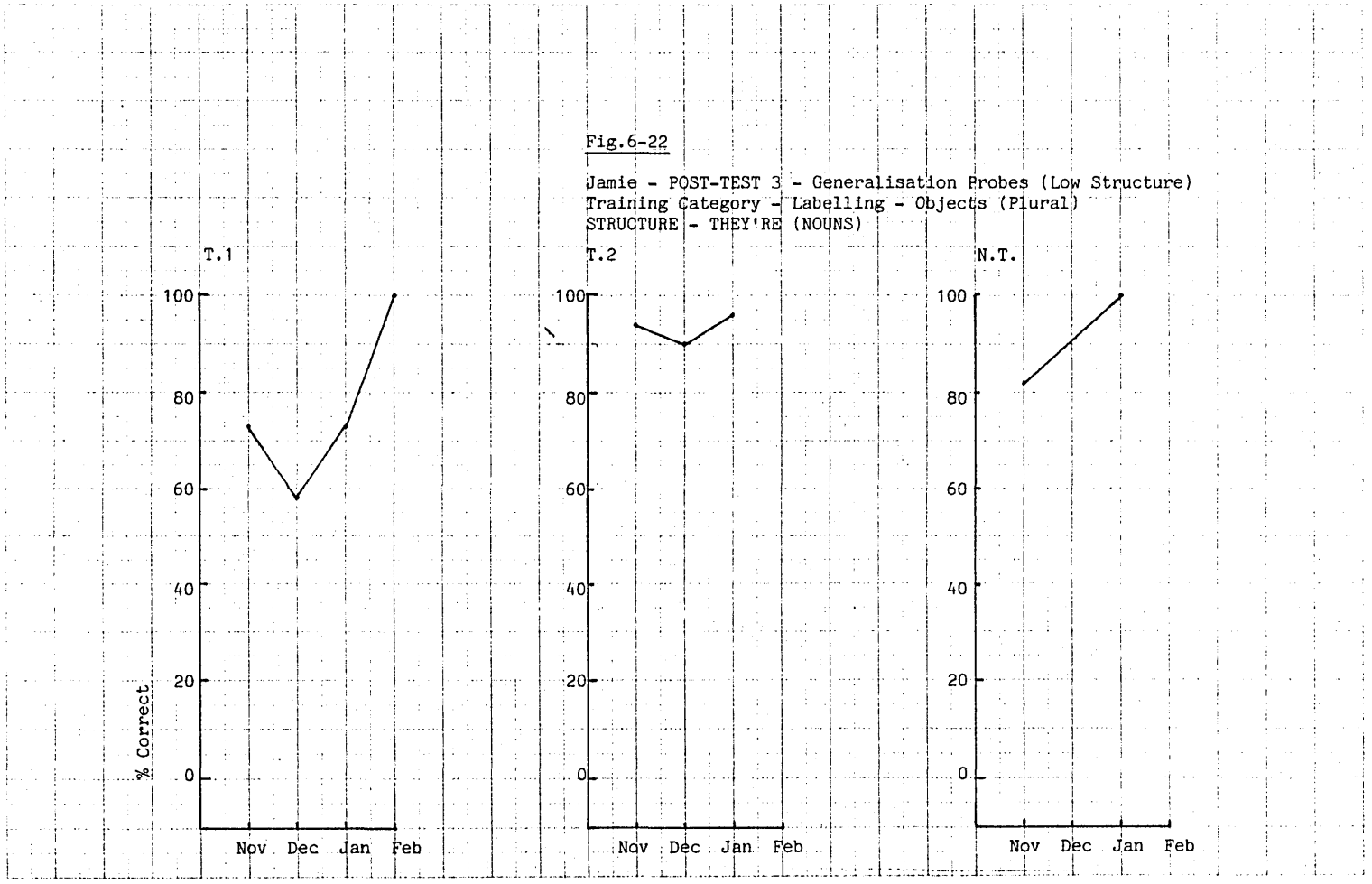
Training Category - Labelling Objects - (Plural)

STRUCTURE - THEY'RE NOUNS
(pron + cop' + noun + pl)

Trainer 1	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	5(100)	6(50)	8(50)	6(67)
Context	3	2	3	4
Trainer 1	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	6(67)	-	6(50)	6(100)
Context	2/3	3/4	1	1
Trainer 1	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	6(83)	6(67)	6(100)	6(100)
Context	1	1	1	1
Trainer 2	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	6(100)	6(83)	4(100)	5(80)
Context	3	1	2/3?	3
Trainer 2	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	4(100)	-	6(100)	6(83)
Context	2/3	-	3	1
Trainer 2	18.1.80	29.1.80		
Trials (% correct)	6(100)	5(100)		
Context	1	3		
Non-Trainer	7.11.79	29.11.79	30.1.80	
Trials (% correct)	6(83)	5(80)	3(100)	
Context	3	3	3	

Fig.6-22

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Labelling - Objects (Plural)
STRUCTURE - THEY'RE (NOUNS)



Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-23

Summary of Generalisations per Structure by Sessions, Trials and Context

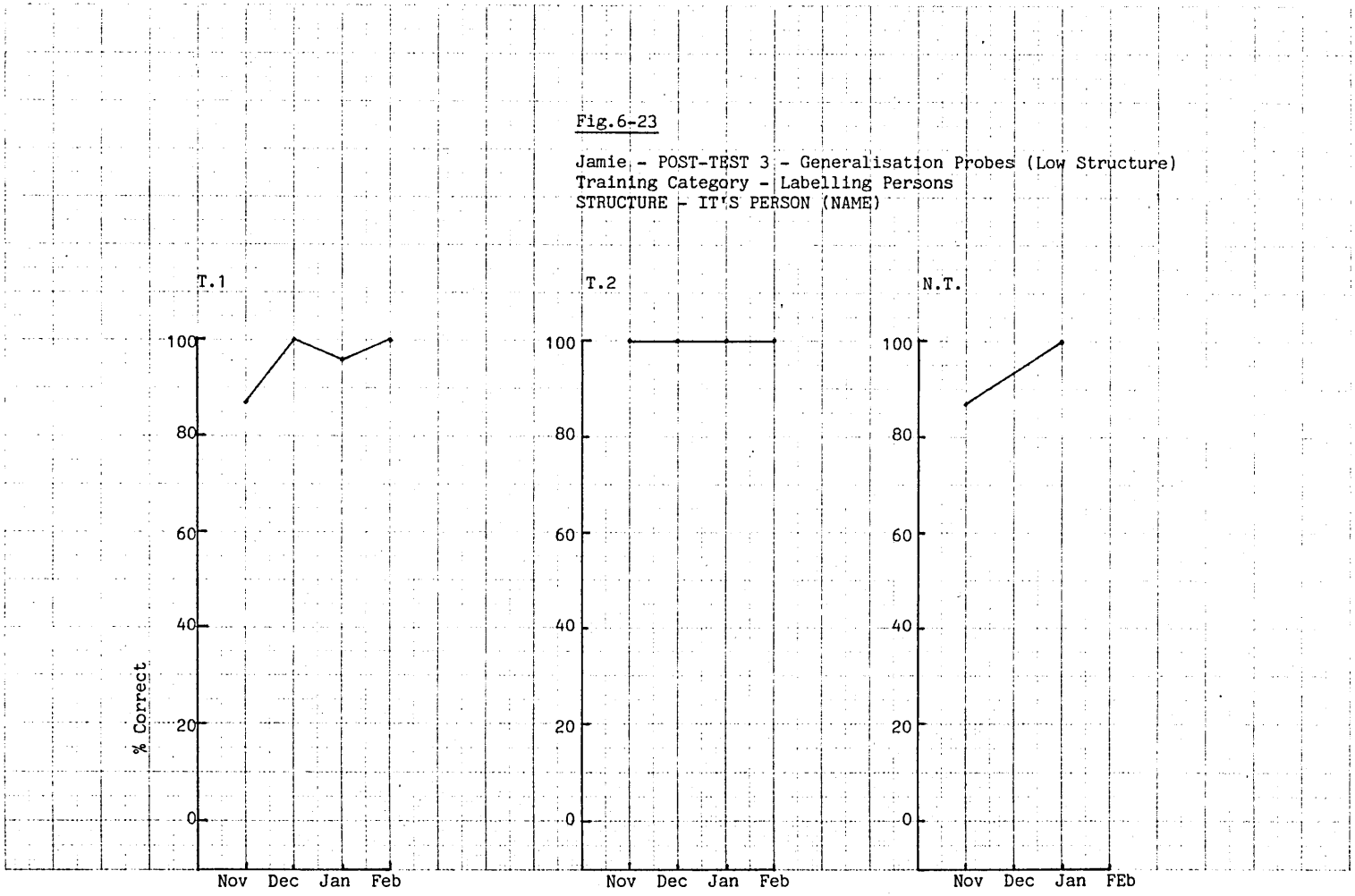
Training Category - Labelling - Persons

STRUCTURE - IT'S PERSON (NAME)
(pron + cop + proper noun)

Trainer 1	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	4(100)	4(75)	2(100)	3(100)
Context	3	2/3	3	4
Trainer 1	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	2(100)	3(100)	4(100)	4(100)
Context	2/3	3/4	1	1
Trainer 1	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	4(75)	4(100)	4(100)	4(100)
Context	1	1	1	1
Trainer 2	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	4(100)	4(100)	3(100)	4(100)
Context	3	1	2/3?	3
Trainer 2	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	3(100)	3(100)	2(100)	4(100)
Context	2/3	3	3	1
Trainer 2	18.1.80	29.1.80		
Trials (% correct)	4(100)	4(100)		
Context	1	3		
Non-Trainer	7.11.79	29.11.79	30.1.80	
Trials (% correct)	4(75)	4(100)	4(100)	
Context	3	3	3	

Fig.6-23

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Labelling Persons
STRUCTURE - IT'S PERSON (NAME)



Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-24

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - I + Labelling - Actions

STRUCTURE - VERB-ING (OBJ)/(AOBJ)/(PREP)/I'M/I AM VERB-ING (OBJ)/(AOBJ)/(PREP) (verb + ing (obj)/(det + obj)/(prep) (pron + aux + verb + ing (obj)/(det + obj)/(prep))

Trainer 1	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	2	3	4
Trainer 1	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	3/4	1	1
Trainer 1	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	1	1	1
Trainer 2	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	1(100)	1(0)	1(100)	1(100)
Context	3	1	2/3?	3
Trainer 2	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	3	3	1
Trainer 2	18.1.80	29.1.80		
Trials (% correct)	1(100)	1(100)		
Context	1	3		
Non-Trainer	7.11.79	29.11.79	30.1.80	
Trials (% correct)	1(100)	-	-	
Context	3	-	-	

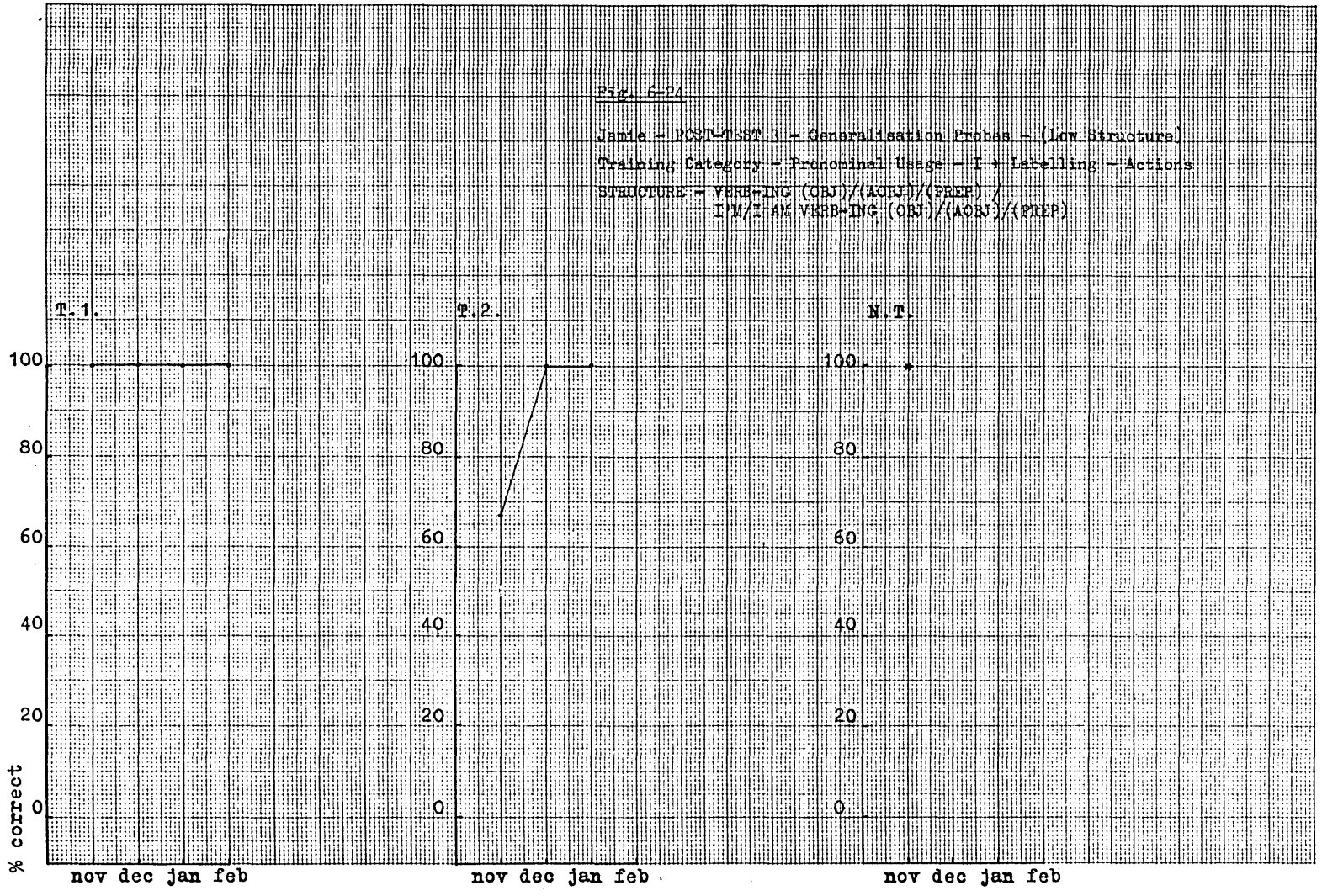


Fig. 6-24
Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Pronominal Usage - I + Labelling - Actions
STRUCTURE - VERB-ING (OBJ)/(ADJ)/(PREP) /
I'M/I AM VERB-ING (OBJ)/(ADJ)/(PREP)
T.1.
T.2.
N.T.
100
80
60
40
20
0
% correct
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-25

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling - Actions - Persons

STRUCTURE - VERB-ING (OBJ)/(AOBJ)/(PREP)
(verb+ing +: (obj)/(det + obj)/(prep)

Trainer 1	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	2	3	4
Trainer 1	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	3/4	1	1
Trainer 1	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	1(100)	1(0)	1(100)	1(100)
Context	1	1	1	1
Trainer 2	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	1	2/3?	3
Trainer 2	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	3	3	1
Trainer 2	18.1.80	29.1.80		
Trials (% correct)	1(100)	1(100)		
Context	1	3		
Non-Trainer	7.11.79	29.11.79	30.1.80	
Trials (% correct)	1(100)	-	-	
Context	3	-	-	

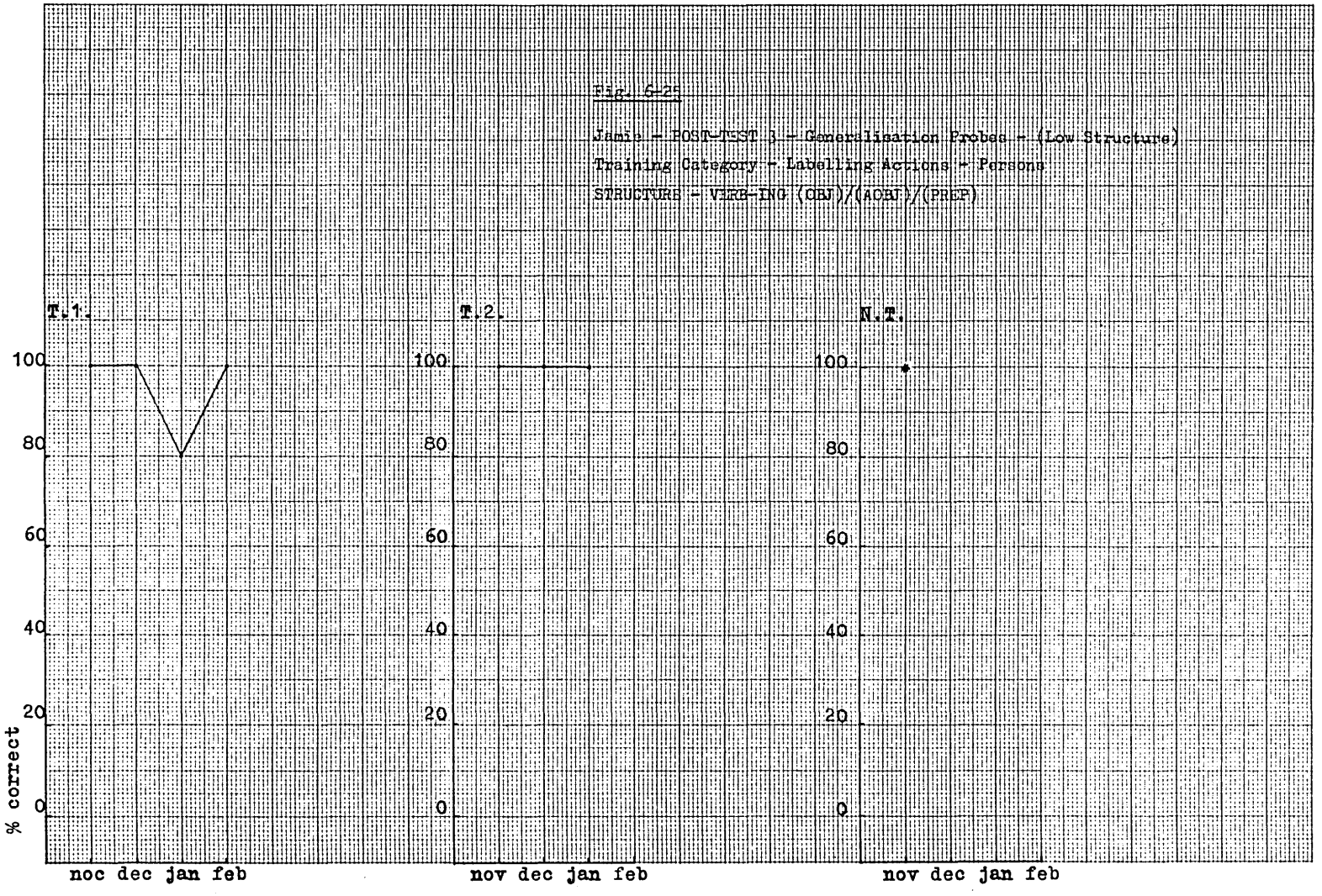


Fig. 6-25
Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Labelling Actions - Persons
STRUCTURE - VERB-ING (OBJ)/(ADJ)/(PREP)
T.1.
T.2.
N.T.
% correct
100
80
60
40
20
0
noc dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-26

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling (Persons/Actions/Things)

STRUCTURE - IT'S A MAN/WOMAN/GIRL/BOY/VERB-ING
(OBJ)/(AOBJ)/(PREP)
(pron + cop + det + subj + verb + ing +
(obj)/(det + obj)/(prep)

Trainer 1	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	3(67)	2(100)	1(100)	1(100)
Context	3	2/3	3	4
Trainer 1	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	2(100)	-	3(100)	1(0)
Context	3	-	1	1
Trainer 1	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	3(100)	3(100)	3(100)	3(100)
Context	1	1	1	1

Trainer 2	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	3(67)	3(67)	2(100)	-
Context	3	1	2/3?	3
Trainer 2	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	2(100)	3(100)	2(100)	3(100)
Context	2/3	3	3	1
Trainer 2	18.1.80	29.1.80		
Trials (% correct)	3(67)	2(100)		
Context	1	1		

Non-Trainer	7.11.79	29.11.79	30.1.80
Trials (% correct)	3(67)	-	-
Context	3	3	3

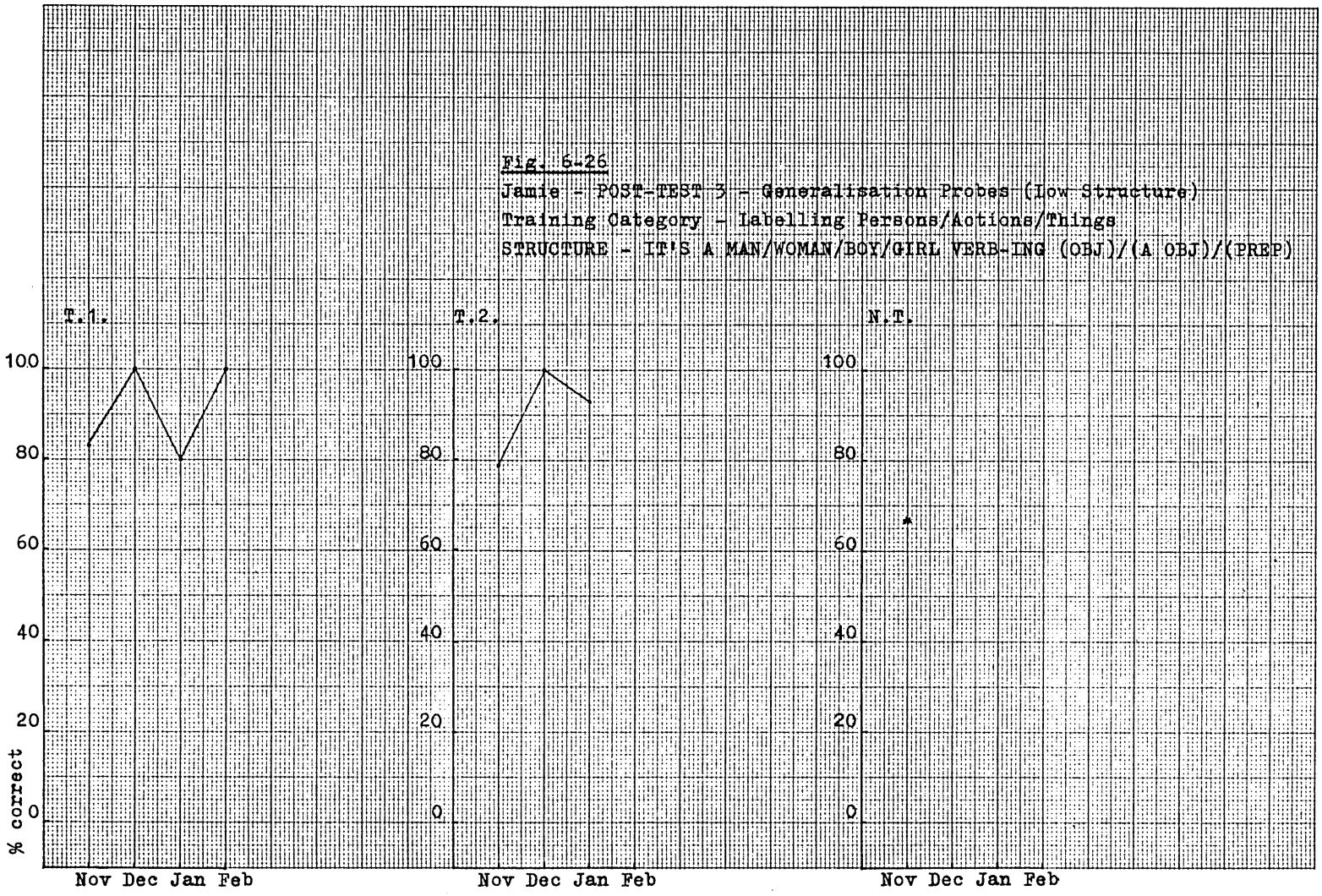


Fig. 6-26
Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Labelling Persons/Actions/Things
STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(A OBJ)/(PREP)
T.1.
T.2.
N.T.
% correct
100
80
60
40
20
0
Nov Dec Jan Feb
Nov Dec Jan Feb
Nov Dec Jan Feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-27

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - YES/NO Discrimination (singular)

STRUCTURE - YES IT IS (yes + pron + copula)

Trainer 1	4.12.79	5.12.79	10.1.80	14.1.80
Trials (% correct)	3(100)	5(100)	4(75)	4(100)
Context	3	4	3	3/4
Trainer 1	21.1.80	24.1.80	28.1.80	30.1.80
Trials (% correct)	4(100)	4(100)	4(100)	4(75)
Context	1	1	1	1
Trainer 1	5.2.80	26.2.80		
Trials (% correct)	4(100)	4(100)		
Context	1	1		
Trainer 2	12.12.79	13.12.79	4.1.80	9.1.80
Trials (% correct)	3(33)	2(100)	4(100)	2(100)
Context	3	3/2	3	3
Trainer 2	14.1.80	18.1.80	29.1.80	
Trials (% correct)	4(100)	4(75)	4(100)	
Context	1	1	3	
Non-Trainer	7.12.79	12.12.79	30.1.80	
Trials (% correct)	4(75)	4(25)	4(100)	
Context	3	3	3	

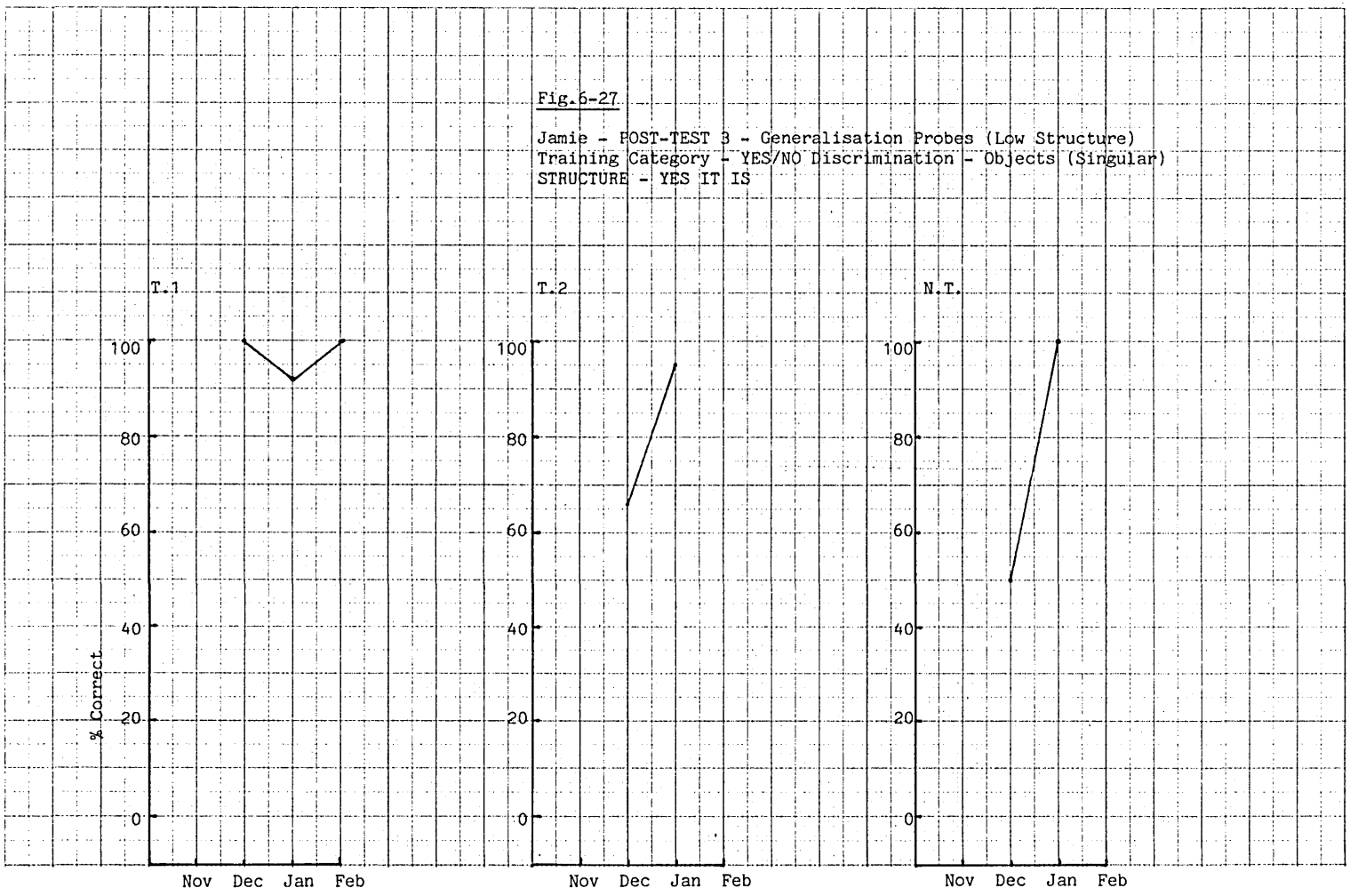


Fig.6-27
Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - YES/NO Discrimination - Objects (Singular)
STRUCTURE - YES IT IS
T.1
T.2
N.T.
% Correct
100
80
60
40
20
0
Nov
Dec
Jan
Feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-28

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Yes/No Discrimination

STRUCTURE - NO IT'S A (NOUN)
(No + pron + cop' + det + noun)

Trainer 1	4.12.79	5.12.79	10.1.80	14.1.80
Trials (% correct)	5(60)	4(75)	4(100)	4(75)
Context	3	4	3	4/3
Trainer 1	21.1.80	24.1.80	28.1.80	30.1.80
Trials (% correct)	4(75)	4(50)	4(75)	4(100)
Context	1	1	1	1
Trainer 1	5.2.80	26.2.80		
Trials (% correct)	2(100)	4(50)		
Context	1	1		
Trainer 2	12.12.79	13.12.79	4.1.80	9.1.80
Trials (% correct)	2(50)	4(75)	2(50)	3(67)
Context	3	3/2	3	3
Trainer 2	14.1.80	18.1.80	29.1.80	
Trials (% correct)	4(25)	4(50)	3(33)	
Context	1	1	3	
Non-Trainer	7.12.79	12.12.79	30.1.80	
Trials (% correct)	4(75)	4(75)	2(0)	
Context	3	3	3	

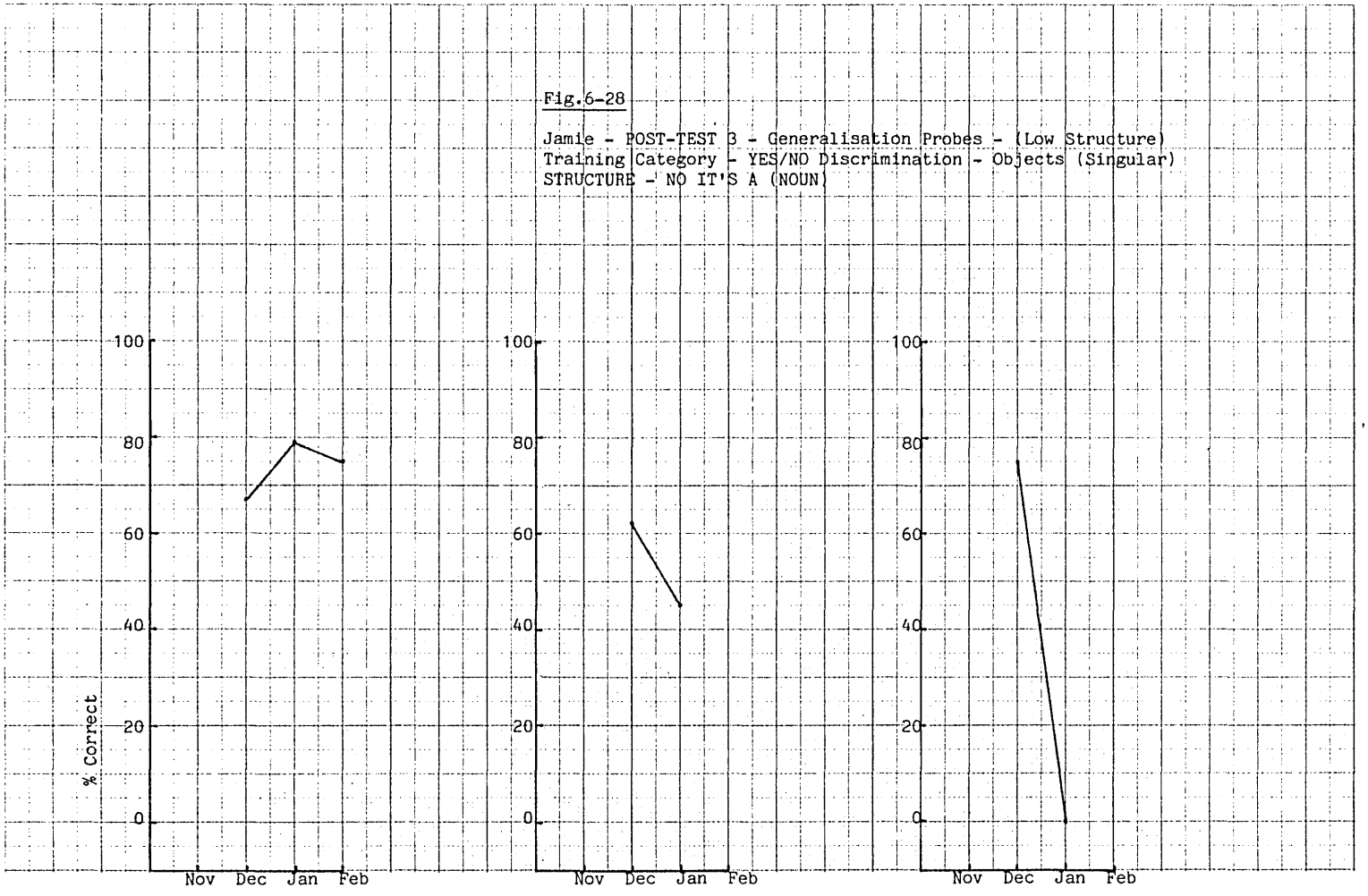


Fig.6-28
Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - YES/NO Discrimination - Objects (Singular)
STRUCTURE - NO IT'S A (NOUN)
% Correct
100
80
60
40
20
0
Nov
Dec
Jan
Feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-29

Summary of Generalisations per Structure by Sessions and Trials

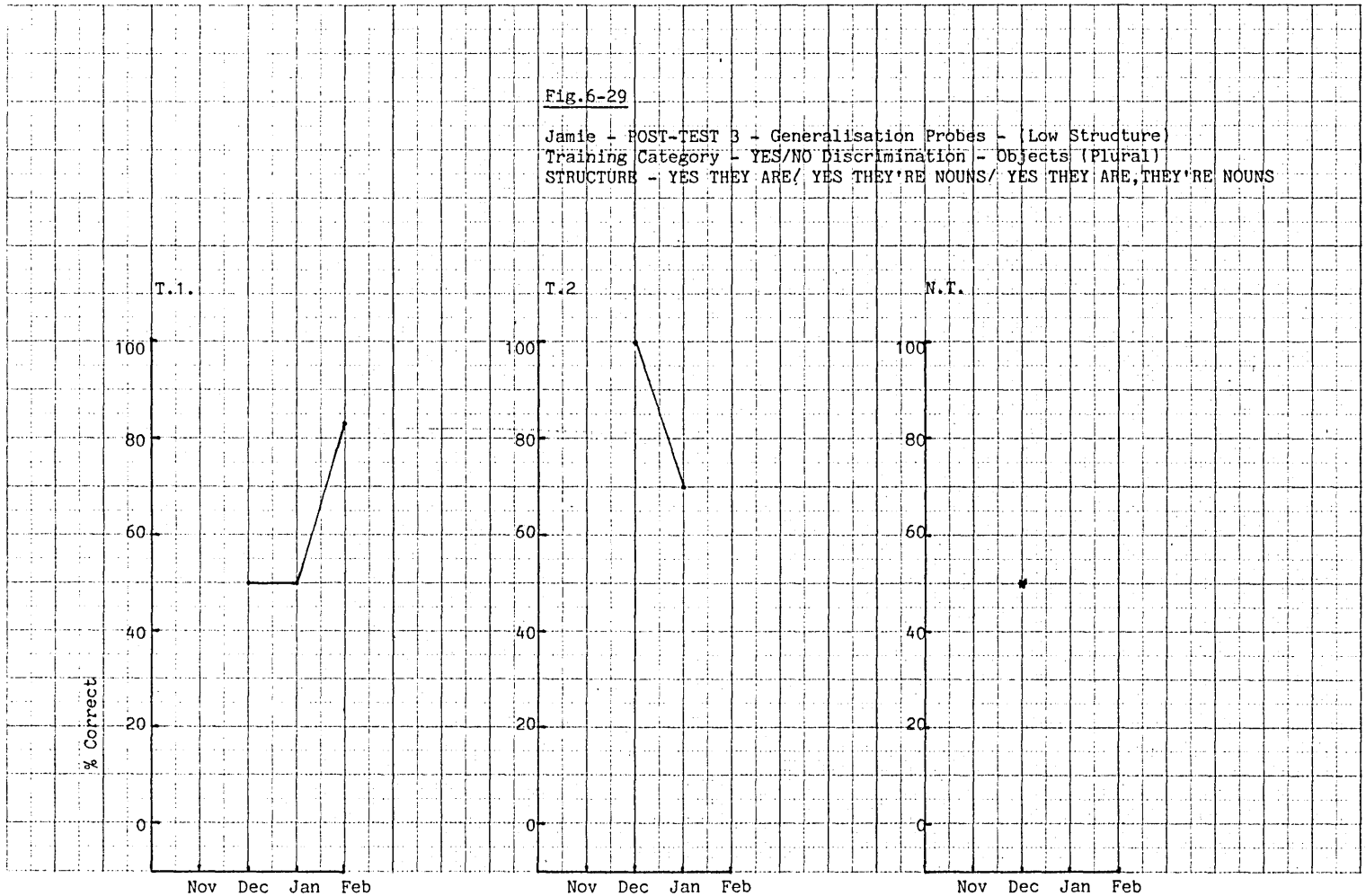
Training Category - Yes/No Discrimination

STRUCTURE - YES THEY ARE/YES THEY'RE NOUNS/YES THEY ARE THEY'RE (NOUNS)
(yes + pron + copula + pl) - (yes + pron + cop' + noun + pl) - (yes + pron + copula + pron + cop' + noun + pl)

Trainer 1	4.12.79	5.12.79	10.1.80	14.1.80
Trials (% correct)	6(33)	3(67)	2(0)	3(67)
Context	3	4	2/3	4/3
Trainer 1	21.1.80	24.1.80	28.1.80	30.1.80
Trials (% correct)	3(67)	3(67)	3(33)	3(67)
Context	1	1	1	1
Trainer 1	5.2.80	26.2.80		
Trials (% correct)	3(100)	3(67)		
Context	1	1		
Trainer 2	12.12.79	13.12.79	4.1.80	9.1.80
Trials (% correct)	1(100)	3(100)	2(50)	2(100)
Context	3	2/3	3	3
Trainer 2	14.1.80	18.1.80	29.1.80	
Trials (% correct)	3(100)	3(33)	3(67)	
Context	1	1	3	
Non-Trainer	7.12.79	12.12.79		
Trials (% correct)	3(33)	3(67)		
Context	3	3		

Fig.6-29

Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - YES/NO Discrimination - Objects (Plural)
STRUCTURE - YES THEY ARE/ YES THEY'RE NOUNS/ YES THEY ARE, THEY'RE NOUNS



Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-30

Summary of Generalisations per Structure by Sessions and Trials

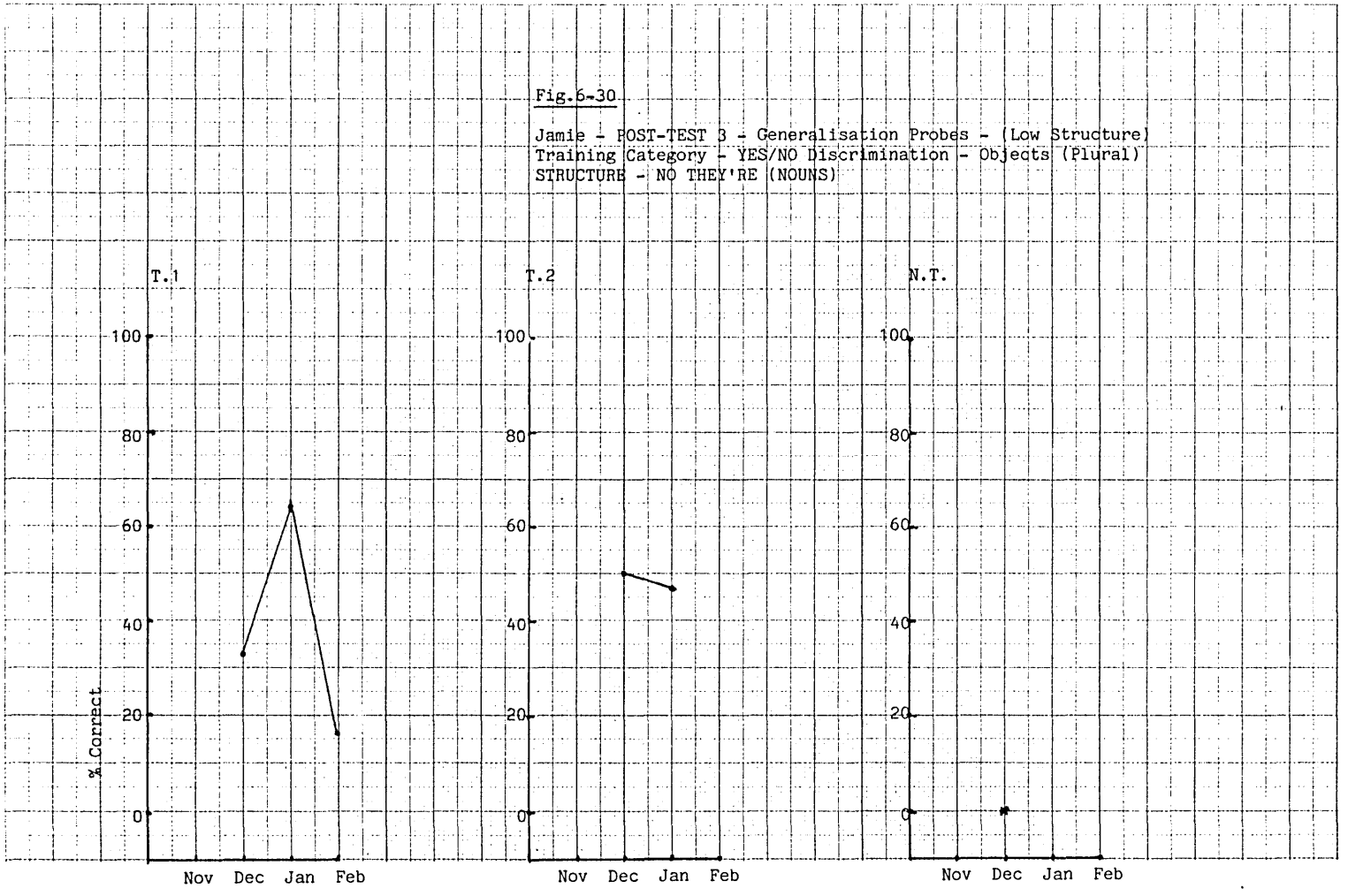
Training Category - Yes/No Discrimination

STRUCTURE - NO THEY'RE (NOUNS)
(No + pron + cop' + noun + pl)

Trainer 1	4.12.79	5.12.79	10.1.80	14.1.80
Trials (% correct)	3(67)	3(0)	2(50)	3(33)
Context	3	4	3/2	4/3
Trainer 1	21.1.80	24.1.80	28.1.80	30.1.80
Trials (% corrct)	3(67)	3(100)	3(100)	3(33)
Context	1	1	1	1
Trainer 1	5.2.80	26.2.80		
Trials (% correct)	3(0)	3(33)		
Context	1	1		
Trainer 2	12.12.79	13.12.79	4.1.80	9.1.80
Trials (% correct)	2(100)	3(0)	2(100)	2(100)
Context	3	2/3	3	3
Trainer 2	14.1.80	18.1.80	29.1.80	
Trials (% correct)	3(0)	3(33)	3(0)	
Context	1	1	3	
Non-Trainer	7.12.79	12.12.79		
Trials (% correct)	3(0)	3(0)		
Context	3	3		

Fig.6-30

Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - YES/NO Discrimination - Objects (Plural)
STRUCTURE - NO THEY'RE (NOUNS)



Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-31

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - IN

MOTOR RESPONSE - (Manipulation of objects)

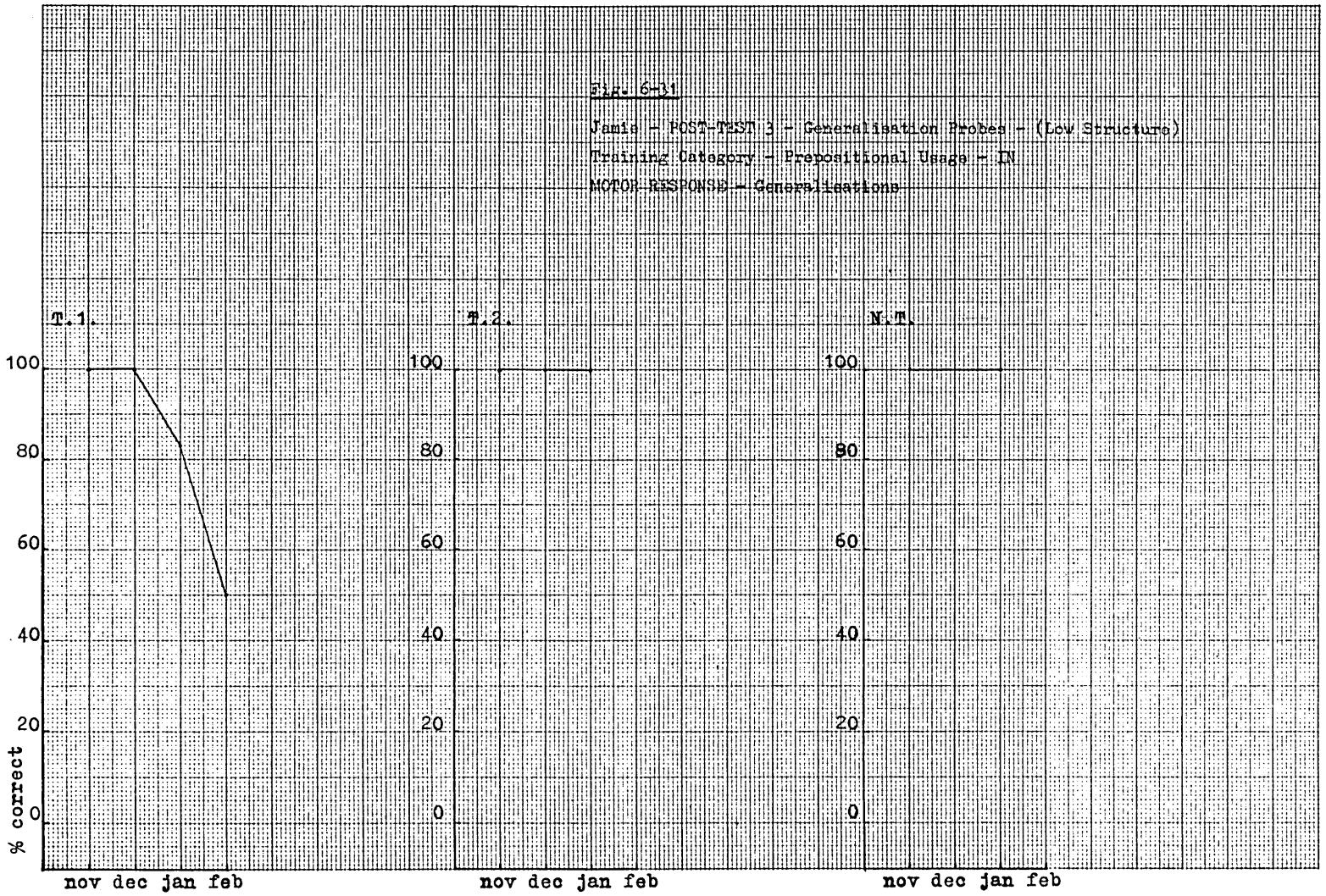
Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	2	3	4
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	1(100)	1(100)	1(0)	1(100)
Context	3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(0)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	1	2/3	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3/2	3	3	1
Trainer 2				
Date	18.1.80	28.1.80		
Trials (%% correct)	1(100)	1(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	28.11.79	29.11.79	30.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	3	3	3

Fig. 6-31

Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)

Training Category - Prepositional Usage - IN

MOTOR RESPONSE - Generalisations



Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-32

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - IN

STRUCTURE - IT'S IN THE (OBJECT)/IN THE (OBJECT)/ IT'S IN (OBJECT)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	2(100)	2(100)	2(100)	1(100)
Context	3	2	3	4
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	2(100)	2(100)	2(100)	1(100)
Context	3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	2(100)	1(100)	2(100)	2(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	2(50)	3(100)	2(100)	2(100)
Context	3	1	2/3	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	2(100)	2(50)	2(100)	2(100)
Context	3/2	3	1	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	2(50)	2(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	28.11.79	29.11.79	30.1.80
Trials (% correct)	1(100)	2(100)	2(100)	2(100)
Context	3	3	3	3

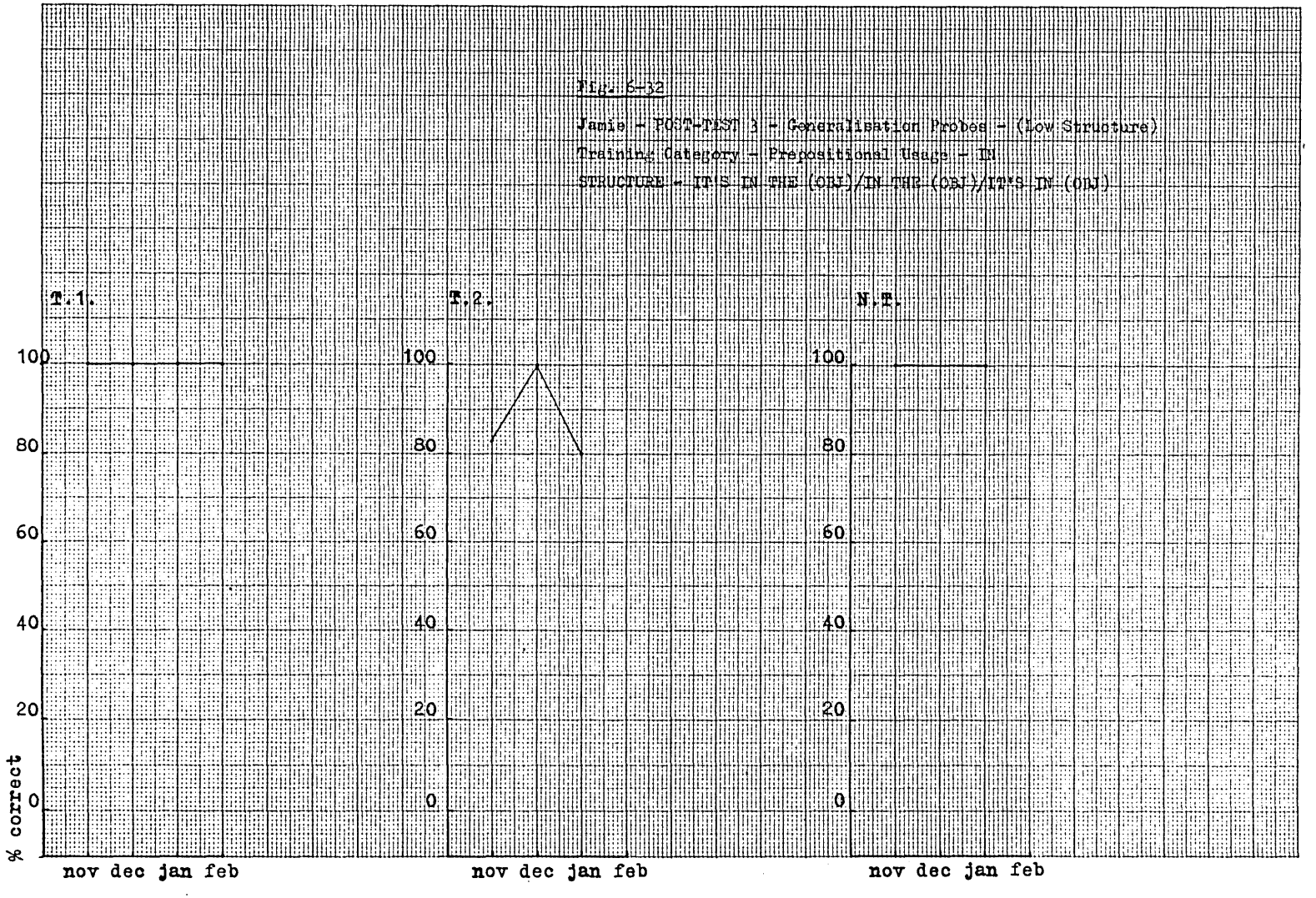


Fig. 6-32
Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - IN
STRUCTURE - IT'S IN THE (OBJ)/IN THE (OBJ)/IT'S IN (OBJ)
T.1.
T.2.
N.E.
% correct
100
80
60
40
20
0
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-33

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - ON

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	1(100)	2(100)	1(0)	1(100)
Context	3	2	3	4
Trainer 1				
Date	10.1.80	14.1.80	28.1.80	24.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	1(100)	1(100)	-	1(100)
Context	3	1	-	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3/2	3	3	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	1(100)	1(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	28.11.79	29.11.79	30.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	3	3	3

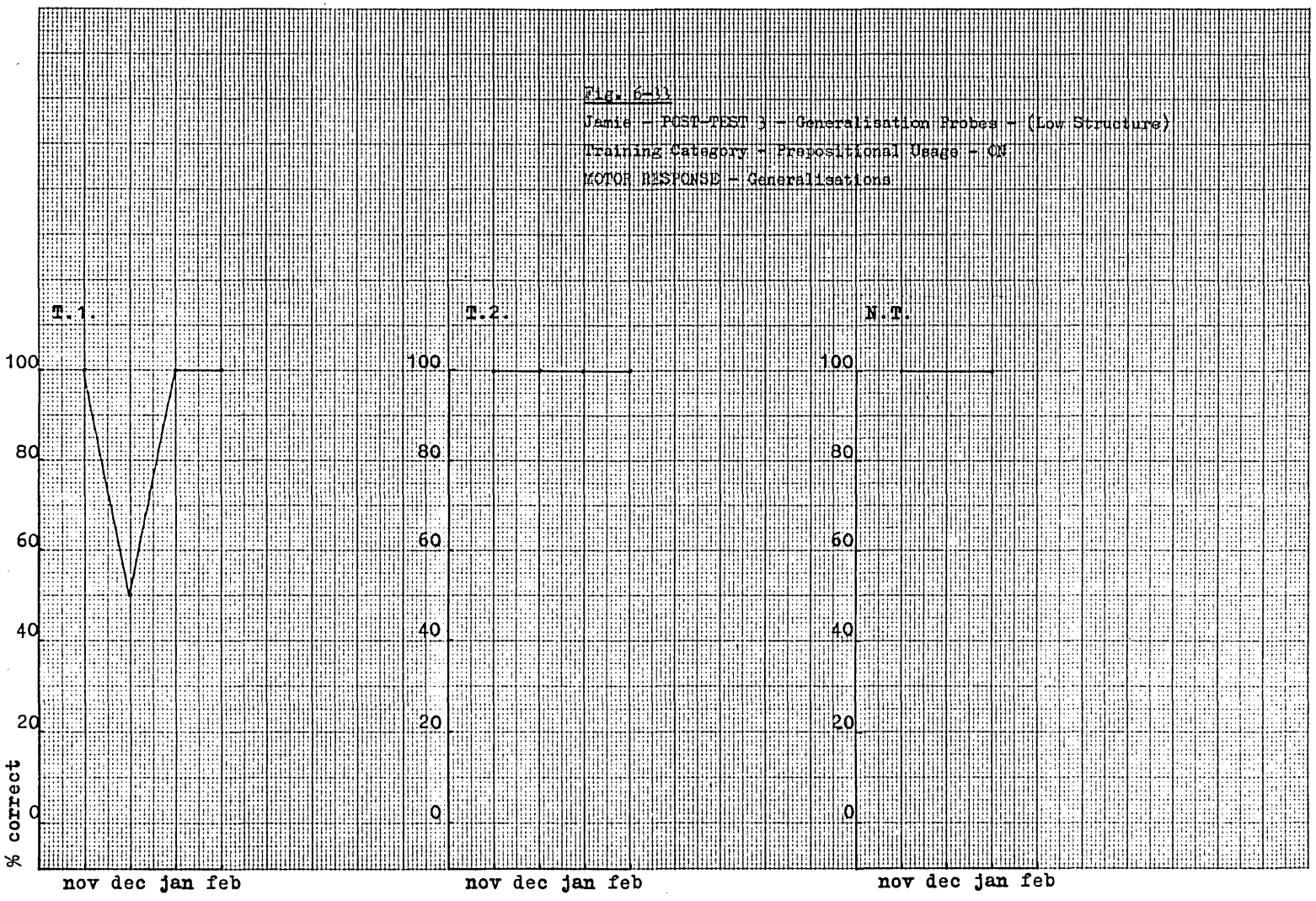


Fig. 6-11
Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - ON
MOTOR RESPONSE - Generalisations
T.1.
T.2.
N.T.
100
80
60
40
20
0
% correct
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-34

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - ON

STRUCTURE - IT'S ON THE (OBJECT)/ON THE (OBJECT)/ IT'S ON (OBJECT) (pronoun+cop'+preposition+det+noun/preposition+det(noun (pronoun+cop'+preposition(noun)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	2(100)	2(100)	-	1(100)
Context	3	2	-	4
Trainer 1				
Date	10.1.80	14.1.80	28.1.80	24.1.80
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	2(50)	2(100)	2(100)	1(100)
Context	1	1	2	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	2(100)	1(0)	-	2(100)
Context	3	1	-	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	3/2	3	3	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	2(50)	2(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	28.11.79	29.11.79	30.1.80
Trials (% correct)	2(100)	2(50)	2(100)	2(100)
Context	3	3	3	3

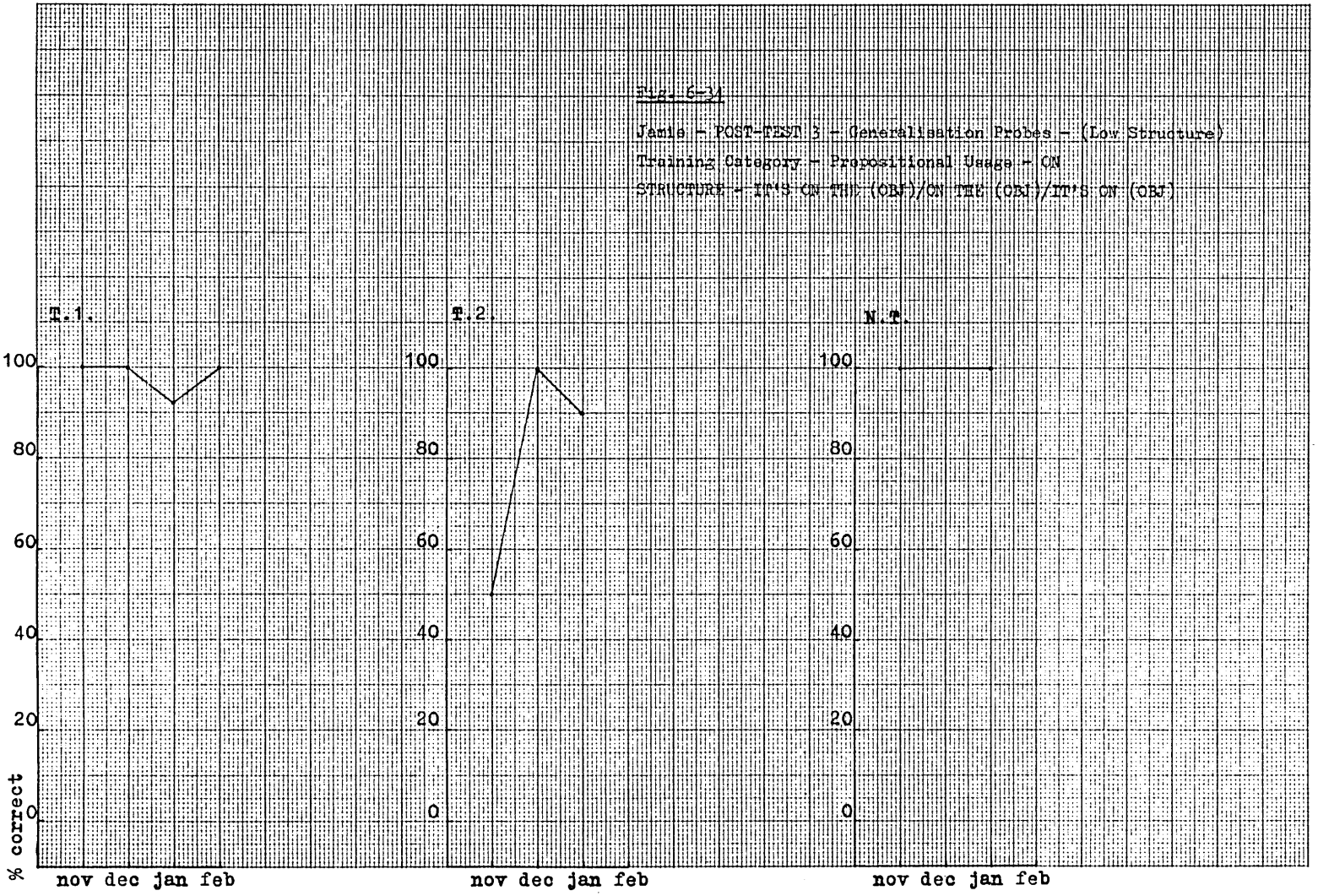


Fig. 6-31
Jamie - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Propositional Usage - ON
STRUCTURE - IT'S ON THE (OBJ)/ON THE (OBJ)/IT'S ON (OBJ)
T.1.
T.2.
N.T.
100
80
60
40
20
0
% correct
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-35

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - BEHIND

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	1(100)	1(100)	1(0)	1(100)
Context	3	2	3	4
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	1(0)	1(100)	1(100)	1(100)
Context	2/3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	1(100)	1(100)	1(100)	-
Context	3	1	2/3	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	1(0)	1(100)	1(100)	1(0)
Context	2/3	3	3	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	1(100)	1(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	29.11.79	30.1.80	
Trials (% correct)	1(100)	1(100)	1(100)	
Context	3	3	3	

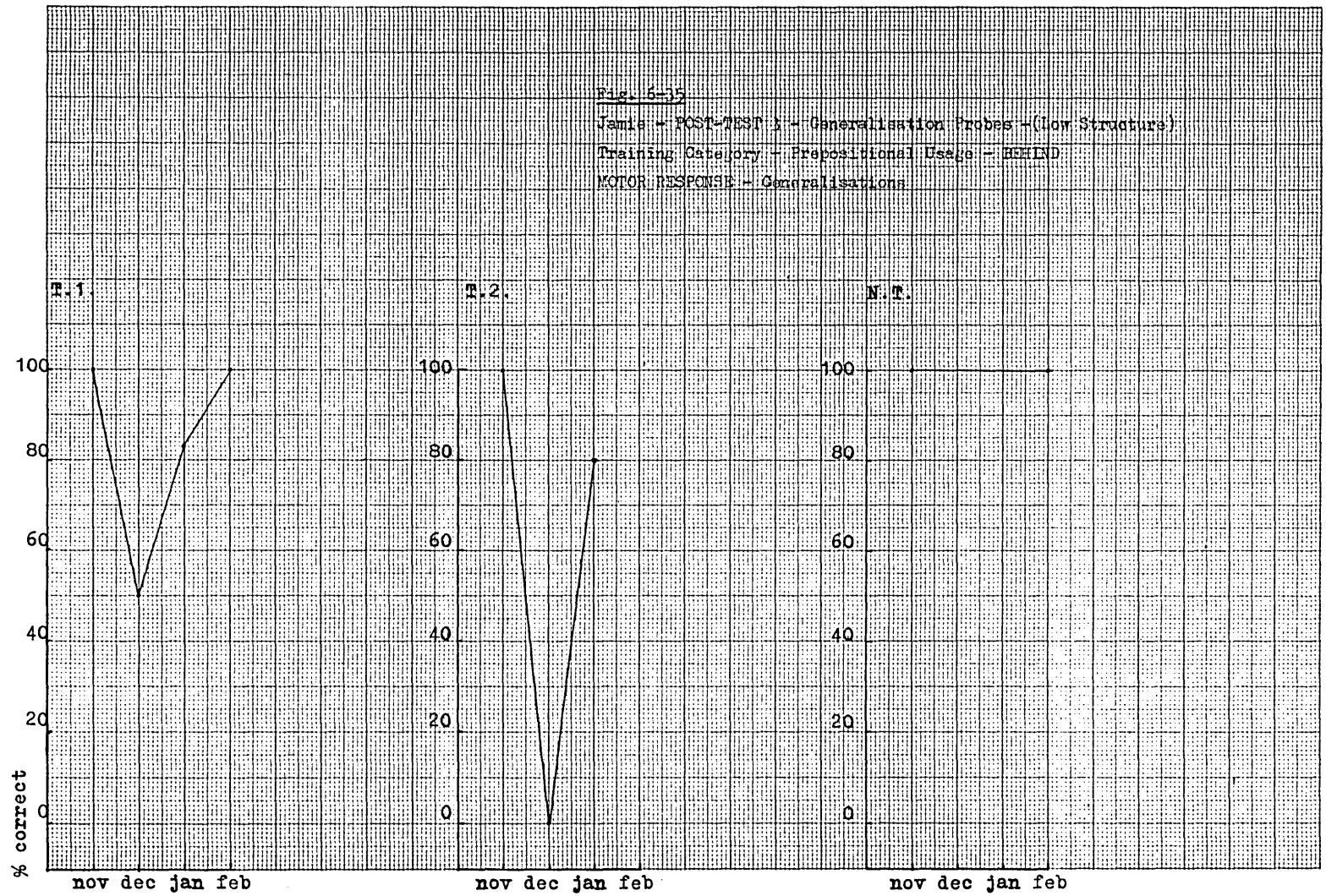


Fig. 6-35
Jamie - POST-TEST 1 - Generalisation Probes - (low Structure)
Training Category - Prepositional Usage - BEHIND
MOTOR RESPONSE - Generalisations
T.1.
T.2.
N.T.
100
80
60
40
20
0
% correct
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-36

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - BEHIND

STRUCTURE - IT'S/THEY'RE BEHIND THE (OBJECT)/BEHIND THE (OBJECT)/IT'S/THEY'RE BEHIND (OBJECT)
(pron + cop' + prep + det + noun/prep + det + noun)
(pron + cop' + prep + noun)

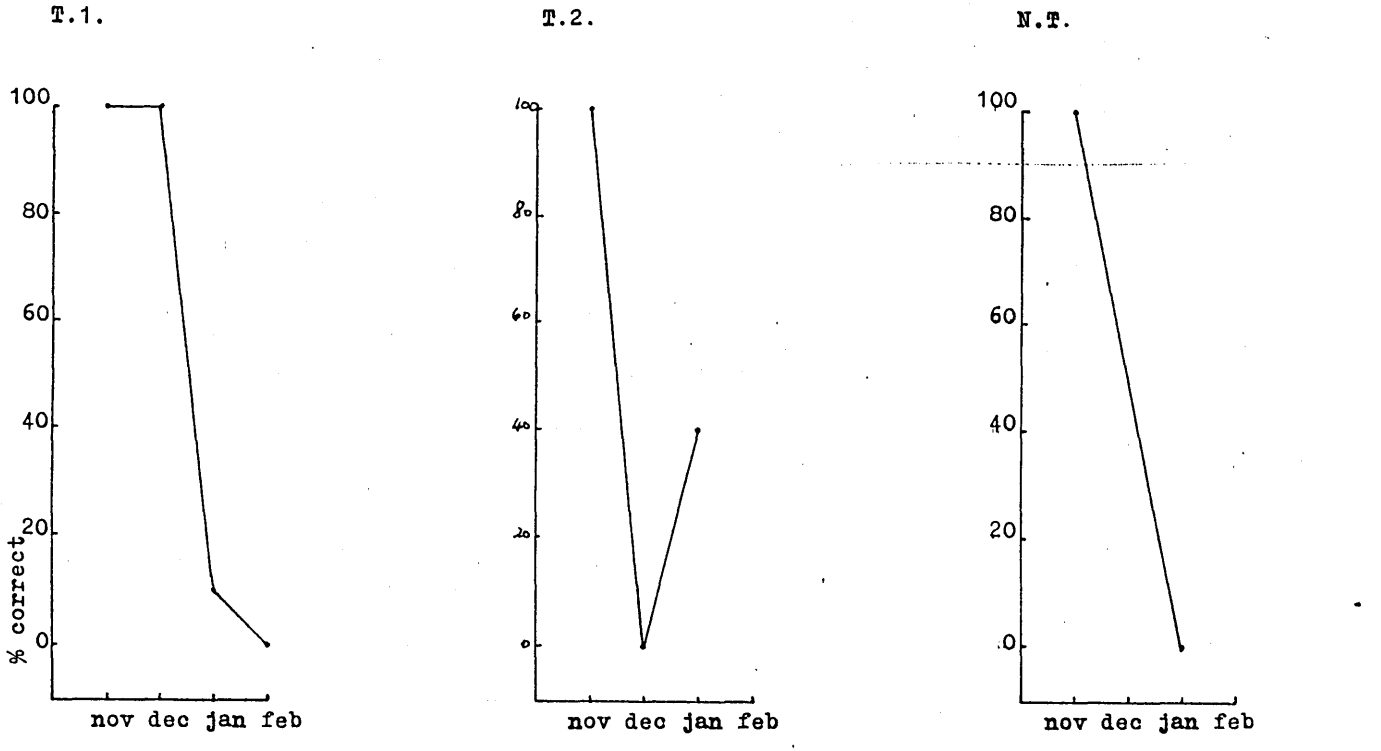
Trainer 1	22.11.79	4.12.79	5.12.79	10.1.80
Trials (% correct)	1(100)	-	1(100)	1(0)
Context	2	-	4	2+3
Trainer 1	14.1.80	21.1.80	28.1.80	30.1.80
Trials (% correct)	2(50)	2(0)	2(0)	1(0)
Context	4+3	1	1	1
Trainer 1	5.2.80	26.2.80		
Trials (% correct)	1(0)	2(0)		
Context	1	1		
Trainer 2	6.11.79	12.11.79	20.11.79	30.11.79
Trials (% correct)	-	2(100)	2(100)	2(100)
Context	3	3	1	2/3
Trainer 2	12.12.79	13.12.79	4.1.80	9.1.80
Trials (% correct)	-	2(0)	2(0)	2(0)
Context	-	2/3	3	3
Trainer 2	14.1.80	18.1.80	29.1.80	
Trials(% correct)	2(0)	2(100)	2(100)	
Context	3	1	3	
Non-Trainer	7.11.79	29.11.79	30.1.80	
Trials (% correct)	2(100)	2(100)	2(0)	
Context	3	3	3	

Fig. 6-36

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Training Category - Prepositional Usage - BEHIND

STRUCTURE - IT'S BEHIND THE (OBJECT)/BEHIND THE (OBJECT)/IT'S BEHIND (OBJECT)/IT'S BEHIND



Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-37

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - IN FRONT

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	1(100)	-	3(100)	1(100)
Context	3	-	3	4
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	1(100)	1(100)	-	1(100)
Context	3	1	-	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	-	1(100)	1(0)	1(100)
Context	-	3	3	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	1(100)	1(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	29.11.79	30.1.80	
Trials (% correct)	1(0)	1(100)	1(100)	
Context	3	3	3	

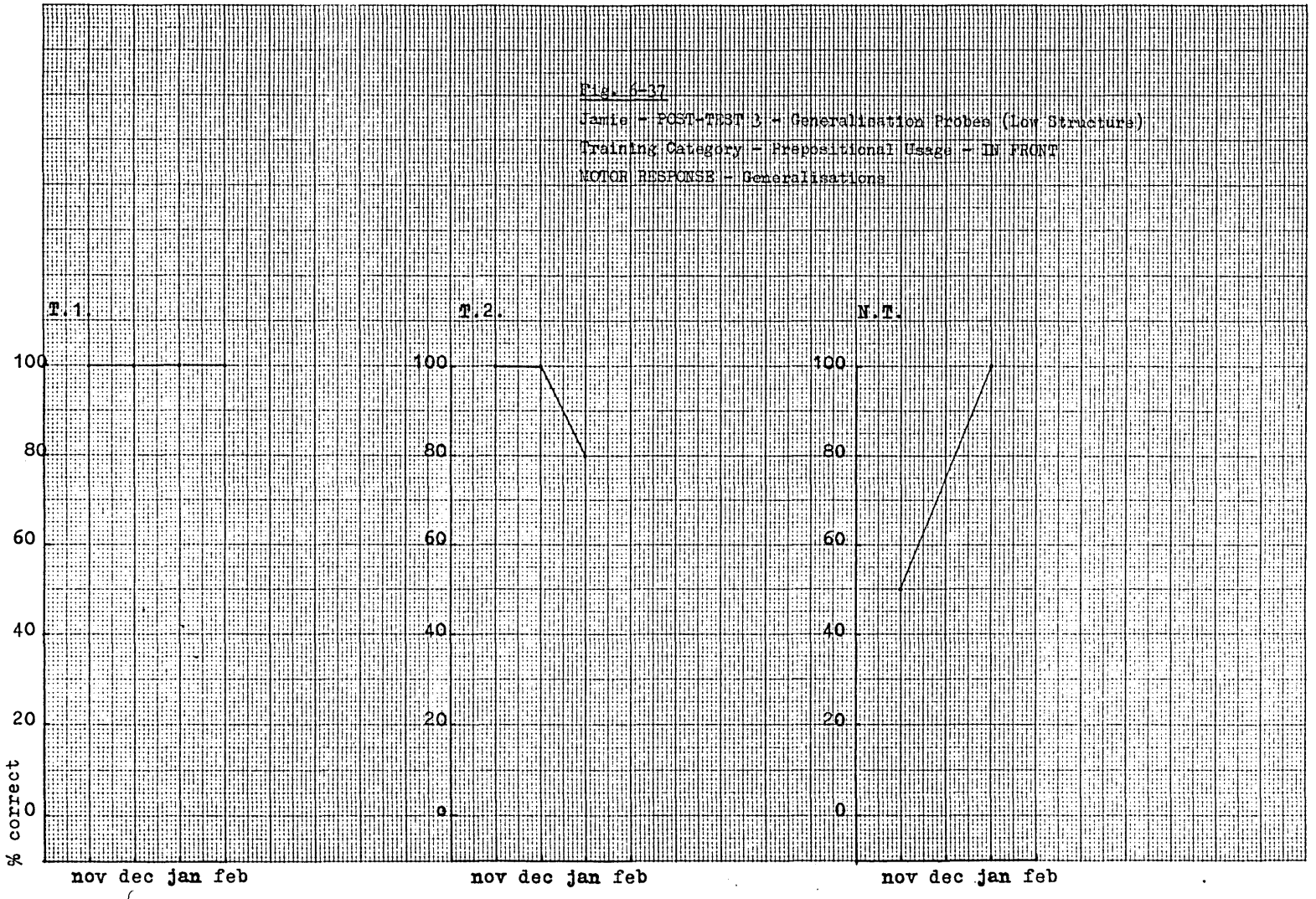


Fig. 6-37
Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Prepositional Usage - IN FRONT
MOTOR RESPONSE - Generalisations
T.1.
T.2.
N.T.
% correct
100
80
60
40
20
0
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-38

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - IN FRONT

STRUCTURE - IT'S IN FRONT OF THE (OBJECT)/IT'S IN FRONT/ IN FRONT OF THE (OBJECT) (pron + cop' + prep + det + noun)/(pron + cop' + prep)/(prep + det + noun) IT'S IN FRONT OF (OBJECT) (pron + cop' + prep + noun)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	2(100)	-	3(67)	2(50)
Context	3	-	3	4
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	2/3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	2(100)	2(100)	1(100)	3(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	2(100)	2(0)	-	2(100)
Context	3	1	-	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	-	2(100)	2(0)	2(100)
Context	-	3	3	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	2(100)	2(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	29.11.79	30.1.80	
Trials (% correct)	2(100)	2(100)	2(100)	
Context	3	3	3	

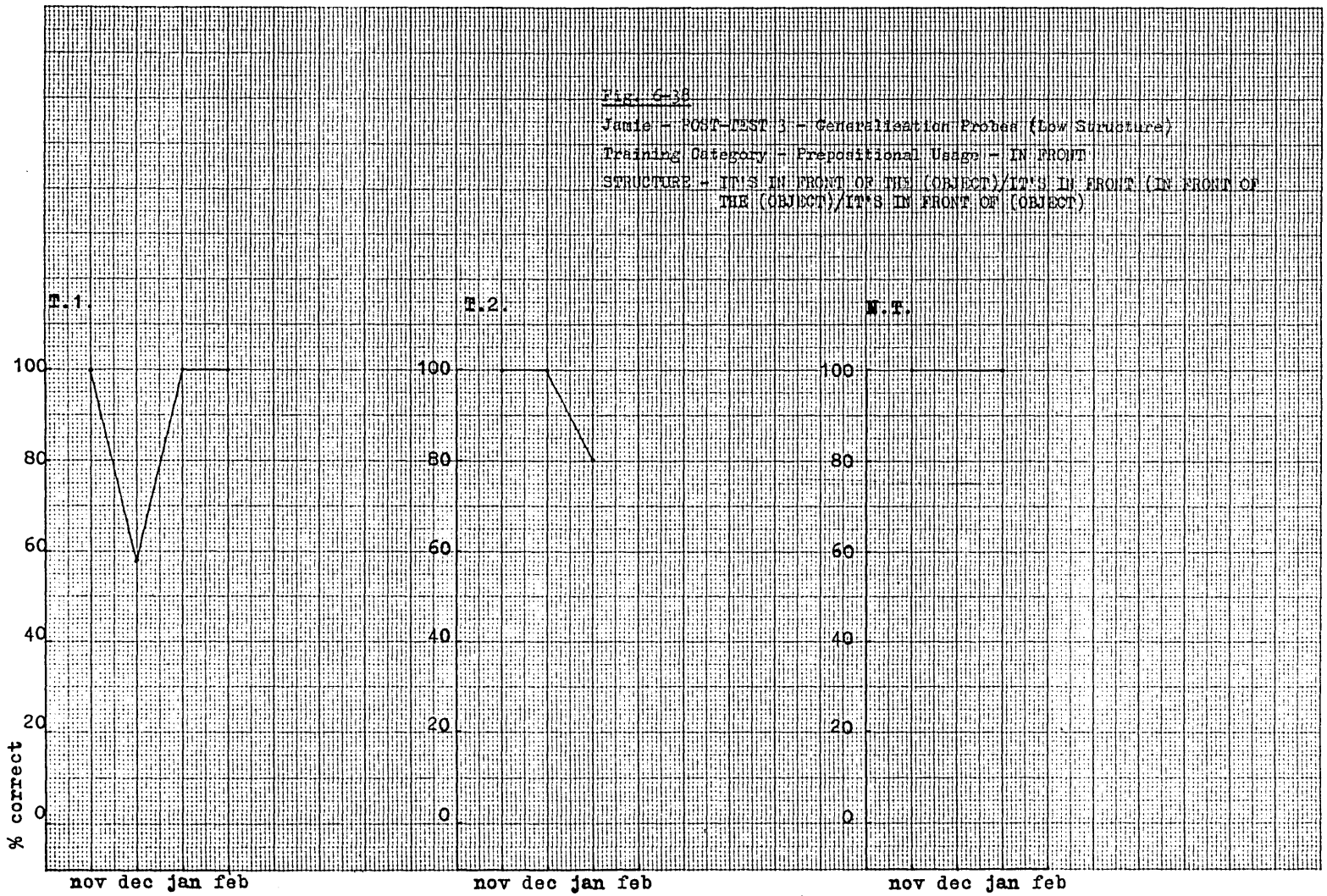


Fig. G-38
Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Prepositional Usage - IN FRONT
STRUCTURE - IT'S IN FRONT OF THE (OBJECT)/IT'S IN FRONT (IN FRONT OF THE (OBJECT)/IT'S IN FRONT OF (OBJECT)
T.1.
T.2.
N.T.
% correct
100
80
60
40
20
0
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-39

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - OVER

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	1(0)	1(0)	1(100)	-
Context	3	2	3	4
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	1(0)	1(100)	1(0)	-
Context	3	1	2/3	-
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	3	3	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	1(100)	1(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	28.11.79	29.11.79	30.1.80
Trials (% correct)	1(100)	1(100)	1(0)	1(100)
Context	3	3	3	3

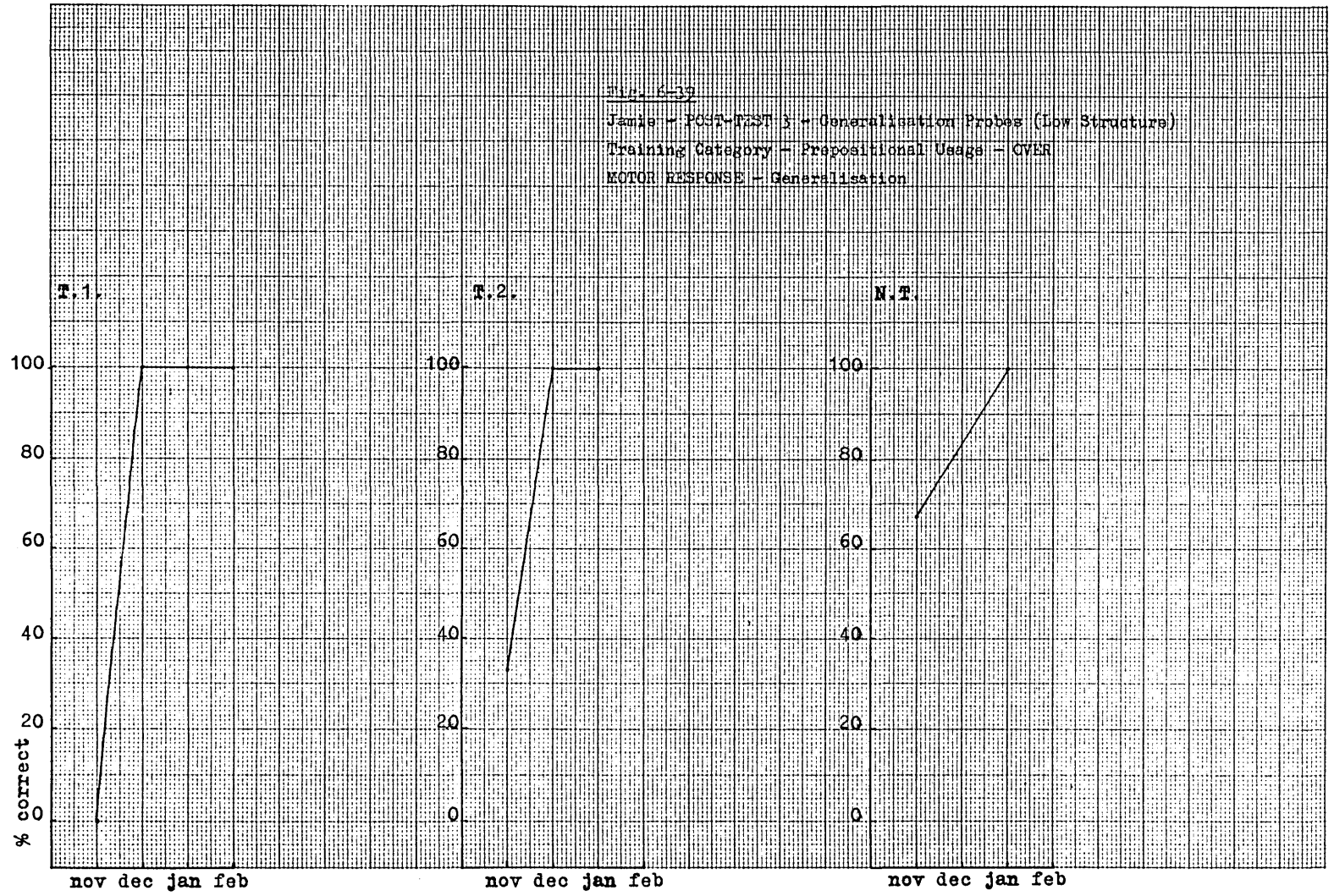


Fig. 6-32
Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Prepositional Usage - OVER
MOTOR RESPONSE - Generalisation
T.1.
T.2.
N.T.
% correct
100
80
60
40
20
0
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-40

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - OVER

STRUCTURE - IT'S OVER THE (OBJECT)/OVER THE (OBJECT)/
IT'S OVER (OBJECT)
(pronoun+cop'+preposition+det+(noun)/prep+det+(noun))
pronoun+cop'+preposition+(noun)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	-	-	2(0)	-
Context	-	-	3	-
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	2/3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	2(0)	2(0)	1(0)	-
Context	3	1	2/3	-
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	2(100)	2(100)	2(100)	2(50)
Context	2/3	3	3	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	2(100)	2(0)		
Context	1	3		
Non-Trainer				
Date	7.11.79	28.11.79	29.11.79	30.1.80
Trials (% correct)	2(0)	2(0)	1(0)	2(50)
Context	3	3	3	3

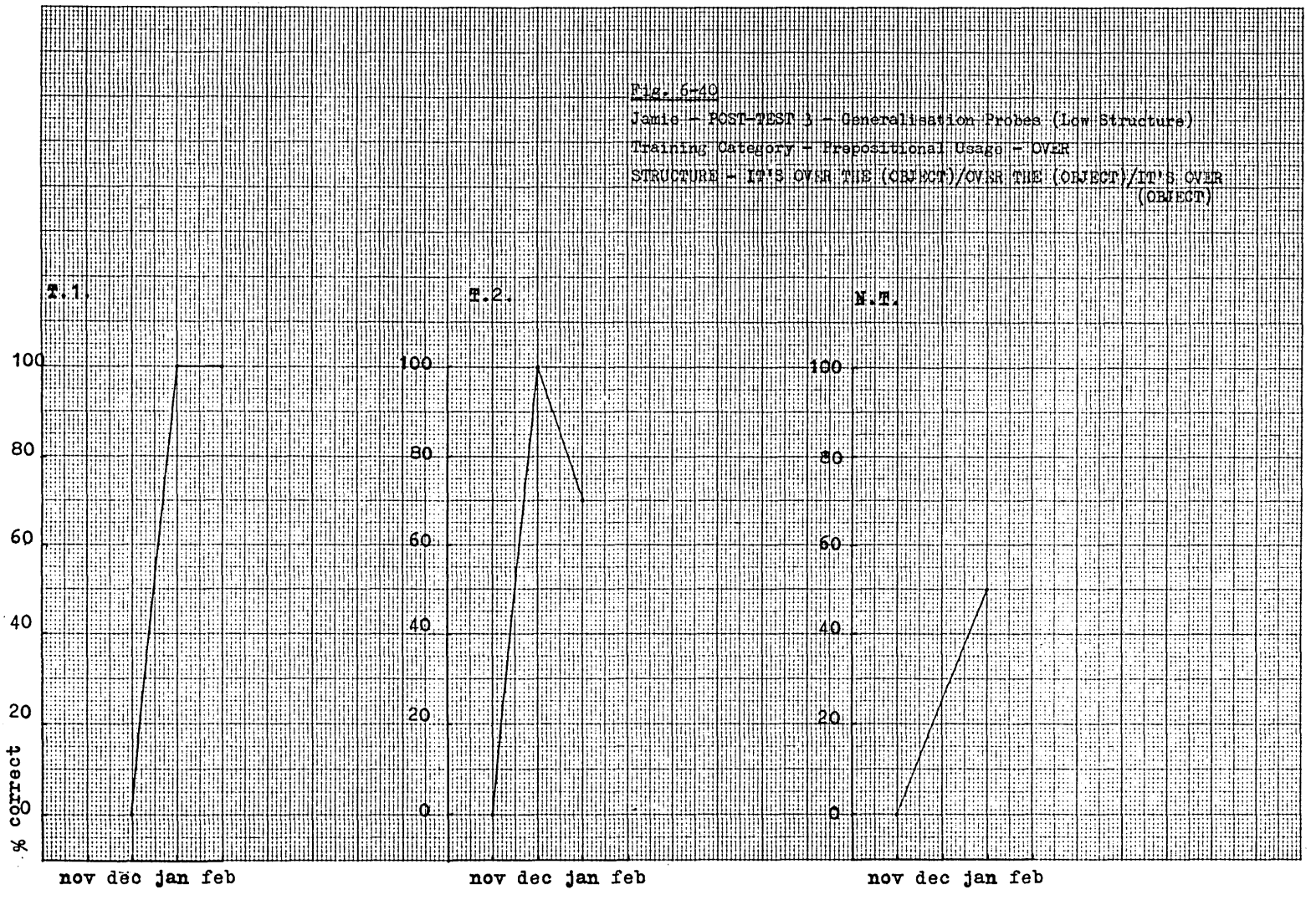


Fig. 6-40
Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Prepositional Usage - OVER
STRUCTURE - IT'S OVER THE (OBJECT)/OVER THE (OBJECT)/IT'S OVER (OBJECT)
T.1.
T.2.
N.T.
% correct
100
80
60
40
20
0
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-41

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - UNDER

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	1(0)	1(100)	1(0)	-
Context	3	2	3	-
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	1(0)	1(100)	1(0)	1(100)
Context	2/3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	1(0)	1(100)	1(100)	1(100)
Context	3	1	2/3	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	-	1(100)	1(0)	1(100)
Context	-	3	3	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	1(0)	1(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	28.11.79	29.11.79	30.1.80
Trials (% correct)	1(100)	-	1(100)	1(100)
Context	3	-	3	3

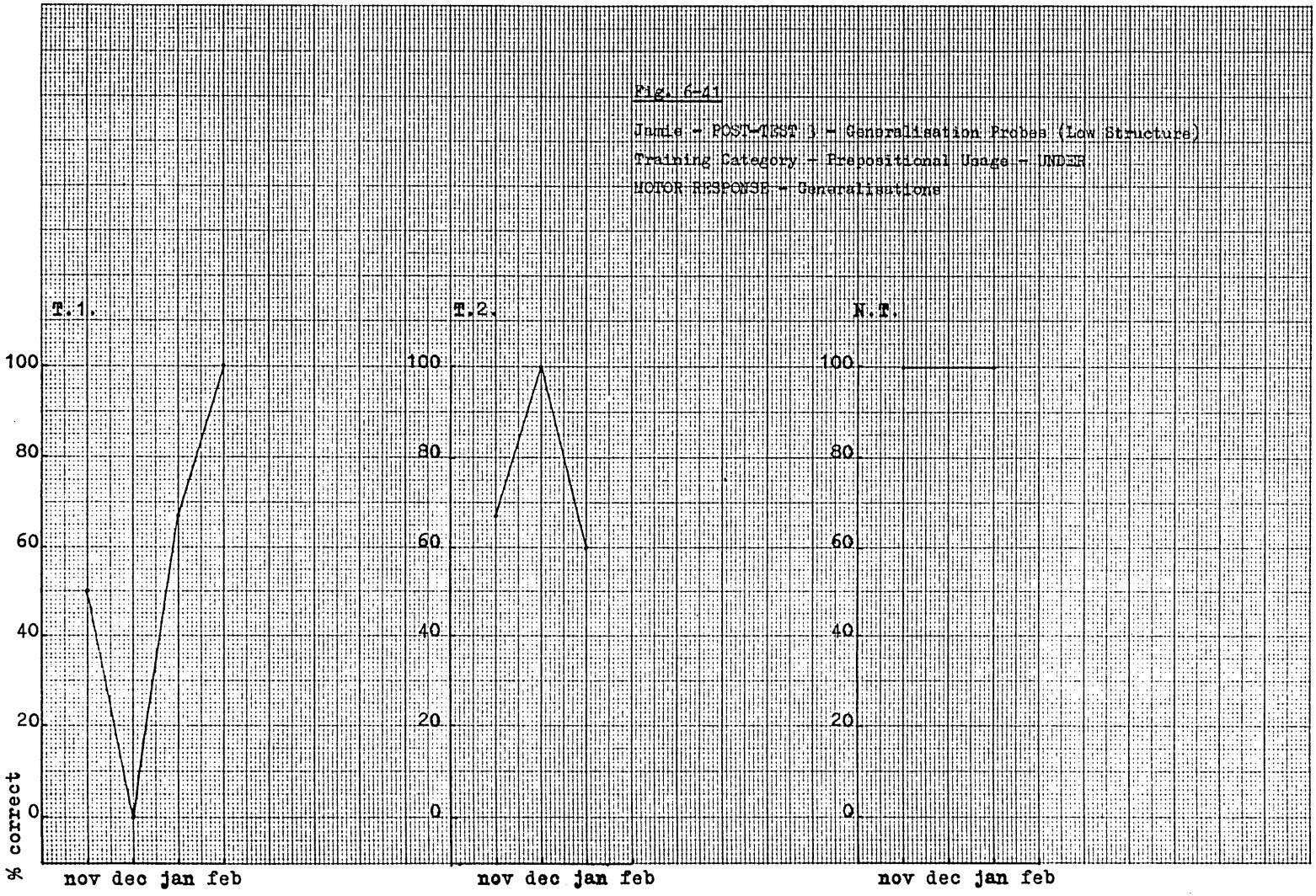


Fig. 6-41
Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Prepositional Usage - UNDER
MOTOR RESPONSE - Generalisations
T.1.
T.2.
N.T.
100
80
60
40
20
0
% correct
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-42

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Under

STRUCTURE - IT'S UNDER THE (OBJECT)/UNDER THE (OBJECT)/ IT'S UNDER (OBJECT) (pronoun+cop'+preposition+det+(noun)/prep+det(noun))

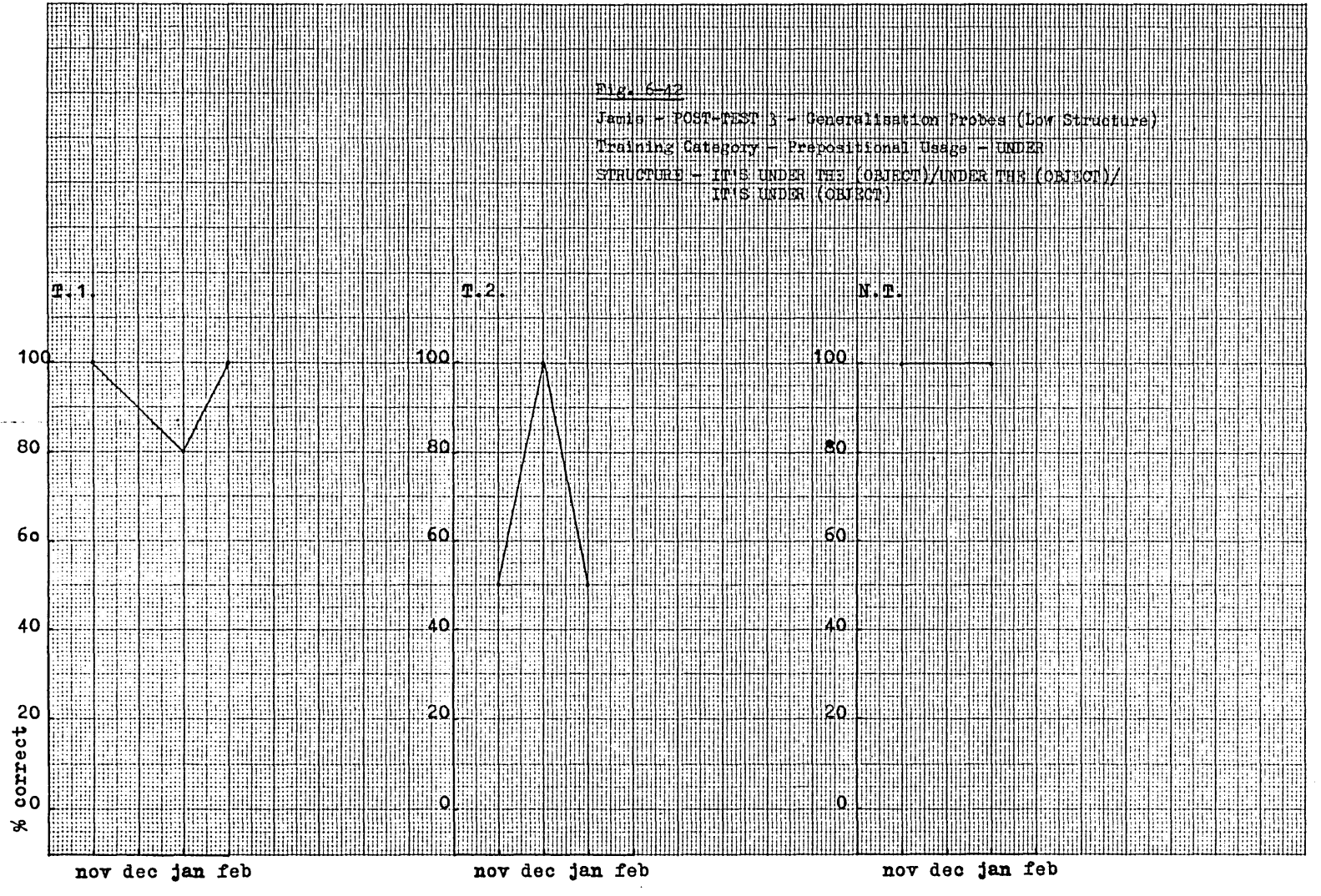
Trainer 1	pronoun +cop'+preposition+(noun)			
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	-	2(100)	-	-
Context	-	2	-	-
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	-	3(100)	1(0)	2(100)
Context	-	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	1(100)	2(100)	2(100)	1(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	2(0)	2(50)	2(100)	2(100)
Context	3	1	2/3	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	-	2(100)	2(0)	2(50)
Context	-	3	3	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	2(0)	2(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	28.11.79	29.11.79	30.1.80
Trials (% correct)	2(100)	1(100)	1(100)	2(100)
Context	3	3	3	3

