A SYSTEMS APPROACH TO ASSESSING CHILD LANGUAGE

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To a Very Good Friend,

From pure Joy springs all creation,
By Joy it is sustained, Toward Joy it
proceeds and To Joy it returns.

From the Sanscrit.

With Love and Gratitude, Kathy

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DECLARATION

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ABSTRACT

In this project, a unit of measurement was created for assessing the development of communicative competence in children between the ages of one to seven years. This unit of measurement differs from other assessments as it investigates the child's pattern of performance of developing language and language related behaviour within various communicative contexts. The underlying theory that the unit of measurement was created from is the Communicative Competence Model which views language development as part of a complex system. Within this complex system a child's pattern of performance is generated by variable context sensitive rules. The Rasch model of test construction was used as the psychometric analysis for the unit of measurement. This mathematical model uses an algebraic formula to transform the item and person scores into an interval scale. Both item calibrations and person measures are located on the scale. It is through the locating of the child's pattern of performance on this scale that the child's discrete language abilities are assessed as part of a complex system. The unit of measurement was then used to assess two children with language learning difficulties. Case study one was longitudinal and demonstrated the unit of measurement's ability to statistically relate test scores which were obtained on test forms designed with different tasks that pertained specifically to different age groups. Case study two was of a child who demonstrated a unique pattern of development and highlighted the need for profiling patterns of performance in communicative contexts and in different ability dimensions. The unit of measurement provides the means for combining the benefits of both descriptive and psychometric assessments in one method of analysis. It was shown to be useful in assessing children's communicative competence and, now, can be used as the basis for developing standardised tests. Throughout this project, communicative competence has been viewed as part of a complex system and a systems approach to problem solving has been adopted.

NOTATIONS

CCM	abr. for COMMUNICATIVE COMPETENCE MODEL
ToS	abr. for TABLE OF SPECIFICATIONS
PROX	The method of analysis used to construct the variable. (Wright and Stone, 1979)
1;00-7;09	The numerical representation of ages. 2;11 is two years eleven months.

GLOSSARY

LANGUAGE	Language is viewed as a behavioural system which is comprised of subsystems: phonology, syntax, semantics and pragmatics.
COMMUNICATIVE COMPETENCE	Is a theoretical construct which views utterances as being linguistically appropriate for a child's age, social and cognitive development and for the communicative context in which they occur. There exists a theoretical ideal level of communicative competence from which each child will have individual variations.
PERFORMANCE	Is the observable behaviour within a given situation. It is from a child's performance that inferences can be made about a child's knowledge.
COMMUNICATIVE COMPETENCE MODEL	Is the abstract theoretical construct which accounts for the concepts and data which provide the foundations for understanding communicative competence.

1.0. INTRODUCTION.

In this chapter the rationale behind the designing of the project is briefly discussed, the aims and objectives of the project are explained and a summary of the chapters is presented.

1.1. THE RATIONALE.

The past forty years have seen a vast research endeavour into language development and the results have presented not only a rich description of child language at each age but also a description of language development as a complex system. A current primary model views children developing language as having communicative competence. Their utterances are not only linguistically appropriate for their age but they also are appropriate to their social and cognitive development. The utterances, also, are appropriate for the communicative contexts in which they occur. This Communicative Competence Model (CCM) views language use and development as part of a dynamic interpersonal situation rather than as a static entity, and the premises of the CCM are important for intervention practice. As it views language use and development as being dynamic then language differences (or difficulties) are seen as being interpersonal in nature and culturally bound, rather than residing solely in the child. Language development is considered to be a continuum of a varying set of rules, the variations are context generated and language change can be implemented in a variety of ways. Within the model, the clinician is an information gatherer and decision maker rather than the only source of knowledge.

In her article titled the 'mismatched premises of the Communicative Competence Model and intervention practice' Rice states that the Communicative Competence Model is widely advocated by people working in the field of language intervention but it is only partially adopted.

The detailed information is dipped into but it has never been pulled together an made use of in a cohesive manner. The main areas of the CCM that are established and used consistently are the discrete units of behaviour that have been itemised. They provide a means for making comprehensive descriptions of children's communicative repertoires. These communicative repertoires are then used as a guide for analysis and as a source for planning goals and activities in therapy.

The main methodology used in the research designs has been to collect spontaneous language samples and analyse them to find the universal rules of child language development. This type of methodology has transferred into intervention with moderate success, but it is not sufficient to assess and diagnose difficulties with communicative competence.

Descriptive analysis does not provide the type of guidance that is needed for the implementation and monitoring of therapy. There is, as yet, no normal continuum outlined which would provide the necessary 'road map' for clinicians. The categories are well known, but the developmental change mechanisms are not as fully understood. Also less well known are how the observable categories are interrelated and the type of synchrony there is in development. While these aspects are still unclear, individual differences and patterns of language performance cannot be accounted for.

Descriptive analysis is not psychometric assessment, and as a form of assessment it does not meet basic measurement requirements. During this time of vast research endeavours, the development of assessments with a psychometric basis has taken a backseat to the development of taxonomies to be used in analysing spontaneous language samples. In fact the idea of a formal standardised assessment appears at first to contradict the premises of the CCM, but it can actually provide the much needed road map.

In order to make the information in the research literature more useful for the clinician, an operational definition of the CCM needs to be devised. Then this definition needs to

be transformed into a clinical tool. The Rasch method of test construction (Wright and Stone, 1979) provides the necessary mathematical model to transform the information in the literature into a unit of measurement which would provide the type of guidance that is required for implementing and monitoring therapy.

The Rasch mathematical model assumes the existence of a characteristic function that is dependent upon both the position of a subject on the latent trait and the position of an item on the same latent trait. This is fundamentally different to traditional test construction methodology and provides for item difficulty invariance and score invariance. These two properties are unique to the Rasch mathematical model and are particularly important for assessing child language. The Rasch model provides the means for transforming item and person scores into a measurement scale which is at the interval level of measurement. This variable allows for an Item Bank to be created. From this core set of items other items in the future can be added to it and from this core set various standardised tests can be constructed. The Rasch mathematical model provides the necessary sound psychometric underpinnings for constructing standardised tests.

In this project child language development is viewed as being part of a complex system (that of communicative competence), therefore the scientific thinking of systems science was required to provide the guidelines for designing a unit of measurement of it. A systems approach to problem solving was adopted throughout this project. The operational definition has the philosophies of Piaget's structuralism and Laszlo's cybernetics underpinning it. The methodologies of hard systems thinking, soft systems thinking and critical systems thinking each have been used in researching the Model of Communicative Competence. Together they have enabled a holistic view to be taken so that the complex system could be seen as a manageable concept from which a clinical tool which demonstrated practical relevance could be developed.

1.2. THE AIMS AND OBJECTIVES.

1.2.1. THERE ARE TWO AIMS FOR THIS PROJECT.

1. As there now exists in the literature sufficient information to devise an operational definition for the Communicative Competence Model, the literature will be reviewed so that a synthesis of the relevant areas can be presented. From this synthesis an operational definition will be devised.

2. Through the use of the Rasch mathematical model, the operational definition will be transformed into a clinical tool which can be used to assess the pattern of performance of a child within various communicative contexts.

1.2.2. TO ACHIEVE THESE AIMS, SEVEN OBJECTIVES NEED TO BE SATISFIED.

OBJECTIVE 1. To critically review the literature so that an operational definition of the Communicative Competence Model can be devised. This operational definition will provide the theoretical concepts and observable categories that are to be transformed into a clinical tool.

OBJECTIVE 2. To devise a Table of Specifications. A Table of Specifications is the blueprint that is first devised when constructing a test. It is a two dimensional matrix comprised of the theoretical concepts as one dimension and the sets of test situations as the other dimension. The behaviour that is to be elicited is then placed in the appropriate cell. The purpose of this exercise is to achieve the required balance of items for the theoretical concepts and situations that are being examined.

OBJECTIVE 3. To devise a hierarchy of structured tasks from one to seven years within the CCM. A selection of test situations will be devised that elicit developing language behaviour (items) between these ages. The

situations will be designed, using current practice and information in the literature as a frame of guidance. The specific behaviour to be elicited will be provided by the literature.

OBJECTIVE 4. To obtain person and item scores for the tasks. In order to transform the hierarchy of structured tasks into a clinical tool, observations need to be made as to how children respond when presented with the situations. Two types of scores are needed to make the transformation: person scores (how many items a person scored correctly) and item scores (how many persons scored an item correctly).

OBJECTIVE 5. To analyse the scores so that a variable is constructed. A variable is a line of inquiry that is marked in linear units. In this case, the line of inquiry is that of language development as defined by the CCM from age one to seven years. The Rasch mathematical model is applied to the item scores so that they become item calibrations and to the person scores so that they become person measures. The item calibrations and person measures are the substance of the variable that they construct.

OBJECTIVE 6. To define the variable. The variable is an abstraction of reality, but it can be operationalised through providing it with a definition. The variable is defined through the spread of the the item calibrations, person measures, their frequencies and the standard errors; through the location on the variable of the items, person scores, norms, standard deviations and through the profiling of an individual's pattern of performance.

OBJECTIVE 7. To use the variable to assess the communicative competence abilities in two children with language learning difficulties. The usefulness of the definition can only be demonstrated by putting it into practice. The variable will be piloted on two different children.

1.3. THE STRUCTURE OF THE THESIS.

In this section an overview of how the thesis is structured will be presented.

Chapter 2. The rationale behind the development of this project is described in more detail.

Chapter 3. Review of the Literature: Assessing Communicative Competence. A critical review of the literature is provided which presents an operational definition of the Communicative Competence Model and an explanation of some of the reasons as to why the model has been advocated but not adopted into practice. The forms of assessment currently used and the Rasch method of test construction is presented.

Chapter 4. Methodology: Constructing the Variable. The Table of Specifications and the Task Structures are presented with the rationale for initial item selection. The methodology used to collect the person and item scores is described. The mathematical modelling process used to transform the scores into item calibrations and person measures is presented along with the results that construct the variable.

Chapter 5. Results: Defining the Variable. A presentation of the results is provided so that the variable that was constructed in Chapter 4 can be given a definition. It is through the defining of the variable that the type of generalisations that the measurements imply are stated.

Chapter 6. Two Case Studies: Using the Variable. Two case histories are presented. One is longitudinal in nature and provides a means for demonstrating the 'score invariance' aspect of the Rasch method of test construction. The second case history is of a child who presents with a unique pattern of language development. It provides an opportunity to discuss the profiling of individual patterns and demonstrate 'item invariance', another aspect of the Rasch method of test construction.

Chapter 7. Discussion: Adopting the Communicative Competence Model. The aims and objectives are discussed in relation to the results, and suggestions for further studies to refine the Table of Specifications are given. The achievement of the project is then summarised and the type of standardised test which can be devised from the constructed variable is described. This standardised test is then put into the context of how it would operate in a clinic setting within a test battery comprised of current assessments. The type of statistically related test battery that can be developed with further research using this variable as a core Item Bank is described. The type of research that can be carried out in the field of intervention with the use of this variable and with the Rasch mathematical model is presented. The concepts and approaches of systems science that were used in the project are reviewed. In the final section, the difficulties that were encountered with developing an assessment for a complex system such as language development are reviewed and how these difficulties were tackled is discussed.

Chapter 8. Conclusions. A summary is provided of how well the aims and objectives have been achieved and further studies, which have been highlighted as being needed as a result of the work described in this thesis, are reviewed. The contributions that this project makes to the fields of speech therapy, assessment and system science are presented.

1.4. SUMMARY.

In this chapter a brief description of the rationale behind the project has been given. The aims and objectives have been outlined and the structure of the chapters has been presented. In Chapter 2 a more detailed description of the rationale will be presented.

2.0. INTRODUCTION.

Chapter 1 presented a brief summary of the rationale behind this project and presented the aims and objectives. In Chapter 2, a more detailed presentation of the rationale will be discussed.

2.1. THE COMMUNICATIVE COMPETENCE MODEL AND PSYCHOMETRIC ASSESSMENT.

During the past half century the research endeavours to find out what is 'child language' have been intensive and have yielded vast and detailed results. Language has been described as a 'structure' with the component parts of phonology, syntax, semantics and pragmatics. The child will have his or her own knowledge system of these parts which will interact with the child's developing social, cognitive and motor systems. The integration of this knowledge system has been described as communicative competence which will provide a range of possible behaviour for the child to use. The child's level of communicative competence will interact with the differing variables in the environment causing variations in the child's performance. Communicative competence has been described by Rice (1986) as an underlying network to performance which consists of variable context-sensitive rules.

For a child who is developing communicative competence the environment is an important arena. The child's unique but still species specific context-sensitive rule system will interact with the environment in ways in which will foster development or hinder it.

The research endeavours have provided us with knowledge about the structure of communicative competence and with knowledge about the types of interactions that will help develop communicative competence. It provides good observable categories which describe the child's language

related behaviour, and it provides a description of developmental change mechanisms that can be translated into intervention strategies. Child language interventionists have advocated the model's premises but have not incorporated them into therapy. Therapy guidelines exist for working within the Communicative Competence Model, and the knowledge base in the literature has been used to assess children by describing their language and language related behaviour.

As new knowledge about language development and language related behaviour was 'uncovered', taxonomies and assessments would be devised. The clinician now has a large body of assessment methods and tests to draw upon. However, this battery of assessments is now too cumbersome to use and they are not statistically related. It is left to the clinician to use them in an eclectic manner. Also, during the past twenty years, descriptive taxonomies have flourished, with few psychometric assessments being developed. Whilst, using a 'descriptive' method of assessment is valuable for providing detailed information about the child's unique pattern of performance, it is a time consuming method and has validity pitfalls due to the extreme levels of variations that can occur between assessments. A psychometric assessment allows one to make comparisons of test performance over time and to a peer group. The limitations of this type of assessment is that it compresses the child's performance into a score and a standard deviation which provides little help in goal setting and therapy planning. Yet, a psychometric assessment is a necessary instrument in the battery of available tools. However, there is no formal standardised assessment of communicative competence.