Fig. 6-42

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Training Category - Prepositional Usage - UNDER

STRUCTURE - IT'S UNDER THE (OBJECT)/UNDER THE (OBJECT)/
IT'S UNDER (OBJECT)



Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-43

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - NEXT TO

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	1(0)	1(100)	1(100)	1(100)
Context	3	2	3	4
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	1	2/3	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	1(0)	1(100)	-	1(0)
Context	2/3	3	-	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	1(100)	1(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	29.11.79	30.1.80	
Trials (% correct)	1(100)	1(100)	1(100)	
Context	3	3	3	

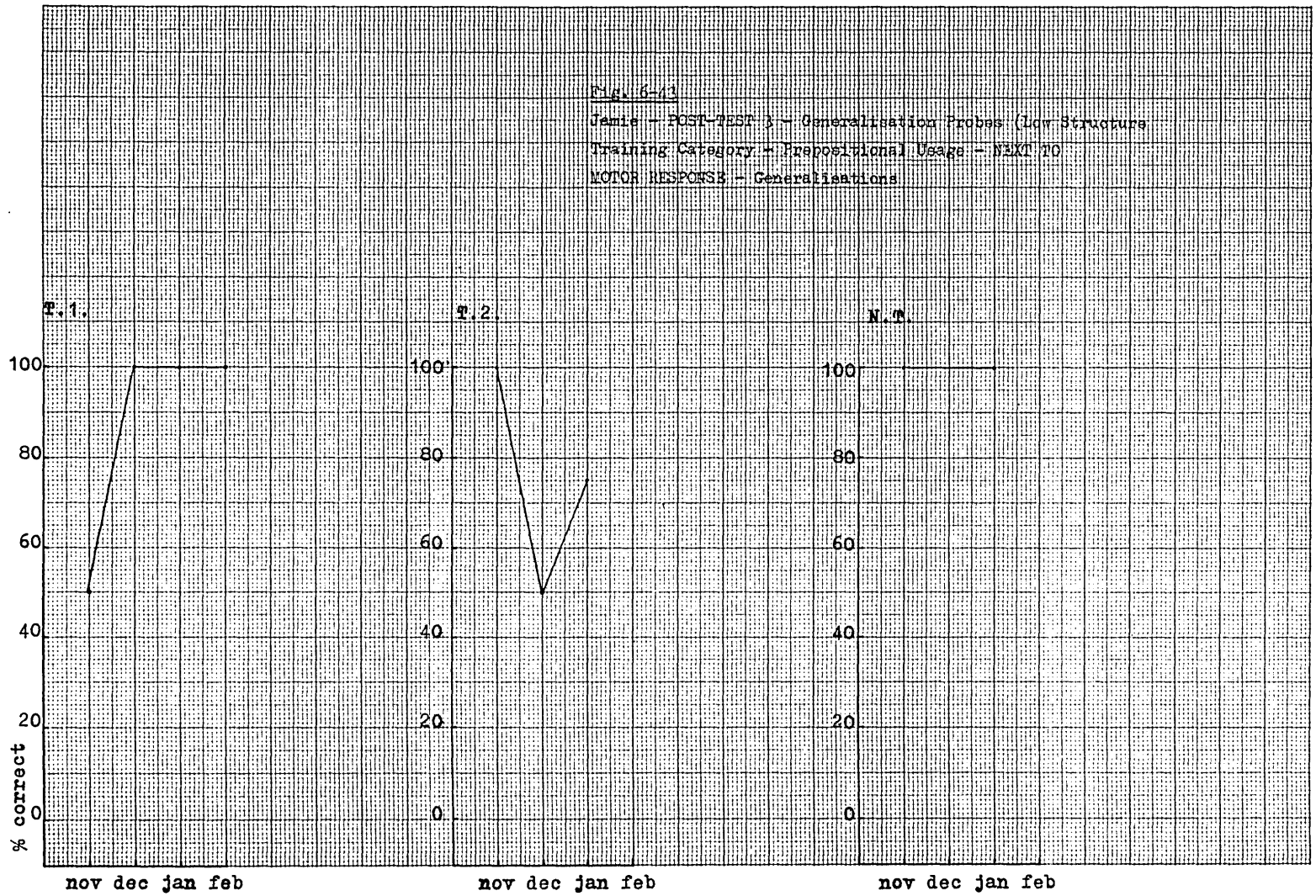


Fig. 6-43
Jamie – POST-TEST 3 – Generalisation Probes (Low Structure
Training Category – Prepositional Usage – NEXT TO
MOTOR RESPONSE – Generalisations
T.1.
T.2.
N.T.
100
80
60
40
20
0
% correct
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-44

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - NEXT TO

STRUCTURE - IT'S NEXT TO THE (OBJECT)/NEXT TO THE (OBJECT)/IT'S NEXT TO (OBJECT) (pron + cop' + prep + det + noun)/(prep + det + noun)/(pron + cop' + prep + noun)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	-	2(50)	2(100)	2(100)
Context	-	2	3	1
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	2(100)	1(100)	2(100)	2(100)
Context	2/3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	2(100)	2(50)	2(100)	2(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	2(100)	2(50)	2(100)	2(100)
Context	3	1	2/3	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	2(100)	2(100)	-	2(0)
Context	2/3	3	-	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	2(100)	2(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	29.11.79	30.1.80	
Trials (% correct)	2(100)	2(100)	2(100)	
Context	3	3	3	

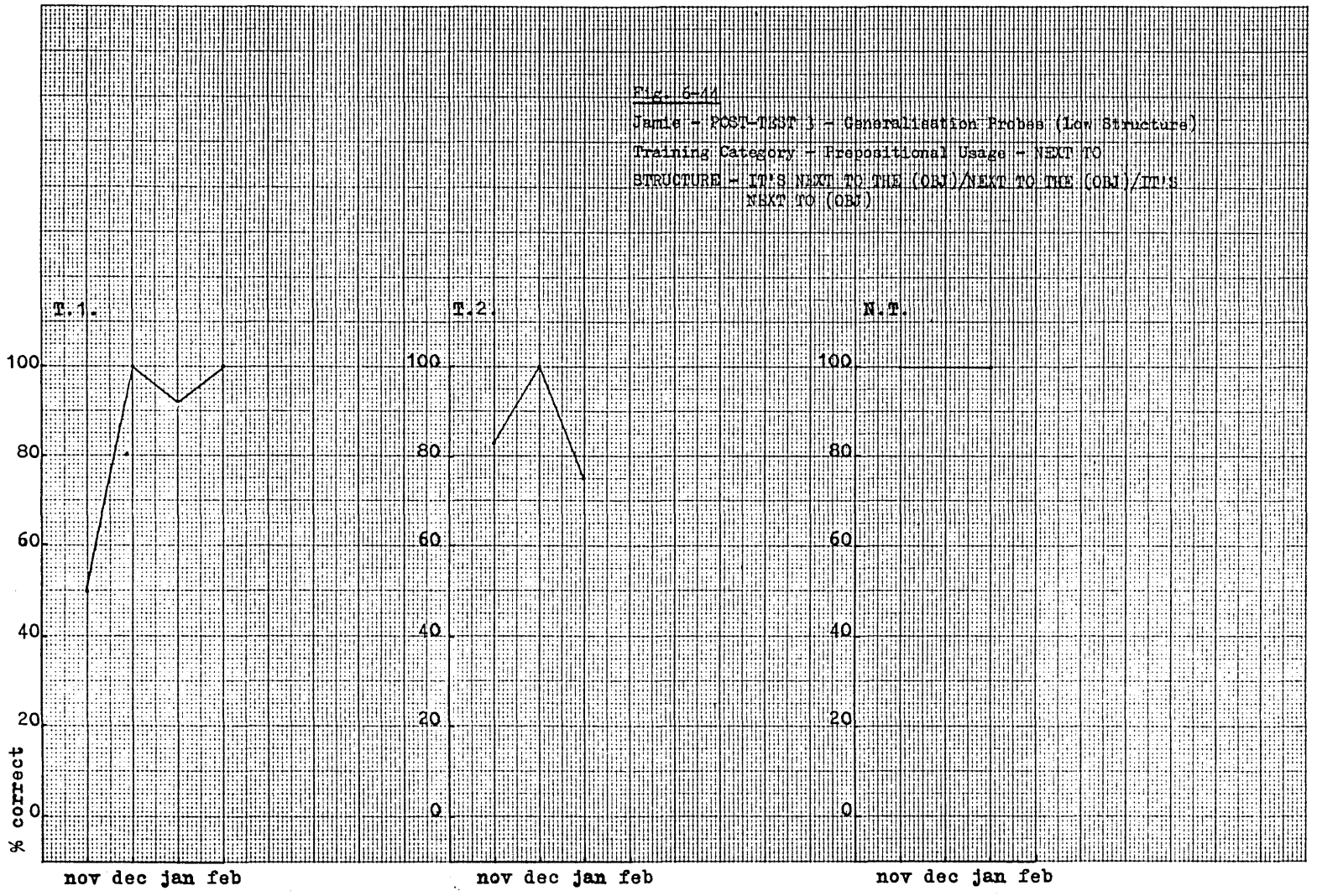


Fig. 6-44
Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Prepositional Usage - NEXT TO
STRUCTURE - IT'S NEXT TO THE (OBJ)/NEXT TO THE (OBJ)/IT'S NEXT TO (OBJ)
T.1.
T.2.
N.T.
% correct
100
80
60
40
20
0
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-45

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - OVER THERE

MOTOR RESPONSE - (manipulation of objects)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	2	3	4
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	3	1	2/3	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	3	3	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	1(100)	1(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	29.11.79	30.1.80	
Trials (% correct)	1(100)	1(100)	1(100)	
Context	3	3	3	

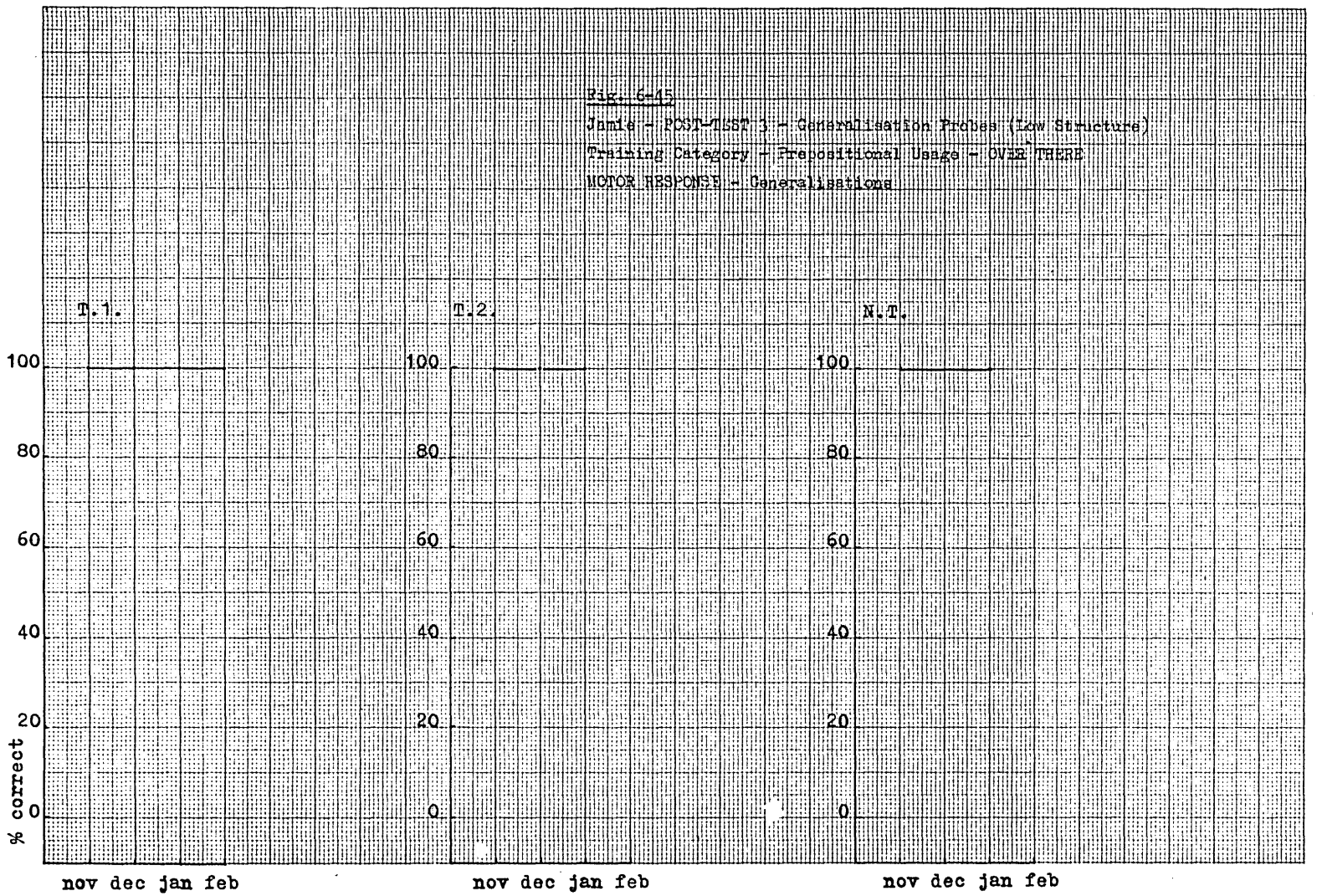


Fig. 6-15
Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Prepositional Usage - OVER THERE
MOTOR RESPONSE - Generalisations
T.1.
T.2.
N.T.
% correct
100
80
60
40
20
0
nov dec jan feb
nov dec jan feb
nov dec jan feb

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 6-46

Summary of Generalisations per Structure by Sessions, Trials and Context

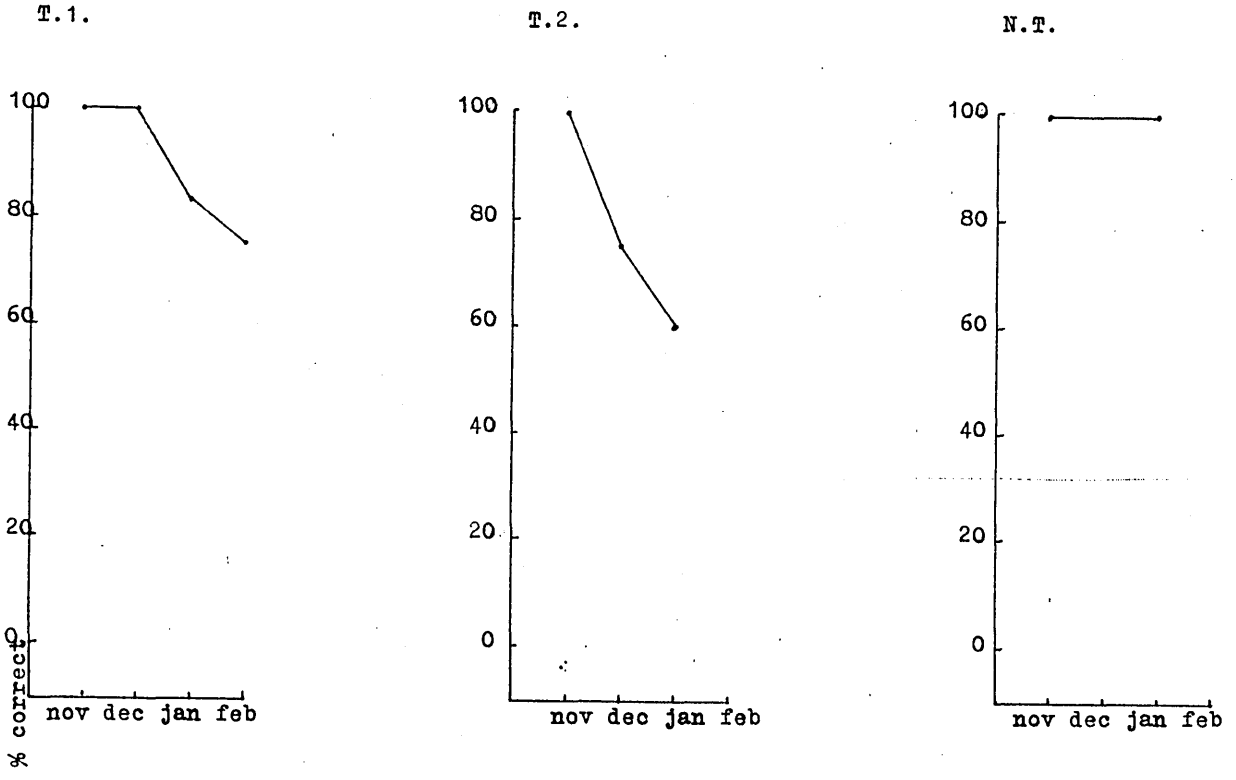
Training Category - Prepositional Usage - OVER THERE

STRUCTURE - IT'S OVER THERE/OVER THERE
(pron + cop' + prep)/(prep)

Trainer 1				
Date	6.11.79	22.11.79	4.12.79	5.12.79
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	3	2	3	4
Trainer 1				
Date	10.1.80	14.1.80	21.1.80	24.1.80
Trials (% correct)	2(100)	2(100)	2(0)	2(100)
Context	2/3	4/3	1	1
Trainer 1				
Date	28.1.80	30.1.80	5.2.80	26.2.80
Trials (% correct)	2(100)	2(100)	2(50)	2(100)
Context	1	1	1	1
Trainer 2				
Date	12.11.79	20.11.79	30.11.79	12.12.79
Trials (% correct)	2(100)	2(100)	2(100)	2(50)
Context	3	1	2/3	3
Trainer 2				
Date	13.12.79	4.1.80	9.1.80	14.1.80
Trials (% correct)	2(100)	2(100)	2(100)	2(0)
Context	2/3	3	3	1
Trainer 2				
Date	18.1.80	29.1.80		
Trials (% correct)	2(0)	2(100)		
Context	1	3		
Non-Trainer				
Date	7.11.79	29.11.79	30.1.80	
Trials (% correct)	2(100)	2(100)	2(100)	
Context	3	3	3	

Fig. 6-46

Jamie - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Prepositional Usage - OVER THERE
STRUCTURE - IT'S OVER THERE/OVER THERE



Appendix F

Case Study 3 Nicola

Language Training and Testing Data

Tables 7-1 to 7-14; Figures 7-1 to 7-14 - Progress in learning the main structures taught covering the period October 1978 to December 1979.

Tables 7-15 to 7-23; Figures 7-15 to 7-23 - POST-TEST 1 data showing generalisations per structure by trainer/non-trainer/child interactions in Test Conditions A and B.

Table 7-24 to 7-26; Figures 7-24 to 7-26 - POST-TEST 2 (High Structure) data showing generalisations per structure in Sub-Tests I and II.

Table 7-27; Figure 7-27 - POST-TEST 3 (High Structure) data showing generalisations per structure.

Tables 7-28 to 7-55; Figures 7-28 to 7-55 - POST-TEST 3 (Low Structure) data showing generalisations per structure by trainer/non-trainer/child interactions covering the period November 1979 to February 1980.

Nicola - Language Training

Table 7-1

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Objects - (singular)

Structure - IT'S A (NOUN)
(pron + cop + det + noun)

Training commenced - 4.10.78
Training terminated - 5.1.79
Number of sessions - 12

Imitations

Trials (% correct) - 60(45), 18(62), 12(67), 18(91), 12(92), 6(100), 6(100)

Non-imitative responses

Trials (% correct) - 18(28), 48(17), 18(61), 18(44), 24(67), 30(77), 6(100), 30(70), 12(67), 18(61), 36(47), 6(100)

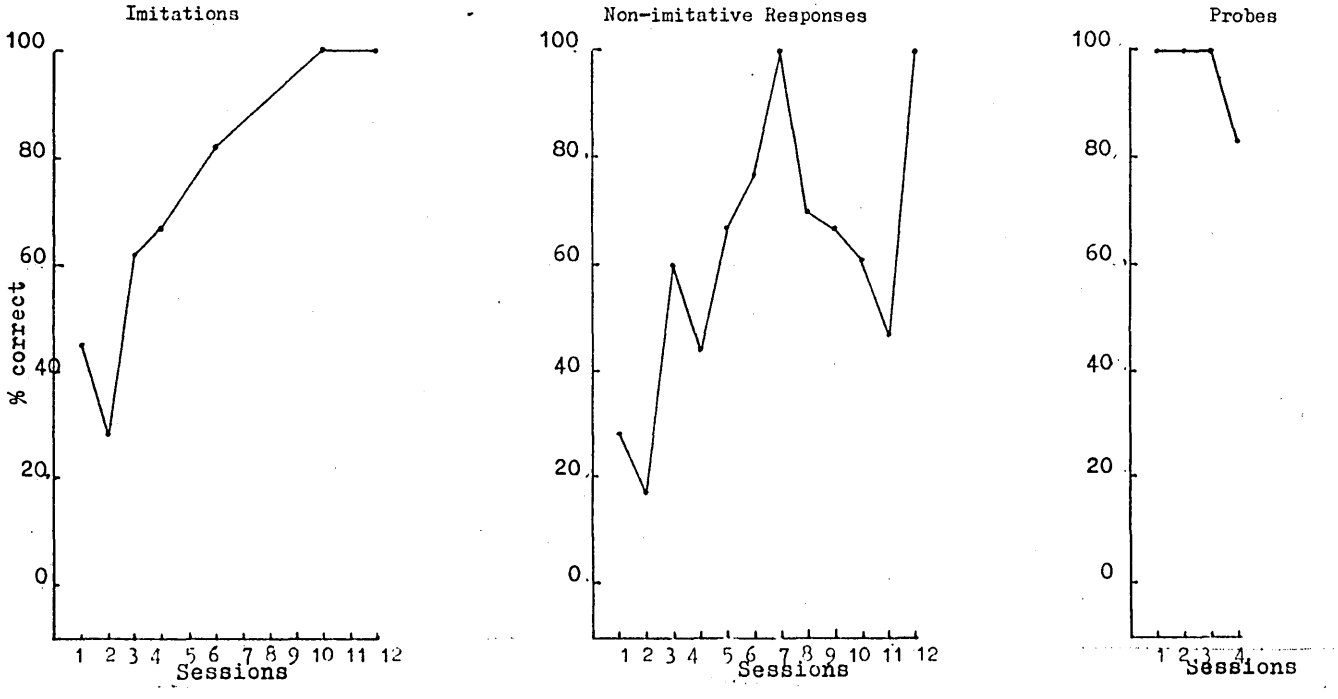
Probes

Trials (% correct) - 12(100), 18(100), 6(100), 24(83)

Fig 7-1

Nicola - Language Training - Progress in Learning Labelling - Objects (Singular)

STRUCTURE - IT'S A (NOUN)



Nicola - Language Training

Table 7-2

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Persons

Structure - IT'S PERSON (NAME)
(pron + cop + proper noun)

Training commenced - 11.10.78
Training terminated - 20.12.78
Number of sessions - 8

Imitations

Trials (% correct) - 6(67), 6(83), 6(100), 6(100)

Non-imitative responses

Trials (% correct) - 12(42), 12(25), 12(75), 6(100), 18(89), 6(67), 6(100), 24(87)

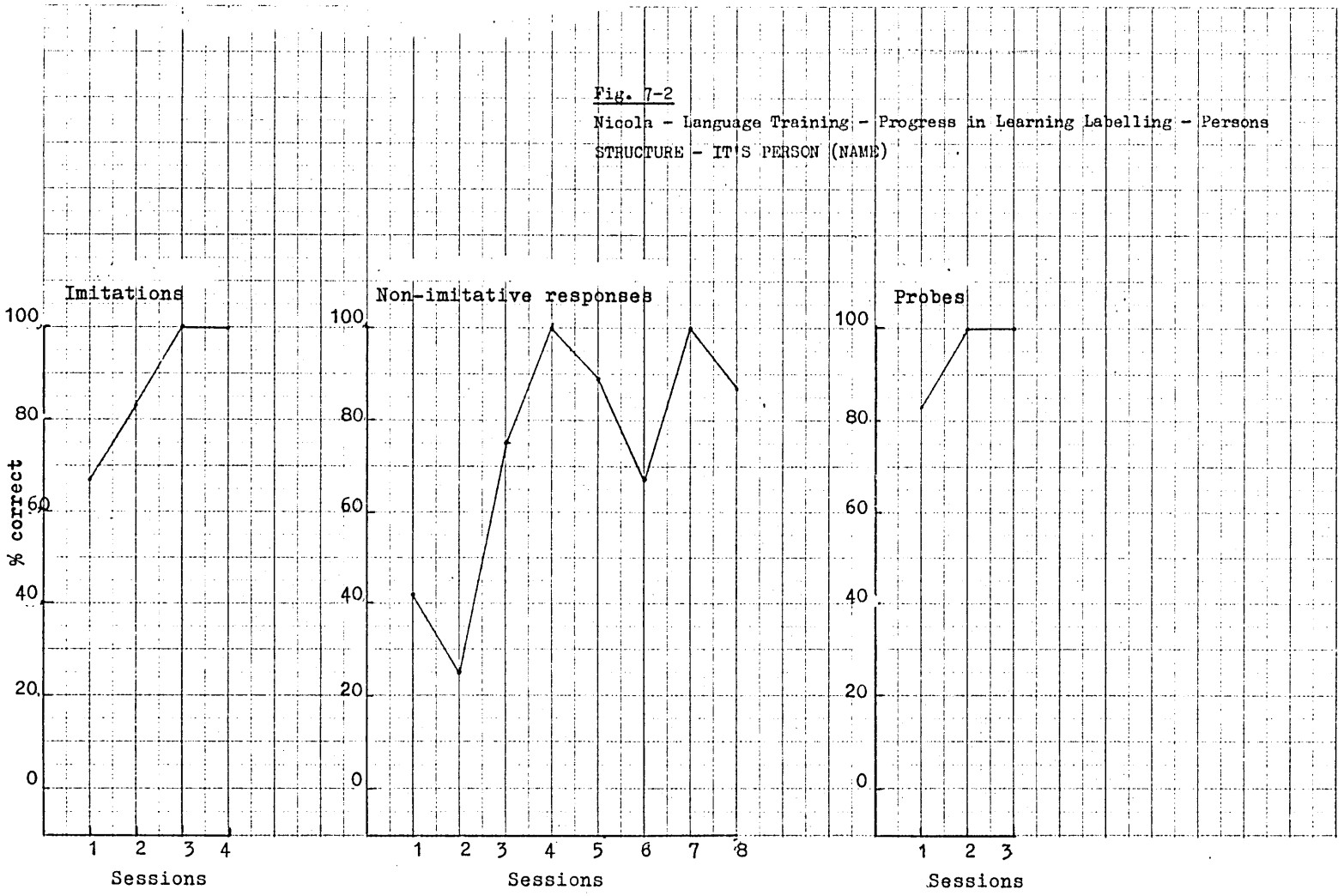
Probes

Trials (% correct) - 12(83), 6(100), 6(100)

Fig. 7-2

Nicola - Language Training - Progress in Learning Labelling - Persons

STRUCTURE - IT'S PERSON (NAME)



Nicola - Language Training

Table 7-3

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Objects -(Plural)

Structure - THEY'RE (NOUNS)
(pron + cop' + noun(pl)

Training commenced - 1.11.78
Training terminated - 5.1.79
Number of sessions - 11

Imitations

Trials (% correct) - 18(72), 6(50), 18(89), 6(100)
6(50), 6(100)

Non-imitative responses

Trials (% correct) - 18(28), 12(58), 30(40), 42(71)
12(34), 36(50), 12(42), 6(83), 6(100)

Probes

Trials (% correct) - 12(100), 24(37), 12(92), 6(100)
12(67)

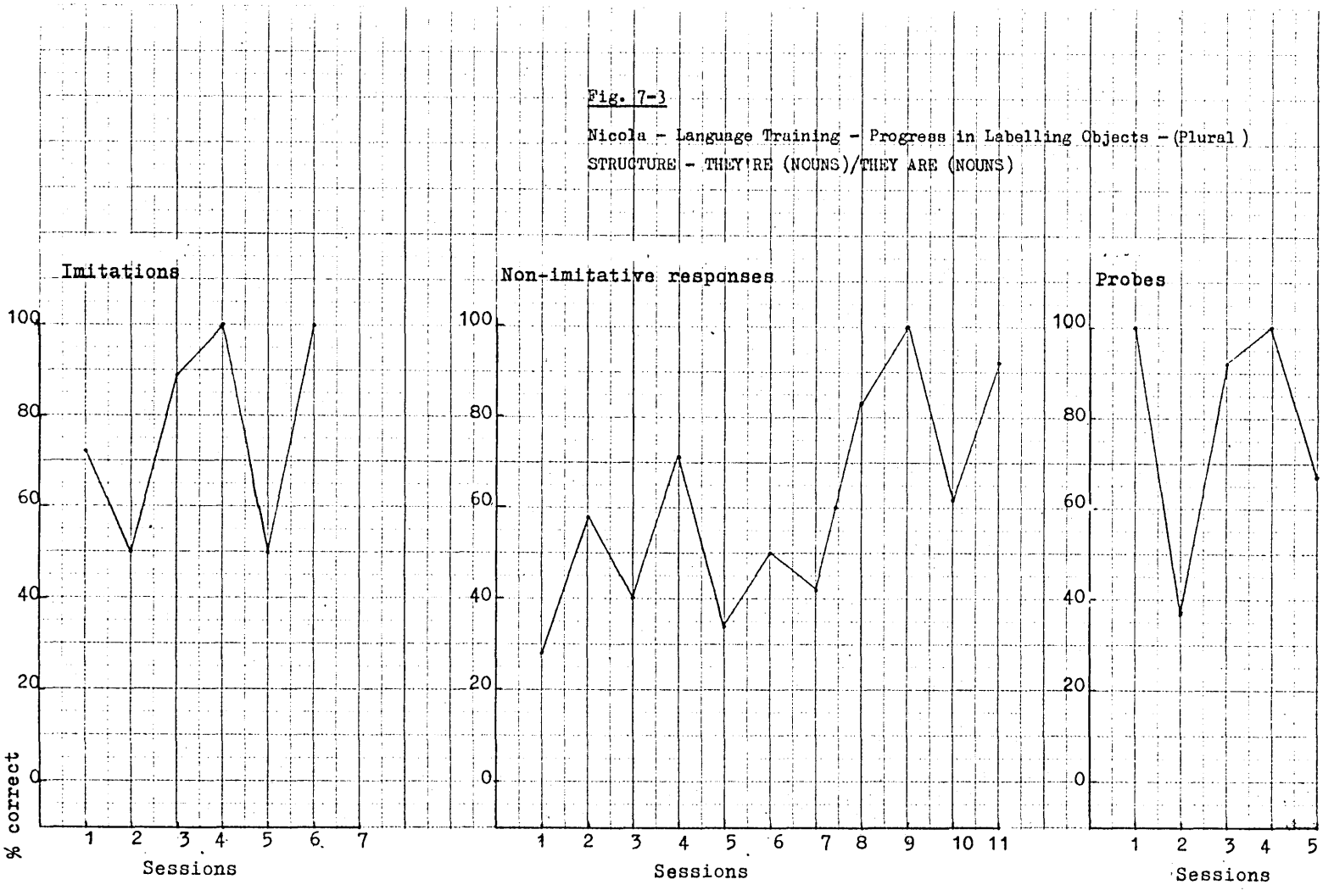


Fig. 7-3

Nicola - Language Training - Progress in Labelling Objects - (Plural)
STRUCTURE - THEY'RE (NOUNS)/THEY ARE (NOUNS)

Nicola - Language Training

Table 7-4

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling Persons and Actions

Structure - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING
(pron + cop + det + subj + verb + ing)

Training commenced - 20.1.79
Training terminated - 27.2.79
Number of sessions - 12

Imitations

Trials (% correct) - 18(88), 18(0), 12(25)

Non-imitative responses

Trials (% correct) - 24(44), 30(23), 12(67), 6(100)
12(75), 6(83), 12(58), 6(50),
12(50), 6(50), 12(67), 12(75)

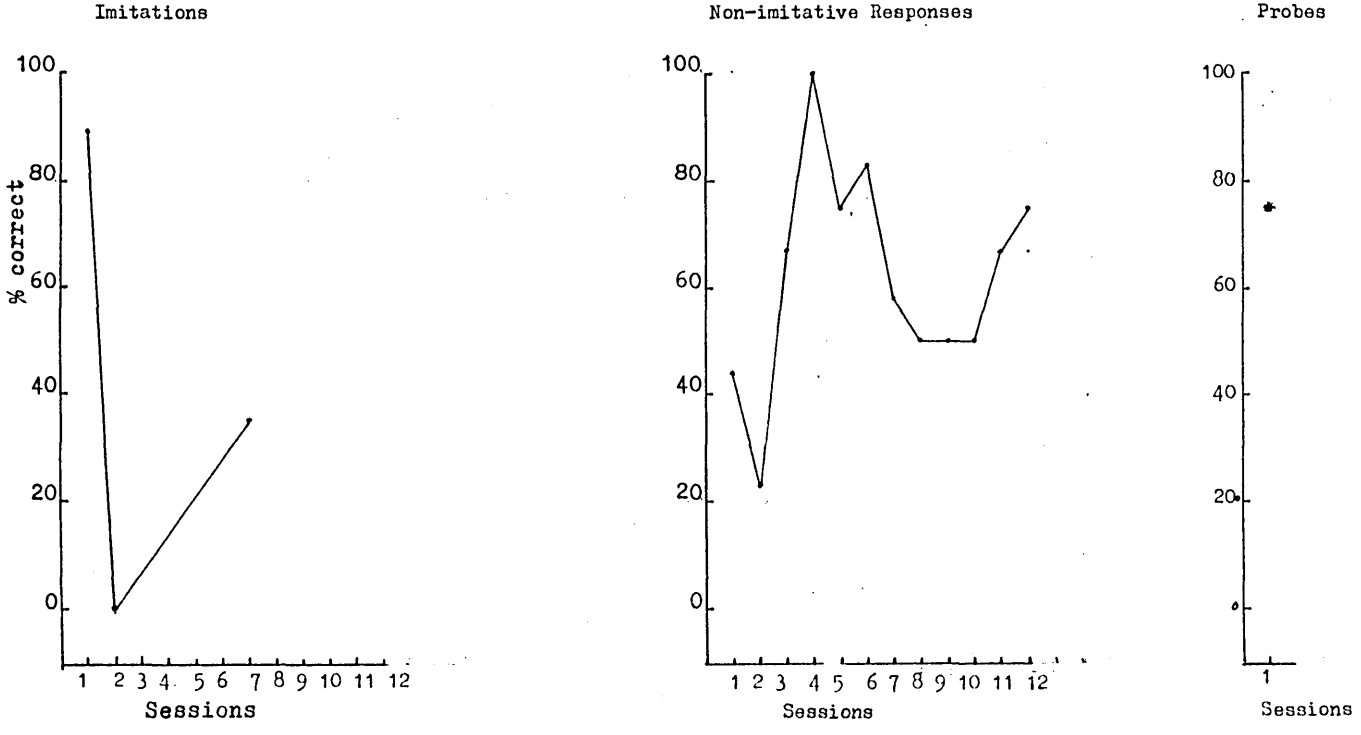
Probes

Trials (% correct) - 12(75)

Fig.7-4

Nicola - Language Training - Progress in Learning Labelling - Persons/Actions

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING



Nicola - Language Training

Table 7-5

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Persons/Actions/Things

Structure - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(AOBJ)/(PREP)
(pron + cop + det + subj + verb + ing + det + (obj)/(prep)

Training commenced - 23.1.79
Training terminated - 13.3.79
Number of sessions - 15

Imitations

Trials (% correct) - 12(25), 6(83), 6(100), 6(33), 6(83), 12(100), 6(100)

Non-imitative responses

Trials (% correct) - 24(17), 12(67), 12(50), 18(67), 12(92), 24(29), 12(50), 6(50), 6(50) 12(67), 12(58), 18(11), 12(50), 24(46), 30(37)

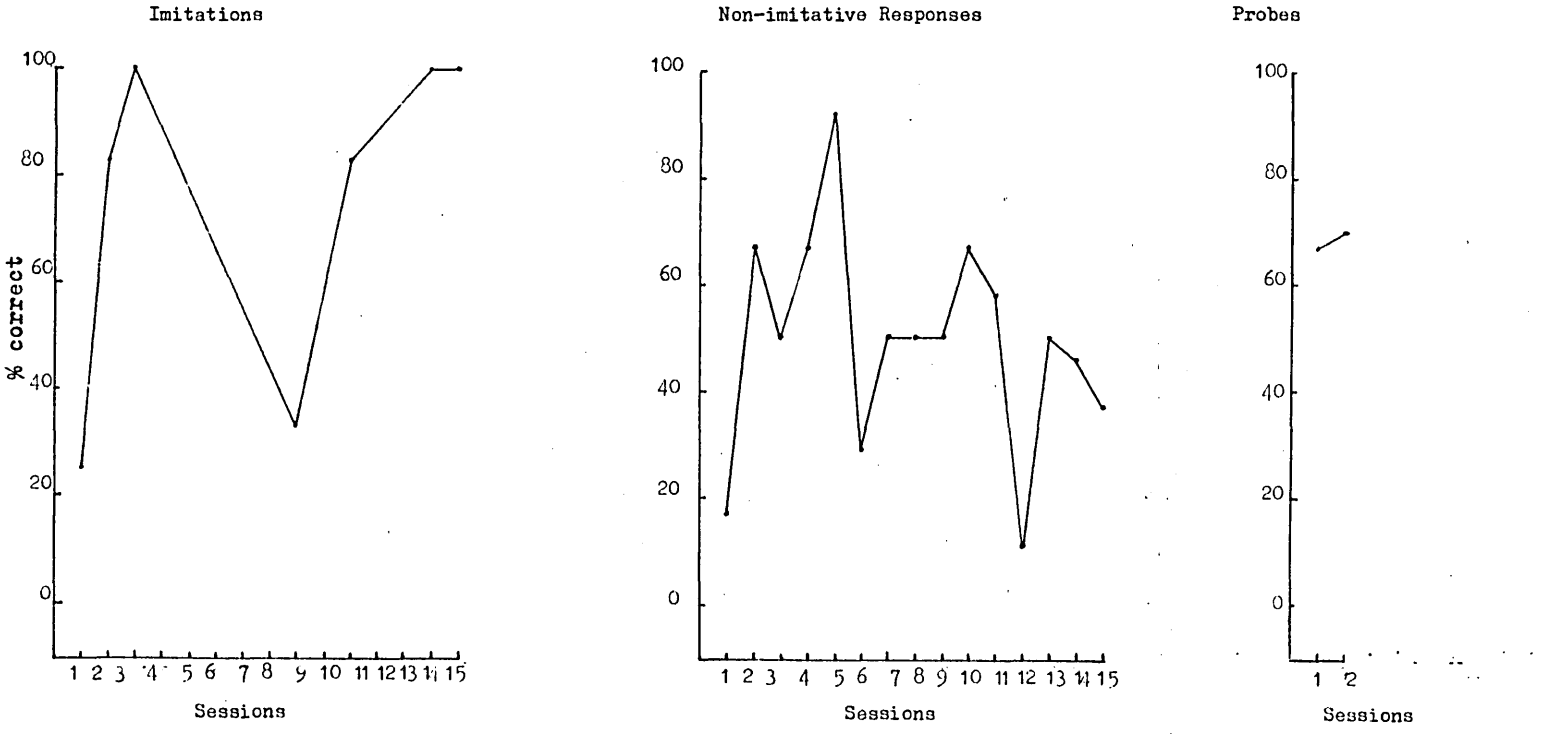
Probes

Trials (% correct) - 6(67), 12(75)

Fig. 7-5

Nicola - Language Training - Progress in Learning Labelling Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)(AOBJ)/(PREP)



Nicola - Language Training

Table 7-6

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - Pron I + actions

Structure - I AM VERB-ING (PREP)
(pron + aux + verb + ing + (prep))

Training commenced - 26.1.79
Training terminated - 15.3.79
Number of sessions - 10

Imitations

Trials (% correct) - 6(83), 6(83), 6(100)

Non-imitative responses

Trials (% correct) - 12(83), 6(83), 6(67), 12(58), 18(78), 15(47), 18(83), 6(83), 6(83)

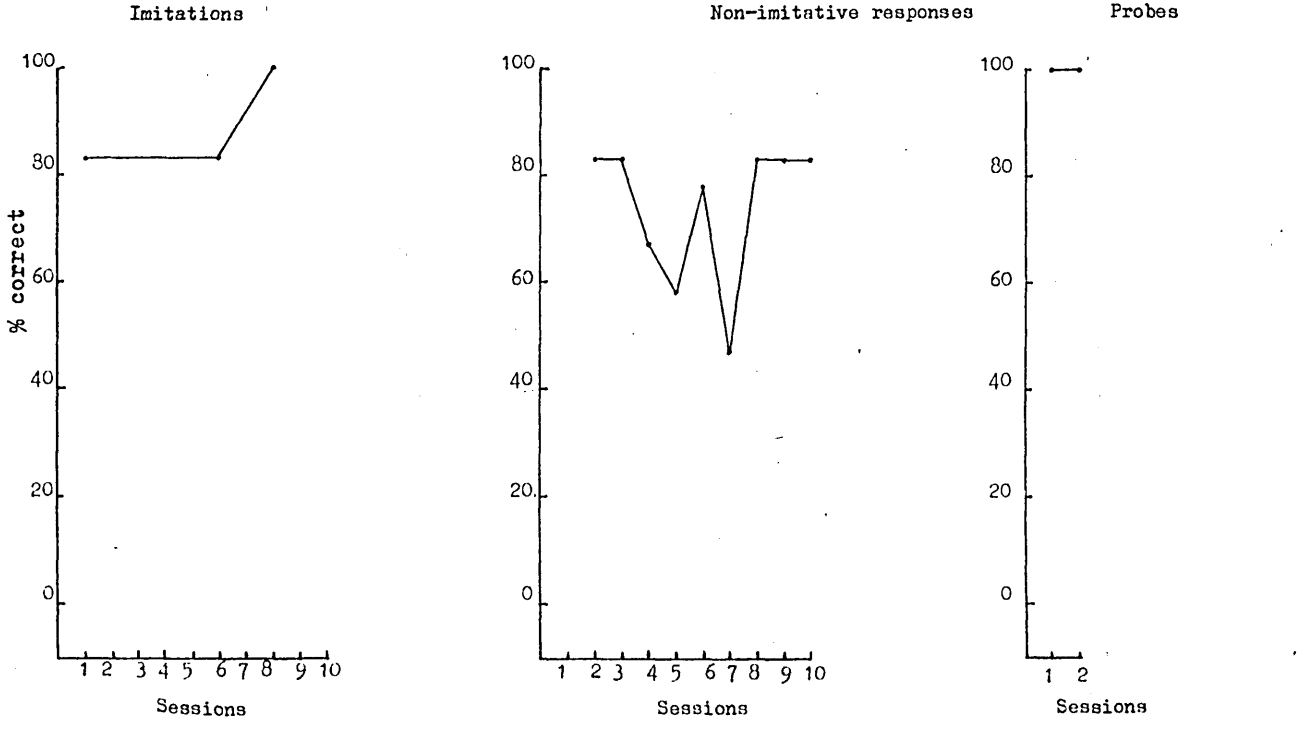
Probes

Trials (% correct) - 6(100), 6(100)

Fig.7-6

Nicola - Language Training - Progress in Learning Labelling - Actions + Pronoun I

STRUCTURE - I AM VERB-ING (PREP)



Nicola - Language Training

Table 7-7

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I + requesting (objects)

STRUCTURE - CAN I HAVE A/SOME/MY (NOUN(S)) PLEASE? (modal + pron + verb + det/poss.pron + noun (pl) please?)

Training commenced - 6.3.79
Training terminated - 9.5.79
Number of sessions - 23

Imitations

Trials (% correct) - 12(58), 6(33), 18(44), 3(100), 12(33), 2(50), 6(50), 6(100)

Non-imitative responses

Trials (% correct) - 12(67), 12(58), 18(33), 18(43), 36(78), 30(30), 36(58), 22(59), 36(47), 18(11), 24(87), 24(42), 30(47), 30(60), 30(73), 38(60), 18(94), 36(89), 36(80), 36(80), 32(62), 30(90)

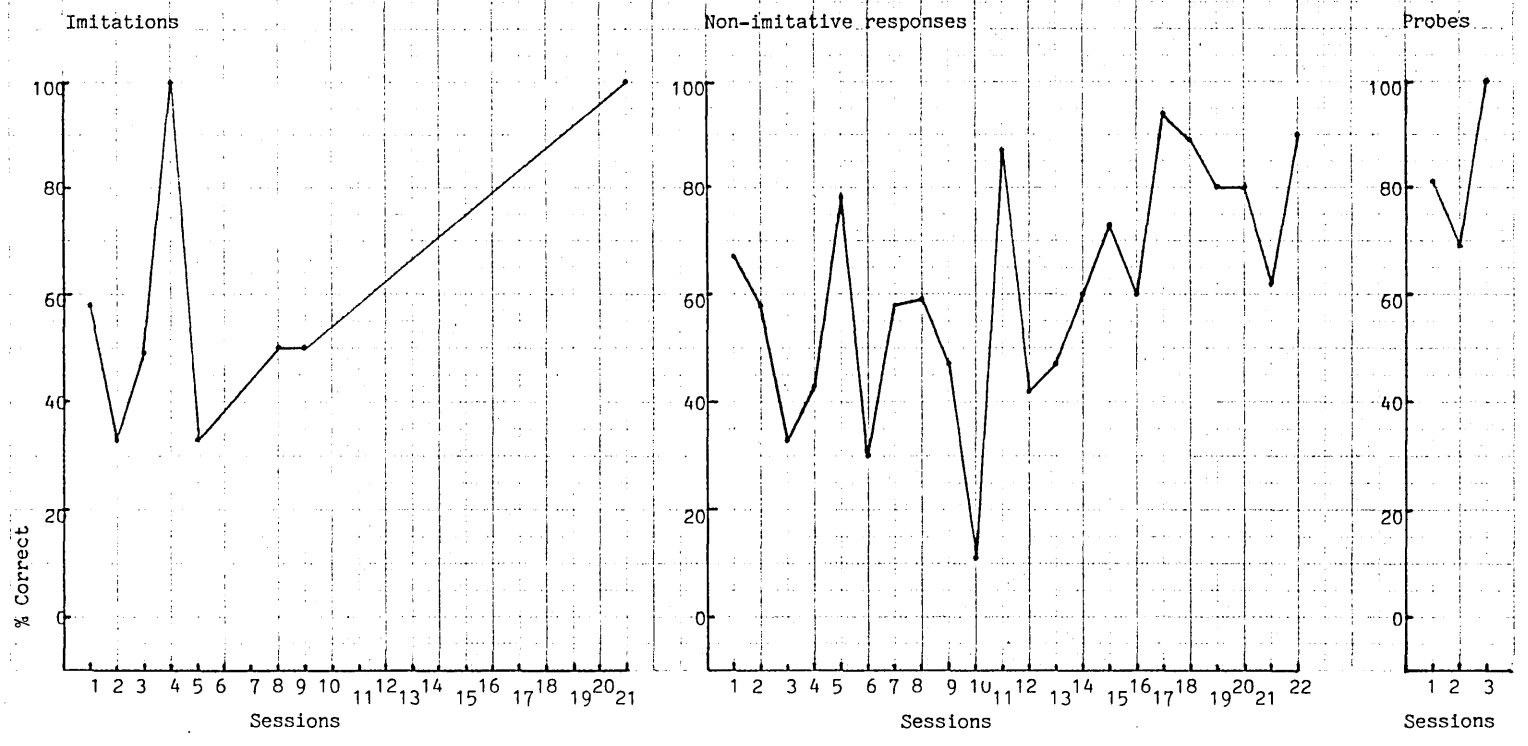
Probes

Trials (% correct) - 16(88), 16(69), 18(100)

Fig.7-7

Nicola - Language Training - Progress in Learning Pronominal Usage -
I - Requesting (Objects)

STRUCTURE - CAN I HAVE A/SOME/MY (NOUN(S)) PLEASE?



Nicola - Language Training

Table 7-8

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I + Requesting - (Actions)

Structure - CAN I VERB A/MY (OBJ)/(PREP)?
(modal + pron + verb + det/poss.pron (obj)/(prep))

Training commenced - 16.5.79
Training terminated - 19.6.79
Number of sessions - 10

Imitations

Trials (% correct) - 24(46), 13(15)

Non-imitative responses

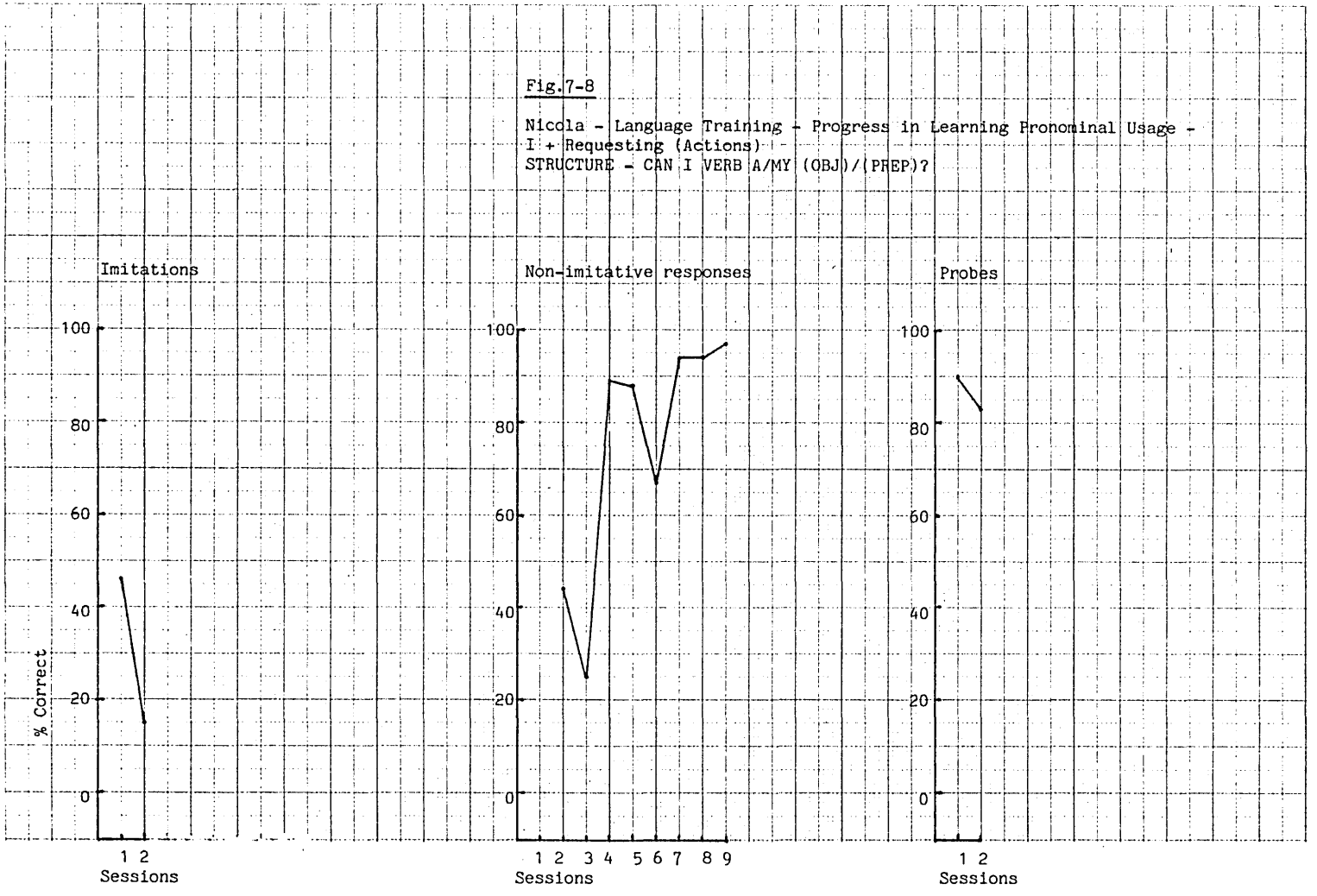
Trials (% correct) - 25(44), 36(25), 37(89), 36(88), 37(67)
36(94), 36(94), 36(97)

Probes

Trials (% correct) - 30(90), 12(83)

Fig.7-8

Nicola - Language Training - Progress in Learning Pronominal Usage -
I + Requesting (Actions) -
STRUCTURE - CAN I VERB A/MY (OBJ)/(PREP)?



Nicola - Language Training

Table 7-9

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I/You
(Person Deixis) + Wh?

Structure - WHAT DO YOU WANT?
(what + aux + pron + verb?)

Training commenced - 21.9.79
Training terminated - 21.11.79
Number of sessions - 29

Imitations

Trials (% correct) - 2(100), 2(100), 2(100)

Non-imitative responses

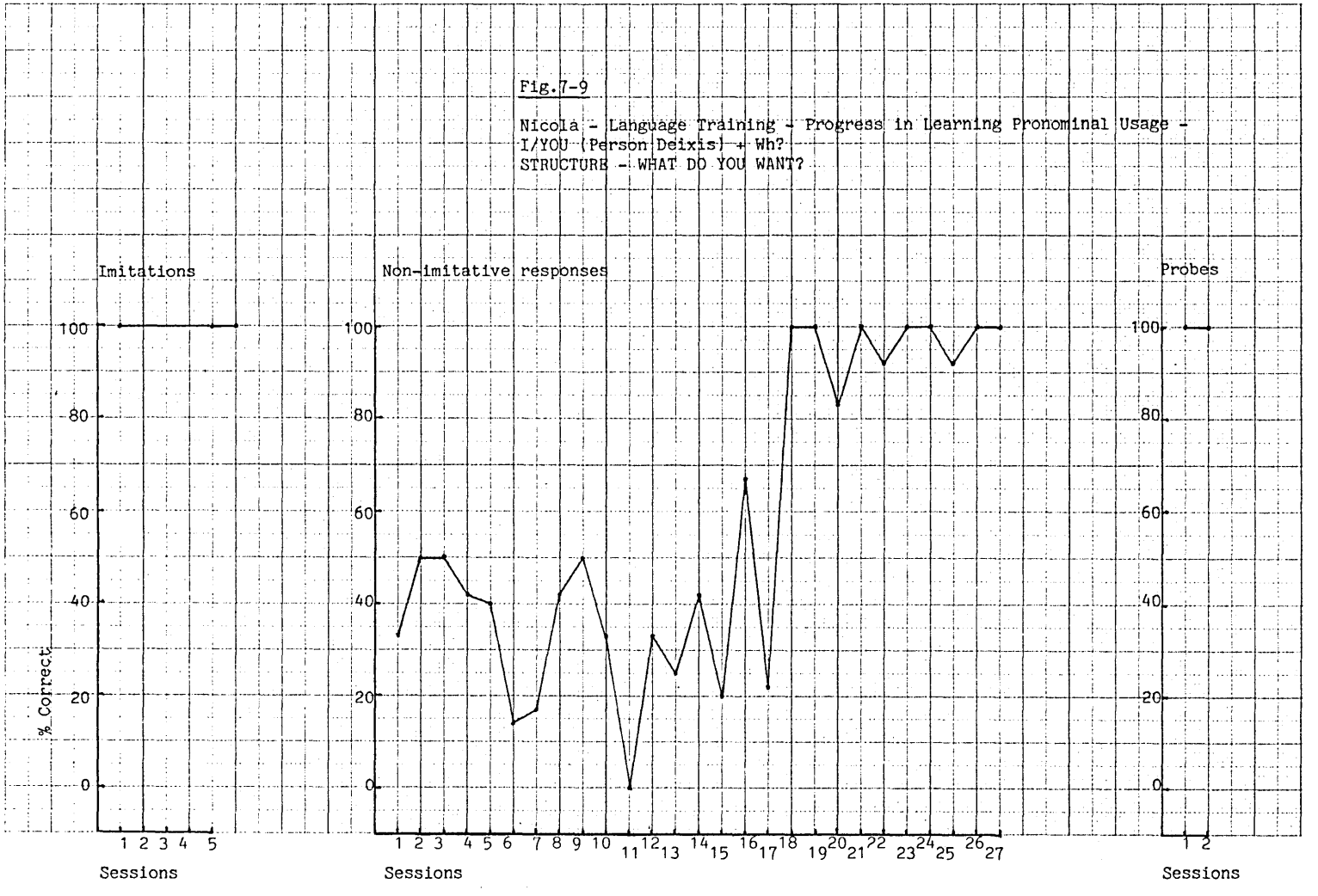
Trials (% correct) - 6(33), 6(50), 6(50), 12(42)
10(40), 7(14), 12(17), 12(42)
12(50), 12(33), 6(0), 6(33), 12(25)
12(42), 6(20), 9(67), 18(22)
6(100), 6(100), 12(83), 12(100)
12(92), 12(100), 12(100), 12(100)
12(92), 6(100), 12(100)

Probes

Trials (% correct) - 6(100), 9(100)

Fig.7-9

Nicola - Language Training - Progress in Learning Pronominal Usage -
I/YOU (Person Deixis) + Wh?
STRUCTURE - WHAT DO YOU WANT?



Nicola - Language Training

Table 7-10

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I/you
(Person Deixis)

STRUCTURE - YOU WANT A/SOME/YOUR (NOUN(S))
(pron + verb + det/poss.pron + noun (pl))

Training commenced - 21.9.79
Training terminated - 21.11.79
Number of sessions - 29

Imitations

Trials (% correct) - 2(100), 1(100), 2(100), 3(100)

Non-imitative responses

Trials (% correct) - 6(33), 6(0), 6(33), 12(8), 10(30),
7(14), 12(42), 12(17), 12(42),
12(67), 6(67), 6(67), 15(23), 12(50),
6(50), 9(55), 12(33), 6(67), 6(83),
12(42), 12(42), 12(83), 12(67), 12(50),
12(75), 12(67), 12(83), 18(83)

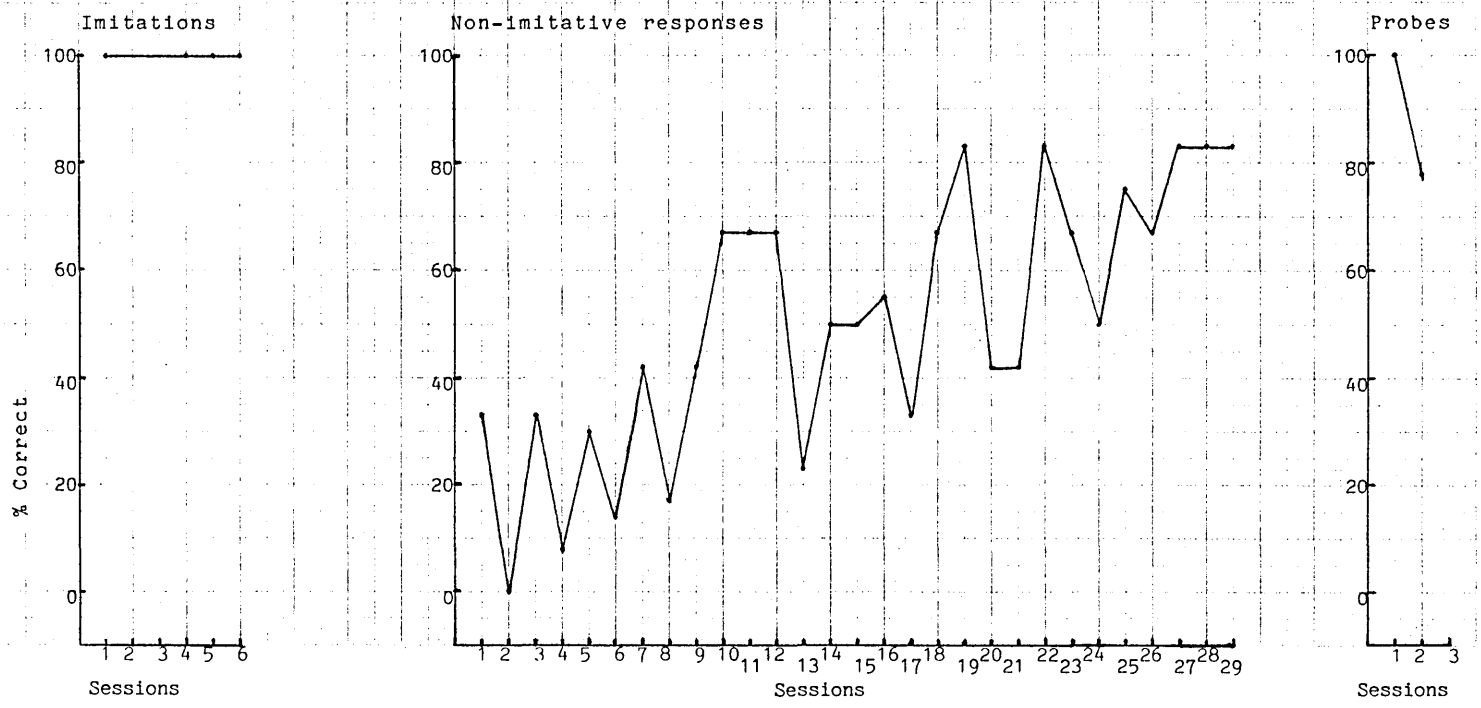
Probes

Trials (% correct) - 6(100), 9(78)

Fig.7-10

Nicola - Language Training - Progress in Learning
Pronominal Usage - I/You (Person Deixis)

STRUCTURE - 'YOU WANT A/SOME/YOUR (NOUN(S))



Nicola - Language Training

Table 7-11

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I/you
(Person deixis) + Wh?

Structure - WHAT ARE YOU DOING?
(What + aux + pron + verb + ing?)

Training commenced - 21.9.79
Training terminated - 21.11.79
Number of sessions - 29

Imitations

Trials (% correct) - 6(100)

Non-imitative responses

Trials (% correct) - 6(8), 6(0), 12(50), 12(25), 10(40), 6(50), 6(33), 6(6), 6(13), 6(67), 7(86), 6(50), 6(83), 6(83), 8(75), 6(100), 6(67), 12(100), 12(100), 12(100), 12(100), 12(83), 12(100), 12(100), 12(100), 6(100), 12(100)

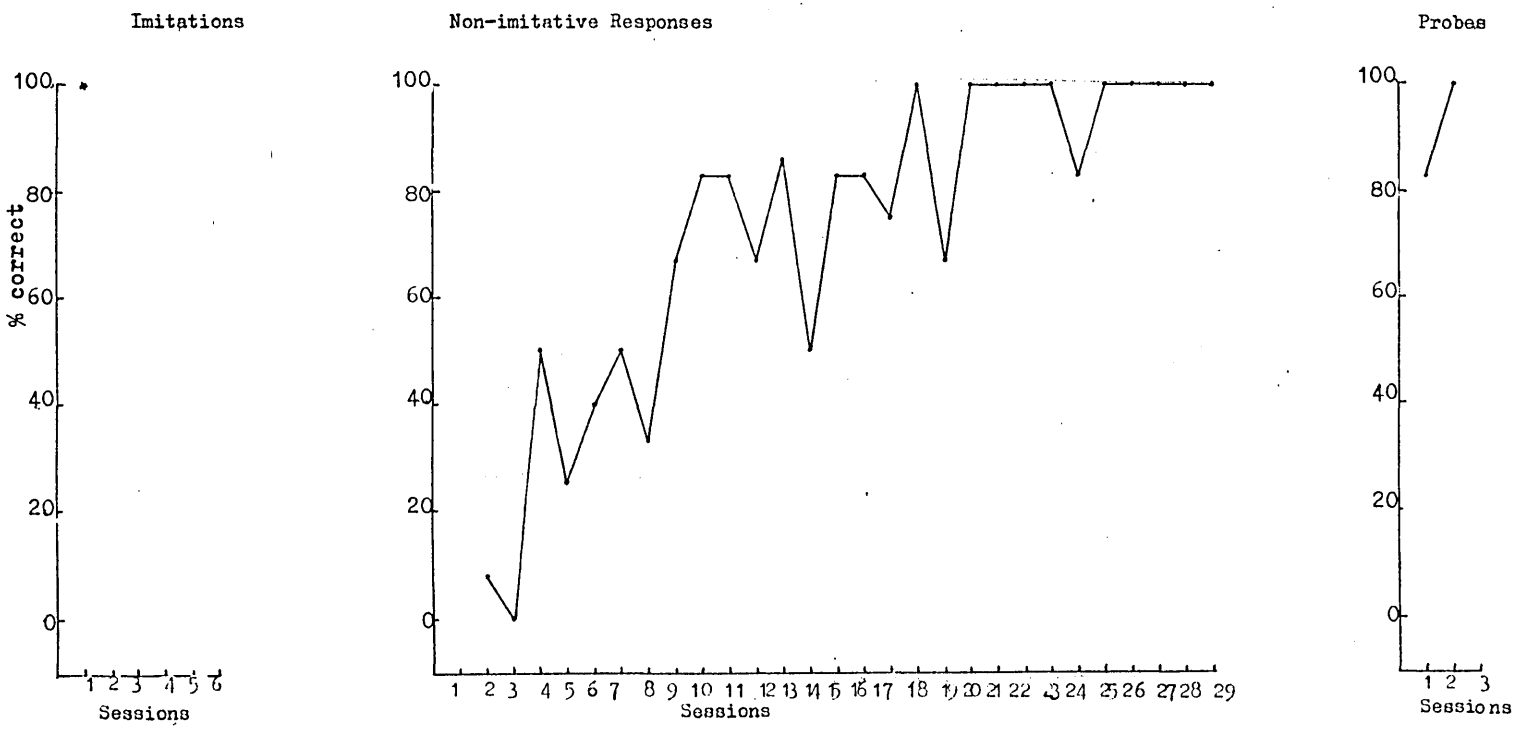
Probes

Trials (% correct) - 6(83), 9(100)

Fig. 7-11

Nicola - Language Training - Progress in Learning Pronominal Usage - I/You (Person Deixis) + Wh?

STRUCTURE - WHAT ARE YOU DOING?



Nicola - Language Training

Table 7-12

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I/you
(person deixis)

Structure - YOU ARE VERB-ING A/YOUR (OBJ)/(PREP)
(pron + aux + verb + ing + det + (obj)/(prep))

Training commenced - 21.9.79
Training terminated - 21.11.79
Number of sessions - 29

Imitations

Trials (% correct) - 6(100)

Non-imitative responses

Trials (% correct) - 6(8), 6(33), 12(50), 12(33), 7(0), 6(0), 6(33), 6(50), 6(67), 6(33), 6(67), 6(50), 6(33), 6(50), 6(67), 7(71), 6(67), 6(67), 12(83), 12(67), 12(83), 12(75), 14(50), 12(83), 12(75), 6(100), 12(83)

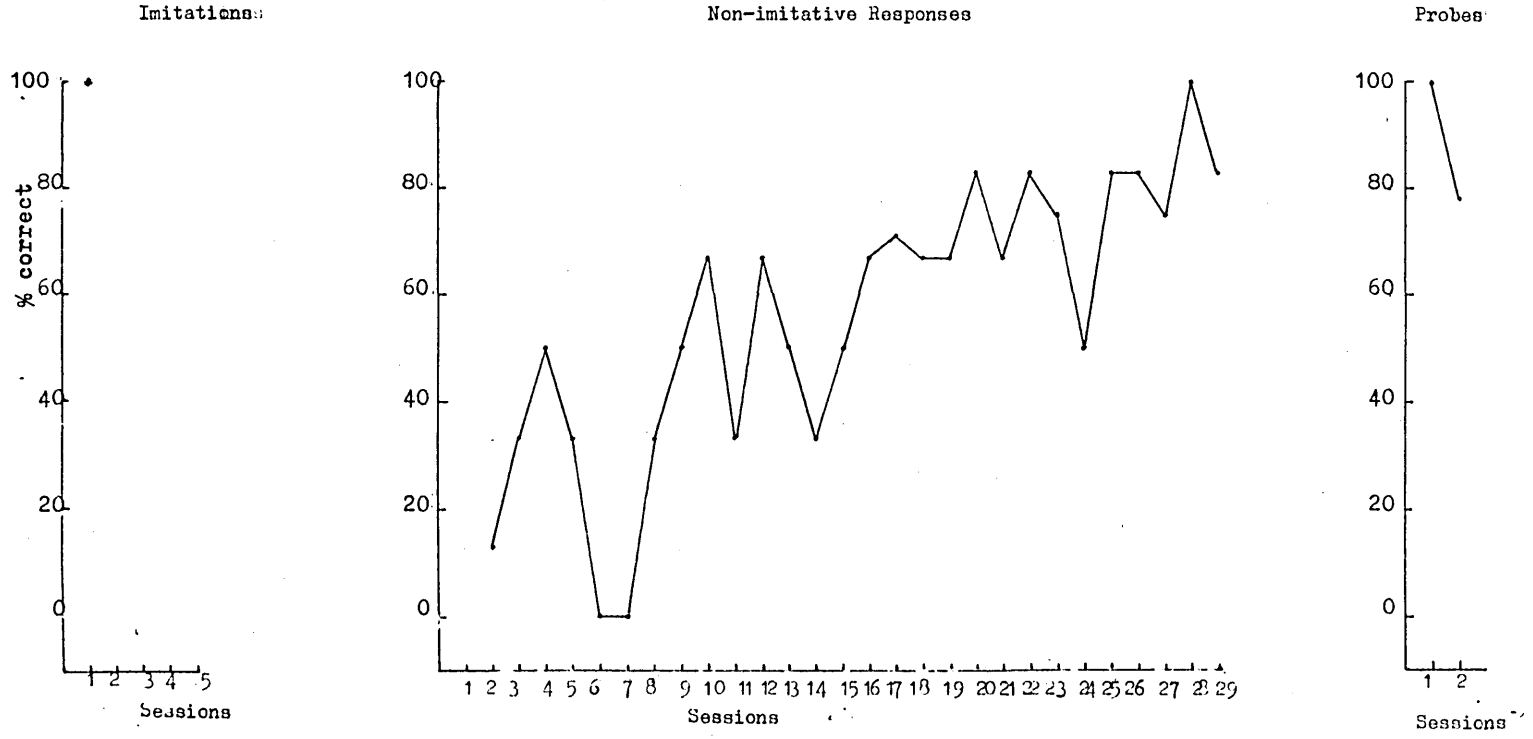
Probes

Trials (% correct) - 6(100), 9(78)

Fig. 7-12

Nicola - Language Training - Progress in Learning Pronominal Usage - I/You (Person Deixis)

STRUCTURE - YOU ARE VERB-ING A/YOUR (OBJ)/(PREP)



Nicola - Language Training

Table 7-13

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I/you
(person deixis)

Structure - WILL YOU VERB (PREP)?
(modal + pron + verb + prep?)

WILL YOU VERB A NOUN FOR ME?
(modal + pron + verb + det + noun?)

WILL YOU VERB ME A/YOUR NOUN?
(modal + pron + verb + pron + det + noun?)

Training commenced - 27.11.79
Training terminated - 18.12.79

Imitations

Trials (% correct) - 2(100), 2(50)

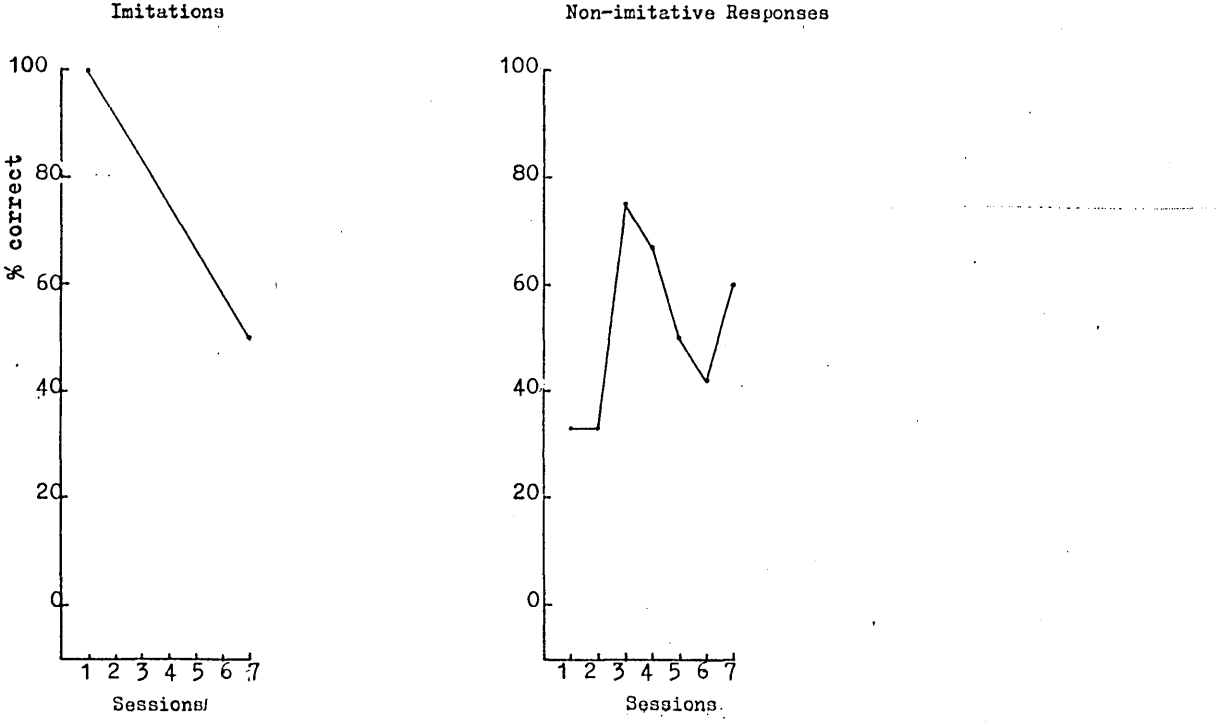
Non-imitative responses

Trials (% correct) - 12(33), 12(33), 12(75), 12(67),
12(50), 12(42), 15(60)

Fig.7-13

Nicola - Language Training - Progress in Learning Pronominal Usage - I/You (Person Deixis) + Yes/No question

STRUCTURE - WILL YOU VERB (PREP)?/WILL YOU (VERB) A (NOUN) FOR ME?/ WILL YOU (VERB) ME A/YOUR/NOUN?



Nicola - Language Training

Table 7-14

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I/you
(Person Deixis)

Structure - I WANT YOU TO VERB(PREP)
(pron + verb + pron + infinitive verb + prep)

I WANT YOU TO VERB A (NOUN) FOR ME
(pron + verb+ pron + infinitive verb + det + noun)

I WANT YOU TO VERB ME A/YOUR (NOUN)
(pron + verb + pron + infinitive + pron + det/
pron + noun)

Training commenced - 27.11.79
Training terminated - 18.12.79

Imitations

Trials (% correct) - 2(100), 2(50)

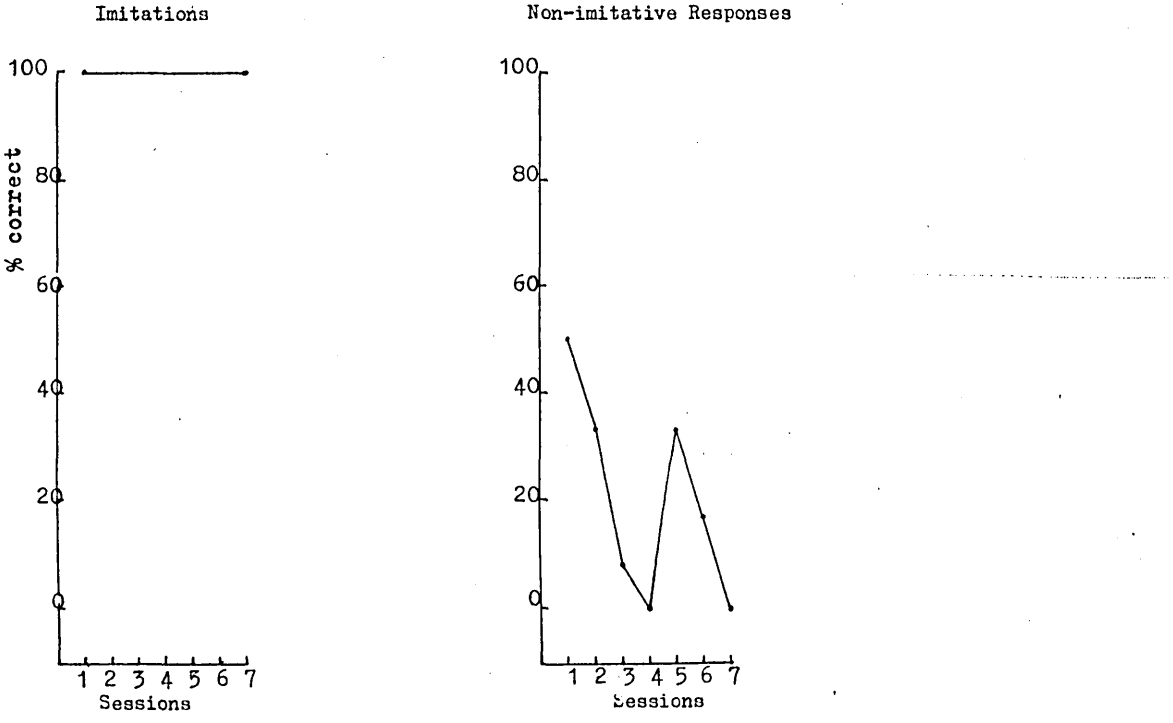
Non-imitative responses

Trials (% correct) - 12(33), 12(33), 12(75), 12(67),
12(50), 12(42), 15(60)

Fig.7-14

Nicola - Language Training - Progress in Learning Pronominal Usage - I/You (Person Deixis)

STRUCTURE - I WANT YOU TO (VERB)(PREP)/I WANT YOU TO (VERB) A (NOUN) FOR ME/I WANT YOU TO (VERB) ME A/YOUR(NOUN)



Nicola - Post-Test I - Generalisation Probes

Table 7-15

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - Objects - (Singular)

Structure - IT'S A NOUN - (pron + cop + det + noun)

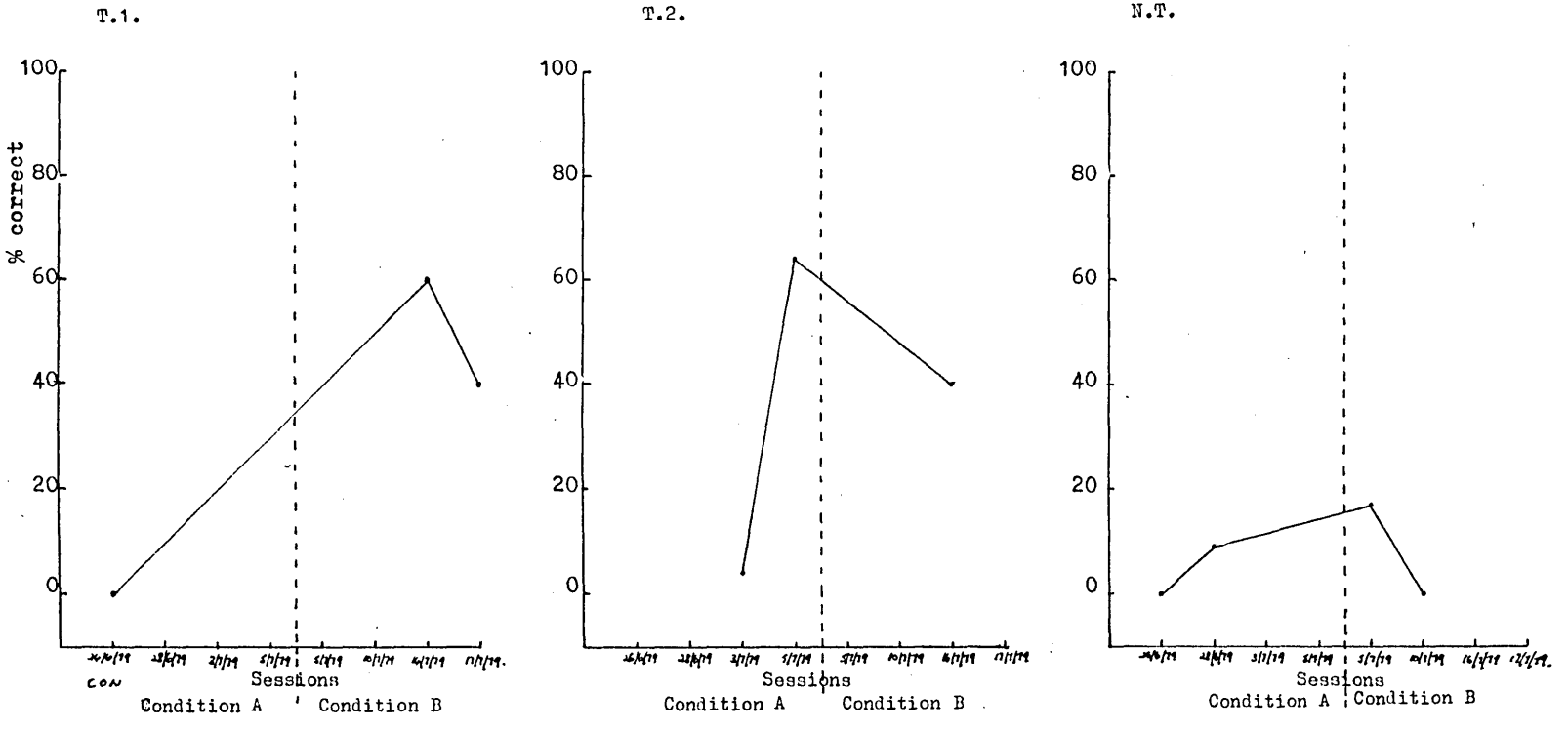
	Condition A	Condition B
i)	Trainer 1	
	Sessions 26.6.79	16.7.79, 17.7.79
	Trials (% correct)	
	13(0)	5(60), 5(40)
ii)	Trainer 2	
	Sessions 3.7.79, 5.7.79	10.7.79, 16.7.79
	Trials (% correct)	
	26(4) 28(64)	(faulty tape, data missing) 10(40)
iii)	Non-Trainer	
	Sessions 26.6.79, 28.6.79	5.7.79, 10.7.79
	Trials (% correct)	
	16(0), 11(9)	6(16), 5(0)

Fig. 7-15

Nicola - Post-Test 1 - Generalisation Probes

Training Category - Labelling - Objects (Singular)

STRUCTURE - IT'S A (NOUN)



Nicola - Post-Test I - Generalisation Probes

Table 7-16

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - (Persons)

Structure - IT'S PERSON (NAME)
(pron + cop' + proper noun)

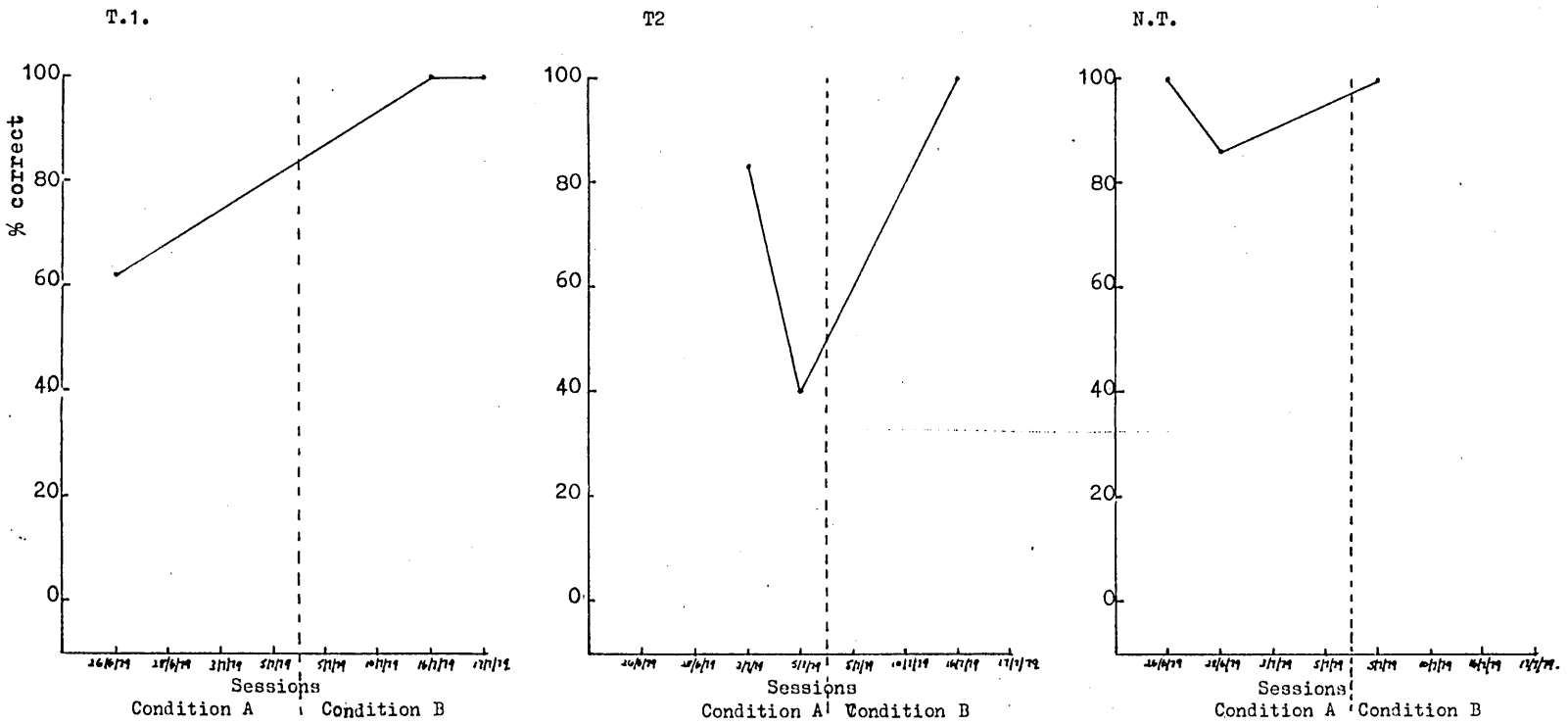
	Condition A	Condition B
i)	Trainer 1	
	Sessions 26.6.79	16.7.79, 17.7.79
	Trials (% correct)	
	8(62)	3(100), 3(100)
ii)	Trainer 2	
	Sessions 3.7.79, 5.7.79	10.7.79, 16.7.79
	Trials (% correct)	
	6(83), 5(40)	(faulty tape, data missing) 3(100)
iii)	Non-Trainer	
	Sessions 26.6.79, 28.6.79	5.7.79, 10.7.79
	Trials (% correct)	
	6(100), 7(86)	6(100), - (structure not included by Tester)

Fig. 7-16

Nicola - POST-TEST 1 - Generalisation Probes -

Training Category - Labelling-Persons

STRUCTURE - IT'S PERSON (NAME)



Nicola - Post-Test I - Generalisation Probes

Table 7-17

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - Objects - (Plural)

Structure - THEY'RE NOUNS
(pronoun + cop' + noun(pl))

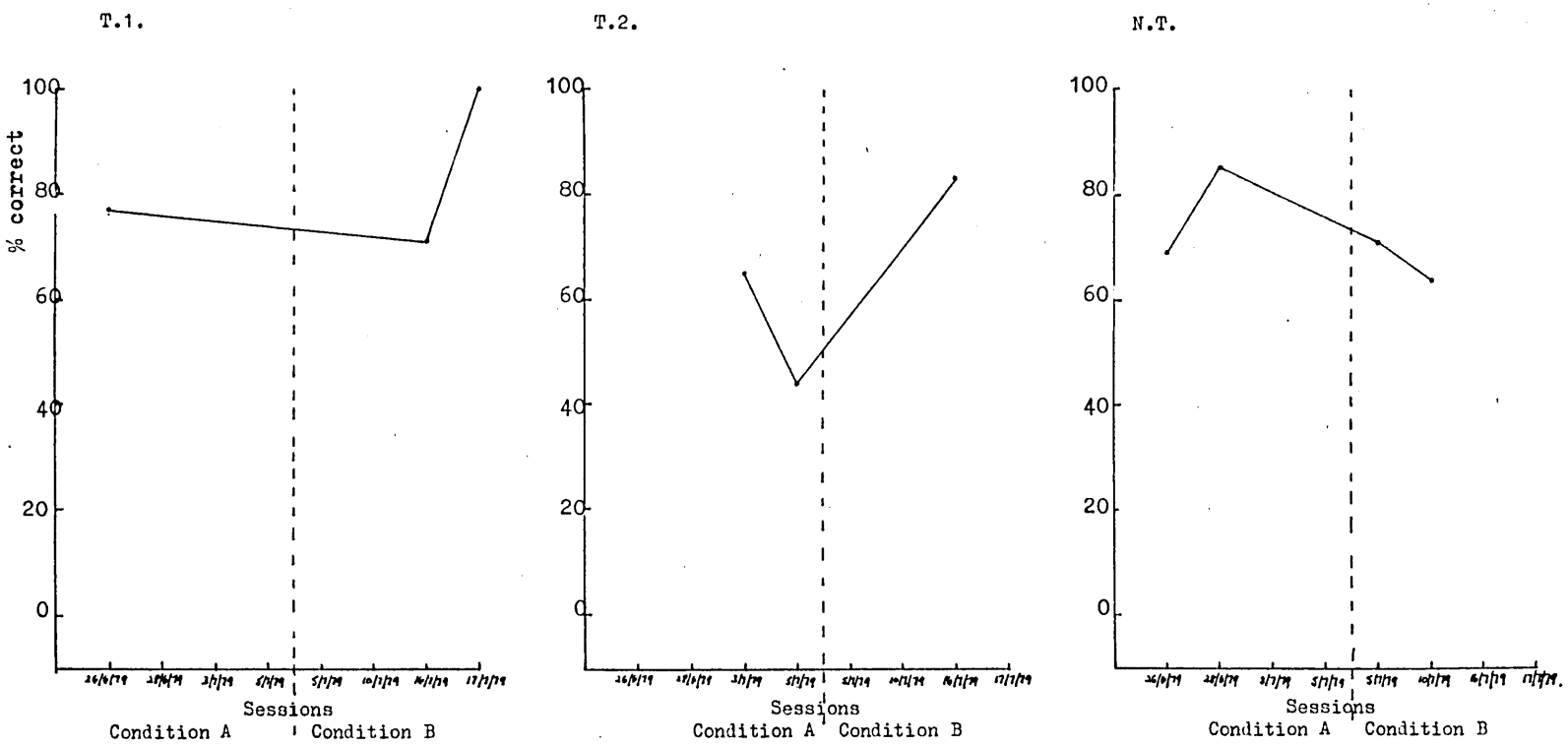
	Condition A	Condition B
i)	Trainer 1	
	Sessions 26.6.79	16.7.79, 17.7.79
	Trials (% correct)	
	13(77)	7(71), 6(100)
ii)	Trainer 2	
	Sessions 3.7.79, 5.7.79	10.7.79, 16.7.79
	Trials (% correct)	
	17(65), 34(44)	(faulty tape, data missing) 6(83)
iii)	Non-Trainer	
	Sessions 26.6.79, 28.6.79	5.7.79, 10.7.79
	Trials (% correct)	
	16(69), 13(85)	7(71), 14(64)

Fig. 7-17

Nicola - POST-TEST 1 - Generalisation Probes

Training Category - Labelling - Objects (Plural)

STRUCTURE - THEY'RE (NOUNS)



Nicola - Post-Test I - Generalisation Probes

Table 7-18

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - Persons/Actions/Things

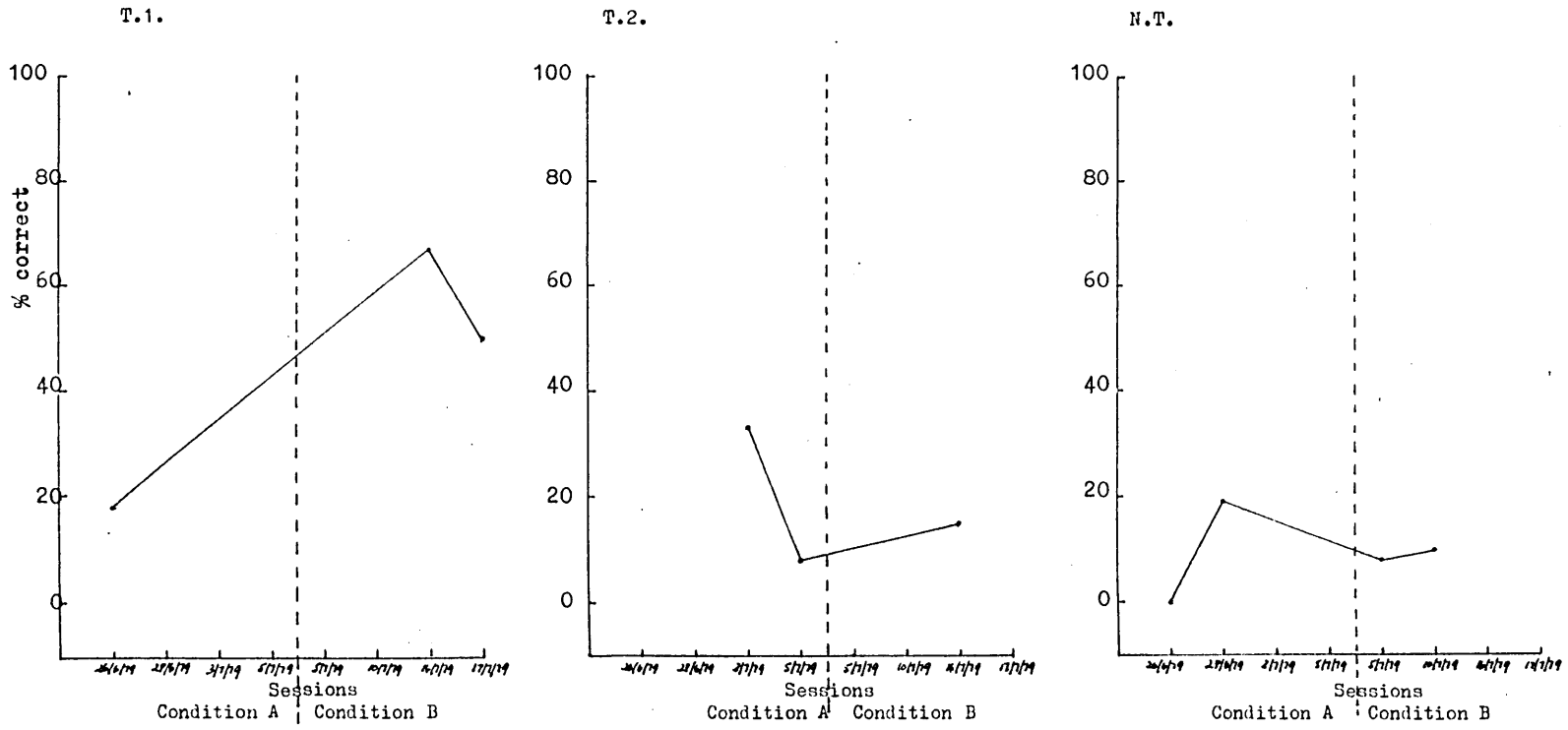
Structure - IT'S A MAN/WOMAN/BOY/GIRL VERBING (OBJ)/(AOBJ)/(PREP)
(pron + cop' + det + subj + verb + ing (obj)/(det + obj)/(prep))

	Condition A	Condition B
i)	Trainer 1	
	Sessions 26.6.79	16.7.79, 17.7.79
	Trials (% correct)	
	28(18)	3(67), 6(50)
ii)	Trainer 2	
	Sessions 3.7.79, 5.7.79	10.7.79, 16.7.79
	Trials (% correct)	
	21(33), 35(8)	(faulty tape, data missing) 20(15)
iii)	Non-Trainer	
	Sessions 26.6.79, 28.6.79	5.7.79, 10.7.79
	Trials (% correct)	
	24(0), 26(19)	13(8), 10(10)

Fig. 7-18

Nicola - POST-TEST 1 - Generalisation Probes in Test Conditions A and B
- Labelling Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (AOBJ)/(PREP)



Nicola - Post-Test I - Generalisation Probes

Table 7-19

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - Actions

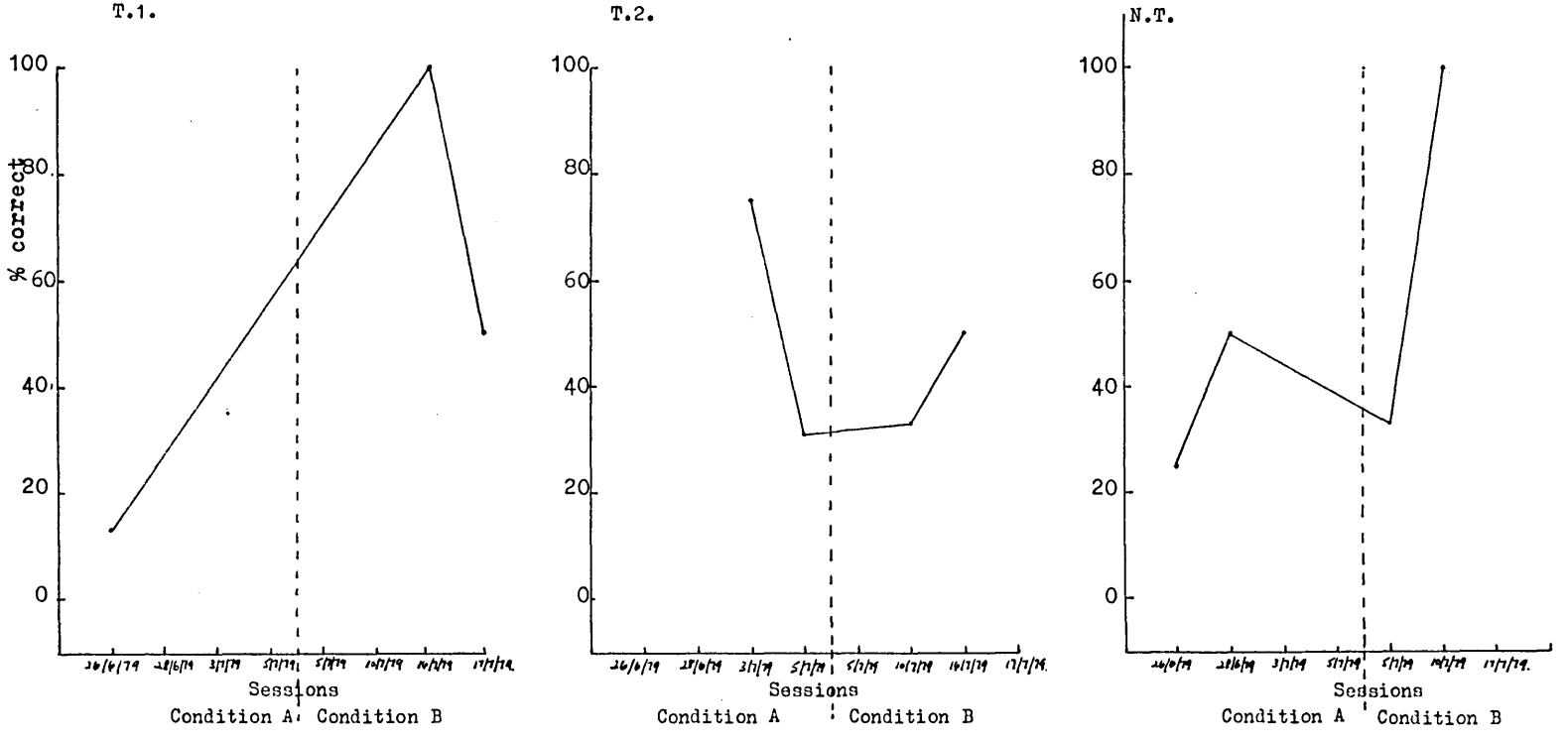
Structure - I AM/I'M VERB-ING (OBJ)/(AOBJ)/(PREP)
(pron + aux + verb + ing + obj/(det + obj)/(prep))

	Condition A	Condition B
i)	Trainer 1	
	Sessions 26.6.79	16.7.79, 17.7.79
	Trials (% correct)	
	15(13)	3(100), 4(50)
ii)	Trainer 2	
	Sessions 3.7.79, 5.7.79	10.7.79, 16.7.79
	Trials (% correct)	
	8(75), 16(31)	3(33), 2(50)
iii)	Non-Trainer	
	Sessions 26.6.79, 28.6.79	5.7.79, 10.7.79
	Trials (% correct)	
	12(24), 12(50)	9(33), 3(100)

Fig. 7-19

Nicola - POST-TEST 1 - Generalisation Probes in Test Conditions A and B
- Pronominal Usage - I + Labelling Actions

STRUCTURE - I AM/I'M VERB-ING (OBJ)/(AOBJ)/(PREP)



Nicola - Post-Test I - Generalisation Probes

Table 7-20

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

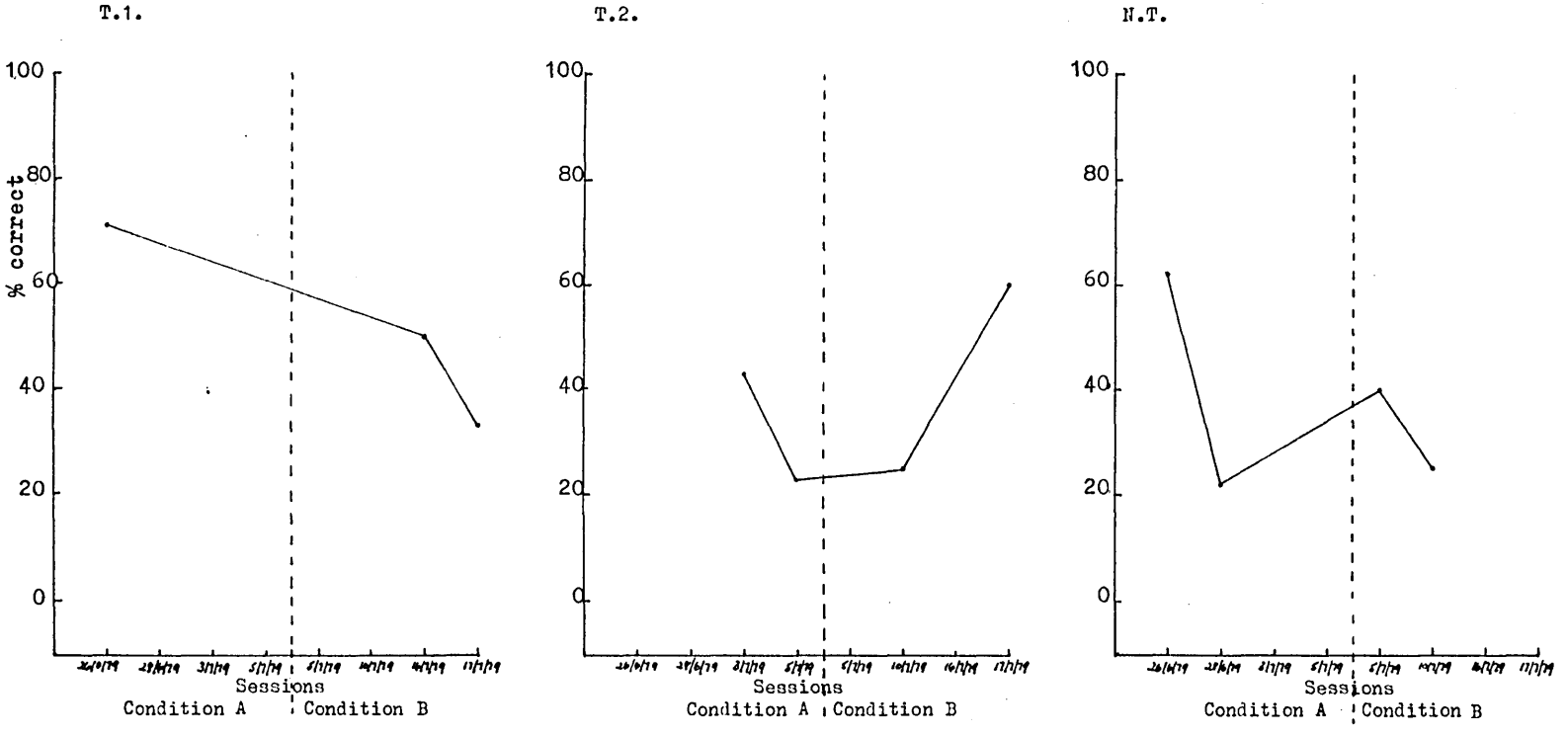
Training Category - Labelling - Actions - (Persons)

Structure - VERB-ING (OBJ)/(AOBJ)/(PREP)
(verb + ing + (obj)/(det + obj)/(prep))

	Condition A	Condition B
i)	Trainer 1	
	Sessions 26.6.79	16.7.79, 17.7.79
	Trials (% correct)	
	7(71)	6(50), 6(33)
ii)	Trainer 2	
	Sessions 3.7.79, 5.7.79	10.7.79, 16.7.79
	Trials (% correct)	
	14(43), 17(23)	12(25), 5(60)
iii)	Non-Trainer	
	Sessions 26.6.79, 28.6.79	5.7.79, 10.7.79
	Trials (% correct)	
	8(62), 18(22)	10(40), 8(25)

Fig. 7-20

Nicola - Post-Test 1 - Generalisation Probes in Test Conditions A and B
Labelling - Actions - Persons
STRUCTURE - VERB-ING (OBJ)/(AOBJ)/(PREP)



Nicola - Post-Test I - Generalisation Probes

Table 7-21

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

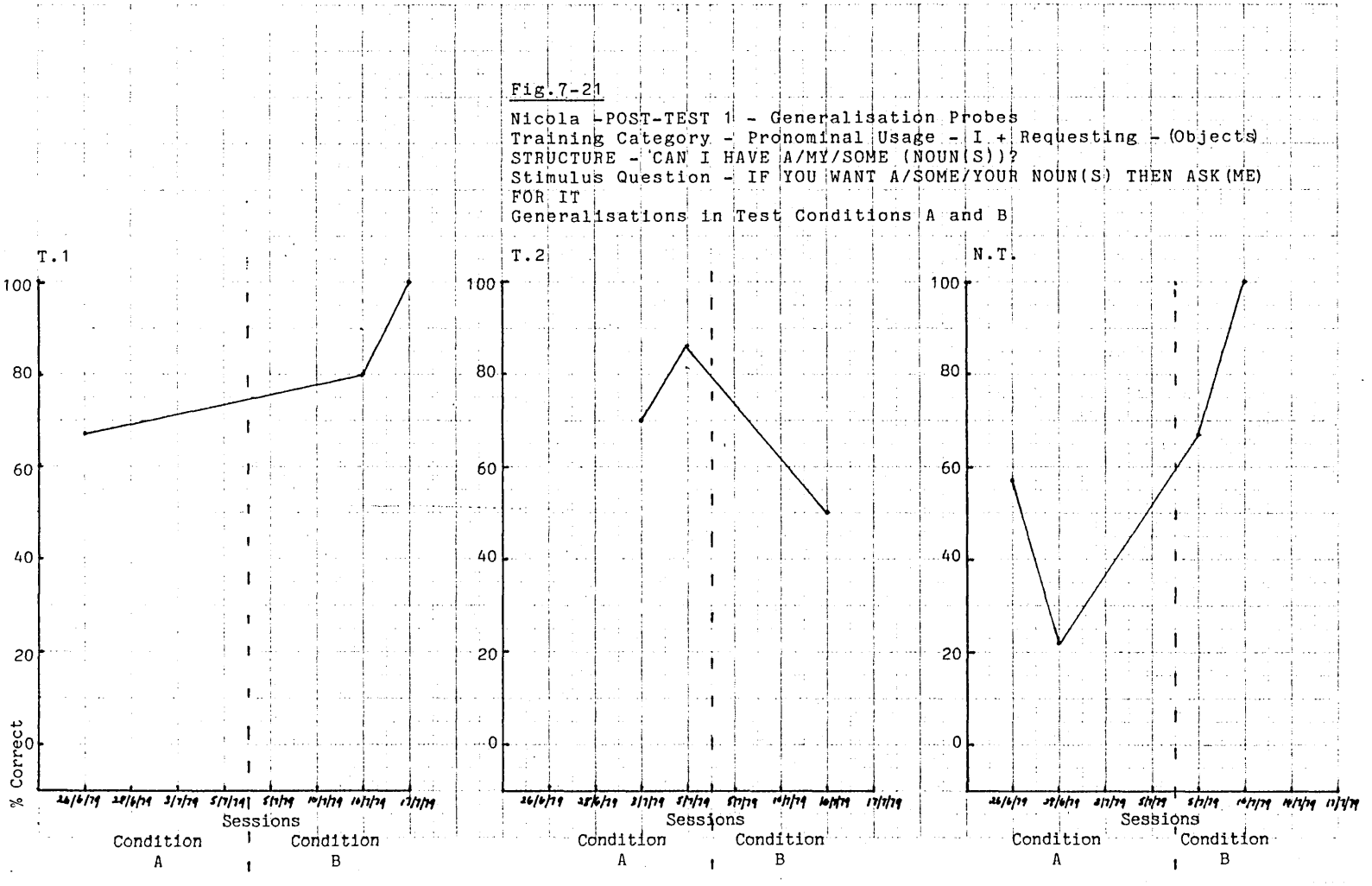
Training Category - Pronominal Usage - I + Requesting - Objects

Structure - CAN I HAVE A/MY/SOME NOUN(S)
(modal + pron + verb + det/poss.pron + noun(pl))
Stimulus - IF YOU WANT A/SOME/YOUR (NOUN(S))
THEN ASK (ME) FOR IT

	Condition A	Condition B
i)	Trainer 1	
	Sessions 26.6.79	16.7.79, 17.7.79
	Trials (% correct)	
	6(67)	5(80), 3(100)
ii)	Trainer 2	
	Sessions 3.7.79, 5.7.79	10.7.79, 16.7.79
	Trials (% correct)	
	8(70), 7(86)	2(100), 4(50)
iii)	Non-Trainer	
	Sessions 26.6.79, 28.6.79	5.7.79, 10.7.79
	Trials (% correct)	
	7(57), 9(22)	6(67), 3(100)

Fig.7-21

Nicola -POST-TEST 1 - Generalisation Probes
Training Category - Pronominal Usage - I + Requesting - (Objects)
STRUCTURE - 'CAN I HAVE A/MY/SOME (NOUN(S))?
Stimulus Question - IF YOU WANT A/SOME/YOUR NOUN(S) THEN ASK(ME) FOR IT
Generalisations in Test Conditions A and B



Nicola - Post-Test I - Generalisation Probes

Table 7-22

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Pronominal Usage - I + Requesting (Objects)

Structure - CAN I HAVE A/SOME/MY (NOUN(S))?
(modal + pron + verb + det/poss.pron + noun(pl))

Stimulus - WHAT DO YOU WANT?