2.2. THE NEED FOR A PSYCHOMETRIC ASSESSMENT OF COMMUNICATIVE COMPETENCE.

A psychometric assessment of communicative competence needs to provide a normal continuum of observable

language related behaviour that can provide a 'road map' within therapy. It would consist of a series of communicative contexts that can be related to the communicative situations of the child's world. It also would provide a profile of the child's individual performance pattern within these communicative contexts. This individual profile could be related to the normal continuum so that the child's progress could be charted in relation both to the content of the test and to the child's peer group. This type of assessment would provide the means for combining the benefits of both descriptive and psychometric assessments in one method of analysis.

2.3. CONSTRUCTING A PSYCHOMETRIC ASSESSMENT OF COMMUNICATIVE COMPETENCE.

The mathematical model constructed by Georg Rasch, to develop tests of reading ability, can be used to construct tests which meet the criteria listed above. The mathematical model provides the possibility of transforming the observable categories of behaviour into items which are located an interval scale. Through the linking of tests, an item bank of observable behaviour can be established, providing a method of descriptive analysis. The demographic characteristics of the population can be accounted for so that there can be peer group comparison and the monitoring of intervention through norm referencing.

2.4. CONSTRUCTING A UNIT OF MEASUREMENT.

The first step in constructing a standardised test of communicative competence is to create a unit of measurement. This unit consists of the procedure used to collect observations of a child's performance in various communicative contexts and the variable (a line of inquiry marked in linear units) to which the child's performance can be compared. This project has been devised to create a measuring unit for communicative competence. Its aims are to devise an operational

definition of the Communicative Competence Model and to use the Rasch method of mathematical modelling to effectuate the definition into a clinical tool.

2.5. SUMMARY.

In this chapter an outline of the rationale has been presented. The research literature is rich in detail on child language development and a Model of Communicative Competence has been suggested. Although interventionists agree with the information in the literature, only a minimal amount of it has been adopted into practice. The one looming gap in the research field has been in the area of transforming the information into a psychometric test. In Chapter 3 a critical review of the literature will be given to suggest the reasons as to why a formal standardised test has not been developed and to suggest how one could be.

CHAPTER 3 THE REVIEW OF THE LITERATURE

ASSESSING COMMUNICATIVE COMPETENCE

3.0. INTRODUCTION.

This review of the literature provides a synthesis of the research work into child development, so that an operational definition of the Communicative Competence Model (CCM) can be presented. The review also will take a critical look at the reasons as to why the premises of this model have not been adopted into intervention practice, although they have been advocated by interventionists. A method of transforming the operational definition into a clinical tool will be examined with the view to using this method to devise a unit of measurement.

3.1. LANGUAGE DEVELOPMENT, AN HISTORICAL PERSPECTIVE.

The study of language development in children aged from birth to seven years is an endeavour to draw out and follow the threads that run through a fine mesh of human evolution and cultural attainment. The literature on child development has addressed itself to the importance of nature and nurture for the last forty years and the two issues have often been discussed as if they were polar opposites that affect both learning and potential. On the 'nature' side of the issue learning and potential have been presented as innately emerging abilities which unfold at predetermined times that are both species specific and specific to the individual child. On the 'nurture' side development has been presented as the effects that the environment has taught or caused. In the last twenty years there has been a more specific look at what are the innately emerging abilities, how they differ between individuals, what type of environments help or hinder the emergence of them, and what type of skills are learnt through interaction with the environment. What has emerged, is the idea of language as a complex system, which is used within another system--the interaction of the child and the environment.

3.1.1. THE RESEARCH FOUNDATIONS.

Piaget (1971a) used the idea of 'structure' to help define a complex system. The goal of using this idea was to recover the unity of the system that was often lost when the system was first described in terms of its elements. The system was not a mere collection of elements, but it also had at its core of existence an interplay of the elements which followed certain laws. These 'laws' were a set of 'transformations'. Encompassed in the idea of structure are three ideas: wholeness, transformations, and self-regulation. Together these three ideas define the structure of the system under inspection. The idea of wholeness helps to distinguish between **structure** and **aggregates.** An aggregate is a whole, a structure is a composite of elements that are independent of the structure but comprise the structure through the richness of their ordered interplay. The idea of transformations means that this interplay follows rules which leads to the structuring of the system. The very nature of the ordered interplay leads to the simultaneous occurrence of the ongoing structuring of the system and of its being fully structured. The idea of self-regulation means that the elements and their laws of transformations are defined and never lead beyond the structured system. An accurate description of the the elements and their transformation laws defines the system.

Modern linguists were interested in describing language as a system with a duality of structure. That is, there is a finite collection of sounds that do not represent meaning and there is a systematic method to combining the sounds so that they do represent meaning. The system also has the property of being creative: within certain rules, speakers can combine the sounds and words in unique ways that will still be recognised by other speakers as being correct. 'Discovering' the sound system and the particular systems of meaning of various languages were the goals of most of the linguists during the first half of this century. In North America the early part of this century presented a dilemma: how to record the dying

native languages of the North American Indians. With urgency, many field study 'discovery procedures' were developed by American linguists to record these North American Indian languages. A written record of the surface structure was wanted and little regard was given to the reasons for speaking.

At the heart of recording languages, was making a true record of the grammar (the rule system of combining sounds into meaning which also accounted for the creative aspect). To help define a 'true record' Chomsky (1965) made the distinction between 'competence and performance'. Performance was the collection of utterances that were produced. These are often ungrammatical due to irrelevant factors that could be attributed to underlying processing mechanisms. Competence, however, is the underlying knowledge of language and is the 'idealised' form of the language.

With Chomsky's theory always at the forefront, the field study techniques of discovering a language were applied to discovering the language of children. The methodologies were soon extended, as the original purpose of recording the surface structure of spoken language was found to be too narrow to account for child language. The importance of context was noted by Bloom (1970) when she stated that meaning could not be found in just the early spoken words of young children but it could be recovered from noting the situation at hand as well as the verbal behaviour. Throughout the 1970s analysing samples of children's speech was an important research method with the goal of using the child's **performance** to help determine the **competence** of Child Language. From this research, we now have an extremely detailed description of normal language development from pre-verbal to complex sentences through various levels (phonology, morphology, syntax, semantics and pragmatics).

The beginnings of integrating the various levels of language was initiated by Bloom and Lahey (1978), when

they stated a definition of language for the purposes of studying child language development and providing intervention for those with language learning problems. Their definition, 'language is a code whereby ideas about the world are represented through a conventional system of arbitrary signals for communication' (p.4) gave a shape to the structure of the interacting components. A venn diagram was used to describe language as the interaction of content (semantics), form (syntax and phonology) and use (pragmatics).

Whilst one line of research endeavoured to draw out the thread of **WHAT** developed in child language another line of research was concerned with **HOW** child language developed. Skinner (1957) argued that behaviour was conditioned by its operations upon the environment. As a child learned how to talk, the environment reinforced these early attempts and shaped the child's communicative abilities. 'Mands' (commands) and 'Tacts' (comments) were the type of utterances used by the child that were subsequently shaped into more sophisticated language use. Skinner's work and theories were highly controversial with Chomsky putting forth the theory that child language was a species specific trait that unfolded. The resulting debate generated a field of research. The question of just how important is the role of the environment in language development has been at the forefront of the research into Mother-Child Interactions. Much more is now known about the role of human interaction in learning language. Bruner (1978a) integrated the maturational and behavioural concepts into a theory that presents language acquisition as a situation that relies both on individual maturation of species specific abilities and on the child's interaction with the environment.

The criticism of the research from the mother-child interaction field is that the subjects were drawn from middle-class western societies. It could turn out that the results may be culture specific rather than describing universal competence but for the culture from which they were made, the conclusions are

valuable. These conclusions have held up through twenty years of research and are proving to be valuable for intervention with the children who have language learning problems.

Another influential line of research was looking at how people processed information. Information processing theories were initially developed forty years ago when psychologists began to draw similarities between the logical method with which computers operated and the manner in which the human mind functioned. The 'rules' that one formed about the world were used as devices for processing information. The rules were deleted, added to or refined through interactions with the world. In the early years of the development of this theory the main concern has been to look at the underlying processes of visual and auditory perception, attention and memory, and to discover how these aspects affect cognitive perception and 'overload'. Another dimension to information processing has been developed during the 1980s and that is the manner in which schema is organised and evoked. Schema theory (Pearson and Spiro, 1980) is a theory of human processing. A script is the conceptualisation that has been developed about objects, people and events and it provides the basis through which the selection of information, expectations of events and inferences of experiences are processed.

3.1.2. A COMMUNICATIVE COMPETENCE MODEL.

The majority of research on child language development has stemmed from the aim of discovering the competence of child language. The main focus has been to discover the universals of language learning. Hymes (1971) has been critical of these studies because performance has been neglected. He defines performance as 'communicative competence' which encompasses the individual's knowledge of grammar, cognitive perception-organisation, social context and cultural identity. Developmental theories so far have not described the total picture of the

communication situation as they have emphasized competence at the expense of performance. He advocates a Communicative Competence Model which respects the universals of language learning but places the importance of study on the individual's pattern of performance within given communicative contexts.

To adequately account for performance the communicative situation has to be taken into account. Whilst the concept of 'competence' is used to describe the specific 'general rules of behaviour' that the individual knows, performance is a description of the individual's rules of behaviour within a given situation. Halliday (1971) defines communicative competence as 'a range of possibilities, an open-ended set of options in behaviour that are available to the individual in his existence as a social man' (p. 166). A complementary relationship exists between the context of culture and the context of a given situation (Malinowski, 1923). Halliday describes the interaction of the two as: the context of culture is the environment for the total set of variables and the context of situation is the environment for the particular selection of variables. Within any situation there will be a range of behaviour that will be considered socially acceptable performance--or in other words as demonstrating communicative competence.

The idea of performance places more importance upon the specific individual and considers the question of why that person is performing in a particular manner in a situation. This focus of attention is particularly inviting to those working in the field of language intervention. During the 1970s 'language' as a structure has been described in terms of its component parts (Lund and Duchan, 1983). Phonology, syntax, semantics and pragmatics have come to be accepted as the major language areas with each having their own subcomponets. These major areas have often been labelled as 'levels' of language and the idea of levels of language ability has been accepted in clinical work with each considered equally important

enough to warrant assessment and intervention. However, there has been little attention given to how the levels interact and how these interactions affect the performance of the language impaired child (Crystal, 1987). Crystal makes the point that for assessment and intervention purposes an explanation of the interaction of levels may explain the particular language learning path a language handicapped person is taking. The variations from the 'normal path' that have in the past been attributed to 'fatigue, attention problems, carry-over and the like' may in fact be a 'systematic consequence of an interaction between levels' (p. 12). An interaction between levels could cause the child's disability within a level (phonology, syntax, semantics or pragmatics) to hinder the appropriate use of a level in which the child was competent.

Accounting for individual differences within situations is deemed important and people are trying to include an explanation for its occurrence in theories of development. Within 'stage' developmental theories the concept of a 'stage' has often been viewed as if it were an all or nothing amount of knowledge that a child has or has not reached. 'Horizontal decalage' (Piaget, 1941) is the term given to the unevenness of skill accessing or learning within stages. It has been the bug-bear of normal development research, when explaining the development of skills: how is it that a skill which can be accessed easily in one task can not be accessed in another similar task which appears to be of the same stage? Piaget (1971b) finally had to say that although he believed in stages of development, he could not explain 'horizontal decalage' even though he could see that unevenness of skill development and accessing did exist.

The variations in the individual's performance is explained by several authors. White (1980) describes performance as being a set of "wobbly competencies". Within any situation some factors will help a child pull together a coherent address to a problem whilst other

factors will hinder the pulling together of a coherent address and make a child "not know". Rice (1986) suggests that communicative competence rests on an 'underlying network of variable, context-sensitive rules' (p. 272).

3.1.3. ADOPTING A COMMUNICATIVE COMPETENCE MODEL.

Rice presents the premises of the Communicative Competence Model as 1) language differences do not reside solely in the child but are interpersonal in nature and culturally bound, 2) language development is a continuum of variable, context-sensitive rules, 3) language change can be implemented in a variety of ways, and 4) the clinician is an information gatherer and decision maker rather than the only source of knowledge. Rice states that although language interventionists have adopted the model of communicative competence, the model's premises have not been incorporated into therapy implementation. She suggests that there are several reasons as to why this has happened. The main one is that therapists using the model still do not have a clear idea of the structure of communicative competence. The elements have been defined but the interplay of the laws are still unknown. Siebert and Hogan (1982) state that those working in language intervention need a model of language that represents the processes underlying its development as best as they are currently understood. At a minimum the model should provide the practitioner with good observation categories which describe the child's language-related behaviour, and it should suggest probable developmental change mechanisms that may be translated into intervention strategies.

In the next section a detailed look at the structure of communicative competence as it is presented in the literature will be given. An outline of the observation categories which can be used to describe the child's language-related behaviour and the type of developmental change mechanisms that may be translated into intervention strategies will be presented.

3.2. COMMUNICATIVE LANGUAGE ABILITIES AS A SYSTEM.

Due to the research work of the last forty years, the elements of the structure of communicative competence are well known and do provide good categories which will describe the child's language behaviour. The change mechanisms are not as well understood, but they have been outlined in a somewhat nebulous manner. In the following sections the elements and the change mechanisms will be presented as they have been described in the literature.

3.2.1. CONTENT DOMAINS: Observable Categories.

When studying child development, the item of analysis is the child's behaviour, or what the child does, in a given situation. To further assist researchers in understanding the development of a child's behaviour, specific behaviour has been classified into 'behavioural domains' such as motor, cognitive, social, emotional and communicative. A further step in assisting the understanding of child development is to create 'content domains'. This is the abstraction of real child behaviour into theoretical categories. These domains consist of a collection of specific behaviour which either at one level simply cluster together (appear at the same time of development) or at a second level have a demonstrable relationship between each other which can be observed and measured. In this study nine content domains have been created. The content domains have been titled: 1) Other behavioural domains, 2) Early communicative interactions 3) Comprehension, 4) Symbolic communications 5) Rule based linguistic development, 6) Interactive dialogue, 7) Oral and literary style language, 8) Narrative development and 9) Aesthetics of language.

3.2.1.1. Other Behavioural Domains.

Woodruff and Maxwell (1981) state that a system of symbols such as verbal language can not be understood

independent of development in other behavioural domains which coincide with it. In this section the behavioural systems that coincide with speech and language development are considered. In child development study, the domains other than speech and language (the ability to understand and use communication) have been classified as cognitive (the ability to use thought), motor (the ability to move), social (the ability to interact with people) and emotional (the ability to have feelings and to express and control them). Each of these behavioural domains are present at birth in some form and continue to develop into a sophisticated network of interrelated behaviour throughout life.

Piaget and Inhelder (1969) state that during the first two years, a child builds up a knowledge of himself and the world, from the intake of information through his senses and through his actions. This sensori-motor intelligence characterises the means by which the child comes to impose structure on his experiences. From this early sensori-motor behaviour a store of knowledge is built up, which is first demonstrated through representing the knowledge in the immediate situation. How this emerging nonverbal and verbal 'thought representing' behaviour cluster and relate to each other in various periods of early development have been the focus of several studies.

Bates (1979) looked at the nonverbal correlates with the first word and found that the emergence of imitation, communicative pointing and object-combinatorial play correlated with the emergence of comprehension and production, whilst the emergence of means-end play and symbolic play correlated with the emergence of language production. This behaviour was found to emerge between the nine to thirteen month period. Piaget's diary study has been extended into more precise observation categories by video recording children longitudinally between the ages of nine and twenty-four months. The results demonstrated structural parallels between language and

symbolic play at least through to the creative use of two word utterances (Nicolich, 1975; Sugarman-Bell, 1978; McCune-Nicolich, 1982).

Other studies have shown that children who engage in pretend play exhibit longer and more complex utterances, more explicit use of language and are more sensitive to the communicative cues from others (Westby, 1984). The early exploratory and representative type behaviour develops into knowledge that can be used outside of the immediate situation and the child can become freed from learning through direct perception and action.

Seibert and Hogan (1982) describe how the development of the social and emotional behavioural domains takes place within the context of interaction. This begins with an interest in the attention of others to self and develops into the ability to enter into and maintain joint attention with another person. The later development of the ability to regulate the flow of behaviour between people and to take either role of initiator and responder within communicative routines contributes the development of communicative sequences and to the ability to maintain communicative routines. Bruner (1975) found that this behaviour developed between the eight to fourteen month period.

Also encompassed within the social/emotional behavioural domains is the early developing ability to make needs and desires known and fulfilled, which appears between the thirteen to twenty-four months period. The ability to express thoughts within a conventional social framework relies on the integration of linguistic knowledge with social and cognitive knowledge (McShane, 1980).

3.2.1.2. Early Communicative Interactions.

Early vocalisations develop in the first year of life. Changes in type and duration of vocalising has been shown

to be linked to another person's vocalisations within social interactions and to the child's play with objects (Hilke, 1988).

Bruner (1975) uses the term 'speech acts' to explain how communicative routines are created by the care giver and the baby. Language is then mapped onto the meaning of the exchanges within these non-verbal play routines. The child's early needs, wants and thinking patterns are reflected in the sounds that the child makes. These sound patterns are not sent to the adult as an intentional means of communication, but the adult who knows the child can interpret them--leading to successful communicative routines. These 'understood' routines build into early communicative exchanges. This takes place in the nine month to eighteen month age period.

Early communicative patterns are created by developing social conventions and arbitrary codes. Early routines that arise spontaneously through daily care giving will develop into conventions. These are 'sounds or gestures whose form and function are agreed upon and recognised by both agent and child' (Bates, 1979: 36). These conventions turn into behavioural turn taking exchanges which can be initiated and responded to, by either the adult or the baby. A higher level of communication also develops--the knowledge of arbitrary codes. These are signals with specific meaning attached to them and are discovered by the child through observing them in the social world. These arbitrary codes can be meaningful to the culture at large or idiosyncratic in nature--only meaningful to the child and care giver. This takes place in the eight to twelve month age period.

The nature of early communicative interaction facilitates the development of meaning and intentionality within the child. Meaning and intentionality go on to facilitate the development of first words and early word combinations (Chapman, 1981). The sharing of joint focus and the temporal proximity of parental feedback help children make

both cognitive and linguistic comparisons between their parents' speech and their acts (Wells, 1984; Shatz 1982, Snow 1977).

3.2.1.3. Symbolic Communication.

These early routines and arbitrary codes then turn into intentional communication--'a signalling behaviour in which the sender is aware, a priori, of the effect that a signal will have on his listener, and he persists in that behaviour until the effort is obtained or failure is clearly indicated' (Bates, 1979: 36). Bates uses the term 'decontextualising' to describe the process of early language production when the child first uses words to represent things and events that are not present. She also presents a sequence of how a child uses vocalisations on a path of 'progressive distancing' of the vocalisations from their use within the immediate action routine to their use of representing non-present things and events. Performatives are vocalisations which have been specifically linked to a situation, such as always saying 'mmm' when eating or 'whee' when putting a toy down a slide. A protoword is a non-conventional word. It is a vocalisation that is not a true word of the adult language. However, this non-conventional word, such as 'mmm' is used to represent things and events. So when the child hands mother her bag and says 'mmm', she then knows that she is meant to fish out the crisps for the child. It is then that 'mmm' has been used as a protoword. The final step is when the child uses vocalisations, that can be recognised as true adult words, in appropriate situations or to represent situations. This sequence emerges between eight and thirteen months.

3.2.1.4. Comprehension.

Wells (1976) defines comprehension as 'the result of an interactional process between the cues provided by the sender's utterance and the knowledge that the receiver can bring to bear in interpreting those cues' (p. 28). That

interactional process includes the ability to identify which aspects of represented reality are being referred to by the speaker and the ability to construct an adequate representation of it from a store of linguistic and nonlinguistic knowledge. Chapman (1978) states that the routines that the child understands first are the routines that language is first used in and are the events that language is later used to represent. This occurs between eight to thirteen months. Later (at around the twelve to eighteen months age) comprehension further develops into a specific understanding of word meanings--linguistic comprehension. Chapman reported that at around two years the child demonstrated a lexical understanding of syntactic elements. This ability continued to develop rapidly to the age of four but they still relied upon context to help them determine sentence meaning. Later comprehension becomes very subtle with an understanding of task structure which includes social understanding as well as linguistic understanding. It is at this four years plus age that children are able to use their knowledge and go beyond the immediately given cues. It is then that inferences, predictions and hypothesis can be made about the given information (Tough, 1973, 1977).

3.2.1.5. Rule Based Linguistic Development.

The form of language is characterised by the rule structure that underlies it. Historically, three rule systems have been used to characterise any specific language. The first is phonology, the rule system for the finite range of sounds and the systematic method of combining them which comprises the language. The second rule system is morphology, the rules for combining the sounds into different word meanings. The third rule system is syntax, the rules for combining words into sentences. Crystal, Fletcher and Garman (1976) state that these rule systems are the network of organisational principles underlying linguistic expression which keeps language from being a jumble of sound. Crystal, Fletcher and Garman

provide a taxonomy for describing the development of syntax, which they call LARSP. The three major elements of subject, verb, and object or complement or adverb provide the clause structure. Each of the clause elements can be expanded into phrase structure while word structure provides a morphology analysis. In order to use the LARSP taxonomy, a language sample has to be taken and then each of the items are counted and a frequency tally is entered. A discussion of typological patterns which are different to the 'normal' pattern also is presented. The gaps or weakness can occur at the clause level, phrase level, word level or discourse level. The clause structure is the most basic part of syntax and all the other levels depend upon its development.

3.2.1.6. Interactive Dialogue.

Conversation is the reciprocal means by which at least a dyad or more organises verbal exchanges (Garvey, 1977). Conversations are interactive. The participants can depend on the here and now to help provide meaning. In which case, the language used may be elliptical in nature, as both participants rely on situational support. Or they may be talking about shared experiences, in which the language also will be elliptical, with shared knowledge providing the support to meaning. Or they may be talking about experiences and knowledge that is new between them, in which case meaning will be extracted solely from the lexical and syntactical choices (Dore, 1979).

Children with well-developed dialogue skills then go on to elicit quantitatively more linguistic input; the quality of which is more likely to reflect their own level and is at a level of which they can make use (Cross 1984, Lieven 1984). School age children who had poor dialogue skills were at risk for school failure (Verney, 1987).

3.2.1.7. Oral Style and Literary Style Language.

A distinction has been made between the style of speech that relies on the situation or shared knowledge for meaning support and the style of speech that relies solely on the lexicon and syntax for meaning support. The first style has been labelled 'oral style' of discourse and is the first discourse style learnt. It develops in the home and from child rearing practice, arising as means of sharing understanding of concrete situations and practical actions. Literary style discourse, the second discourse, observes formal rules of logic and is a powerful tool for constructing an abstract theory of reality. The development of the two styles should be considered as a continuum rather than as a dichotomy. The literary style language is important for school success in general and particularly for reading success (Tannen, 1980; Menyuk, 1983).

The freeing of language and thinking from the context of immediate experience is facilitated by formal schooling and by the acquisition of literary style language (Wells, 1981, 1986). Those students using the oral style when speaking had more difficulty expressing themselves in writing than did children with the literate style, spoken discourse. An ability to use literate conversational style was associated with higher reading skills (Collins and Michaels, 1980). Good readers used language more to reflect on and reason about perception or experiences than did the poor readers (Blank, Weider and Bridger, 1968). Westby (1985) found that all the children with normal intelligence, who were experiencing school failure exhibited a greater difficulty with the literary style discourse than with the oral style. Their oral language abilities were not commensurate with other students their age, but their literary style language skills were even more delayed if not totally missing. The literary style discourse also became proportionately more delayed as they continued through the educational system. What did happen, was that, the child continued to rely on an oral language system in a school culture that was functioning predominantly in the literary style (Nelson, 1984).

3.2.1.8. Narrative Development.

The act of making up a story has the most potential for yielding the literary style language because the narrator must be as explicit as possible. The speaker must organise the ideas depicted, by evoking necessary schema, into a style of language that will only rely on lexicon and syntax to maintain meaning within the story. Narratives are the first language form that require a person to formulate a monologue rather than participate in an interactive dialogue. A narrative is a unit of personally organised sequences of sentences and it is structurally midway between the language of the oral tradition and the language of the essay literary tradition. The early question-answer 'talk-about' format that parents use with children while reading a story provide a step between interactive dialogue and letting the child formulate their own narrative (Westby, 1984).

Just as language has its rule systems that organise meaning into words and sentences, narratives have a rule system that helps to organise the meaning between propositions. This rule system turns the propositions into a whole text and not just a string of sentences. Roth and Spekman (1986) state that a narrative can be distinguished from a conversation in that it involves the extended units of text that are in a monologue form. The speaker alone is responsible for its organisation, continuity and completeness. It includes 'story markers', and it has an orderly presentation that moves towards a logical resolution. Just as there are levels of rule systems in language--phonology, morphology and syntax there are levels of rule systems in narratives. There is the macrostructure which describes the story organisation and theme, the microstructure which describes the story content, and the cohesive factors which describe the structural ties between propositions.

The ability to make up stories begins in the early years of childhood and has its roots in pretend play (Westby, 1984). Experience with well formed stories and a chance to talk about story books contributes to a child's ability

to create their own well organised stories, and by five years children can make up a story that is well organised and complete (Applebee, 1978). A series of milestones from early pretend play to complete narrative has not been outlined. Nor has there been an in depth look at the development of narratives within tasks of differing structures across age groups from one to seven years (Ohlenschlager, 1989).

3.2.1.9. Aesthetics of Language.

Aesthetics is a relationship between structure and content and conveys a wholeness of thought. Note the difference between the sentence 'The mad dinosaur walked forward slowly' and one created by a six year six months old American boy: 'Tyrannosaurus rex lumbered forward filled with rage' (Van Dongen and Westby, 1986). Aesthetic knowledge helps to create harmony by allowing people to confer order on the world, 'to make that world hang together, to fit, to feel right, to put things in balance' (Eisner, 1985: 29). However, aesthetics in the curriculum as been viewed as an extra--something nice but not essential (Van Dongen and Westby 1986). Grice (1975) provided guidelines for the judging of harmony in language: utterances can be judged for their truth, relevance, clarity and perspicuity.

3.2.1.10. Summary of Content Domains.

These studies have resulted in important information for intervention planning by providing discrete observation categories. However, communicative language development is a succession of being able to use a network of novel, additional and interlocking behaviour in more complex situations. Therefore, it is important to note when specific behaviour emerges, how it combines with other specific behaviour and the further complex skills that it combines into. This type of outline of the normal continuum of language development still remains illusive: there is no cohesive road map to pull all the detail

together. For those working in the field of intervention, this accumulation of a wealth of data without a theory of development that has empirical validation has made the useful information stored within it nearly inextricable.

To make a cohesive framework that explains language development, one will have to outline the parts at each period of development and describe the interaction of the parts in a particular period of time. Bloom (1983) puts forward the position that future research should take; the phenomenon to be explained is the starting point of inquiry. A normal continuum will be developed from the question of: how does earlier behaviour relate to later behaviour. Shatz (1983) indicates that this approach raises many remaining questions in child language research: What is a theoretically sound set of subsystems? What characterises the development of each? What are the conditions for the interactions of subsystems?