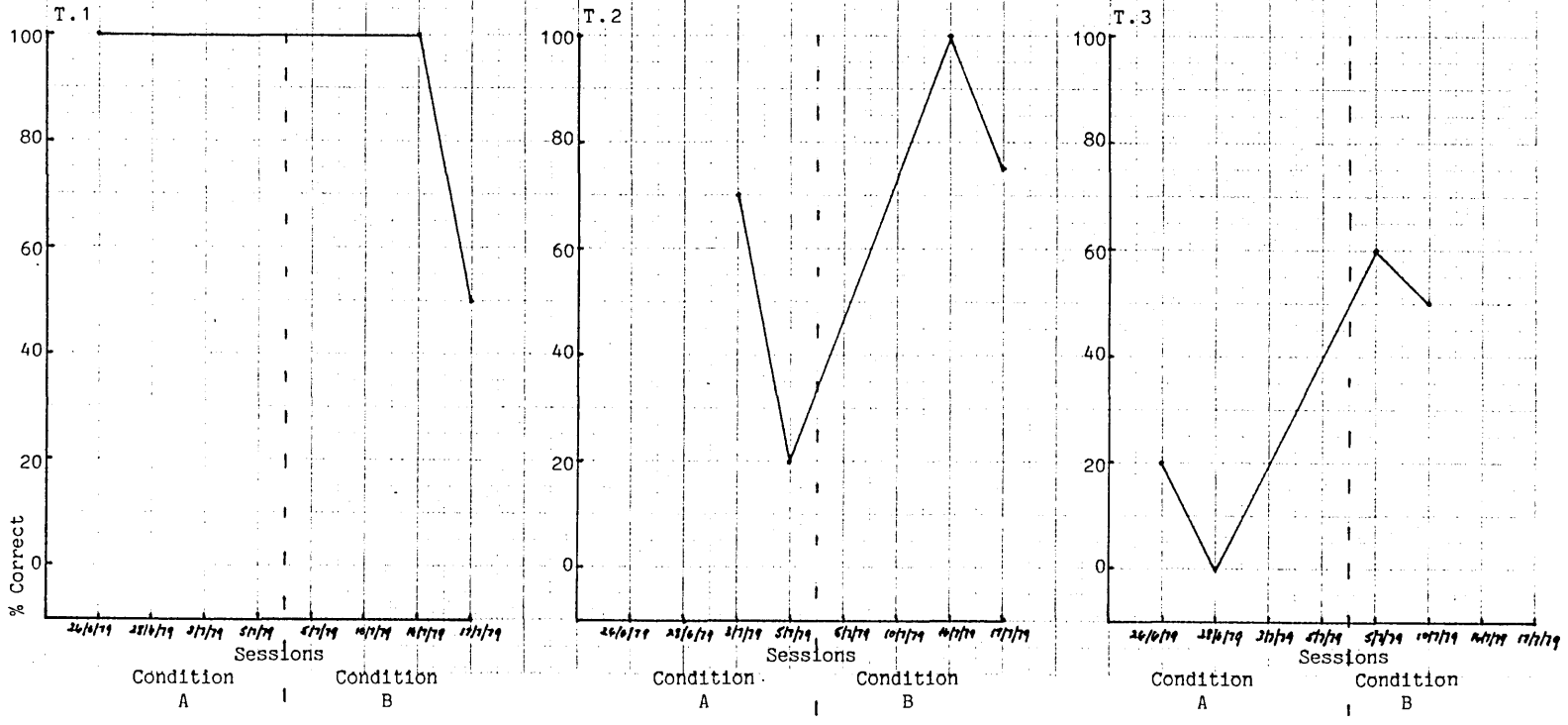
	Condition A	Condition B
i)	Trainer 1	
	Sessions 26.6.79	16.7.79, 17.7.79
	Trials (% correct)	
	6(100)	2(100), 4(50)
ii)	Trainer 2	
	Sessions 3.7.79, 5.7.79	10.7.79, 16.7.79
	Trials (% correct)	
	10(70), 15(20)	3(100), 75(4)
iii)	Non-Trainer	
	Sessions 26.6.79, 28.6.79	5.7.79, 10.7.79
	Trials (% correct)	
	10(20), 13(0)	5(60), 10(50)

Fig.7-22

Nicola - POST-TEST 1 - Generalisation Probes

Training Category - Prohominal Usage - I + Requesting (Objects)
STRUCTURE - CAN I HAVE A/SOME/MY (NOUN(S))?

Stimulus - WH. DO YOU WANT?
Generalisations in Test Conditions A and B



Nicola - Post-Test I - Generalisation Probes

Table 7-23

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Pronominal Usage - I + Requesting (Action)

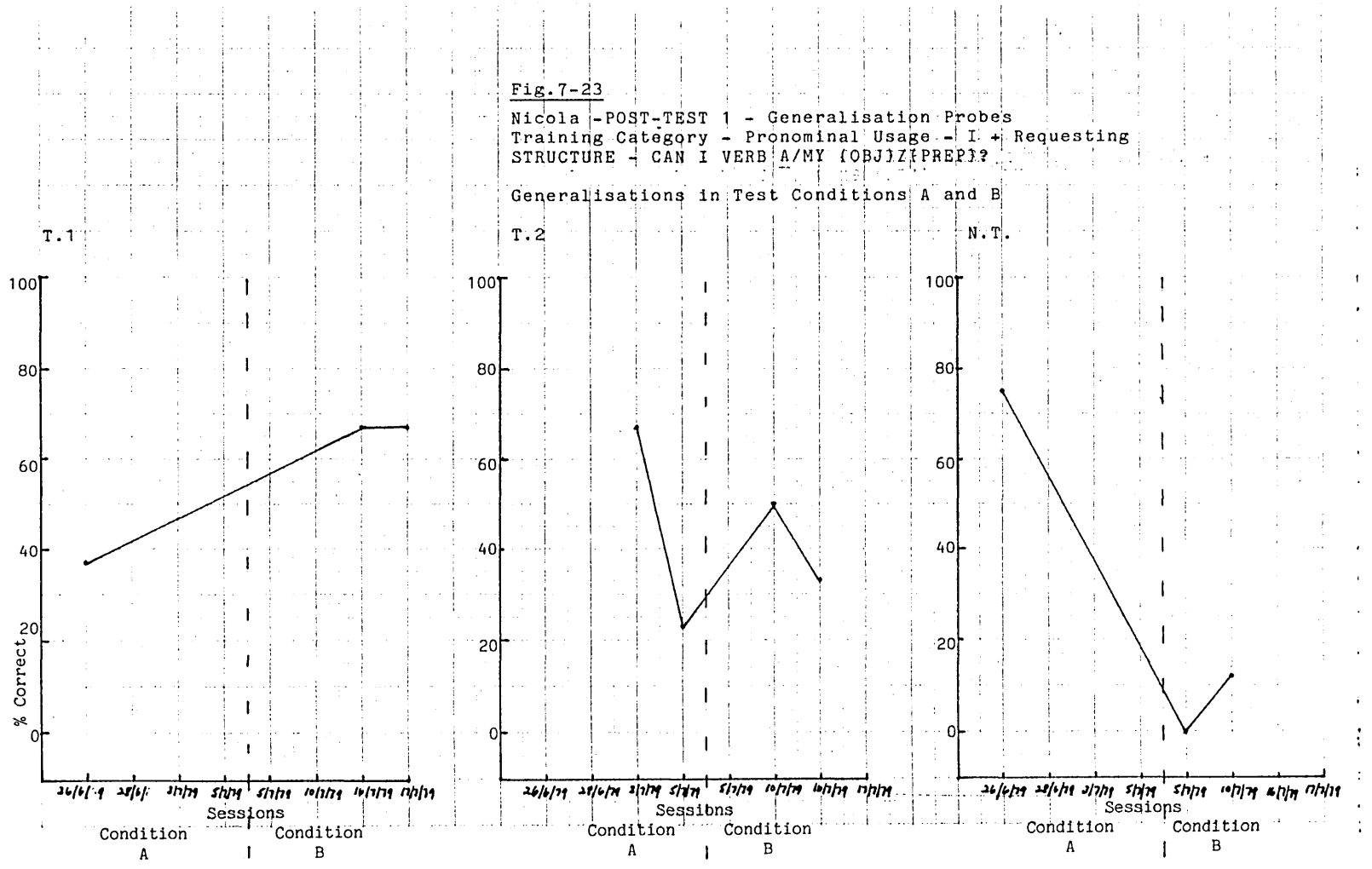
Structure - CAN I VERB - A/MY (OBJ)/(PREP) (modal + pron + verb + det/poss.pron + (obj)/(prep))

	Condition A	Condition B
i)	Trainer 1	
	Sessions 26.6.79	16.7.79, 17.7.79
	Trials (% correct)	
	8(37)	3(67), 3(67)
ii)	Trainer 2	
	Sessions 3.7.79, 5.7.79	10.7.79, 16.7.79
	Trials (% correct)	
	9(67), 17(23)	4(50), 3(33)
iii)	Non-Trainer	
	Sessions 26.6.79, 28.6.79	5.7.79, 10.7.79
	Trials (% correct)	
	8(75), 7(57)	2(0), 8(12)

Fig.7-23

Nicola -POST-TEST 1 - Generalisation Probes
Training Category - Pronominal Usage - I + Requesting
STRUCTURE - CAN I VERB A/MY (OBJ)(PREP)?

Generalisations in Test Conditions A and B



Nicola - Post-Test 2 - Generalisation Probes (High Structure)

Table 7-24

Summary of Generalisations per Structure by Sessions and Trials

Training Category - Labelling Objects - (Singular)

STRUCTURE - IT'S A (NOUN)
(pron + cop + det + noun)

Sub-test I - 6.9.79
Trials (% correct) - 7(43)

Sub-Test II - 10.9.79
Trials (% correct) - 8(38)

Training Category - Labelling Objects - (Plural)

STRUCTURE - THEY'RE (NOUNS)
(pron + cop + noun plural)

Sub-test I - 6.9.79
Trials (% correct) - 13(78)

Sub-Test II - 10.9.79
Trials (% correct) - 7(71)

Training Category - Labelling (Persons)

STRUCTURE - IT'S PERSON (NAME)

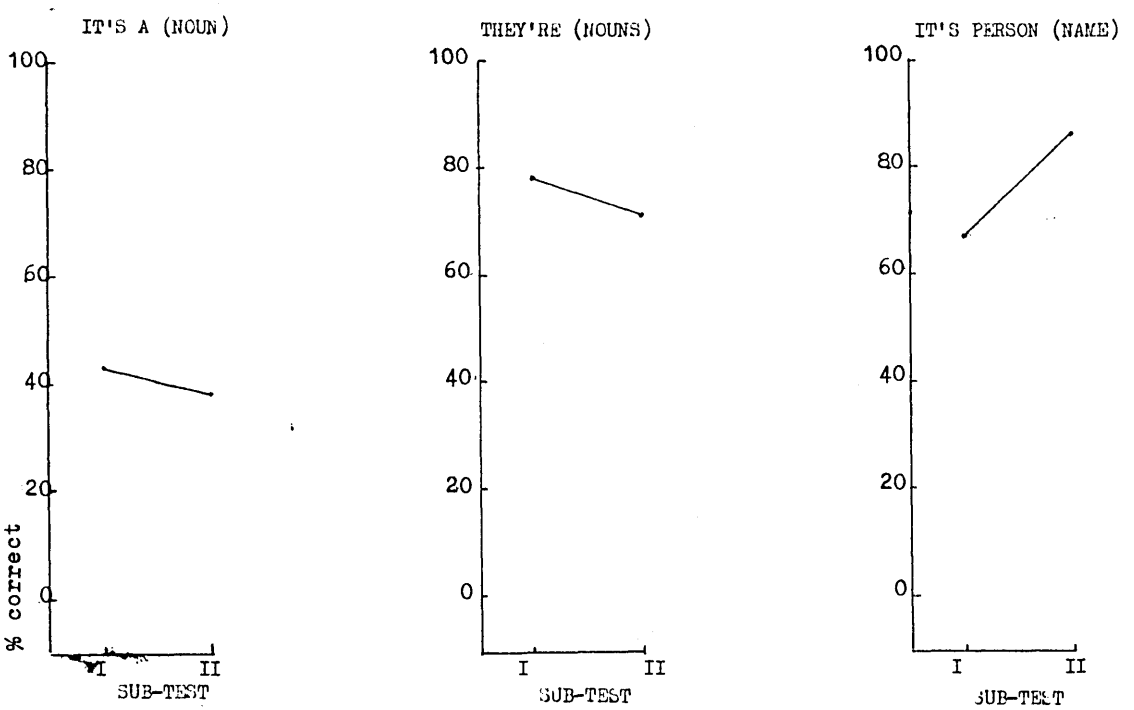
Sub-test I - 6.9.79
Trials (% correct) - 9(67)

Sub-Test II - 10.9.79
Trials (% correct) - 7(86)

Fig. 7-24

Nicola - POST-TEST 2 - Generalisation Probes (High Structure)

Generalisations in Sub-Tests I and II



Nicola - Post-Test 2 - Generalisation Test Probes (High Structure)

Table 7-25

Summary of Generalisation per Structure by Sessions and Trials

Training Category - Labelling Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(AOBJ)/(PREP)
(pron + cop + det + subject + verb + ing + (obj)/(det + obj)/(prep))

Sub-test I - 6.9.79
Trials (% correct) - 14(36)

Sub-Test II - 10.9.79
Trials (% correct) - 17(29)

Training Category - Labelling Actions (personal) + pronoun I

STRUCTURE - I'M/I AM VERB-ING (OBJ)/(AOBJ)/(PREP)
(pron + aux + verb + ing + (obj)/ (det + obj)/(prep))

Sub-test I - 6.9.79
Trials (% correct) - 7(28)

Sub-Test II - 10.9.79
Trials (% correct) - 10(50)

Training Category - Labelling Actions (Persons)

STRUCTURE - VERB-ING (OBJ)/(AOBJ)/(PREP)
(verb + ing (obj)/(det + obj)/(prep))

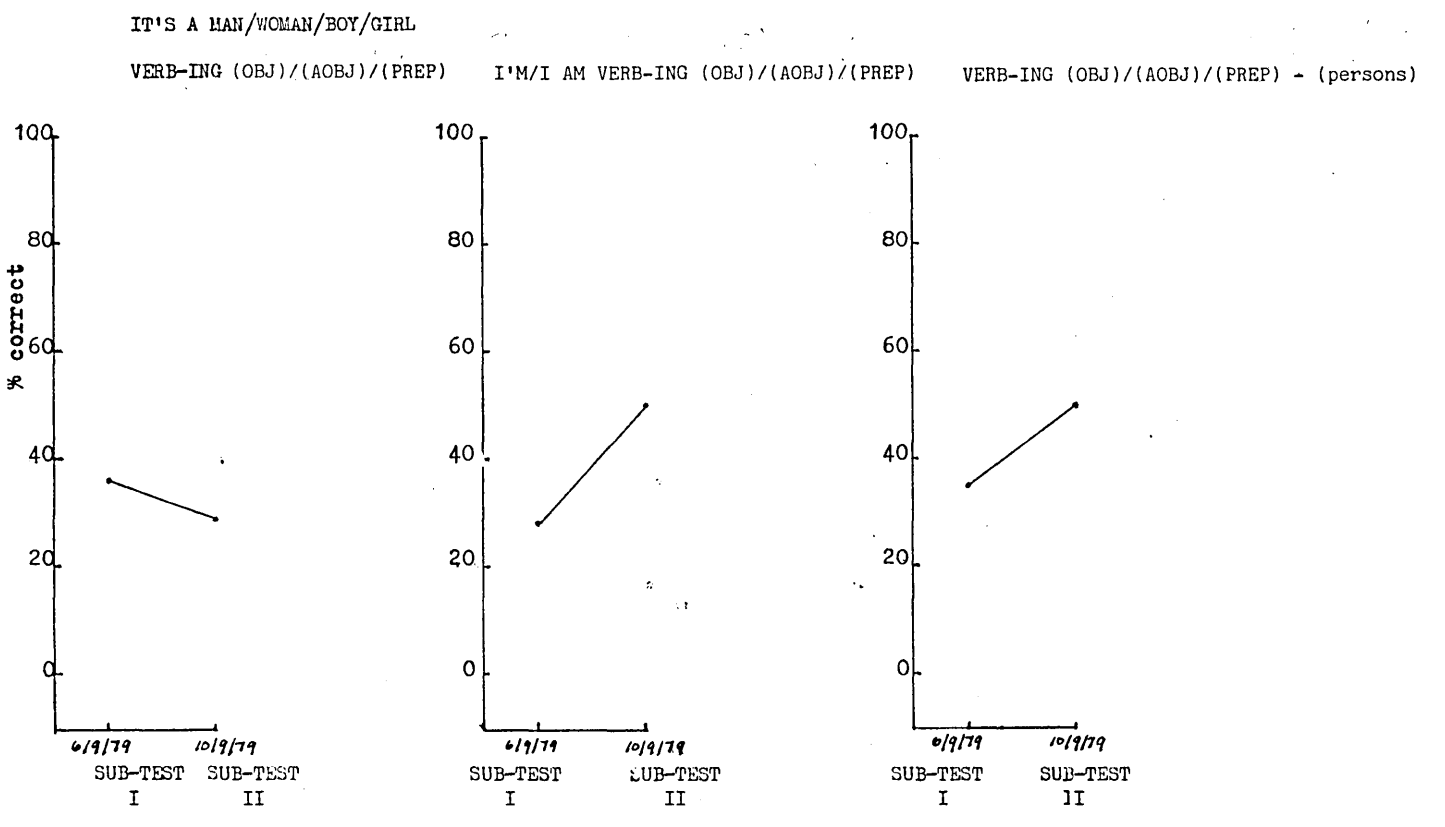
Sub-test I - 6.9.79
Trials (% correct) - 17(35)

Sub-Test II - 10.9.79
Trials (% correct) - 10(50)

Fig. 7-25

Nicola - POST-TEST 2 - Generalisation Probes - Structured Elicitation

Generalisations in Sub-tests I and II



Nicola - Post-Test 2 - Generalisation Probes (High Structure)

Table 7-26

Summary of Generalisations per Structure by Sessions and Trials in Sub-Tests I and II

Training Category - Pronominal Usage - I + Requesting (Objects)

STRUCTURE - CAN I HAVE A/SOME/MY NOUN(S)?
(modal + pron + verb + det/poss.pron + noun(pl))

Stimulus - If you want a/some/your (noun(s)) then ask (me) for it

Sub-Test I - 6.9.79
Trials (% correct) - 4(100)

Sub-Test II - 10.9.79
Trials (% correct) - 4(100)

STRUCTURE - CAN I HAVE A/SOME/MY NOUN(S)?
(modal + pron + verb + det/poss.pron + noun(pl))

Stimulus - What do you want?

Sub-Test I - 6.9.79
Trials (% correct) - 4(50)

Sub-Test II - 10.9.79
Trials (% correct) - 4(100)

Training Category - Pronoun training/I + Requesting (Actions)

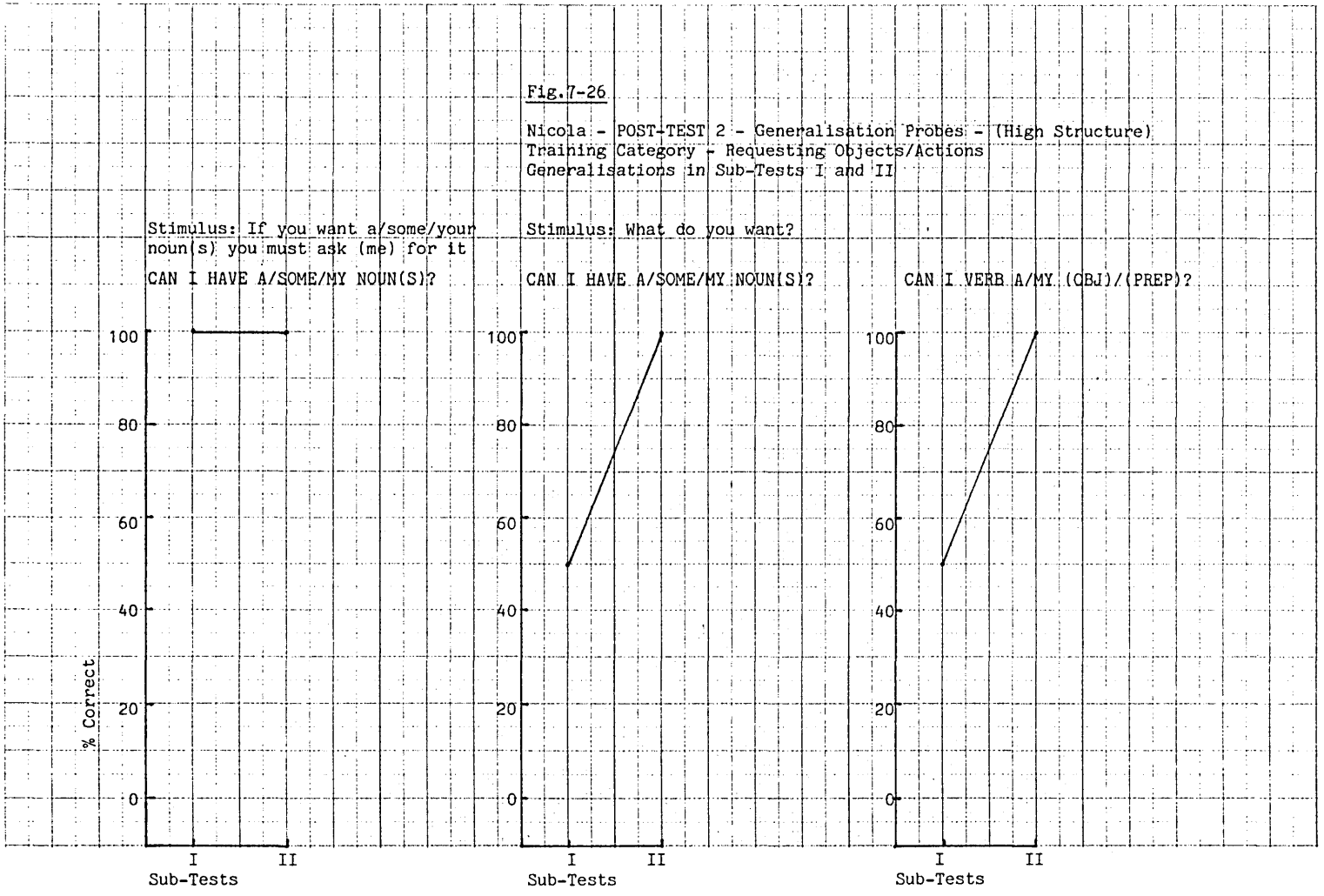
STRUCTURE - CAN I VERB A/MY(OBJ)/(PREP)?
(modal + pron + verb + det/poss.pron + (obj)/(prep))

Sub-Test I - 6.9.79
Trials (% correct) - 8(50)

Sub-Test II - 10.9.79
Trials (% correct) - 6(100)

Fig.7-26

Nicola - POST-TEST 2 - Generalisation Probes - (High Structure)
Training Category - Requesting Objects/Actions
Generalisations in Sub-Tests I and II



Nicola - Post-Test 3 - Generalisation Probes (High Structure)

Table 7-27

Summary of Generalisations per Structure by Trials

Training Category - Labelling Objects - (Singular)

STRUCTURE - IT'S A (NOUN)
(pron + cop + det + noun)

Trials (% correct) - 6(83)

Training Category - Labelling Objects - (Plural)

STRUCTURE - THEY ARE/THEY'RE (NOUNS)
(pron + cop(pl) + noun + pl)

Trials (% correct) - 6(67)

Training Category - Labelling Persons

STRUCTURE - IT'S PERSON (NAME)
(pron + cop + proper noun)

Trials (% correct) - 3(100)

Training Category - Labelling Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING
(OBJ)/(AOBJ)/(PREP)
(pron + cop + det + subj + verb-ing + (obj)/
(det + obj)/(prep))

Trials (% correct) - 6(50)

Training Category - Labelling Actions + pronoun I

STRUCTURE - I AM/I'M VERB-ING (OBJ)/(AOBJ)/(PREP)
(pron + aux + verb-ing (obj)/(det + obj)/
(prep))

Trials (% correct) - 5(60)

Category - (untrained) - Labelling Actions -
(Persons)

STRUCTURE - VERB-ING (OBJ)/(AOBJ)/(PREP)

Trials (% correct) - 3(67)

Training Category - Pronominal Usage - I + Requesting (Objects)

Stimulus - If you want a/some/your (nouns) then ask (me) for it

STRUCTURE - CAN I HAVE A/SOME/MY (NOUN(S)) (modal + pron + verb + det/poss.pron + noun (pl))

Trials (% correct) - 4(100)

Training Category - Pronominal Usage - I + Requesting (Objects)

Stimulus - What do you want?

STRUCTURE - CAN I HAVE A/SOME/MY (NOUN(S))? (modal + pron + verb + det/poss.pron + noun (pl))

Trials (% correct) - 4(100)

Training Category - Pronominal Usage - I + Requesting (Action)

STRUCTURE - CAN I (VERB)/A/MY(OBJ)/(PREP)? (modal + pron + verb + det/poss.pron + (obj)/(prep)

Trials (% correct) - 4(50)

Training Category - Pronominal Usage - I/You (person deixis) + Wh?

STRUCTURE - WHAT DO YOU WANT? (Wh + aux + pron + verb)

Trials (% correct) - 3(100)

Training Category - Pronominal Usage - I/You (person deixis)

STRUCTURE - YOU WANT A/SOME/YOUR NOUN(S) (pron + verb + det/poss.pron/noun (pl))

Trials (% correct - 7(28)

Training Category - Pronominal Usage - I/You (person deixis) + Wh?

STRUCTURE - WHAT ARE YOU DOING?
(wh + aux + pron + verb+ing?)

Trials (% correct) - 3(100)

Training Category - Pronominal Usage - I/You (person deixis)

STRUCTURE - YOU ARE VERB-ING (OBJ)/(A/YOUR OBJ)
(pron + aux + verb-ing (obj)/(det/poss.pron + obj))

Trials (% correct) - 4(75)

Training Category - Preposition

MOTOR RESPONSE - IN/ON, UNDER/OVER, IN FRONT/BEHIND, NEXT TO/OVER THERE

Trials (% correct) - 8(50)

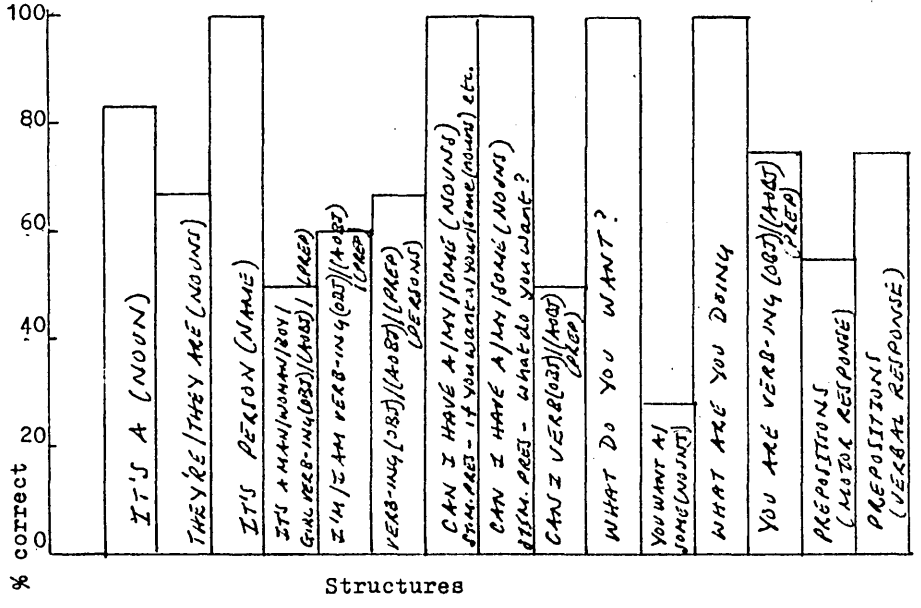
VERBAL RESPONSE - IT'S IN/ON THE (NOUN), UNDER/OVER, IN FRONT/BEHIND, NEXT TO/OVER THERE

Trials (% correct) - 4(75)

Fig. 7-27

Nicola - POST-TEST 3 - Generalisation Probes -(High Structure)

Generalisations



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-28

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling-Objects - (Singular)

STRUCTURE - IT'S A NOUN
(pron + cop' + det + noun)

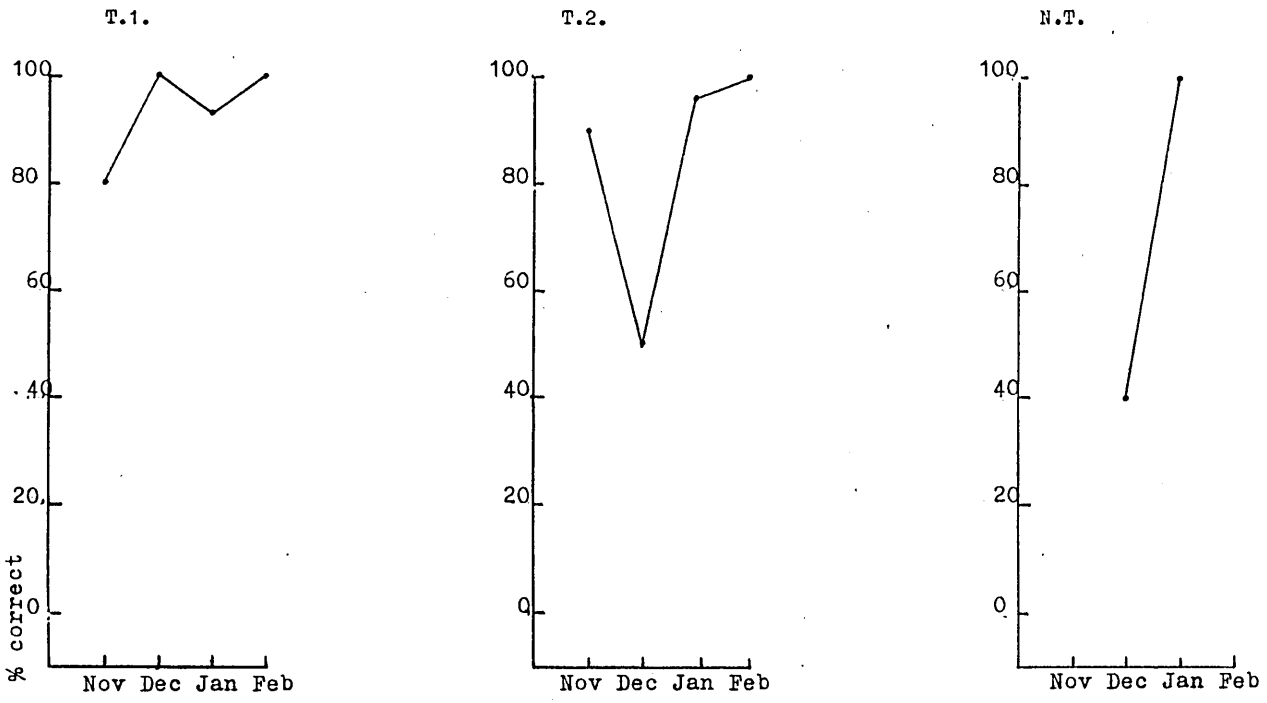
Trainer 1	8.11.79	9.11.79	21.11.79	3.12.79
Trials (% correct)	5(60)	5(80)	5(100)	5(100)
Context	2	2	2	2
Trainer 1	14.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	2(100)	5(80)	2(100)	5(100)
Context	1	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	5(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	5(60)	1(100)	5(100)	1(100)
Context	1	1	3	2
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(50)	3(100)	5(100)	5(100)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No date
Trials (% correct)	5(80)	3(100)	5(100)	4(100)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	10(40)	4(100)		
Context	2	2		

Fig. 7-28

Nicola - POST-TEST 3 - Generalisation Probes -(Low Structure)

Training Category - Labelling - Objects -(Singular)

STRUCTURE - IT'S A NOUN



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-29

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling-Objects (Plural)

STRUCTURE - THEY'RE/ARE NOUN(S)
(pron + copula+ det + noun + pl)

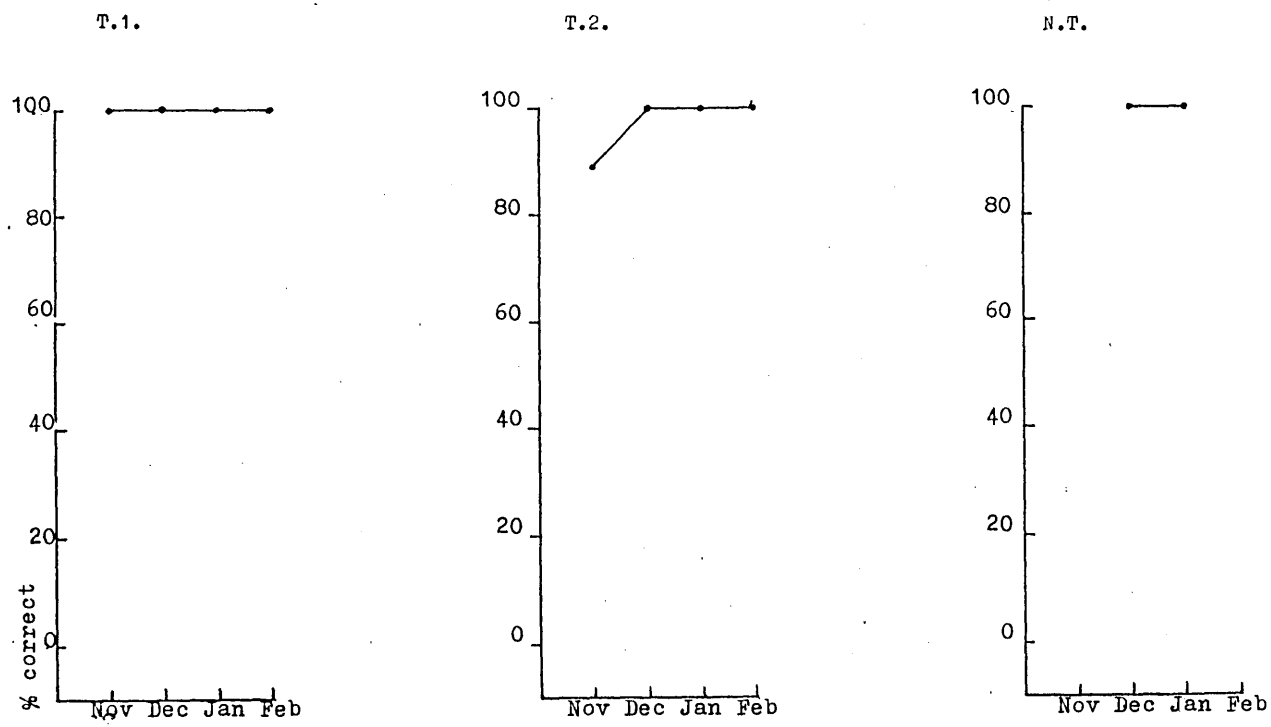
Trainer 1	8.11.79	9.11.79	21.11.79	3.12.79
Trials (% correct)	6(100)	6(100)	6(100)	3(100)
Context	2	2	2	2
Trainer 1	14.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	3(100)	5(100)	6(100)	6(100)
Context	1	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	6(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	11.12.79
Trials (% correct)	6(100)	5(100)	3(67)	6(100)
Context	1	1	3	2
Trainer 2	3.1.80	10.1.80	23.1.80	29.1.80
Trials (% correct)	-	6(100)	4(100)	6(100)
Context	-	1	3	1
Trainer 2	5.2.80	13.2.80	No date	
Trials (% correct)	5(100)	5(100)	4(100)	
Context	2	3	1	
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	5(100)	6(100)		
Context	2	2		

Fig. 7-29

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Training Category - Labelling - Objects (Plural)

STRUCTURE - THEY'RE/THEY ARE (NOUNS)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-30

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling-Persons

STRUCTURE - IT'S PERSON (NAME)
(pron + cop + proper noun)

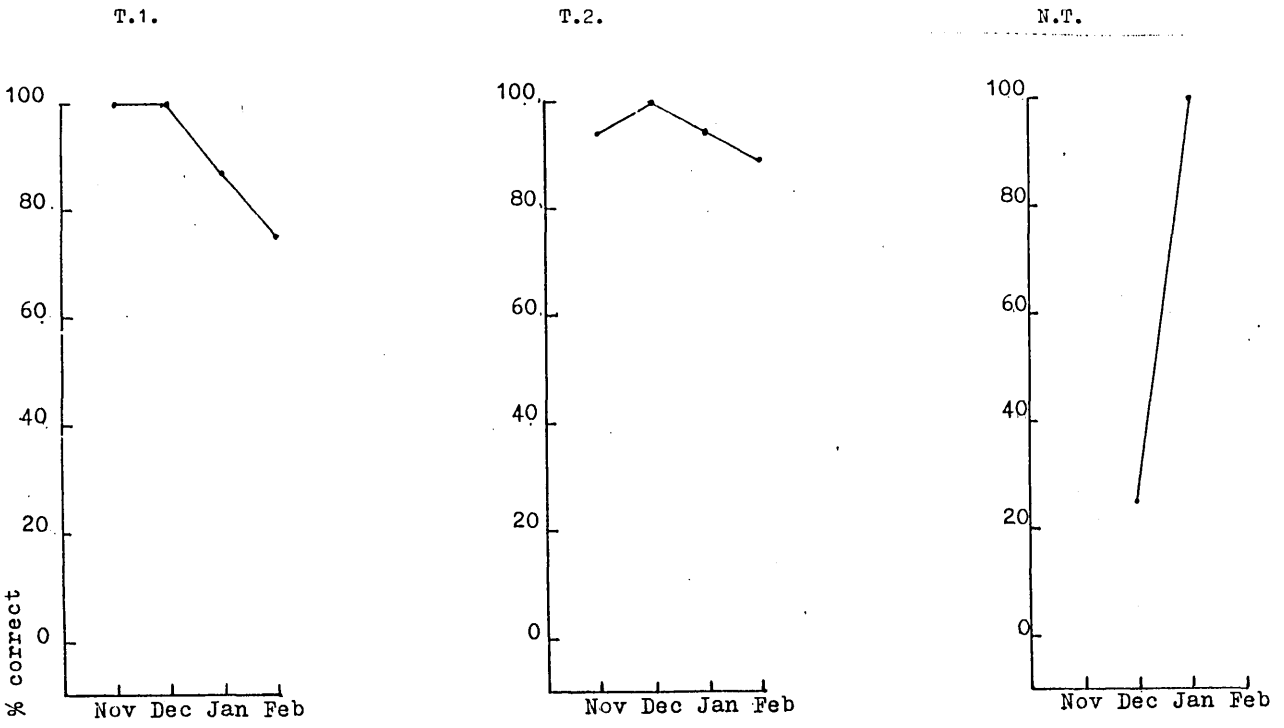
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	4(100)	4(100)	4(100)	4(100)
Context	2	2	2	2 + 3
Trainer 1	3.12.79	14.12.79	9.1.80	15.1.80
Trials (% correct)	4(100)	1(100)	1(100)	-
Context	2	1	1	1
Trainer 1	28.1.80	28.2.80		
Trials (% correct)	4(75)	4(75)		
Context	1	1		
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	4(75)	2(100)	1(100)	1(100)
Context	1	1	3	2
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	4(100)	3(100)	4(100)	4(75)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No date
Trials (% correct)	4(100)	3(100)	4(100)	3(67)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	4(25)	2(100)		
Context	2	2		

Fig. 7-30

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Training Category - Labelling - (Persons)

STRUCTURE - IT'S PERSON (NAME)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-31

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ/(PREP) (pron + cop' + det + subj + verb + ing + (det + obj)/(prep)

Trainer 1	8.11.79	9.11.79	9.1.80	15.1.80
Trials (% correct)	3(33)	2(0)	3(67)	3(33)
Context	2	2	1	1
Trainer 1	28.1.80	28.2.80		
Trials (% correct)	3(100)	3(33)		
Context	1	1		
Trainer 2	12.11.79	15.11.79	28.11.79	11.12.79
Trials (% correct)	3(100)	3(67)	1(0)	2(100)
Context	1	1	3	2
Trainer 2	3.1.80	10.1.80	29.1.80	5.2.80
Trials (% correct)	3(100)	3(33)	3(33)	2(100)
Context	2	1	1	2
Trainer 2	13.2.80	No date		
Trials (% correct)	3(100)	2(100)		
Context	3	1		
Non-Trainer	-			
Trials (% correct)	-			
Context	-			

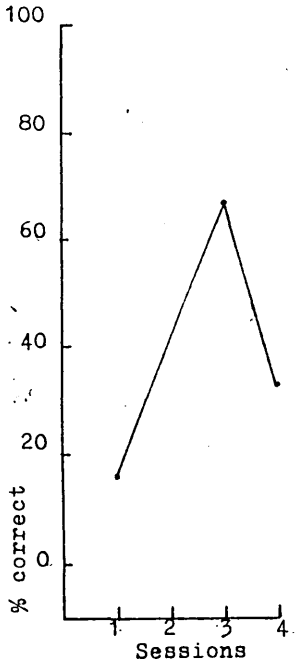
Fig. 7-31

Nicola - POST-TEST 3 - Generalisation Probes -(Low Structure)

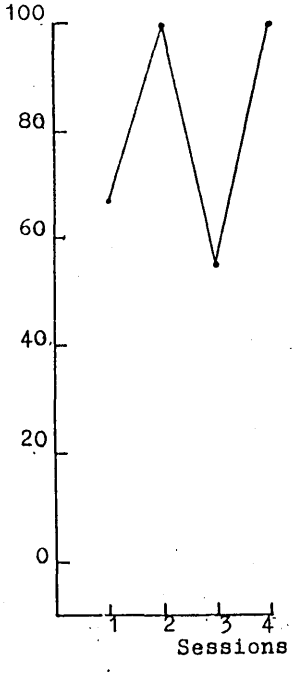
Training Category - Labelling - Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/GIRL/BOY VERB-ING (AOBJ)/(PREP)

T.1.



T.2.



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-32

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - I + Labelling-Actions

STRUCTURE - I AM VERBING (OBJ)(PREP)
(pron + aux + v +ing + (obj)/(prep)

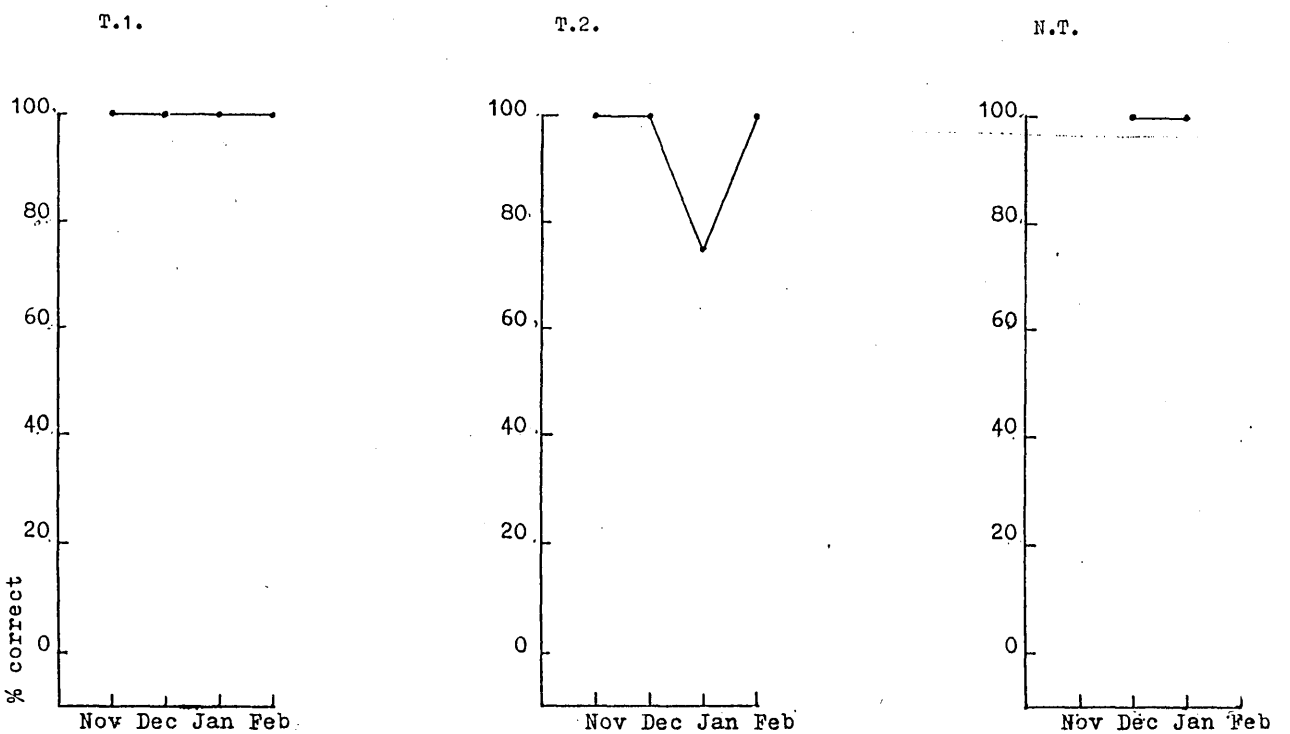
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(100)	2(100)	2(100)	1(100)
Context	2	2	2	2 + 3
Trainer 1	3.12.79	14.12.79	9.1.80	15.1.80
Trials (% correct)	2(100)	1(100)	1(100)	1(100)
Context	2	1	1	1
Trainer 1	28.1.80	28.2.80		
Trials (% correct)	1(100)	1(100)		
Context	1	1		
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	1(100)	1(100)	2(100)	3(100)
Context	1	1	3	2
Trainer 2	11.12.79	3.1.80	10.1.80	
Trials (% correct)	1(100)	1(100)	1(100)	
Context	2	1	1	
Trainer 2	23.1.80	29.1.80	5.2.80	13.2.80
Trials (% correct)	1(0)	1(100)	1(100)	1(100)
Context	3	1	2	3
Trainer 2	No date			
Trials (% correct)	1(100)			
Context	1			
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	3(100)	1(100)		
Context	2	2		

Fig.7-32

Nicola - POST-TEST 3 - Generalisation Probes -(Low Structure)

Training Category - Pronominal Usage- I + Labelling Actions

STRUCTURE - I'M/I AM VERBING (OBJ)/(PREP)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-33

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling-Actions (Persons)

STRUCTURE - VERBING (OBJ) (PREP)
verb + ing + (object) + (preposition)

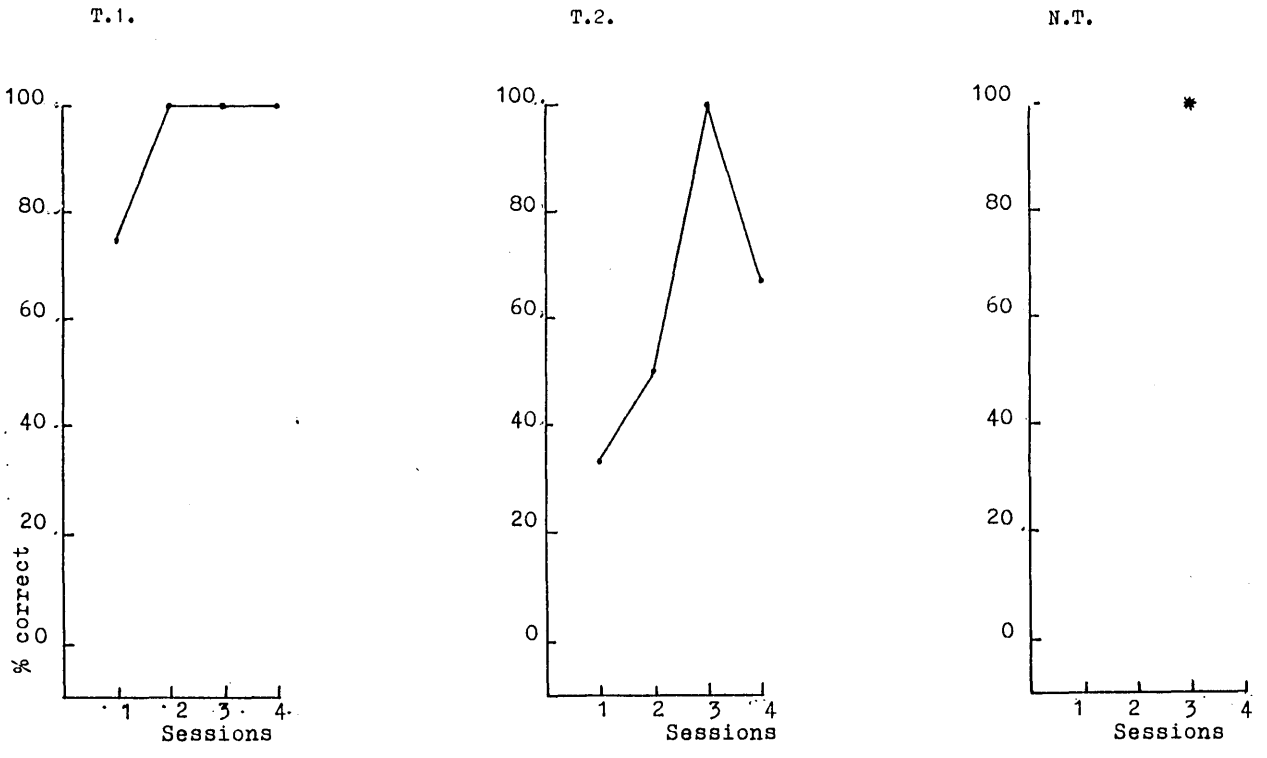
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(100)	1(100)	1(100)	1(0)
Context	2	2	2	2 + 3
Trainer 1	3.12.79	14.12.79	9.1.80	15.1.80
Trials (% correct)	1(100)	2(100)	1(100)	1(100)
Context	2	1	1	1
Trainer 1	28.1.80	28.2.80		
Trials (% correct)	1(100)	1(100)		
Context	1	1		
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	1(100)	1(0)	1(0)	(not
Context	1	1	3	included)
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	1(0)	1(100)	1(100)	1(100)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No date
Trials (% correct)	1(100)	1(100)	1(100)	1(0)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	-	1(100)		
Context	-	2		

Fig. 7-33

Nicola - POST-TEST 3 - Generalisation Probes

Training Category - Labelling Actions -(Persons)

STRUCTURE - VERB-ING (OBJ)/(PREP)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-34

Summary of Generalisations per Structure by Sessions, Trials and Context

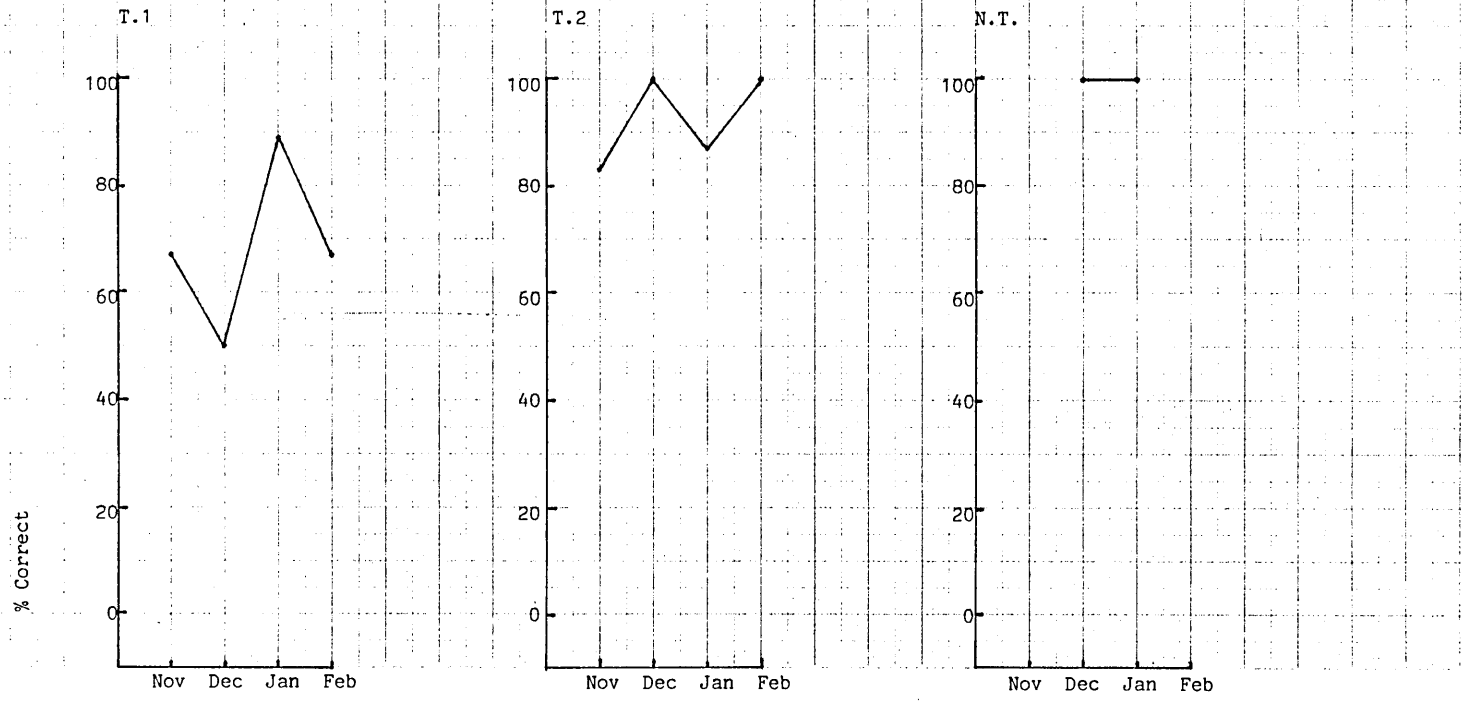
Training Category - Pronominal Usage - I + requesting (objects)

STRUCTURE - CAN I HAVE A/SOME/MY NOUN(S)?
I WANT A/SOME/MY NOUN(S)
(modal + pron + verb + det + poss.pron. + noun(pl))/
(pron + verb + det/poss.pron. + noun (pl)

Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	3(67)	3(33)	3(100)	3(67)
Context	2	2	2	2+3
Trainer 1	3.12.79	14.12.79	9.1.80	15.1.80
Trials (% correct)	2(50)	-	2(100)	2(100)
Context	2	-	1	1
Trainer 1	28.1.80	28.2.80		
Trials (% correct)	3(67)	3(67)		
Context	1	1		
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	3(100)	3(100)	3(67)	3(67)
Context	1	1	3	2
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	3(100)	3(100)	3(100)	2(50)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No date
Trials(% correct)	3(100)	3(100)	3(100)	3(100)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	4(100)	2(100)		
Context	2	2		

Fig.7-34

Nicola - POST-TEST 3 - Generalisation Probes (low structure)
Training Category - Pronominal Usage - I + Requesting(Objects)
STRUCTURE - CAN I HAVE A/SOME/MY NOUN(S)
I WANT A/SOME/MY NOUN(S)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-35

Summary of Generalisations per Structure by Sessions, Trials and Context

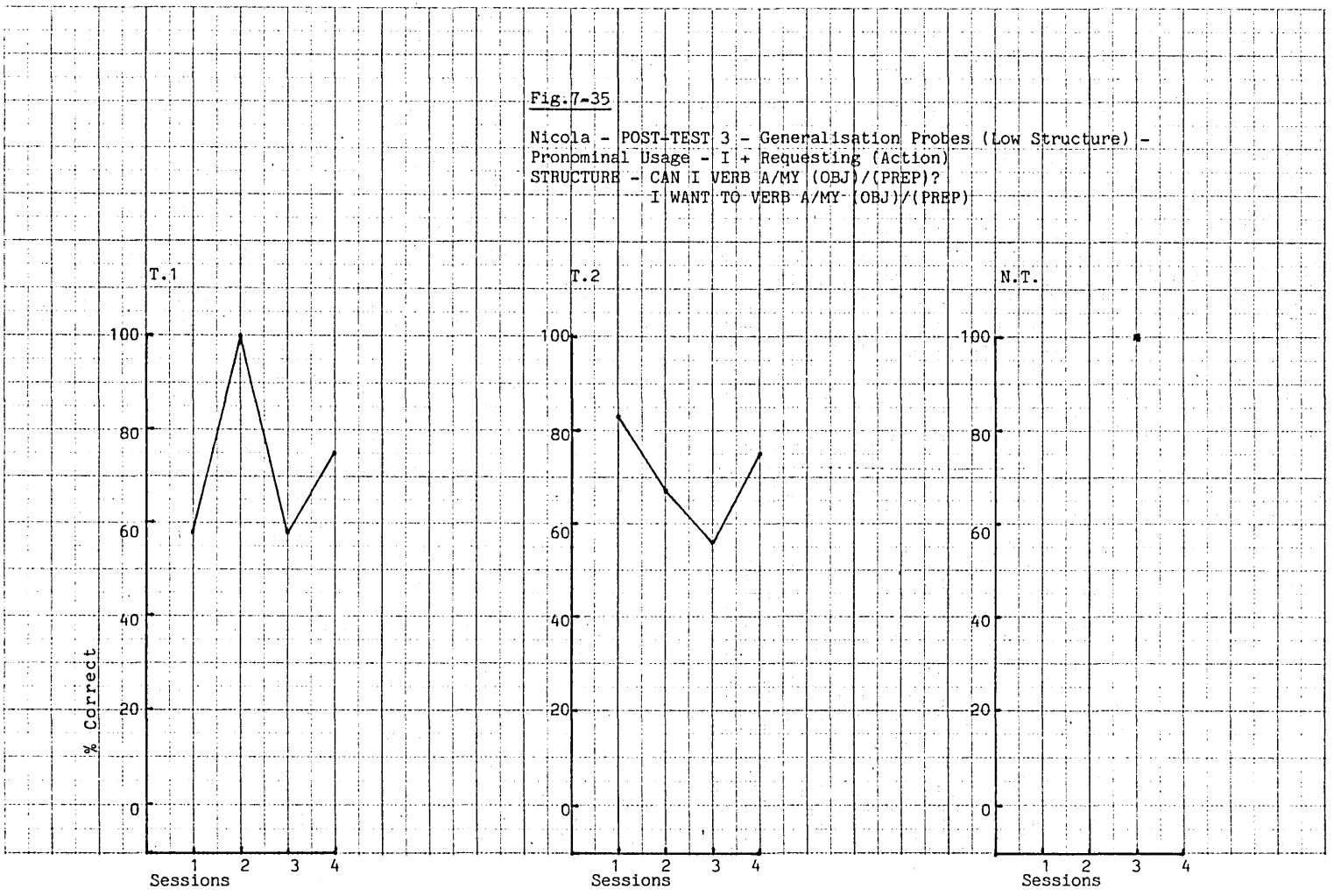
Training Category - Pronominal Usage - I + Requesting (Action)

STRUCTURE - CAN I VERB A/MY(OBJ)/(PREP)?
(modal + pron + verb + det/poss.pron + (obj)/(prep))
I WANT TO VERB A/MY(OBJ)/(PREP)
(pron + infinitive + verb + det/poss.pron + (obj)/(prep))

Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	4(75)	3(33)	4(75)	4(50)
Context	2	2	2	2+3
Trainer 1	3.12.79	14.12.79	9.1.80	15.1.80
Trials (% correct)	3(100)	-	3(100)	4(25)
Context	2	-	1	1
Trainer 1	28.1.80	28.2.80		
Trials (% correct)	2(50)	4(75)		
Context	1	1		
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	3(100)	1	3(67)	-
Context	1	-	3	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	3(67)	4(50)	4(75)	4(50)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No date
Trials (% correct)	4(50)	4(75)	4(50)	4(100)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	-	4(100)		
Context	2	2		

Fig.7-35

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure) - Pronominal Usage - I + Requesting (Action)
STRUCTURE - CAN I VERB A/MY (OBJ)/(PREP)?
I WANT TO VERB A/MY (OBJ)/(PREP)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-36

Summary of Generalisations per Structure by Sessions, Trials and Context

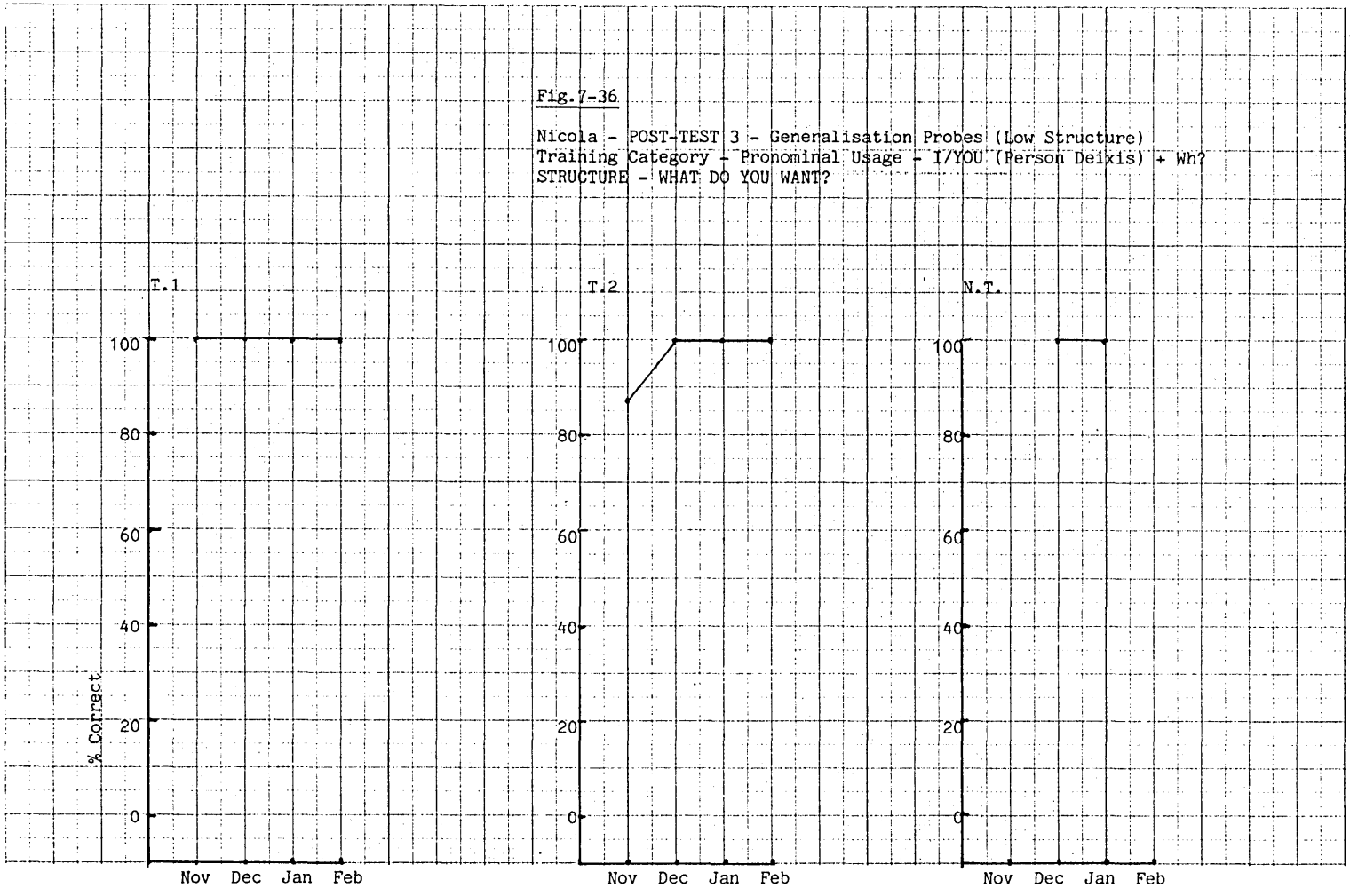
Training Category - Pronominal Usage - I/You (person deixis) + wh?

STRUCTURE - WHAT DO YOU WANT? - (wh + aux + pron + verb?)

Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	-	2(100)	1(100)	2(100)
Context	2	2	2	2 + 3
Trainer 1	3.12.79	14.12.79	9.1.80	15.1.80
Trials (% correct)	2(100)	1(100)	2(100)	1(100)
Context	2	1	1	1
Trainer 1	28.1.80	28.2.80		
Trials (% correct)	1(100)	2(100)		
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	2(100)	1(100)	2(100)	4(50)
Context	1	1	3	2
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(100)	2(100)	2(100)	1(100)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	1	2	3	
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	1(100)	2(100)		
Context	2	2		

Fig.7-36

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Pronominal Usage - I/YOU (Person Deixis) + Wh?
STRUCTURE - WHAT DO YOU WANT?



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-37

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - I/You (person deixis)

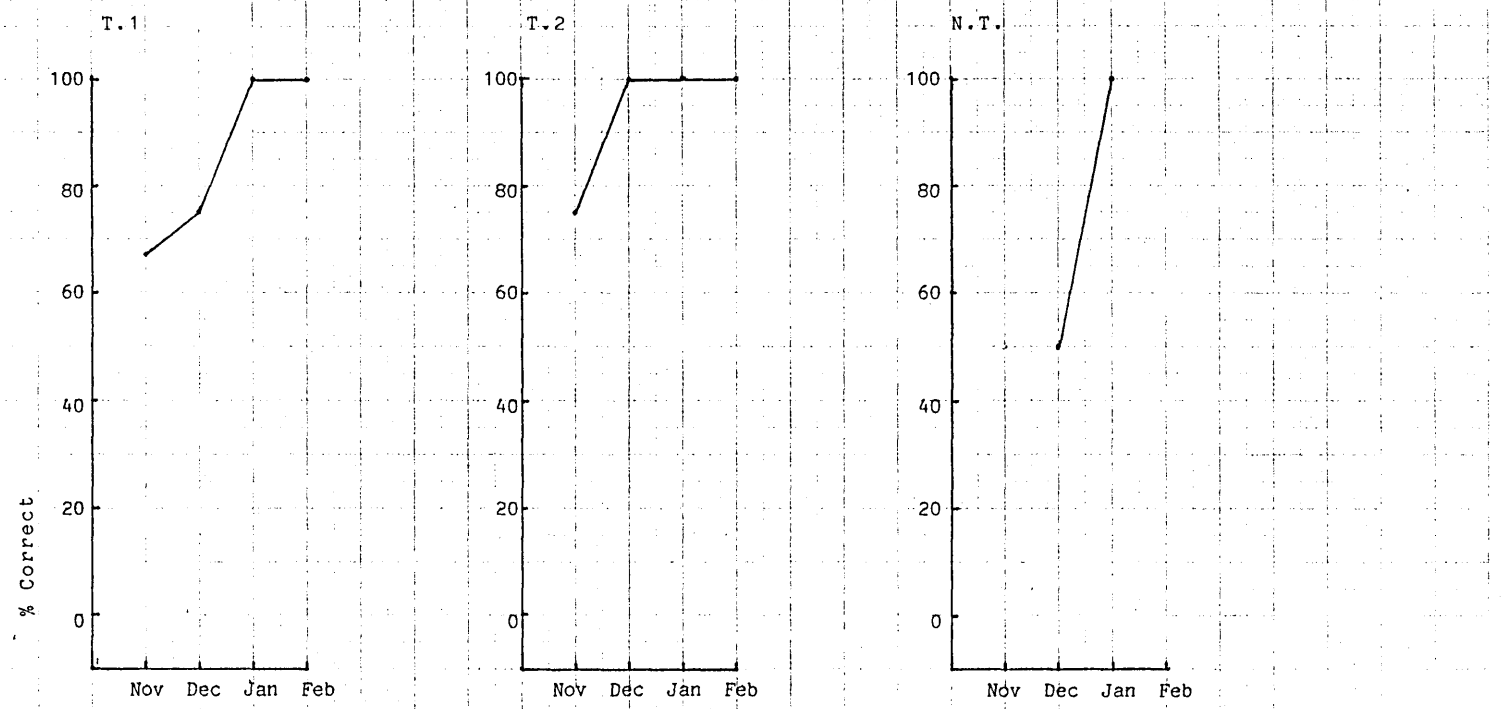
STRUCTURE - YOU WANT A/SOME/YOUR NOUN(S)
(pron + verb + det/poss.pron + noun(pl))

Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	-	2(0)	1(100)	2(100)
Context	2	2	2	2+3
Trainer 1	3.12.79	14.12.79	9.1.80	15.1.80
Trials (% correct)	2(50)	1(100)	2(100)	1(100)
Context	2	1	1	1
Trainer 1	28.1.80	28.2.80		
Trials (% correct)	1(100)	2(100)		
Context	1	1		
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	2(100)	1(100)	2(100)	1(0)
Context	1	1	3	2
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(100)	2(100)	2(100)	1(100)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No date
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	2(50)	2(100)		
Context	2	2		

Fig.7-37

Nicola -POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Pronominal Usage - I/You (Person Deixis)

STRUCTURE - YOU WANT A/SOME/YOUR (NOUN(S))



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-38

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - I/You (person deixis) + wh?

STRUCTURE - WHAT ARE YOU DOING? (wh + aux + pron + verb + ing)

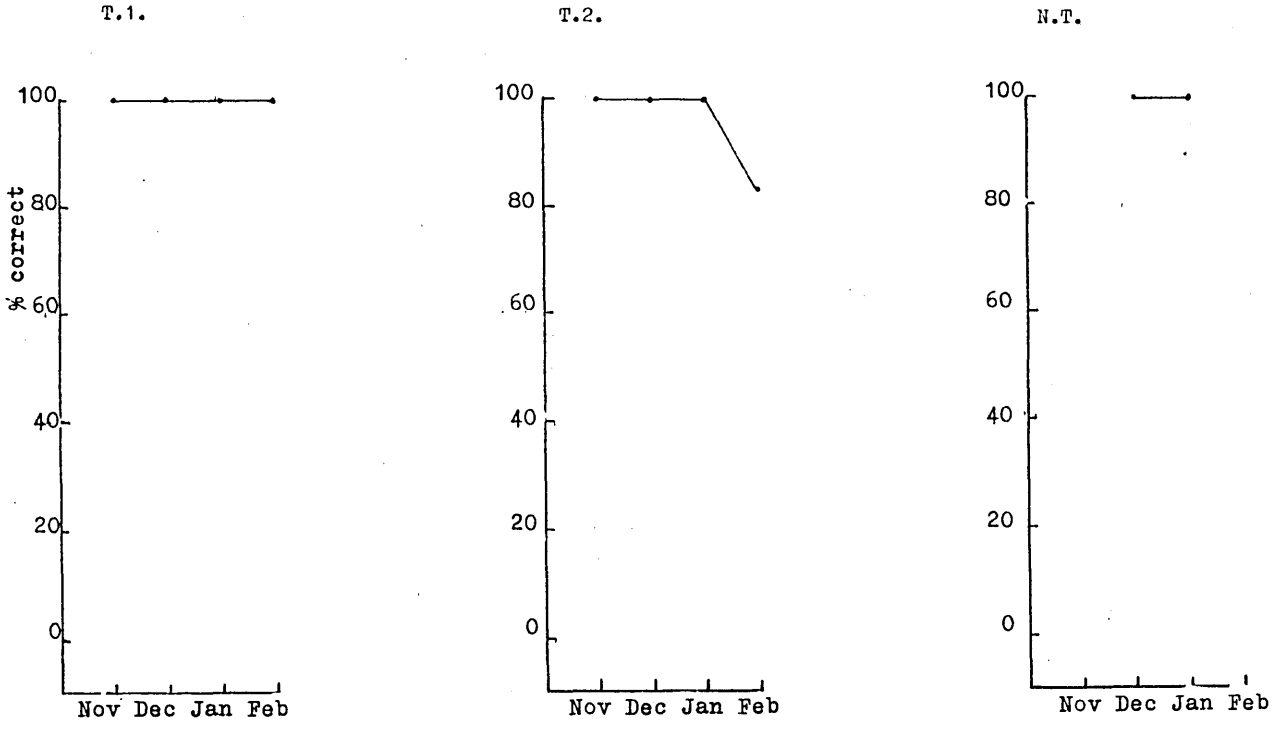
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	-	2(100)	1(100)	2(100)
Context	2	2	2	2 + 3
Trainer 1	3.12.79	14.12.79	9.1.80	15.1.80
Trials (% correct)	2(100)	-	2(100)	1(100)
Context	2	1	1	1
Trainer 1	28.1.80	28.2.80		
Trials (% correct)	1(100)	2(100)		
Context	1	1		
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	2(100)	2(100)	-	1(100)
Context	1	1	3	2
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(100)	1(100)	2(100)	-
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	2(100)	2(100)	2(50)	2(100)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	2(100)	2(100)		
Context	2	2		

Fig.7-38

Nicola - POST-TEST 3 - Generalisation Probes - (Low Structure)

Training Category - Pronominal Usage - I/You (Person Deixis) + Wh?

STRUCTURE - WHAT ARE YOU DOING?