The focus of research, in the study of intervention, needs to be not only that of developing categories which one can apply through using the existing normative research data, but also one that has the laws of transformation and the levels of self-regulation outlined. The next section looks at literature which has addressed these issues.

3.2.2. THE NORMAL CONTINUUM: The Patterns of Performance and the Laws of Change.

Piaget (1971a) presented the idea of the laws of transformations. In child development two types of variations are discussed. One is the type of fluctuations that occur when a child is performing within a 'stage' and the other fluctuation occurs when there is movement into another stage of functioning. Both the patterns of performance within a stage and the laws of change between stages are important parts of the laws of transformation.

This section will look at how variations and change in child development has been accounted for in the literature.

3.2.2.1. The Course of Development: Continuous or Discontinuous?

Although a wealth of information about when the discrete language skills develop is known, a neat continuous picture of skill learning through out the early years has not been outlined. The continuity of skills growing in systematic complexity and in a fashion that can be observed, noted and explained with ease and then the sudden seemingly discontinuous emergence of new abilities as the child reaches a new, novel and almost **magic** 'stage' has stumped researchers when they have tried to develop a theory that will explain the course of normal child development. The advocates of a theory of 'Continuous Development' can rely on a thorough itemising of the emergence of crucial behaviour (a listing of the elements); which to them seems continuous in spite of 'abrupt changes'. The advocates of a theory of 'Discontinuous Development' can rely on the fact that it is still not clear as to what happens to behaviour during its course of developing in complexity. Neither theory has been able to cope with explaining the 'transition' from one stage to the next, so from where, how and why the novel emerging behaviour originates still seems a mystery.

The idea of 'stages' still remains in both child development and child language development even though a cohesive 'Stage Theory' has not been presented. Brainerd (1978) states that for a 'stage theory' to be an explanatory construct it must fulfil three criteria: (1) it must describe some behaviour that undergoes age change, (2) it must posit antecedent variables believed to cause the changes, and (3) it must provide procedures whereby the behavioural changes and the antecedent variables can be independently measured.

The nature of the continuity of development is an important question when working with disabilities in language development. The severity of the pattern of unevenness can make the handicapped child's unique developmental pattern difficult to fit on to a normal pattern and explained through our current knowledge of normal development. In this case a 'patchy' development is reported. In some cases the development is so patchy that no stage can be associated with the child's pattern. Yet, a concept of development should be able to explain unique patterns (Fischer, 1980). Also important is being able to explain how one can facilitate the emergence of those novel behaviour stages which occur so naturally in other children. Questions as to where to go next and what is the best course of action for getting there are still not only unanswered in intervention research but methods for obtaining these answers are still under-developed. The next section will take a look at a model of change and then review how it applies to child language development.

3.2.2.2. Laszlo's Model of Change.

Laszlo (1969, 1972a, 1972b) proposes a theory of development that corresponds closely with the child development theory of Piaget. He states that two events can happen when an organism is functioning in the environment: the first is maintenance of a typical structure over a period of time in a dynamic environment. This, Laszlo called self-stabilisation or steady state. The second is modification of structure that can occur in response to input from the environment. This, he called self-reorganisation, evolution or development.

Adaptive self-stabilisation occurs when an organism can function within its given structure. The constant constraints that the environment imposes bring about an unchanging steady state: all events can be handled by and within the existing systems. Therefore the existing systems resist change and continue to function as they are without having to restructure. Variations in

reactions are possible due to the complexity of the interrelating constituent systems. A complex multi-system organism functioning in a steady state conserves invariance of structure and is given a greater range of variance in its functioning. A learning of new but similar behaviour is possible by increasing the range of variation within the existing systems at that stage.

However, as well as being able to resist perturbations from the environment and functioning in a steady state the organism also is able to reorganise itself and acquire new parameters to deal with the environment. Systems will become more complex in response to inputs from the environment. Adapting to the forces in the environment, which are acting upon it, initiates the reorganisation process--but the reorganisation of the structure results from internal constraints which are genetically programmed. To propose that the ability to reorganise is genetically programmed does not exclude the importance of the environmental context but it does stress the ability of the individual to organise oneself. In the process of developing more complex behaviour, early prototypes of behaviour integrate from previously separate systems into more advanced behaviour which form novel stages of functioning. When this happens a new steady state is reached. Each new stage brings with it new structures and functioning patterns because the new stage incorporates more than simply the systems that existed before.

The study of an advanced state will not clearly show the separate threads of development leading up to the present state, just as a detailed study of a lower state will not fully explain the behaviour of an advanced state. The new ways of functioning will not seem to be continuous with the skills that were previously developing with some synchronisation.

A reorganised system does not necessarily mean a more stable system. The more systems involved in the process

of becoming more complex the more prone to disorganisation the end result will be. A lack of development in one system or subsystem will influence the development throughout the organism. Yet, systems based on hierarchies are much more stable, as failure in organisation will not destroy the whole system but will only decompose it to the next stable subsystem stage where it will continue to function and integrate with other systems. This means that it can reconstitute the loss in a much shorter period of time. Development will always be on the course of increasing hierarchical structural development.

3.2.2.3. The Laws of Change and Child Development.

Although, Laszlo was not explaining child development, the proposed theory goes a long way towards suggesting the change mechanism involved in development and explaining the nature of its disabilities. From the view point of this model the occurrence of horizontal decalage (the unevenness of skill learning) can be seen as variations within situations causing the variations in accessing of skills through different systems. Sroufe (1979) views the child as an individual who is organising the world through several systems simultaneously and any one system can affect the accessing of knowledge within another system.

In explaining the development of the smile, Bowlby (1980) stated that the baby enters the world equipped with a number a behavioural systems. Each of these behavioural systems are ready to be 'activated' by the environment but each system is biased. The behavioural systems are ready to be activated by some input, or its emergence could be terminated by other input, or the systems' development could be strengthened or weakened by other input. Whilst the child is genetically programmed to be able to select information and create meaning from it, the range of stimuli that is important to the child is specific for each individual.

The importance of the 'meaning' that the individual derives from input from the environment and the results of this 'meaning' on the state of the individual has been noted in psychology and other fields of science. Self-regulation by an individual requires an autonomous power supply. While the individual's energy supply is provided by the metabolism which takes in substances, breaks them down and reconstitutes them for its own regulative purposes, active behaviour requires further energy input in the form of information concerning the environment. This information reaches the control centre of the individual and it is in reference to this information that the individual maintains him or herself. Prigogene (1978) states that stimulation through the input of meaningful information is necessary to provide energy for the mental processes and organised systems emerge from what appears to be a morass of disordered inputs.

The specific role that the environment plays in the development of the child has been difficult to explain. The observed impact of environmental factors can be very dramatic, so its relationship to development has often been described in an over emphasised manner. It has been contributed with being the 'trigger', the 'driving force' or the 'constructing' element for the child. The environment does not merely 'trigger' development nor does it supply the main force of development, nor does it 'construct' the individual (Sameroff, 1983). While quality of environment is important, even more important is the individual's 'self-organisational' ability: what the child chooses to select from the environment, when he chooses to select it, how he uses it and for what purposes he chooses to use it is the main force of reorganisational ability (Gleitman, Newport, Gleitman, 1984). The appropriateness of an environment can then be judged by whether it gives the child what he or she needs when it is needed.

3.2.2.4. Laws of Change and Language Development.

Knowing and performing as an independent communicator means that an adult will have the ability to organise a coherent monologue or be able to be a partner in a conversation. For a child, knowing and performing as an independent communicator means that he or she will be on the path to becoming an adult communicator.

The majority of the laws of change that have been spelt out the most clearly in child language development have come from early child interaction studies (Bruner, 1978b), but dialogue skills, also, have been shown to be important for classroom success (Blank, 1973, 1985). Change has been facilitated by involving the child in dialogue type interactions which provide responses to the child's meaning. This success of providing responses to the child's meaning as a means for facilitating conversational participation and language development has been further demonstrated with a wide range of children including prematurely born children (Rocissano and Yatchmink, 1983) language-handicapped children, physically handicapped children and emotionally disturbed children (Dickens, 1989).

Bruner (1975) reports that in the interaction routines between young children and care givers, the care giver not only responds to the child's intent and meaning, but they also provide adult initiations that are at the child's communicative stage or just a step above--almost as if to give the child a chance to 'stretch' themselves a bit with their communicative skills. Girolametto, Greenberg and Manolson (1986) report that intervention programmes which focus on improving the dialogue skills of communicatively handicapped children enhances their language development.

Unfortunately, the very nature of the language-handicap draws out of care givers the type of input that is least

facilitative of good communicative interaction (Snow, 1984). The language-handicapped child demonstrates an inability to alternate turns and an impaired ability to initiate interaction and an inability to sustain turns in a contingent manner (Vietze, Abernathy, Ashe and Faulstich 1978). In response to this behaviour care givers use a faster-paced interaction style, respond less in a contingent manner to the child's nonverbal behaviour and initiate and control the topic more (Snow, Midkiff-Borunda and Small, 1984; Tiegerman and Siperstein, 1984). Intervention strategies for these type of change mechanisms need to be outlined in a manner which can provide guidelines.

3.2.2.5. The Laws of Change and Intervention.

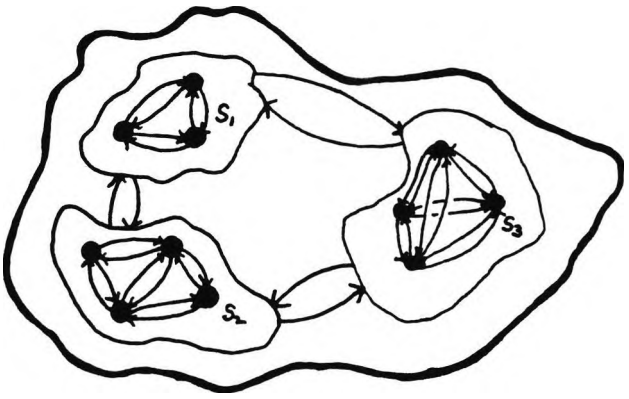
All intervention methodologies have as their aim to provide for the person an environment that will assist them in their learning by creating a situation that is other-assisted, but arrives at the end result of the person knowing and performing in an independent manner (Silliman, 1984). The child, who has a handicap in learning language-communicative skills, must learn the dialogue or monologue skills; and participation in those two activities provides the processes through which language-communicative skills are learnt.

For language intervention, some laws of transformation have been set out. Language learning does not occur in a vacuum. Its development is dependent upon the opportunities for meaningful discourse (Bloom 1973, 1980; Berlin, Blank and Rose, 1980). Developmental stages are not the sole guide to communicative ability. The stage of communicative ability that the child has attained (the stage of individual competence) will interact with situational variables to make a communicatively-competent child perform in certain ways within situations. 'Communicative competence is not an all or nothing capability. Individuals will probably be differentially competent when communicating with different persons in

different situations' (Johnson 1974: 11). Various situational variables have been identified as being important in influencing the child's choice of communication strategies: topic of interaction, the goal or task structure, the participants present, preceding events, the setting or time, place and physical arrangements (Cazden, 1970).

Duchan (1986) states that, in the language intervention situation, both the adult and child have a role to play--those of providing 'fine tuning' and 'sensemaking'. The adult must always be providing 'fine tuning' by assisting the child in activities by being sensitive to the child's stage of communicative ability. The adult will always be providing responses to the child's meaning as well as providing the child with speech to which the child is able to respond. The child's role of 'sensemaking' means that the child will always be using his or her abilities to pull together a coherent understanding of the communicative interaction and will be providing contingent initiations or responses. Within the interplay of these dual roles a situation is formed where intervention takes place.

Cazden (1981) states that performance may exceed competence during intervention when others function as an externalised source of social support. This allows the child to accomplish with help what only later can be accomplished alone. As an independent communicator, a child's performance then stems from internalised and autonomous operations. Communicative scaffolding would be the structure that the adult applies to the situation by careful selection of topic, task goal, participants, time, place and physical arrangement (Cazden, 1983). Within this 'scaffolding' the child is able to extract meaning and self organisation takes place. What is needed is an outline of a support system continuum within the 'stages' of communication. This would in effect outline discourse procedures in which 'fine-tuning and sensemaking' could take place and would lead to



KEY	
SL	LANGUAGE SYSTEM
S_L	SUBSYSTEM
SO_L	OTHER SYSTEM
SD_L	STAGES OF DEVELOPMENT
•	AN ELEMENT
⇄	A RELATIONSHIP

FIGURE 3.1.: LANGUAGE IS A SYSTEM OF SUBSYSTEMS.

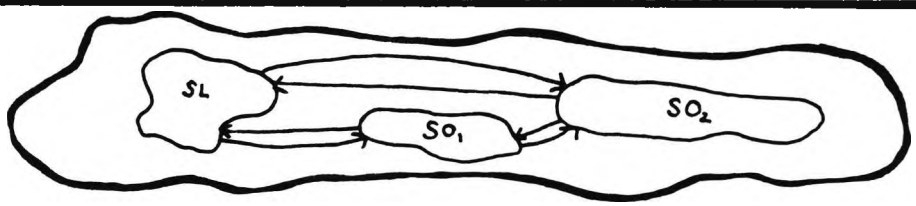


FIGURE 3.2.: THE SYSTEM OF LANGUAGE IS INTERRELATED WITH OTHER SYSTEMS.

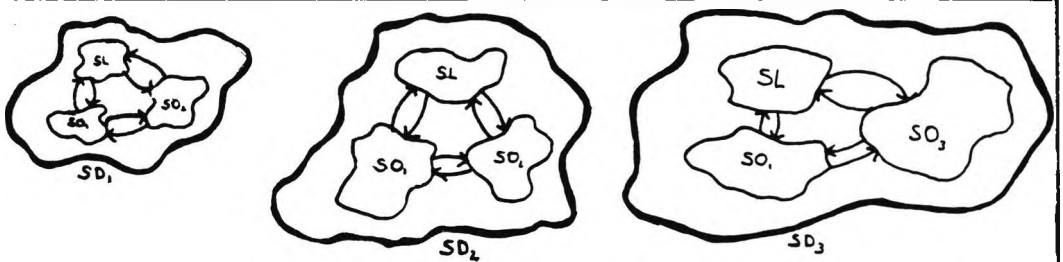


FIGURE 3.3.: THE SYSTEM OF LANGUAGE IS A DEVELOPING SYSTEM WHICH INTERRELATES WITH OTHER DEVELOPING SYSTEMS.

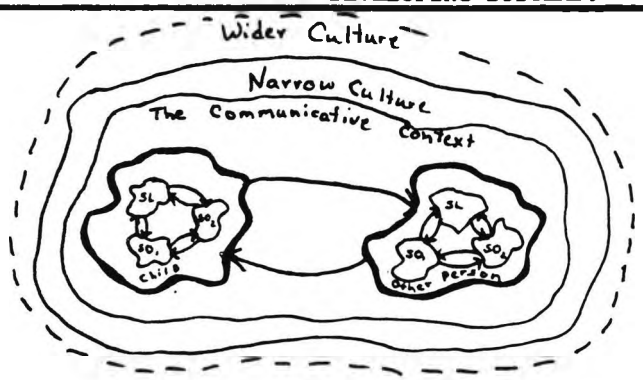


FIGURE 3.4.: THE CHILD'S SYSTEM OF SYSTEMS RELATES TO OTHER PEOPLE'S SYSTEM OF SYSTEMS WITHIN A COMMUNICATIVE CONTEXT. THIS IS EMBEDDED WITHIN A SYSTEM OF CULTURES WHICH IS MULTILAYERED.

intervention targets and strategies. What also is needed in order to devise intervention programmes is an assessment of how the child's pattern of performance is strengthened or weakened by situational variables.

3.2.3. THE OPERATIONAL DEFINITION.

The information in the literature has provided an operational definition of communicative competence. Communicative competence is presented as a complex system which includes language, its use as a form of communication, the person, the environment and the culture of the environment. Language is viewed as a developing system that is species specific but also specific to the individual. It can be described as a system of interacting subsystems (phonology, morphology, syntax, semantics and pragmatics). In its course of development, it interrelates with other developing behavioural systems; those of cognitive, motor, social and emotional. The facilitation of its development and of the other behavioural systems occurs within the environment. The interactional setting of the environment provides communicative contexts which will influence the child's accessing of behaviour. The environment is also a system that is culturally bound. Figures 3.1, 3.2, 3.3 and 3.4 present language as part of a complex system.

The interrelatedness and manners of interacting of the systems are further defined by a structure. There are three dimensions to the structure of communicative competence. The first dimension is the composite of elements which comprise the structure through the wholeness of their ordered interplay. These are the observable categories that have been outlined so minutely from the research results. The next dimension consists of the two parts to the laws of transformations. The first part is the interplay of the elements which are the child's context sensitive rules (or 'wobbly competencies') that make the child perform in the variety of manners that he or she does. The other dimension to the laws of transformation is that of the change

mechanisms that facilitate the movement to the next stage. The third dimension is the concept of self-organisation which means that the child will behave in a pattern of performance that has a definition to it.

This pattern of performance provides the means by which communicative competence can be measured. Through investigating the child's performance in different communicative contexts, inferences can be made about the context sensitive rules that the child is using. The communicative contexts are activities which are deemed to be important for the culture of the child. The inferences about the child's context sensitive rules and knowledge of the child's culture provide a basis from which decisions can be made as to the type of intervention that is necessary for the child.

Intervention takes place through practising 'the art of scaffolding'. This happens by providing support for the person to perform and then by gradually removing the support so that they can perform independently. In intervention with communicative competence, the scaffolding is provided through the application of various situational variables such as the topic of interaction, the goal or task structure, the participants present, preceding events, the setting or time, place and physical arrangements. Within the practice of 'scaffolding' a dialogue situation is created where 'fine-tuning' and 'sensemaking' are occurring. This allows the child to extract the required meaning and follow self-organisational rules.

With this definition the premises of the Communicative Competence Model as outlined by Rice can be implemented. The disability does not reside solely in the child, as the environment plays an important part and is culturally bound and the child's performance is generated by context-sensitive rules. The therapist is an information gatherer and plays the part of a decision maker. The type of treatment that is required for a disability can vary between children.

3.2.4. WHY HASN'T THE COMMUNICATIVE COMPETENCE MODEL BEEN ADOPTED?

Rice had stated that the reason why the premises of the communicative competence had not been adopted was because its structure was not known. Yet, the structure of communicative competence is known. In order to understand why these premises are advocated but are not adopted, current practice in diagnosing and assessing language disability needs to be looked at.

3.3. DIAGNOSIS OF LANGUAGE DEVELOPMENT DISABILITIES.

Although intervention with learning language abilities has been a recognised field of study for over a quarter of a decade, no substantial categories of language learning disabilities have been devised.

Historically, a speech therapist's aim in assessment was to make a differential diagnosis which would lead to identification of aetiology. Aetiological classification has always had a psychological reality to it, in that, it has given both parents and clinicians a sense of knowing what they are talking about. Unfortunately, the classifications have not had empirical validation in either being able to reliably identify specific communicative disabilities within populations or in providing diagnostic information from which intervention can be successfully planned, implemented and monitored (Bloom and Lahey, 1978). The very nature of language-communicative development makes the study of causes difficult. Research has shown that the type of environment that is provided for the child will have an important impact on subsequent development, however all classification systems currently used only look at the child and generally view the problem as intrinsic to the child.

One of the main problems with working with aetiological categories has been the method of making the differential diagnosis and the categories with which the clinician has had to work. Aetiological classifications have been

created from the medical model premise: to find an underlying cause and cure it thereby eliminating the unwanted behaviour. This premise is untenable in communicative-language development intervention as the 'undesirable' behaviour is not a symptom but is a pattern of behaviour which is the focus of attention in intervention and is evolved through interactions or through learning.

The purpose for using the categories supplied by the medical model was to differentiate between common aetiologies which contribute to communicative-language developmental problems; the most often cited were: blindness, deafness, autism, mental retardation, childhood aphasia, cerebral palsy, emotional disturbance and dyslexia. An important question in using these aetiological categories for communicative and language intervention is: Do the labels indicate either qualitative or quantitative differences in language development? Whilst research has shown both quantitative and qualitative differences between the groups and normal populations, what has been demonstrated is the ability to use language behaviour to assist in the diagnosis of the aetiology but not the ability to diagnose the individual's communicative and language abilities and intervention needs from the identification of the aetiological category, except on the grossest of terms. 'Thus, while many children do manifest common behavioural patterns, seeking to categorise children according to aetiological syndromes is rarely useful to educators or clinicians interested in developing language skills. Careful description of the child's behaviour is more important in determining what and how the child will learn' (Bloom and Lahey, 1978: 525).

There are existing classifications that distinguish between different management alternatives but these are not fully developed in the manner that is required. Crystal, Fletcher and Garman (1976) devised a description of patterns of language disability based on where the gaps in language learning were occurring. Bloom and Lahey

(1978) devised a taxonomy so that the child's abilities could be plotted on a normal continuum. Lund and Duchan (1983) advocated describing the child's language in terms of its structural elements. The College of Speech Therapists' Working Party Paper on Child Language Disability (1988) advocated distinguishing the disability as either 'delayed' or 'disordered'. A delayed disability was one which was following a typical developmental pattern and a disordered disability was one which was delayed but also atypical in its pattern of development. No definitions of a 'typical' or 'atypical' pattern were given.

Unfortunately, in the last twenty years the terms being used in the literature to describe these populations have become more generic in nature rather than more specific. This has not contributed in a positive manner to sound research methodology. However, a valid and reliable classification system is necessary in order to plan adequate intervention provisions and to allocate the children appropriately within them. What is needed is a classification system which will identify the patterns of language acquisition and use that can be used across populations. The classification system also needs to take into account the contexts that are used to generate the communicative performance.

3.4. ASSESSMENT AND THE COMMUNICATIVE COMPETENCE MODEL.

Not only is there a lack of diagnostic categories which could be applied so that the premises of the Communicative Competence Model could be used, there is also a gap in the assessments that are in current use. The next sections looks at **WHY, WHAT,** and **HOW** language development is currently measured.

3.4.1. WHY DO WE MEASURE?

Emerick and Hatton (1979) state that 'the philosophy of diagnosis dictates the uses of diagnostic information'

(p.11). The philosophy of diagnosis also dictates the type of information that is to be gathered. Emerick and Hatton list the uses of diagnostic information as identifying the problem, indicating the logical entry level for clinical work, identifying the aetiological factors which impact upon the problem, identifying the avenues of input and output which will best serve the individual, determining the most appropriate methods to approach the problem, establishing the most logical setting and timetable for clinical work, determining the most appropriate stimuli and reinforcers and determining the level of motivation and desire for change. They list three interrelated and overlapping aspects to diagnosis: (1) determination of the reality of the problem (2) determination of the aetiology of the problem, and (3) providing clinical focus. Gerard and Carson (1990) view assessment as a decision making process. The purpose of gathering information is for its subsequent implementation in the intervention procedure.

Assessment also provides the means for evaluating the success of the intervention programme. Prelock and Panagos (1981) formulated three guiding principles for evaluating intervention programmes: (1) language intervention programmes should stimulate novel linguistic responses, cognitive processing and conversational usage within and outside the training setting (2) language intervention programmes should be evaluated comprehensively through measurement of linguistic, cognitive and conversational learning within and outside the training setting (3) measured learning effects should be evaluated relative to each of the areas mentioned in principle one and to one's theory of language intervention (p. 437).

Lahey (1990) states that the reasons as to why an assessment is needed will change the requirements of the assessment. Whilst comparison to peer group is required for identification of language learning problems, descriptive analysis is required for goal setting and intervention planning. Comparison to peer group and

descriptive analysis is needed for correct allocation of intervention provisions and finally comparison to peer group is needed to monitor intervention progress.

These philosophies of assessment agree with the premises of the Communicative Competence Model. So if these are the current philosophies, then the next area to examine is: **WHAT** is measured when language development is assessed?

3.4.2. WHAT IS MEASURED?

Current trends in assessment are in the identification of a child's language disability through assessing the child's language performance (Crystal, Fletcher and Garman, 1976; Bloom and Lahey, 1978; Lund and Duchan, 1983; Lahey, 1988, 1990) rather than in making inferences about the type of knowledge underlying language performance. Lahey advocates descriptive work to assess and monitor progress with the child's language performance being sampled in more than one context, but in contexts that stress the language system. The varying constraints of the contexts will influence the child's performance (Gibbons, 1988). Lahey states that the 'past two decades have provided us with the information necessary for improving our description of children's performance and with developmental sequences that are helpful as a standard of comparison for determining goals of intervention' (Lahey, 1990: 614)

The vast area of research has provided a detailed account of what constitutes language and language development--the elements of language and language related behaviour are well established. What is missing is any form of analysis of the laws of change. No taxonomies have been devised for 'fine tuning' and 'sensemaking'. However, the taxonomies that have been devised over the past twenty years all fit the Communicative Competence Model. The next step is to look at **HOW** we measure language.

3.4.3. HOW DO WE MEASURE?

3.4.3.1. Descriptive Analysis and Psychometric Analysis

Over the past twenty years, as gains were made in the accumulation of knowledge about child language development, many assessments of child language disability have been developed to account for each of the newly outlined areas. There now are assessments for each of the main levels of language and for many of the language related areas. The situation has arrived where the battery of assessments that a clinician may use is very rich in detail and methods. It also is too cumbersome to use efficiently (Duchan, 1986).

There are three basic types of assessment procedures that speech and language therapists can use: 1) formal, standardised assessments, that have been constructed through psychometric methods, 2) informal standard assessments and 3) natural observation.

In a formal, standardised assessment procedure the method of presentation and scoring of responses is structured in a prescribed manner. The assessment has been standardised on a population and the scores attained on the test can be compared across people and over time periods. In an informal standard assessment, part of the procedure--usually the items and scoring procedures--are set out in a prescribed manner. However, the method of collecting the observations is not standard, and an informal assessment has not been standardised on a population. Any comparisons of scores are only very rough estimates of ability. A person using 'natural observation' as an assessment procedure has two methods that can be followed. The first is observing the child in their own environment, such as at home or school, in a daily routine. The second method of natural observation is to observe the child in a 'non-natural' setting (such as the clinic) but to give the child a chance to participate in 'free play' with toys that would be appropriate for his or her ability or age level. Usually a handwritten description of the child's behaviour is made and then comparisons can be made to the very

detailed information in the literature--even though that information was not collected in the same manner.

Collecting information through formal standardised assessments has had its critics in the last ten years, as the importance of 'natural situations' and 'representative language samples' has been advocated. Because of this, descriptive methods of analysis have flourished. Although, this descriptive method of analysis is good for setting goals and planning intervention, there are difficulties with the method when comparing samples between people and over time. There are several reasons as to why this is.

An important reason for these variations is that language requirements are different for different tasks. The main method in a descriptive type of language analysis is to take a 'spontaneous language sample which is representative of the child's ability'. It is left to the therapist both to decide how to obtain a 'representative sample of language' and to decide just what constitutes a representative sample. The scoring procedures for informal assessments also has caused difficulties as most informal assessments rely on a frequency count. Yet, a frequency count has never been standardised. The required amount of items within a language category that would ensure a 'representative' sample, or indicate a need for intervention or indicate achievement has never been stated. Only suggestions have been made as to how many items are needed to be considered 'normal development' and these 'suggestions' are not based on a research sample. There are also problems inherent in the data collection procedures. It has never been established as to how many total utterances within the whole sample are necessary to ensure that the sample is representative. Due to the lack of standardisation of the type of language categories that will occur within a task, the frequency with which an item of behaviour will occur, and the total number of utterances that are needed to ensure a representative sample, the reliability of these 'representative samples' is unknown.