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-39

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - I/You
(person deixis)

STRUCTURE - YOU ARE VERB-ING A/YOUR (OBJ)/(PREP)
(pron + aux + verb + ing + det/poss.pron + (obj)/(prep))

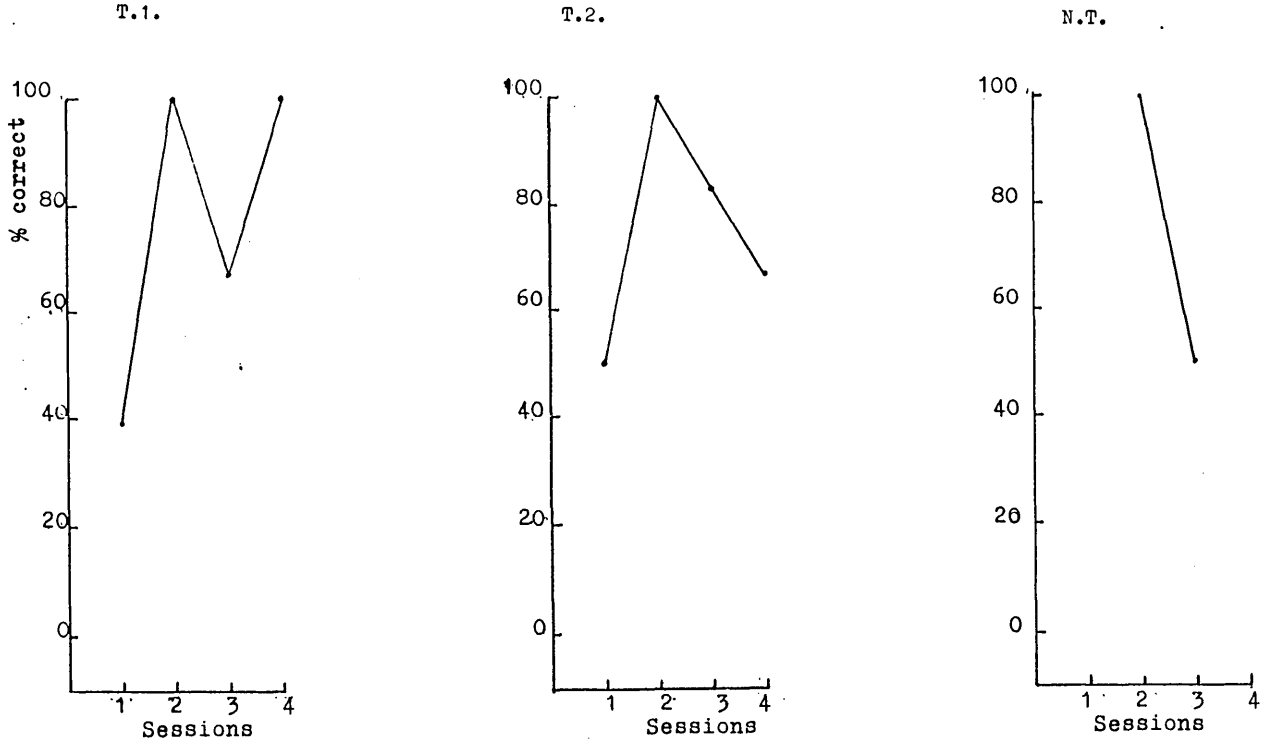
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	-	3(67)	1(0)	2(50)
Context	2	2	2	2+3
Trainer 1	3.12.79	14.12.79	9.1.80	15.1.80
Trials (% correct)	2(100)	6(100)	2(100)	1(0)
Context	2	1	1	1
Trainer 1	28.1.80	28.2.80		
Trials (% correct)	1(100)	2(100)		
Context	1	1		
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	2(100)	2(50)	-	3(0)
Context	1	1	-	2
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(100)	1(100)	2(100)	-
Context	2	2	1	-
Trainer 2	29.1.80	5.2.80	13.2.80	No date
Trials (% correct)	2(50)	2(100)	2(50)	2(50)
Context	-	2	3	2
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	2(100)	2(50)		
Context	2	2		

Fig. 7-39

Nicola - POST-TEST 3 - Generalisation Probes

Training Category - Pronominal Usage - I/You (Person Deixis)

STRUCTURE - YOU ARE VERB-ING A/YOUR (OBJ)/(PREP)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-40

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Preposition Usage - IN

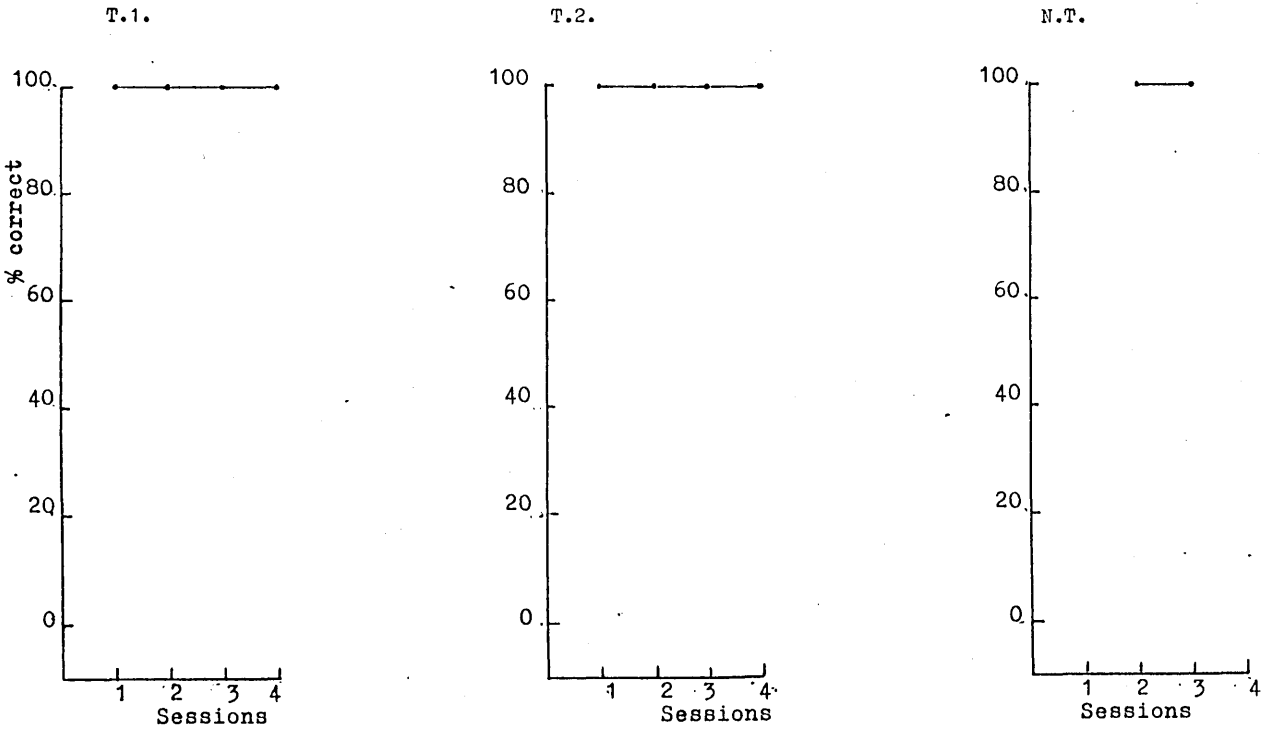
MOTOR RESPONSE - (manipulation of objects)

Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(100)	-	1(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	1(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	1(100)	1(100)	1(100)	-
Context	2	1	3	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	1(100)	1(100)		
Context	2	2		

Fig. 7-40

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Prepositional Usage - IN

MOTOR RESPONSE - Generalisations



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-41

Summary of Responses per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - In

STRUCTURE - IT'S IN THE (OBJECT)/IN THE OBJECT

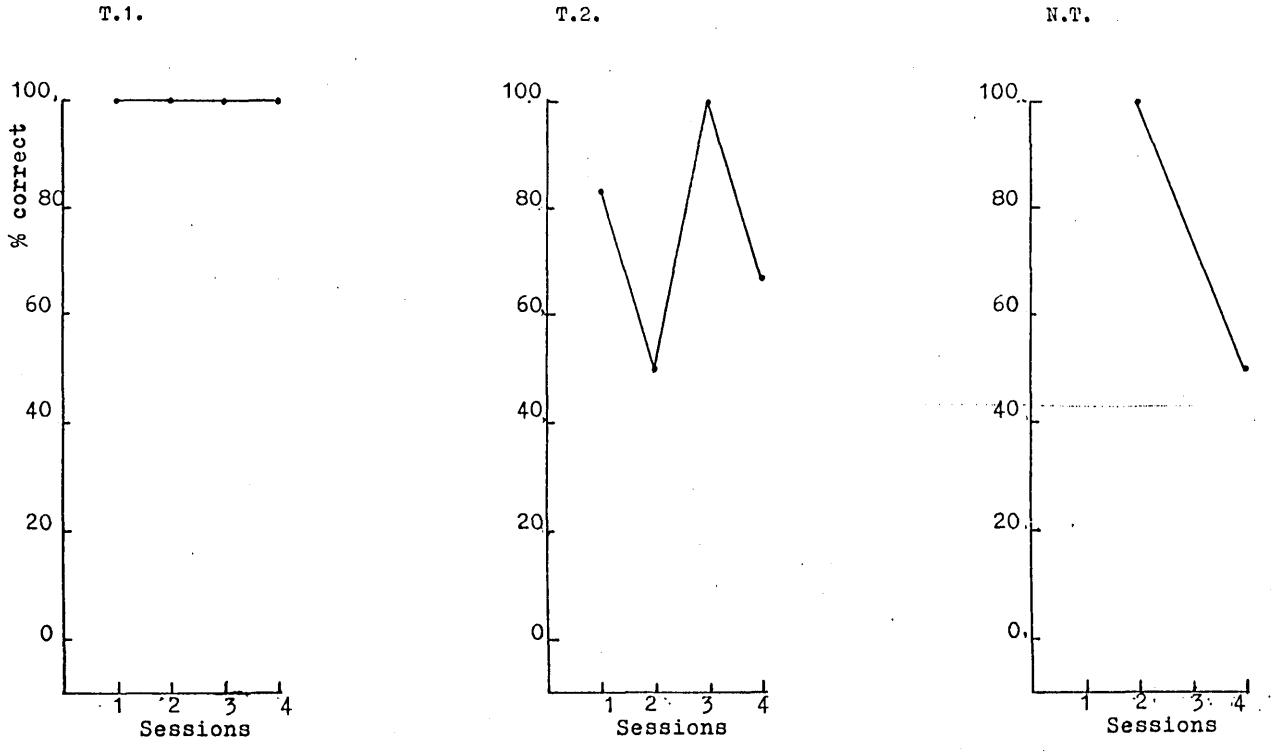
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	2(100)	-	2(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(100)	2(100)	2(100)	2(100)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	2(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	2(50)	2(100)	2(100)	-
Context	2	1	3	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(50)	2(100)	2(100)	2(100)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	2(100)	2(100)	2(0)	2(100)
Context	1	2	3	-
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	2(100)	2(50)		
Context	2	2		

Fig. 7-41

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Training Category - Prepositional Usage - IN

STRUCTURE - IT'S IN THE (OBJECT)/IN THE (OBJECT)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-42

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - On

MOTOR RESPONSE - (manipulation of objects)

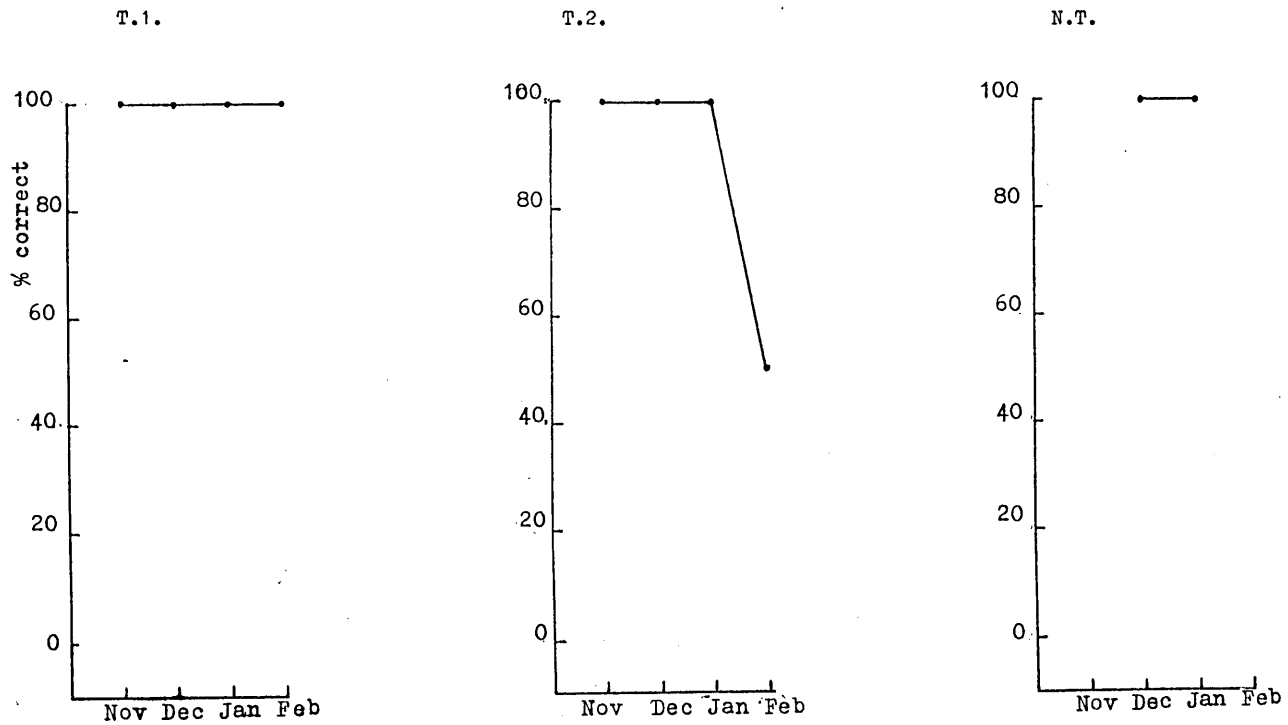
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(100)	-	1(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	1(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	1(100)	1(100)	-	-
Context	2	1	-	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	1(100)	-	1(100)	-
Context	2	2	1	-
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	1(100)	1(0)	1(100)	-
Context	1	2	3	-
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	1(100)	1(100)		
Context	2	2		

Fig. 7-42

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Training Category - Prepositional Usage - ON

MOTOR RESPONSE - Generalisation



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-43

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - On

STRUCTURE - IT'S ON THE (OBJECT)/ON THE (OBJECT)

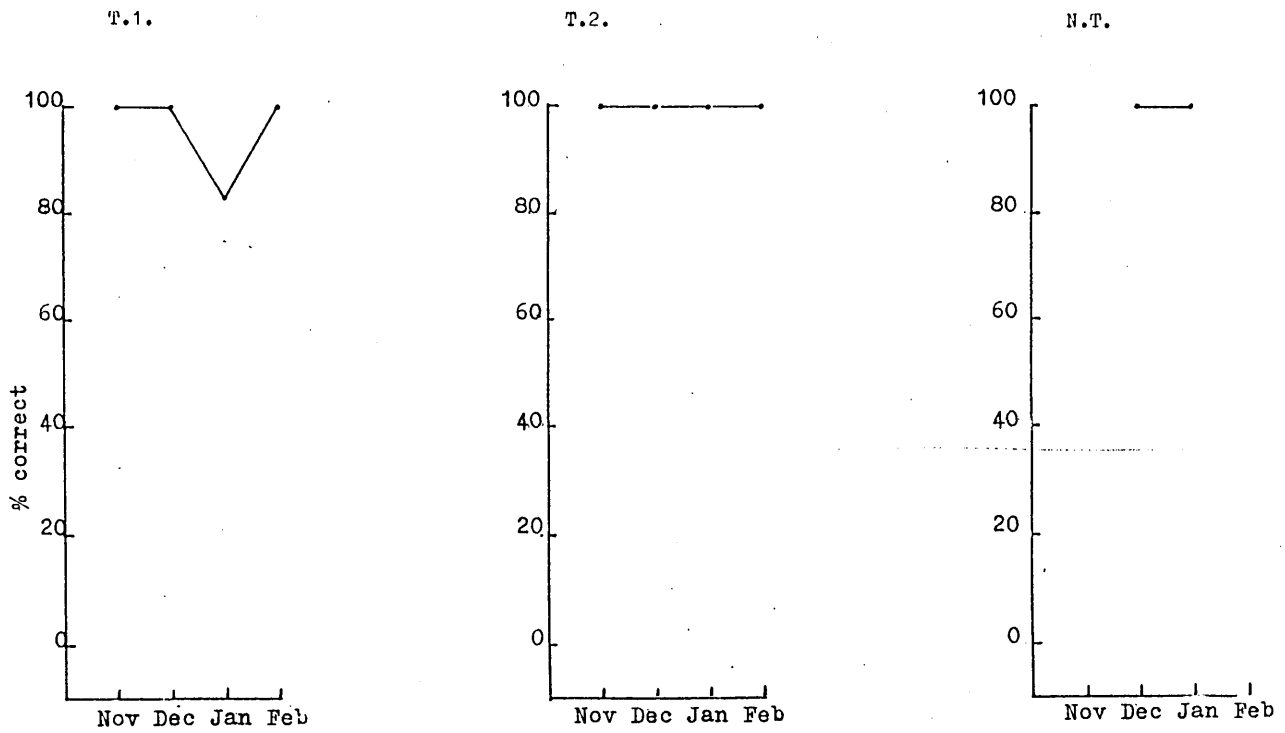
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	3(100)	-	2(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	2(100)	2(100)	2(50)	6(100)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	2(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	2(100)	2(100)	-	-
Context	2	1	-	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(100)	2(100)	2(100)	-
Context	2	2	1	-
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	4(100)	2(100)	2(100)	-
Context	1	2	3	-
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	2(100)	3(100)		
Context	2	2		

Fig. 7-43

Nicola - POST-TEST 3 - Generalisation Probes -(Low Structure)

Training Category - Prepositional Usage - ON

STRUCTURE - IT'S ON THE (OBJECT)/ON THE (OBJECT)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-44

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - BEHIND

MOTOR RESPONSE - (manipulation of objects)

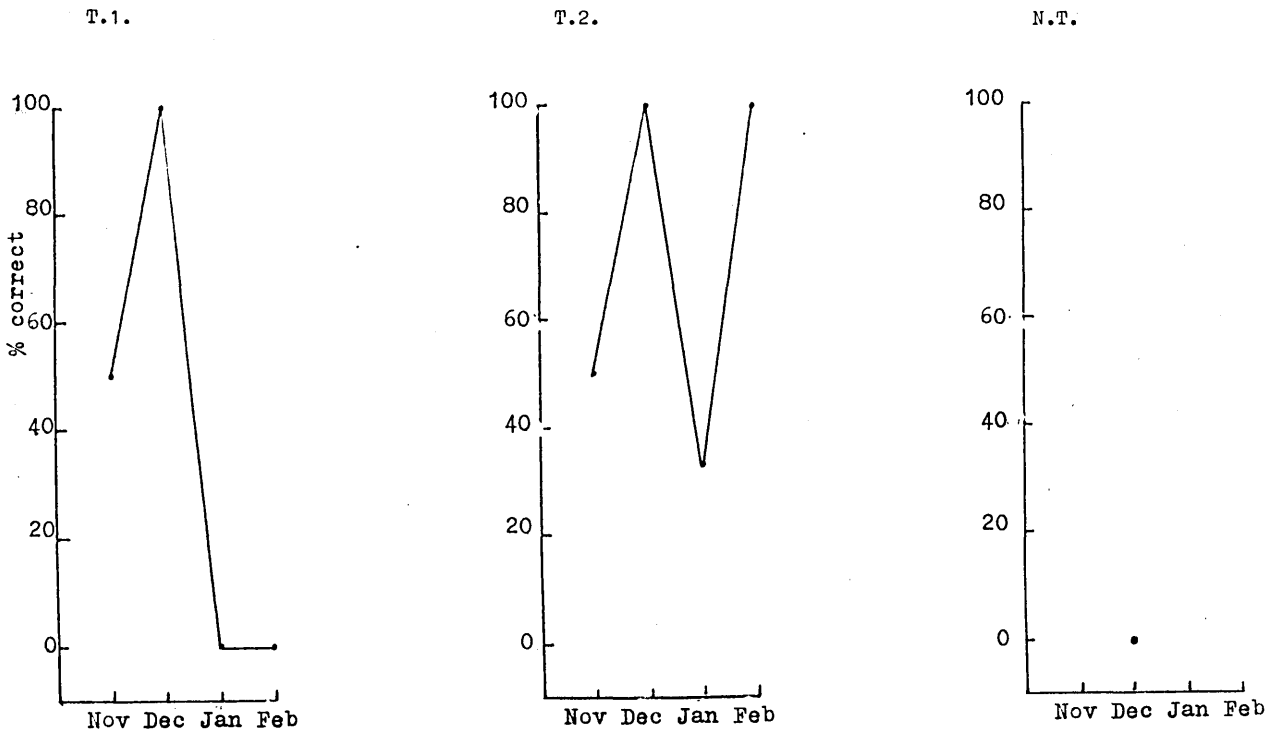
Trainer 1	8/11/79	9/11/79	21/11/79	23/11/79
Trials (% correct)	1(0)	-	1(100)	-
Context	2	-	2	-
Trainer 1	3/12/79	9/1/80	15/1/80	28/1/80
Trials (% correct)	1(100)	1(0)	1(0)	1(0)
Context	2	1	1	1
Trainer 1	28/2/80			
Trials (% correct)	1(0)			
Context	1			
Trainer 2	12/11/79	15/11/79	28/11/79	
Trials (% correct)	1(0)	1(100)	-	
Context	1	1	-	
Trainer 2	30/11/79	11/12/79	3/1/80	10/1/80
Trials (% correct)	-	1(100)	-	1(100)
Context)	-	-	-	1
Trainer 2	23/1/80	29/1/80		
Trials(% correct)	1(0)	1(0)		
Context	3	1		
Non-Trainer	5/12/79	10/1/80		
Trials (% correct)	1(0)	-		
Context	2	-		

Fig. 7-44

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Training Category - Prepositional Usage - BEHIND

MOTOR RESPONSE - Generalisations



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-45

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - BEHIND

STRUCTURE - IT'S BEHIND THE (OBJECT)/BEHIND THE (OBJECT)/ IT'S BEHIND (OBJECT)
(pronoun + cop' + preposition + det + (noun))

Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(100)	-	2(0)*	-
Context	2	-	2	-
Trainer 1	3.12.79	14.12.79	9.1.80	15.1.80
Trials (% correct)	1(0)*	2(0)*	1(0)*	2(0)*
Context	2	-	1	1
Trainer 1	28.1.80	28.2.80		
Trials (% correct)	1(0)*	-		
Context	1	-		
Trainer 2	12.11.79	15.11.79	27.11.79	28.11.79
Trials (% correct)	2(100)	1(0)*	-	-
Context	1	1	-	-
Trainer 2	30.11.79	11.12.79	3.1.80	10.1.80
Trials (% correct)	-	2(100)	-	2(0)*
Context	-	2	-	3
Trainer 2	23.1.80	29.1.80	5.2.80	13.2.80
Trials (% correct)	2(0)*	2(0)*	2(0)*	2(0)*
Context	3	1	2	3
Trainer 2	No Date			
Trials (% correct)	-			
Context	-			
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	2(0)*	-		
Context	2	-		

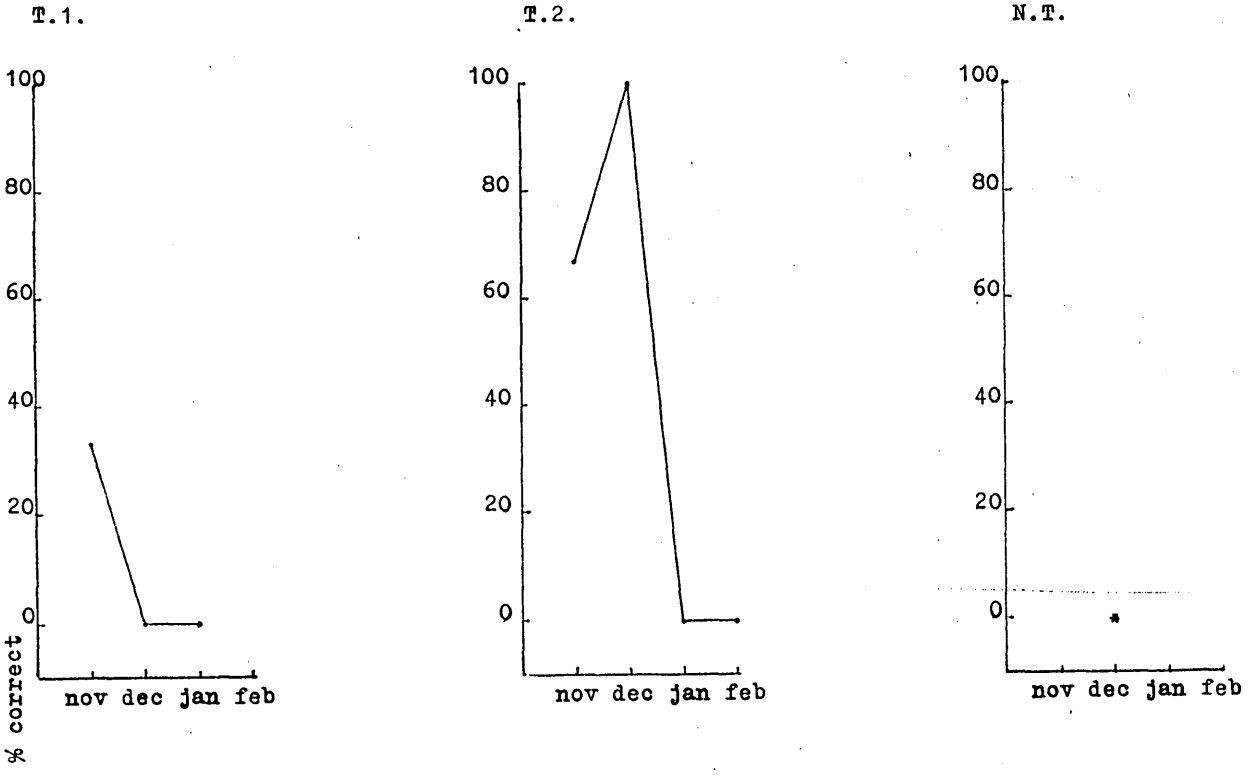
* child response = IT'S 'HIND THE BOX.

Fig. 7-45

Nicola - POST-TEST 3 - Generalisation Probes

Training Category - Prepositional Usage - BEHIND

STRUCTURE - IT'S BEHIND THE (OBJECT)/BEHIND THE (OBJECT)/
IT'S BEHIND (OBJECT)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-46

Summary of Generalisations per Structure by Sessions, Trials and Context

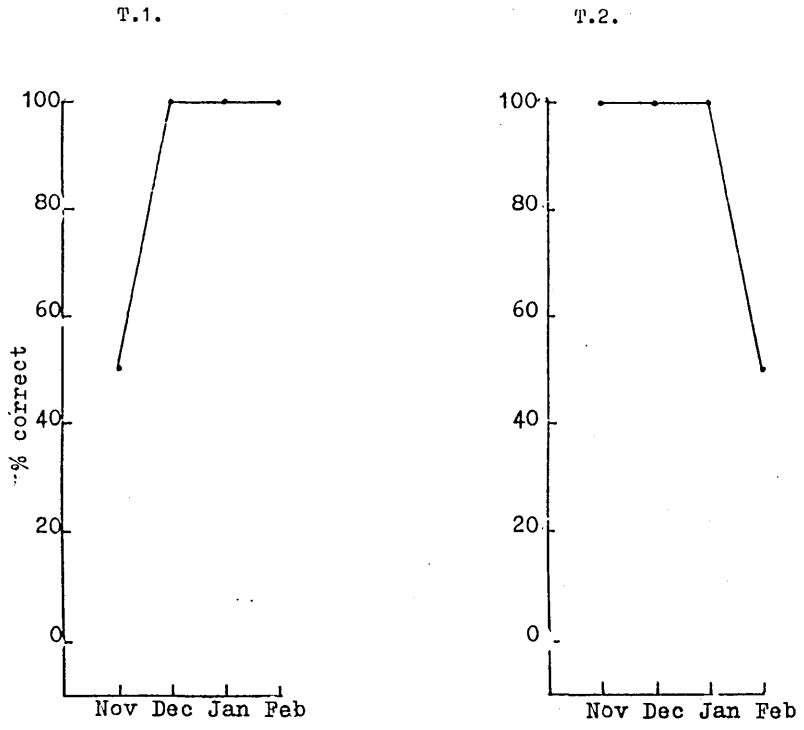
Training Category - Prepositional Usage - In front of

MOTOR RESPONSE (Manipulation of objects)

Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(0)	-	1(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	1(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	1(100)	1(100)	1(100)	-
Context	1	1	3	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	1(100)	-	1(0)	1(100)
Context	1	-	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	-	-		
Context	-	-		

Fig. 7-46

Nicola - POST-TEST 3 Generalisation Probes -(Low Structure)
Training Category: Prepositional Usage - IN FRONT OF
MOTOR RESPONSE - Generalisations



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-47

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - In front of

STRUCTURE - IT'S IN FRONT OF THE (OBJECT)/IN FRONT OF (OBJECT)
pronoun + cop' + preposition + det + (noun)

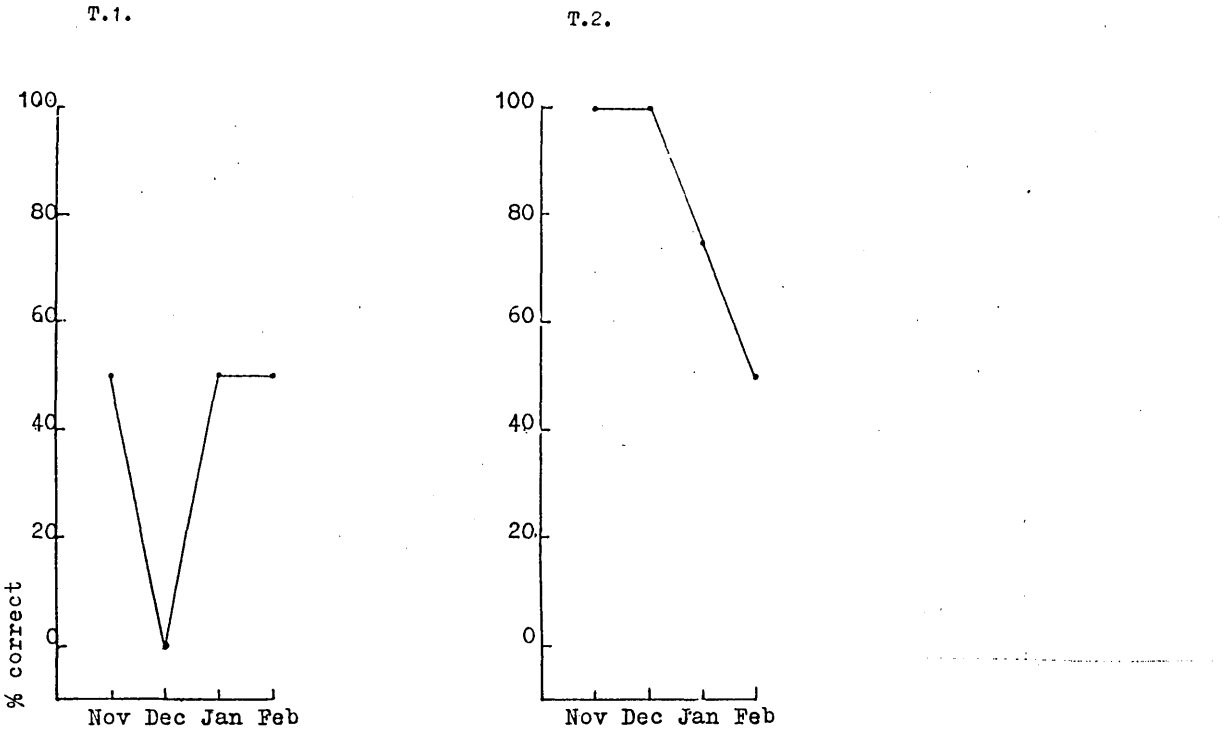
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	2(0)	-	2(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(0)	2(0)	2(50)	1(100)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	2(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	2(100)	2(100)	2(100)	-
Context	1	1	3	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(100)	2(100)	2(0)	2(100)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	2(100)	-	2(0)	2(100)
Context	1	-	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	-	-		
Context	-	-		

Fig. 7 -47

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Training Category - Prepositional Usage - In front of

STRUCTURE - IT'S IN FRONT OF THE (OBJECT)/IT'S IN FRONT/IN FRONT OF (OBJECT)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-48

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - UNDER

MOTOR RESPONSE (Manipulation of objects)

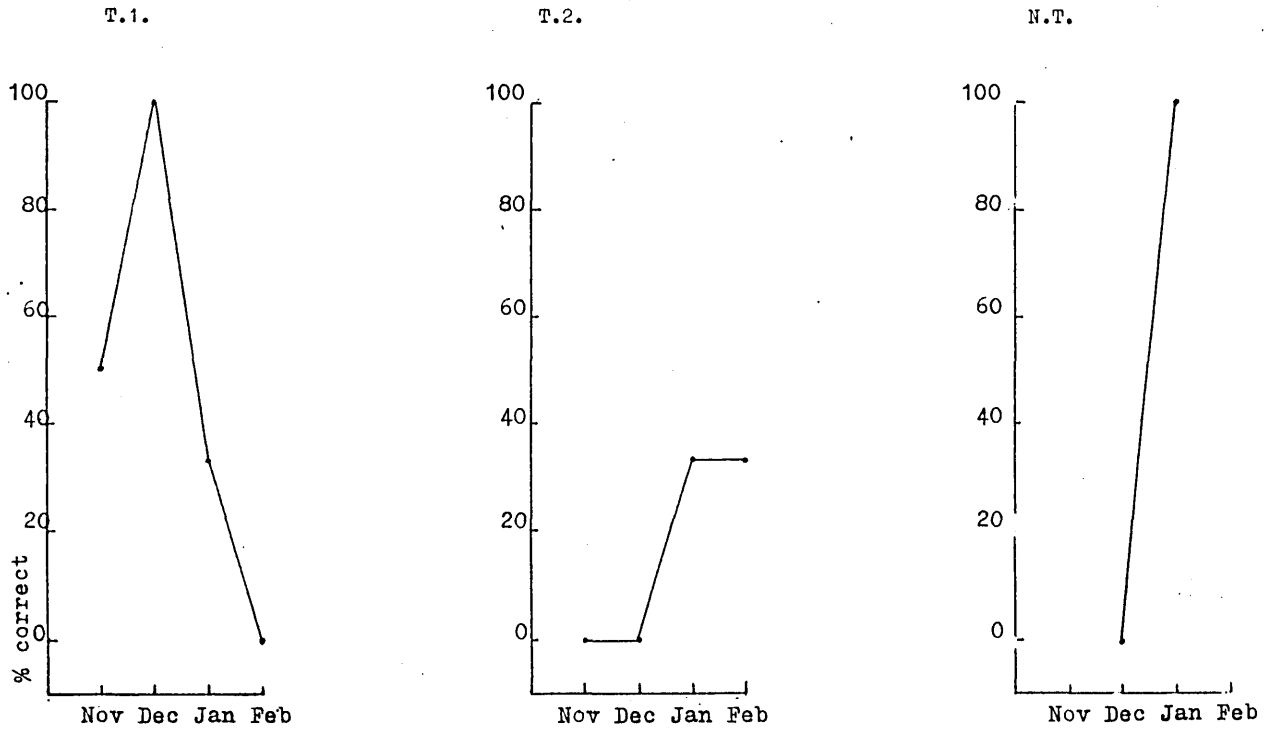
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(0)	-	1(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(100)	1(0)	1(100)	1(0)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	1(0)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	1(0)	-	1(0)	-
Context	2	-	3	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	1(0)	1(100)	1(0)	-
Context	2	2	1	-
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	1(0)	1(100)	1(100)	1(0)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	1(0)	1(100)		
Context	2	2		

Fig. 7-48

Nicola - POST-TEST 3 - Generalisation Probes -(Low Structure)

Training Category - Prepositional Usage - UNDER

MOTOR RESPONSE - Generalisations



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-49

Summary of Generalisations per Structure by Sessions, Trials and Context

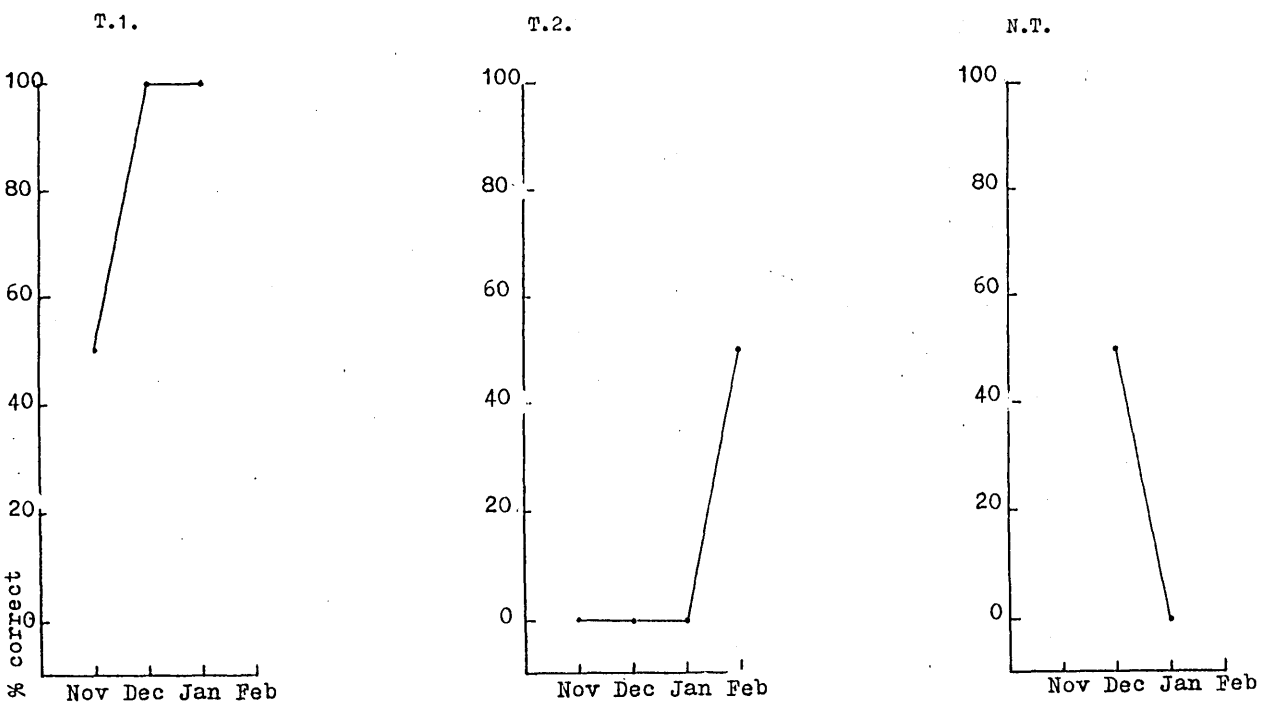
Training Category - Prepositional Usage - UNDER

STRUCTURE - IT'S UNDER THE (OBJECT)/UNDER (OBJECT)
pronoun + cop' + preposition + det + (noun)

Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(0)	-	2(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(100)	-	2(100)	-
Context	2	-	1	-
Trainer 1	28.2.80			
Trials (% correct)	-			
Context	-			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	2(0)	-	2(0)	-
Context	2	-	3	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(0)	1(0)	2(0)	-
Context	2	2	1	-
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	2(0)	2(100)	2(0)	4(50)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	2(50)	1(0)		
Context	2	2		

Fig. 7-49

Nicola - POST-TEST 3 - Generalisation Probes -(Low Structure)
Training Category - Prepositional Usage - UNDER
STRUCTURE - IT'S UNDER THE (OBJECT)/UNDER (OBJECT)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-50

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - OVER

MOTOR RESPONSE (Manipulation of objects)

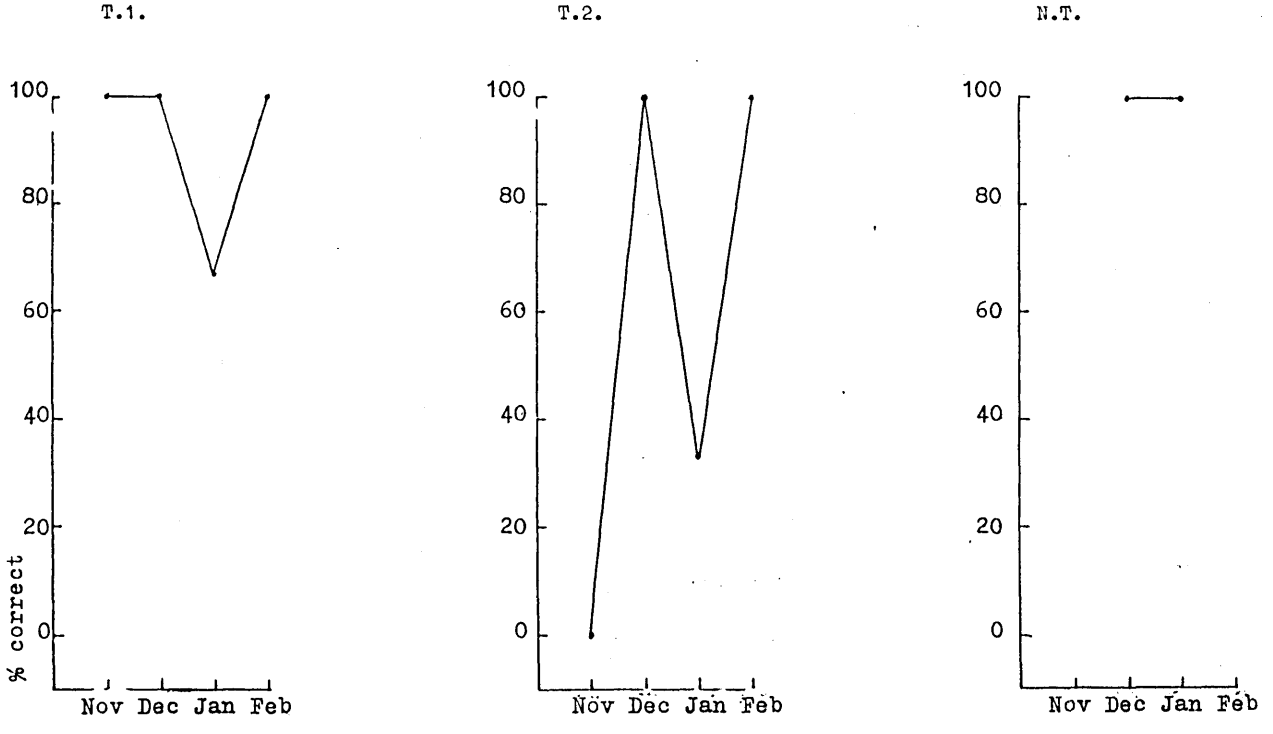
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(100)	-	1(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(100)	1(0)	1(100)	1(100)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	1(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	1(0)	-	-	-
Context	2	-	-	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	1(100)	1(0)	1(0)	-
Context	2	2	1	-
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	1(100)	-	1(100)	-
Context	1	-	-	-
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	1(100)	1(100)		
Context	2	2		

Fig. 7-50

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Training Category - Prepositional Usage - OVER

MOTOR RESPONSE - Generalisation



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-51

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - OVER

STRUCTURE - IT'S OVER THE (OBJECT)/OVER (OBJECT)
(pronoun + cop' + preposition + (noun))

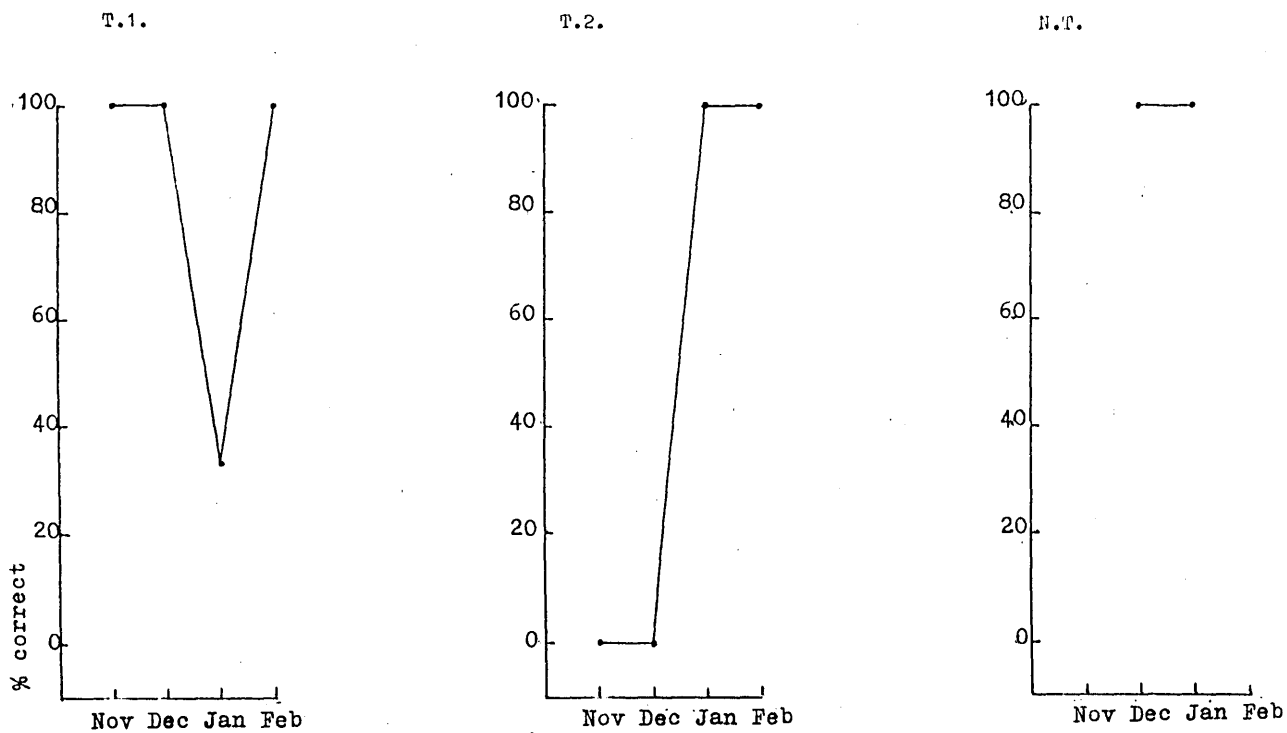
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	2(100)	-	1(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(100)	1(0)	2(100)	2(0)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	2(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	2(0)	-	-	-
Context	2	-	-	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(0)	-	2(100)	-
Context	2	-	1	-
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	2(100)	-	2(100)	-
Context	1	-	3	-
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	2(100)	2(100)		
Context	2	2		

Fig. 7-51

Nicola - POST-TEST 3 - Generalisation Probes -(Low Structure)

Training Category - Prepositional Usage - OVER

STRUCTURE - IT'S OVER THE (OBJECT)/OVER (OBJECT)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-52

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Next To

MOTOR RESPONSE (Manipulation of objects)

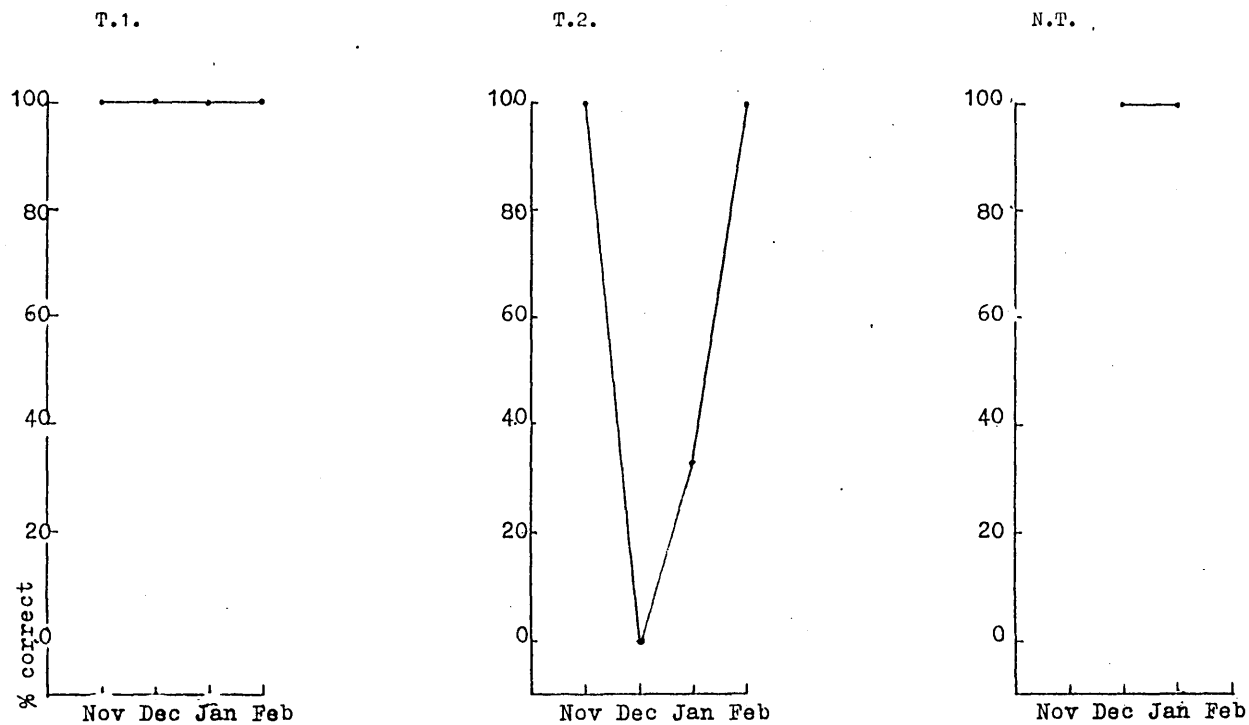
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(100)	-	1(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	1(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	1(100)	-	-	-
Context	2	-	-	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	1(0)	-	1(0)	1(0)
Context	2	-	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	1(100)	1(100)	1(100)	-
Context	1	2	3	-
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	1(100)	1(100)		
Context	2	2		

Fig. 7-52

Nicola - POST-TEST 3 - Generalisation Probes - (Low Structure)

Training Category - Prepositional Usage - NEXT TO

MOTOR RESPONSE - Generalisations



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-53

Summary of Generalisations per Structure by Sessions, Trials and Context

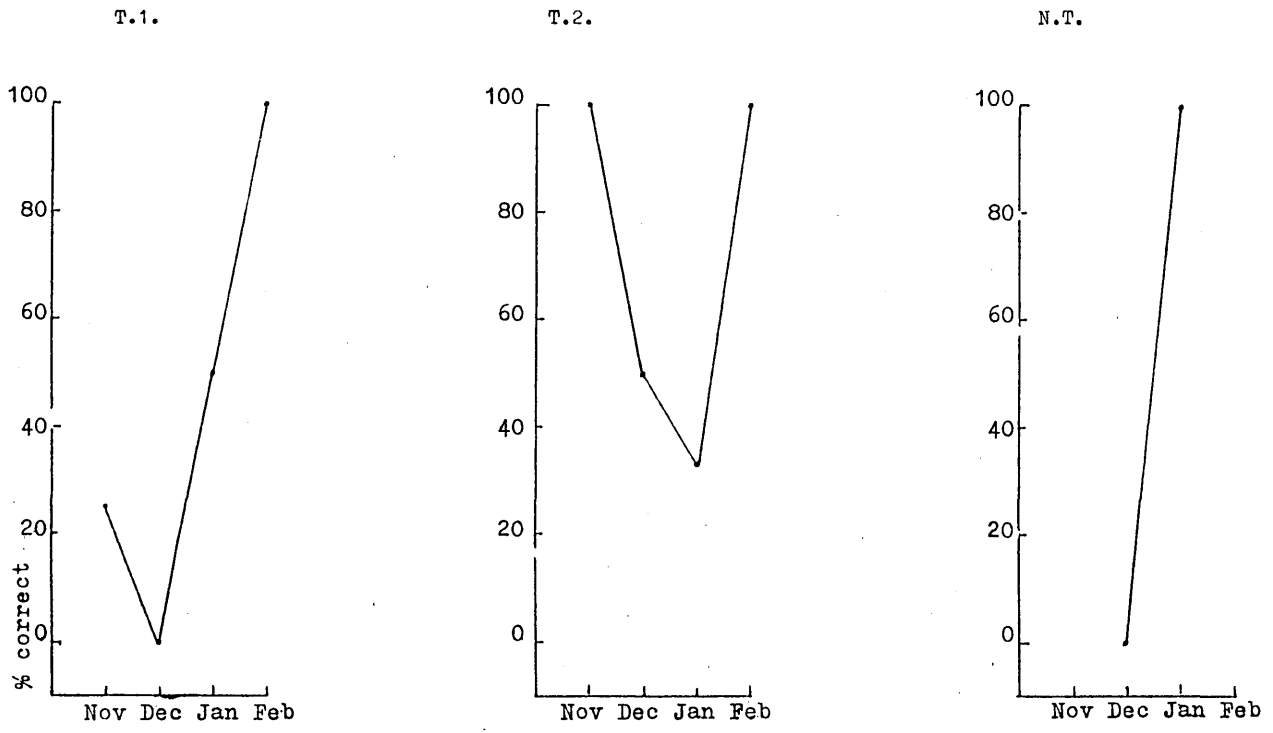
Training Category - Prepositional Usage - Next to

STRUCTURE - IT'S NEXT TO THE (OBJECT)/NEXT TO (OBJECT)
IT'S NEXT (OBJECT)
(pron + cop' + prep + det + noun)

Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	2(50)	-	1(0)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	2(0)	2(50)	2(0)	2(100)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	2(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	2(100)	-	-	-
Context	2	-	-	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(50)	-	2(0)	2(0)
Context	2	-	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	2(100)	2(100)	2(100)	-
Context	1	2	3	-
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	2(0)	1(100)		
Context	2	2		

Fig. 7-53

Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Prepositional Usage - NEXT TO
STRUCTURE - IT'S NEXT TO THE (OBJECT)/NEXT TO (OBJECT)



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-54

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Over there

MOTOR RESPONSE (manipulation of objects)

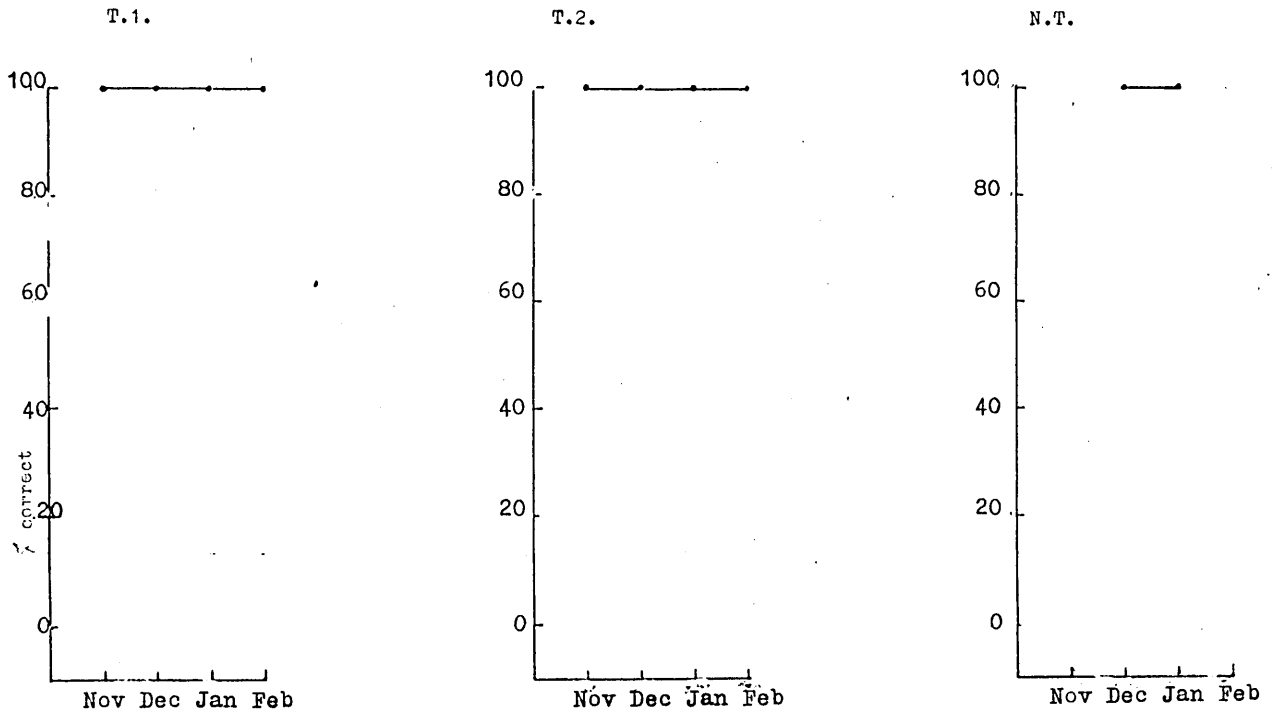
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(100)	-	1(100)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	1(100)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	1(100)	-	1(100)	-
Context	2	-	3	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2	1	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	1(100)	1(100)		
Context	2	2		

Fig. 7-54

Nicola - POST-TEST 3 - Generalisation Probes -(Low Structure)

Training Category - Prepositional Usage

MOTOR RESPONSE - Generalisations - OVER THERE



Nicola - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 7-55

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Over there

STRUCTURE - IT'S OVER THERE/OVER THERE
(pron + cop + prep)

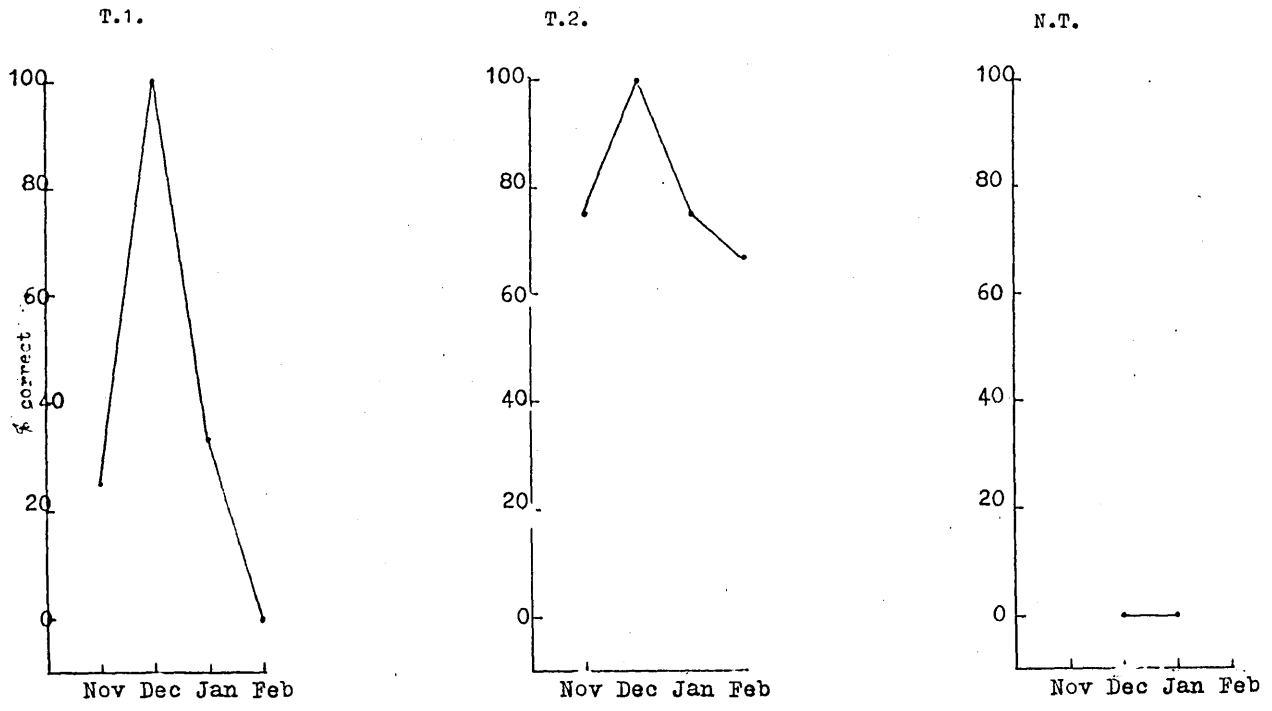
Trainer 1	8.11.79	9.11.79	21.11.79	23.11.79
Trials (% correct)	1(0)	-	2(50)	-
Context	2	-	2	-
Trainer 1	3.12.79	9.1.80	15.1.80	28.1.80
Trials (% correct)	1(100)	1(0)	2(100)	2(0)
Context	2	1	1	1
Trainer 1	28.2.80			
Trials (% correct)	2(0)			
Context	1			
Trainer 2	12.11.79	15.11.79	28.11.79	30.11.79
Trials (% correct)	2(50)	-	2(100)	-
Context	2	-	3	-
Trainer 2	11.12.79	3.1.80	10.1.80	23.1.80
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	2	2	1	3
Trainer 2	29.1.80	5.2.80	13.2.80	No Date
Trials (% correct)	2(0)	2(100)	2(100)	2(0)
Context	1	2	3	1
Non-Trainer	5.12.79	16.1.80		
Trials (% correct)	1(0)	1(0)		
Context	2	2		

Table 7-55

Nicola - POST-TEST 2 - Generalisation Probes -(Low Structure)

Training Category - Prepositional Usage - OVER THERE

STRUCTURE - IT'S OVER THERE/OVER THERE



Appendix G

Case Study 4 Glyn

Language Training and Testing Data

Tables 8-1 to 8-18; Figures 8-1 to 8-18 - Progress in learning the main structures taught covering the period October 1978 to June 1979.

Tables 8-19 to 8-39; Figures 8-19 to 8-39 - POST-TEST 1 data showing generalisations per structure by trainer/non-trainer/child interactions in Test Conditions A and B.

Glyn - Language Training

Table 8-1

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Persons/Actions/Things

Structure - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING
(OBJ)/(AOBJ)/(PREP)
(It + cop' + det + V+ing + det + (obj)/(det + obj)/
(prep))

Training commenced - 12.10.78
Training terminated - 23.11.78
Number of sessions - 6

Imitations

Trials (% correct) - 30(60), 18(61)

Non-imitative responses

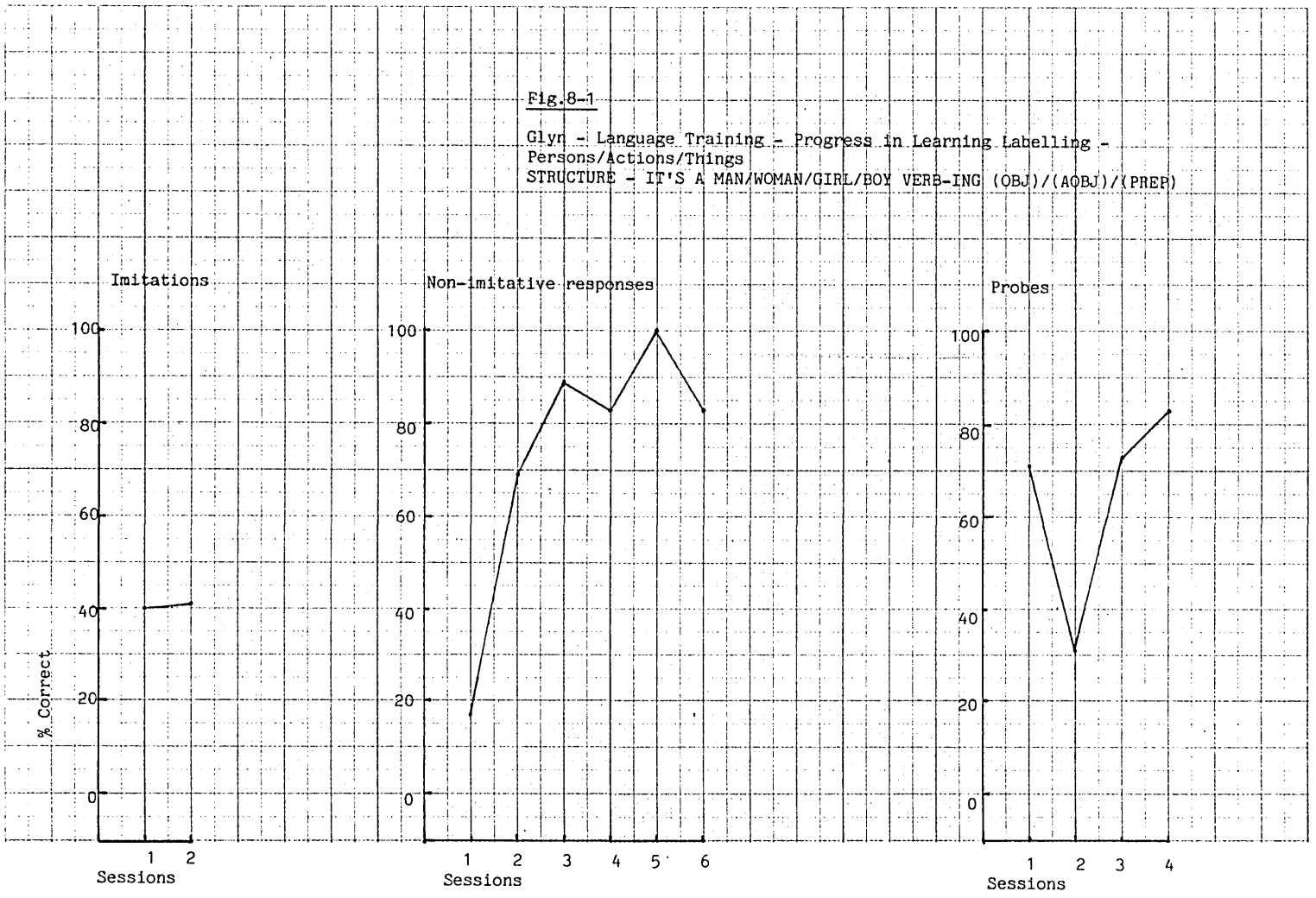
Trials (% correct) - 30(17), 36(69), 18(89), 12(83), 6(100)
6(83)

Probes

Trials (% correct) - 7(71), 26(31), 30(73), 22(82)

Fig.8-1

Glyn - Language Training - Progress in Learning Labelling - Persons/Actions/Things
STRUCTURE - IT'S A MAN/WOMAN/GIRL/BOY VERB-ING (OBJ)/(AOBJ)/(PREP)



Glyn - Language Training

Table 8-2

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - Objects (singular)

Structure - YES IT IS - (Yes + pron. + copula)

Training commenced - 30.11.78
Training terminated - 25. 1.79
Number of sessions - 8

Imitations

Trials (% correct) - 6 (100)

Non-imitative responses

Trials (% correct) - 24(71), 6(100), 6(100), 12(100), 6(100), 6(100), 6(100), 6(83), 6(83)

Probes

Trials (% correct) - 10(100), 6(100), 8(87), 5(100), 8(87), 4(100), 6(100), 6(100)

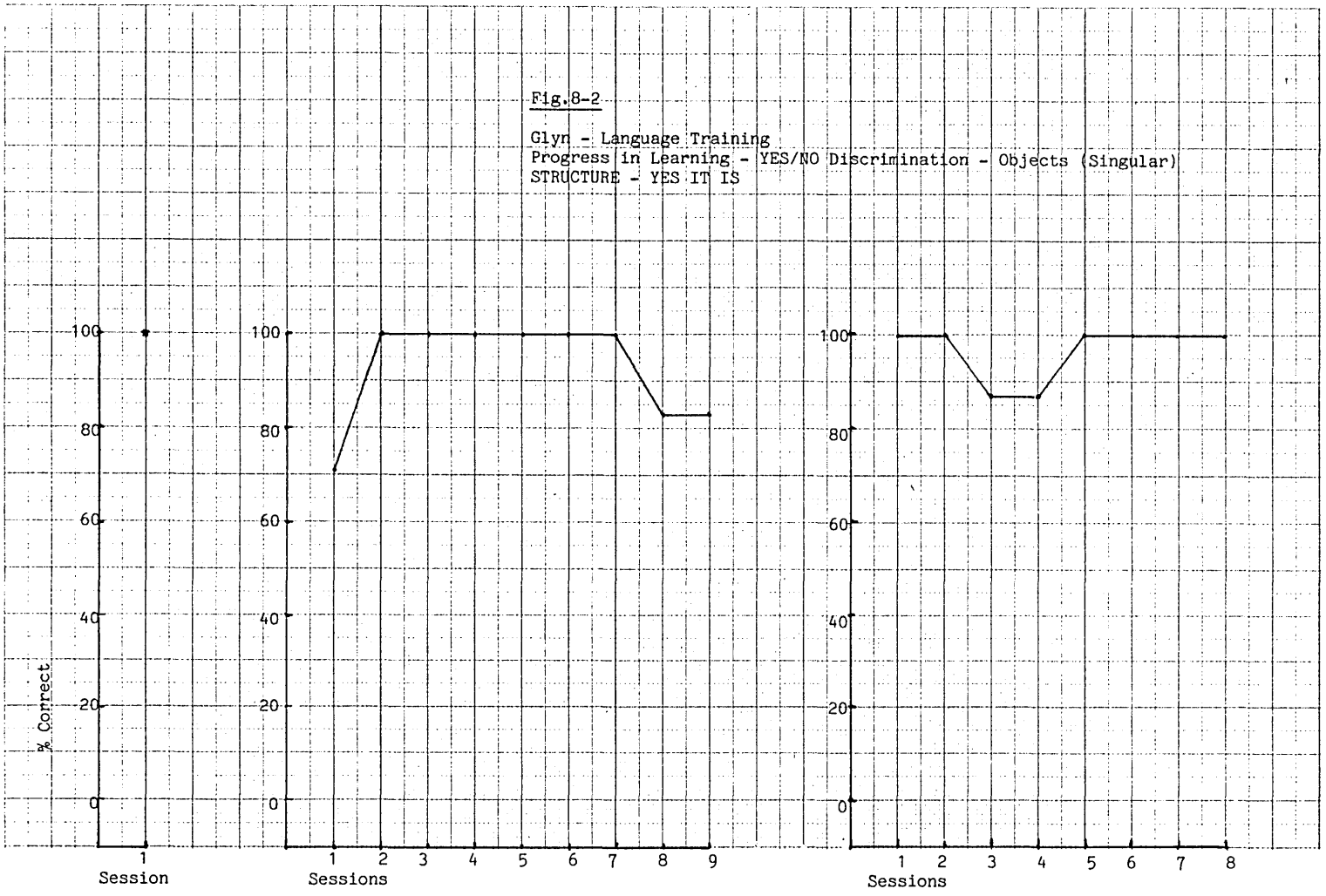


Fig.8-2
Glyn - Language Training
Progress in Learning - YES/NO Discrimination - Objects (Singular)
STRUCTURE - YES IT IS
% Correct
100
80
60
40
20
0
1
Session
1 2 3 4 5 6 7 8 9
Sessions
1 2 3 4 5 6 7 8
Sessions

Glyn - Language Training

Table 8-3

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - Objects (singular)

Structure - NO IT ISN'T, IT'S A (NOUN)
(No + pronoun + copula + neg.+ pron.+ cop. + def.+ noun)

Training commenced - 30.11.78
Training terminated - 25. 1.79
Number of sessions - 9

Imitations

Trials (% correct) - 6(100)

Non-imitative responses

Trials (% correct) - 24(62), 8(100), 18(83), 6(100), 6(83), 6(83), 6(83), 6(100), 6(100)

Probes

Trials (% correct) - 14(93), 6(100), 8(100), 4(100), 8(100), 4(50), 6(100), 4(100)

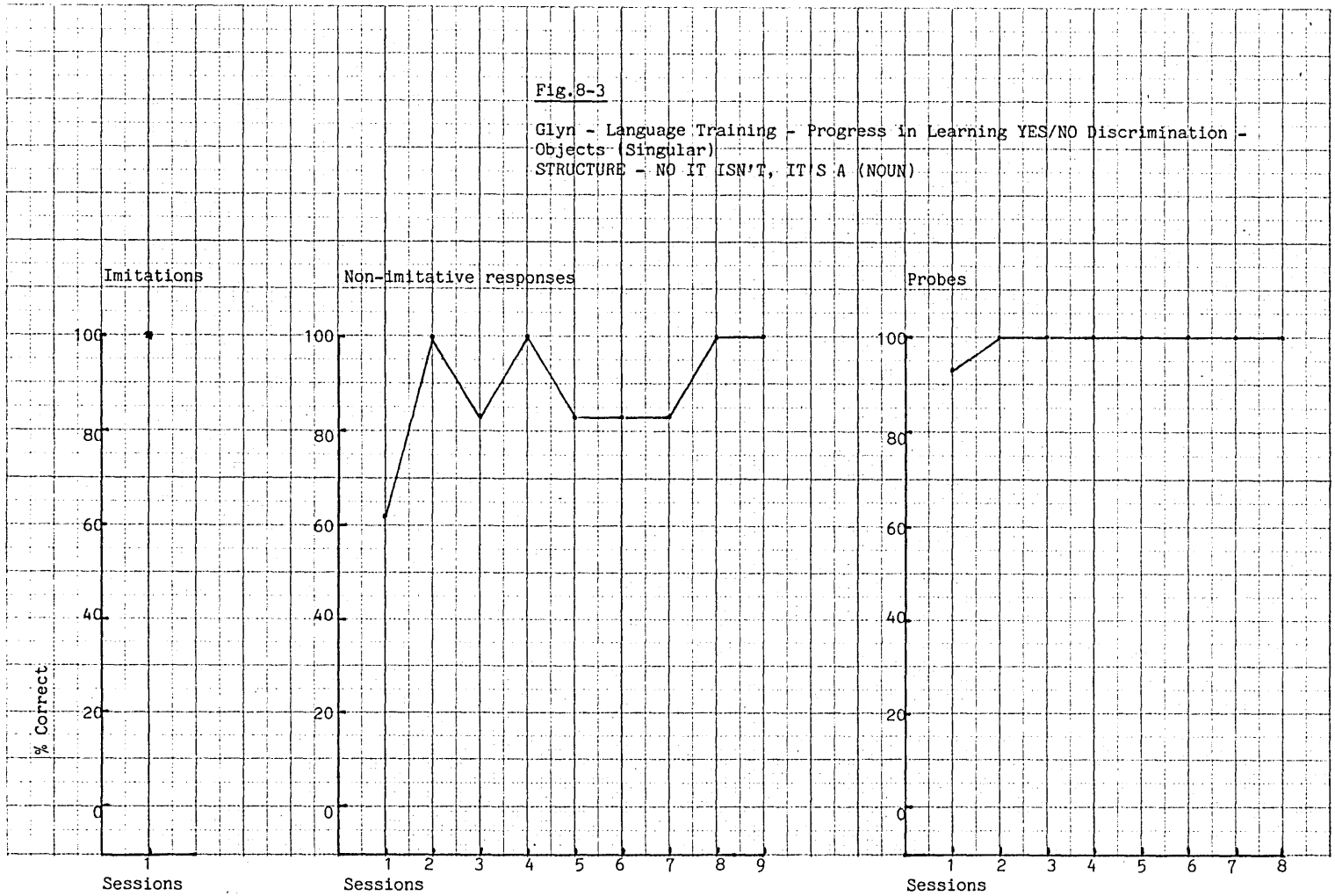


Fig.8-3

Glyn - Language Training - Progress in Learning YES/NO Discrimination - Objects (Singular)
STRUCTURE - NO IT ISN'T, IT'S A (NOUN)

Glyn - Language Training

Table 8-4

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - Objects (plural)

Structure - YES THEY ARE - (Yes + pronoun + verb)

Training commenced - 20.12.78
Training terminated - 25. 1.79
Number of sessions - 5

Imitations

Trials (% correct) - 6(67)

Non-imitative responses

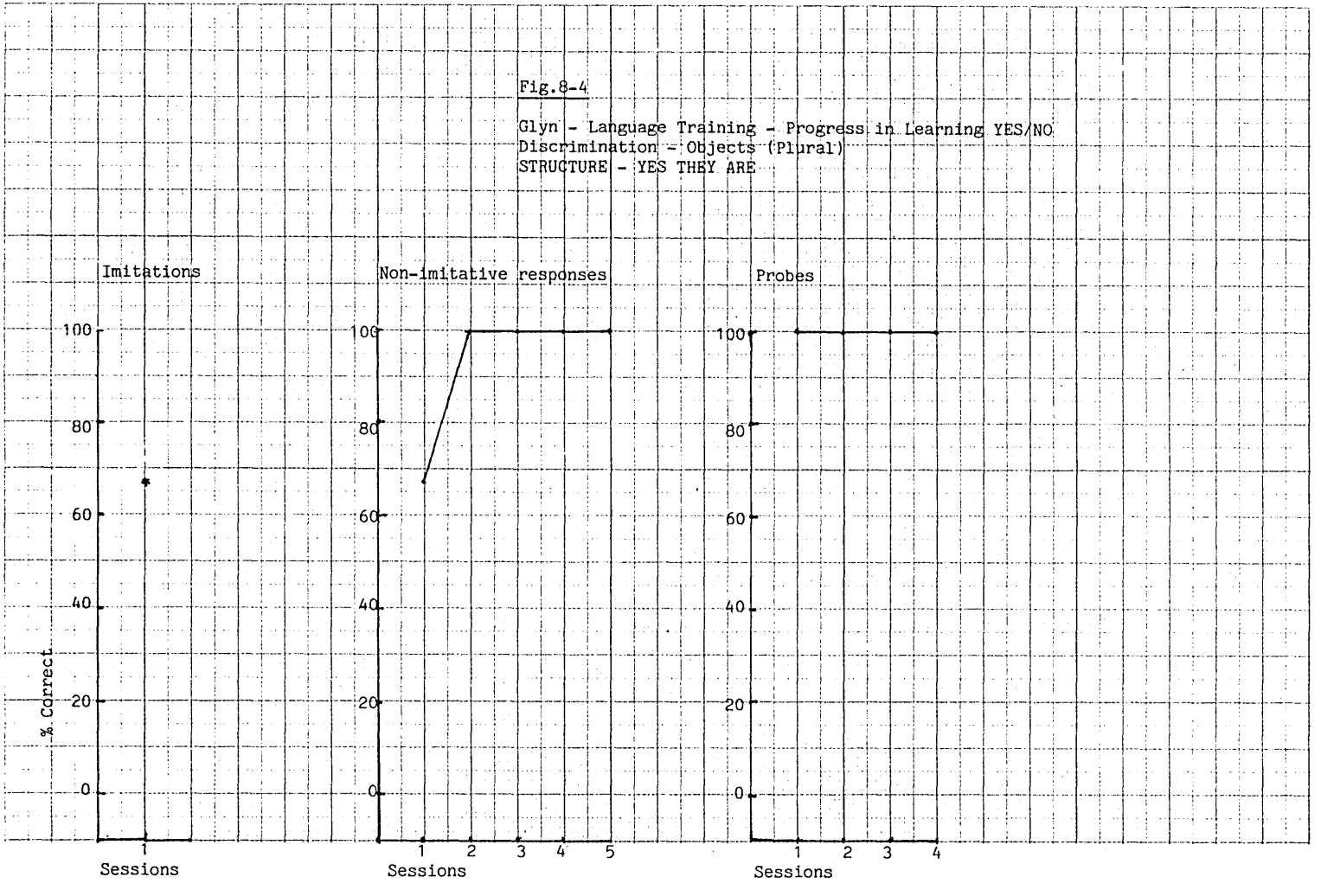
Trials (% correct) - 18(67), 6(100), 6(100), 6(100), 6(100)

Probes

Trials (% correct) - 3(100), 8(100), 8(100), 6(100)

Fig.8-4

Glyn - Language Training - Progress in Learning YES/NO
Discrimination - Objects (Plural)
STRUCTURE - YES THEY ARE



Glyn - Language Training

Table 8-5

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - Objects (plural)

Structure - NO THEY AREN'T/ARE NOT, THEY'RE (NOUNS)
(No + pronoun + verb + neg./verb + negative + pronoun + verb + noun + plural)

Training commenced - 20.12.78
Training terminated - 25. 1.79
Number of sessions - 5

Imitations

Trials (% correct) - 3(0)

Non-imitative responses

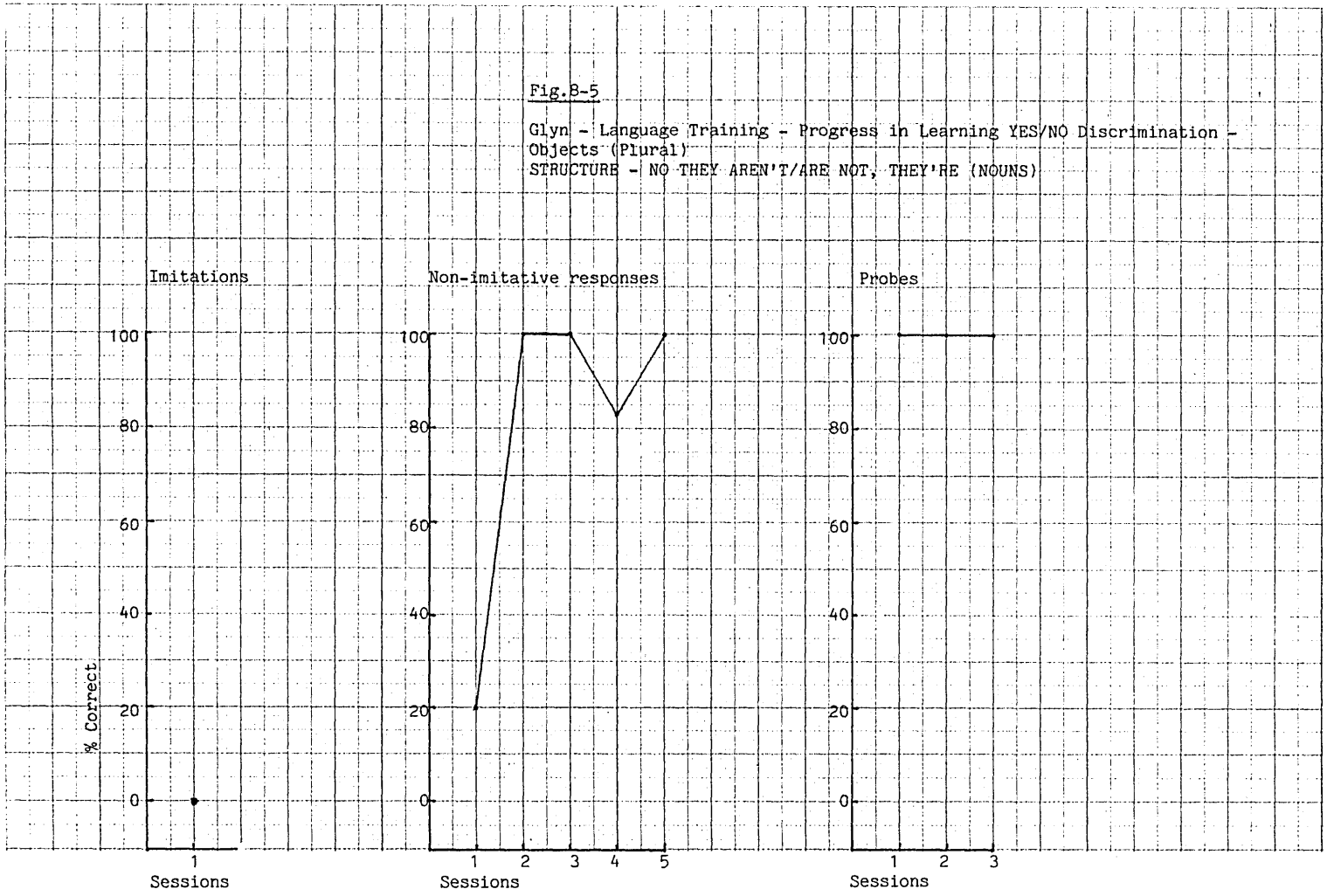
Trials (% correct) - 30(20), 6(100), 6(100), 6(83), 6(100)

Probes

Trials (% correct) - 4(100), 8(100), 6(100)

Fig.8-5

Glyn - Language Training - Progress in Learning YES/NO Discrimination - Objects (Plural)
STRUCTURE - NO THEY AREN'T/ARE NOT, THEY'RE (NOUNS)



Glyn - Language Training

Table 8-6

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal usage - Pronoun I

Structure - I AM/I'M VERB-ING (OBJ)/(PREP)
Pron.+ aux.+ verb + ing (obj)/(prep)

Training commenced - 25.1.79
Training terminated - 21.3.79
Number of sessions - 17

Imitations

Trials (% correct) - 4(100), 2(100)

Non-imitative responses

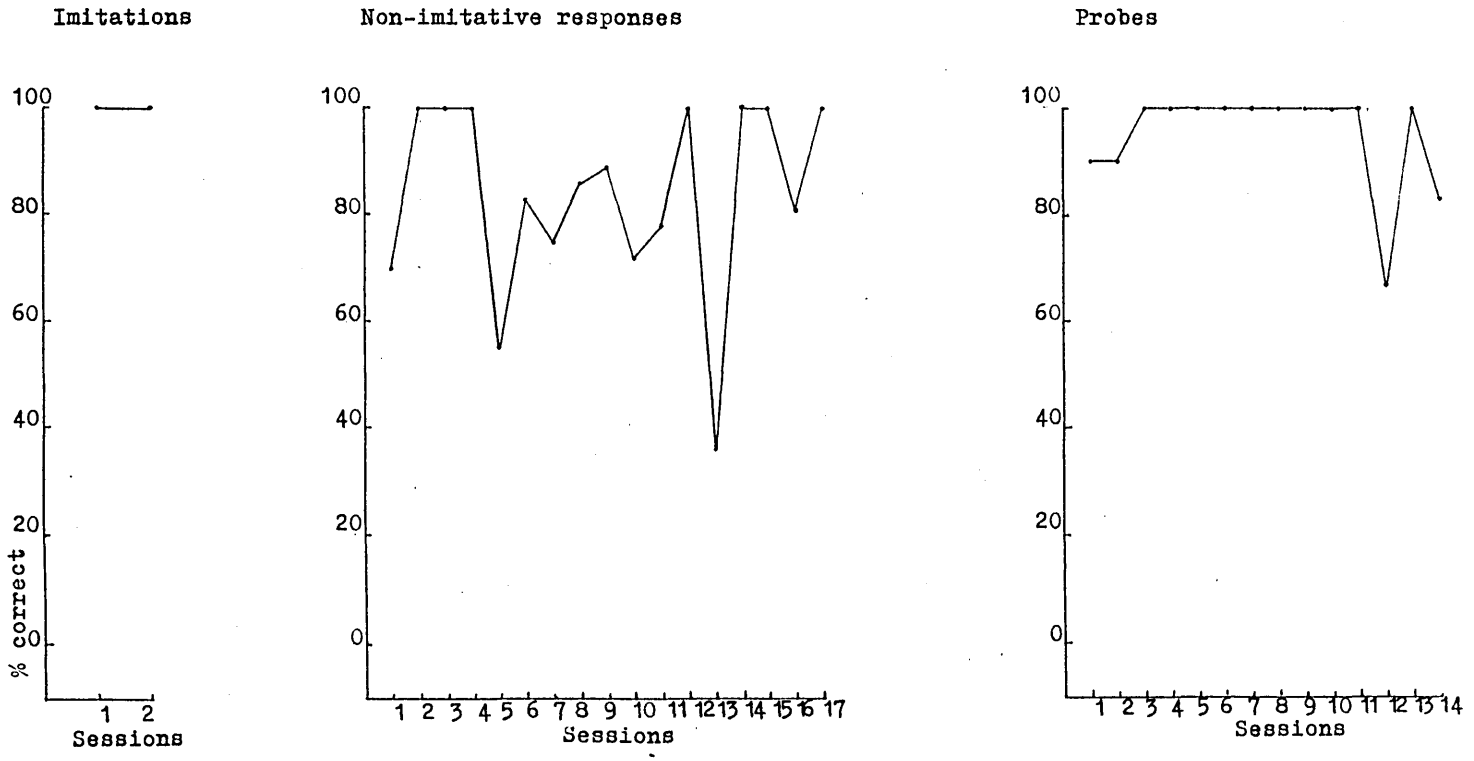
Trials (% correct) - 30(70), 8(100), 12(100), 12(100), 18(55), 6(83), 12(75), 7(86), 9(89), 18(72), 9(78), 7(100), 14(36), 9(100), 6(100), 21(811), 24(100)

Probes

Trials (% correct) - 10(90), 10(90), 6(100), 3(100), 6(100), 9(100), 9(100), 9(100), 8(100), 7(100), 9(100), 6(67), 2(100), 6(83)

Fig. 8-6

Glyn - Language Training - Progress in Learning
Pronominal Usage - Pronoun I + Labelling - Actions
Structure - I AM/I'M VERB-ING (AOBJ)/(PREP)



Glyn - Language Training

Table 8-7

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal usage - Pronoun I + Yes Discrimination

Structure - YES I AM - (Yes + pron.+ aux)

Training commenced - 25.1.78
Training terminated - 21.3.79
Number of sessions - 17

Imitations

Trials (% correct) -

Non-imitative responses

Trials (% correct) - 18(44), 8(87), 9(89), 19(68), 6(83), 9(88), 6(67), 8(100), 15(93), 9(100), 13(100), 22(73), 6(100), 6(100), 36(100), 31(100)

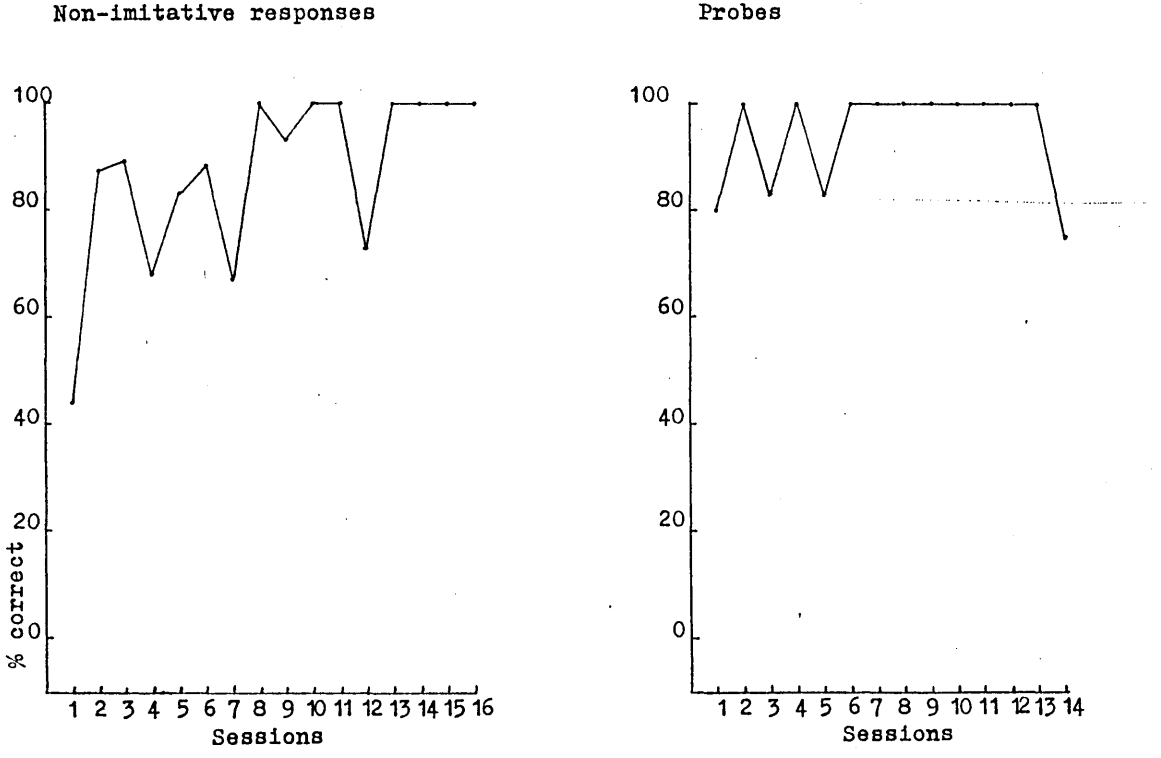
Probes

Trials (% correct) - 10(80), 6(100), 12(83), 5(100), 6(83), 6(100), 4(100), 6(100), 9(100), 2(100), 7(100), 12(100), 12(100), 12(75)

Fig. 8-7

Glyn - Language Training - Progres in Learning Pronominal Usage - I + Yes/No Discrimination

Structure - YES I AM - (Glyn)/Verb-ing)



Glyn - Language Training

Table 8-8

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - Pronoun I

Structure - I AM (Glyn) - (pron. + aux)

Training commenced - 25.1.79
Training terminated - 21.3.79
Number of sessions - 13

Imitations

Trials (% correct) -

Non-imitative responses

Trials (% correct) - 3(67), 6(100), 3(67), 6(17), 12(67), 2(100), 7(87), 3(67), 3(100), 23(48), 6(83), 3(100), 8(100)

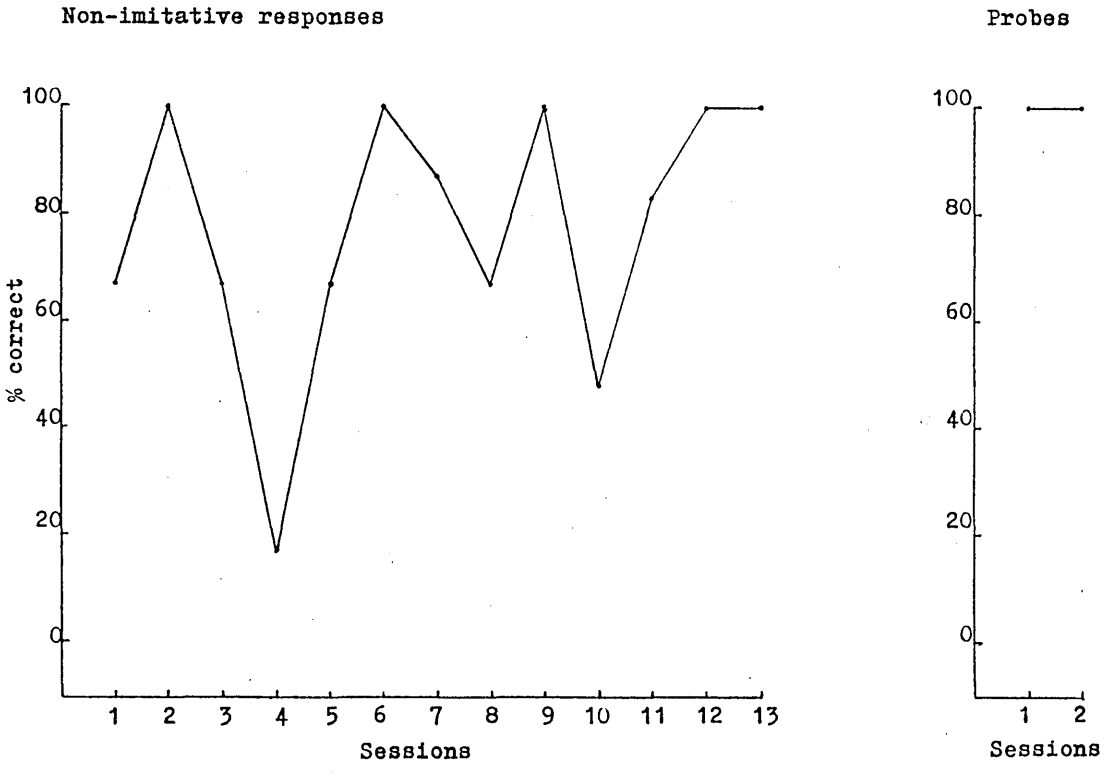
Probes

Trials (% correct) - 3(100), 6(100)

Fig. 8-8

Glyn - Language Training - Progress in Learning
Pronominal Usage - I

Structure - I AM (Glyn)



Glyn - Language Training

Table 8-9

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - Pronoun I +
No discrimination

Structure - NO I'M, I AM NOT, I'M, I AM GLYN
(No + pron.+ aux + neg.+ pron.+ aux + proper noun)

Training commenced - 12.2.79
Training terminated - 21.3.79
Number of sessions - 3

Imitations

Trials (% correct) - 12(83)

Non-imitative responses

Trials (% correct) - 12(83), 16(62), 6(100)

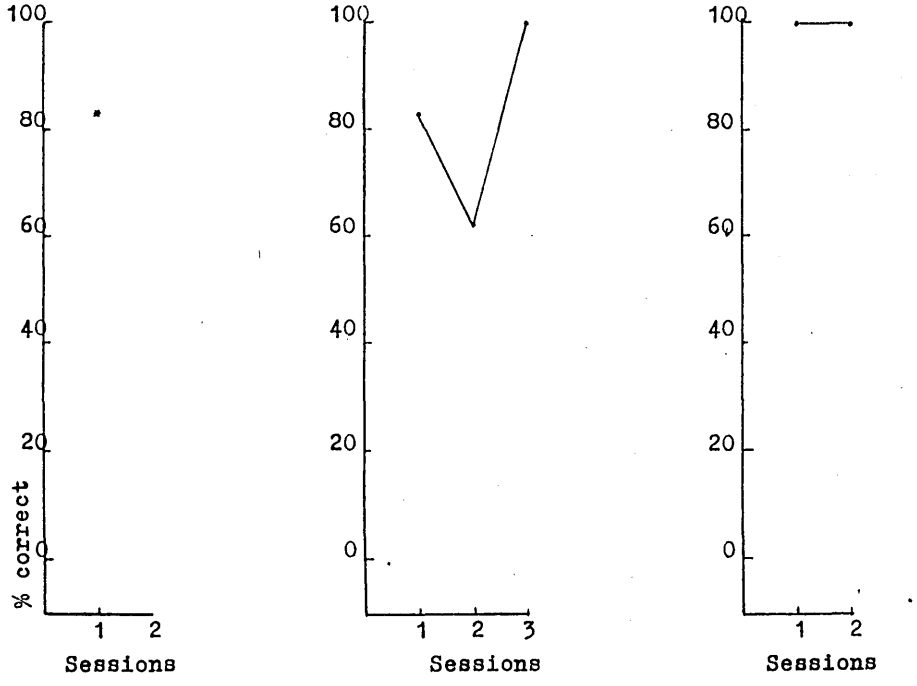
Probes

Trials (% correct) - 9(100), 6(100)

Fig. 8-9

Glyn - Language Training - Progress in Learning Pronominal Usage - I + YES/NO Discrimination

Structure - NO I'M/I AM NOT, I'M GLYN



Glyn - Language Training

Table 8-10

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - Pronoun I +
No discrimination

Structure - NO I'M/I AM NOT, I'M/I AM VERB-ING
(No + pron.+verb + negative + pron. +
aux + verb + ing)

Training commenced - 12.3.79
Training terminated - 21.3.79
Number of sessions - 8

Imitations

Trials (% correct) - 3(100)

Non-imitative responses

Trials (% correct) - 6(100), 4(67), 9(100), 6(100),
13(44), 6(100) 4(100), 18(94)

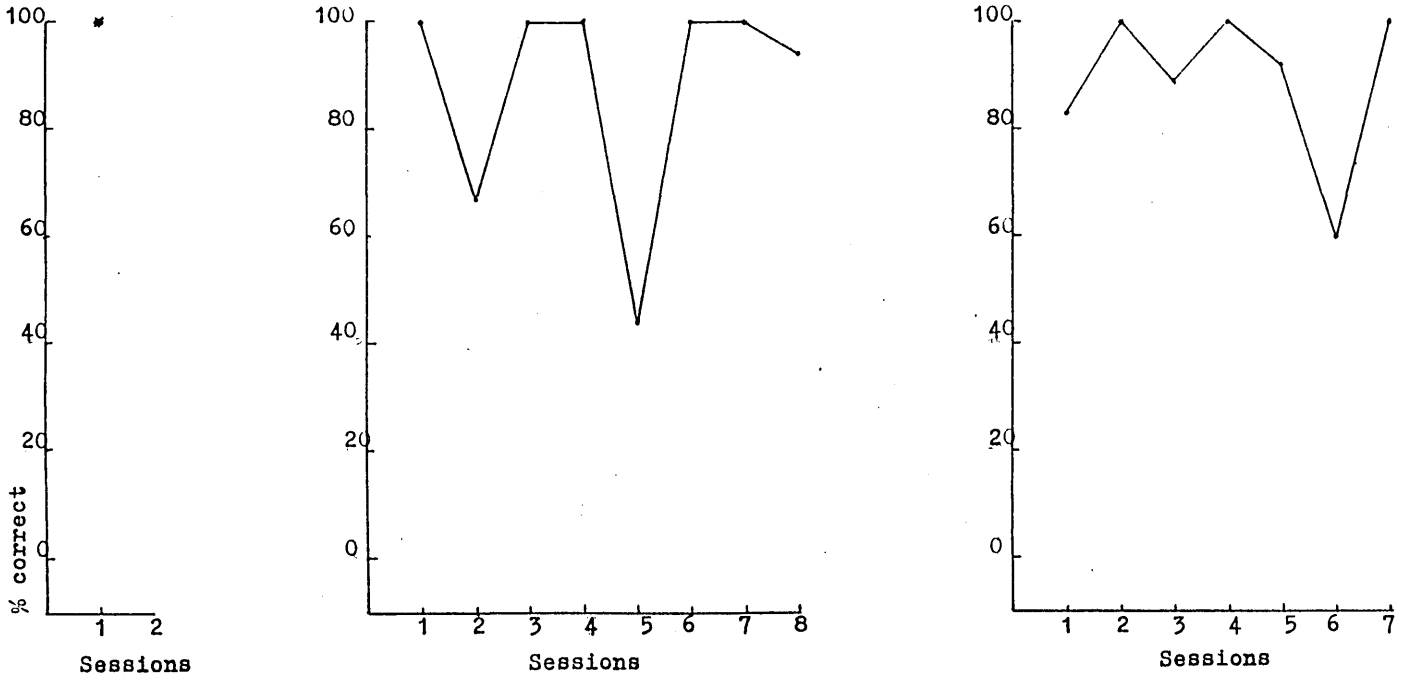
Probes

Trials (% correct) - 6(83), 3(100), 9(89), 2(100),
12(92), 5(60), 6(100)

Fig. 8-10

Glyn - Language Training - Progress in Learning Pronoun - I + YES/NO Discrimination

Structure - NO I'M/I AM NOT, I'M/I AM VERB-ING (AOBJ)/(PREP)



Glyn - Language Training

Table 8-11

Summary of Progress per Structure by Sessions and Trials

Training Category - Prenominal Usage - mine +
Yes discrimination (singular)

Structure - YES IT IS (Yes + pron.+ cop')

Training commenced - 26.3.79
Training terminated - 30.4.79
Number of sessions - 8

Imitations

Trials (% correct) - 3(67)

Non-imitative responses

Trials (% correct) - 27(48), 8(100), 8(75), 12(58),
12(100), 15(80), 18(100), 9(100)

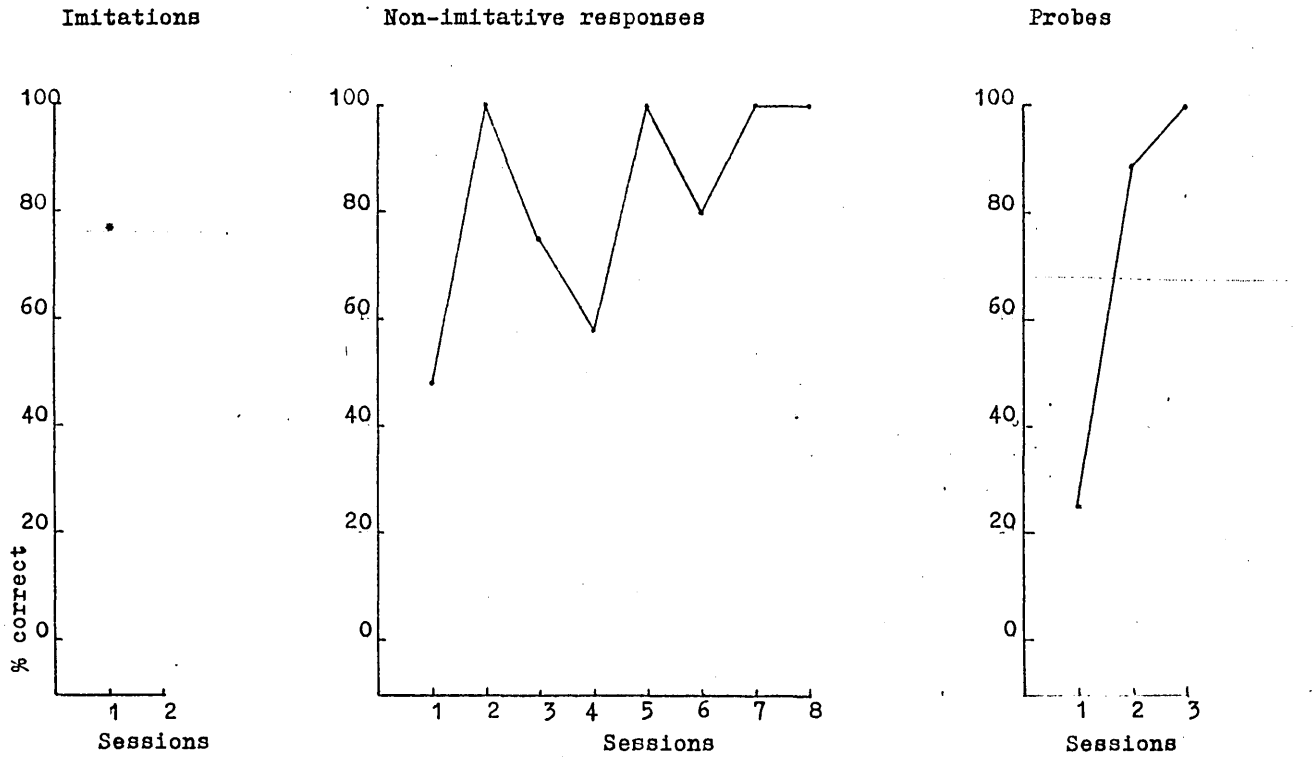
Probes

Trials (% correct) - 4(25), 9(89), 6(100)

Fig. 8-11

Glyn - Language Training - Progress in Learning Pronominal Usage - possessive-mine + YES/NO Discrimination - (Singular)

Structure - YES IT IS - (mine)



Glyn - Language Training

Table 8-12

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - mine

Structure - IT'S MINE (Pron.+ cop.+ possessive pron.)