The strength of these descriptive taxonomies is that they are very detailed and allow for profiling the different areas of language. Yet, there are still gaps in the knowledge provided by them. Some aspects which are crucial for success in education will not be present in a spontaneous speech sample which is usually comprised of an 'oral style'. The 'literary style' elements of language will have to be elicited through discourse using a more complex language task. Although, tasks have been developed which will elicit the higher level requisite skills for participating in the social community and for succeeding in the first years of education, a continuum of items of behaviour has not been established (Ohlenschlager, 1989).

In other words as well as not being clear on the type of data that is needed, we still do not know the best method for collecting it and scoring it. Nor do we know the amount that is needed for a reliable analysis, nor the criteria for success in intervention. On a practical level the clinician has found the procedure to be very time consuming. However, in spite of these numerous problems with using informal assessments of language samples, clinicians still find the descriptive accounts gained from spontaneous or elicited language samples, which profile the child's language repertoire over several levels of language, more valuable than a 'test score' provided by a standardised test. Their extreme strengths in content validity are such that therapists are willing to overlook their extreme weaknesses in reliability.

In spite of a 'test score' not being able to provide the type of information that is required for targeting intervention goals and planning therapy, psychometric assessment still provides the only means for making stable generalisations and comparisons to peer group and across time.

Howlin and Kendall (1991) state that reliable and valid psychometric tests are necessary for early and reliable

identification of children with language impairments and for making judgements about prognosis and recommendations for appropriate educational treatment. They are also important for comparative outcome research, experimental research and evaluative studies. However, the design and use of currently used psychometric tests do not contribute to making consistent and conclusive findings. McCauley and Swisher (1984a) state that there is inappropriate use of test scores to formulate treatment objectives and misuse of age-equivalent scores as measures. McCauley and Swisher (1984b) also are critical of the psychometric qualities of frequently used language assessments.

The validity of using many of the tests with a handicapped population is often questioned. Many of the tests are narrow in scope and depth and need to be used within an evaluated test battery. However, Unwin and Yule (1982) found that correlations between test scores for the handicapped population may not be the same as those for normal children. Rutter and Mawhood (1991) state that it is important to identify children who have linguistic difficulties from those who have a pervasive learning difficulty as the intervention provision differs for the two. Yet, tests which allow a clinician to make judgements about the difference between verbal and non-verbal ability are rare.

3.4.3.2. A Test Battery Currently Used in the U.K.

Various forms of descriptive analysis exist but only three will be reviewed here. The Bristol Language Development Scales (Blades) (Gutfreund, Harrison and Wells, 1989) is the most comprehensive as it covers the development of syntax, semantics and pragmatics from 1;03 to 5;00. The item analysis procedure was extensive and is based on ordering theory. Ordering theory avoids the idea of linearity but determines the logical relationship between items represented in the item response matrix. The level of measurement is at the ordinal level. Larsp

(Crystal, Fletcher and Garman, 1976) is a descriptive profile of syntax to which other profile charts have been added. Age levels are given as guidelines only and it is recommended for analysing both child and adult language. Dewart and Summers (1988) devised a descriptive chart for pragmatics: The Pragmatics Profile of Early Communication Skills. The age levels are given as guidelines.

Several tests with psychometric foundations are used. The most frequently used developmental test is the Reynell Developmental Language Scales (RDLS), (Reynell, 1978). The RDLS classifies language into receptive and expressive abilities and covers the age range from 1;00 to 7;00 years. The Symbolic Play Test (SPT), (Lowe and Costello, 1976) was devised to assess the language related behaviour of symbolic play and covers the age range of 1;00 to 3;00 years. The Bus Story and Action Picture Test (Renfrew, 1980) assess the higher levels of language production. Two tests have been designed to specifically assess the comprehension of particular items of grammar, The Test of Receptive Grammar (TROG) (Bishop, 1983) and the Sentence Comprehension Test, Revised (SCT) (Wheldall, Mittler and Hobsbaum, 1987). The Illinois Test of Psycholinguistic Ability (ITPA) (Kirk, McCarthy and Kirk, 1968) was developed from the Information Processing Model and assesses the processing of auditory and visual information. The British Picture Vocabulary Scales (BPVS), (Dunn, Dunn, Whetton and Pintillie; 1982) is a frequently used comprehension vocabulary test.

Several tests, which are currently used, do not have psychometric foundations, although their presentation and manner of use is somewhat 'semi-formal'. The Stycar (Sheridan, 1976) is often considered to be a psychometric test however it has never been standardised. In fact it does not have a standard method of presentation outlined nor items of behaviour to score. It is a frequently used developmental test which does have a wide range of tasks covering language and language related behaviour. It covers the age range of birth to

6;00. Living Language (Locke, 1985) assesses comprehension and expression of vocabulary and parts of the test do have a standard presentation format which is suggested that examiners use. It covers the ability range from pre-speech to complete sentences. The Derbyshire Language Scheme (Knowles and Masidlover, 1979) which mainly examines the specific area of comprehending the information carrying words in utterances, has a formal presentation and scoring format but has never been standardised.

Howlin and Kendall (1991) examined a battery of specialist language tests and verbal and nonverbal cognitive tests that are available and currently used in Britain. The 28 subjects in their study were drawn from a unit for children with developmental language disorders. All scored within the normal range on the nonverbal I.Q. test. They found that although the language tests correlated highly, the mean age scores obtained by individual children on the separate tests varied by as much as two years. This variation in test scores caused them to caution against a 'false security about the merits of any one individual test' when assessing a child with language handicaps (p.363). Selection and evaluation of programmes may be hindered when assessment is limited to only one or two measures. Verney (1987) found that preschool language disordered children who had been assessed as having normal language skills on two currently used psychometric assessments for comprehension and expression did not in fact have the interactive language skills they needed for participation in the school activities.

However, Howlin and Kendall found that a comprehensive evaluation of the variation in test scores obtained on the battery of tests did present a linguistic profile. This provided useful diagnostic information. The tests which tapped more complex language processing tended to indicate impairment more than straight forward assessment of receptive or expressive skills. The measuring of use

or understanding of single words or simple descriptive skills were less sensitive in indicating impairment. Tasks which involved complex syntax and higher levels of communicative ability were more sensitive in indicating impairment. They found the test 'The Bus Story' (Renfrew, 1980) which examined narrative skills to be particularly sensitive to difficulties in processing and expressing higher levels of communicative ability. Bishop and Edmundson, (1987) also found this test to be a particularity sensitive assessment procedure.

Howlin and Kendall also found that the tests that were designed to test complex syntax and higher levels of communicative ability had the least adequate psychometric construction and score information. In fact, the psychometric foundations of many of the tests were of a poor quality and could lead to 'arbitrary and inappropriate choice of tests' and 'to inconclusive, contradictory or erroneous conclusions' (p.365).

Howlin and Kendall found that the verbal I.Q. scores related poorly to the other specialist tests. They suggest that it appears to be not a 'good measure on which to base estimates of language functioning' (p.363). They further suggest that what is needed is a test battery which profiles a child's ability across several language dimensions, including vocabulary, syntax, pragmatic use and language processing in both structured and naturalistic settings. They also state that significant deficits, even in one dimension should be considered an at risk factor. They purpose that detailed profiles may not be practically viable for the purposes of experimental research or large scale screening.

Howlin and Kendall provide some recommendations for selecting which tests to use: 1) those using the tests should be aware of the psychometric design and the implications it will have on making interpretations, reliance on age scores rather than standard scores can cause problems, 2) although there is a high correlation between measures, scores on one test can differ from

scores on other tests, 3) language tests have generally been designed to test normal language and this needs to be taken into account when interpreting the language scores from atypical samples. The choice of test should be made when considering the child's language ability range and not the age range and finally 4) because no one test is likely to be adequate, profiles of language ability should be used.

The reason for not adopting the premises of the Communicative Competence Model into therapy appears to be due to having a large but inadequate battery of tests from which a clinician has to make choices in an eclectic manner and with no guidelines. Descriptive analysis has been demonstrated to have good content validity but little reliability and the psychometric tests currently used do not provide sufficient content validity nor do they have a sufficient psychometric basis to provide reliable scores which can be used for the purposes that intervention practice requires.

3.4.4. ASSESSING FOR THE COMMUNICATIVE COMPETENCE MODEL.

Duchan states that 'fine tuning' and 'sensemaking' offer the principles needed to over come the problem of working with language and communication through several levels of ability. In her article Duchan goes on to outline how intervention should proceed in this fashion. She does not mention how the child will be assessed. Yet, assessment is vital, if one is to work successfully in this manner. Given a situation where the adult is supposed to be structuring the situation by taking the child's ability level as the starting point, then 'fine tuning' into the child's communicative level by following the child's lead, and adding just enough information to provide stimulation without taking control and giving support so that the child can respond, while at the same time

reducing the support so that the child becomes skilful and independent in performance--given **THAT** situation, it is very easy for the adult to feel awash with information or even lost at sea. To carry out this type of intervention strategy, a firm guideline of where intervention is going and what is considered achievement is needed. A description of the normal continuum would provide that map, but also the child's pattern of communicative performance needs to be known. There also needs to be a method of charting the child's individual pattern onto the map of the normal continuum.

Interventionists, who want to adopt the premises of the Communicative Competence Model into practice, need a test that provides observable categories and suggests the transformation procedures. The assessment should provide descriptive data that can be compared to that of the child's peer group and can be compared across test situations over time. The data also should depict the child's individual pattern of performance which can be mapped on to the normal continuum. This pattern of performance should identify the context sensitive rules that the child is using. An assessment of communicative competence would be an assessment of an individual's performance with their language system of interactions within communicative contexts.

3.5. WHY IS THERE NO ASSESSMENT FOR THE COMMUNICATIVE COMPETENCE MODEL?

In spite of the plethora of assessments and taxonomies that have been devised to account for the large body of knowledge of normal development there still is not a robust formal standardised assessment that follows the normal continuum of communicative competence from one to seven years. To understand why there is not such a test one needs to look at test construction methodology. The foundations of traditional test construction methodology are such that a test of communicative competence can not be designed. However, recent developments in test

construction do provide the framework for designing the type of test that can provide a formal standardised assessment to use with the Communicative Competence Model.

3.6. TEST CONSTRUCTION METHODOLOGY.

3.6.1. AN HISTORICAL PERSPECTIVE.

In the preface to his third edition of Essentials of Psychological Testing Cronbach (1970) gives an overview of the history of test construction as, he states, 'forces like these leave their mark'. The foundations in methodological designs for constructing tests date to the era from WORLD WAR I to WORLD WAR II when it was necessary to select men for the military and then quickly classify them as to their natural abilities so that little time and effort was required to train them to perform brilliantly and efficiently in a task (in which they would probably meet their death). The 1950s found large numbers of once full-time applied psychologists, formerly with the military, working without the support, purpose and enthusiasm that the wars had provided. That time span found them somewhat disillusioned and early child development and the field of education were areas that they turned their interests towards.

The traditional test construction methodology was applied to the development of tests for young children and through the years a plethora of tests have emerged. Yet, nearly forty years on, we are still without a formal, standardised test that accounts for current research in language development from one to seven years that clinicians can use when planning intervention programmes with children who have difficulties in developing language. Cronbach stated that as far as practical tests go his impression was that 'tests that saw the light of day before 1949, with new norms and new scoring procedures, are in many areas the best we have today' (Cronbach, 1970: xxviii). He thought that the current

theories were still too broad in the 1970s to be used as blueprints for tests, but that they were well on their way to converging in views and someone would be able to distil from them and the literature in the older traditions of Wechsler and Thurstone-Guilford, a guide to the next generation of tests.

Cronbach also was convinced that the solution for the ills of testing would come from a sound knowledge of the aptitude-treatment interaction process. The tests would then shift from the selection or prediction model to that of allocation, and test procedures would be used for picking out the best education and therapeutic approach that promised the best results for the individual.

He went on to say that only those who eschew theory as entanglement have been marketing practical new products and procedures and the things that actuarially scored tests cannot do are more important than the things they can do. In 1969 he felt that the time was ripe for a wholly fresh effort to construct a new generation of tests. Twenty years later that still has not happened and the majority of recent tests being produced and marketed for use by speech therapists in Britain do not have any test construction methodology behind them. Unfortunately, for a new generation of tests to be developed in the area of child language development, the traditional test construction methods of Cronbach will have to be replaced. The methodology that was developed for the selection and classification of the ability level for accomplishing certain tasks is built on assumptions that do not apply to the developing child and do not assist in classifying the types of disabilities to the degree that is necessary for remediation programmes to be constructed and monitored. The tests constructed with traditional methods needed to discriminate between ability levels and rank a person in comparison to the population so that they were training the most able and the best able. This requirement transfers neatly to success in education. A group of students can be taught a subject and then tested. A well constructed test will

assess ability and rank the student according to other students. This model does not transfer to child communicative-language development, nor does it transfer to failure in education. Why and how the men failed to reach the criterion target was not an issue, hence, the issue of how to help them attain the target was never looked at. Sorting out the best and the brightest for accomplishing a certain task is not the aim of assessing a child's language abilities in order to plan and monitor intervention goals.

3.6.2. TRADITIONAL TEST CONSTRUCTION METHODOLOGY.

6.6.2.1. The Latent Trait.

The underlying assumption of test construction methodology is that there exists some attribute that is intrinsic to an individual and shared by all individuals. This underlying attribute functions as a constraint on the probability that a person will respond in the correct fashion to an item or to a group of items. This underlying attribute is called a 'latent trait' and a continuum or dimension is assumed to exist for it. Therefore, the probability of a subject responding correctly will be a function of the subject's position on this dimension; implied within that is the assumption that the higher the subject's position on the latent trait dimension, the greater is the probability of the subject to responding correctly to a particular item on the same dimension.

3.6.2.2. Traditional Item Analysis.

In traditional item analysis, items, which have certain properties, are selected for inclusion in a test; those of homogenity, internal consistency, maximal total score dispersion (Hashway, 1978). Homogenity occurs if the subject who responds correctly to an item also responds correctly to all other items in the group. Internal consistency is present if subjects with similar positions on the latent trait dimension respond in similar ways to

all items. Maximal total score dispersion occurs if the items selected have a total score variance that is larger than might have been, given any other set of items.

3.6.2.3. The Level of Measurement.

The test scores are obtained through the process of ranking the subjects within the total population selected to calibrate the test. Age groups can be placed on the latent trait dimension through this process of norming. The level of measurement within traditional test construction is that of the Ordinal Scale and the ranking of the population is the substance of the measurement. Goldwin, Sawacki and Frazen state that although most test data could be classified only as 'ordinal in nature' examiners treat the data as if it were of an interval kind. 'Though one would would be hard pressed to identify assessment instruments that meet such a scaling criteria, most psychological data is treated as though it were on an interval scale' (Goldwin, Sawacki and Frazen, 1984:23). In actual fact, in traditional test construction the **items** are not located on a scale at all, only the population is ranked and located on a scale of measurement.

3.6.3. MEASURING THE DEVELOPMENT OF COMMUNICATIVE COMPETENCE.

The underlying assumption, that there is a latent trait, which lies behind traditional test construction does apply to measuring the development of communicative competence. It is the process of ranking populations along the latent trait that does not illustrate the development of communicative abilities. Ranking does depict less knowledgeable students from more knowledgeable, or less able from more able. But an eighteen month old is not a less able seven year old. Development is a continuum of qualitatively different abilities which occur at different age levels. Within

each age level a child may be more able or less able than the age peer group. A test needs to be more sensitive than summarising development as: if you are older you know more. There needs to be a test where groups of items are passed at certain ages and these items may not be applicable to other age levels on the continuum, as some items may disappear when the child gets older and be replaced by others. An older child also will have different types of knowledge and will respond differently than a younger child in the same situation.

Using norms as the sole method for locating an age group's specific place on the continuum and then comparing an individual person's score to a related age group also has its problems. A seven year old with a language problem who receives a low score may not in fact have the language abilities of the age level that the test has assigned him. Age related scores and their standard deviations do provide useful guidelines for identifying children with problems as they can be used to compare the child's performance with the peer group and the scores can be used for monitoring progress. However, age related scores provide little if any guidelines for intervention planning. as they do not provide any description of the child's response patterns. A specific illustration of the child's individual pattern of response that can be related to the normal continuum is more useful than just relating a score to the average age that attained the score.

There are three ways in which these problems can be overcome: through a careful selection of content areas for the Table of Specifications, through the design of the test's scoring (i.e. through developing a hierarchy of answers related to ability level) and through the use of the Rasch mathematical model.

3.6.4. THE RASCH MODEL AND THE BASIC REQUIREMENTS OF MEASUREMENT.

Wright and Masters state that the basic requirements for measuring are: '1) the reduction of experience to a one dimensional abstraction; 2) more or less comparisons amongst people and items; 3) the idea of linear magnitude inherent in positioning objects along a line; 4) and a unit determined by a process which can be repeated without modification over the range on the variable' (Wright and Masters, 1982: 3). They also state that the only models which meet the basic requirements of measurement are those constructed from 'the Rasch Model'. The arbitrary unit of the logit log [p/(1-p)]= L is the probability unit defined by the modelled process. (p = the score's proportion correct among the sample size).

3.6.5. THE RASCH MODEL OF TEST CONSTRUCTION.

Georg Rasch is a Danish mathematician and statistician who has been developing test construction statistics for nearly forty years, although his work has only recently been published in English. He became interested in devising statistics that took into account individual differences which would help select items for tests that would then assess the **traits** of individuals. Rasch was disturbed by the type of results that were obtained through intelligence testing; he considered traditional testing to be assessing the traits of populations and ranking people in comparison to that population rather than ranking individuals on the latent trait dimension. In the 1950s, he began to devise item selection statistics for tests which would be used to investigate the results of people who had been through a remedial programme for learning to read. Wright (1980) states that the psychometric research that Rasch did between 1951 and 1959 marks the point where psychometrics moved from being purely descriptive of populations to becoming a science of objective measurement. Rasch had devised a new approach to psychometric problems by applying algebra to a probabilistic model (Lovinger, 1965). Rasch did do a

set of lectures at the University of Chicago in the early 1960s and his work has been widely used there. There exists a large body of research surrounding his item selection model but few tests for children outside of Denmark have been constructed using it.

The similarities between the Rasch model and traditional item selection is that both assume the existence of a latent trait. In both methods of item analysis, the conditions of unidimensionality, homogeneity, internal consistency and maximum dispersion of scores are aims.

The difference between the Rasch model and traditional item selection is that the Rasch model assumes the existence of a characteristic function that is dependent upon both the position of a subject on the latent trait dimension and the position of the particular item under study on the same latent dimension that the subject's position was determined. 'A person having a greater ability than another should have the greater probability of solving any item of the type in question, and similarly, one item being more difficult than another one means that for any person, the probability of solving the second item correctly is the greater one' (Rasch, 1960: 117).

In traditional test methodology only the subject's position is determined on the latent trait. Through the use of the items, a subject's position is ordered in relation to the population with which the test was constructed. The interactions of the items on the latent trait is not part of the analysis.

Constructing mathematical formulas based on the Rasch assumption results in true objective mental measurement which maps the developmental pattern of the emergence of new behaviour. From this item analysis one can then find a viable set of behaviour, note each items individual pattern of development, note the relatedness of items such as, which items occur together or which are

replaced by others. Then decisions can subsequently be made about quantitatively and qualitatively different 'stages' of development. Patterns of 'disordered' development (those showing an unevenness of performance) can then be related to the normal continuum and viewed through a specific pattern that maps individual differences.

3.6.6. CHARACTERISTIC FUNCTIONS OF THE RASCH MODEL.

3.6.6.1. Item Difficulty Invariance.

The item difficulty invariance means that the position of an item on the latent dimension is not a function of the sample of subjects used to obtain estimates of that position. Measurement which transends the instrument requires that the instrument functions independently of the people measured. This provides 'sample free' item calibration in that the location of items is invariant no matter which population is used to calibrate them.

3.6.6.2. Score Invariance.

A person's location on the variable is not due to the selection of the items used to test the person. This provides 'context free' item calibration. The Rasch scores associated with a particular person obtained from any two or more tests whose items were selected from a calibrated set of items will be statistically equivalent. Two equal ability level subjects taking two different tests constructed from the same item pool will receive the same Rasch score.

3.6.6.3. The Significance of Item and Score Invariance.

With the item and score invariance characteristics, generalisations can be made about a person's location on the latent trait rather than generalisations about the person's rank order to the population used to construct the test. The construction of a variable which is

'Context free' and 'sample free' requires a response model for calibrating the functioning which can separate item and person effect. Only the Rasch mathematical model of item analysis can do this.

3.6.6.4. The Rasch Model and Levels of Measurement.

The scores obtained from Rasch tests are at the level of ratio scales. However, most research uses logarithmic Rasch scores. The logarithmic score is at the interval level of measurement rather than ratio. The transformation of logarithmic scores into other linear transformations such as z-scores and t-scores will preserve the interval scale.

3.6.7. THE RASCH MODEL AND CONSTRUCTING TESTS.

Constructing a test is a process of working in the area of making abstractions of experience. The process begins with an idea about that experience and moves to providing a quantifiable description of that experience. Measurement begins with the idea of a line along which people and items of behaviour can be positioned. Measurement occurs when this line (or variable) is marked off in equal units so that distances between points on the line can be compared. The construction of the variable is a step by step process requiring a systematic and reproducible relation between items and persons.

The idea of a variable presents the possibility of order and an attempt to create order in experiences. Therefore the items used to construct the variable are carefully devised observational procedures. The construction of a test begins with a Table of Specifications (Goldwin, Sawacki and Frazen, 1984). This is a matrix of content areas and the activities. These content areas represent the latent trait dimension. The activities are the presentation procedures used to elicit behaviour. Within the cells of the matrix the items are placed. An item is the specific behaviour used during the test to elicit a

response from the subjects. The Table of Specifications is used as a blueprint for item design to ensure that the desired balance of areas being tested is maintained. Items which on inspection appear to be related to the specifications are included. This ensures face validity. The set of items generated in this manner forms an initial item pool or preliminary version of the test.

Wright and Masters (1982) and Wright and Stone (1979) provide practical procedures for using the Rasch model to construct measures. The process is systematic and reproducible. It involves two major and diverse steps. The first step is to construct the variable by collecting observations of experience. These are then transformed, through the application of an algebraic formula, into a linear abstraction of experience which is at an interval scale of measurement. The variable is then submitted to an Analysis of Fit to ensure unidimensionality. The second step is to define the variable by critically examining the mathematical results to investigate the type of generalisations that they imply. After these steps of item analysis have taken place and the variable has proven validity it can be subjected to further analysis to ensure reliability. In the following two sections the process of constructing and defining a variable will be explained.

3.6.7.1. Constructing Variables.

First, the items are used to collect observations from the people's performance. The 'objects' being measured are the people and the numbers that are derived for them are called 'measures'. The 'instruments' of observation are the test items and the numbers that are derived for them are 'calibrations'. The measures and calibrations together construct 'the variable' which is the quantifiable description of experience.

The item scores (how often an item was performed correctly) and the people's scores (how many items were

performed correctly) are transformed through the application of the mathematical model into item calibrations and person measures. The measurement model used specifies the event as a probability rather than a certainty. The model also preserves the idea of order by requiring these probabilities to be ordered by persons and items simultaneously. The model also enables the independent estimation of distances through the items being calibrated to obtain sample-free item calibrations and and context-free person measures.

The relation between these two sets (measures and calibrations) are formed into one dimension--a line of inquiry which is marked in linear units. This line of inquiry now can be used for making measures. Through this procedure of test construction, the assumption that there is a latent trait dimension underlying an ability becomes a variable that is constructed by the test items and the people who are tested. During test construction the aim is to construct this variable and during its construction it is the experimental variable. After the variable has been constructed and defined it then becomes the control variable to which the person who is being assessed is compared.

3.6.7.2. Defining Variables.

The observations then need to be connected to the idea of measurement that they are intended to imply. The constructed variable is investigated to establish the type of generalisations that can be made from it. The manner in which the person measures and item calibrations evolve along the variable reveals information about the structure of the experience that is under investigation.

The person measures and item calibrations are examined to ensure that they have a balanced spread over the variable. Their location on the variable, their standard errors and their frequencies are used for this examination. Although norms are not used to construct

the variable they are a useful manner for making comparisons and can be used to define the variable. The examination of the location of the age norms and their standard deviations on the variable provide important information in investigating child language development.

As the definition of the variable is established and extended an item bank is created. An item bank is created through the locating of the item calibrations on the variable. Rasch measurement provides a well-defined approach to creating item banks. The Rasch method of creating item banks solves a lot of the problems with devising a measurement of a variable with very different levels of ability such as that found in language development. By using a common item link many items can be calibrated onto a single variable. With the use of common items as links, a test can be devised for the very young and then calibrated with a test devised for an older age group.

Another step in defining the variable is to make the variable more explicit through the use of individual performance profiles. It is the documentation of how the items evolve along the variable which provides a profile of an individual's abilities. The test will not only provide a score for the person's performance but the person's specific response pattern is documented and related to the content of the test.

3.7. ASSESSING COMMUNICATIVE COMPETENCE.

A formal, standardised assessment procedure which provides observable categories of language behaviour, as described in the literature, and suggests the transition mechanism by demonstrating the context sensitive rules that the child is applying is needed. Through the use of the Rasch method of test construction such a test can be constructed. The Rasch mathematical model and Wright and Stone's (1979) procedures which use the Rasch model to

construct tests provide many interesting aspects that are of importance when constructing a test for children with difficulties in learning language.

The use of both person and item to construct the variable is unique to the Rasch model. In traditional test the procedures used to analyse the items and to rank the population are separate and performed for different purposes. Only the people are placed on an ordinal scale. The items are not placed on a measurement scale.

Item difficulty invariance is a property of the Rasch model. It means that an item's location on the variable is not a function of the population that was used to obtain the sample. The pattern of performance obtained with the test from an individual will reflect the person's ability in relation to the content of the test. A normed score will reflect the person's rank in the ordering of the population. In traditional test construction methodology a test will reveal the person's rank in the order of the population but it will not reveal the pattern of performance in comparison to the item difficulty calibrations.

Score invariance is another property of the Rasch model. It means that scores obtained from different tests which are drawn from the same calibrated bank of items will be statistically related. This is important when using different assessments at different points in time which were designed to assess different levels of ability.

The Rasch model constructs measures which are at the interval level of measurement. Interval scales are convenient as many arithmetic operations can be performed with the numbers obtained. The transformed z-scores and t-scores are particularly useful in identifying change when assessing child language. The test also will allow a comparison of the child to his peer group and a comparison of his or her own scores over time.

The methodology used in the Rasch model will result in the construction of an item bank which will provide observable categories of language behaviour. Through the application of the Rasch model, these elements of behaviour will be located on a variable providing a normal continuum of language development from one to seven years. Due to the characteristics that the Rasch model provides, a test can be devised so that scores obtained by one year olds can be compared to scores obtained by seven year olds--even though they participated in different activities with different response patterns. Most tests require older children to do all the items, even those that are appropriate for the younger children as well, but with different test forms that have been calibrated onto the same variable this does not have to happen. It means that the various test forms can be devised so that they are comprehensive for a specific age group and a score attained on one test will be statistically related to a score attained on another test. Wright and Stone (1979) state that with nine good link items and 100 subjects an item bank can be created.

The locating of each item, specifically, on the variable will provide a 'map' and each child's response patterns can be specifically compared to the map, providing an individual performance profile. From the response patterns indicated on the profile, interpretations can be made about the context sensitive rules that the child is applying.