Training commenced - 26.3.79
Training terminated - 30.4.79
Number of sessions - 8

Imitations

Trials (% correct) - 3(100)

Non-imitative responses

Trials (% correct) - 69(81), 16(100), 16(50), 24(96), 24(100), 20(95), 18(78), 27(100)

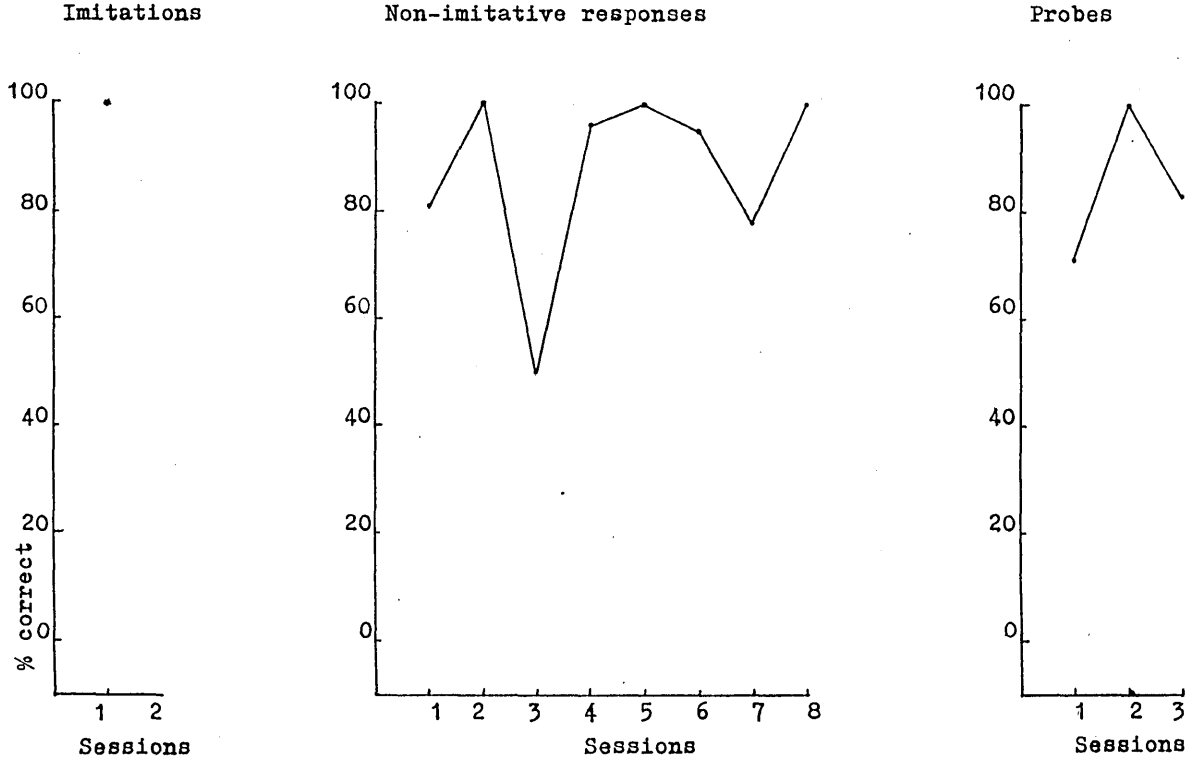
Probes

Trials (% correct) - 7(71), 18(100), 12(83)

Fig. 8-12

Glyn - Language Training - Progress in Learning Pronominal Usage - possessive-mine

Structure - IT'S MINE



Glyn - Language Training

Table 8-13

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - mine +
Yes discrimination (+ plural)

Structure - YES THEY ARE (Mine)
(yes + pronoun + copula)

Training commenced - 28.3.79
Training terminated - 30.4.79
Number of sessions - 7

Imitations

Trials (% correct) - 3(100)

Non-imitative responses

Trials (% correct) - 8(87), 8(25), 12(67), 6(67),
16(81), 18(100), 9(100)

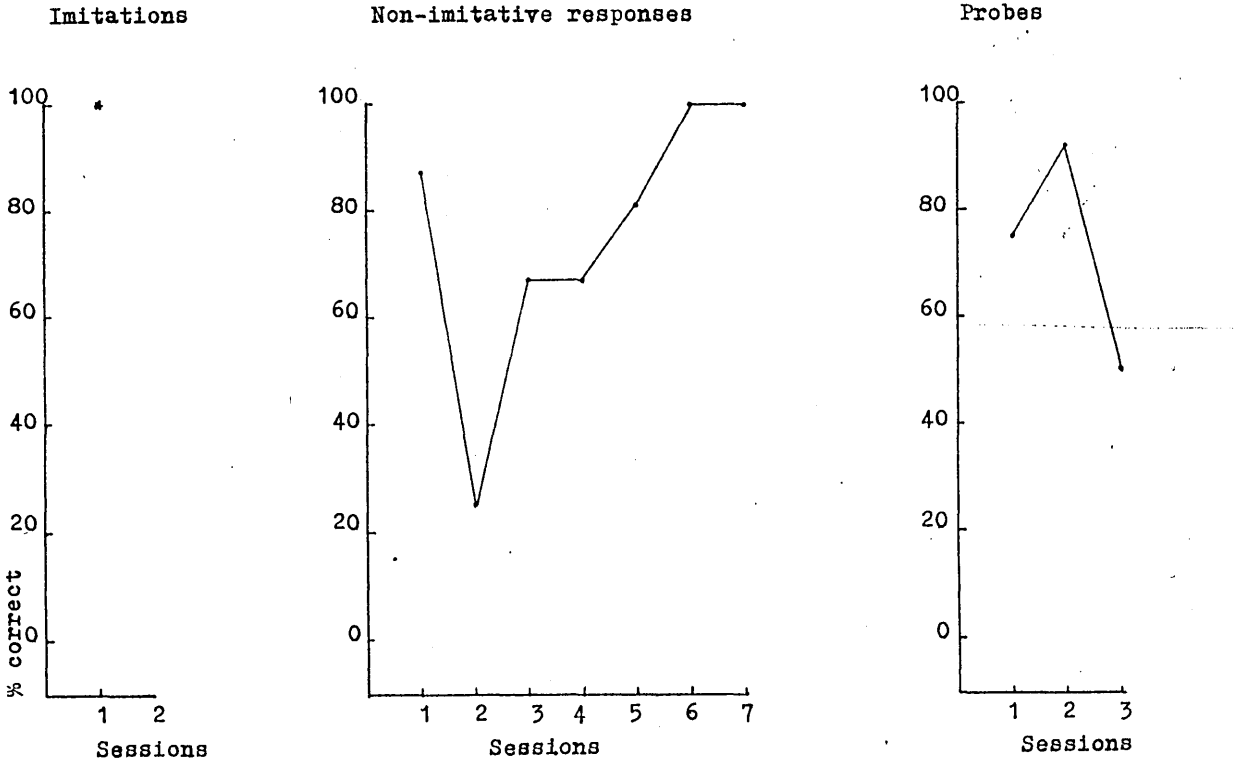
Probes

Trials (% correct) - 4(75), 12(92), 6(50)

Fig. 8-13

Glyn - Language Training - Progress in Learning Pronouns - mine + YES/NO Discrimination (Plural)

Structure - YES THEY ARE (mine)



Glyn - Language Training

Table 8-14

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - Mine - (+plural)

Structure - THEY'RE MINE (Pron.+ cop' + possessive pron.)

Training commenced - 28.3.79
Training terminated - 30.4.79
Number of sessions - 7

Imitations

Trials (% correct) -

Non-imitative responses

Trials (% correct) - 13(92), 16(50), 24(87), 12(100), 29(86), 18(100), 27(100)

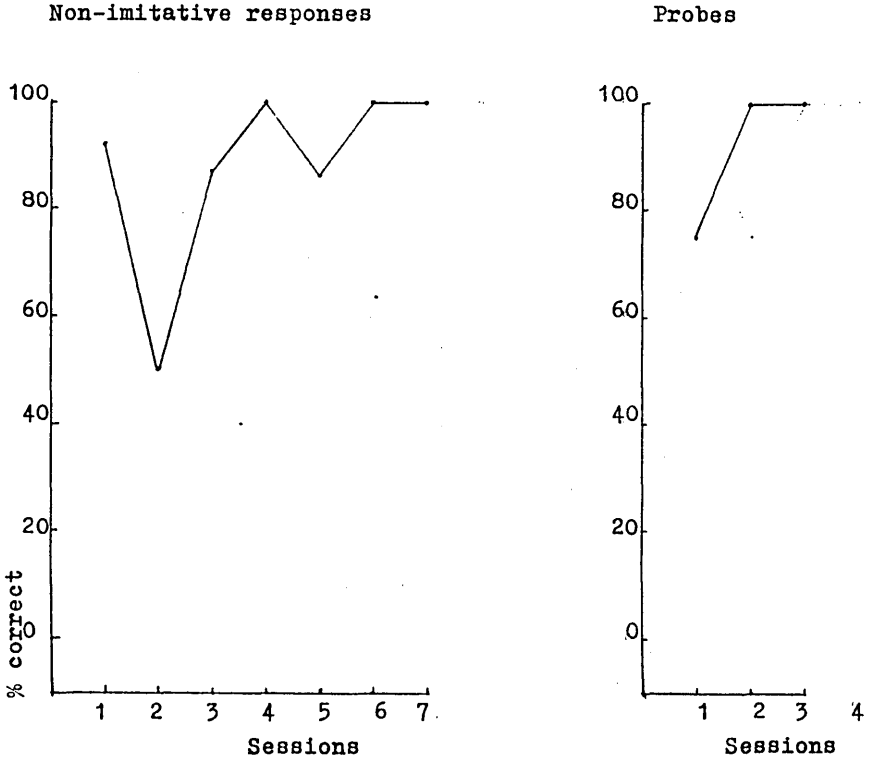
Probes

Trials (% correct) - 8(75), 24(100), 12(100)

Fig. 8-14

Glyn - Language Training - Progress in Learning Pronominal Usage - possessive - mine + (Plural)

Structure - THEY'RE MINE



Glyn - Language Training

Table 8-15

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I + Requesting (Objects)

Structure - I WANT A/MY (NOUN)
(pron + verb + det/poss.pron/ + noun)

Training commenced - 25.4.79
Training terminated - 13.6.79
Number of sessions - 13

Imitations

Trials (% correct) - 6(100), 6(100)

Non-imitative responses

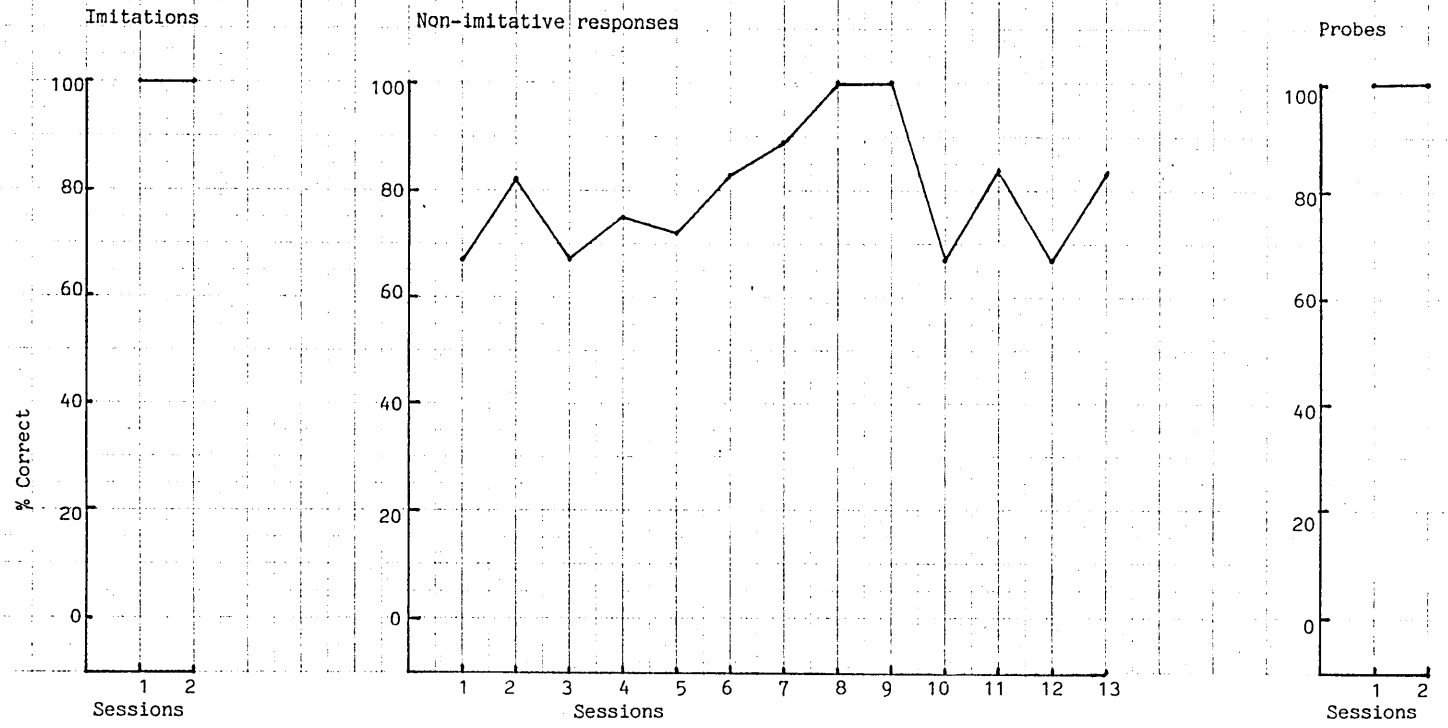
Trials (% correct) - 12(67), 12(92), 12(67), 12(75)
18(72), 18(83), 18(89), 18(100)
18(100), 18(67), 18(94), 15(67)
18(83)

Probes

Trials (% correct) - 6(100), 12(100)

Fig.8-15

Glyn - Language Training - Progress in Learning Pronominal Usage -
I + Requesting (Objects)
STRUCTURE - I WANT A/MY (NOUN)



Glyn - Language Training

Table 8-16

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I/you
(Person Deixis) + Wh?

Structure - WHAT DO YOU WANT?
(What + aux + pronoun + verb)

Training commenced - 25.4.79
Training terminated - 15.6.79
Number of sessions - 14

Imitations

Trials (% correct) - 6(100), 6(100)

Non-imitative responses

Trials (% correct) - 12( ), 12(71), 12(50), 18(89)
12(100), 6(100), 6(100), 6(100)
6(100), 6(100), 6(100), 12(100)
12(100), 6(100)

Probes

Trials (% correct) - 6(100), 12(100)

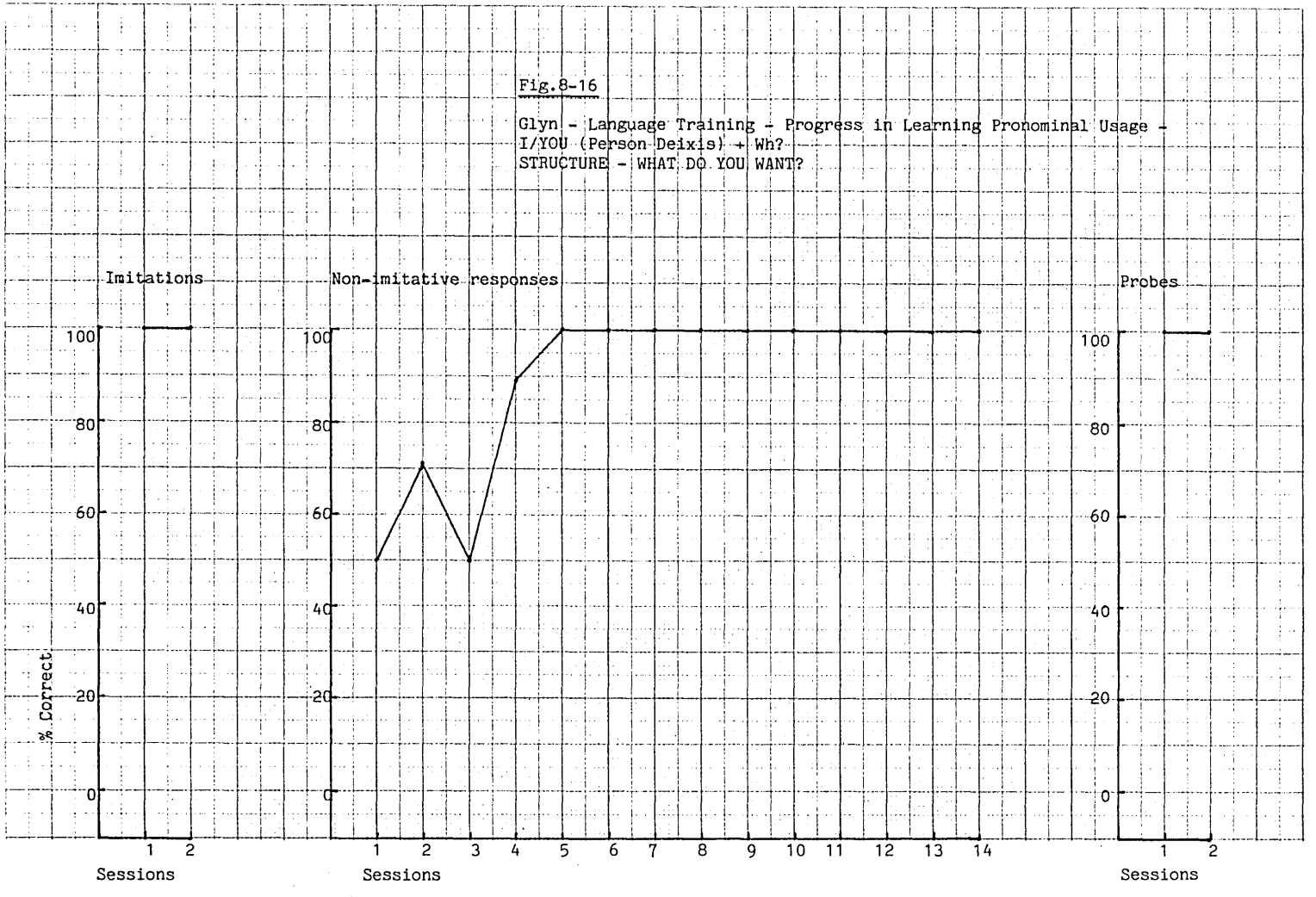


Fig.8-16
Glyn - Language Training - Progress in Learning Pronominal Usage -
I/YOU (Person Deixis) + Wh?
STRUCTURE - WHAT DO YOU WANT?
Imitations
Non-imitative responses
Probes
% Correct
100
80
60
40
20
0
1 2
Sessions
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Sessions
1 2
Sessions

Glyn - Language Training

Table 8-17

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I/You
(Person Deixis) + wh?

Structure - WHAT ARE YOU DOING?
(what + aux + pron + verb + ing)

Training commenced - 10.5.79
Training terminated - 18.6.79
Number of sessions - 11

Imitations

Trials (% correct) -

Non-imitative responses

Trials (% correct) - 6(33), 6(83), 6(83), 12(83), 12(83), 6(100), 14(78), 12(92), 12(100), 6(83)

Probes

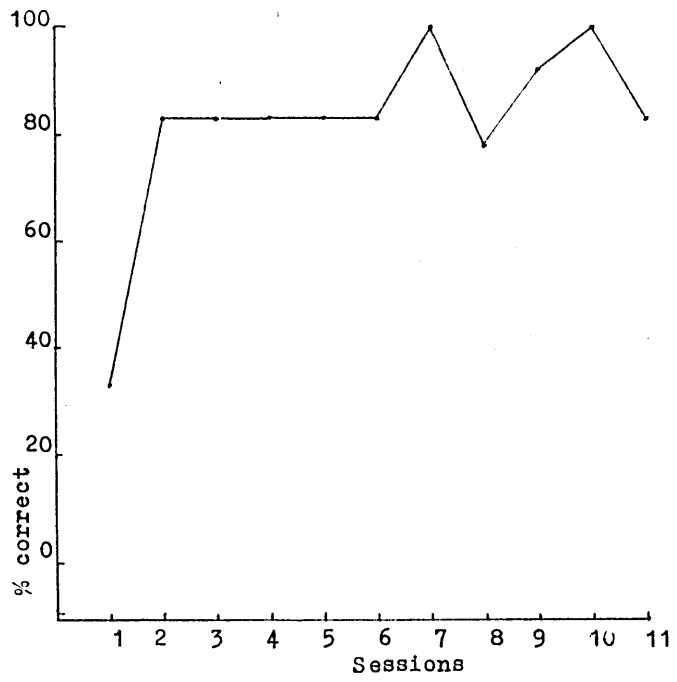
Trials (% correct) - 6(100)

Fig. 8-17

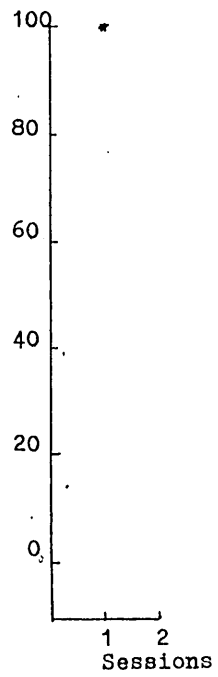
Glyn - Language Training - Progress in Learning Pronominal Usage - I/You (Person Deixis) + Wh?

Structure - WHAT ARE YOU DOING?

Non-imitative responses



Probes



Glyn - Language Training

Table 8-18

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I/You
(Person Deixis)

Structure - YOU ARE VERB-ING A/YOUR (OBJ)/(PREP)
(pron + aux + verb + ing + det/poss.pron (obj)/(prep))

Training commenced - 16.5.79
Training terminated - 18.6.79
Number of sessions - 8

Imitations

Trials (% correct) - 6(100)

Non-imitative responses

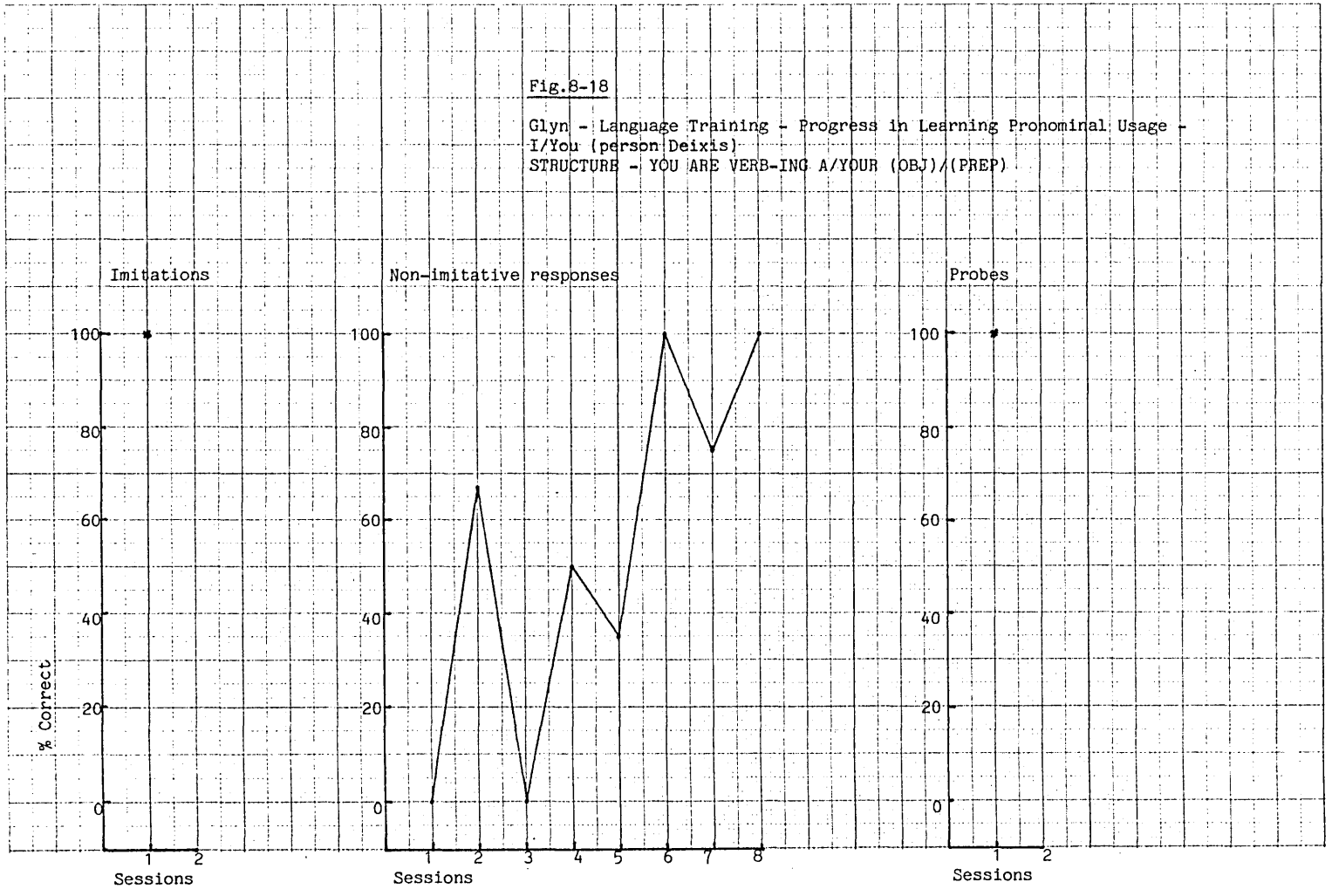
Trials (% correct) - 6(0), 6(67), 6(0), 6(50), 20(35), 12(100), 12(75), 6(100)

Probes

Trials (% correct) - 6(100)

Fig.8-18

Glyn - Language Training - Progress in Learning Pronominal Usage - I/You (person Deixis)
STRUCTURE - YOU ARE VERB-ING A/YOUR (OBJ)/(PREP)



Glyn - Post-Test 1 - Generalisation Probes

Table 8-19

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - Objects - Singular

Structure - IT'S A (NOUN)
(pron.+ cop.+ det.+ noun)

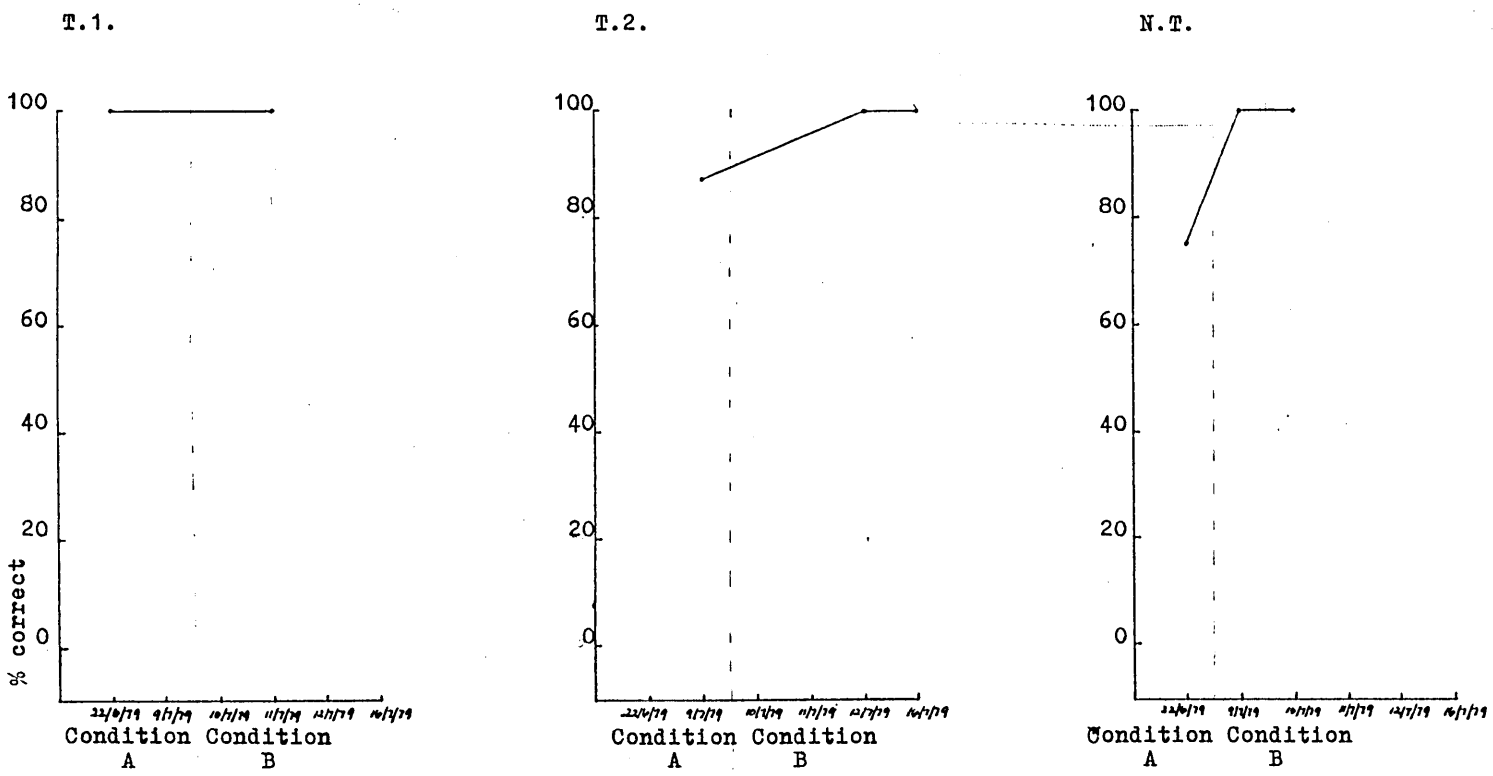
Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 12(100)	Session 11.7.79 Trials (% correct) 6(100)
Trainer 2	
Session 9.7.79 Trials (% correct) 24(87)	Sessions 12.7.79, 16.7.79 Trials (% correct) 6(100), 7(100)
Non-Trainer	
Session 22.6.79 Trials (% correct) 12(75)	Sessions 9.7.79, 10.7.79 Trials (% correct) 6(100), 4(100)

Fig. 8-19

Glyn - Post-Test 1 - Generalisation Probes

Training Category - Labelling Objects -(Singular)- Generalisations in Test Conditions A and B

Structure - IT'S A (NOUN)



Glyn - Post-Test 1 - Generalisation Probes

Table 8-20

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - Objects - Plural

Structure - THEY ARE/THEY'RE (NOUN(S))
(pron.+ cop' + noun + plural)

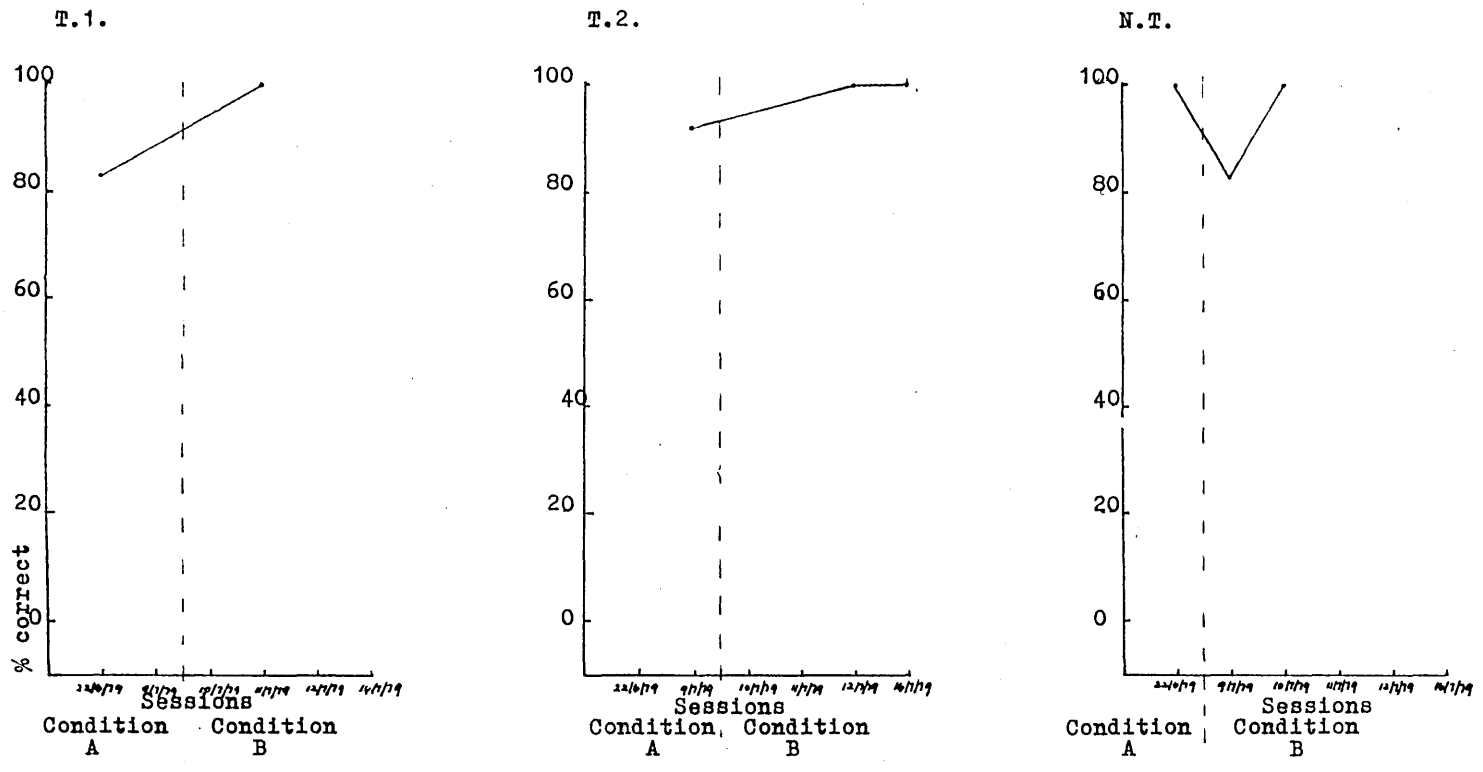
Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 12(83)	Session 11.7.79 Trials (% correct) 6(100)
Trainer 2	
Session 9.7.79 Trials (% correct) 24(92)	Sessions 12.7.79, 16.7.79 Trials (% correct) 6(100), 6(100)
Non-Trainer	
Session 22.6.79 Trials (% correct) 12(100)	Sessions 9.7.79, 10.7.79 Trials (% correct) 6(83), 6(100)

Fig. 8-20

Glyn - Post-Test 1 - Generalisation Probes

Training Category - Labelling Objects -(Plural)- Generalisations in Test Conditions A and B

Structure - THEY ARE/THEY'RE (NOUNS)



Glyn - Post-Test 1 - Generalisation Probes

Table 8-21

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling (Persons)

Structure - IT'S PERSON (NAME)
(pron + cop + proper noun)

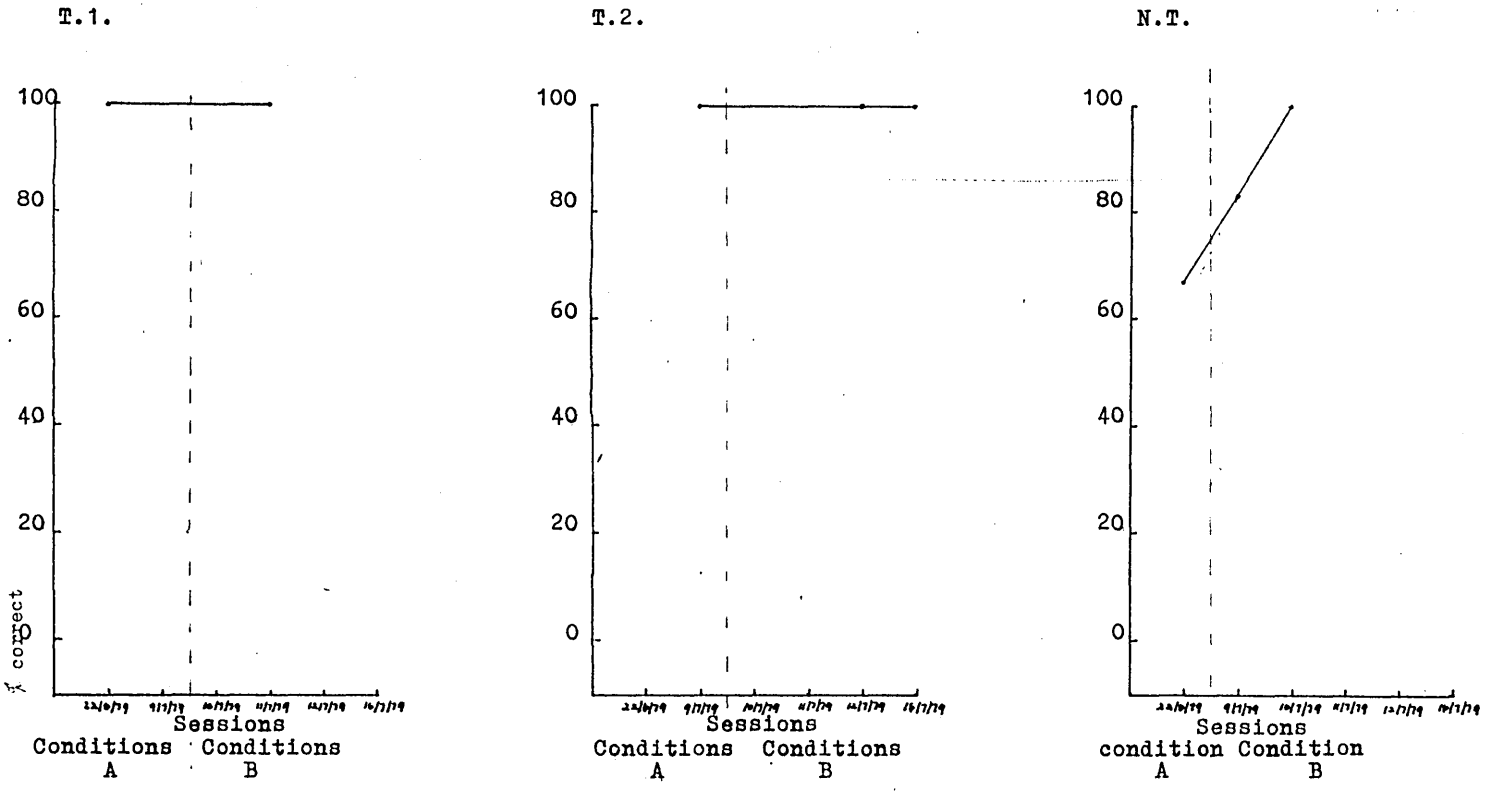
Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 6(100)	Session 11.7.79 Trials (% correct) 6(100)
Trainer 2	
Session 9.7.79 Trials (% correct) 6(100)	Sessions 12.7.79, 16.7.79 Trials (% correct) 6(100), 6(100)
Non-Trainer	
Session 22.6.79 Trials (% correct) 6(67)	Sessions 9.7.79, 10.7.79 Trials (% correct) 6(100), 4(100)

Fig 8-21

Glyn - Post-Test 1 - Generalisation Probes

Training Category - Labelling (Persons) - Generalisations in Test Conditions A and B

Structure - IT'S PERSON (NAME)



Glyn - Post-Test 1 - Generalisation Probes

Table 8-22

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling - Persons/Actions/Things

Structure - IT'S A MAN/WOMAN/BOY/GIRL
VERB-ING (A OBJ)/(PREP)
(Pron + cop + det + subj + verb + ing,
(det + obj)/(Prep))

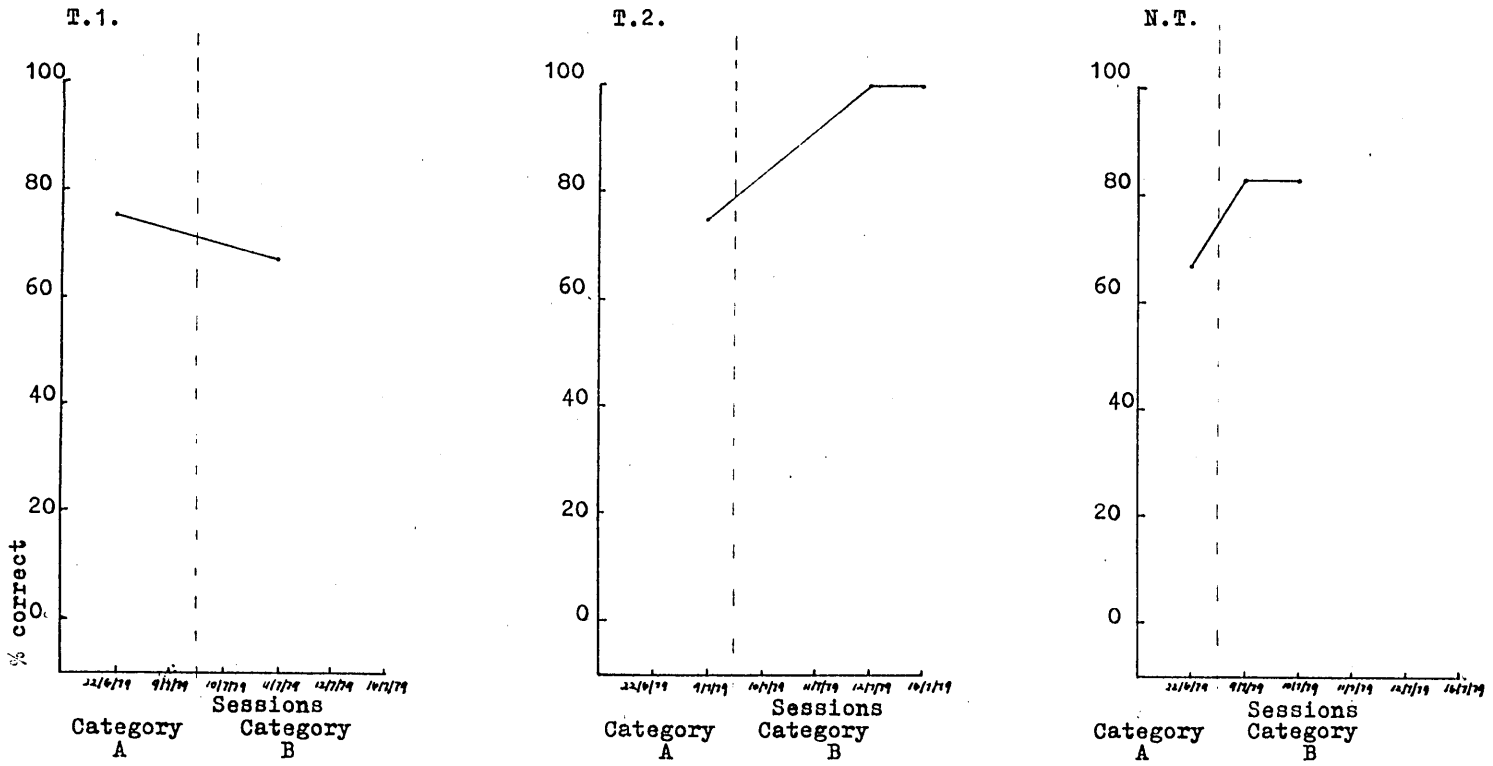
Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 12(75)	Session 11.7.79 Trials (% correct) 6(67)
Trainer 2	
Session 9.7.79 Trials (% correct) 12(75)	Sessions 12.7.79, 16.7.79 Trials (% correct) 4(100), 6(100)
Non-Trainer	
Session 22.6.79 Trials (% correct) 12(67)	Sessions 9.7.79, 10.7.79 Trials (% correct) 6(83), 6(83)

Fig. 8-22

Glyn - Post-Test 1 - Generalisation Probes

Training Category - Labelling Persons/Actions/Things - Generalisations in Test Conditions A and B

Structure - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(AOBJ)/(PREP)



Glyn - Post-Test 1 - Generalisation Probes

Table 8-23

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Pronominal Usage - I +
Labelling - Actions

Structure - I AM VERB-ING (AOBJ)/(PREP)
(Pron + aux + verb + ing +
(det + obj)/(prep))

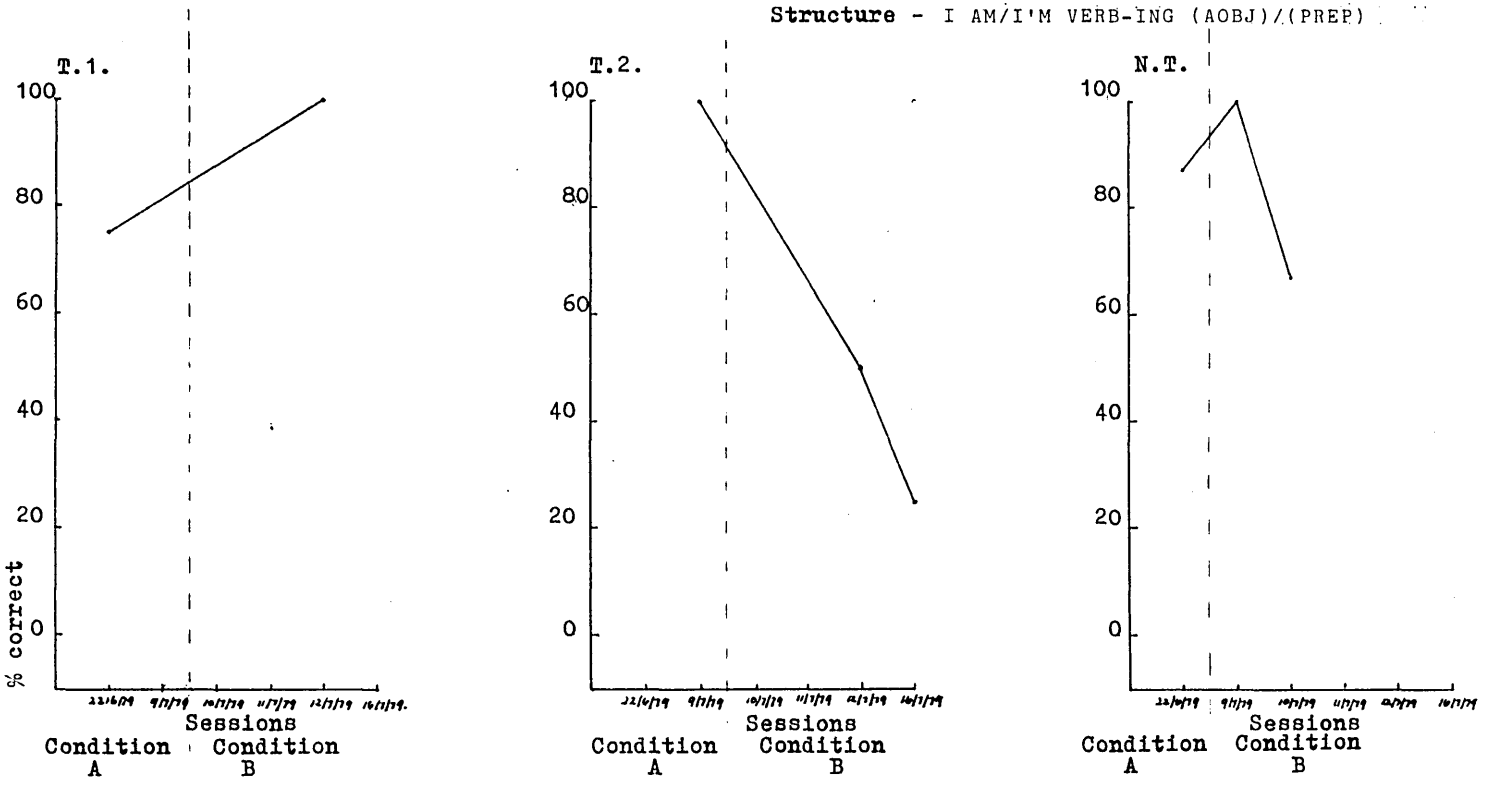
Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 8(75)	Session 11.7.79 Trials (% correct) 1(100)
Trainer 2	
Session 9.7.79 Trials (% correct) 1(100)	Sessions 12.7.79, 16.7.79 Trials (% correct) 4(50), 4(25)
Non-Trainer	
Session 22.6.79 Trials (% correct) 8(87)	Sessions 9.7.79, 10.7.79 Trials (% correct) (3(100), 3(67)

Fig. 8-23

Glyn - Post Test 1 - Generalisation Probes - Pronominal Usage - Pron.I + labelling Actions

Training Category - Pron I + Labelling Actions (personal) - Generalisations in Test Conditions A and B

Structure - I AM/I'M VERB-ING (AOBJ)/(PREP)



Glyn - Post-Test 1 - Generalisation Probes

Table 8-24

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Labelling Actions (Persons)

Structure - VERB-ING (AOBJ)/(PREP)
(verb-ing + (det + obj)/(prep))

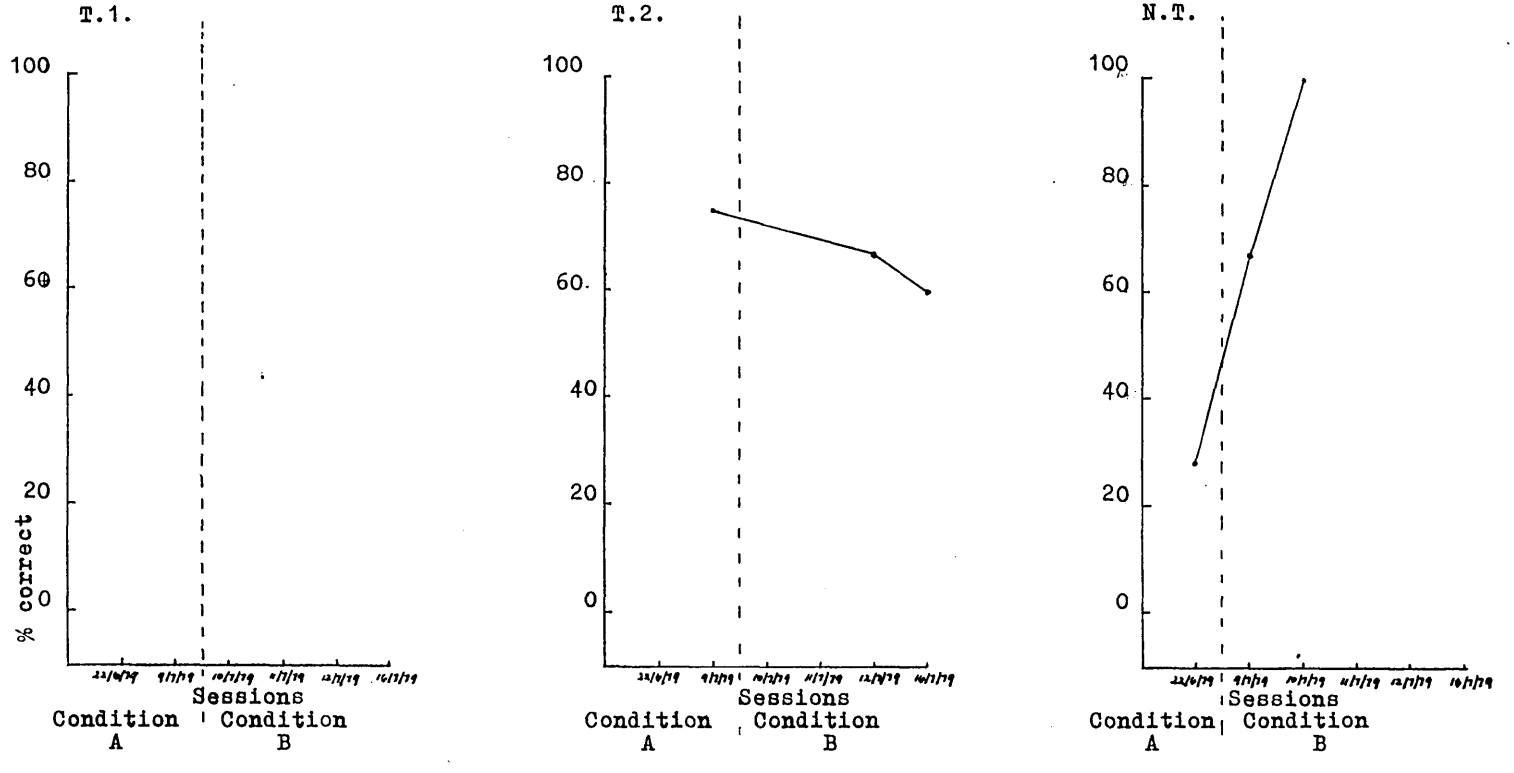
Condition A	Condition B
Trainer 1	
Session Trials (% correct) 6(50)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) 5(100)	Sessions 12.7.79, 16.7.79 Trials (% correct) 3(67), 5(60)
Non-Trainer	
Session 22.6.79 Trials (% correct) 7(28)	Sessions 9.7.79, 10.7.79 Trials (% correct) 6(67), 3(100)

Fig. 8-24

Glyn - Post-Test 1 - Generalisation Probes

Training Category - Labelling Actions - Generalisations in Test Conditions A and B

Structure - VERB-ING (AOBJ)/(PREP)



Glyn - Post-Test 1 - Generalisation Probes

Table 8-25

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

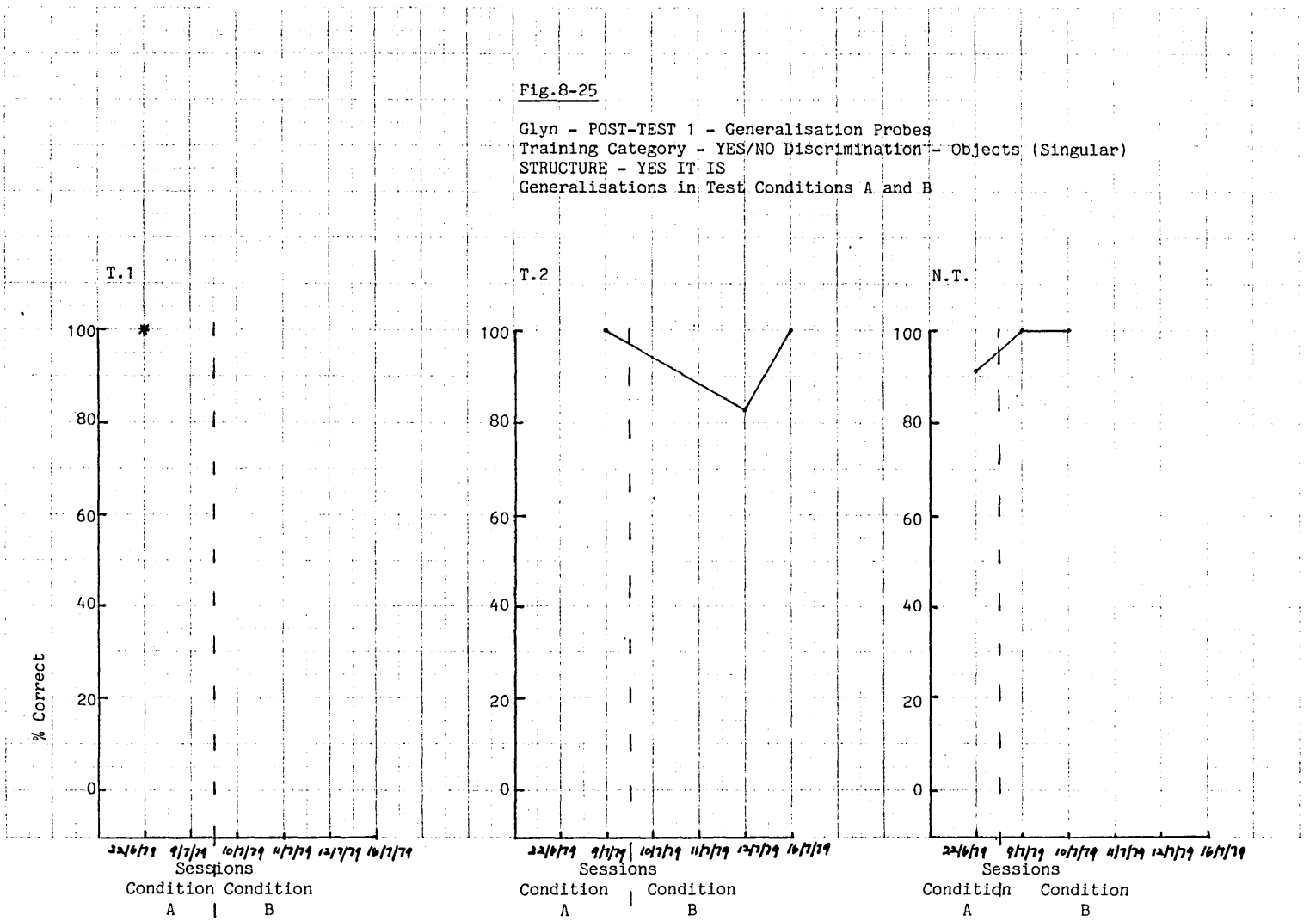
Training Category - YES/NO Discrimination
Objects - (Singular)

Structure - YES IT IS (yes + pron + verb)

Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 12(100)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) 12(100)	Sessions 12.7.79, 16.7.79 Trials (% correct) 6(83), 6(100)
Non-Trainer	
Session 22.6.79 Trials (% correct) 11(91)	Sessions 9.7.79, 10.7.79 Trials (% correct) 6(100), 6(100)

Fig.8-25

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects (Singular)
STRUCTURE - YES IT IS
Generalisations in Test Conditions A and B



Glyn - Post-Test 1 - Generalisation Probes

Table 8-26

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

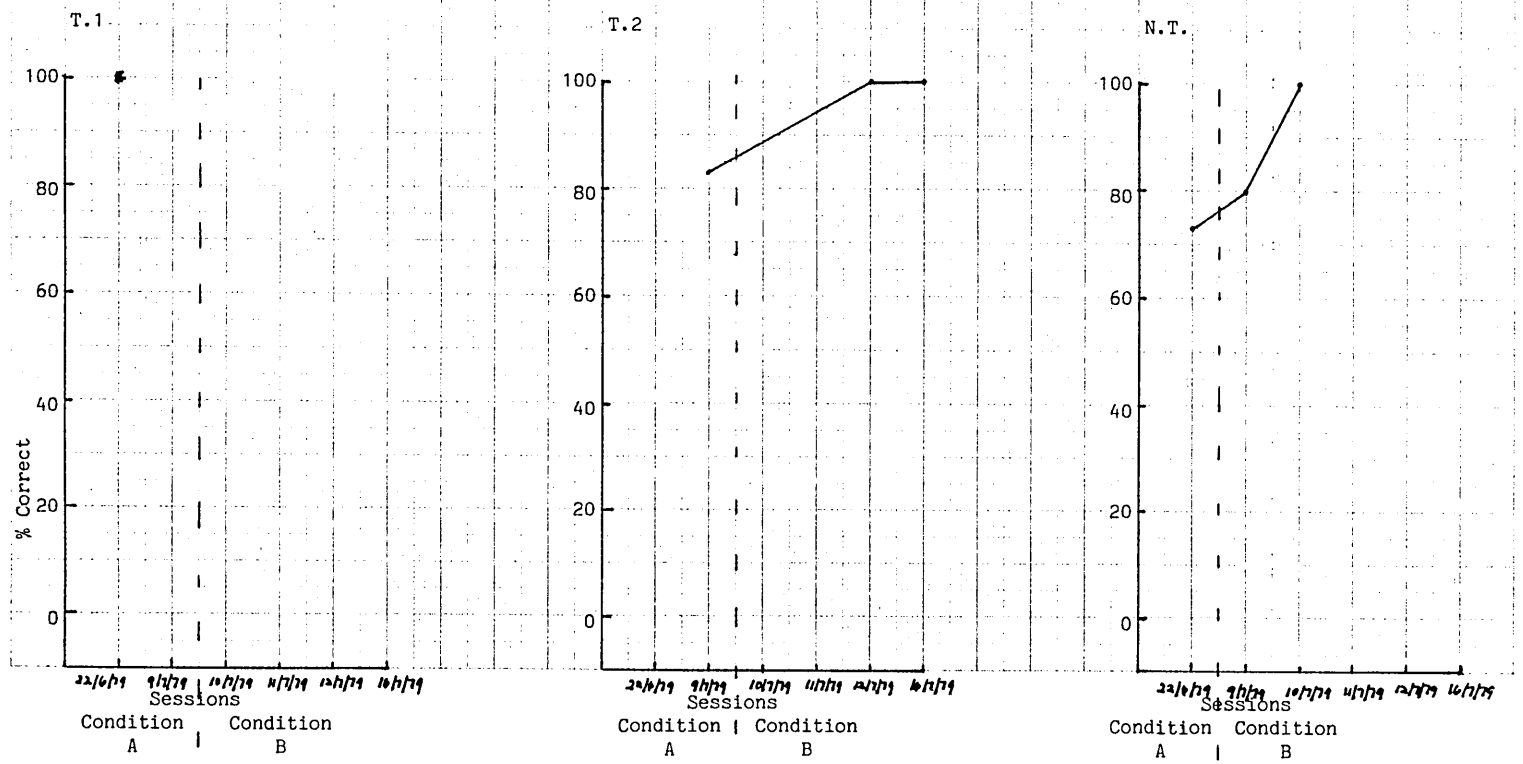
Training Category - YES/NO Discrimination - Objects (singular)

Structure - NO IT ISN'T, IT'S A (NOUN) (No + pron + cop' + neg + pron + cop + article + noun)

Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 12(100)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) 12(83)	Sessions 12.7.79, 16.7.79 Trials (% correct) 3(100), 3(100)
Non-Trainer	
Session 22.6.79 Trials (% correct) 11(73)	Sessions 9.7.79, 10.7.79 Trials (% correct) 5(80), 6(100)

Fig.8-26

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects - (Singular)
STRUCTURE - NO IT ISN'T/IT'S A (NOUN)
Generalisations in Test Conditions A and B



Glyn - Post-Test 1 - Generalisation Probes

Table 8-27

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

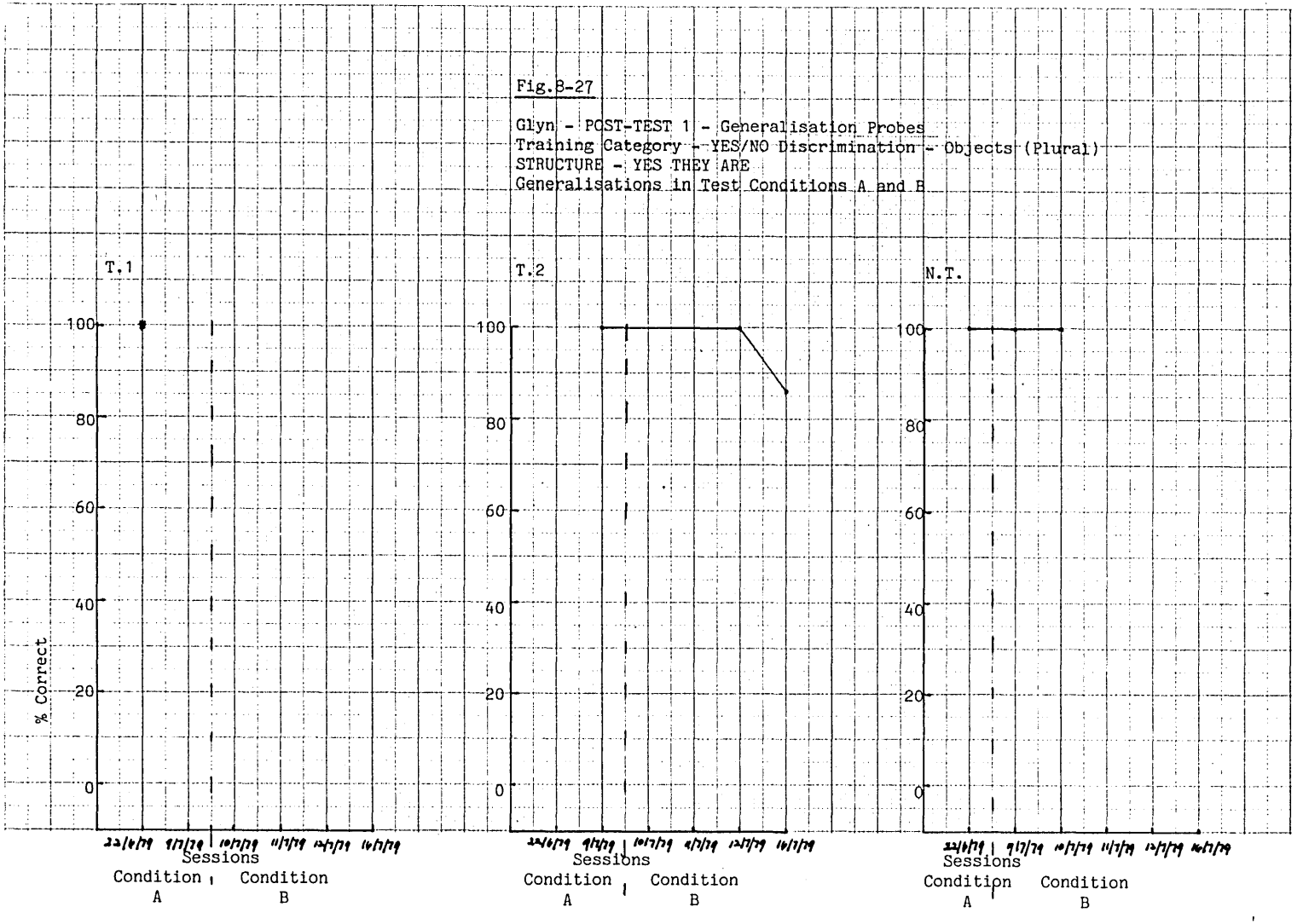
Training Category - YES/NO Discrimination - Objects (plural)

Structure - YES THEY ARE (yes + pron + copula)

Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 11(100)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) 10(100)	Sessions 12.7.79, 16.7.79 Trials (% correct) 6(100), 7(86)
Non-Trainer	
Session 22.6.79 Trials (% correct) 9(100)	Sessions 9.7.79, 10.7.79 Trials (% correct) 8(100), 6(100)

Fig.8-27

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects (Plural)
STRUCTURE - YES THEY ARE
Generalisations in Test Conditions A and B



Glyn - Post-Test 1 - Generalisation Probes

Table 8-28

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

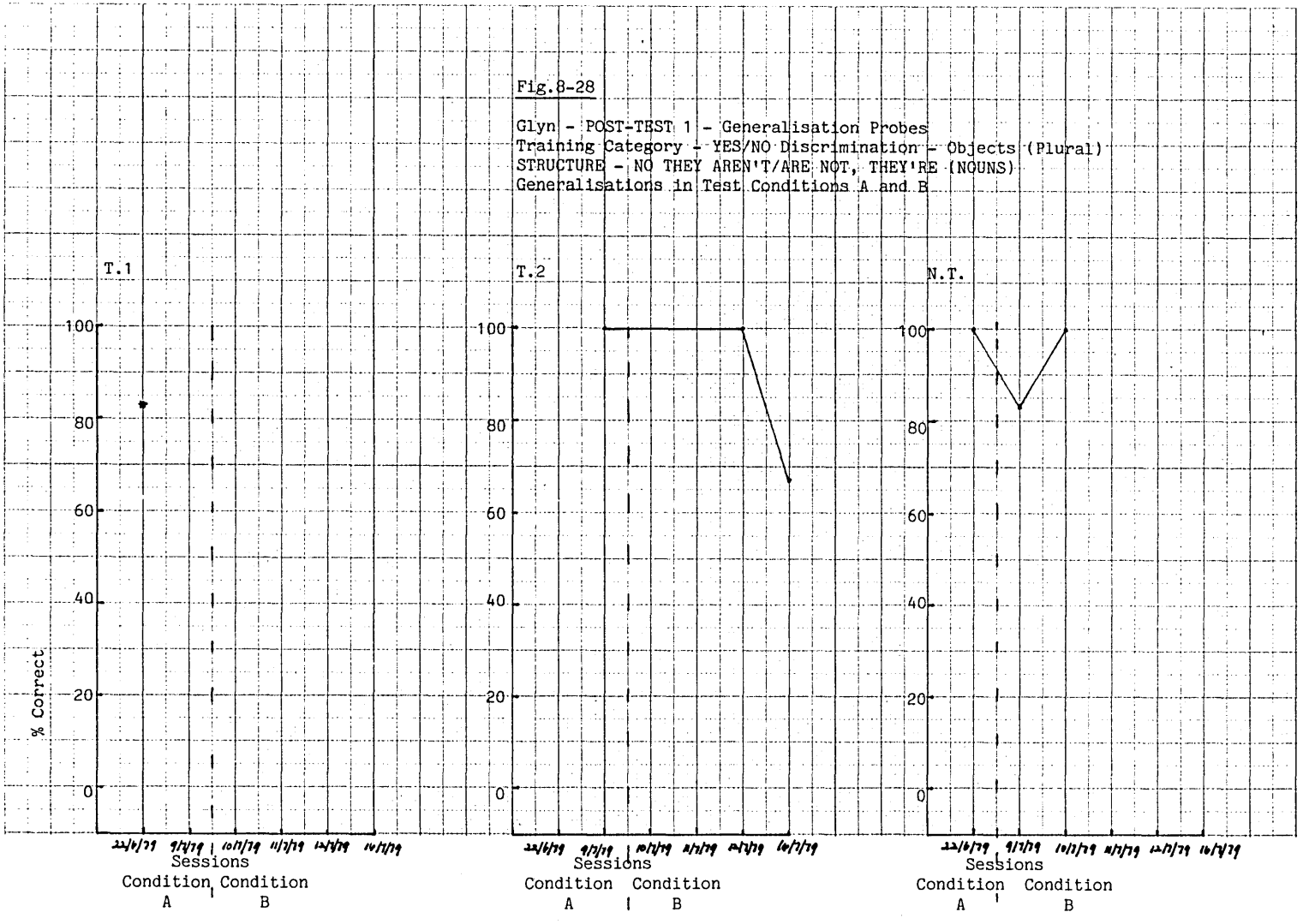
Training Category - YES/NO Discrimination - Objects (plural)

Structure - NO THEY AREN'T, THEY'RE (NOUNS) (No + pron + verb + neg/negative, pron + verb + noun + plural)

Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 6(83)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) 12(100)	Sessions 12.7.79, 16.7.79 Trials (% correct) 3(100), 3(67)
Non-Trainer	
Session 22.6.79 Trials (% correct) 8(100)	Sessions 9.7.79, 10.7.79 Trials (% correct) 6(83), 6(100)

Fig.8-28

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects (Plural)
STRUCTURE - NO THEY AREN'T/ARE NOT, THEY'RE (NOUNS)
Generalisations in Test Conditions A and B



Glyn - Post-Test 1 - Generalisation Probes

Table 8-29

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - YES/NO Discrimination (pron I (personal identity)/personal actions)

Structure - YES I AM (Glyn/verbing)
(Yes + Pron + aux)

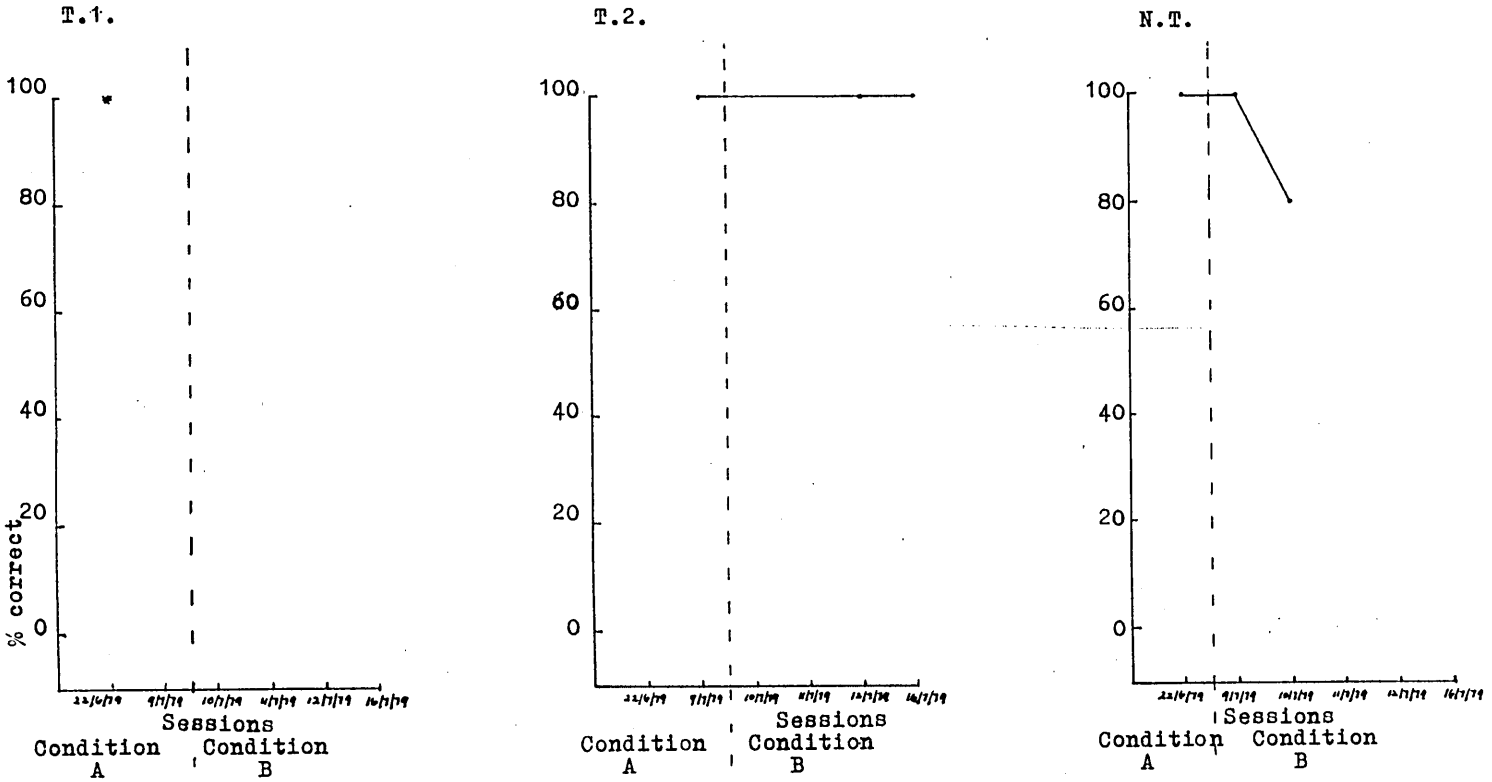
Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 9(100)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) 7(100)	Sessions 12.7.79, 16.7.79 Trials (% correct) 4(100), 4(100)
Non-Trainer	
Session 22.6.79 Trials (% correct) 7(100)	Sessions 9.7.79, 10.7.79 Trials (% correct) 8(100), 5(80)

Fig. 8-29

Glyn - Post-Test 1 - Generalisation Probes

Training category - YES/NO Discrimination (Pronoun I (personal identy)/personal actions)

Structure - YES I AM (Glynn/verbing)



Glyn - Post-Test 1 - Generalisation Probes

Table 8-30

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - YES/NO Discrimination (pron I/ personal identity/persocal actions)

Structure - NO I'M NOT, I'M NOT, I'M VERB-ING
(No + pron + aux + negative + pron + aux + verb + ing(obj)

NO I'M/I AM NOT, I'M GLYN
(No + pron + aux + negative + pron + aux + (Glyn)

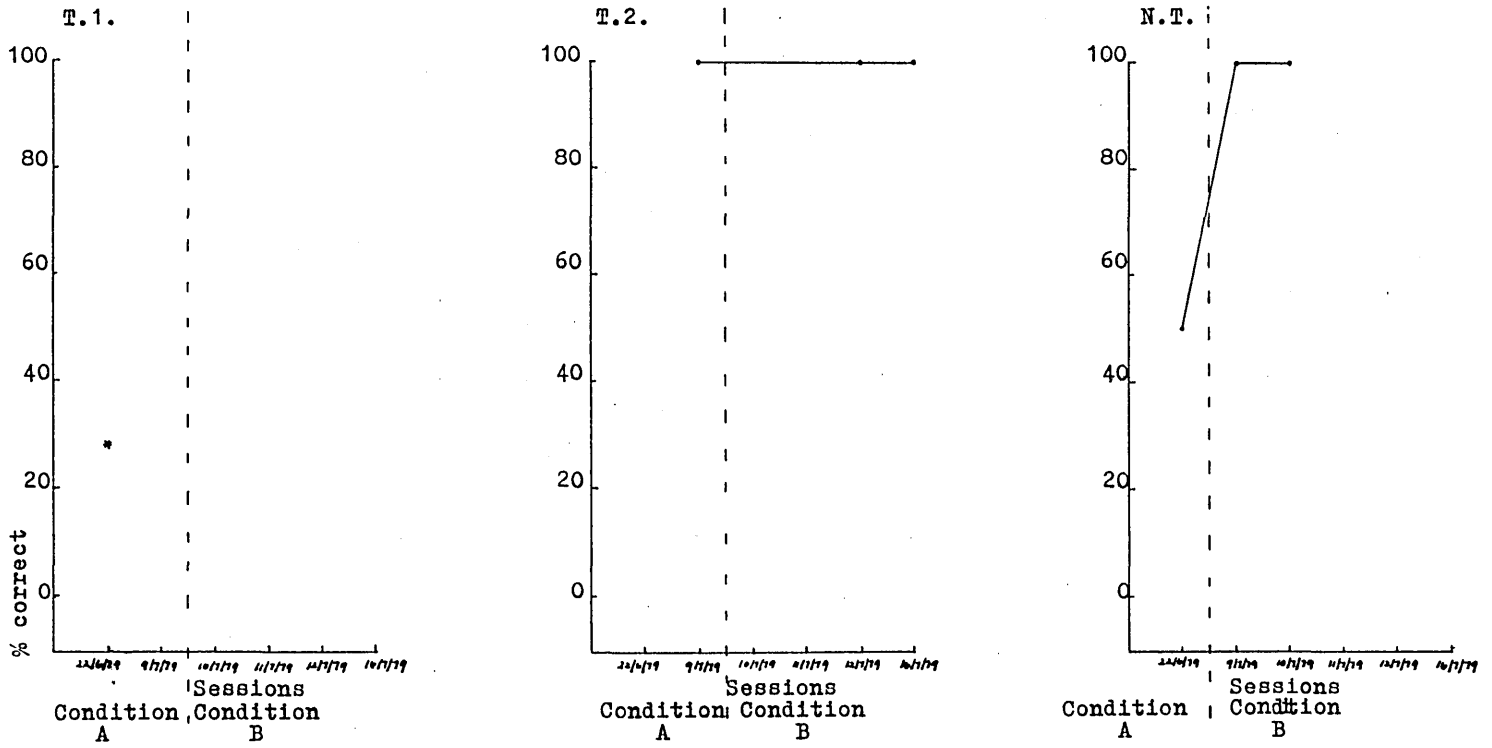
Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 7(28)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) 6(100)	Sessions 12.7.79, 16.7.79 Trials (% correct) 3(100), 3(100)
Non-Trainer	
Session 22.6.79 Trials (% correct) 6(50)	Sessions 9.7.79, 10.7.79 Trials (% correct) 2(100), 3(100)

Fig. 8-30

Glyn - Post-Test 1 - Generalisation Probes

Training Category - YES/NO Discrimination (Pron I - personal actions/personal identity)

Structure - NO I'M NOT, I'M NOT VERB-ING(OBJ)/(AOBJ)/(PREP)/
NO I'M NOT, I'M GLYN



Glyn - Post-Test 1 - Generalisation Probes

Table 8-31

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Pronouns - I

Structure - I AM (Glyn) - (Pron + aux)

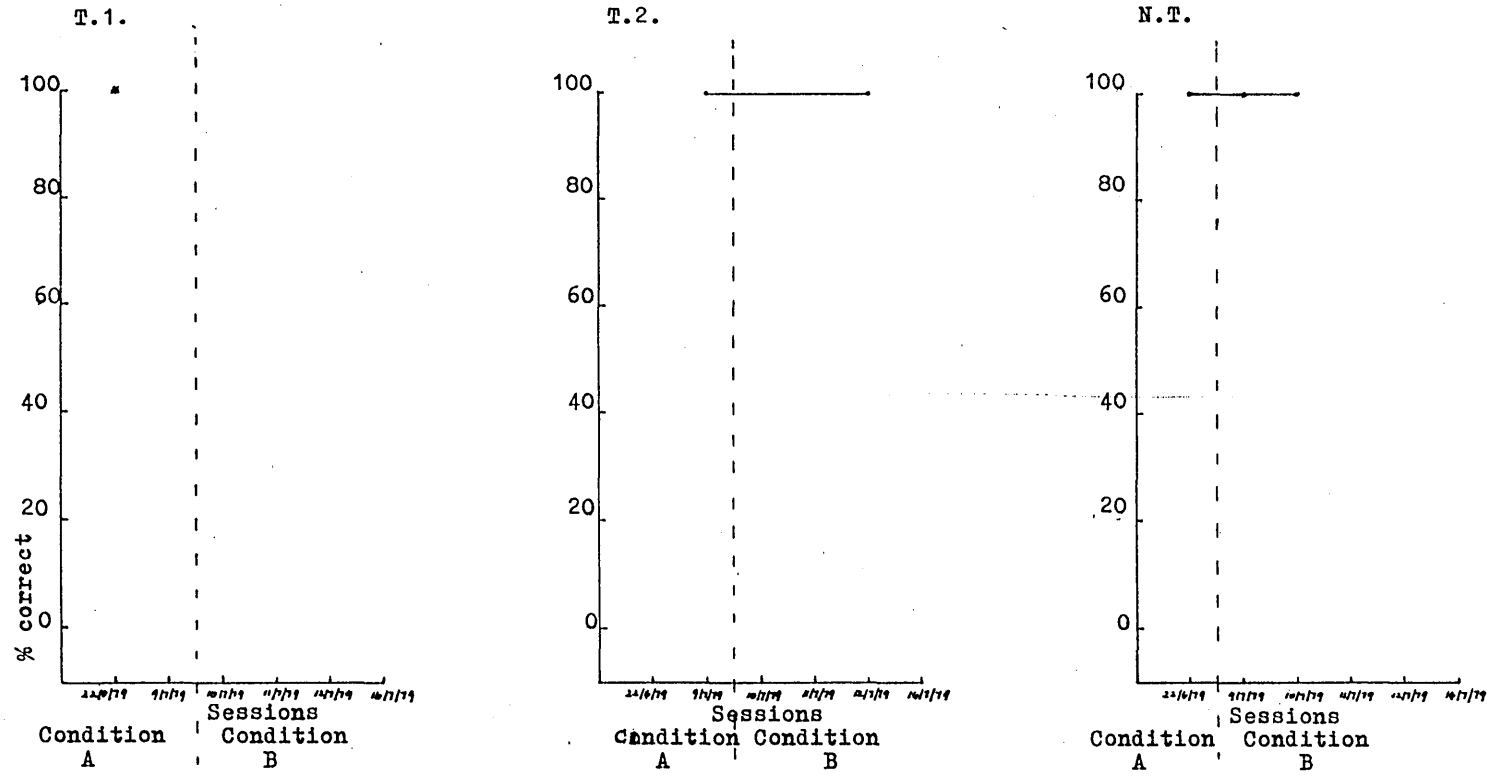
Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 1(100)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) 1(100)	Sessions 12.7.79, 16.7.79 Trials (% correct) 1(100), --
Non-Trainer	
Session 22.6.79 Trials (% correct) 2(100)	Sessions 9.7.79, 10.7.79 Trials (% correct) 2(100), 1(100)

Fig. 8-31

Glyn - Post-Test 1 - Generalisation Probes

Training Category - Pronouns - Pron.I - Generalisations in Test Conditions A and B

Structure - I AM/I'M GLYN



Glyn - Post-Test 1 - Generalisation Probes

Table 8-32

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Pronouns - Possessive - mine

Structure - IT'S MINE
(Pron + cop + possessive pron)

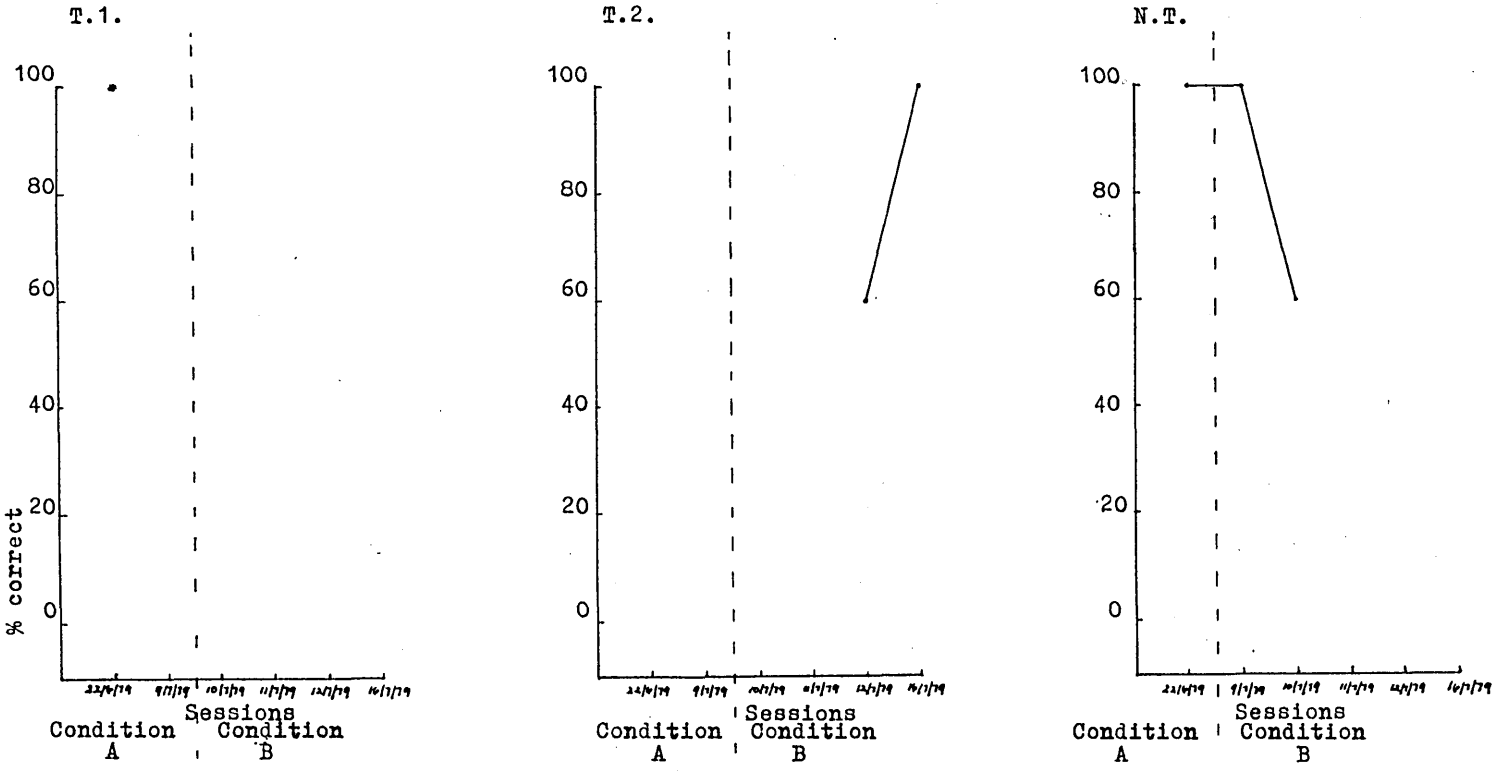
Condition A	Condition B
Trainer 1	
Session Trials (% correct) 2(100)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) -	Sessions 12.7.79, 16.7.79 Trials (% correct) 5(60), 1(100)
Non-Trainer	
Session 22.6.79 Trials (% correct) 4(100)	Sessions 9.7.79, 10.7.79 Trials (% correct) 4(100), 5(60)

Fig. 8-32

Glyn - Post-Test 1 - Generalisation Probes

Training Category -Pronouns - possessive - mine - Generalisations in Test Conditions A and B

Structure - IT'S MINE



Glyn - Post-Test 1 - Generalisation Probes

Table 8-33

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Pronominal Usage - Possessive
mine + yes discrimination (singular)

Structure - YES IT IS - (mine)
(yes + pronoun + copula)

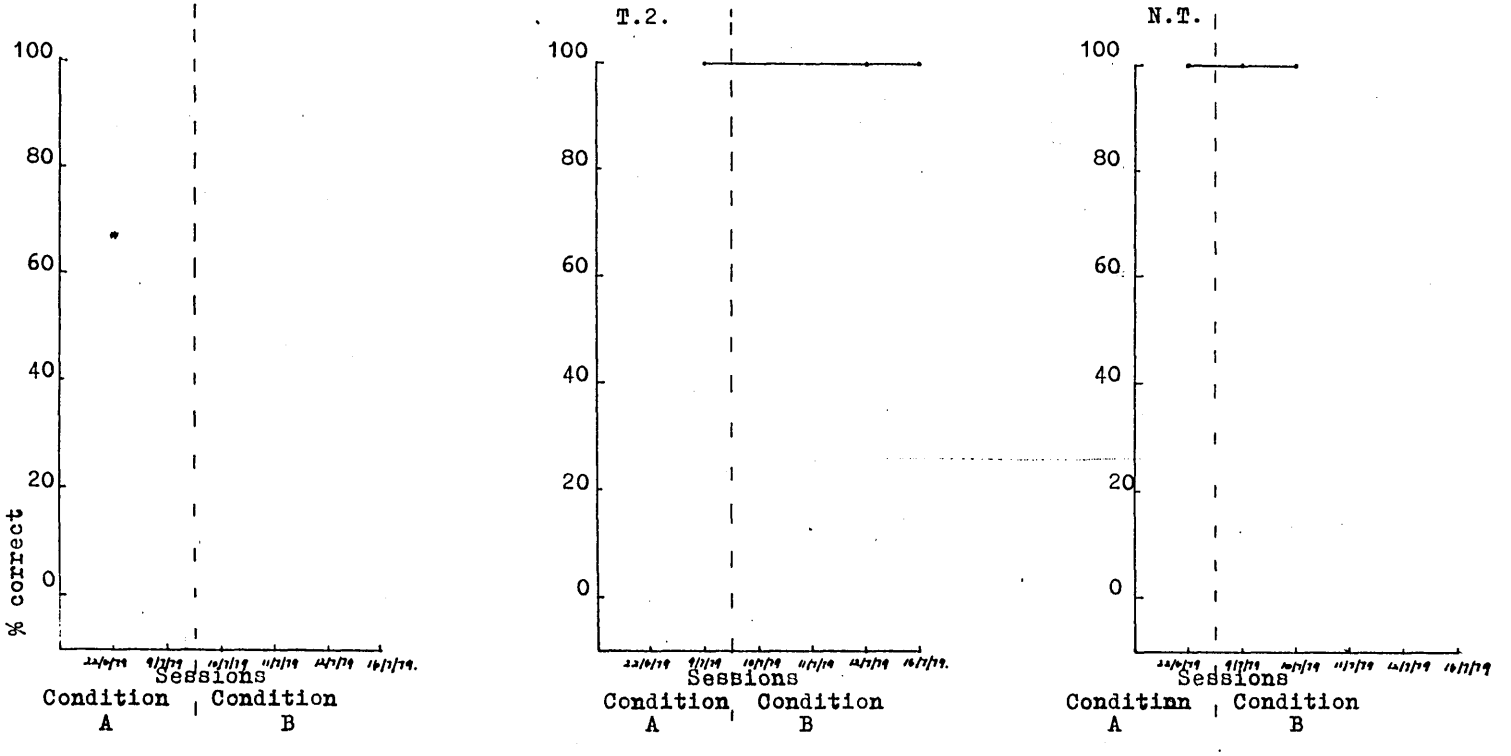
Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 6(67)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) 1(100)	Sessions 12.7.79, 16.7.79 Trials (% correct) 3(100), 2(100)
Non-Trainer	
Session 22.6.79 Trials (% correct) 4(100)	Sessions 9.7.79, 10.7.79 Trials (% correct) 2(100), 3(100)

Fig. 8-33

Glyn - Post-test 1 - Generalisation Probes - Pronominal Usage - Possessive-mine + YES/NO Discrimination

Training Category - Pronouns - Possessives/mine + YES/NO Generalisations in Test Conditions A and B

Structure - YES IT IS (mine) -(Singular)



Glyn - Post-Test 1 - Generalisation Probes

Table 8-34

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Pronominal Usage - Possessive/mine-(plural)

Structure - THEY'RE MINE (pron + cop' + possessive pron)

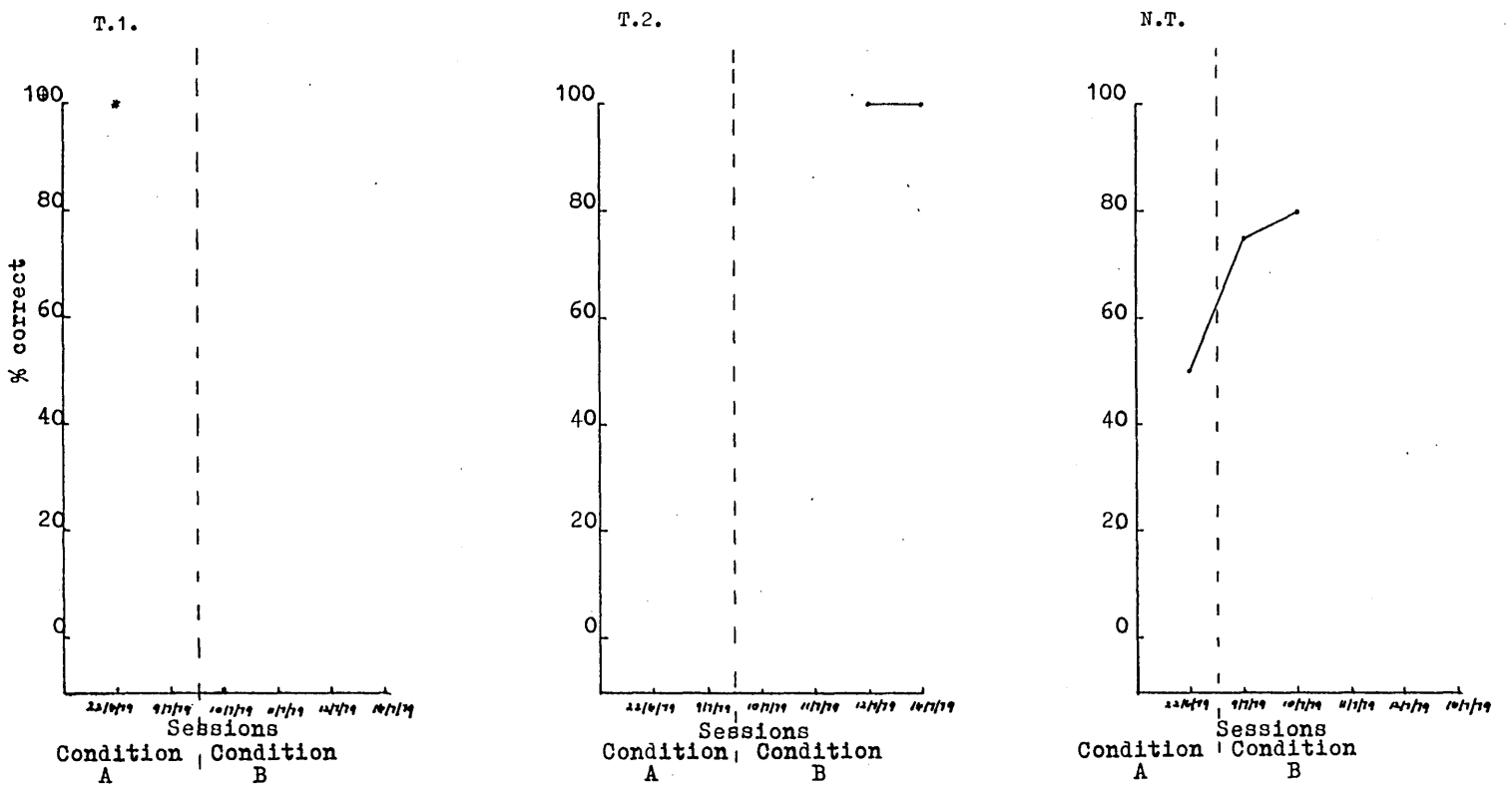
Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 3(100)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) -	Sessions 12.7.79, 16.7.79 Trials (% correct) 2(100), 4(100)
Non-Trainer	
Session 22.6.79 Trials (% correct) 6(50)	Sessions 9.7.79, 10.7.79 Trials (% correct) 4(75), 5(80)

Fig. 8-34

Glyn - POST-TEST 1 - Generalisation Probes

Training Category. - Pronouns - possessives/mine

STRUCTURE - THEY'RE MINE - (plural) - Generalisations in Test Conditions A and B



Glyn - Post-Test 1 - Generalisation Probes

Table 8-35

Summary of Generalizations per Structure by Session and Trials in Test Conditions A and B

Training Category - Pronominal Usage - possessive-mine
+ yes discrimination + (plural)

Structure - YES THEY ARE - (mine)
(yes + pron + copula)

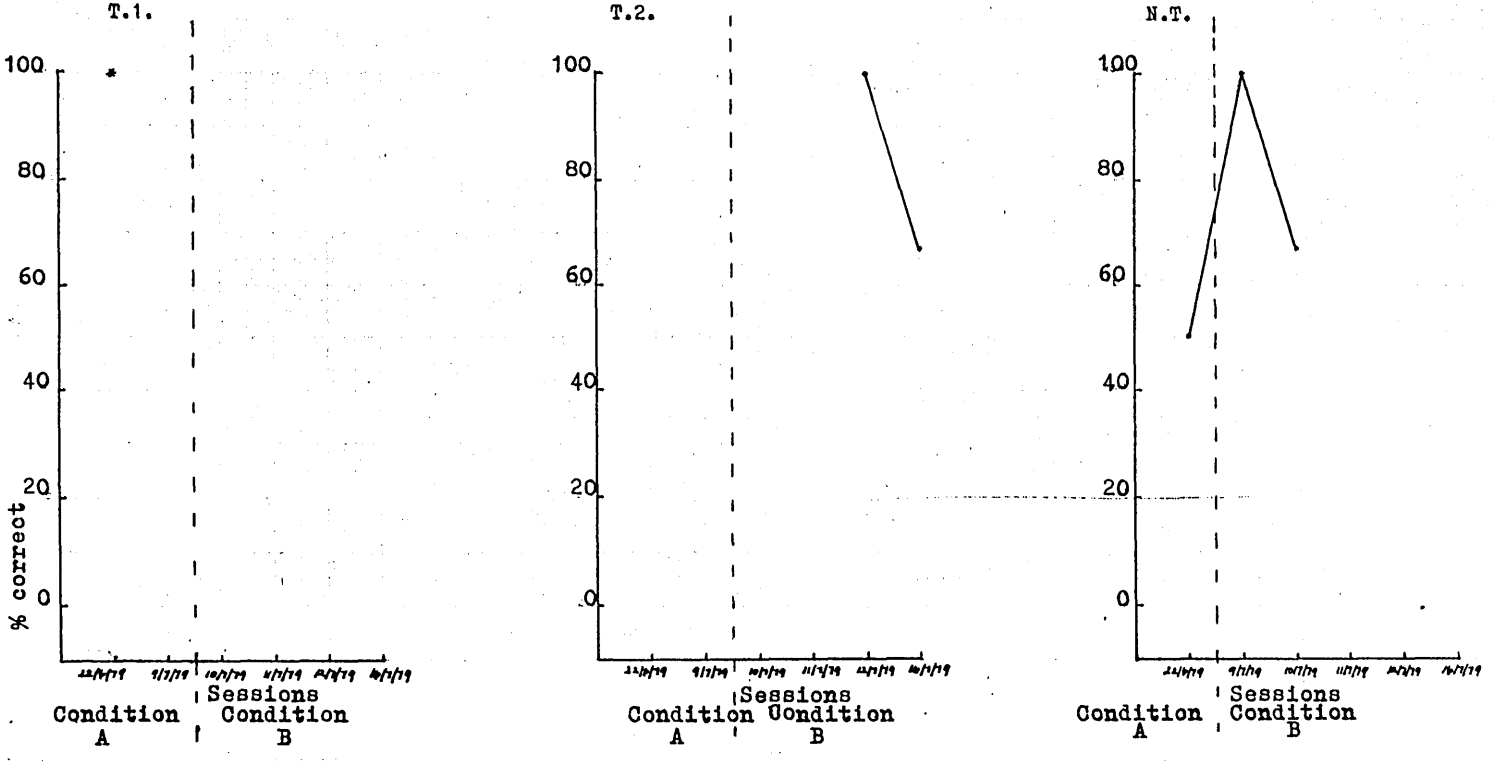
Condition A	Condition B
Trainer 1	
Sessions 22.6.79 Trials (% correct) 1(100)	Sessions Trials (% correct)
Trainer 2	
Sessions 9.7.79 Trials (% correct)	Sessions 12.7.79, 16.7.79 Trials (% correct) 4(100), 6(67)

Fig. 8-35

Glyn - POST-TEST 1 - Generalisation Probes

Training Category - Pronouns - possessives/mine + YES/NO - Generalisations in Test Conditions A and B

STRUCTURE - YES THEY ARE (mine)



Glyn - Post-Test I - Generalisation Probes

Table 8-36

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

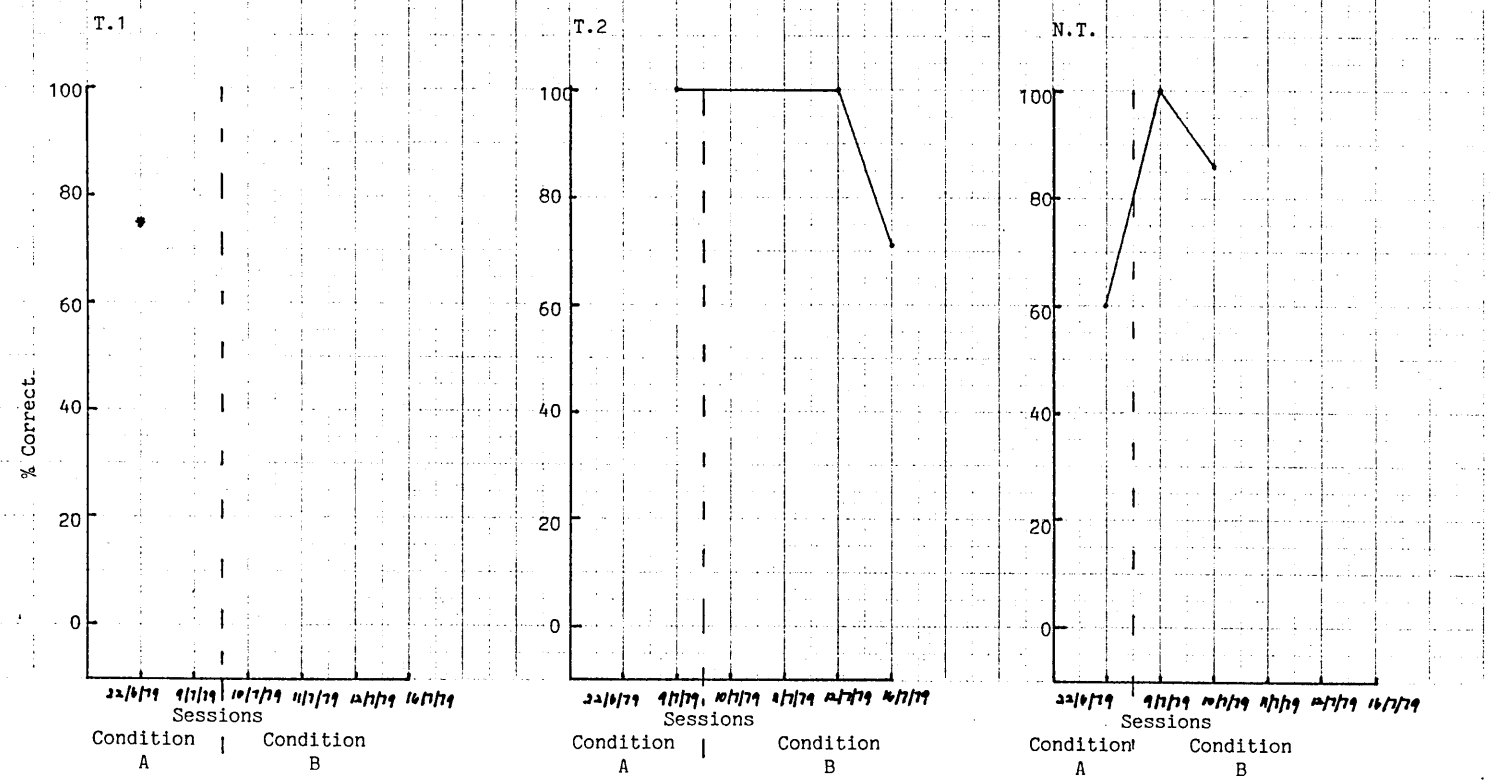
Training Category - Pronominal Usage - I + Requesting (Objects)

Structure - I WANT A/MY (NOUN)
(pron + verb + det/poss.pron + noun)

	Condition A	Condition B
i)	Trainer 1	
	Sessions 22.6.79	
	Trials (% correct)	
	8(75)	
ii)	Trainer 2	
	Sessions 9.7.79	12.7.79, 16.7.79
	Trials (% correct)	
	3(100)	6(100), 7(71)
iii)	Non-Trainer	
	Sessions 22.6.79	9.7.79, 10.7.79
	Trials (% correct)	
	5(60)	7(100), 7(86)

Fig.8-36

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - Prohominal Usage I + Requesting
STRUCTURE - I WANT A/MY (NOUN)
Generalisations in Test Conditions A and B



Glyn - Post-Test 1 - Generalisation Probes

Table 8-37

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Pronominal Usage - I/you (Person Deixis) + Wh?

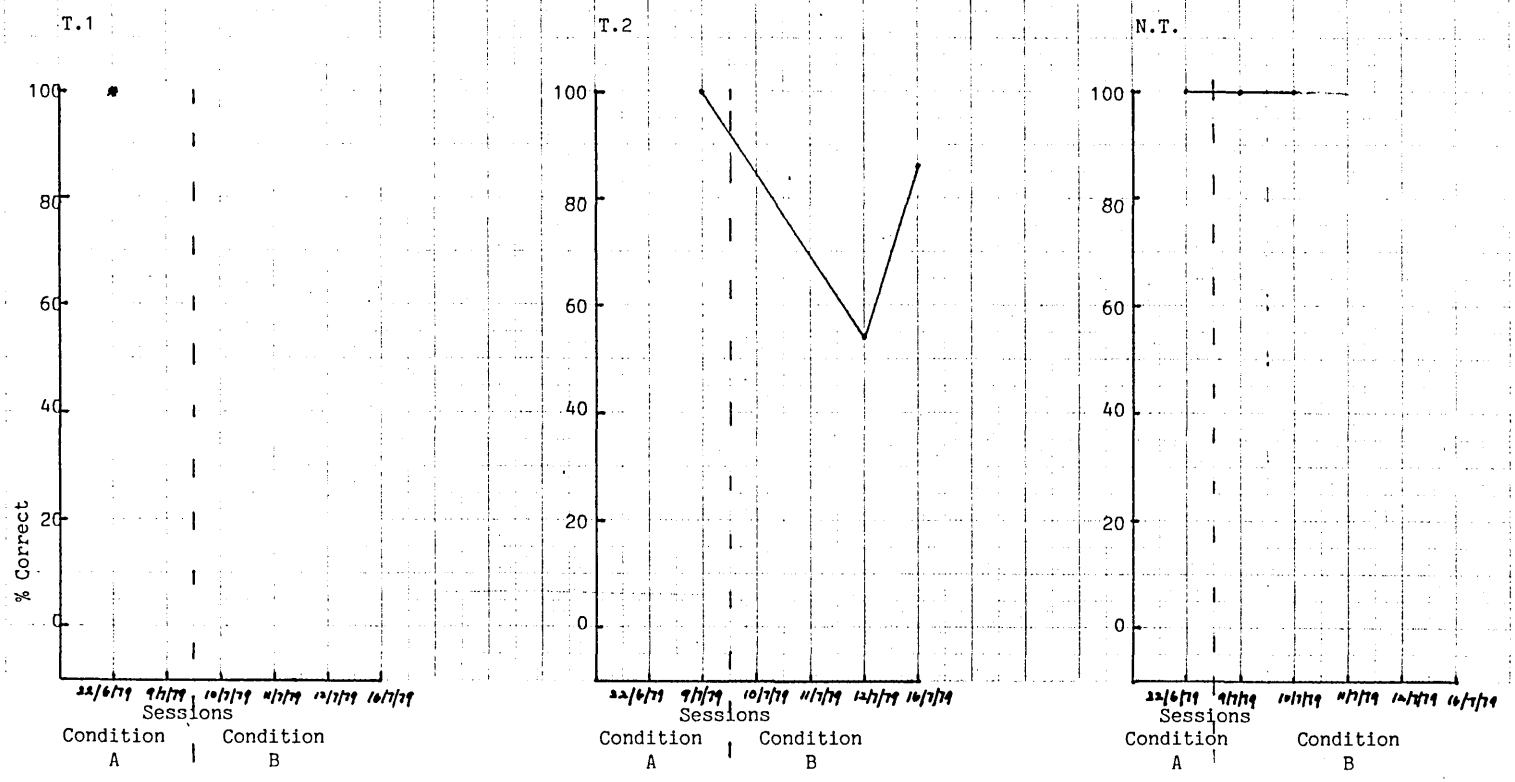
Structure - WHAT DO YOU WANT?
(What + aux + pron + verb ?)

WHAT YOU WANT?
(What + pronoun + verb ?)

Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 3(100)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) 6(100)	Sessions 12.7.79, 16.7.79 Trials (% correct) 11(54), 7(86)
Non-Trainer	
Session 22.6.79 Trials (% correct) 2(100)	Sessions 9.7.79, 10.7.79 Trials (% correct) 4(100), 3(100)

Fig.8-37

Glyn - POST-TEST 1 - Generalisation Probes
Training Category + Requesting + Pronouns I/You (person deixis)
STRUCTURE - WHAT DO YOU WANT/WHAT YOU WANT?
Generalisations in Test Conditions A and B



Glyn - Post-Test 1 - Generalisation Probes

Table 8-38

Summary of Generalizations per Structure by Sessions and Trials in Test Conditions A and B

Training Category - Pronominal Usage - I/you (Person Deixis) + Wh?

Structure - WHAT ARE YOU DOING? (What + aux + pron + verb + ing?)

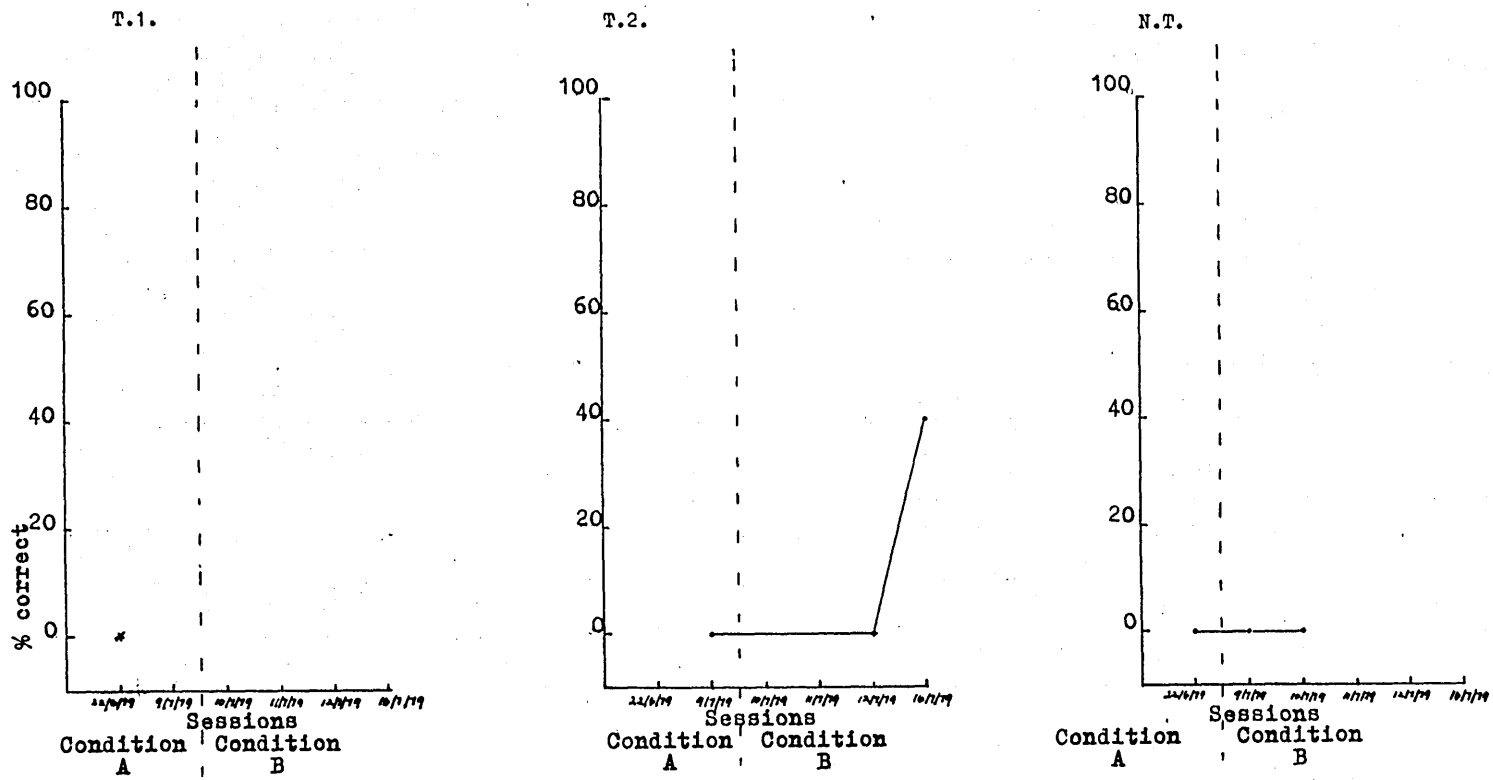
Condition A	Condition B
Trainer 1	
Session 22.6.79 Trials (% correct) 3(0)	Session Trials (% correct)
Trainer 2	
Session 9.7.79 Trials (% correct) 6(0)	Sessions 12.7.79, 16.7.79 Trials (% correct) 3(0), 5(40)
Non-Trainer	
Session 22.6.79 Trials (% correct) 2(0)	Sessions 9.7.79, 10.7.79 Trials (% correct) 3(0), 4(0)

Fig. 8-38

Glyn - POST-TEST 1

Training Category - Requesting - Pronouns I/You (person deixis)

STRUCTURE - WHAT ARE YOU DOING? Generalisations in Test Conditions A and B



Glyn - Post-Test I - Generalisation Probes

Table 8-39

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

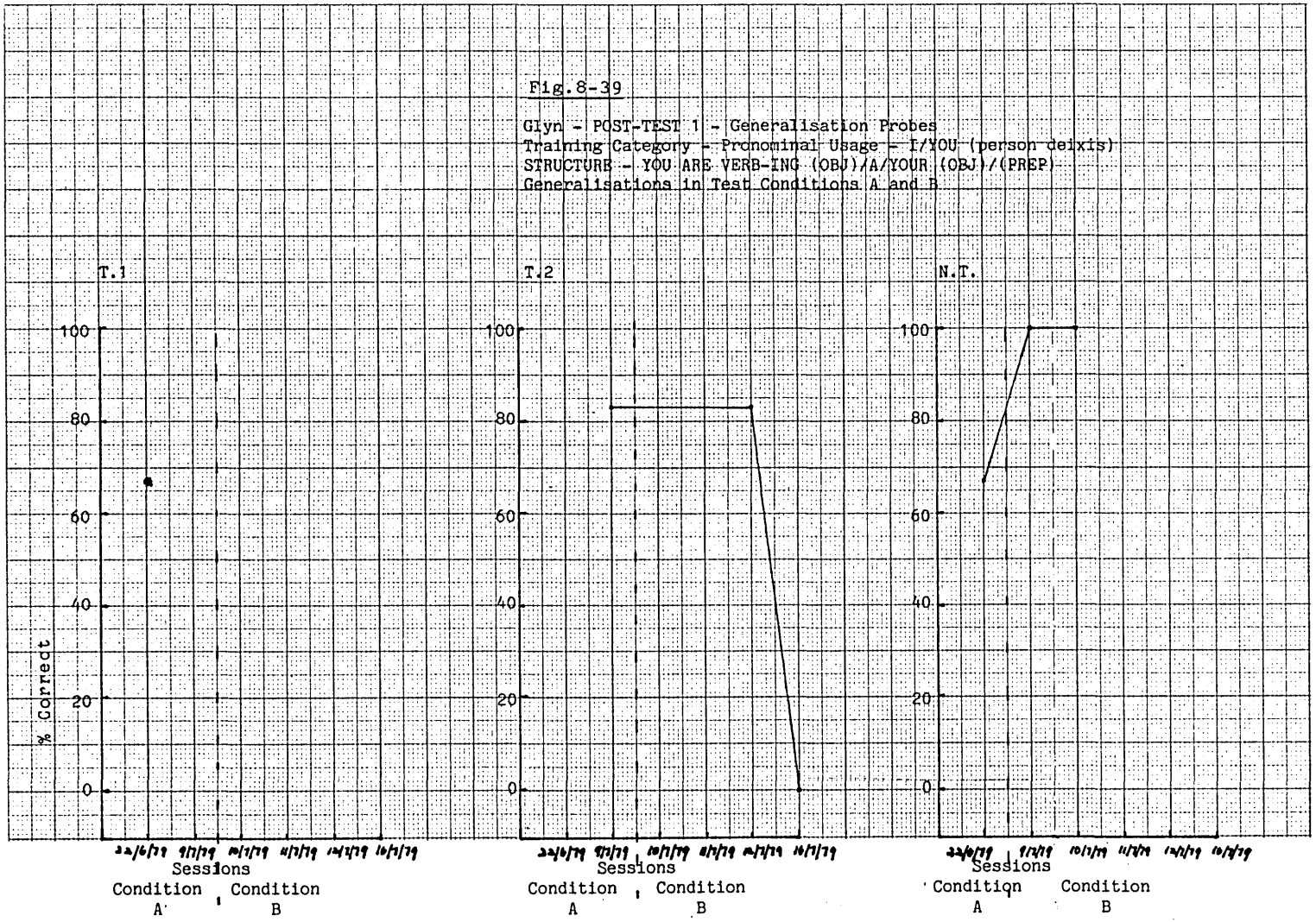
Training Category - Pronominal Usage - I/You
(Person Deixis)

Structure - YOU ARE VERB-ING A/YOUR(OBJ)/(PREP)
(pron + aux + verb + ing + det/poss.pron + (obj)/(prep))

	Condition A	Condition B
i)	Trainer 1	
	Sessions 22.6.79	
	Trials (% correct)	
	3(67)	
ii)	Trainer 2	
	Sessions 9.7.79	12.7.79, 16.7.79
	Trials (% correct)	
	6(83)	6(83), 2(0)
iii)	Non-Trainer	
	Sessions 22.6.79	9.7.79, 10.7.79
	Trials (% correct)	
	3(67)	3(100), 3(100)

Fig.8-39

Glyn - POST-TEST 1 - Generalisation Probes
Training Category - Pronominal Usage - I/YOU (person deixis)
STRUCTURE - YOU ARE VERB-ING (OBJ)/A/YOUR (OBJ)/(PREP)
Generalisations in Test Conditions A and B



Appendix H

Case Study 5 Lee

Language Training and Testing Data

Tables 9-1 to 9-24; Figures 9-1 to 9-24 - Progress in learning the main structures taught covering the period October 1978 to December 1979.

Tables 9-25 to 9-33; Figures 9-25 to 9-33 - POST-TEST 1 data showing generalisations per structure by trainer/ non-trainer/child interactions in Test Conditions A and B.

Tables 9-34 to 9-36; Figures 9-34 to 9-36 - POST-TEST 2 (High Structure) data showing generalisations per structure in Sub-Tests I and II.

Table 9-37; Figure 9-37 - POST-TEST 3 (High Structure) data showing generalisations per structure.

Tables 9-38 to 9-69; Figures 9-38 to 9-69 - POST-TEST 3 (Low Structure) data showing generalisations per structure by trainer/non-trainer/child interactions covering the period November 1979 to February 1980.

Table 9-1

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling Objects - (Singular)

STRUCTURE - IT'S A (NOUN)
(pron + cop' + det + noun)

Training commenced - 4.10.78
Training terminated - 24.1.79
Number of sessions - 6

Imitations
Trials (% correct) - 36(83), 24(62)

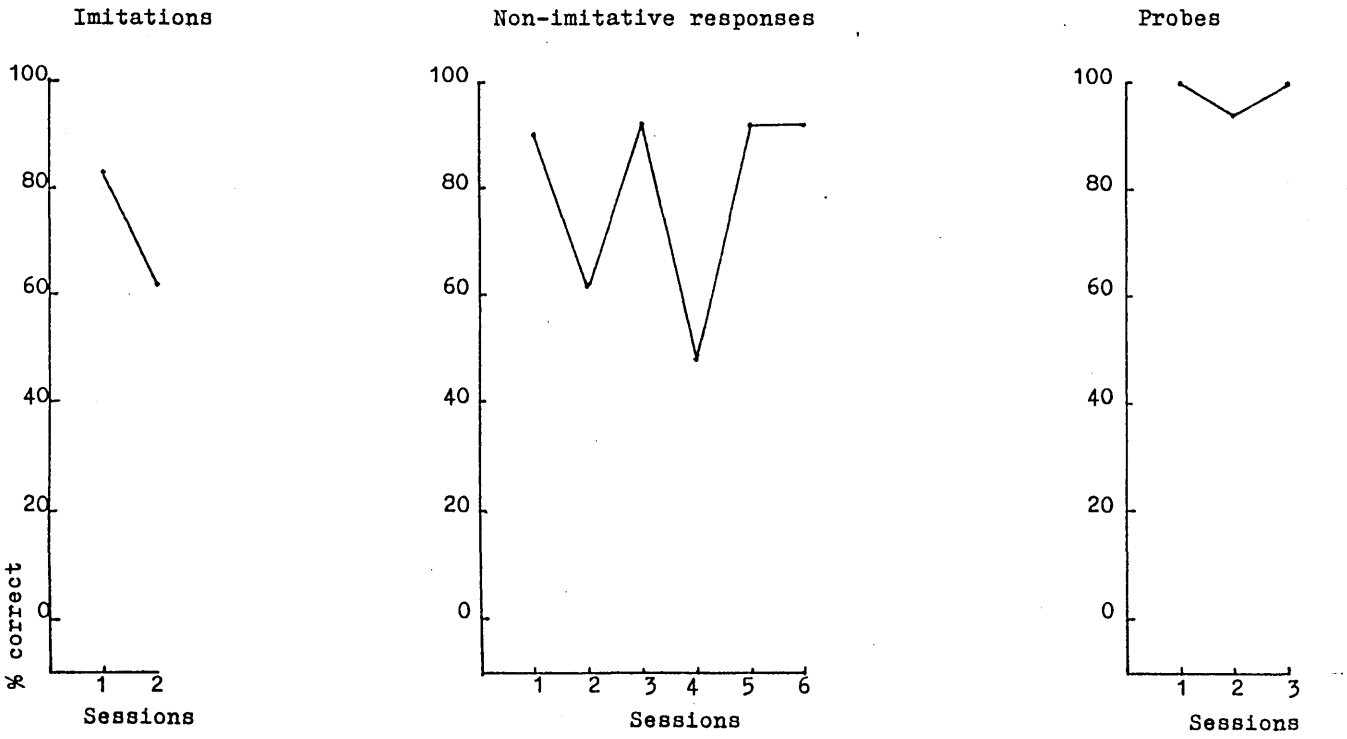
Non-imitative responses
Trials (% correct) - 48(90), 34(62), 12(92), 42(48), 12(92), 12(92),

Probes
Trials (% correct) - 8(100), 18(94), 18(100)

Fig. 9-1

Lee - Language Training - Progress in Learning Labelling
Objects - (Singular)

STRUCTURE - IT'S A (NOUN)



Lee - Language Training

Table 9-2

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling Objects - (Plural)

STRUCTURE - THEY'RE (NOUNS)
(pron + cop + noun (pl))

Training commenced - 30.11.78
Training terminated - 24.1.79
Number of sessions - 5

Imitations
Trials (% correct) - 24(71)

Non-imitative responses
Trials (% correct) - 42(64), 12(83), 48(62), 12(83), 12(83)

Probes
Trials (% correct) - 12(83), 18(61)

Fig. 9-2

Lee - Language Training - Progress in Learning Labelling Objects - (Plural)

STRUCTURE - THEY'RE (NOUNS)

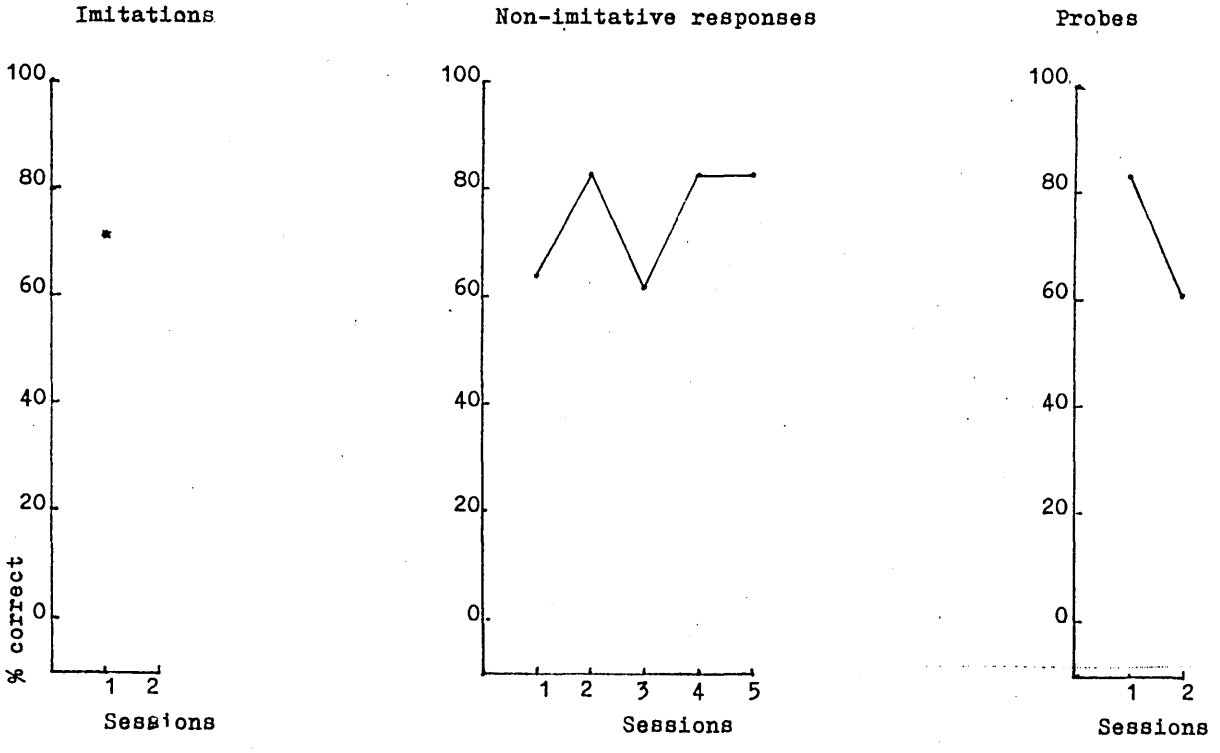


Table 9-3

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Persons

STRUCTURE - IT'S PERSON (NAME)
(pron + cop' + proper noun)

Training commenced - 1.12.78
Training terminated - 24.1.79
Number of sessions - 3

Imitations
Trials (% correct) -

Non-imitative responses
Trials (% correct) - 3(100), 6(100), 6(50)

Probes
Trials (% correct) -

Fig. 9-3

Lee - Language Training - Progress in Learning Labelling - Persons

STRUCTURE - IT'S PERSON (NAME)

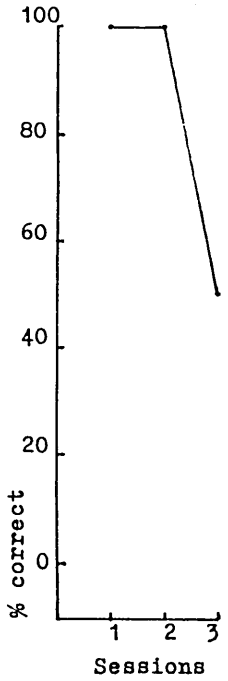


Table 9-4

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Persons/Actions
(pictorial stimuli)

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING
(pron + cop' + det + subj + verb + ing)

Training commenced - 10.1.79
Training terminated - 30.1.79
Number of sessions - 6

Imitations
Trials (% correct) - 24(83), 6(100), 6(100)

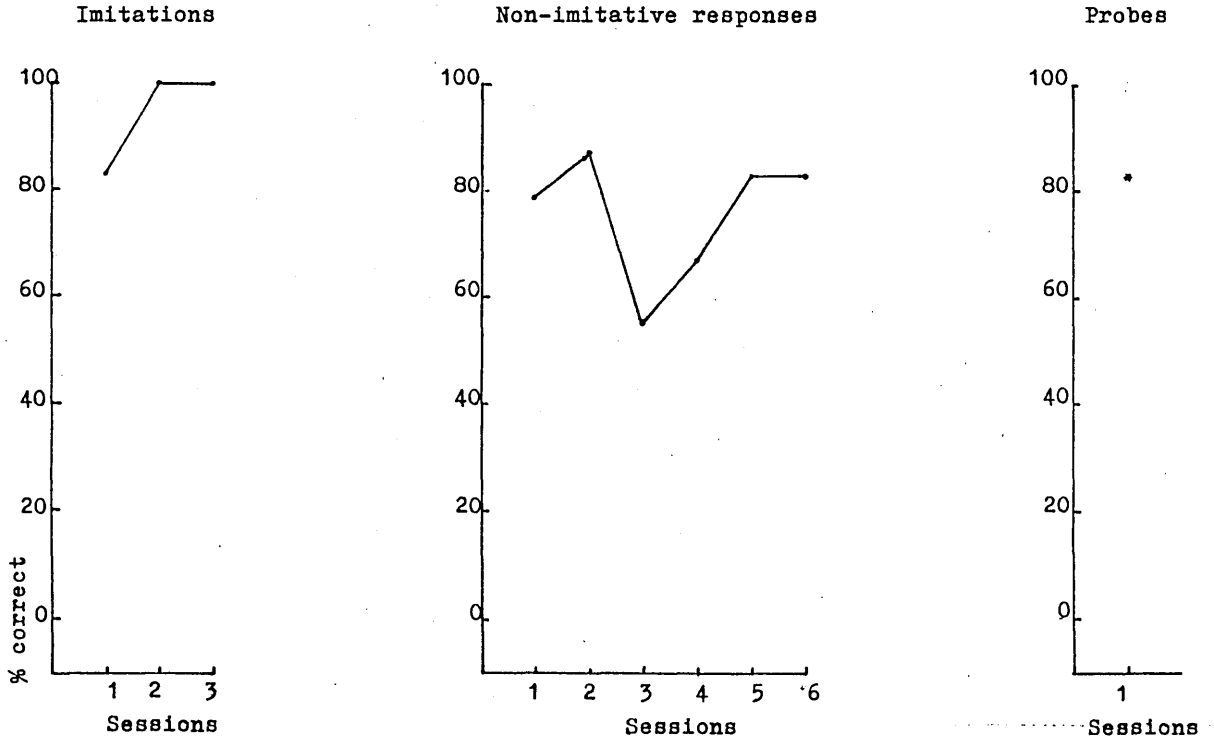
Non-imitative responses
Trials (% correct) - 24(79), 24(87), 18(55), 6(67), 6(83), 6(83)

Probes
Trials (% correct) - 6(83)

Fig. 9-4

Lee - Language Training - Progress in Learning Labelling - Persons/Actions - (pictorial stimuli)

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING



Lee - Language Training

Table 9-5

Summary of Progress per Structure by Sessions and Trials

Training Category - Labelling - Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/
(A OBJ)/(PREP)
(pron + cop' + det + subj + verb + ing +
(det + obj)/(prep)

Training commenced - 24.1.79
Training terminated - 23.3.79
Number of sessions - 10

Imitations
Trials (% correct) - 2(100), 12(83)

Non-imitative responses
Trials (% correct) - 9(67), 12(92), 6(100), 6(100), 6(100),
6(100), 6(100), 6(83), 24(46), 36(89)

Probes
Trials (% correct) - 9(78), 10(90), 8(100), 12(83)

Fig. 9-5

Lee - Language Training - Progress in Learning Labelling
- Persons, Actions, Things

STRUCTURE - IT'S A MAN/ WOMAN/BOY/GIRL verb-ing (OBJ)/
(AOBJ)/PREP)

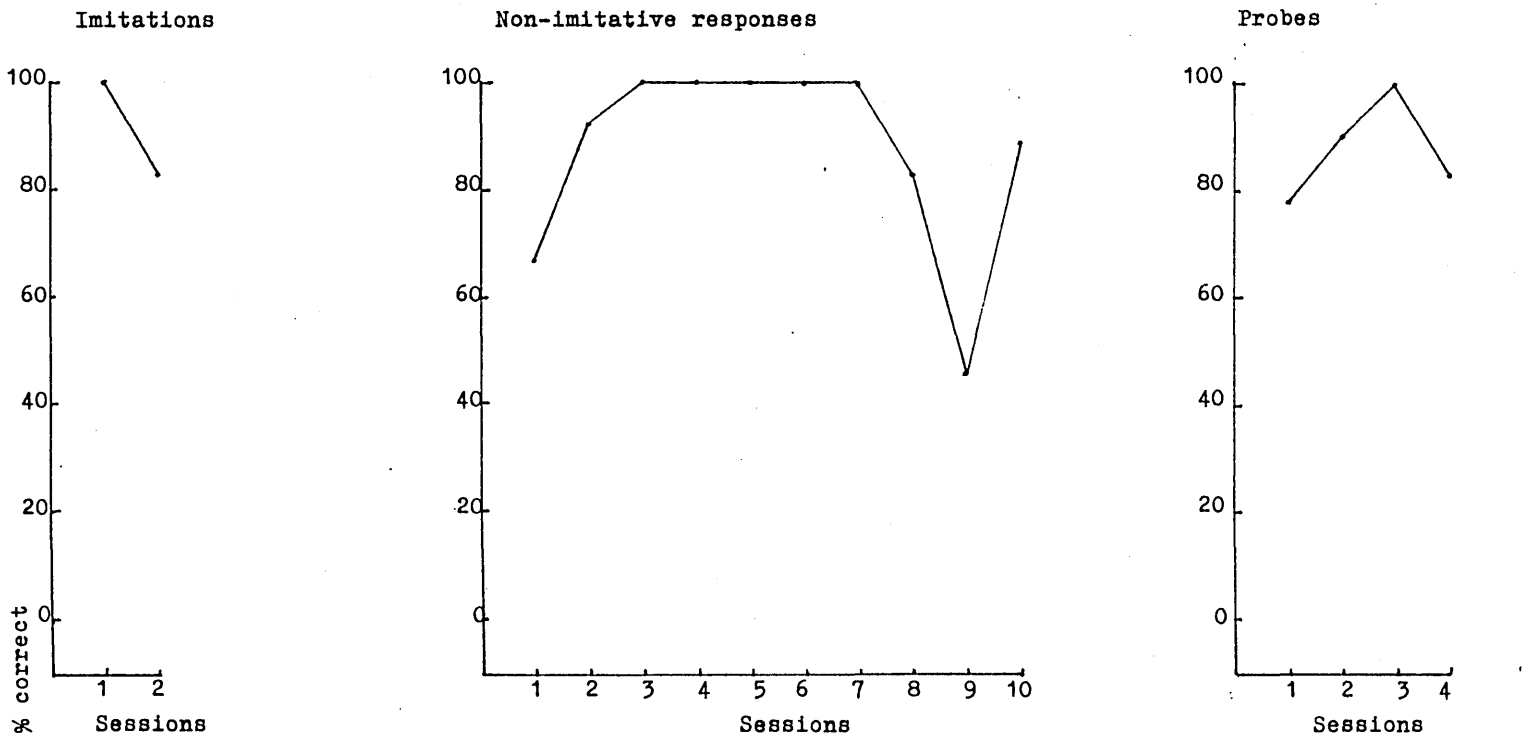


Table 9-6

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - Objects (singular)

STRUCTURE - YES IT IS (yes + pron + copula)

Training commenced - 26.3.79
Training terminated - 18.6.79
Number of sessions - 23

Imitations
Trials (% correct) - 3(100)

Non-imitative responses
Trials (% correct) - 35(83), 6(83), 6(67), 6(83), 6(83), 6(100), 6(100), 6(100), 6(100), 6(100), 6(100), 6(100), 6(100), 6(100), 6(83), 6(100), 6(100), 6(100), 10(70), 8(87), 7(86), 7(86)

Fig. 9-6

Lee - Language Learning - Progress in Learning
YES/NO Discrimination - Objects -(Singular)
STRUCTURE - YES IT IS

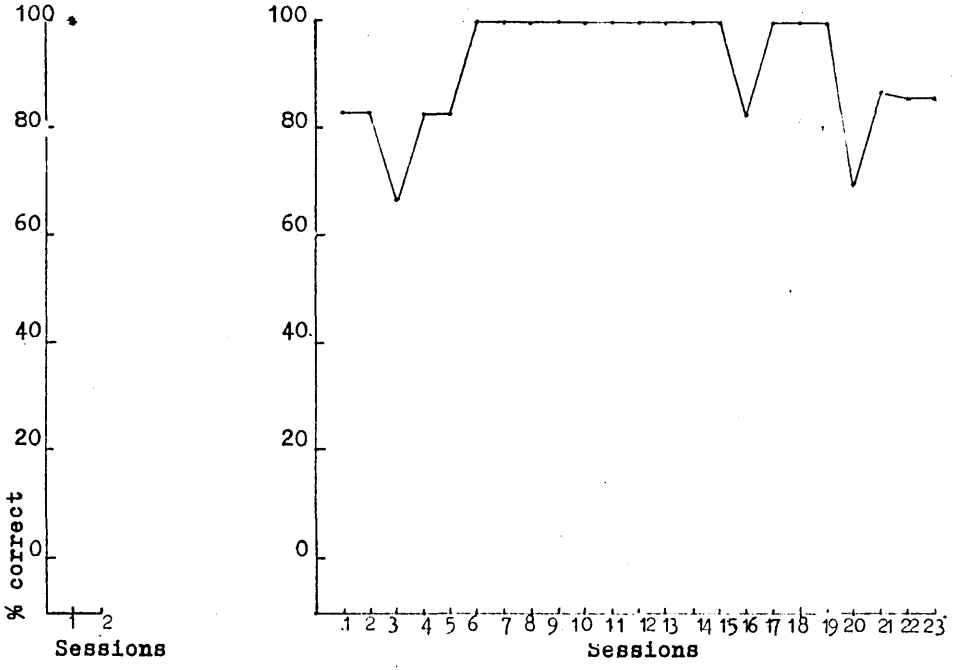


Table 9-7

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - Objects (Plural)

STRUCTURE - YES THEY ARE
(yes + pron + copula)

Training commenced - 26.3.79
Training terminated - 18.6.79
Number of sessions - 23

Imitations
Trials (% correct) - 7(86)

Non-imitative responses
Trials (% correct) - 33(88), 6(83), 6(83), 6(83), 6(83), 6(100), 8(62), 6(83), 6(83), 6(67), 6(67), 6(67), 6(100), 6(100), 6(100), 6(67), 6(100), 6(50), 6(83), 12(67), 8(100), 8(87), 6(83)

Fig. 9-7

Lee - Language Training - Progress in Learning
YES/NO Discrimination - Objects -(Plural)
STRUCTURE - YES THEY ARE

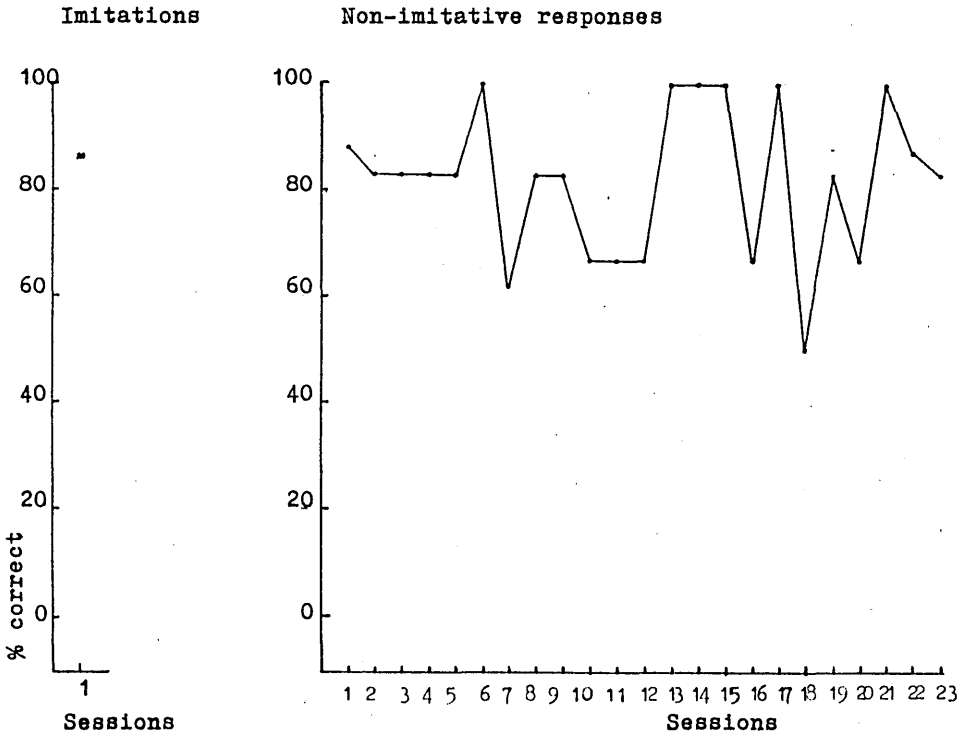


Table 9-8

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - Objects - (Singular)

STRUCTURE - NO IT ISN'T IT'S A (NOUN)
(neg + pron + copula + neg' + pron + cop' + det + noun)

Training commenced - 28.3.79
Training terminated - 18.6.79
Number of sessions - 21

Imitations
Trials (% correct) - 6(100), 6(100), 6(100)

Non-imitative responses
Trials (% correct) - 6(17), 4(50), 6(83), 6(50), 6(33), 6(33), 6(83), 6(50), 6(83), 12(33), 6(67), 6(83), 6(50), 6(83), 6(67), 6(50), 6(67), 10(80), 8(62), 6(83), 7(86)

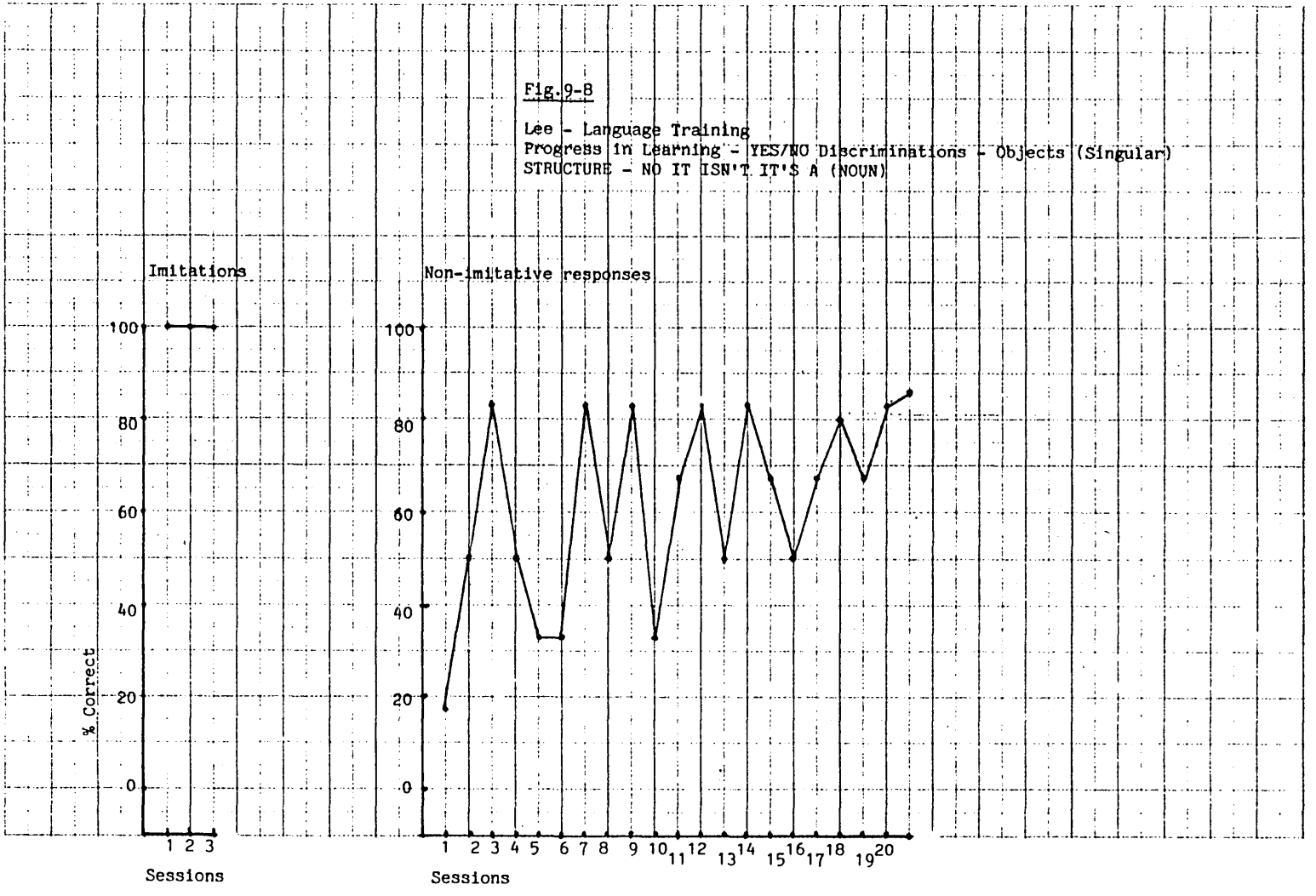


Fig.9-8
Lee - Language Training
Progress in Learning - YES/NO Discriminations - Objects (Singular)
STRUCTURE - NO IT ISN'T IT'S A (NOUN)
Imitations
Non-imitative responses
% Correct
100
80
60
40
20
0
1 2 3
Sessions
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Sessions

Table 9-9

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - Objects (plural)

Structure - NO THEY AREN'T/ARE NOT, THEY'RE (NOUNS) (neg + pron + cop' + neg' + pron + cop' + noun + pl)

Training commenced - 28.3.79
Training terminated - 18.6.79
Number of sessions - 20

Imitations

Trials (% correct) - 6(100)

Non-imitative responses

Trials (% correct) - 6(33), 6(67), 6(83), 6(17), 6(50)
6(33), 6(83), 6(67), 8(62), 6(67)
6(67), 6(83), 6(83), 6(50), 7(71)
6(67), 9(55), 8(100), 6(100), 6(100)

Fig. 9-9

Lee - Language Training - Progress in Learning
YES/NO Discrimination - Objects - (Plural)
STRUCTURE - NO, THEY AREN'T/ARE NOT, THEY'RE (NOUNS)

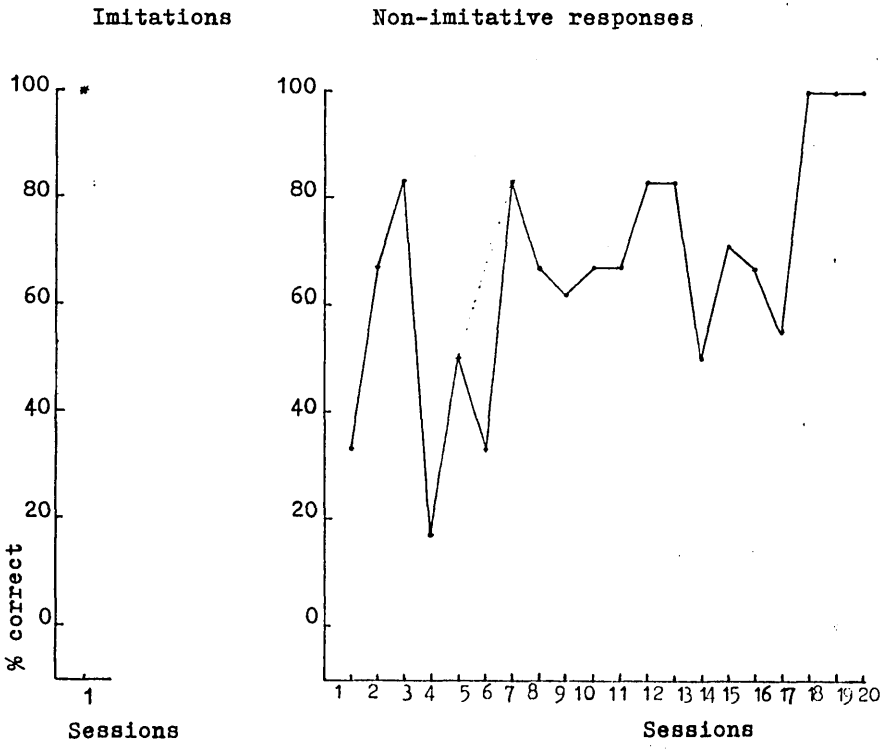


Table 9-10

Summary of Progress per Structure by Sessions and Trials

Training Category - YES/NO Discrimination - (retraining)

STRUCTURE - YES IT IS
(yes + pron + copula)

Retraining commenced - 12.9.79
Retraining terminated - 18.9.79
Number of sessions - 3

Non-imitative responses
Trials (% correct) - 3(67), 6(100), 6(83)

Training Category - YES/NO Discrimination - (plural) (retraining)

STRUCTURE - NO IT ISN'T, IT'S A (NOUN)
(no + pron + copula + neg' + pron + cop' + det + noun)

Retraining commenced - 12.9.79
Retraining terminated - 18.9.79
Number of sessions - 3

Non-imitative responses
Trials (% correct) - 3(67), 6(83), 6(83)

Training Category - YES/NO Discrimination - (retraining)

STRUCTURE - YES THEY ARE
(yes + pron + verb)

Retraining commenced - 12.9.79
Retraining terminated - 18.9.79
Number of sessions - 3

Non-imitative responses
Trials (% correct) - 3(33), 7(57), 6(100)

Cont. table 9-10

Training Category - YES/NO Discrimination - (plural)
(retraining)

STRUCTURE - NO THEY AREN'T/ARE NOT, THEY'RE NOUNS
(no + pron + copula + neg'/copula + neg + pron
+ cop' + noun (pl))

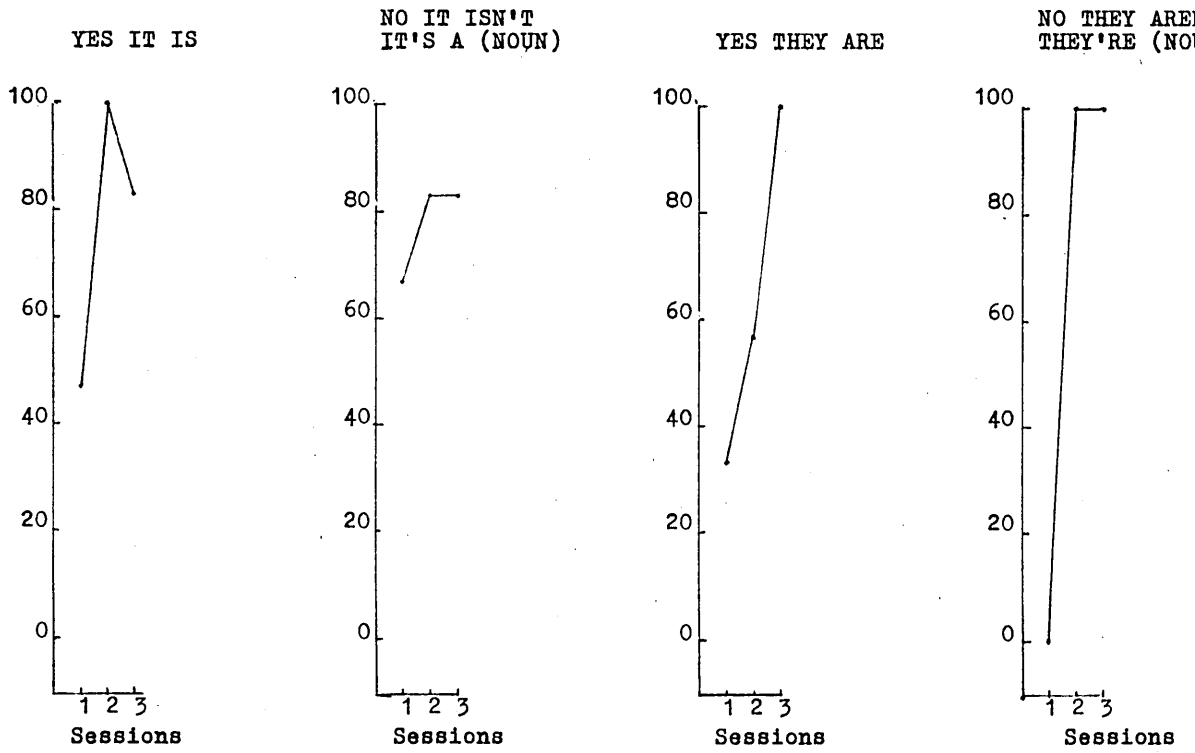
Retraining commenced - 12.9.79
Retraining terminated - 18.9.79
Number of sessions - 3

Non-imitative responses
Trials (% correct) - 3(0), 6(100), 6(100)

Fig. 9-10

Lee - Language Training - Progress in Learning
YES/NO Discrimination - Objects

Retraining - (September 1979)



Lee - Language Training

Table 9-11

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronoun Training - I

STRUCTURE - I AM (LEE)
(pron + verb)

Training commenced - 21.9.79
Training terminated - 9.10.79
Number of sessions - 8

Imitations
Trials (% correct) -

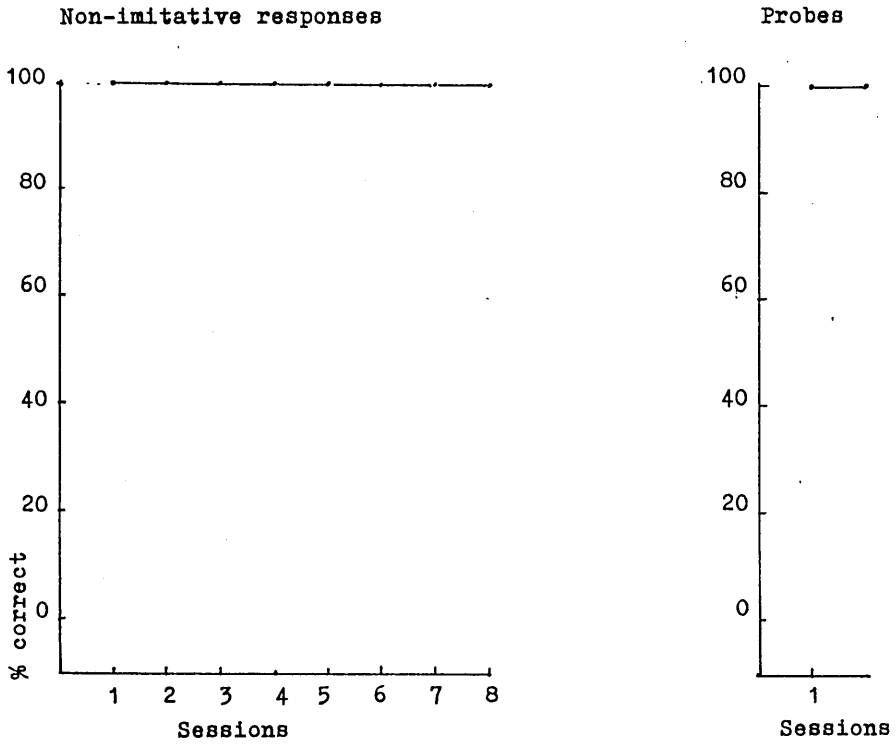
Non-imitative responses
Trials (% correct) - 4(100), 6(100), 4(100), 4(100), 4(100), 4(100), 4(100), 4(100)

Probes
Trials (% correct) - 4(100), 4(100)

Fig. 9-11

Lee - Language Training - Progress in Learning
Pronominal Usage - I

STRUCTURE - I AM (LEE)



Lee - Language Training

Table 9-12

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronoun Training - I +
Yes Discrimination

STRUCTURE - YES I AM (LEE)
(yes+pron+verb)
Training commenced - 21.9.79
Training terminated - 9.10.79
Number of sessions - 9

Imitations
Trials (% correct) -

Non-imitative responses
Trials (% correct) - 4(100), 6(17), 4(100), 4(75), 4(100),
4(100), 4(100), 4(75), 4(75)

Probes
Trials (% correct) - 4(100), 4(100)

Fig. 9-12

Lee - Language Training - Progress in Learning Pronominal Usage - I + Yes discrimination

STRUCTURE - YES I AM (Lee)

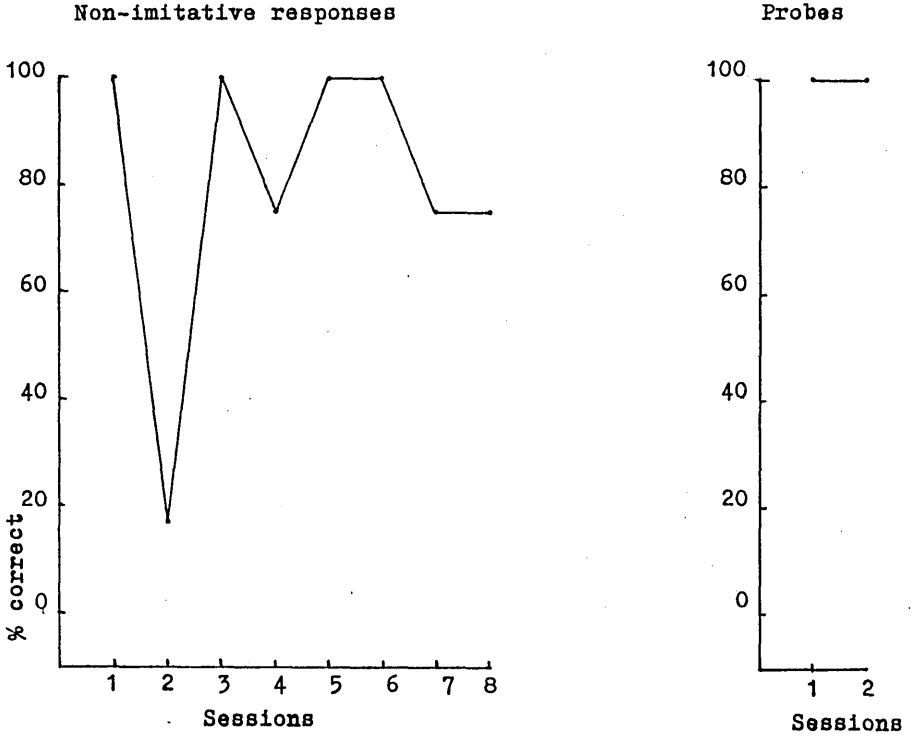


Table 9-13

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronoun Training - I +
No Discrimination

STRUCTURE - NO I'M NOT, I'M LEE
(no+pron+verb+negative+pron+verb+proper noun)

Training commenced - 26.9.79
Training terminated - 9.10.79
Number of sessions -

Imitations
Trials (% correct) - 4(50), 4(100)

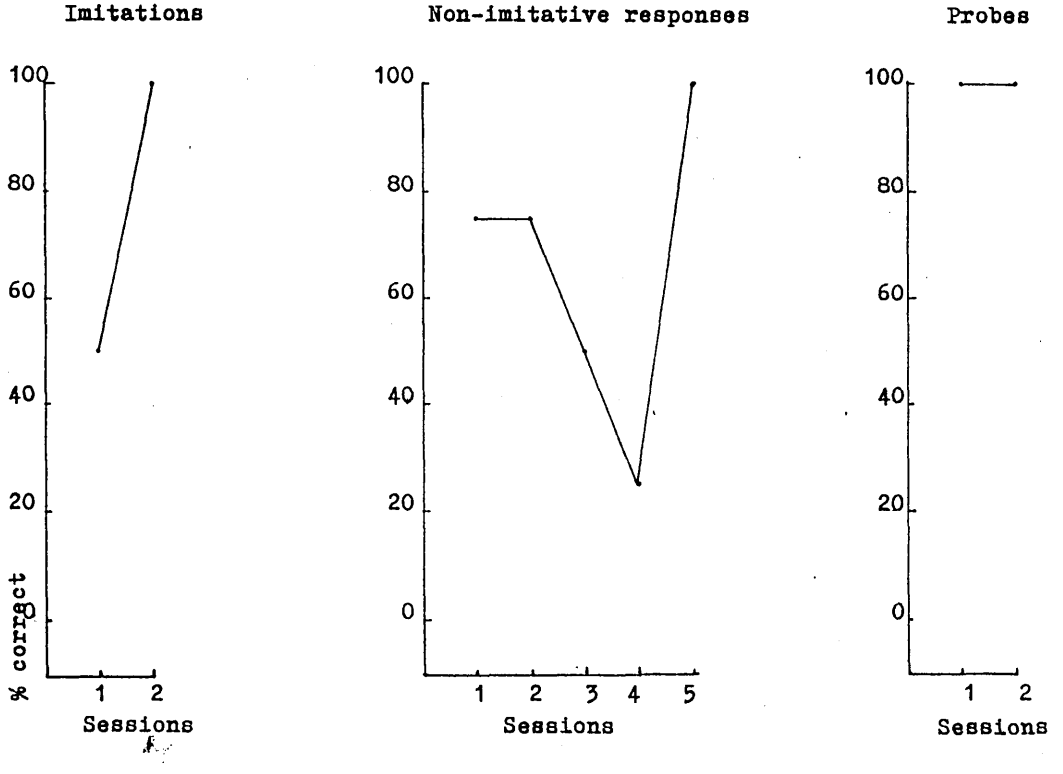
Non-imitative responses
Trials (% correct) - 4(75), 4(75), 4(50), 4(25), 4(100)

Probes
Trials (% correct) - 4(100), 4(100)

Fig. 9-13

Lee - Language Training - Progress in Learning Pronominal Usage - I + No discrimination

STRUCTURE - NO I'M NOT, I'M LEE



Lee - Language Training

Table 9-14

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - I + Labelling Actions)

Structure - I AM VERB-ING (OBJ)/(AOBJ)/(PREP)
(pron + aux + verb + ing + (obj)/(det + obj)/ (prep))

Training commenced - 21.9.79
Training terminated - 9.10.79
Number of sessions - 9

Imitations

Trials (% correct) -

Non-imitative responses

Trials (% correct) - 24(75), 36(78), 24(92), 24(100), 24(96) 24(100), 22(50), 24(92), 24(96)

Probes

Trials (% correct) - 6(50), 6(50)

Fig. 9-14

Lee - Language Training - Progress in Learning Pronominal Usage - I + Labelling - Actions

STRUCTURE - I AM VERB-ING (OBJ)/(AOBJ)/(PREP)

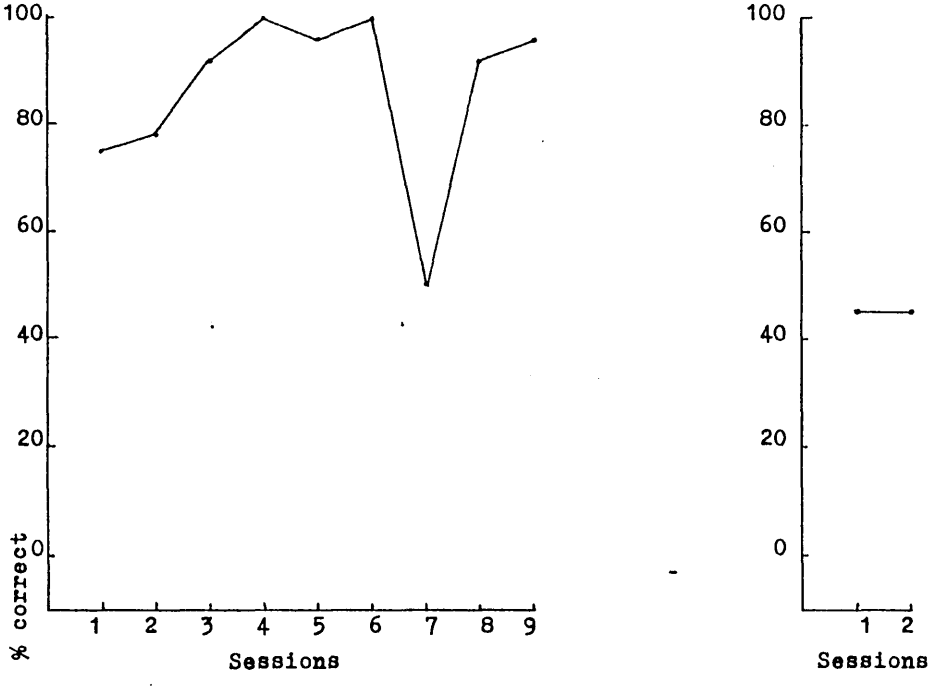


Table 9-15

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronoun Training - I + Yes Discrimination

STRUCTURE - YES I AM (VERBING)
(Yes + pronoun + verb + ing)

Training commenced - 21.9.79
Training terminated - 9.10.79
Number of sessions - 8

Imitations
Trials (% correct) -

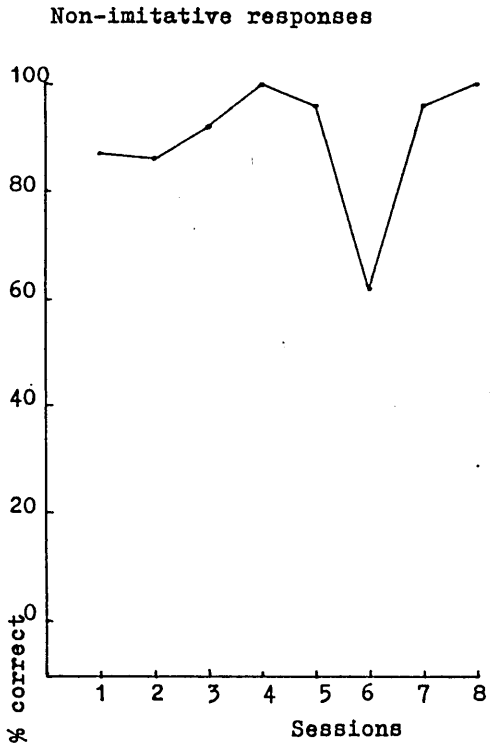
Non-imitative responses
Trials (% correct) - 24(87), 36(86), 24(92), 24(100), 24(96), 21(62), 24(96), 24(100)

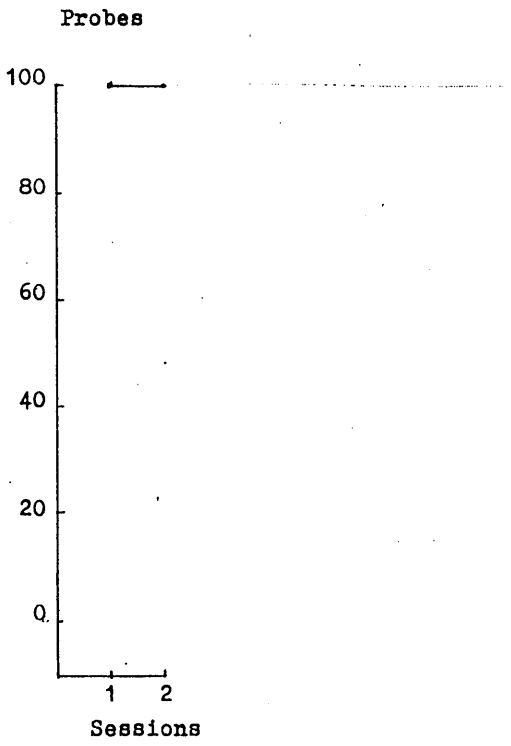
Probes
Trials (% correct) - 6(100), 6(100)

Fig. 9-15

Lee - Language Training - Pronominal Usage - I + Yes Discrimination

STRUCTURE - YES I AM (VERBING)





Lee - Language Training

Table 9-16

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronoun Training - I +
No Discrimination

STRUCTURE - NO I'M NOT/I AM NOT, I'M VERBING (OBJ)/(AOBJ)/(PREP)
(no+pron+verb+negative+pron+aux+verb+present participle (obj)/(det+obj)/(prep)

Training commenced - 25.9.79
Training terminated - 9.10.79
Number of sessions - 7

Imitations
Trials (% correct) - 5(100)

Non-imitative responses
Trials (% correct) - 24(62), 24(62), 24(96), 23(53), 24(87), 24(83)

Probes
Trials (% correct) - 6(100), 6(100)

Fig. 9-16

Lee - Language Training - Pronominal Usage - I + Yes Discrimination

STRUCTURE - NO I'M NOT, I'M VERB-ING (OBJ)/(AOBJ)/(PREP)

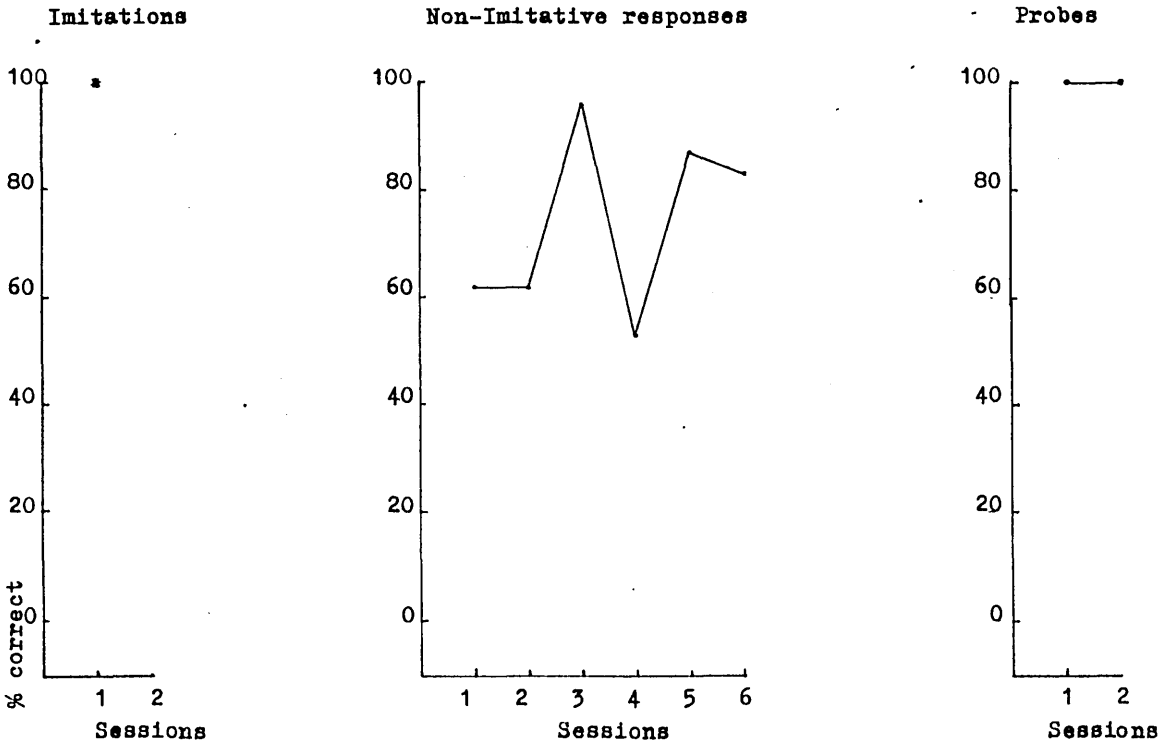


Table 9-17

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - He/She

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING
(AOBJ)/(PREP)
(pron + cop' + det + subj + verb + ing + (det obj)/(prep)

Training commenced - 11.10.79
Training terminated - 3.11.79
Number of sessions - 10

Imitations
Trials (% correct) - 6(100)

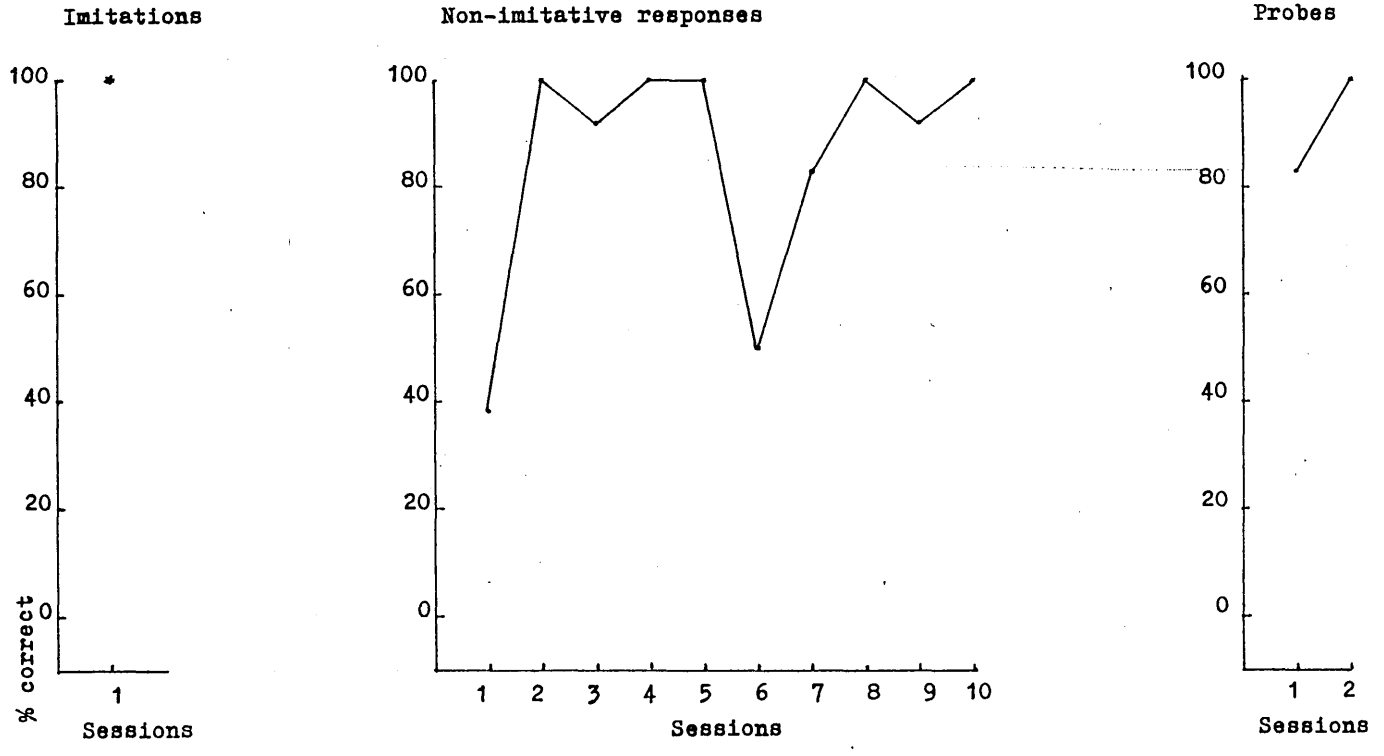
Non-imitative responses
Trials (% correct) - 13(38), 12(100), 12(92), 12(100), 6(100), 6(50), 12(83), 6(100), 12(92), 12(83)

Probes x 2
Trials (% correct) - 6(83), 6(100)

Fig. 9-17

Lee - Language Training - Progress in Learning Pronominal Usage - He/she

STRUCTURE = IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (AOBJ)/(PREP)



Lee - Language Training

Table 9-18

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - He/She + Labelling Actions/Things

Structure - HE/SHE IS VERB-ING (AOBJ)/(PREP)
HE/SHE'S VERB-ING (AOBJ)/(PREP)
(pron + aux + verb + ing + (det + obj)/(prep))

Training commenced - 11.10.79
Training terminated - 23.11.79
Number of sessions - 10

Imitations

Trials (% correct) - 6(100)

Non-imitative responses

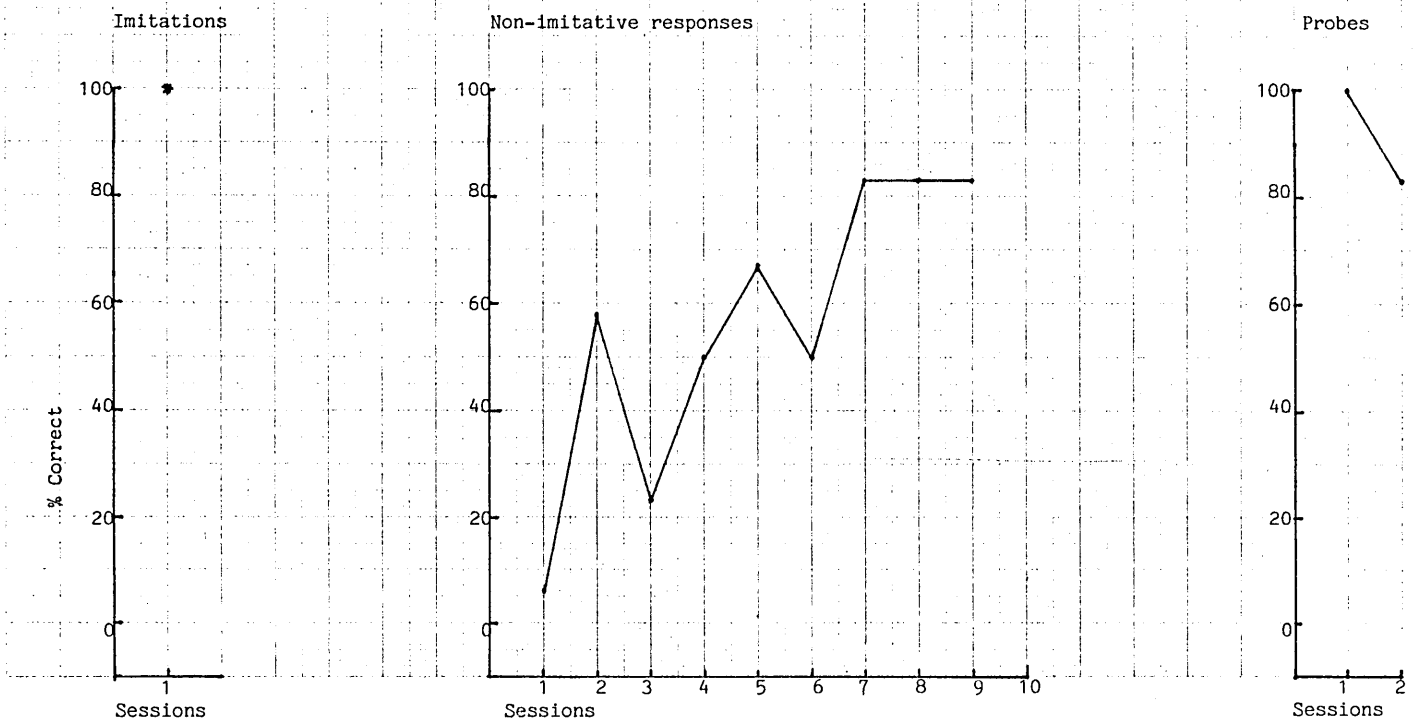
Trials (% correct) - 17(6), 12(58), 12(33), 12(50), 6(67)
6(50), 12(83), 6(83), 12(83), 12(83)

Probes

Trials (% correct) - 6(100), 6(83)

Fig.9-18

Lee - Language Training - Progress in Learning Pronominal Usage -
He/She + Labelling Actions/Things
STRUCTURE - HE/SHE'S VERB-ING (A OBJ)/(PREP)-
HE IS/SHE IS VERB-ING (A OBJ)/(PREP)



Lee - Language Training

Table 9-19

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - He/She + Yes Discrimination

STRUCTURE - YES HE/SHE IS (VERBING)

Training commenced - 11.10.79
Training terminated - 23.11.79
Number of sessions - 10

Imitations
Trials (% correct) -

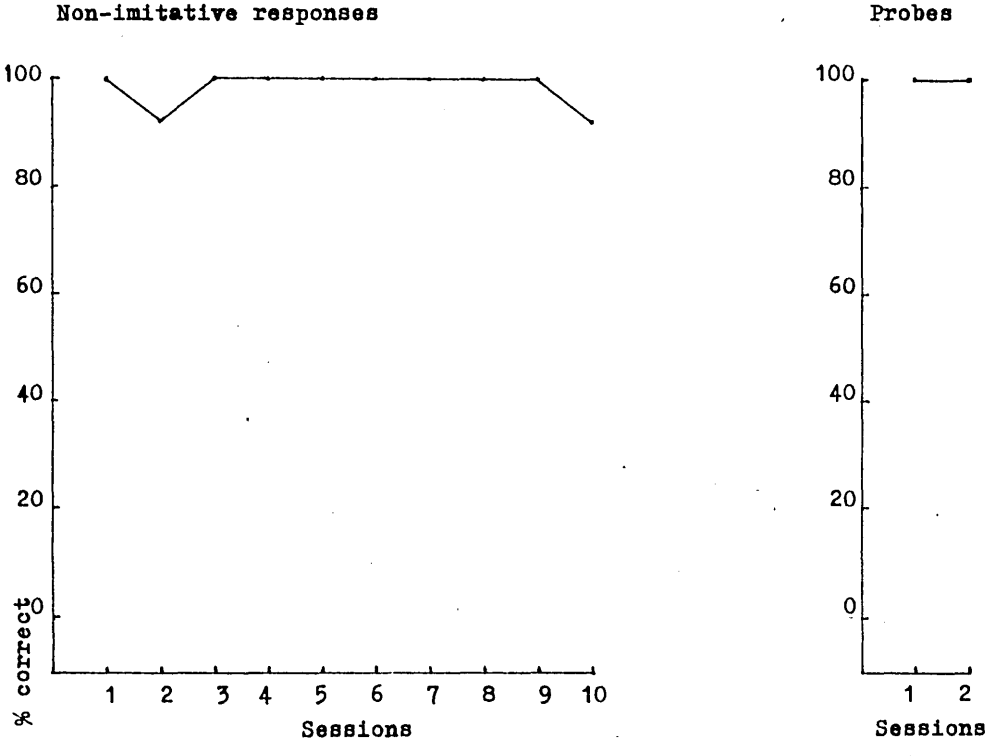
Non-imitative responses
Trials (% correct) - 12(100), 12(92), 12(100), 12(100), 6(100), 6(100), 12(100), 6(100), 12(100), 12(92)

Probes
Trials (% correct) - 6(100), 6(100)

Fig. 9-19

Lee - Language Training - Progress in Learning Pronouns - HE/SHE + YES/NO Discrimination

STRUCTURE - YES HE/SHE IS (VERB-ING)



Lee - Language Training

Table 9-20

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - He/She + Yes/No Discrimination

Structure - NO HE/SHE ISN'T/HE/SHE'S VERB-ING (AOBJ)/(PREP)
(No + pron + verb + neg' + pron + aux + verb-ing (det + obj)/(prep))

Training commenced - 11.10.79
Training terminated - 23.11.79
Number of sessions - 10

Imitations

Trials (% correct) - 6(100)

Non-imitative responses

Trials (% correct) - 13(0), 12(25), 12(0), 12(25), 6(67) 6(67), 12(50), 6(67), 12(67), 12(83)

Probes

Trials (% correct) - 6(67), 6(100)

Fig.9-20

Lee - Language Training - Progress in Learning Pronominal Usage
HE/SHE + YES/NO Discrimination
STRUCTURE - NO HE/SHE ISN'T, HE/SHE'S VERB-ING (A OBJ)/(PREP)

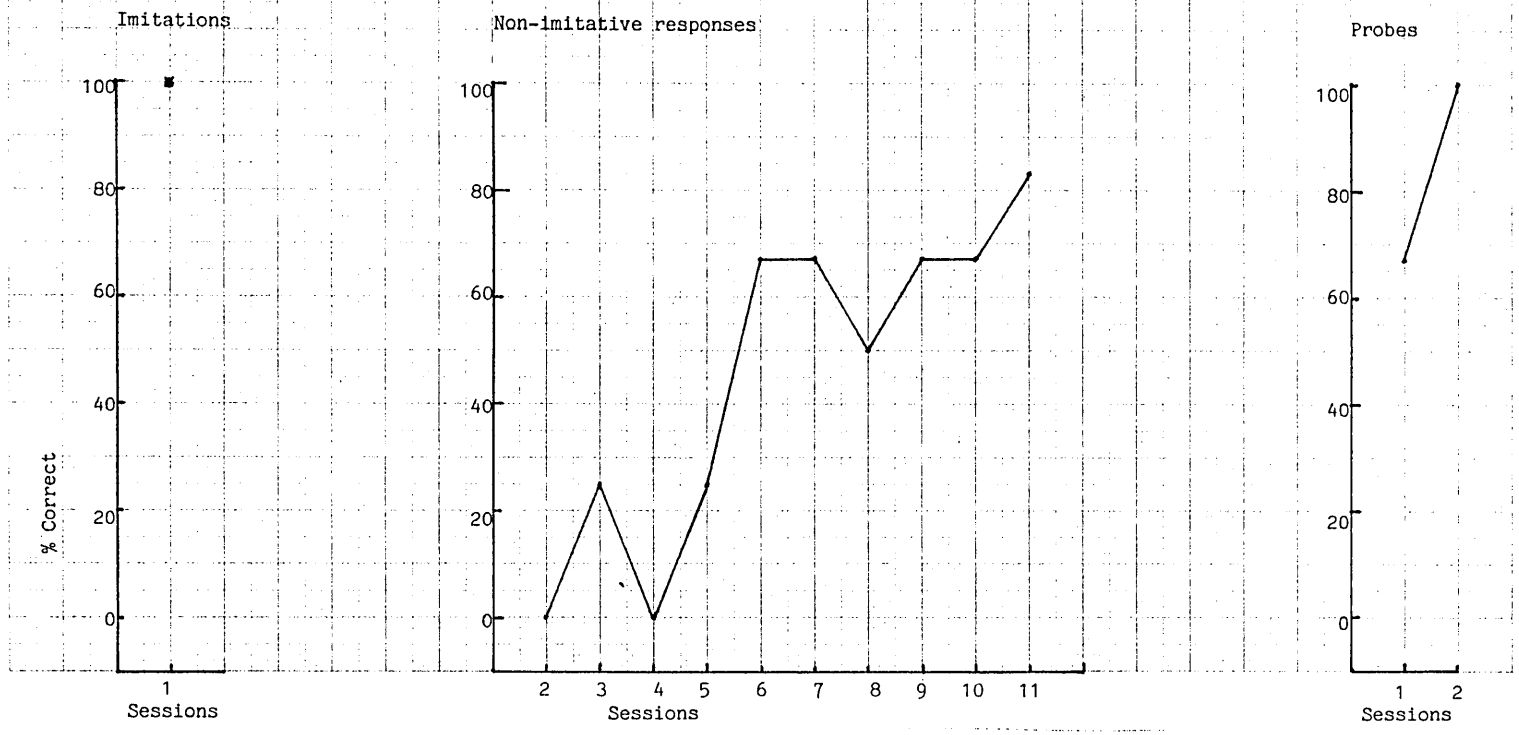


Table 9-21

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - His/Hers
(possessive - 's')

STRUCTURE - IT'S PERSON'S
(pron + cop + proper noun + possessive)

Training commenced - 26.11.79
Training terminated - 18.12.79
Number of sessions - 5

Imitations
Trials (% correct) - 5(80)

Non-imitative responses
Trials (% correct) - 4(75), 8(87), 12(92), 8(87), 12(58)

Fig. 9-21

Lee - Language Training - Progress in Learning Pronouns
HIS/HERS - possessive

STRUCTURE - IT'S PERSON'S

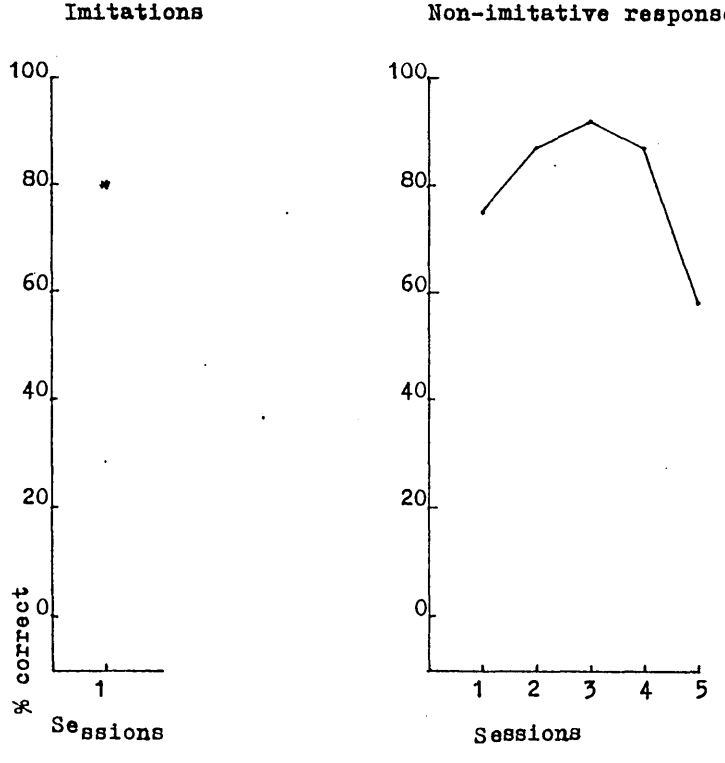


Table 9-22

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - His/Hers - possessive

STRUCTURE - IT'S HIS/HERS
(pron + cop + possessive pron)

Training commenced - 26.11.79
Training terminated - 18.12.79
Number of sessions - 5

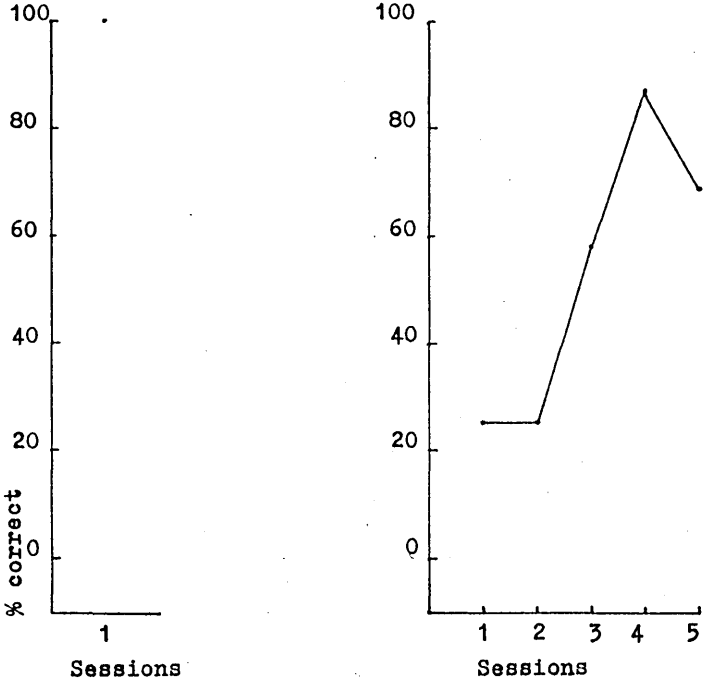
Imitations
Trials (% correct) - 2(100)

Non-imitative responses
Trials (% correct) - 4(25), 8(25), 12(58), 8(87), 13(69)

Fig. 9-22

Lee - Language Training - Progress in Learning Pronouns
- HIS/HERS (possessive)

STRUCTURE - IT'S HIS/HERS



Lee - Language Training

Table 9-23

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage - His/Hers
possessive - 's'

STRUCTURE - THEY'RE PERSON'S
(pron + cop'+ proper noun + possessive 's)

Training commenced - 26.11.79
Training terminated - 18.12.79
Number of sessions - 5

Imitations
Trials (% correct) - (100)

Non-imitative responses
Trials (% correct) - 8(50), 8(62), 12(100), 8(75)
13(85)

Fig. 9-23

Lee - Language Training - Progress in Learning Pronouns
HIS/HERS - possessive

STRUCTURE - THEY'RE PERSON'S

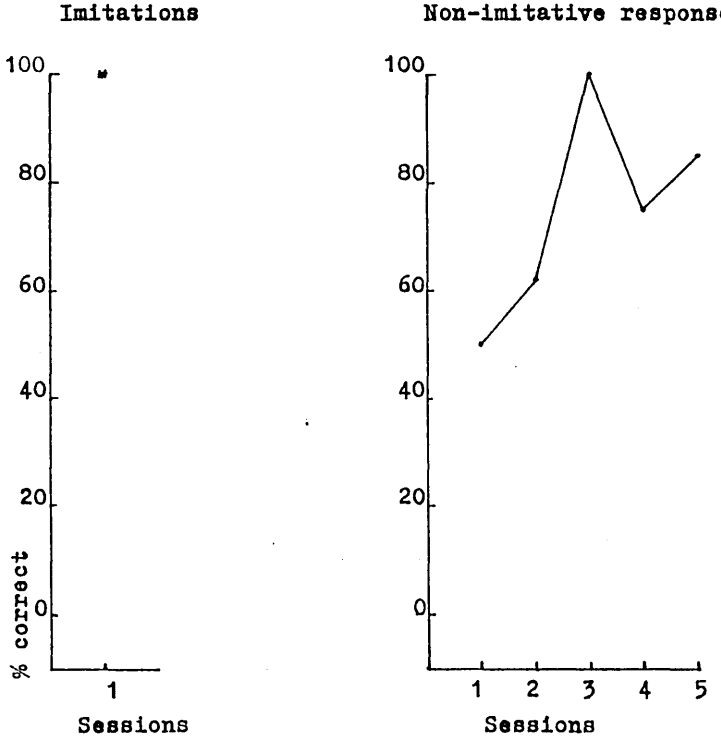


Table 9-24

Summary of Progress per Structure by Sessions and Trials

Training Category - Pronominal Usage His/Hers

STRUCTURE - THEY'RE HIS/HERS

Training commenced - 26.11.79
Training terminated - 18.12.79
Number of sessions - 5

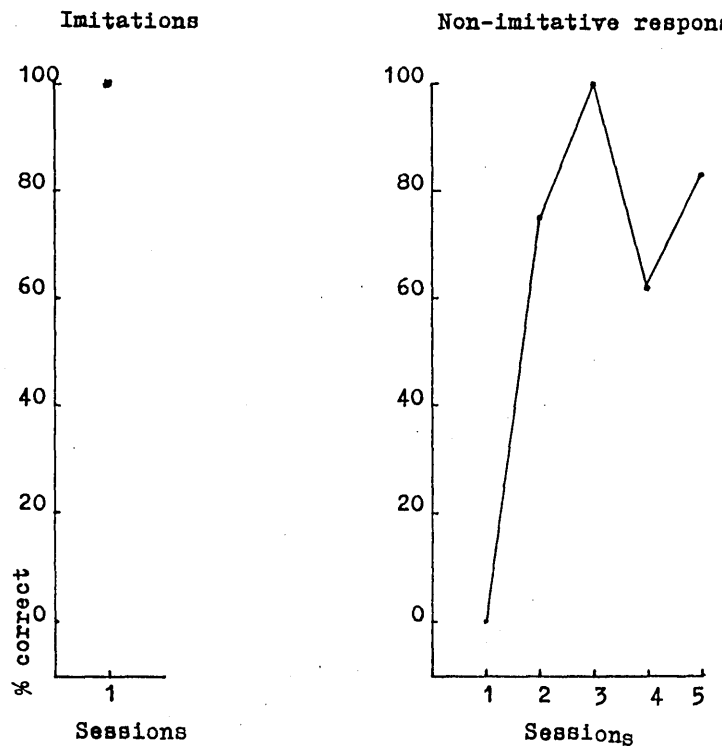
Imitations
Trials (% correct) - 6(100)

Non-imitative responses
Trials (% correct) - 7(0), 8(75), 12(100), 8(62), 12(83)

Fig. 9-24

Lee - Language Training - Progress in Learning Pronominal Usage
- HIS/HERS - possessive

STRUCTURE - THEY'RE HIS/THEY'RE HERS



Lee - POST-TEST 1 - Generalisation Probes

Table 9-25

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

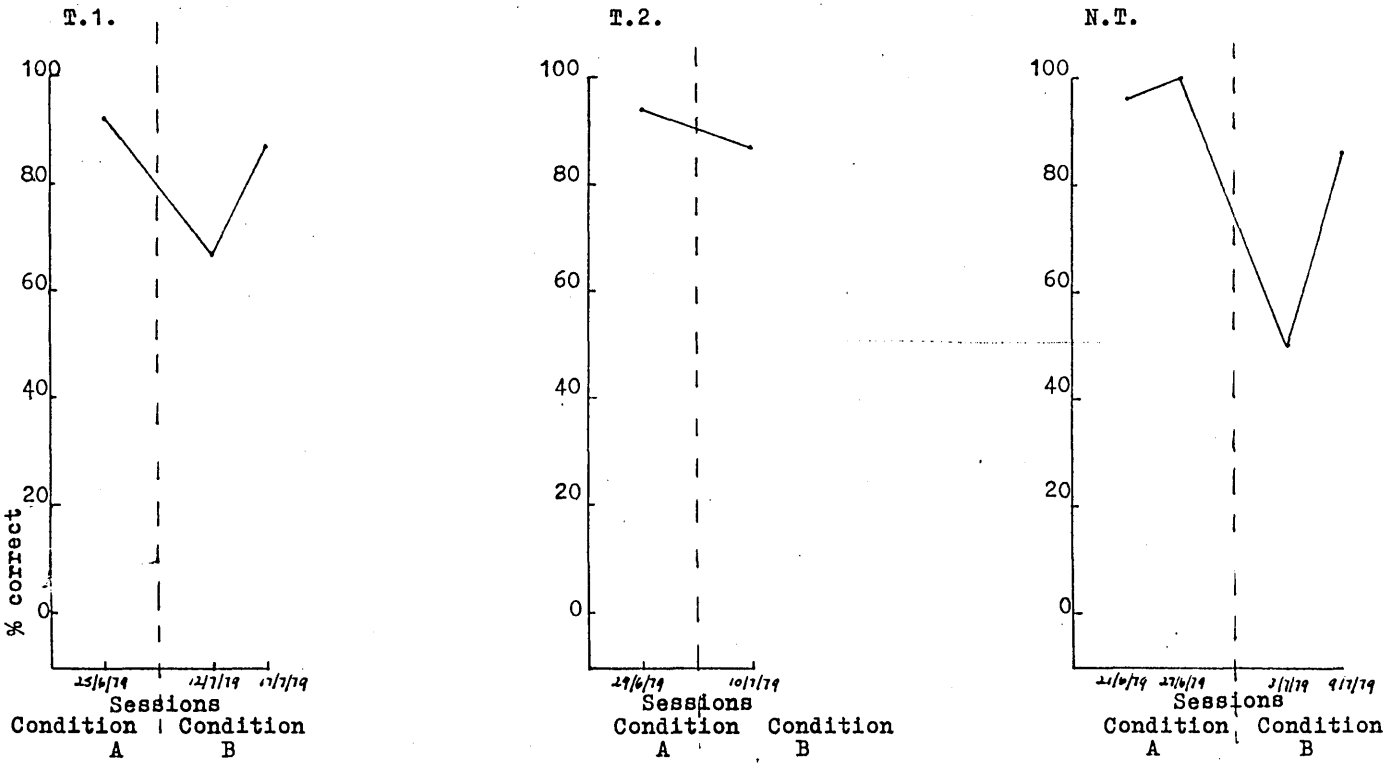
Category - Labelling - Objects - (Singular)

STRUCTURE - IT'S A (NOUN)
(pron + cop + det + noun)

	CONDITION A	CONDITION B
Trainer 1		
Date	25.6.79	12.7.79, 17.7.79
Trials (% correct)	12(92)	6(67), 8(87)
Trainer 2		
Date	29.6.79	10.7.79
Trials (% correct)	18(94)	8(87)
Non-Trainer		
Date	21.6.79, 27.6.79	3.7.79, 9.7.79
Trials (% correct)	23(96), 22(100)	14(50), 7(87)

Fig. 9-25

Lee - POST-TEST 1 - Generalisation Probes
Training Category - Labelling Objects - (singular)
STRUCTURE - IT'S A (NOUN) - Generalisations in Test Conditions A and B



Lee - POST-TEST 1 - Generalisation Probes

Table 9-26

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

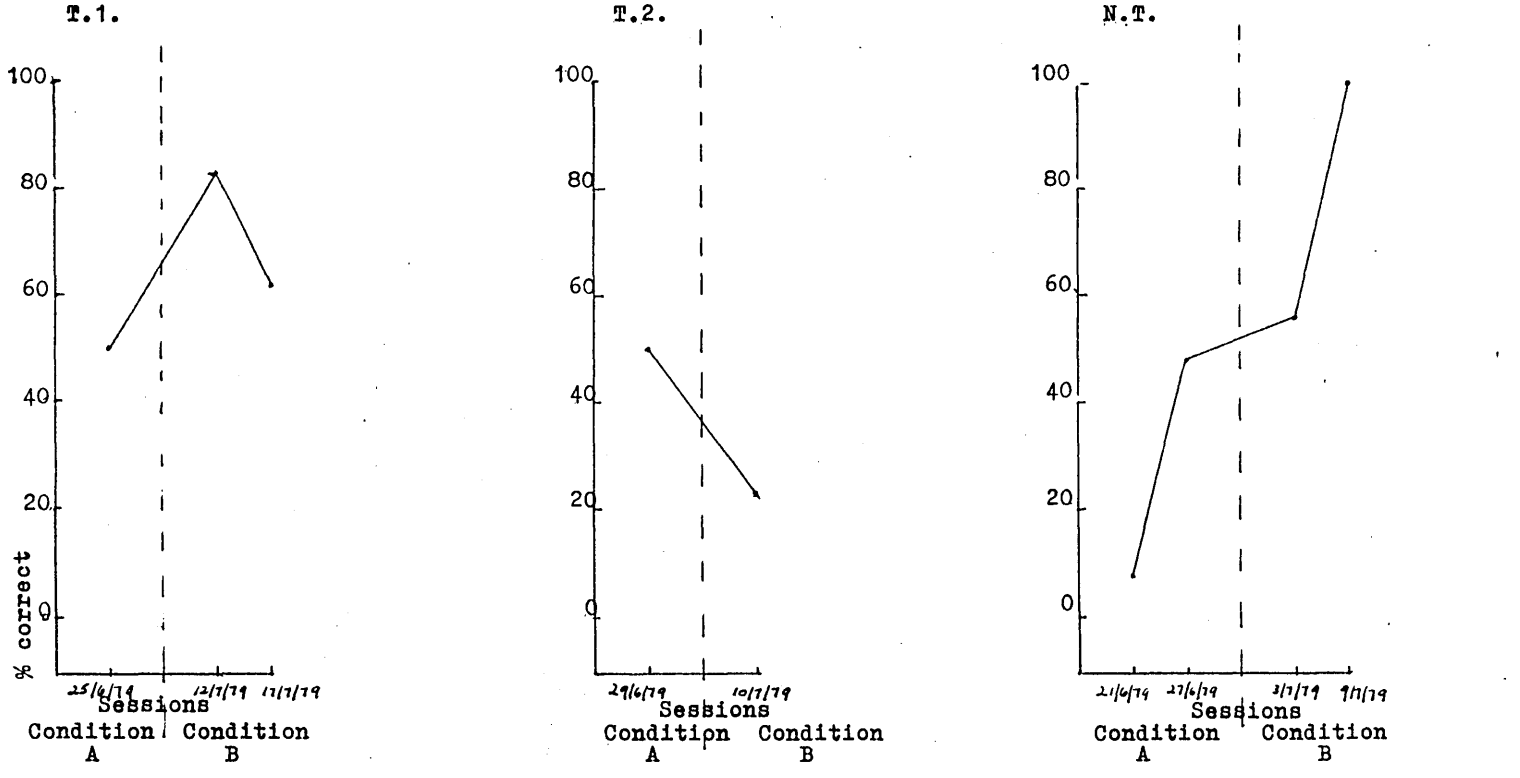
Category - Labelling - Objects - (Plural)

STRUCTURE - THEY'RE(NOUNS)
(pron + verb + noun + pl)

	CONDITION A	CONDITION B
Trainer 1		
Date	25.6.79	12.7.79, 17.7.79
Trials (% correct)	12(50)	6(83), 8(62)
Trainer 2		
Date	29.6.79	10.7.79
Trials (% correct)	12(50)	6(33)
Non-Trainer		
Date	21.6.79, 27.6.79	3.7.79, 9.7.79
Trials (% correct)	24(8), 29(48)	16(56), 7(100)

Fig. 9-26

Lee - POST-TEST 1 - Generalisation Probes
Training Category - Labelling Objects - (Plural)
STRUCTURE - THEY'RE (NOUNS) - Generalisations in Test Conditions A and B



Lee - POST-TEST 1 - Generalisation Probes

Table 9-27

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

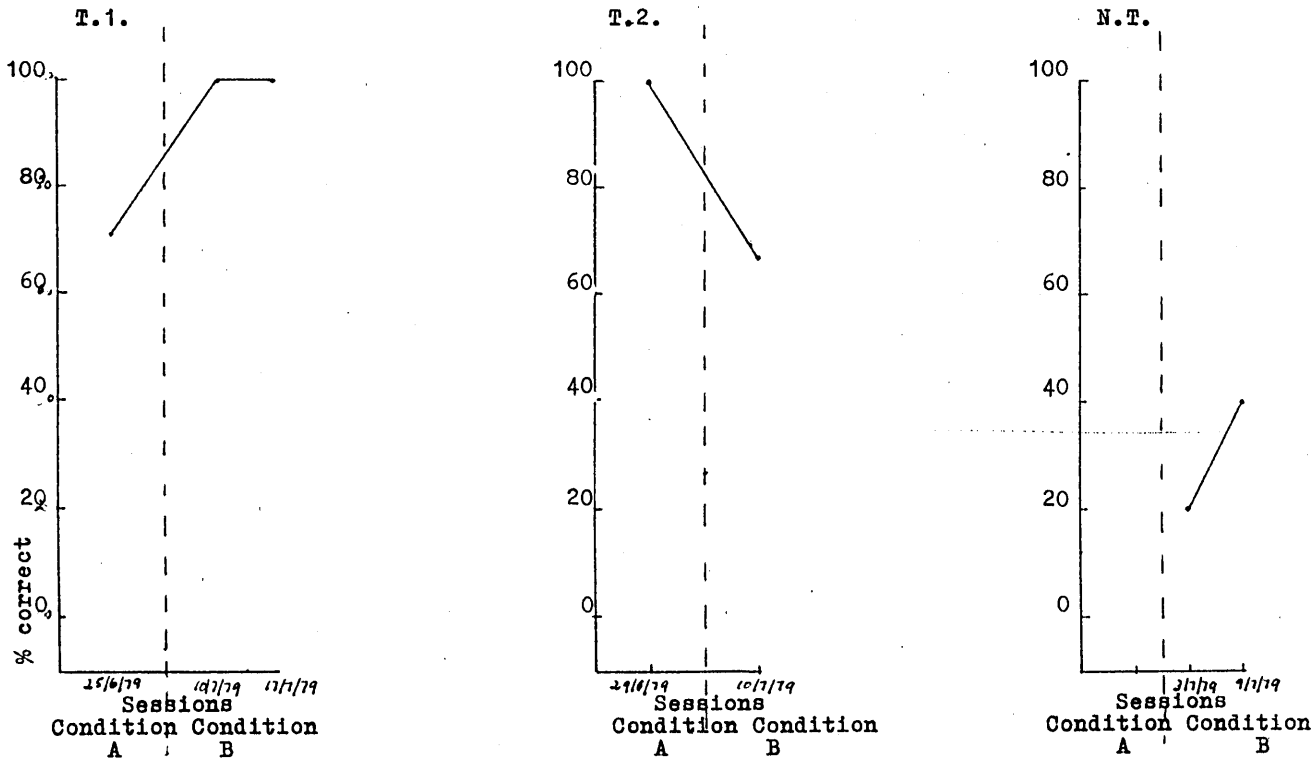
Category - Labelling - Persons

STRUCTURE - IT'S PERSON (NAME)
(pron + cop + proper noun)

	CONDITION A	CONDITION B
Trainer 1		
Date	25.6.79	12.7.79, 17.7.79
Trials (% correct)	7(71)	3(100), 3(100)
Trainer 2		
Date	29.6.79	10.7.79
Trials (% correct)	6(100)	3(67)
Non-Trainer		
Date		3.7.79, 9.7.79
Trials (% correct)		5(20), 5(40)

Fig. 9-27

Lee - POST-TEST 1 - Generalisation Probes
Training Category - Labelling Persons
STRUCTURE - IT'S PERSON (NAME) - Generalisations in Test Conditions A and B



Lee - POST-TEST 1 - Generalisation Probes

Table 9-28

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

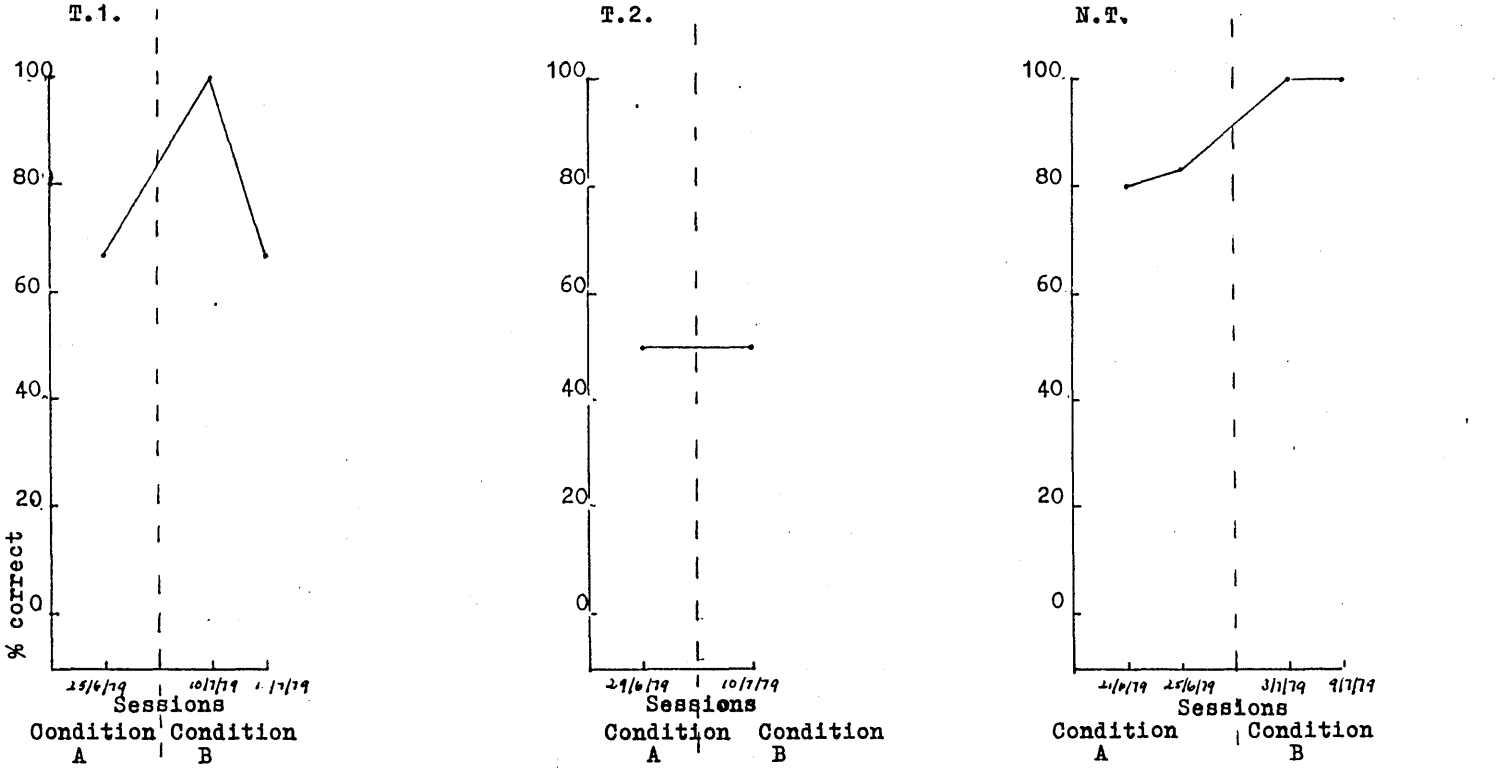
Category - Labelling - Actions (Persons)

STRUCTURE - VERBING (OBJ)/(AOBJ)/(PREP)
verb+ing(obj)/(det+obj)/(prep)

	CONDITION A	CONDITION B
Trainer 1		
Date	25.6.79	12.7.79, 17.7.79
Trials (% correct)	15(67)	3(100), 3(67)
Trainer 2		
Date	29.6.79	10.7.79
Trials (% correct)	6(50)	4(50)
Non-Trainer		
Date	21.6.79, 27.6.79	3.7.79, 9.7.79
Trials (% correct)	5(80), 6(83)	5(100), 3(100)

Fig. 9-28

Lee - POST-TEST 1 - Generalisation Probes
Training Category - Labelling Actions - (Persons)
STRUCTURE - VERB-ING (OBJ)/(AOBJ)/(PREP) - Generalisations in Test Conditions A and B



Lee - POST-TEST 1 - Generalisation Probes

Table 9-29

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

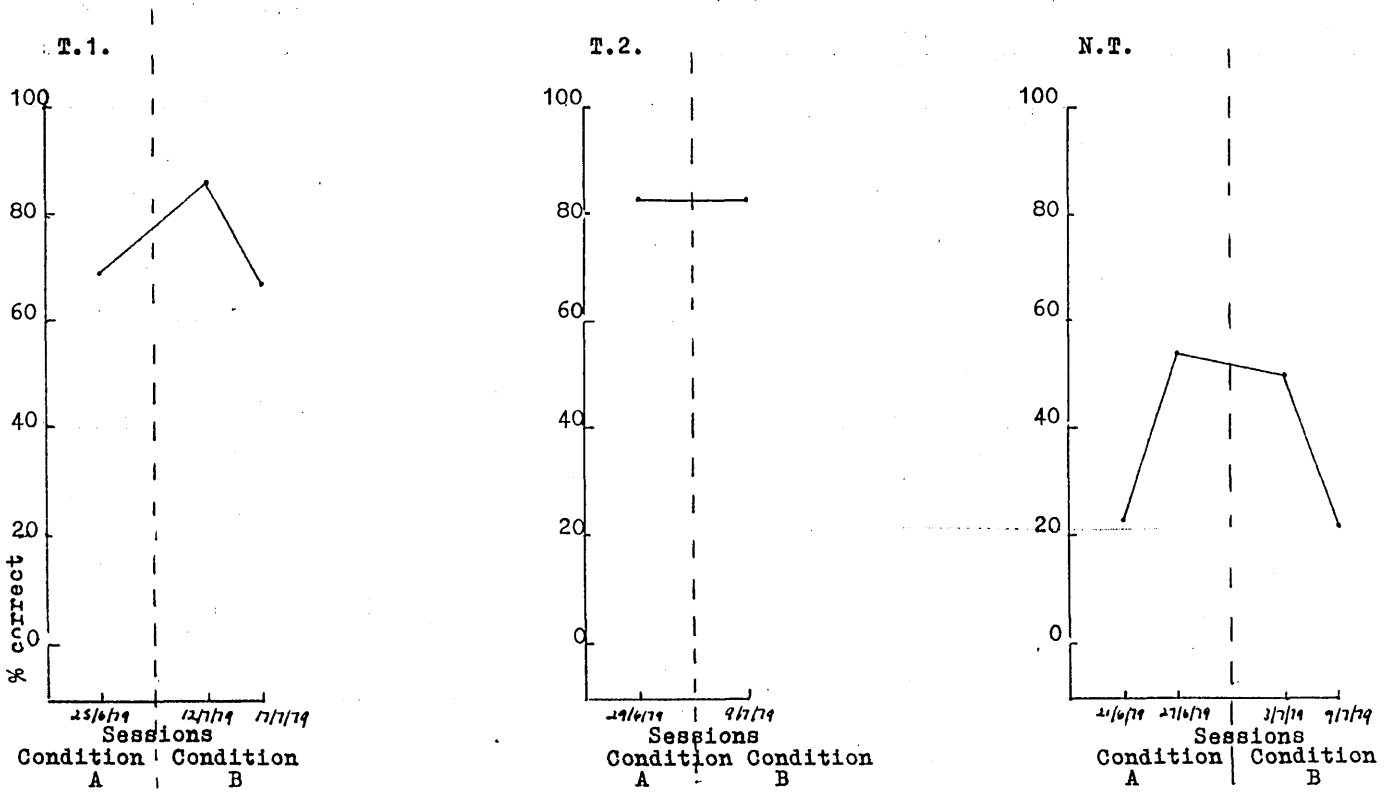
Category - Labelling Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERBING (OBJ)/(AOBJ)/(PREP)
(pron + cop + det + subj + verb + ing + (obj) (det + obj)/(prep))

	CONDITION A	CONDITION B
Trainer 1		
Date	25.6.79	12.7.79, 17.7.79
Trials (% correct)	13(69)	7(86), 6(67)
Trainer 2		
Date	29.6.79	10.7.79
Trials (% correct)	12(83)	6(83)
Non-Trainer		
Date	21.6.79, 27.6.79	3.7.79, 9.7.79
Trials (% correct)	13(23), 13(54)	12(50), 9(22)

Fig. 9-29

Lee - POST-TEST 1 - Generalisation Probes
Training Category - Labelling Persons/Actions/Things
STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(AOBJ)/(PREP)
- Generalisations in Test Conditions A and B



Lee - POST-TEST 1 - Generalisation Probes

Table 9-30

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

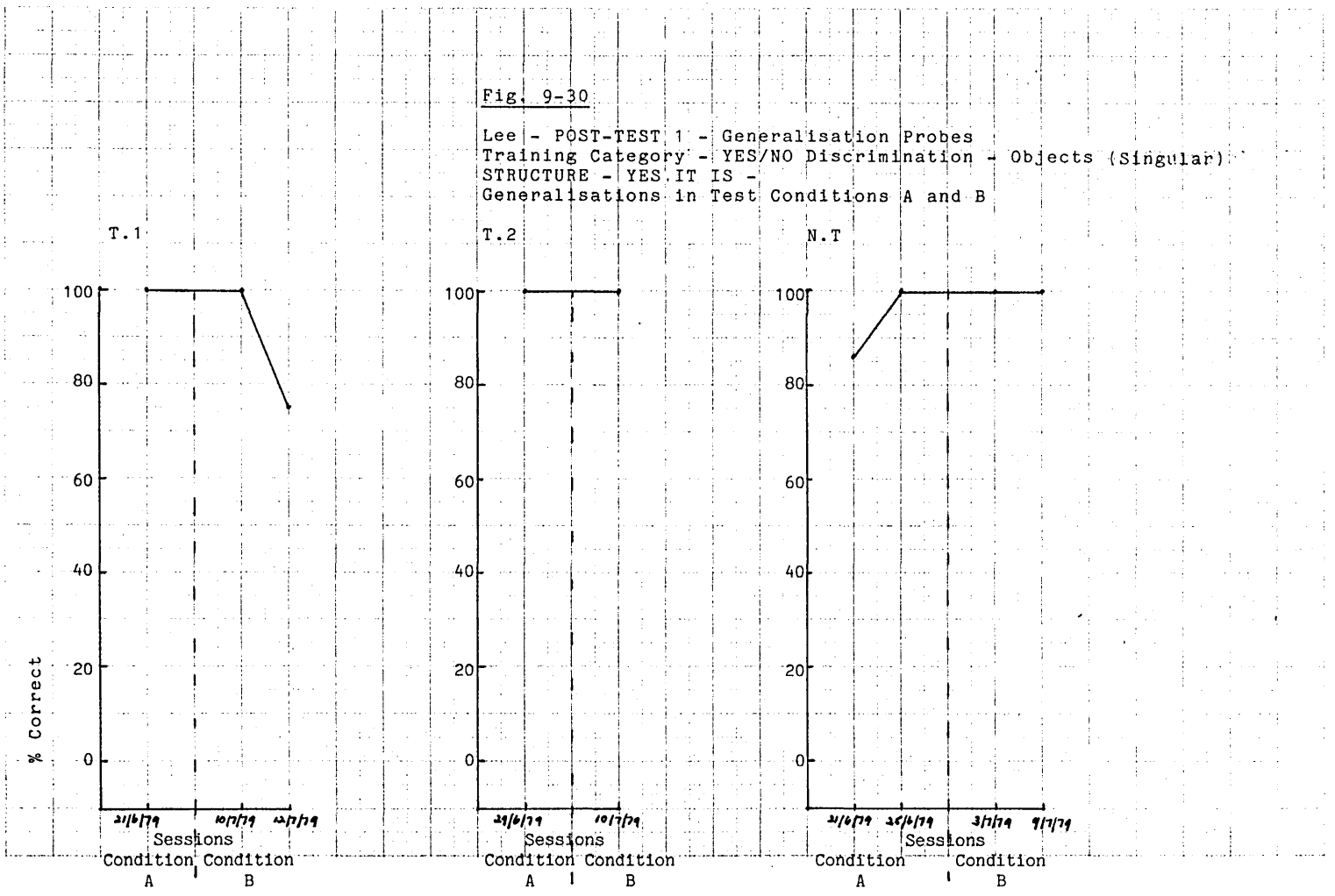
Training Category - YES/NO Discrimination - Objects - (Singular)

STRUCTURE - YES IT IS (yes + pron + copula)

	CONDITION A	CONDITION B
Trainer 1		
Date	25.6.79	12.7.79, 17.7.79
Trials (% correct)	12(100)	3(100), 4(75)
Trainer 2		
Date	29.6.79	10.7.79
Trials (% correct)	13(100)	9(100)
Non-Trainer		
Date	21.6.79, 27.6.79	3.7.79, 9.7.79
Trials (% correct)	7(86), 12(100)	6(100), 6(100)

Fig. 9-30

Lee - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects (Singular)
STRUCTURE - YES IT IS -
Generalisations in Test Conditions A and B



Lee - POST-TEST 1 - Generalisation Probes

Table 9-31

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

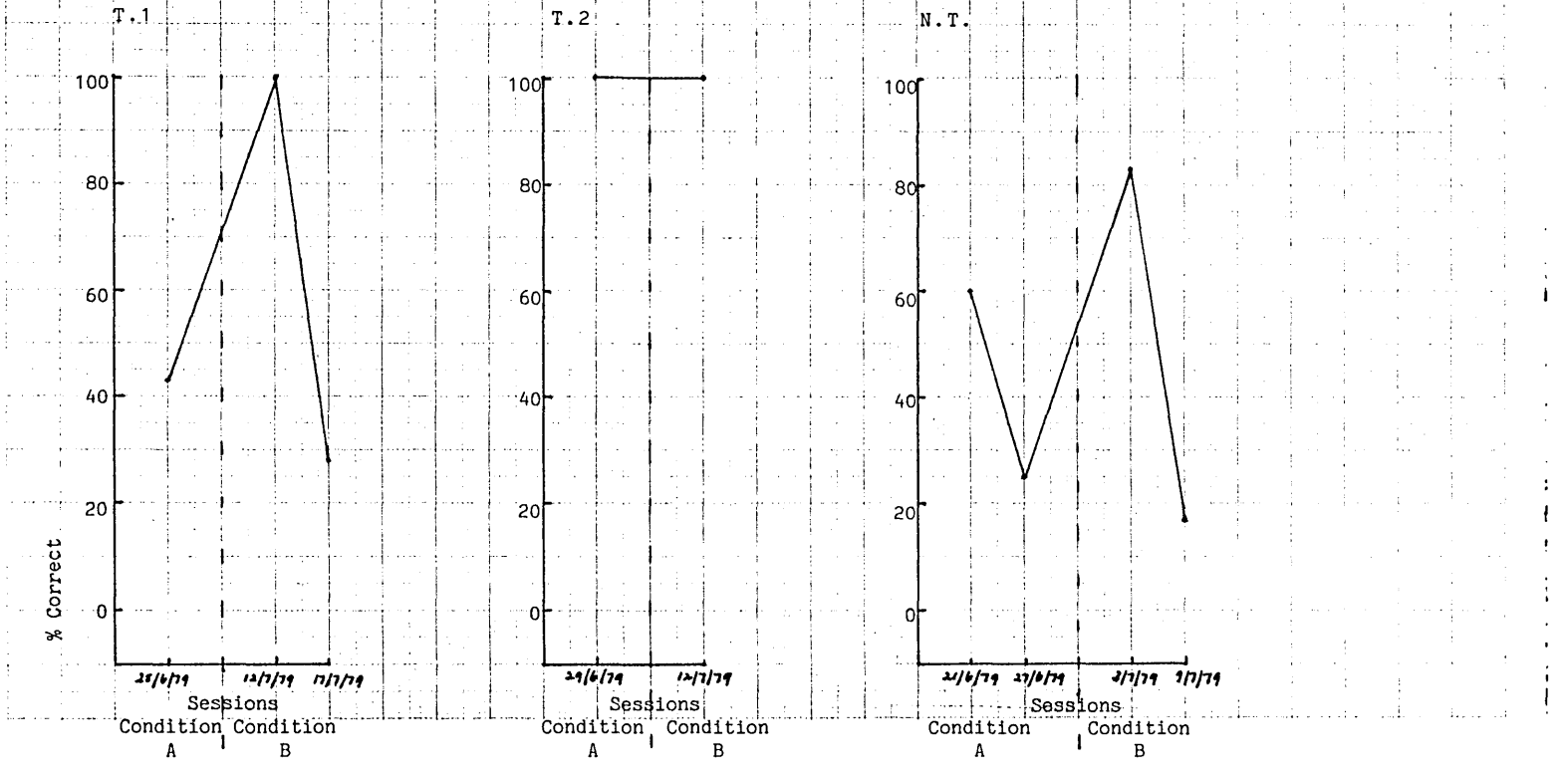
Training Category - YES/NO Discrimination - Objects - (Singular)

STRUCTURE - NO IT ISN'T IT'S A (NOUN)
(no + pron + copula + neg + pron + cop + det + noun)

	CONDITION A	CONDITION B
Trainer 1		
Date	25.6.79	12.7.79, 17.7.79
Trials (% correct)	7(43)	3(100), 7(28)
Trainer 2		
Date	29.6.79	10.7.79
Trials (% correct)	6(100)	6(100)
Non-Trainer		
Date	21.6.79, 27.6.79	3.7.79, 9.7.79
Trials (% correct)	5(60), 4(25)	6(83), 6(17)

Fig. 9-31

Lee - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects (Singular)
STRUCTURE - NO IT ISN'T, IT'S A (NOUN)
Generalisations in Test Conditions A and B



Lee - POST-TEST 1 - Generalisation Probes

Table 9-32

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

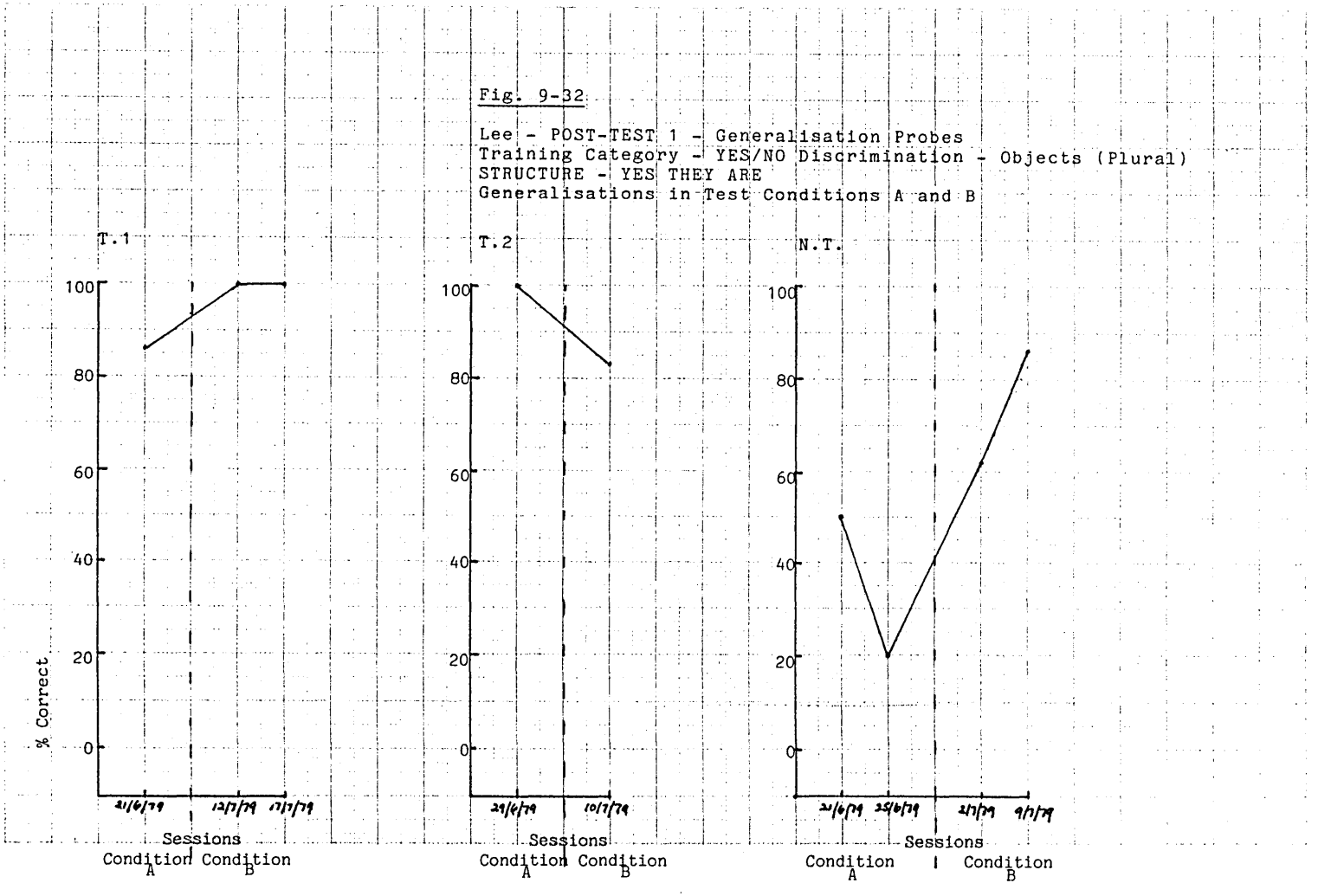
Training Category - YES/NO Discrimination - Objects - (Plural)

STRUCTURE - YES THEY ARE (yes + pron + copula)

	CONDITION A	CONDITION B
Trainer 1		
Date	25.6.79	12.7.79, 17.7.79
Trials (% correct)	7(86)	3(100), 3(100)
Trainer 2		
Date	29.6.79	10.7.79
Trials (% correct)	13(100)	6(83)
Non-Trainer		
Date	21.6.79, 27.6.79	3.7.79, 9.7.79
Trials (% correct)	6(50), 10(20)	8(62), 7(86)

Fig. 9-32

Lee - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects (Plural)
STRUCTURE - YES THEY ARE
Generalisations in Test Conditions A and B



Lee - POST-TEST 1 - Generalisation Probes

Table 9-33

Summary of Generalisations per Structure by Sessions and Trials in Test Conditions A and B

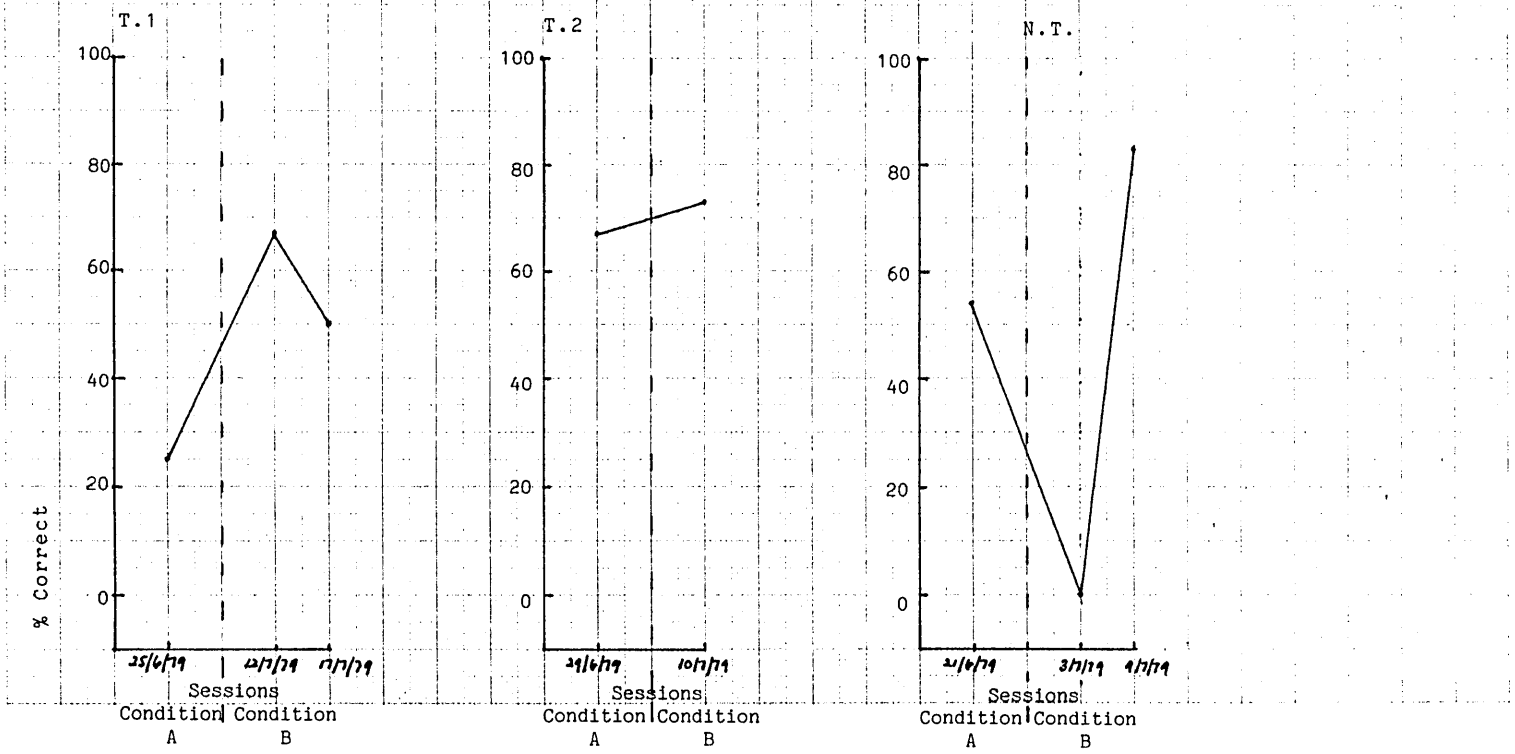
Training Category - YES/NO Discrimination - Objects - (Plural)

STRUCTURE - NO THEY AREN'T/ARE NOT THEY'RE (NOUNS)
(No + pron + copula + neg + pron + cop' + noun + pl)

	CONDITION A	CONDITION B
Trainer 1		
Date	21.6.79	12.7.79, 17.7.79
Trials (% correct)	12(25)	3(67), 4(50)
Trainer 2		
Date	29.6.79	10.7.79
Trials (% correct)	6(67)	6(83)
Non-Trainer		
Date	21.6.79, 27.6.79	3.7.79, 9.7.79
Trials (% correct)	11(54) -	6(8), 6(83)

Fig. 9 - 33

Lee - POST-TEST 1 - Generalisation Probes
Training Category - YES/NO Discriminations - Objects (Plural)
STRUCTURE - NO THEY AREN'T/ ARE NOT, THEY'RE (NOUNS)
Generalisations in Test Conditions A and B



Lee - POST-TEST 2 Generalisation Probes - (High Structure)

Table 9-34

Summary of Generalisations per Structure by Sessions and Trials in Sub-Tests I and II

Training Category - Labelling Objects -(Singular)

STRUCTURE - IT'S A (NOUN)

Trainer 1

Sub-Test I
Trials (% correct) - 11(45)

Sub-Test II
Trials (% correct) - 17(18)

Training Category - Labelling Objects - Plural

STRUCTURE - THEY'RE (NOUNS)

Trainer 1

Sub-Test I
Trials (% correct) - 15(60)

Sub-Test II
Trials (% correct) - 12(100)

Training Category - Labelling Persons

STRUCTURE - IT'S PERSON (NAME)

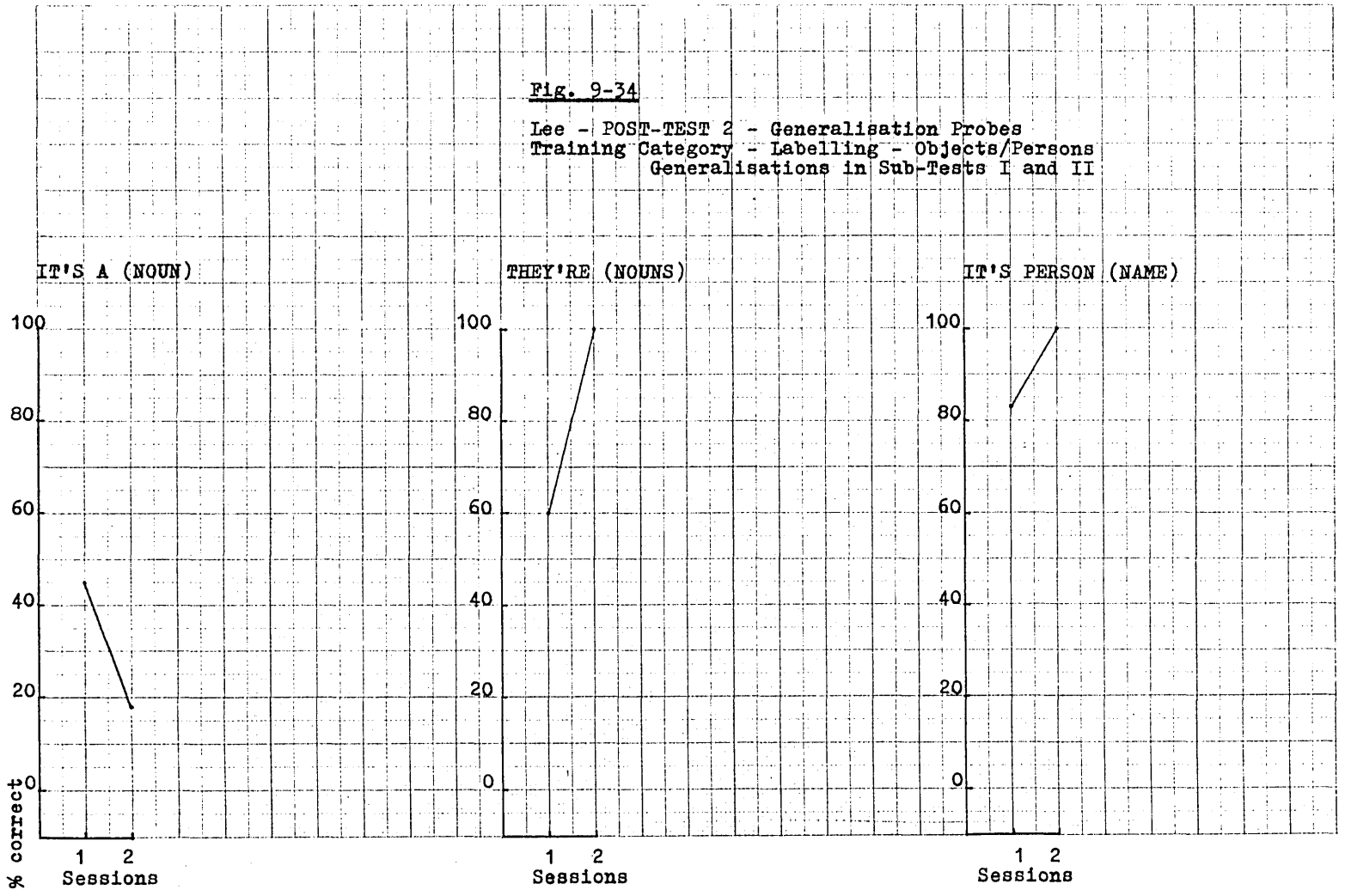
Trainer 1

Sub-Test I
Trials (% correct) - 6(83)

Sub-Test II
Trials (% correct) - 7(100)

Fig. 9-34

Lee - POST-TEST 2 - Generalisation Probes
Training Category - Labelling - Objects/Persons
Generalisations in Sub-Tests I and II



Lee - POST-TEST 2 - Generalisation Probes -
High Structure

Table 9-35

Summary of Generalisations per Structure by Sessions and Trials in Sub-Tests I and II

Training Category - Labelling Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/GIRL/BOY VERB-ING (OBJ)/(AOBJ)/(PREP)
(pron + cop + det + subj + (obj)/
(det + obj)/(prep)

Trainer 1

Sub Test I
Trials (% correct) - 12(67)

Sub-Test II
Trials (% correct) - 13(54)

Training Category - Labelling Actions - Persons (untrained)

STRUCTURE - VERBING (OBJ)/(PREP)

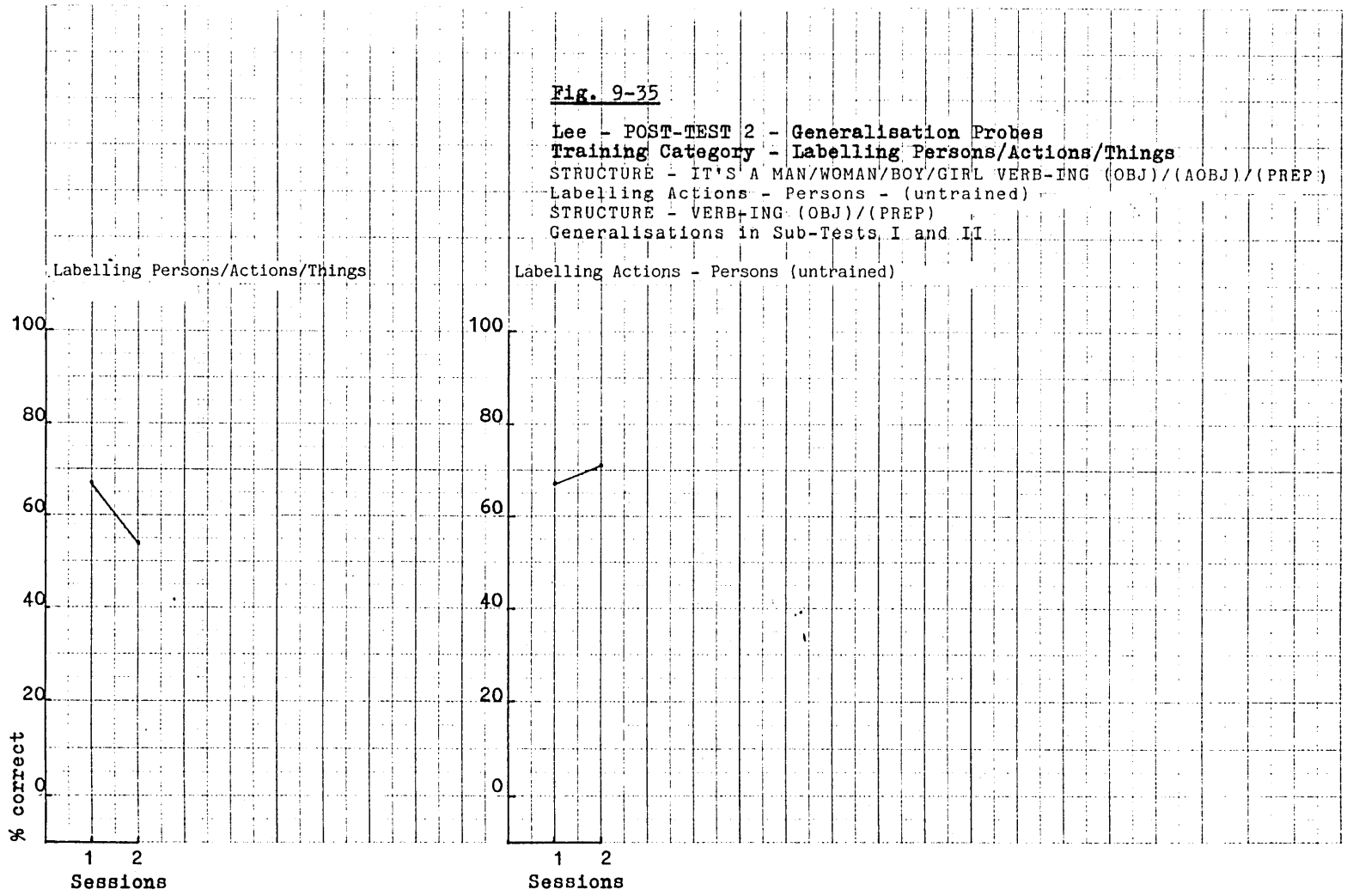
Trainer 1

Sub-Test I
Trials (% correct) - 6(67)

Sub-Test II
Trials (% correct) - 7(71)

Fig. 9-35

Lee - POST-TEST 2 - Generalisation Probes
Training Category - Labelling Persons/Actions/Things
STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(AOBJ)/(PREP)
Labelling Actions - Persons - (untrained)
STRUCTURE - VERB+ING (OBJ)/(PREP)
Generalisations in Sub-Tests I and II



Lee - POST-TEST 2 - Generalisation Probes
- (High Structure)

Table 9-36

Summary of Generalisations per Structure by Sessions and Trials in Sub-Tests I and II

Training Category - YES/NO Discrimination - Objects
- (Singular)

STRUCTURE - YES IT IS
(yes + pron + copula)

Trainer 1

Sub-Test I
Trials (% correct) - 8(100)

Sub-Test II
Trials (% correct) - 3(100)

Training Category - YES/NO Discrimination - Objects -
(Plural)

STRUCTURE - YES THEY ARE
(yes + pron + copula)

Trainer 1

Sub-Test I
Trials (% correct) - 9(87)

Sub-Test II
Trials (% correct) - 5(60)

Training Category - YES/NO Discrimination - Objects
- (Singular)

STRUCTURE - NO IT ISN'T, IT'S A (NOUN)
(no + pron + copula + neg + pron + cop
+ det + noun)

Trainer 1

Sub-Test I
Trials (% correct) - 9(33)

Sub-Test II
Trials (% correct) - 4(100)

Table 9-36 continued

Training Category - YES/NO Discrimination - Objects
- Singular

STRUCTURE - NO THEY AREN'T, THEY'RE (NOUNS)
(no + pron + copula + neg + pron + cop' + noun + pl)

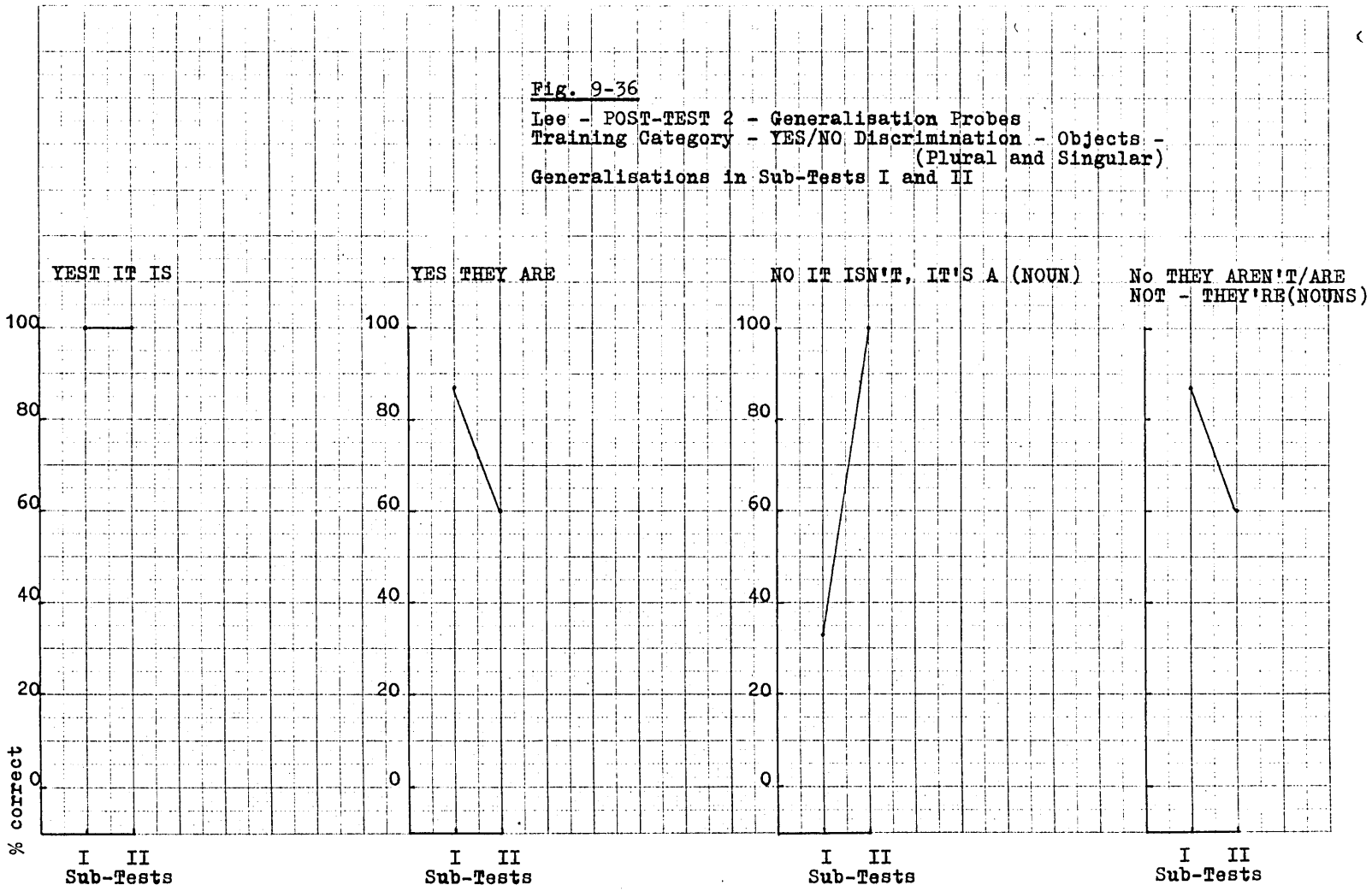
Trainer 1

Sub-Test I
Trials (% correct) - 8(87)

Sub-Test II
Trials (% correct) - 5(60)

Fig. 9-36

Lee - POST-TEST 2 - Generalisation Probes
Training Category - YES/NO Discrimination - Objects - (Plural and Singular)
Generalisations in Sub-Tests I and II



Lee - POST-TEST 3 - Generalisation Probes - (High Structure) - Trainer 1

Table 9-37

Summary of Generalisations per Structure by Sessions and Trials

STRUCTURE - IT'S A (NOUN)
(pron + cop + det + noun)
Labelling - Objects - (Singular)

Trials (% correct) - 6(100)

STRUCTURE - THEY'RE NOUNS
(pron + cop' + noun + pl)
Labelling - Objects - (Plural)

Trials (% correct) - 6(67)

STRUCTURE - IT'S PERSON(NAME)
(pron + cop + proper noun)
Labelling - Persons

Trials (% correct) - 3(100)

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (OBJ)/(PREP)
(pron + cop + det + subj + verb + ing + (obj)/(prep)
Labelling Persons/Actions/Things

Trials (% correct) - 6(100)

STRUCTURE - VERBING (OBJ)/(PREP)
Labelling - Actions - Persons

Trials (% correct) - 4(100)

STRUCTURE - I AM VERBING (OBJ)/(PREP)
VERBING (OBJ)/(PREP)
(pron + aux + verb + ing + (obj)/(prep))
Pronominal Usage - Pron I + Labelling - Actions

Trials (% correct) - 5(80)

STRUCTURE - YES IT IS
(yes + pron + copula)
YES/NO Discrimination - Objects -
(Singular)

Trials (% correct) - 6(100)

STRUCTURE - YES THEY ARE
(yes + pron + cop')
YES/NO Discrimination - Objects -
(Plural)

Trials (% correct) - 6(100)

STRUCTURE - NO IT ISN'T, IT'S A (NOUN)
(no + pron + copula + neg + pron + cop
+ det + noun)
YES/NO Discrimination - Objects (Singular)

Trials (% correct) - 7(71)

STRUCTURE - NO THEY AREN'T/ARE NOT THEY'RE (NOUNS)
(no + pron + cop' + neg + pron + cop'
+ noun (pl))

Trials (% correct) - 7(0)

STRUCTURE - YES I AM (VERB-ING OBJ/PREP)
(yes + pron + aux)
Pronominal Usage - I + YES/NO
Discrimination

Trials (% correct) - 3(0)

STRUCTURE - NO I'M NOT, I'M/I AM VERB-ING (OBJ)/
(AOBJ)/(PREP)
(No + pron + aux + neg + pron + aux
+ verb + ing + (det + obj)/(prep))

Trials (% correct) - 4(0)

STRUCTURE - I AM (VERB-ING) (LEE)
(pron + aux + verb-ing)
Pronominal Usage - I

Trials (% correct) - 3(100)

STRUCTURE - HE/SHE IS/HE/SHE'S VERB-ING (AOBJ)/(PREP)
(pron + aux + verb + ing (det + obj)/
(prep)
Pronominal Usage - HE/SHE + Labelling
Actions/Things

Trials (% correct) - 7(57)

STRUCTURE - YES HE/SHE IS
(yes + pron + copula)
Pronominal Usage - HE/SHE + YES/NO
Discrimination

Trials (% correct) - 5(80)

STRUCTURE - NO HE/SHE ISN'T, HE/SHE'S/VERB-ING
(AOBJ)/(PREP)
(no + pron + cop + neg + pron + aux +
verb-ing (det + obj)/(prep)
Pronominal Usage - HE/SHE + YES/NO
Discrimination

Trials (% correct) - 4(100)

STRUCTURE - PREPOSITIONS IN/ON, BEHIND/IN FRONT OF,
OVER/UNDER, NEXT TO/OVER THERE

MOTOR RESPONSE

Trials (% correct) - 8(87)

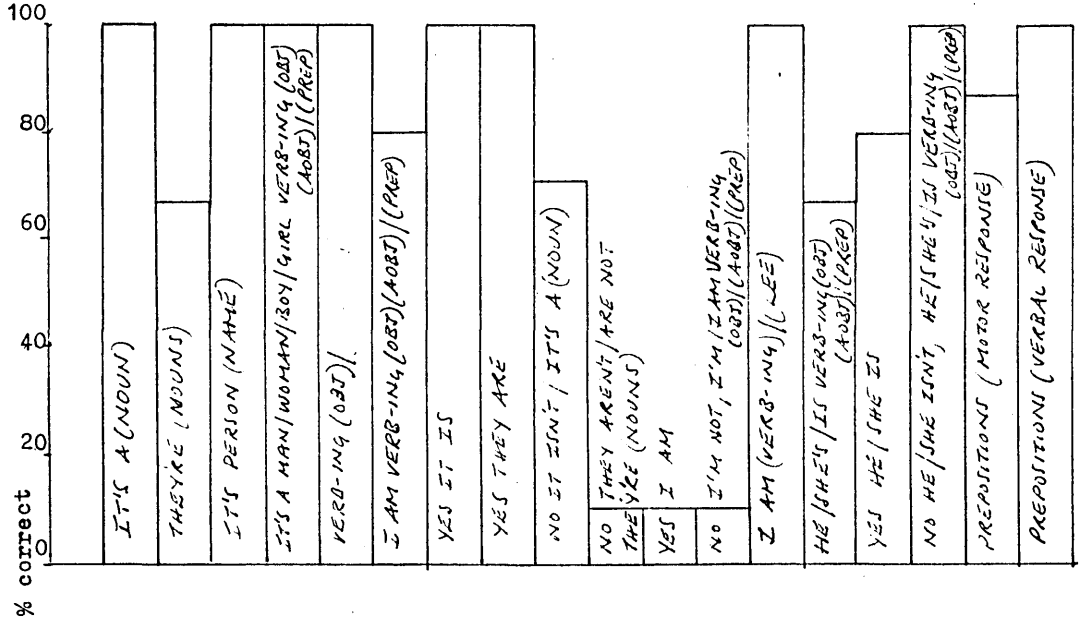
STRUCTURE - PREPOSITIONS IN/ON, BEHIND/IN FRONT OF
OVER/UNDER, NEXT TO/OVER THERE

VERBAL RESPONSE - e.g. IT'S IN THE (NOUN)/IN THE
(NOUN)/IT'S IN (NOUN)

Trials (% correct) - 8(100)

Fig. 9-37

Lee - POST-TEST 3 - Generalisation Probes (High Structure)
Generalisations



Lee - POST-TEST 3 - Generalisation Probes -
(Low Structure)

Table 9-38

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling - Objects (Singular)

STRUCTURE - IT'S A (NOUN)
(pron + cop + det + noun)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	5(60)	5(60)	4(100)	5(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	5(80)	5(100)	5(100)	5(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	1(100)	5(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	4(100)	3(33)	4(75)	5(60)
Context	4	4	3	2

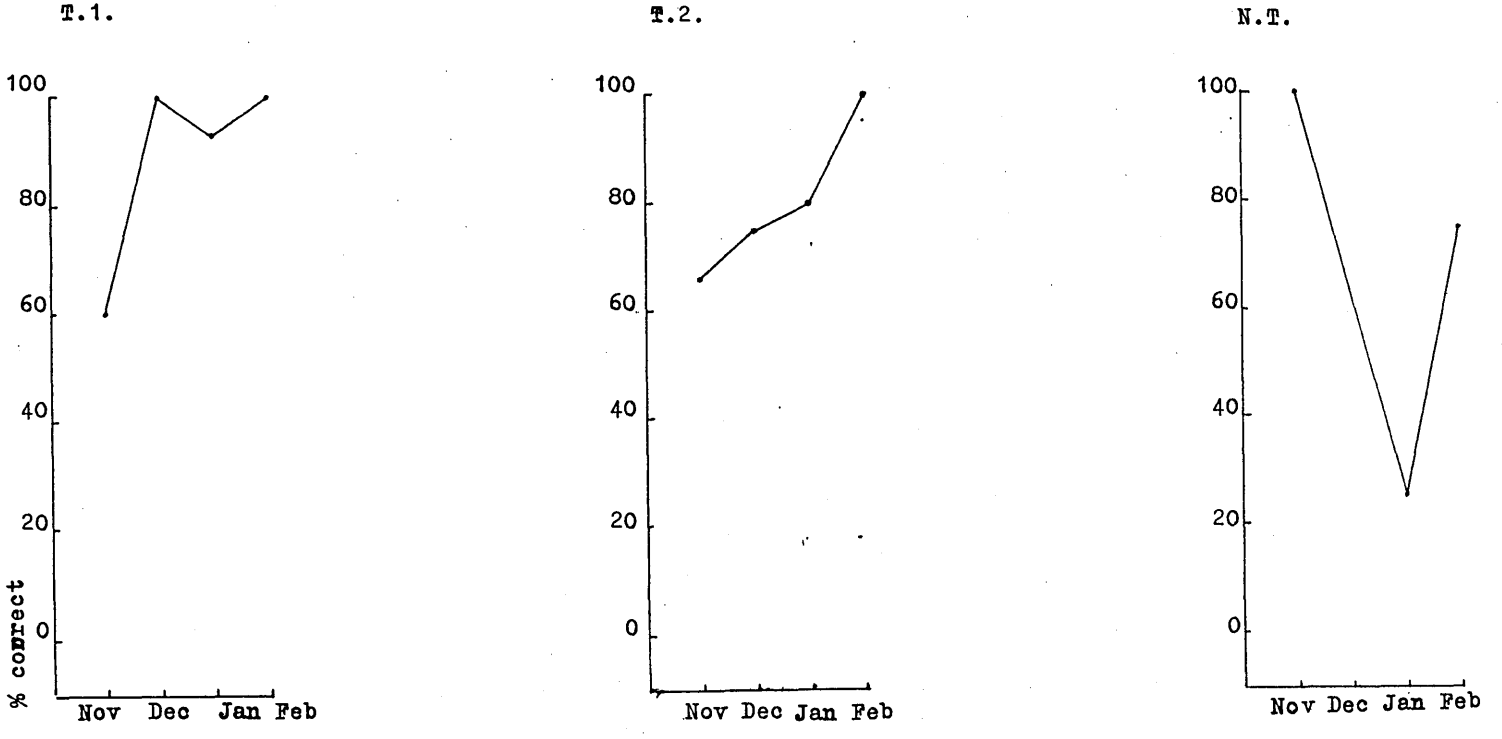
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(100)	4(100)	2(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	5(100)	-	4(25)	4(75)
Context	3	3	3	2

Fig. 9-38

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Category - Labelling Objects - (Singular)
Structure - IT'S A (NOUN) - Generalisations



Lee - POST-TEST 3 - Generalisation Probes -
(Low Structure)

Table 9-39

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling - Objects (Plural)

STRUCTURE - THEY'RE (NOUNS)
(pron + cop' + noun + pl)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	3(100)	6(100)	6(100)	6(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	1(100)	3(100)	-	6(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	6(100)	-
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	2(100)	3(100)	3(100)	5(100)
Context	4	4	2	2

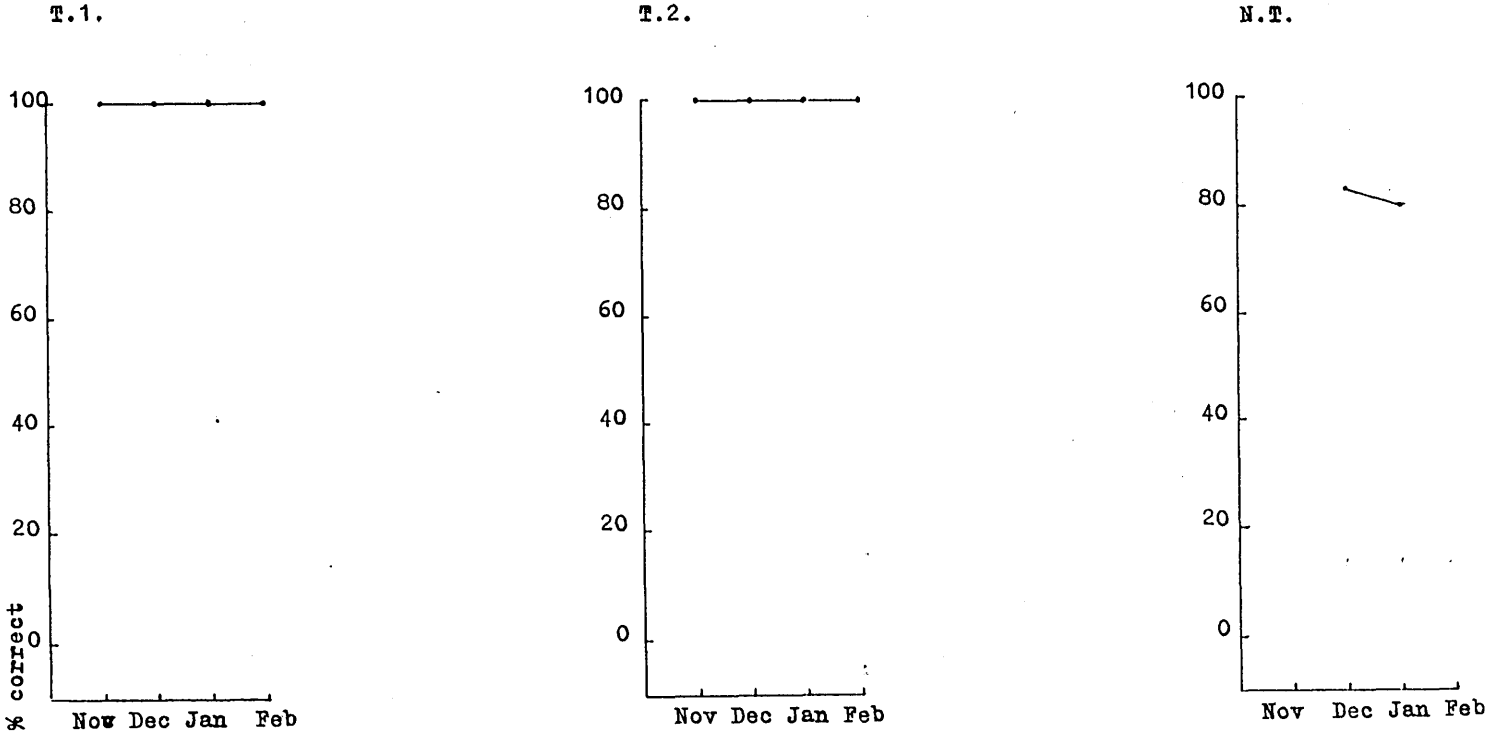
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	4(100)	6(100)	5(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	-	6(83)	5(80)	-
Context	3	3	3	2

Fig. 9-39

Lee - POST-TEST 3 - Generalisation Probes (Low Structure)
Category - Labelling Objects (Plural)
STRUCTURE - THEY'RE (NOUNS) - Generalisations



Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)

Table 9-40

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling - Persons

STRUCTURE - IT'S PERSON (NAME)
(pron + cop + proper noun)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	4(75)	4(100)	2(100)	4(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	3(100)	2(100)	4(100)	3(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	4(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	3(67)	1(100)	3(100)	2(50)
Context	4	4	3	2

Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	4(100)	4(100)	3(100)
Context	2	1	3

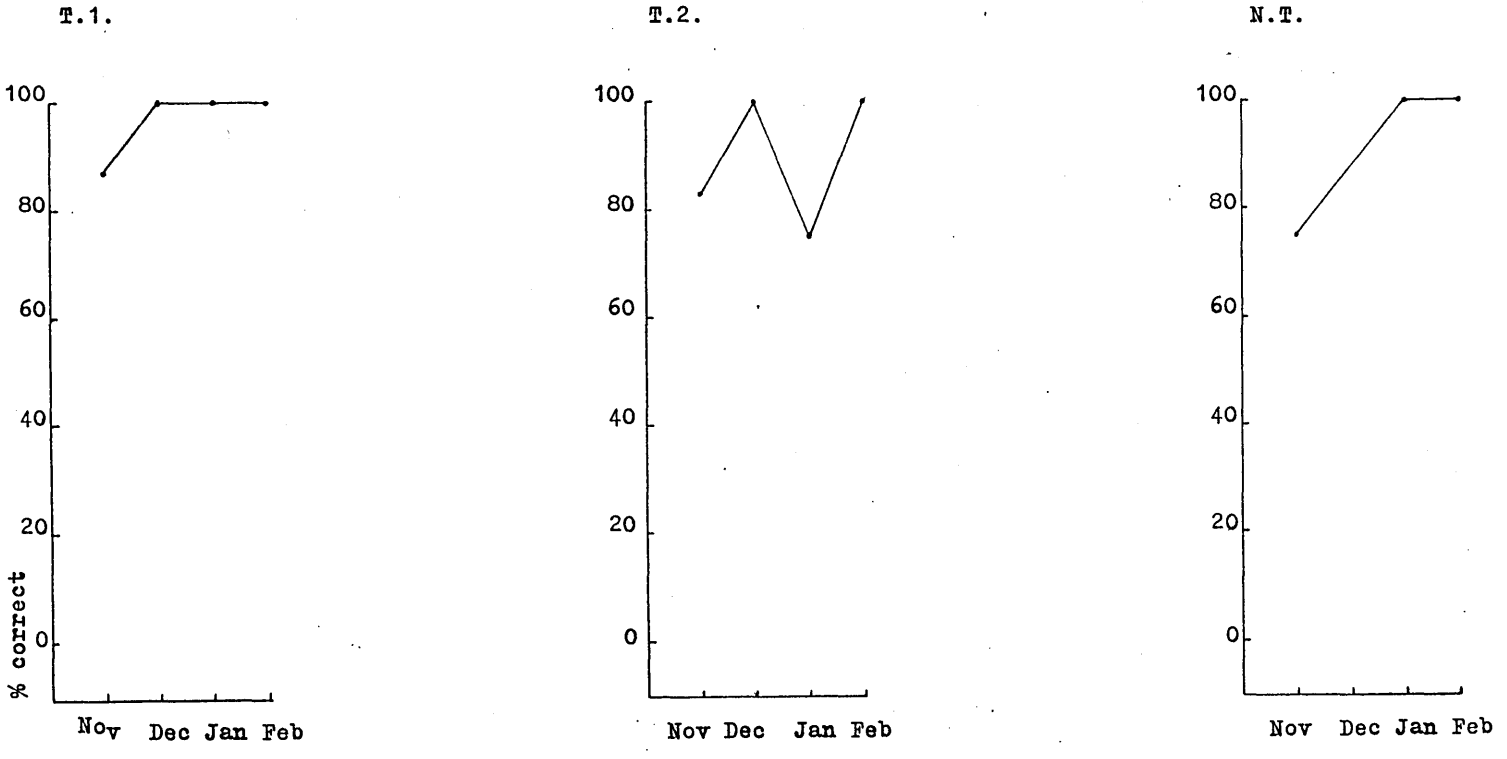
Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	4(75)	-	4(100)	4(100)
Context	2/3	3	3	2

Fig. 9-40

Lee - POST-TEST 3 - Generalisation Probes (Low Structure)
Category - Labelling - Persons

STRUCTURE - IT'S PERSON (NAME) - Generalisations



Lee - POST-TEST 3 - Generalisation Probes -
(Low Structure)

Table 9-41

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling Persons/Actions/Things

STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING
(AOBJ)/(OBJ)/(PREP)
(pron + cop + det + subj + verb + ing +
(det + obj)/(obj)/(prep)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	-	2(100)	3(67)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	3(100)	3(100)	3(100)	-
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	3(100)	-
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	-	1(100)	-	3(67)
Context	4	1	3	2

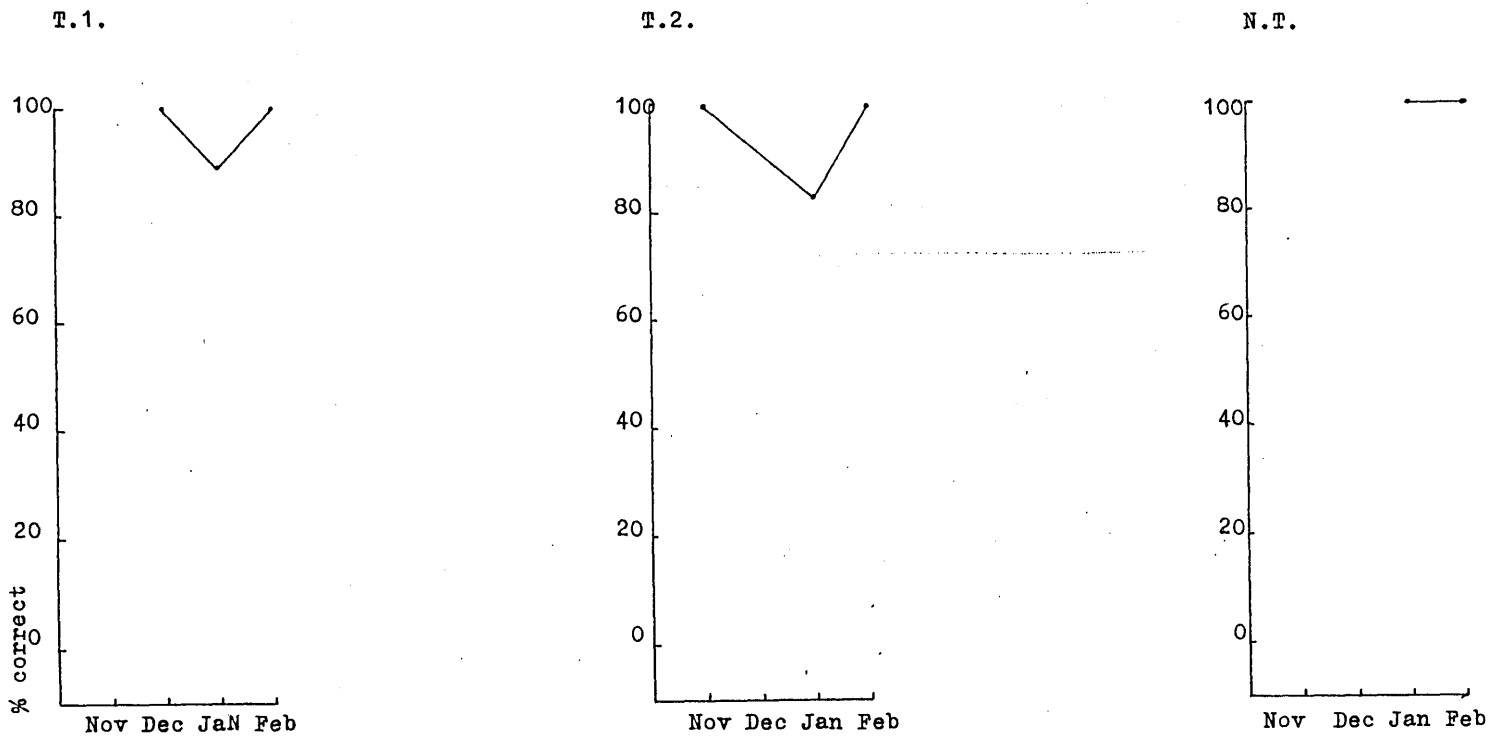
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(100)	2(100)	2(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	-	-	3(100)	3(100)
Context	2/3	3	3	2

Fig. 9-41

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Category - Labelling Persons/Actions/Things
STRUCTURE - IT'S A MAN/WOMAN/BOY/GIRL VERB-ING (AOBJ)/(PREP)
- Generalisations



Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)

Table 9-42

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Labelling - Actions - Persons

STRUCTURE - VERB-ING (A/OBJ)/(PREP)
(verb+ing(obj)/(det+obj)/(preposition))

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	2(50)	1(100)	3(100)	1(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	1(100)	1(100)	1(100)	-
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	1(100)	-
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	28.11.79	14.12.79
Trials (% correct)	1(100)	-	-	1(100)
Context	4	4	1	3

Date	16.1.80	22.1.80	6.2.80	14.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	1(100)	-	1(100)	1(100)
Context	2/3	3	3	2

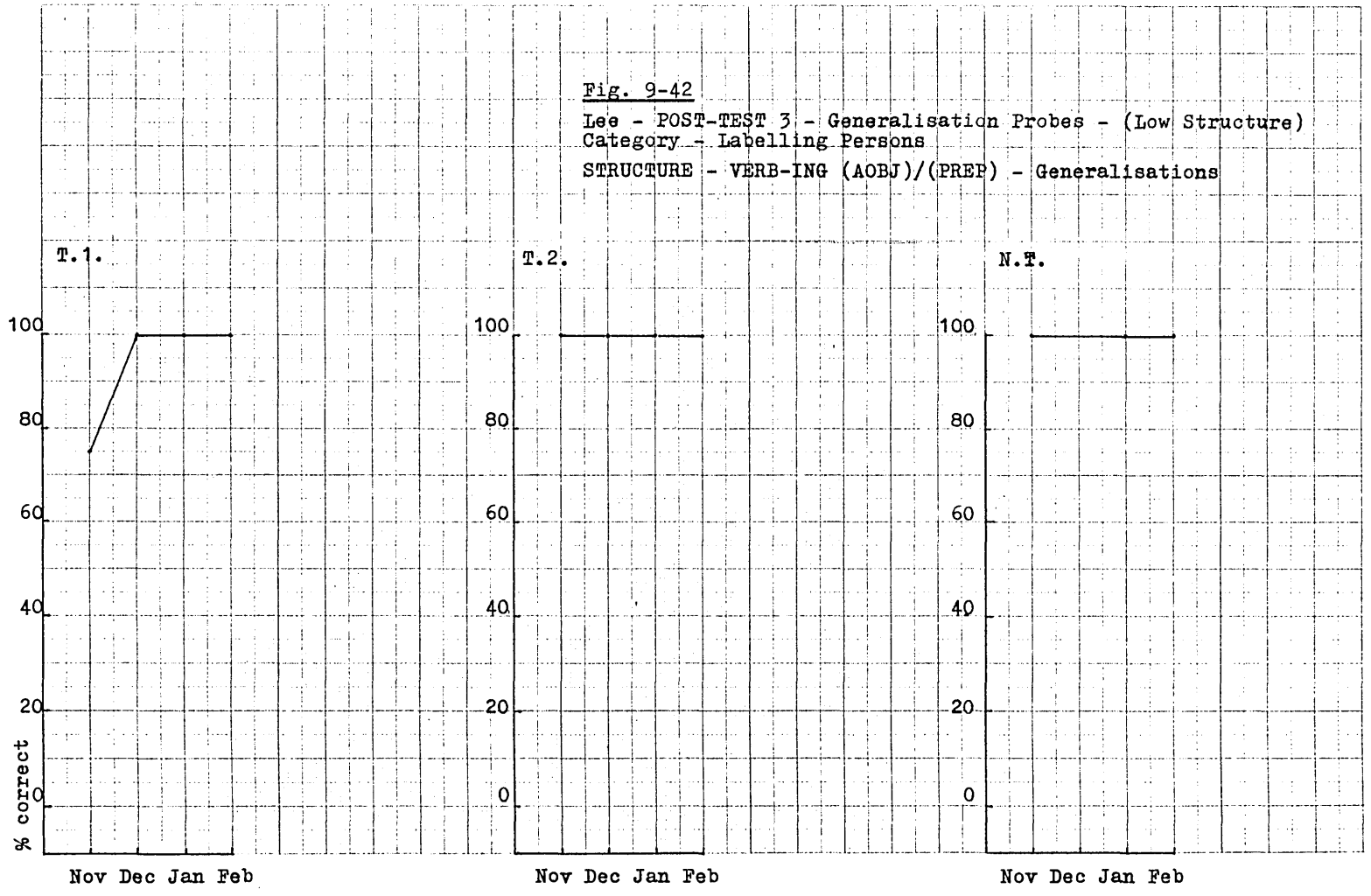


Fig. 9-42
Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Category - Labelling Persons
STRUCTURE - VERB-ING (AOBJ)/(PREP) - Generalisations
T.1.
T.2.
N.T.
100
80
60
40
20
0
% correct
Nov Dec Jan Feb
Nov Dec Jan Feb
Nov Dec Jan Feb

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)

Table 9-43

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Yes/No Discrimination - Objects (Singular)

STRUCTURE - YES IT IS (yes + pron + copula)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	4(100)	4(100)	1(100)	4(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	4(100)	-	4(100)	4(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	3(100)	4(75)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	3(67)	-	1(100)	4(100)
Context	4	1	3	2

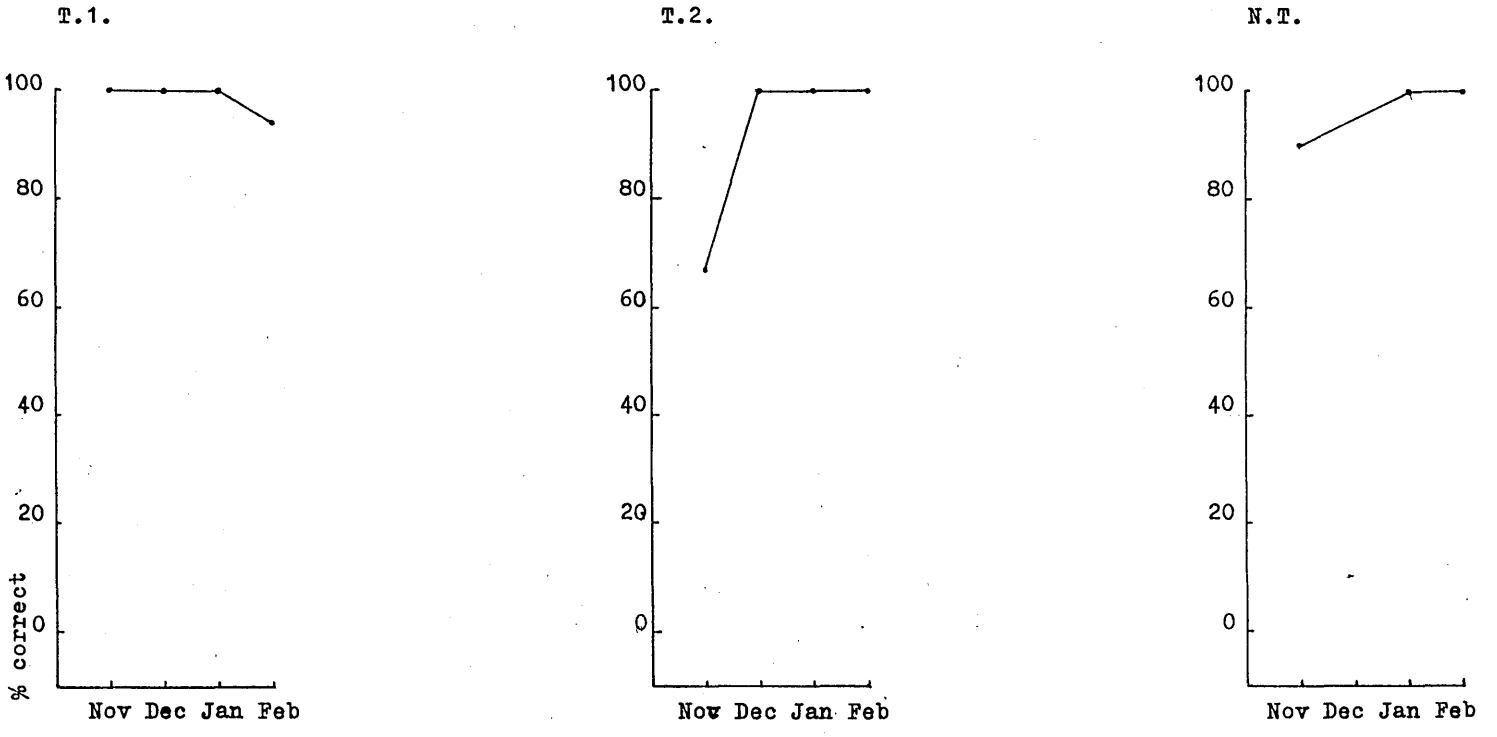
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	3(100)	4(100)	4(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	5(80)	4(100)	4(100)	4(100)
Context	2/3	3	3	2

Fig. 9-43

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - YES/NO Discrimination - Objects/Persons - (Singular)
STRUCTURE - YES IT IS - Generalisations



Lee - POST-TEST 3 - Generalisation Probes -
(Low Structure)

Table 9-44

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Yes/No Discrimination - Objects (Singular)

STRUCTURE - NO IT ISN'T, IT'S A (NOUN)/NO IT'S NOT, IT'S A (NOUN)
(no + pron + copula + neg + pron + cop' + det + noun/+ noun)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	4(75)	4(75)	2(100)	4(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	4(100)	-	4(100)	4(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	4(100)	4(75)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	3(33)	-	3(100)	4(100)
Context	4	1	3	2

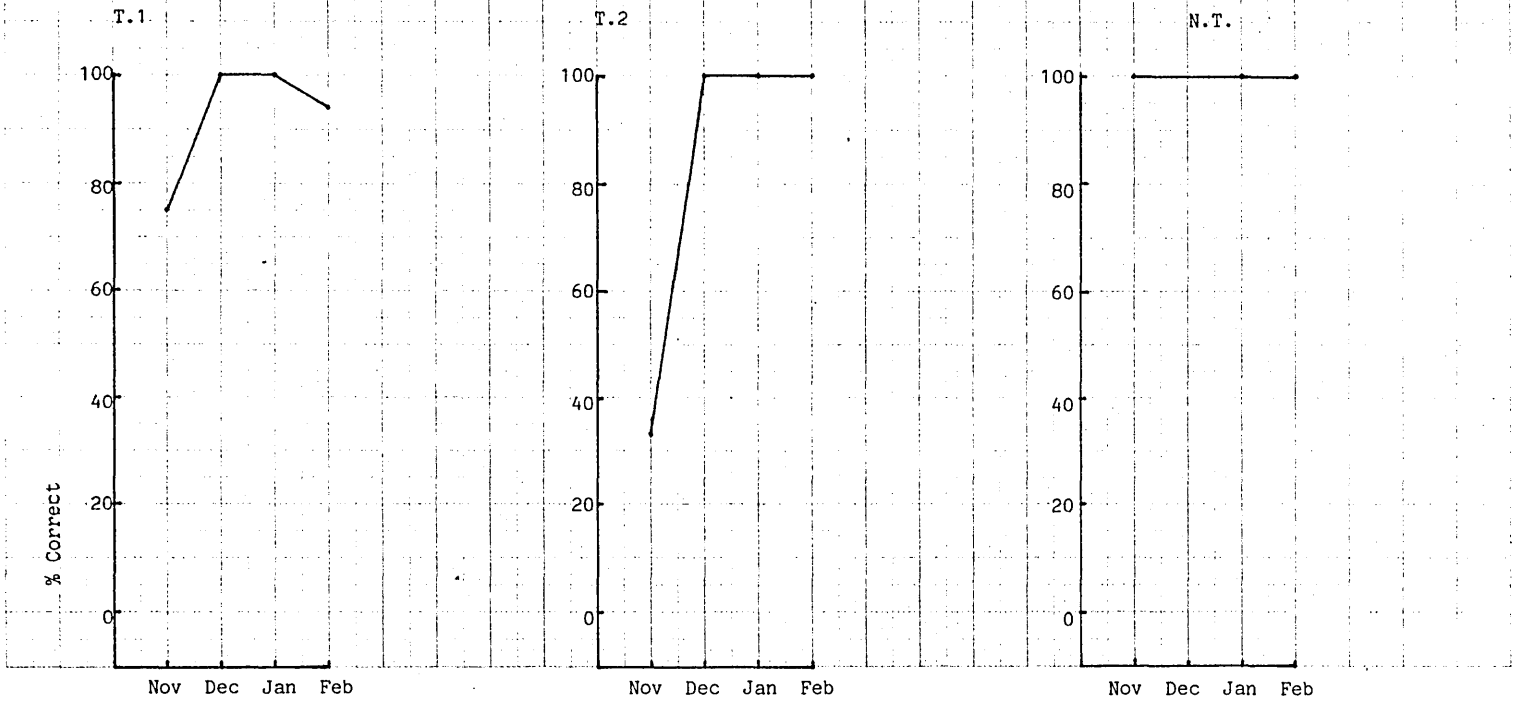
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	3(100)	4(100)	4(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	3(100)	4(100)	4(100)	4(100)
Context	2/3	3	3	2

Fig.9-44

Lee - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - YES/No Discrimination - Objects (Singular)
STRUCTURE - NO IT ISN'T IT'S A (NOUN)/NO IT'S NOT IT'S A (NOUN)



Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)

Table 9-45

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Yes/No Discrimination - Objects (Plural)

STRUCTURE - YES THEY ARE/YES THEY'RE (NOUNS)/YES THEY ARE (NOUNS)
(yes + pron + verb)/(yes + pron + verb + noun + pl)/(yes + pron + verb + noun + pl)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	3(67)	3(67)	4(25)	3(67)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	3(100)	-	3(100)	3(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	3(100)	3(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	3(67)	-	1(0)	3(67)
Context	4	1	3	2

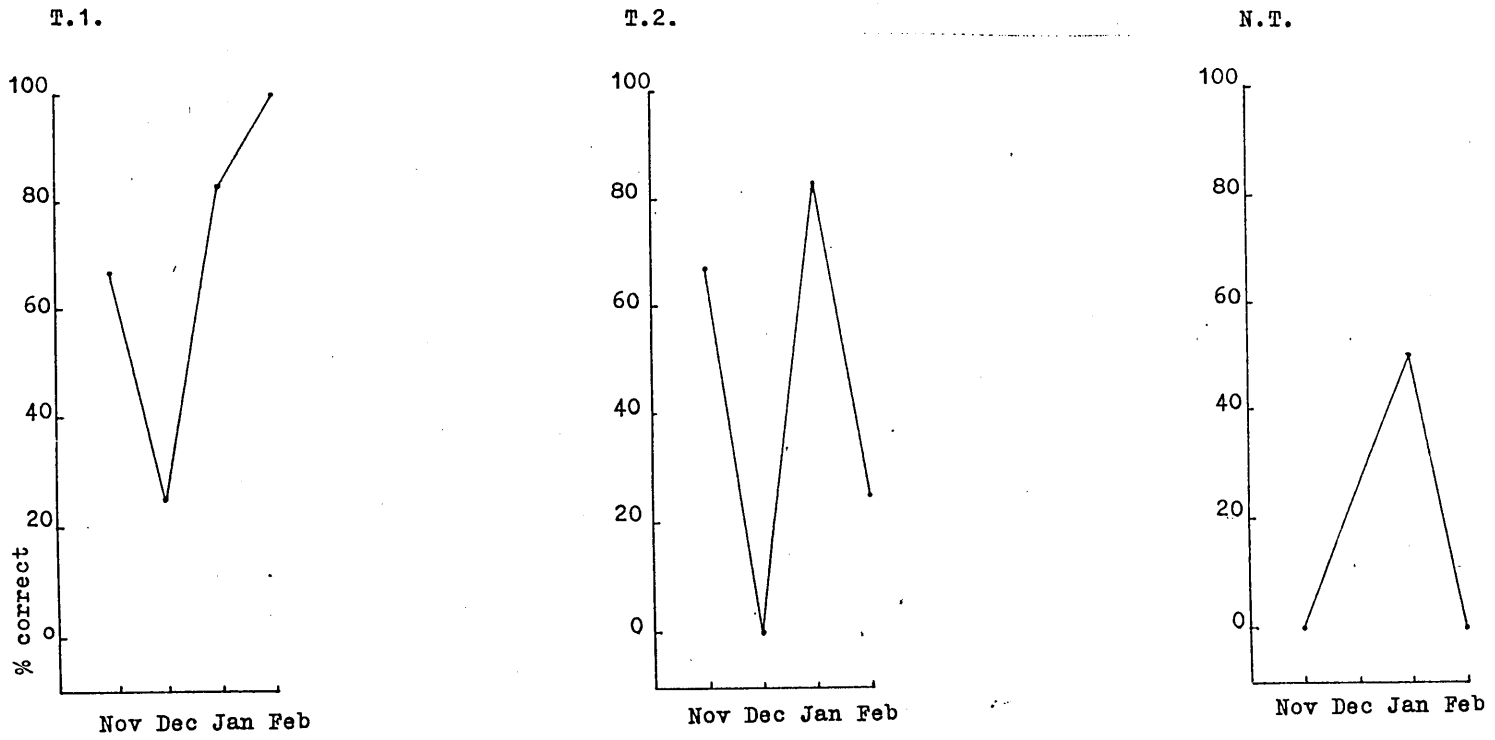
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	1(100)	2(50)	2(0)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(0)	3(0)	2(50)	3(0)
Context	2/3	3	3	2

Fig. 9-45

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - YES/NO Discrimination - Objects (plural)
STRUCTURE - YES THEY ARE/YES THEY'RE (NOUNS)/YES THEY ARE (NOUNS) - Generalisations



Lee - POST-TEST 3 - Generalisation Probes -
(Low Structure)

Table 9-46

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Yes/No Discrimination - Objects - (Plural)

STRUCTURE - NO THEY'RE NOT, THEY'RE (NOUNS)/NO THEY AREN'T/ARE NOT, THEY'RE (NOUNS)
no+pron+cop'+negative+pron+cop'+(noun(pl))
no+pron+cop'+neg/cop'+negative+pron+cop'+(noun(pl))

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	3(67)	3(33)	-	3(0)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	3(67)	-	3(100)	3(67)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	3(100)	3(67)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	1(100)	-	1(100)	3(33)
Context	4	1	3	2

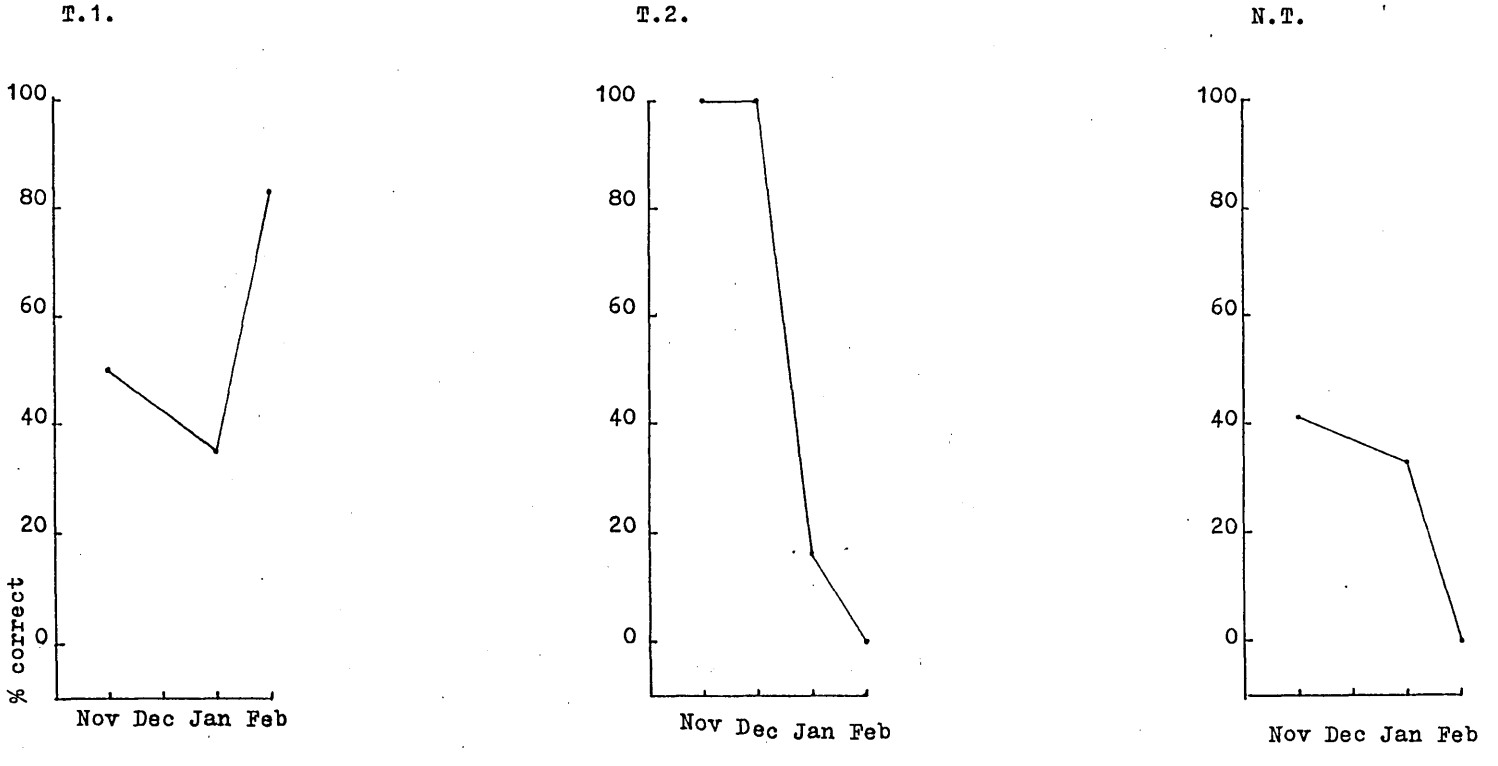
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	1(0)	2(0)	2(0)
Context	2	1	1

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(50)	3(33)	3(33)	3(0)
Context	2/3	3	3	2

Fig. 9-46

Lee - POST-TEST 3 - Generalisation Probes (Low Structure)
Category - YES/NO Discrimination - Objects - (Plural)
STRUCTURE - NO THEY AREN'T, THEY'RE (NOUNS)/NO, THEY'RE (NOUNS)/
NO THEY'RE NOT, THEY'RE (NOUNS)



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-47

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - I + Labelling - Actions

STRUCTURE - I AM/I'M VERBING (OBJ/(A OBJ)/(PREP) - VERBING (OBJ)/(A OBJ)/(PREP)
(pron + aux + verb + ing + (obj)/(det + obj)/(prep) - (verb + ing (obj)/(det + obj)/(prep)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	2(100)	2(100)	1(100)	2(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	2(100)	2(100)	2(50)	1(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	2(100)	1(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	2(100)	-	2(100)	2(100)
Context	4	4/1	3	2

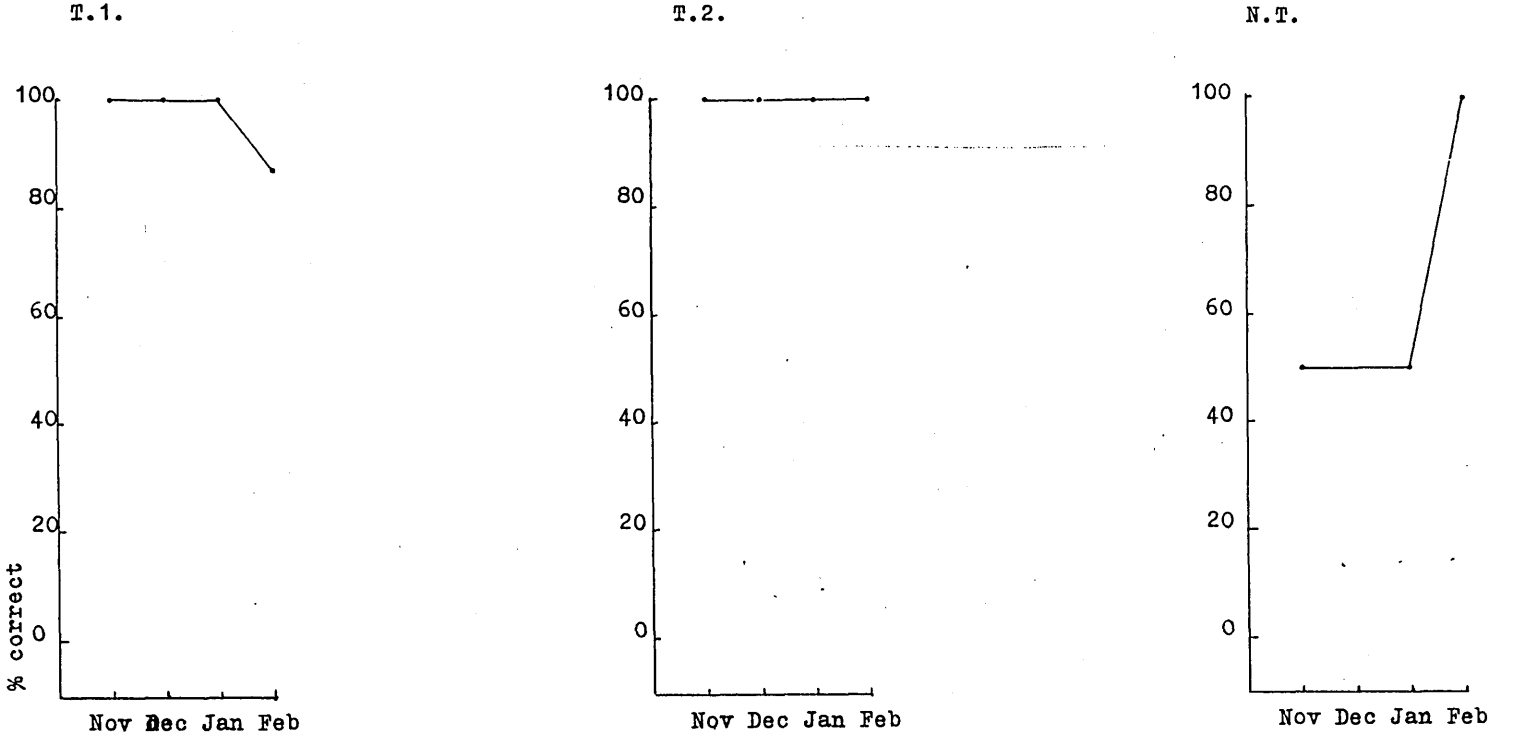
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(100)	2(100)	2(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(100)	1(0)	2(50)	3(100)
Context	2/3	3	3	2

Fig. 9-47

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Pronominal Usage - I + Labelling - Actions
STRUCTURE - I AM/I'M VERB-ING (OBJ)/(AOBJ)/(PREP) -
VERB-ING (OBJ)/(AOBJ)/(PREP) - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-48

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - I

STRUCTURE - I AM - (LEE)/(VERBING)
(pron + verb)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	3(100)	3(100)	3(100)	3(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	3(100)	3(100)	3(100)	3(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	3(100)	3(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	1(100)	2(100)	3(100)	3(100)
Context	4	4/1	3	2

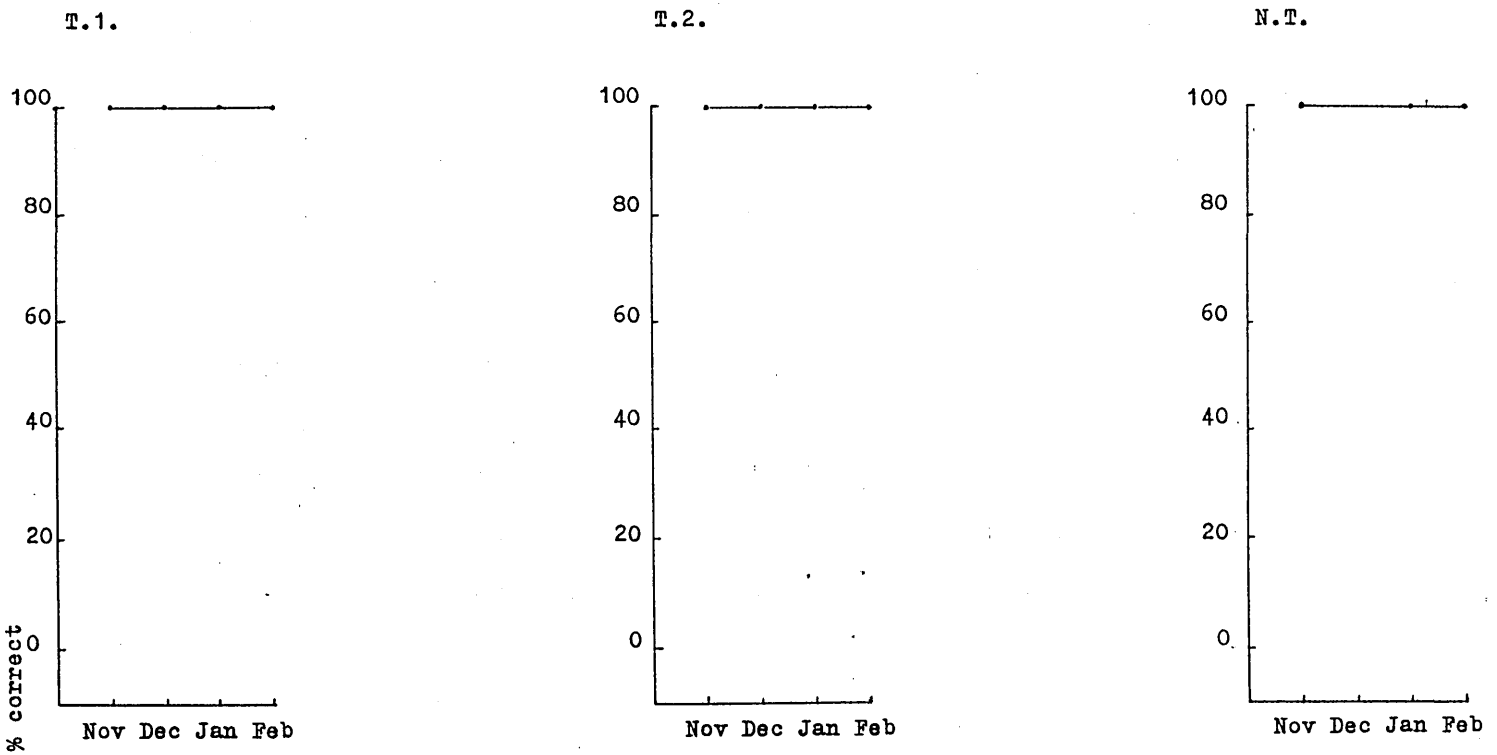
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	3(100)	3(100)	3(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	3(100)	3(100)	1(100)	3(100)
Context	2/3	3	3	-

Fig. 9-48

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Pronominal Usage
STRUCTURE - I AM (Lee)/(verbing) - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-49

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - I + Yes/No Discrimination

STRUCTURE - YES I AM (LEE)/(VERBING)
(yes + pron + verb)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	2(100)	2(100)	2(100)	2(50)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	2(50)	2(100)	2(100)	2(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	2(100)	2(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	1(100)	-	2(50)	2(100)
Context	4	1	3	2

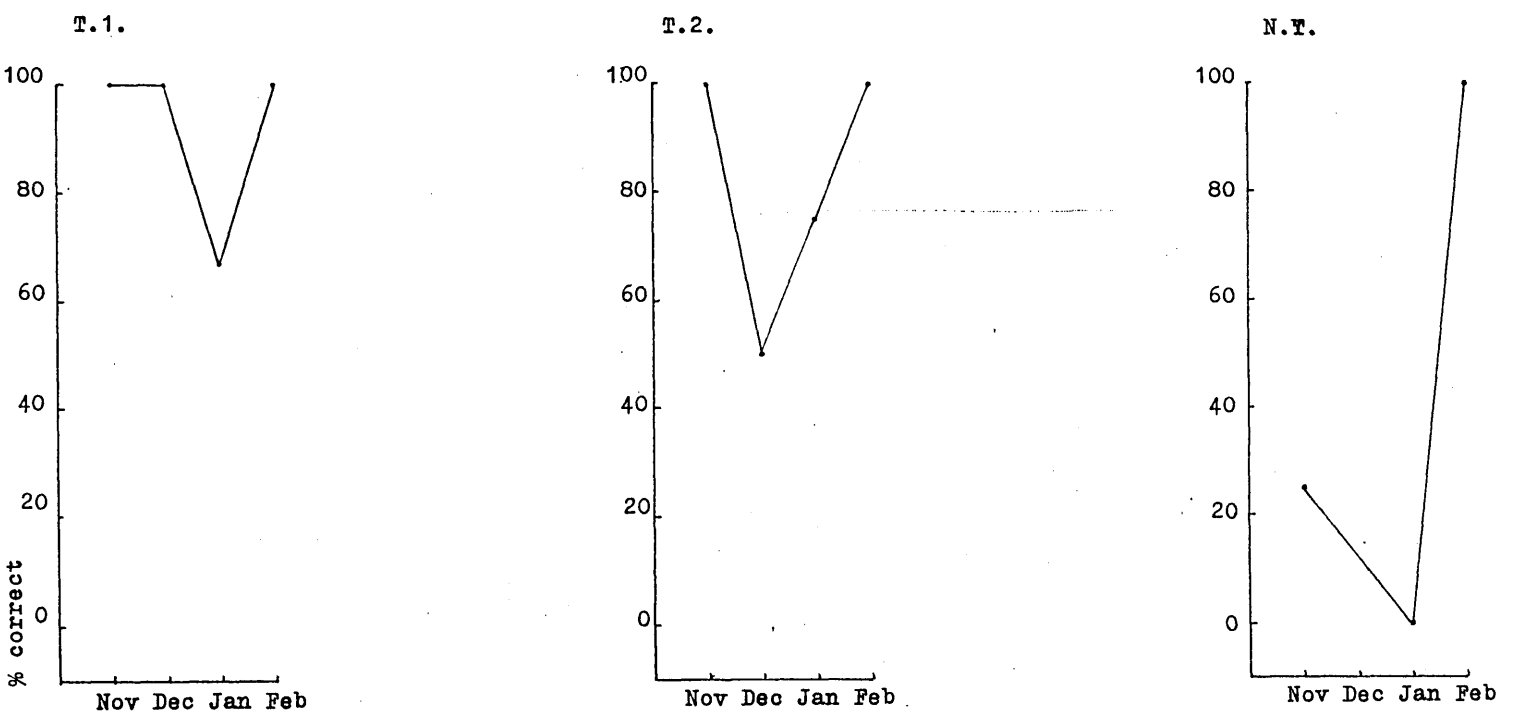
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(50)	2(100)	2(100)
Context	2	1	2

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(0)	2(50)	2(0)	2(100)
Context	2/3	3	3	2

Fig. 9-49

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Pronominal Usage - I + YES/NO Discrimination
STRUCTURE - YES I AM - (Lee)/Verbing) - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-50

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - I + Yes/No Discrimination

STRUCTURE - NO I'M NOT, I'M VERBING (OBJ)/(A OBJ)/(PREP) - NO I'M NOT VERBING (OBJ)/(A OBJ)/(PREP)
(no + pron + verb + neg + pron + aux + verb + ing (obj)(det + obj)(prep) - (no + pron + verb + neg + verb + ing)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	1(100)	1(100)	1(0)	1(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	1(100)	1(0)	1(0)	1(0)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	1(0)	1(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	-	1(0)	1(100)	1(100)
Context	4	1	3	2

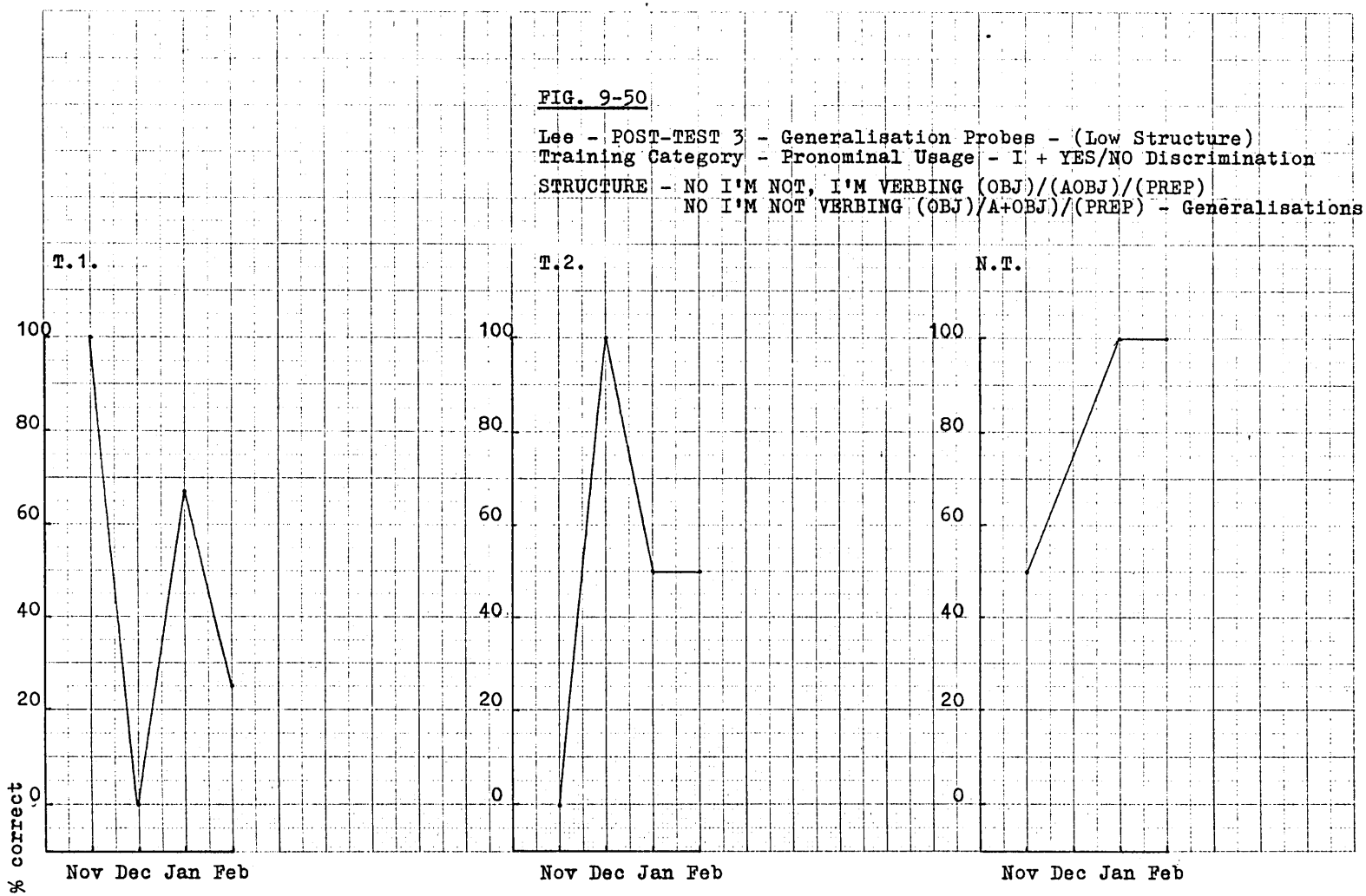
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	1(0)	1(0)	1(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	3	3	2

FIG. 9-50

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Pronominal Usage - I + YES/NO Discrimination
STRUCTURE - NO I'M NOT, I'M VERBING (OBJ)/(AOBJ)/(PREP)
NO I'M NOT VERBING (OBJ)/A+OBJ)/(PREP) - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-51

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - He/She + Labelling - Actions/Things

STRUCTURE - HE/SHE IS VERBING (OBJ)/(A OBJ)/(PREP)/ HE'S/SHE'S VERBING (OBJ)/(A OBJ)/(PREP) (pron + aux + verb + ing (obj)/(det + obj)/ (prep)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	2(100)	-	2(100)	4(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	4(100)	4(100)	4(100)	4(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	4(100)	4(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	-	2(0)	4(100)	4(100)
Context	4	1	3	2

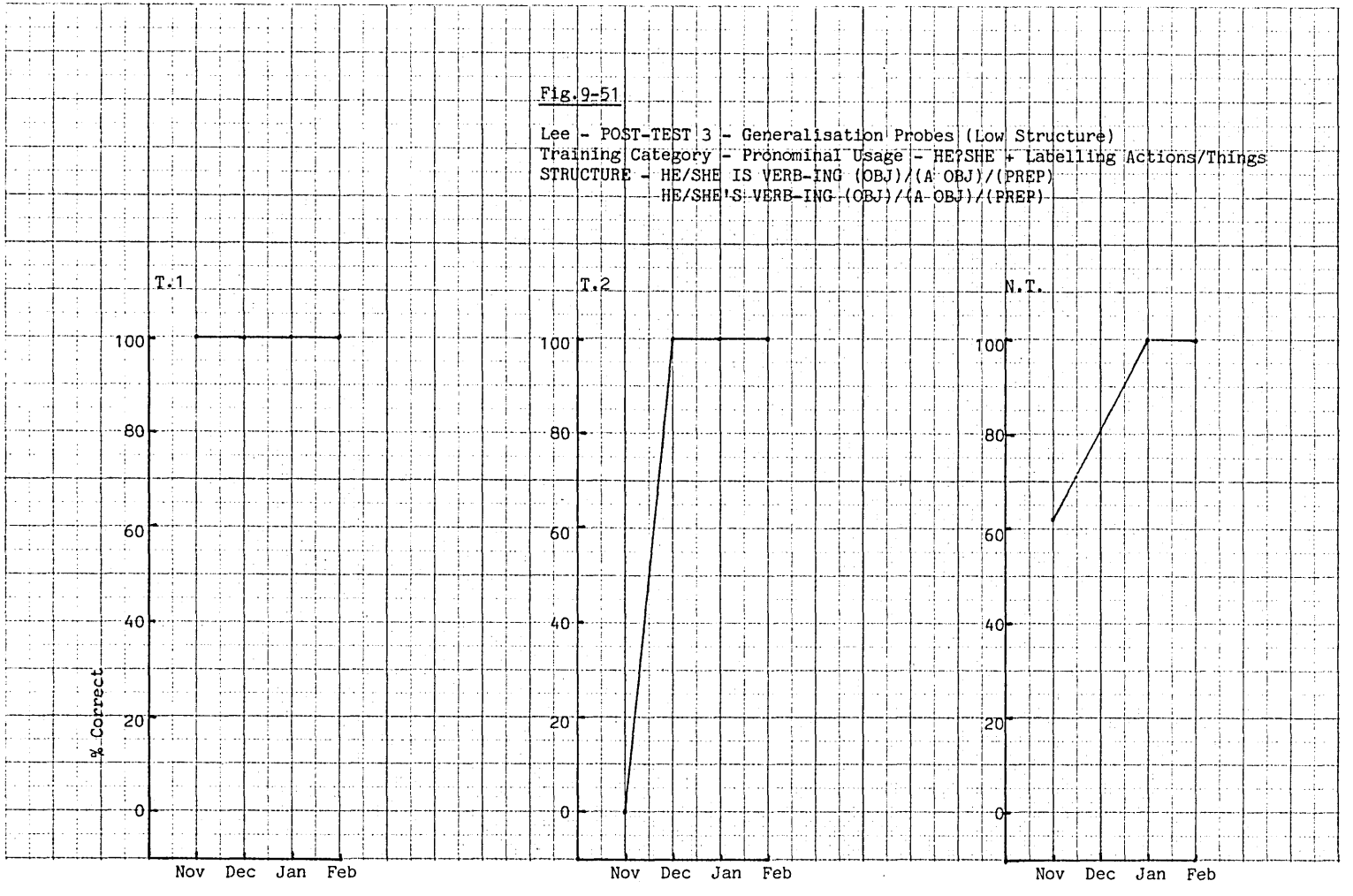
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(100)	4(100)	4(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	4(100)	4(25)	3(100)	4(100)
Context	2/3	3	3	2

Fig.9-51

Lee - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Pronominal Usage - HE?SHE + Labelling Actions/Things
STRUCTURE - HE/SHE IS VERB-ING (OBJ)/(A OBJ)/(PREP)
HE/SHE'S VERB-ING (OBJ)/(A OBJ)/(PREP)



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-52

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - He/She + Yes/No Discrimination

STRUCTURE - YES/HE SHE IS - (VERBING OBJ/PREP)
(yes + pron + verb)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	6(100)	-	4(100)	4(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	4(100)	4(100)	4(100)	4(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	4(100)	4(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	-	1(100)	3(100)	2(100)
Context	4	1	3	2

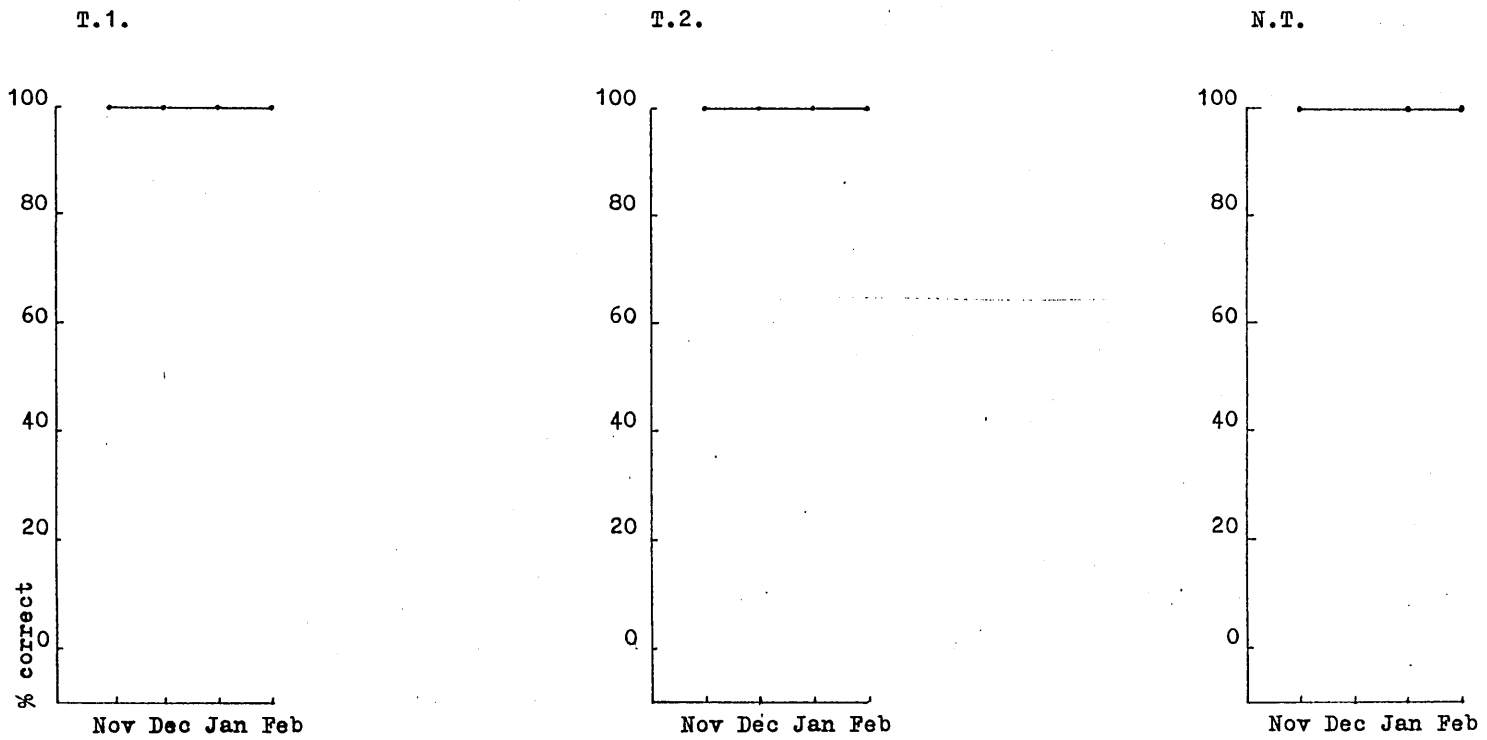
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(100)	4(100)	4(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(100)	4(100)	4(100)	2(100)
Context	2/3	3	3	2

Fig. 9-52

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Pronominal Usage - HE/SHE + YES/NO Discrimination
STRUCTURE - YES HE/SHE IS. (Verbing obj/prep) - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-53

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Pronominal Usage - He/She + Yes/No Discrimination

STRUCTURE - NO HE/SHE'S NOT, HE/SHE'S VERB-ING (OBJ)/(A OBJ)/(PREP)
(no + pron + cop' + neg + pron + aux + verb + ing + (obj) (det + obj) (prep)

NO HE/SHE ISN'T/IS NOT, HE/SHE'S VERB-ING (OBJ) (A OBJ)/(PREP)
(no + pron + cop' + neg + pron + aux + verb + ing (obj)/(det + obj)/(prep)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	2(100)	-	4(100)	4(100)
Context	2/3	3	1	1/3

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	4(100)	4(100)	4(100)	4(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	4(100)	4(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	28.11.79	14.12.79
Trials (% correct)	-	2(100)	2(100)	2(100)
Context	4	4	1	3

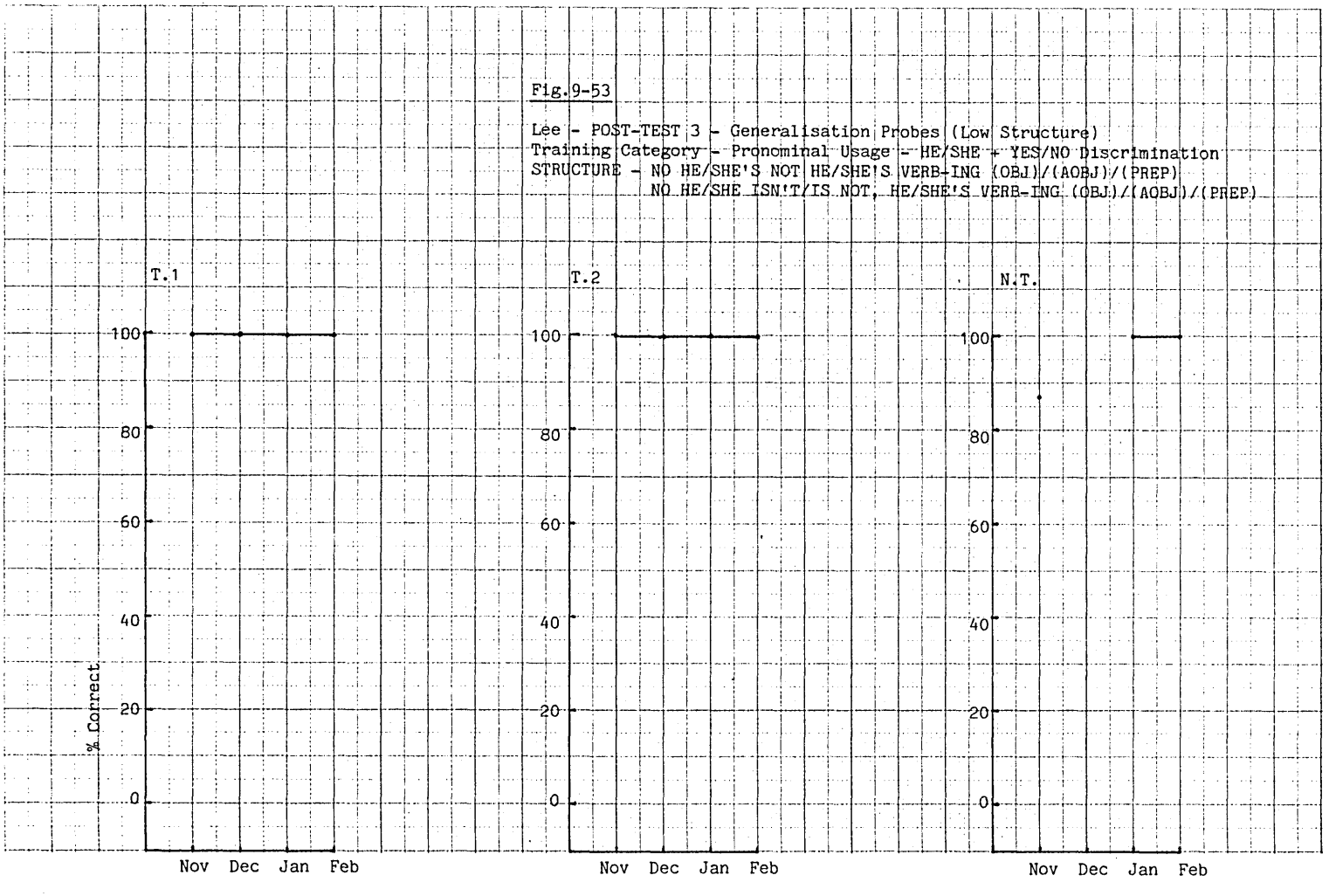
Date	16.1.80	22.1.80	6.2.80	14.2.80
Trials (% correct)	1(100)	2(100)	4(100)	4(100)
Context	2	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	4(100)	4(75)	4(100)	2(100)
Context	2/3	3	3	2

Fig.9-53

Lee - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Pronominal Usage - HE/SHE + YES/NO Discrimination
STRUCTURE - NO HE/SHE'S NOT HE/SHE'S VERB-ING (OBJ)/(AOBJ)/(PREP)
NO HE/SHE ISN'T/IS NOT, HE/SHE'S VERB-ING (OBJ)/(AOBJ)/(PREP)



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-54

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - In

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	1(100)	1(100)	-
Context	3	3	3	1

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	1(100)	1(100)	1(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	1(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	-	1(100)	1(100)	1(100)
Context	4	1	3	2

Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	1(100)	1(100)	1(100)
Context	2	1	3

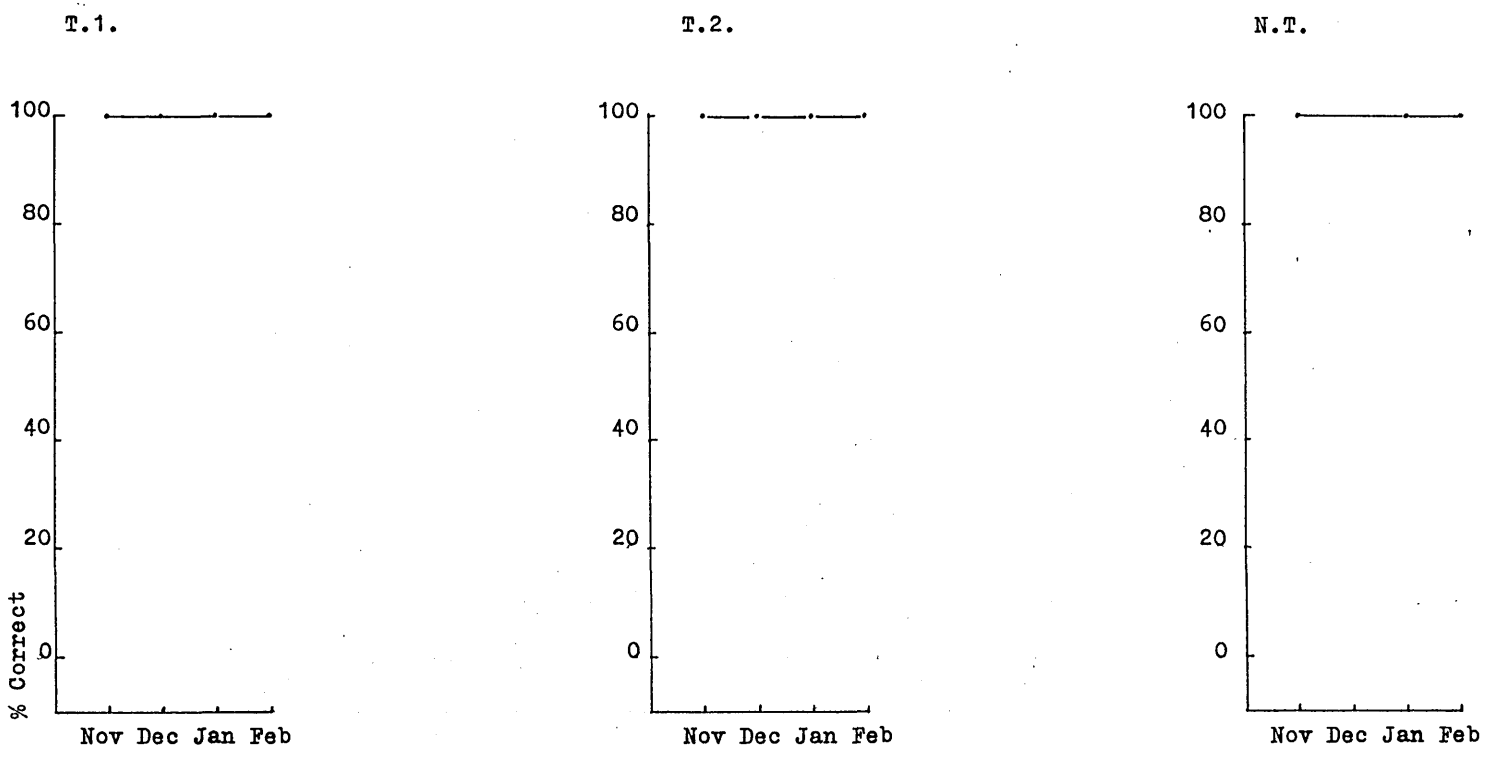
Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	3	3	2

Fig. 9-54

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - IN

MOTOR RESPONSE



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-55

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - In

STRUCTURE - IT'S IN THE (OBJECT)/IN THE (OBJECT)/IT'S IN (OBJECT)
(pron + cop' + prep + det + noun)/(prep + det + noun)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	2(100)	2(100)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	2(100)	1(100)	2(100)
Context	-	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	2(100)
Context	-	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	-	2(100)	2(100)	2(100)
Context	-	1	3	2

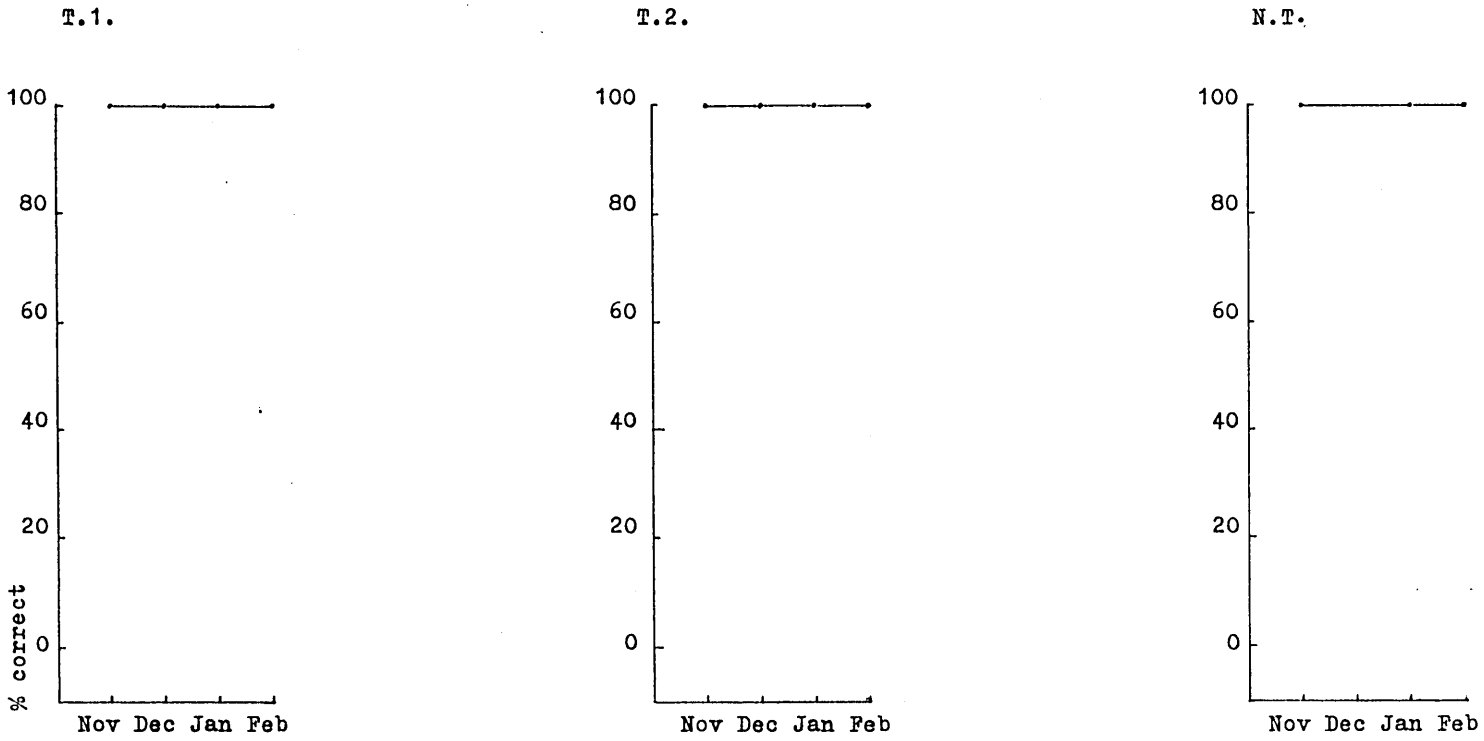
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(100)	2(100)	2(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	2/3	3	3	2

Fig. 9-55

Lee - POST -TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - IN
STRUCTURE - IT'S IN THE (OBJECT)/ IN THE (OBJECT)/IT'S IN (OBJECT)



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-56

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - On

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	1(100)	1(100)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	1(100)
Context	-	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	1(100)	-	1(100)	1(100)
Context	4	-	3	2

Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	-	1(100)	1(100)
Context	-	1	2

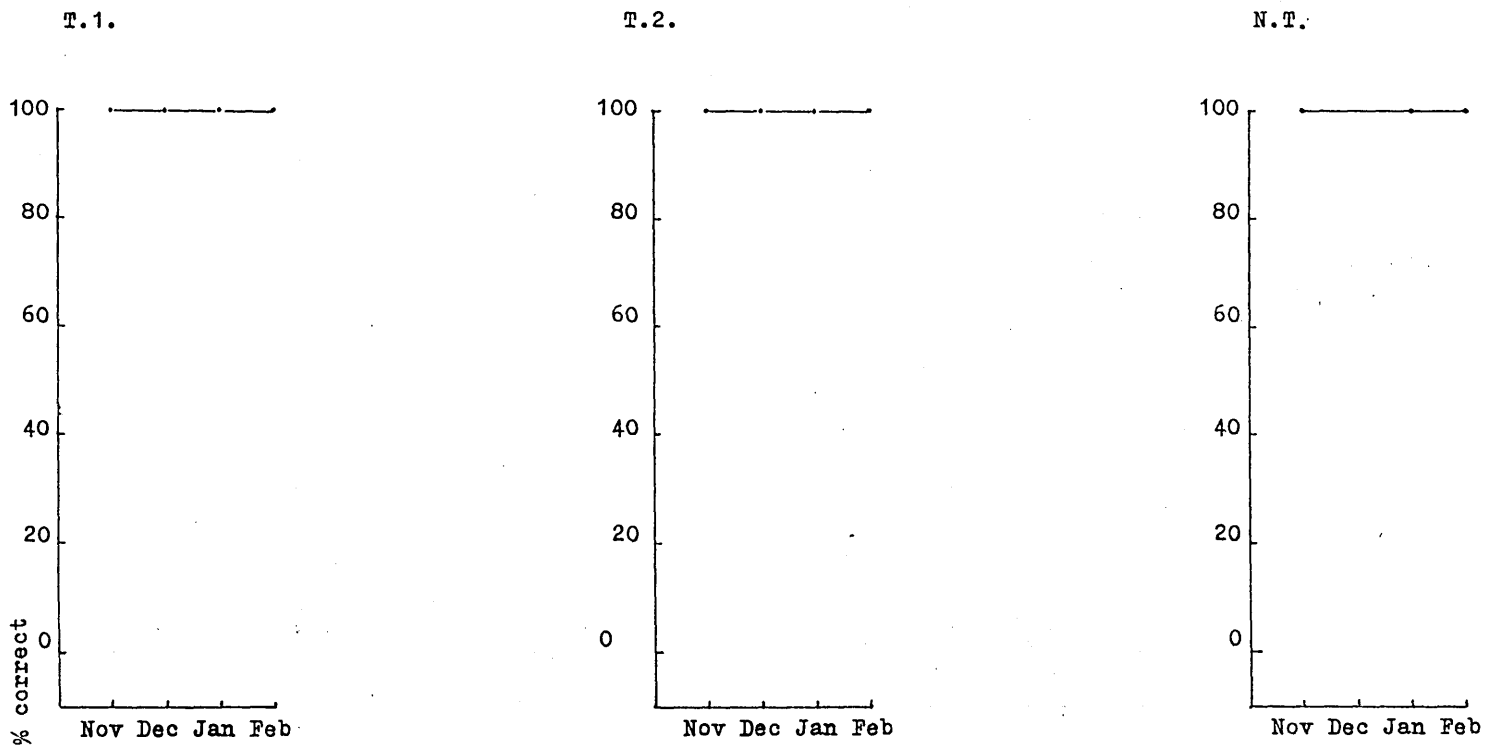
Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	3	3	2

Fig. 9-56

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - ON

MOTOR RESPONSE - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-57

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - On

STRUCTURE - IT'S ON THE (OBJECT)/ON THE (OBJECT)/IT'S ON (NOUN)
(pron + cop' + prep + det + noun)(prep + det + noun)/(pron + cop + prep + noun)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	2(100)	2(100)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	1	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	2(100)
Context	-	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	2(100)	-	2(50)	2(100)
Context	4	-	3	2

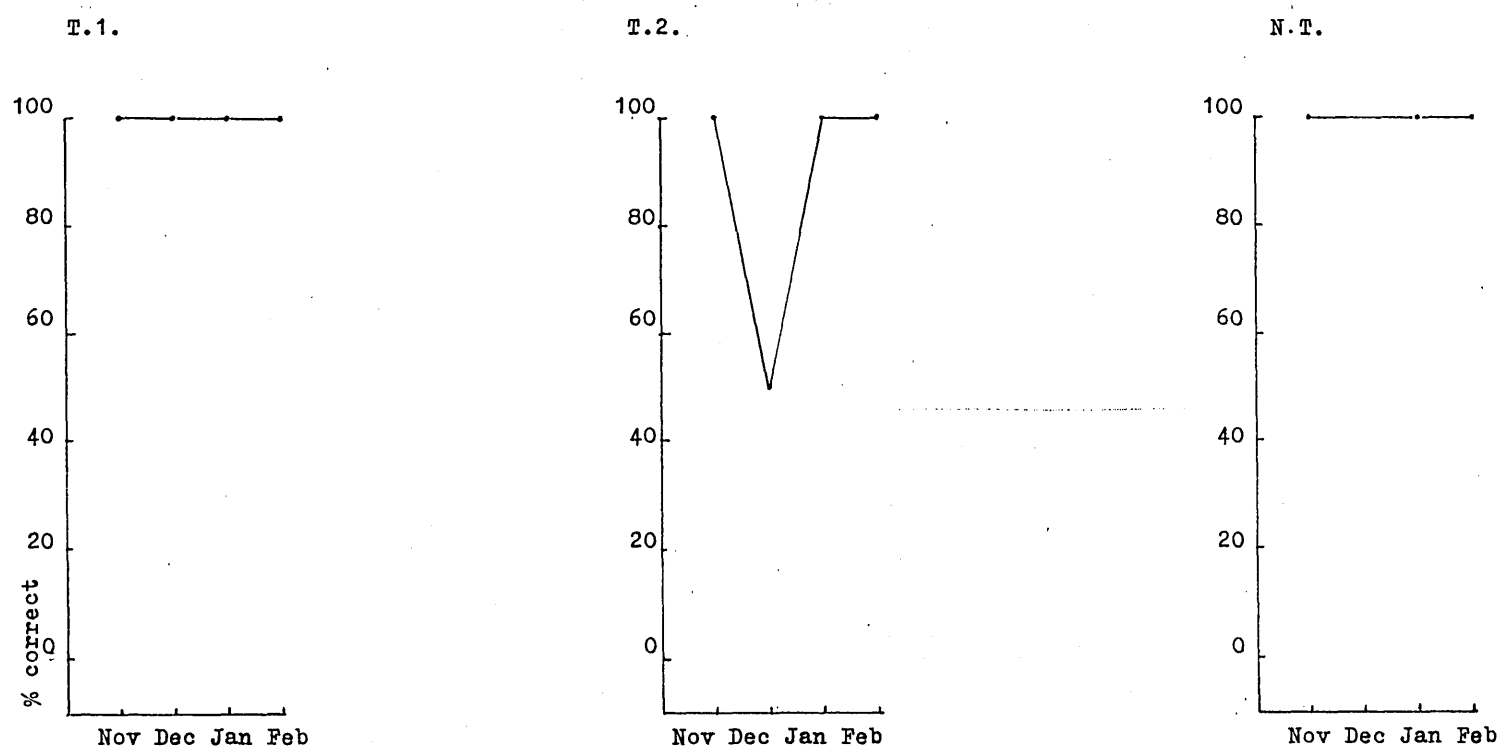
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	-	2(100)	2(100)
Context	-	2	2

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	2/3	3	3	2

Fig. 9-57

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - ON
STRUCTURE - IT'S ON THE (OBJECT)/ON THE (OBJECT)/IT'S ON (OBJECT)
- Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-58

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Behind

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	1(100)	1(100)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	1(0)	1(100)	1(100)
Context	-	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	1(100)
Context	-	-

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	1(100)	-	1(100)	1(100)
Context	4	-	3	2

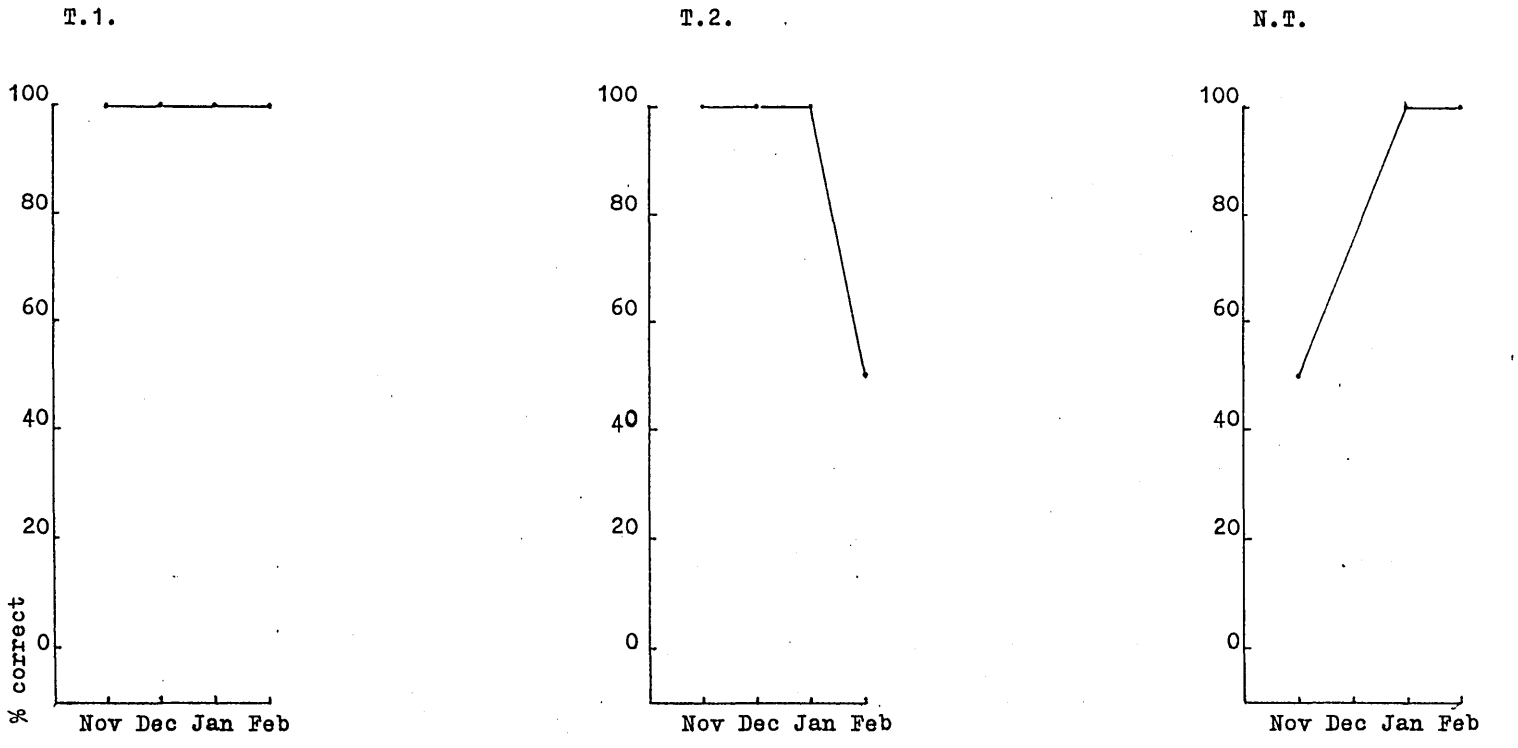
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	1(100)	1(0)	1(0)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	1(100)	1(0)	1(100)	1(100)
Context	2/3	3	3	2

Fig. 9-58

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - BEHIND
MOTOR RESPONSE - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-59

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Behind

STRUCTURE - IT'S THEY'RE BEHIND THE (OBJECT)/BEHIND THE OBJECT/IT'S/THEY'RE BEHIND (OBJECT) (pronoun + cop'+preposition+det+(noun)/preposition det+noun/pronoun +cop'+preposition('t)(noun))

Trainer 1

Date	4.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	2(0)*	1(0)*	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	-	2(0)*	2(0)*
Context	-	-	-	-

Date	26.2.80	29.2.80
Trials (% correct)	-	2(0)*
Context	-	-

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	2(100)	-	2(50)*	2(0)*
Context	4	-	3	2

Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(0)*	2(0)	2(0)
Context	2	1	3

Non-Trainer

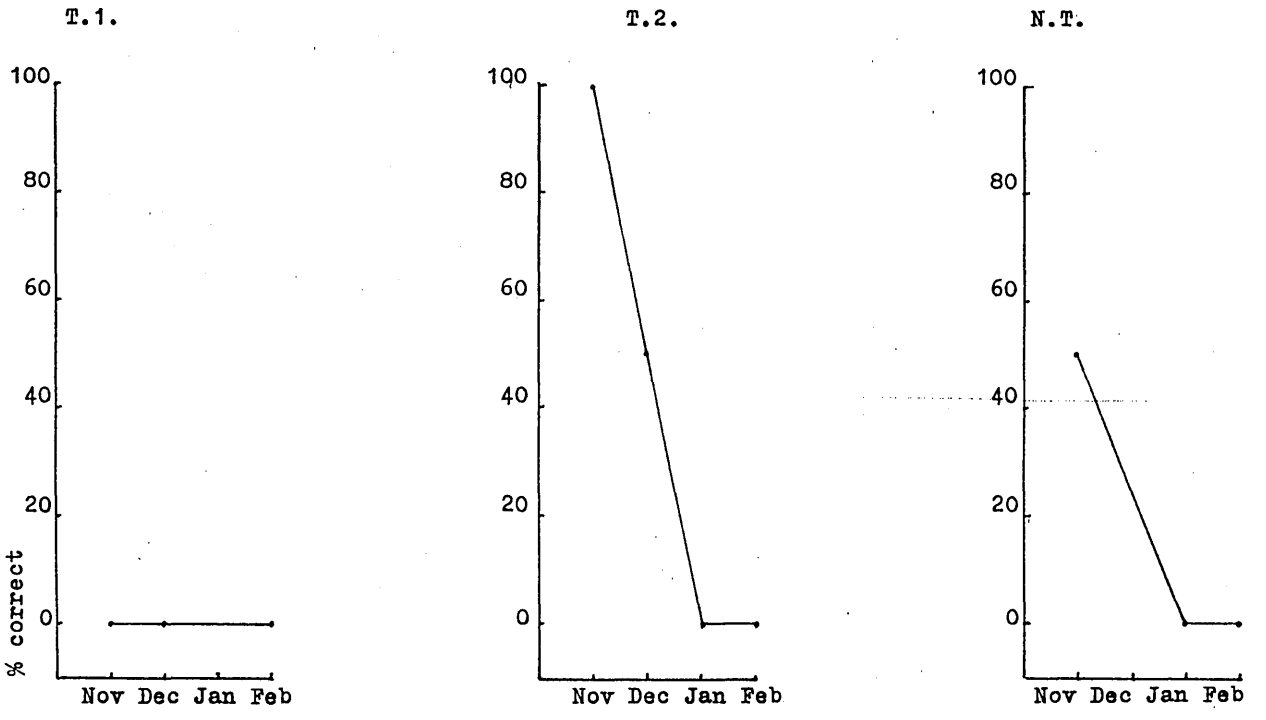
Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(0)*	2(100)	2(0)*	1(0)*
Context	2/3	3	3	2

* child response = IT'S 'HIND THE (OBJECT)

Fig. 9-59

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - BEHIND

STRUCTURE - IT'S/BEHIND THE (OBJECT)/BEHIND THE (OBJECT)/
IT'S BEHIND (OBJECT)/IT'S BEHIND



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-60

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - In Front

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	1(100)	1(0)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	1(100)	1(100)	1(100)
Context	-	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	1(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	1(0)	-	-	1(0)
Context	4	-	-	2

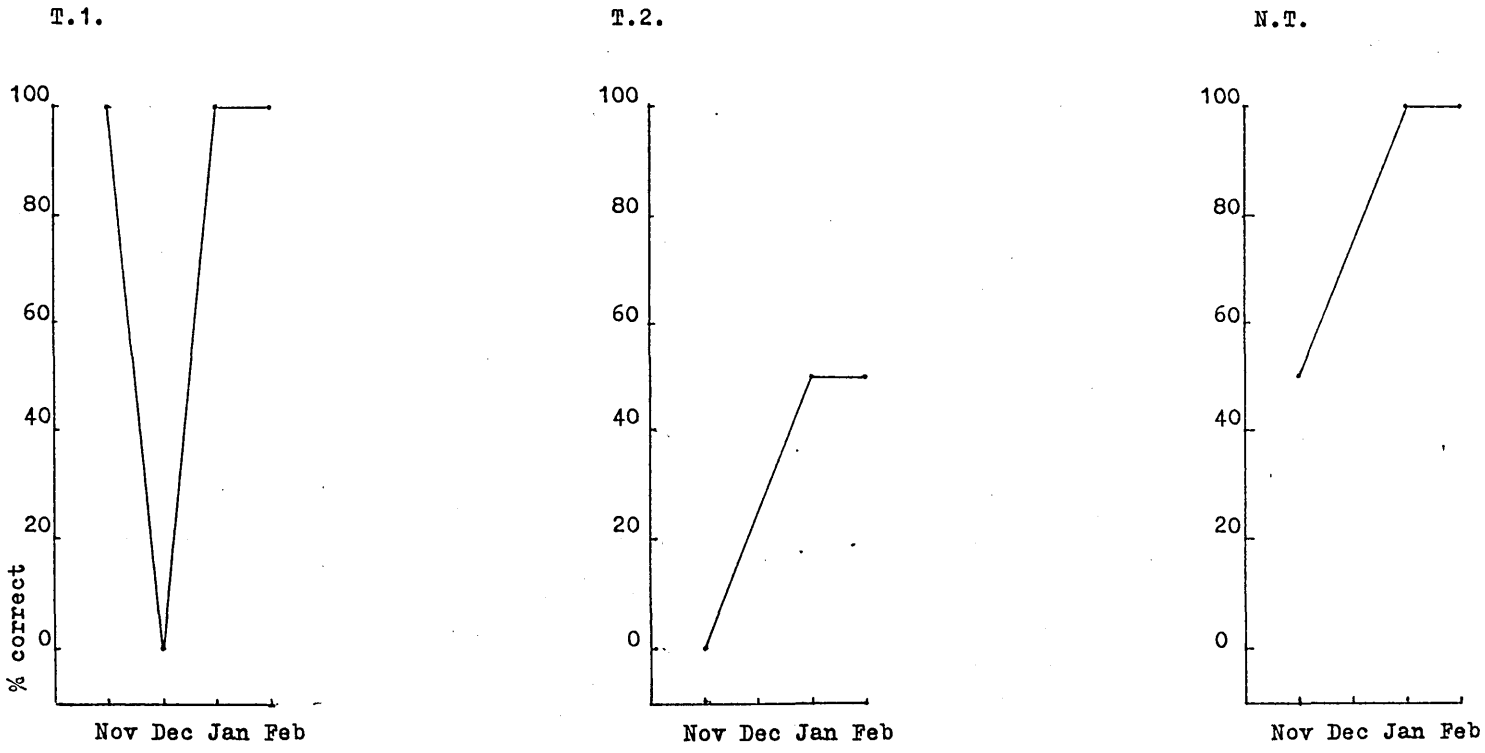
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	1(100)	1(100)	1(0)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	1(0)	1(100)	1(100)	1(100)
Context	2/3	3	3	2

Fig. 9-60

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Categpry - Prepositional Usage - IN FRONT
MOTOR RESPONSE - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-61

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - In Front

STRUCTURE - IT'S IN FRONT OF THE (OBJECT)/(PERSON)/ IN FRONT OF (PERSON)/THE (OBJECT) (pron + cop' + prep + det + noun)/(proper noun)/prep + (proper noun)/(det + noun)

IT'S IN FRONT (pron + cop' + prep)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	2(100)	2(0)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	1(100)	2(100)	2(50)
Context	-	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	2(0)
Context	-	-

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	2(100)	-	-	2(0)
Context	4	-	-	-

Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(100)	2(100)	2(0)
Context	-	-	-

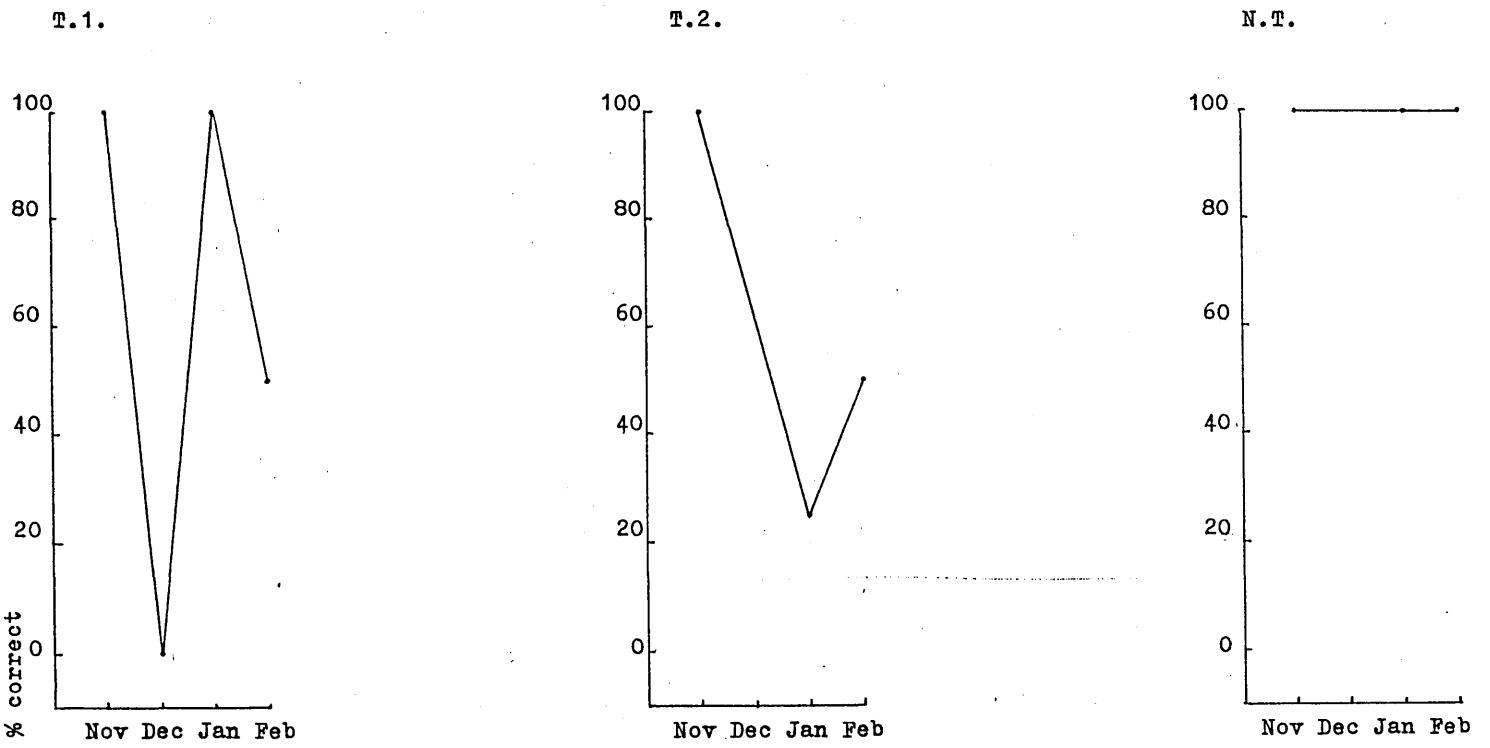
Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	-	2(100)	1(100)	2(100)
Context	-	3	3	2

Fig. 9-61

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - IN FRONT

STRUCTURE - IT'S IN FRONT OF (THE OBJECT)/(PERSON)/IN FRONT OF (THE OBJECT)/PERSON/IT'S IN FRONT - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-62

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Over

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	1(0)	1(100)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	1(100)	1(100)	1(100)
Context	-	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	1(100)
Context	-	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	-	1(100)	-	1(100)
Context	-	1	-	2

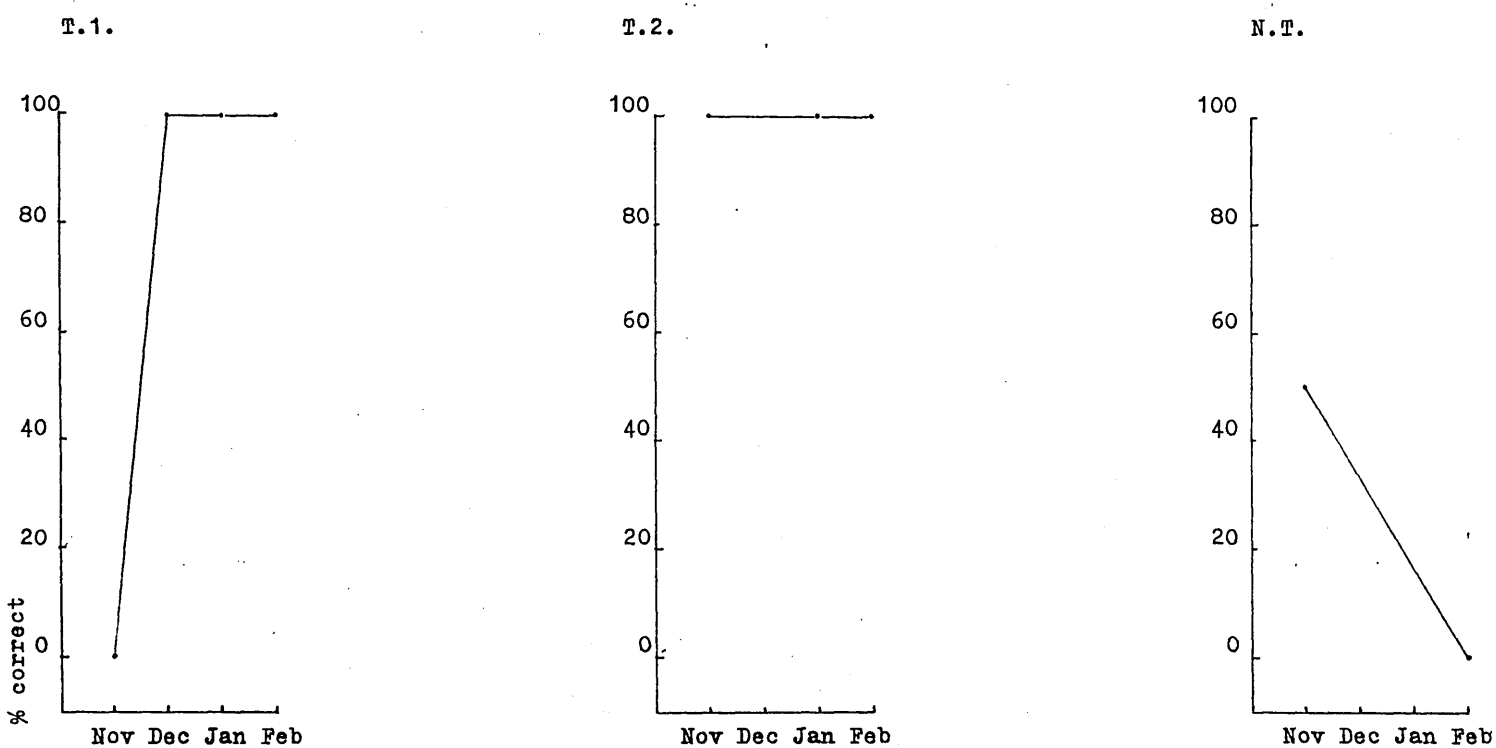
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	1(100)	1(100)	1(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	1(100)	1(0)	-	1(0)
Context	2/3	3	-	2

Fig. 9-62

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - OVER
MOTOR RESPONSE - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-63

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Over

STRUCTURE - IT'S OVER THE (OBJECT)/OVER THE (OBJECT)/ IT'S OVER (OBJECT)
(pron + cop' + prep + det + noun)/(prep + det + noun)/(pron + cop' + prep + noun)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	-	2(100)	-
Context	-	-	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	2(100)	2(100)	2(100)
Context	-	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	2(50)
Context	-	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	-	2(100)	-	2(100)
Context	-	1	-	2

Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(100)	2(100)	2(100)
Context	2	1	3

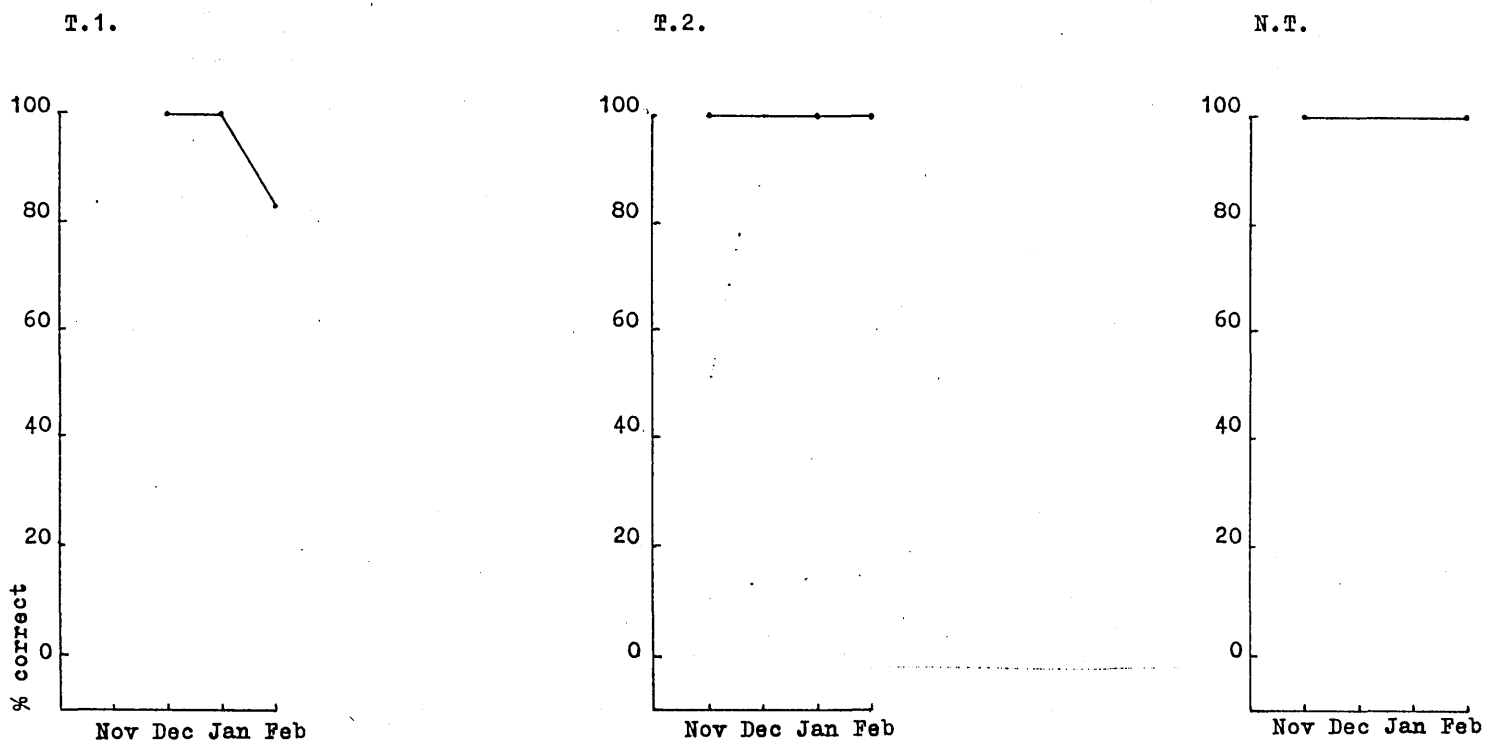
Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(100)	2(100)	-	2(100)
Context	2/3	3	-	2

Fig. 9-63

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - OVER

STRUCTURE - IT'S OVER THE (OBJECT)/OVER THE (OBJECT)/IT'S OVER (OBJECT) - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-64

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Under

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	1(100)	1(100)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	1(100)	1(100)	1(100)
Context	-	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	1(100)
Context	-	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	9.1.80
Trials (% correct)	-	1(0)	1(100)	1(100)
Context	-	1	3	2

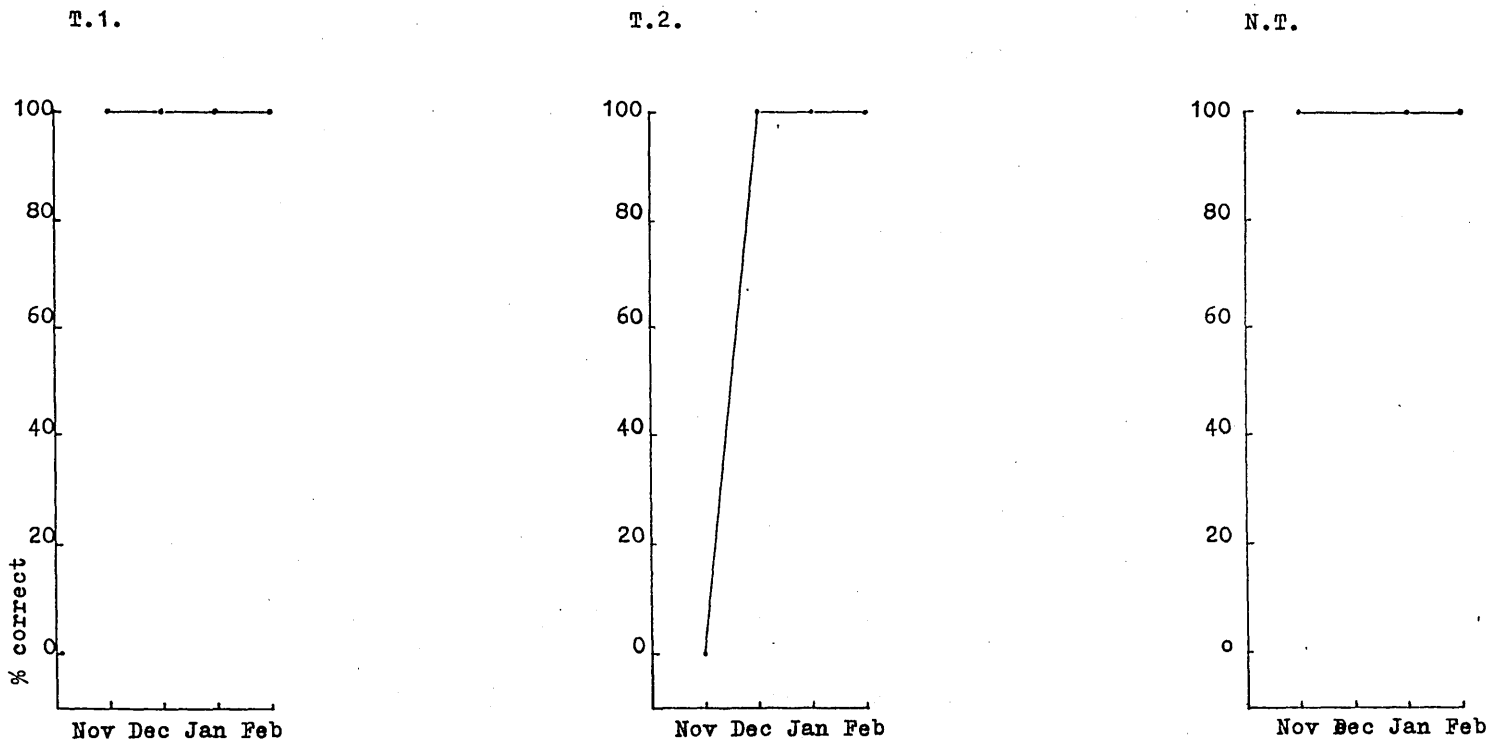
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	1(100)	1(100)	1(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	3	3	2

Fig. 9-64

Lee - POST-TEST 3 - Generalisation Probes
Training Category - Prepositional Usage - UNDER
MOTOR RESPONSE - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-65

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Under

STRUCTURE - IT'S UNDER THE (OBJECT)/UNDER THE (OBJECT)/ IT'S UNDER (OBJECT)
(pron + cop' + prep + det + noun)/(prep + det + noun)/(pron + cop' + prep + noun)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	2(100)	2(100)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	2(100)	2(100)	2(100)
Context	-	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	2(100)
Context	1	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	9.1.80
Trials (% correct)	-	2(50)	2(100)	2(100)
Context	-	1	3	2

Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(100)	2(100)	2(100)
Context	2	1	3

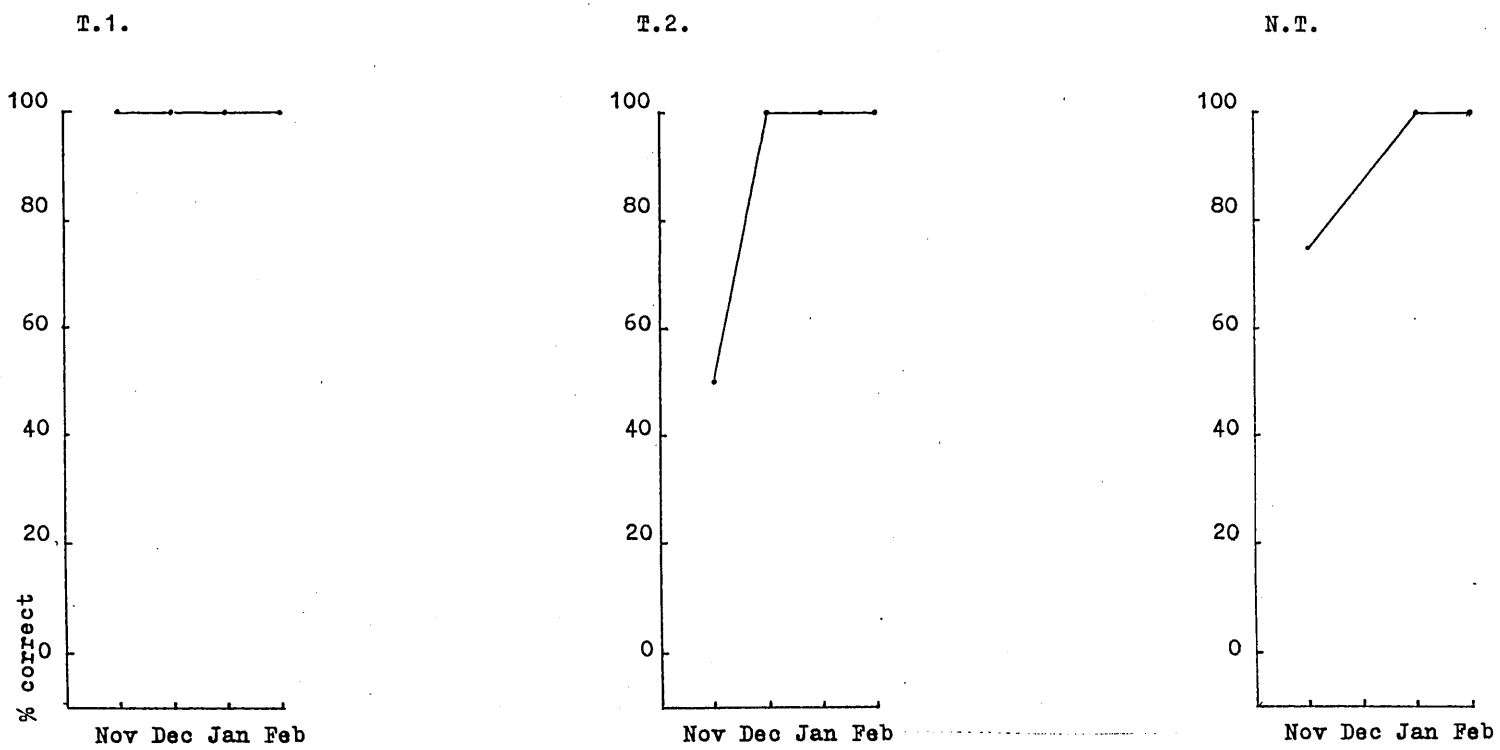
Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(100)	2(50)	2(100)	2(100)
Context	2/3	3	3	2

Fig. 9-65

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - UNDER

STRUCTURE - IT'S UNDER THE (OBJECT)/UNDER THE (OBJECT)/
IT'S UNDER (OBJECT)



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-66

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Next To

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	1(100)	1(100)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	1(100)	1(100)	1(0)
Context	-	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	1(100)
Context	-	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	1(100)	-	-	1(100)
Context	4	-	-	2

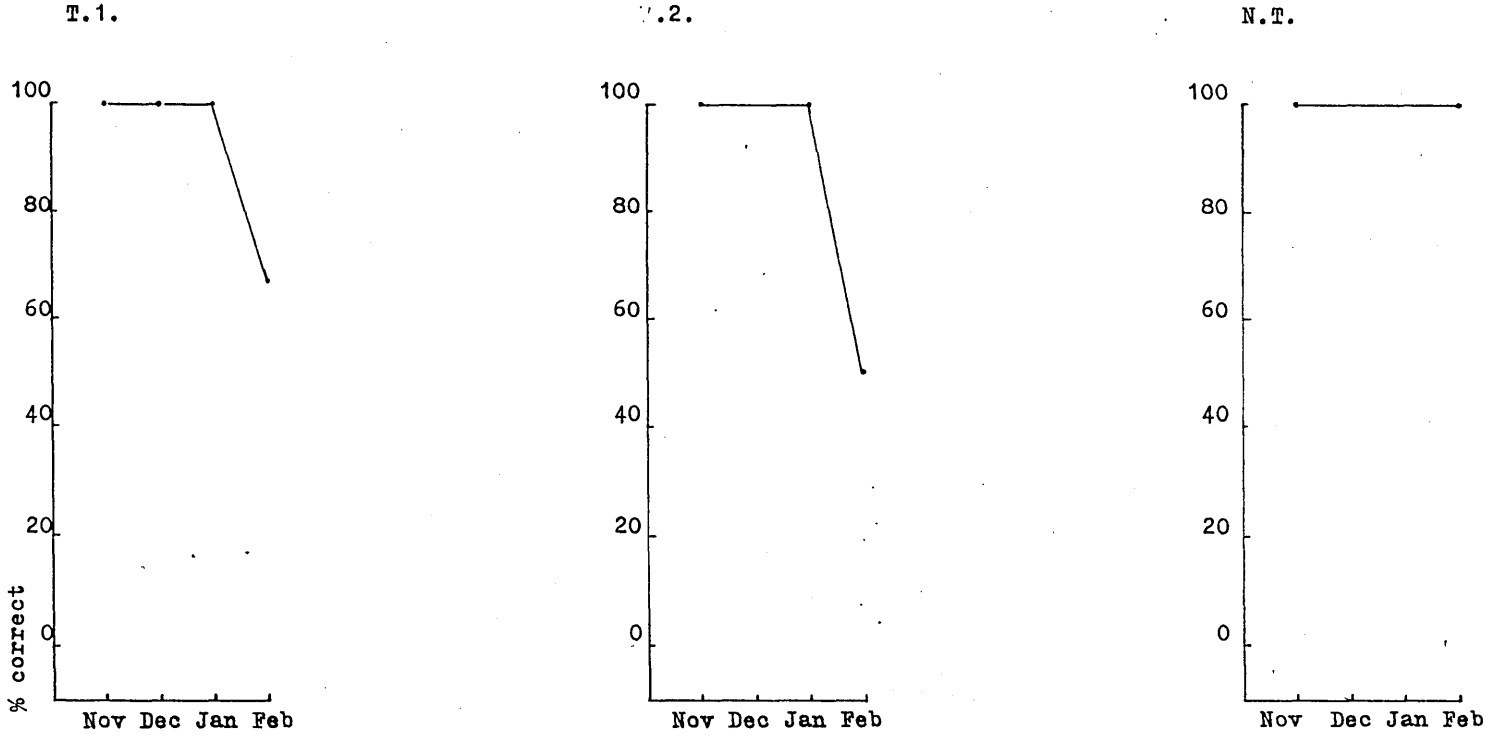
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	-	1(0)	1(100)
Context	-	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	1(100)	1(100)	-	1(100)
Context	2/3	3	-	2

Fig. 9-66

Lee - POST-TEST 3 - Generalisation Probes (Low Structure)
Training Category - Prepositional Usage - NEXT TO
MOTOR RESPONSE - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-67

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Next To

STRUCTURE - IT'S NEXT TO THE (OBJECT)/NEXT TO THE (OBJECT)/IT'S NEXT TO (OBJECT) (pron + cop' + prep + det + noun)/(prep + det + noun)/(pron + cop' + prep + noun)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	2(100)	2(0)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	2(100)	2(50)	-
Context	-	1	1	-

Date	26.2.80	29.2.80
Trials (% correct)	-	2(100)
Context	-	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	2(0)	-	-	2(100)
Context	4	-	-	2

Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	-	2(0)	2(100)
Context	-	1	3

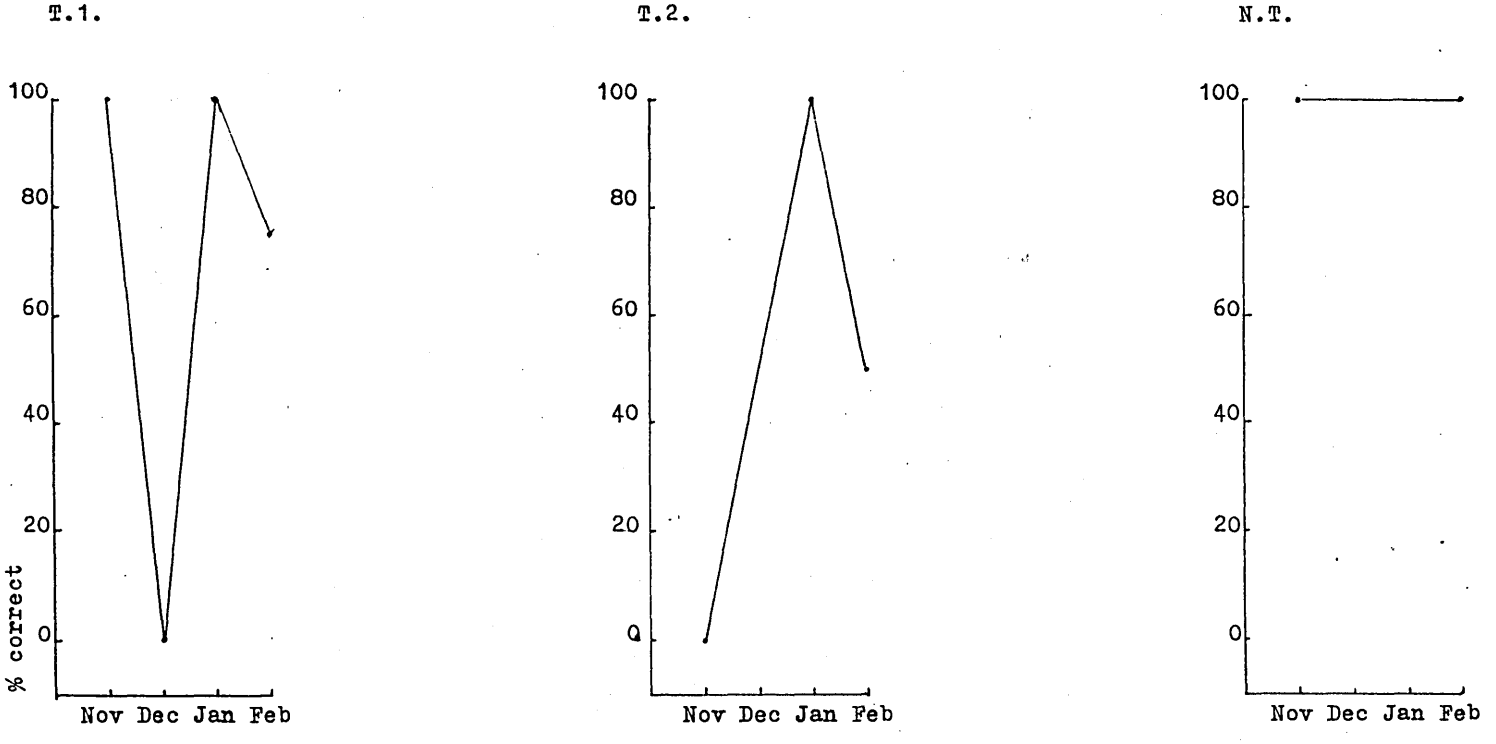
Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(100)	2(100)	-	2(100)
Context	2/3	3	-	2

Fig. 9-67

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - NEXT TO

STRUCTURE - IT'S NEXT TO THE (OBJECT)/NEXT TO THE (OBJECT)/
IT'S NEXT TO (OBJECT) - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-68

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Over There

MOTOR RESPONSE - (Manipulation of objects)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	1(100)	1(100)	-
Context	-	3	3	-

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	1(100)	1(100)	1(100)
Context	-	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	1(100)
Context	-	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	1(100)	-	1(100)	1(100)
Context	4	-	3	2

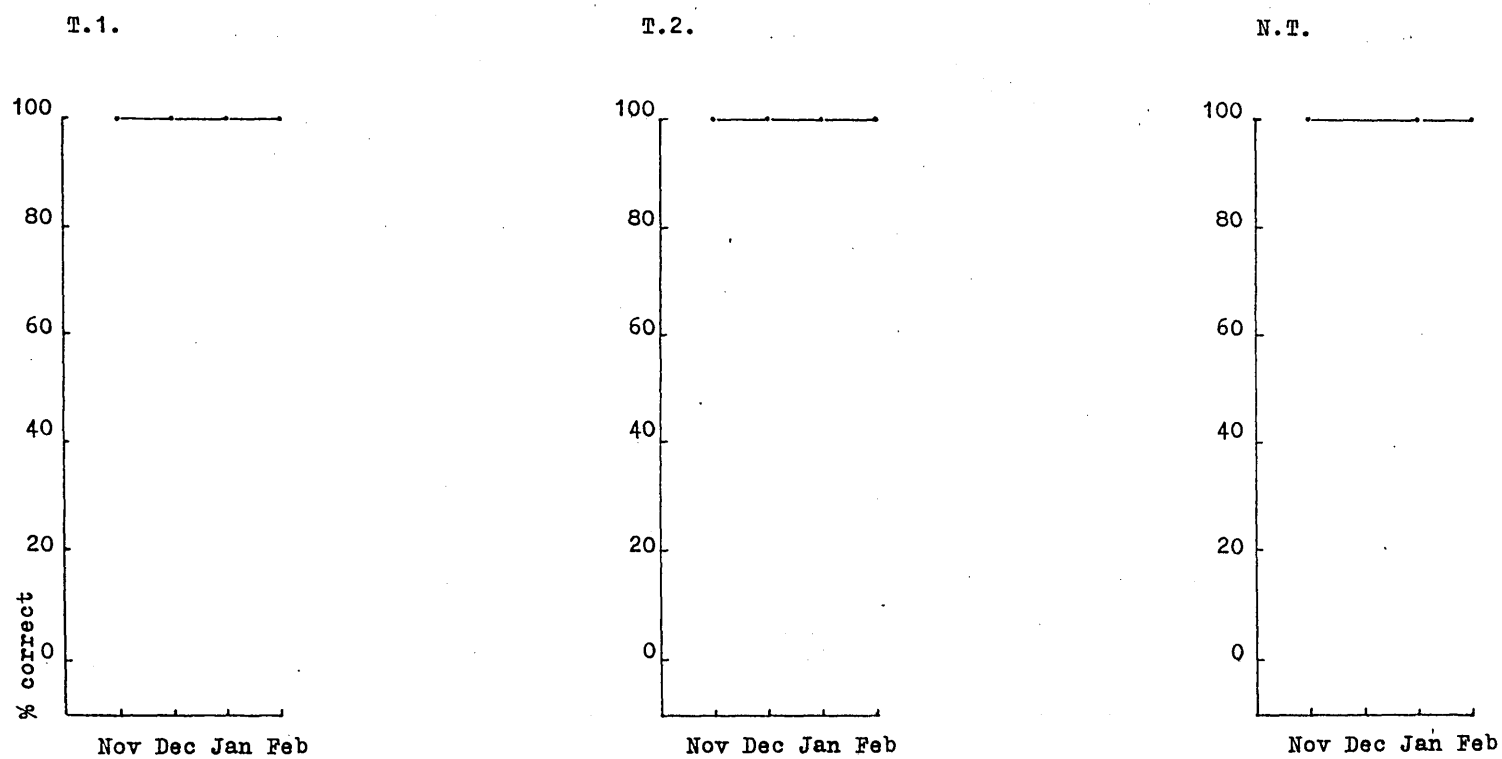
Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	1(100)	1(100)	1(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	1(100)	1(100)	1(100)	1(100)
Context	2/3	3	3	2

Fig. 9-68

Lee - POST-TEST 3 - Generalisation Probes - (Low Structure)
Training Category - Prepositional Usage - OVER THERE
MOTOR RESPONSE - Generalisations



Lee - POST-TEST 3 - Generalisation Probes (Low Structure)

Table 9-69

Summary of Generalisations per Structure by Sessions, Trials and Context

Training Category - Prepositional Usage - Over There

STRUCTURE - IT'S OVER THERE/OVER THERE
(pron+cop'+preposition)

Trainer 1

Date	21.11.79	23.11.79	14.12.79	15.1.80
Trials (% correct)	-	2(100)	2(100)	-
Context	-	3	3	1

Date	24.1.80	30.1.80	1.2.80	5.2.80
Trials (% correct)	-	2(100)	2(100)	2(100)
Context	-	1	1	1

Date	26.2.80	29.2.80
Trials (% correct)	-	2(100)
Context	-	1

Trainer 2

Date	27.11.79	28.11.79	14.12.79	16.1.80
Trials (% correct)	2(100)	-	2(100)	2(100)
Context	4	-	3	2

Date	22.1.80	6.2.80	14.2.80
Trials (% correct)	2(100)	2(100)	2(100)
Context	2	1	3

Non-Trainer

Date	12.11.79	14.11.79	9.1.80	6.2.80
Trials (% correct)	2(100)	2(100)	2(100)	2(100)
Context	2/3	3	3	2

Fig. 9-69

Lee - POST-TEST 3 - Generalisation Probes -(Low Structure)
Training Category - Prepositional Usage - OVER THERE
STRUCTURE - IT'S OVER THERE/OVER THERE - Generalisation