3.8. PROBLEMS ASSOCIATED WITH MEASUREMENT.

Jones (1970) defines the aim of educational or psychological assessment as making a description of behaviour or experience of people with the goal of modifying behaviour or experience. The person carrying out the assessment will work from a theoretical frame of reference but is ultimately concerned with real people in real-world situations. At the practical level assessment

means the forming of impressions and the making of judgements about people. The impressions and judgements must be a reliable representation of the person's behaviour and they must have valid content in order to meet appropriately the goal of assessment for the person concerned.

3.8.1. RELIABILITY AND VALIDITY.

Reliability and validity are essential features of assessment from the initial stages of test construction through to the final stages of forming and implementing judgements. Reliability is influenced by the theoretical orientation taken, the item selection procedures, the item analysis procedures, the test construction methods, the test situation and the examiner. Validity is based on whether the test measures what it was intended to measure and produces information that is useful to the person making the impressions and judgements. Face validity, content validity and criterion validity are important issues in examining the validity of a test.

3.8.2. USING THE RASCH MODEL TO ASSESS FOR THE COMMUNICATIVE COMPETENCE MODEL.

Within the Communicative Competence Model, language development has been presented as a complex system and the Rasch model of item analysis has been put forward as the appropriate method for constructing a clinical tool. In this section some issues of validity and reliability pertaining to this choice will be examined.

Forster (1976) examined the reliability of item difficulty invariance between sample size when using the Rasch model. He compared sample size groups of 50, 100, 200 and 300 to groups of 1,400 and 1,800. The lowest sample size obtained a correlation of .9471. He suggests sample sizes of 150 will correlate with a larger sample size at .9910.

The psychometric basis of traditional test construction aims for a balanced and unidimensional representation of the latent trait. The Rasch model also aims for a balanced representation of the latent trait. However, it also allows for a valid representation of a more global trait. This is an important function for designing tests for complex systems.

> 'It is possible to obtain Rasch item calibrations from a composite item pool without first performing a subtest breakdown. This can be interpreted in two ways: The Rasch model may be sufficiently robust with respect to violations of the unidimensionality assumption, or the unidimensionality requirement is sufficiently broad to encompass a global trait such as "arithmetic skills"' (Hashway, 1978:14).

Since Rasch started developing tests using his model much research has been carried out to examine the validity of the model and a wealth of data validating it now exists. The literature can be broken into four main headings: 1) the underlying theory (Keifer, Mattson and Carlid, 1975; Wright and Panchapakesan, 1969); 2) parameter estimation (Wright and Panchapakesan, 1969; Wright and Mead, 1975) 3) procedures for constructing Rasch tests (Wright and Stone, 1979, Wright and Masters, 1982) and 4) the invariance properties (Hashway, 1978). Hashway (1978) also presents an extension of the fundamental measurement model into designs for treatment and programme evaluation. These designs include Between Group Comparisons, Repeated Measures and Factorial Designs. Choppin (1978) reviews research in which the Rasch model was used to evaluate educational curriculum.

3.9. SYSTEMS THINKING.

This review of the literature has presented language development as a complex system which has proven both difficult to describe and difficult to assess for the purpose of implementing and monitoring intervention. Through a synthesis of previous research a definition of language development as a complex system has been developed. The need for developing a psychometric assessment has been highlighted and a method of test construction which would create such a test has been described. A systems approach to problem solving was utilised in reviewing the literature through presenting a critical synthesis of previous research. In this section of the literature review a discussion of a systems approach to problem solving will be presented.

3.9.1. SYSTEMS SCIENCE AND PROBLEM SOLVING: METHODOLOGIES.

Flood and Carson (1988) state that two main ideas permeate systems thinking. The first is that systems approach to problem solving utilises a holistic view rather than piecemeal methods. This allows the researcher to move between the reductionist and holistic views with the purpose of reducing a complex system down so that a real world problem can be managed. At all times while moving between the two views the researcher is aware that by reducing a complex system there is always the difficulty that a substitute reality could be created and this must be avoided. The second idea is that a systems approach to problem solving is concerned with real world problems; ones which arise in the everyday world. These problems influence and are influenced by people.

Systems methodologies are systematic in the way that the nature of a 'problem' is tackled in a systemic manner and holistic thinking is maintained even while a reductionist view is being utilised. The chosen methodology follows a related philosophy through

systemic, systematic and iterative guidelines. Checkland (1981) describes philosophy as providing a nonspecific guide for action while a methodology provides a firmer guide. A technique then will provide a specific programme that produces a standard result.

3.9.2. HARD SYSTEMS THINKING/SOFT SYSTEMS THINKING/CRITICAL SYSTEMS THINKING.

Traditional systems thinking evolved hard systems methodologies and more recent endeavours into the problem solving of human activity has evolved soft system methodologies. Even more recent has been the development of critical systems thinking to provide the means for implementing research results.

3.9.2.1. Hard System Methodologies.

Hard system methodologies were designed to develop a means for achieving a defined end. The methodologies are systems analysis, systems engineering and operations research. Systems analysis is used to make a systematic appraisal of issues to meet a defined requirement. The method has four steps: problem analysis, generation of alternative solutions, evaluation of alternatives and selection of the optimal alternative (Atthill, 1977). Systems engineering is used to develop a set of activities that lead toward the creation of a new system. There are four stages: systems analysis, systems design, implementation and operation (Jenkins, 1969). In operations research there is a formulation of a problem and the setting of objectives to reach the goal. There are five phases (Daellenbach, George and McNickle, 1983): Phase 1: formulation of a problem, phase 2: constructing a mathematical model, phase 3: devising a solution to the problem, phase 4: testing the model and evaluating the solution, phase 5: implementing and maintaining the solution.

3.9.2.2. Soft Systems Methodologies.

Subsequent developments in system thinking have arisen from the need to apply systems problem solving approaches to purposeful human activity. The emphasis of these methodologies is on how to cope with ill-structured problems. Traditional systems thinking reduced the complexity of problems so that they could be modelled mathematically. The soft systems methods seek to explore the complexity by working with the different perceptions of a situation that exist in people's minds. Multiple views of reality are admitted and are included rather than excluded.

Soft systems thinking provides a 'tool bag' of methods for exploring the richness of an ill-structured problem so that the various systems within the situation can be represented. Methods such as brainstorming, the creation of rich pictures and devising of root definitions are but some of the methods for eliciting, summarising and capturing the different perspectives of the people involved (Flood and Carson, 1988). Checkland (1972, 1975, 1981) has described an iterative methodology for working with human activity. Phases 1-2: achieve a representation of the problem, Phase 3-4: evolve the structure, process and climate of the relevant system, Phase 5: debate the perceptions and agenda of possible change, Phase 6-7: changes are to be judged.

3.9.2.3. Critical Systems Thinking.

Critical systems thinking has developed from the need to see the solutions of problems implemented. Traditional systems provided 'instrumental reason', or in other words, the methods for helping decide how to proceed with doing something. This type of systems thinking has evolved into 'practical reason' (Ulrich 1983). Practical reason provides the means to help us decide what we ought to do through reflecting upon the presuppositions that enter into any social system design. The process of practical reason includes first determining what presuppositions must be made explicit in order that one

can critically reflect upon a design and secondly set out those principles for a participative debate. This debate needs to include all those who will be affected by a design, before that design can be regarded as validated and accepted for implementation.

3.10. A SYSTEMS APPROACH TO ASSESSING CHILD LANGUAGE.

3.10.1 TOWARDS AN EPISTEMOLOGY FOR CHILD LANGUAGE DEVELOPMENT.

Eastwood (1988) states that speech pathology lacks core paradigms and that the main reason for this state is an over reliance on the conventional scientific methods of experimental design. She suggests that an alteration of this orientation may provide more appropriate and beneficial results and advocates the use of qualitative research methods. In support of Eastwood, Alywin (1988) suggests that qualitative methods provide a large amount of information and are best used with other techniques; such as the use of qualitative methods to generate hypothesis for experimental methods or generating items for designing psychometric instruments.

Eastwood stated that speech therapists 'behave like scientists' (1988: 183). Bench (1991) agreed with the statement up to a point and suggested that speech therapists are not scientists because they have to work without full knowledge or control of all the variables. He goes on to state that because of the need to work without full knowledge and control of the variables 'speech and language pathology cannot be fully scientific in its method' (1991: 239) and to the extent that the development of core paradigms are dependent upon the use of scientific methods 'speech pathology is severely handicapped' (1991: 239). Yet, the Collins dictionary definition of "science" is: the systematic study of nature and behaviour of the material and physical universe based on observation, experiment and measurement and the formulation of laws to describe these facts in

general terms. Its definition of "scientific approach" is: conforming with the principles and methods used in science. Its definition of "scientific method" is: a method of investigation in which a problem is first identified and observations, experiments or other relevant data are used to construct or test hypothesis that purport to solve it. There is a systematic, manner to the procedures in which speech therapist are required to work. This manner does conform to these dictionary definitions in spite of speech therapists having to work without full knowledge or control of all the variables.

Bench (1991) suggests that the use of methods is secondary to the development of paradigms. He states that the main issue is that of epistemology. A scrutiny of the knowledge base that constitutes speech pathology is required. He goes on to state that this type of analysis of speech pathology shows that the discipline is an epistemological hybrid which resists conceptual unification. It is Bench's view that the prospect of attaining core or paradigms for speech pathology is small and the present need is to develop a range of productive ideas and hypothesis. He advocates secular paradigms within speech pathology as the field encompasses such a wide area.

The difficulties that arise when developing an epistemology for child language development stem from child language development being a complex system. Much of the work that is carried out in practice and in research with child language development, which does not use conventional experimental methods is not replicable because of its systemic structure. It is often difficult to control or match the exact interplay of the components. This situation may explain the difficulties of describing the epistemological assumptions in the field but it does not provide an excuse for not doing so. Flood and Jackson (1991) state that the underlying assumptions of a research method and the results need to be critically examined and clearly stated so that this clear, well worked out epistemology can be used to

challenge the untenable and impoverished epistemological positions that have been assumed. Their position is that it is the various methods of scientific endeavour that provide the means for implementing the type of 'scrutiny' of the knowledge base that Bench advocates. He also suggests that systems science has the range of methods that allows practitioners and researchers to elicit, outline and develop the epistemological assumptions of their work.

3.10.2. SYSTEMS METHODOLOGIES FOR ASSESSING CHILD LANGUAGE.

Systems thinking has provided a wealth of methodologies to be used when attempting to solve real world problems. Hard system methodologies arose from the need to represent situations with quantifiable models. The soft systems methodologies were developed from difficulties that arose when transferring the methods that were felt to operate in the world of natural science to human activity. Critical systems thinking has developed to address the issues of implementing the results of real-world problem solving. Flood (1990) states that is wrong to search for a super method which will address all problems but it is equally wrong to revert to a trial and error experimental approach to problem solving. The goal is to retain rigorous formalised thinking while using the appropriate range of problem solving methodologies.

When representing the complexity of human activity, there is a richness that cannot be over simplified. Yet, the literature review has presented a need for measuring child language development, which is a complex system of purposeful human activity, in a quantifiable manner. The Rasch mathematical model has been selected to use as the method of representing the latent trait in a quantifiable manner. The aims of this model are to represent the latent trait in a linear form and make adjustments for the local effects of sample ability distribution. The areas of systems thinking can contribute to this real-world problem of assessing child

language. Soft systems thinking can contribute through using methods which explore, elicit, summarise and capture the perspectives of people who are involved with child language learning difficulties. Hard systems thinking can contribute through providing the means of reducing a complex system into a manageable problem solving method whilst not losing sight of the holistic picture of complexity. Critical systems thinking can contribute by providing the means to explore the issues that are involved with implementing the results of this project.

Jackson (1989) states that there are problems that need to be addressed when applying systems thinking to human activity. He provides three main categories of problems. 1) Multiple perceptions of reality: operations research requires the formulation of a problem on the basis of objectives to be achieved. However, in discussing human activity it is difficult to agree on goals and there are different opinions about the nature of the system and its purpose. 2) Handling Extreme Complexity: traditional approaches seek an 'Objective' and quantifiable account of the system of concern so that a mathematical model can be produced, however, any model produced will be a highly biased version of the reality, and probably produced for only one of the many points of view. There are also problems with the model becoming a substitute reality. 3) Conservative Bias: in traditional approaches, the work may defend the status quo and only serve influential clients. These issues must be considered when applying a quantifiable model to human activity.

In discussing the considerations that Sachs (1977) had about the notion of mathematical inquiry, Diamond and Ellis (1989) state that 'the argument generally put forward is that the mathematical method is at most systematic but can not be considered as a systemic concept in systems science' (p. 48). The relations between the components and the whole can not be identified mathematically and hence the holistic approach

cannot be achieved. Therefore the language of mathematics is inconsistent with the concept of systems science that a reductionist method is applied to a complex situation without losing sight of the holistic picture. However, it is the belief of Diamond and Ellis that mathematics can model the systemic structure of reality. In a functionalist framework, mathematics is used to represent the structure of reality and to validate what is observable.

Diamond and Ellis propose that mathematics can have the ability to describe the characteristics of the system under investigation. The description is generated through an epistemological assumption of how the numbers used in the mathematics are related to the meaning of the observed phenomena. Diamond and Ellis state that the goal of using mathematical models to describe complex human activity is: human behaviour cannot be considered to be a unidimensional variable but has to be seen as a complex aggregate of variables therefore the task is to delineate the boundaries between the variables while avoiding the use of linear notions of change.

The Wright and Stone (1979) method of item analysis which uses the Rasch model involves the systematic procedures of constructing and defining a variable. In constructing the variable the observations are transformed into the language of mathematics and these symbols are then related to the meaning of the observations through the defining of the variable. In constructing the variable a linear description of the observations is created but through the defining of the variable a linear notion of change within the latent trait of child language development is avoided. It is through the constructing of the variable that the systemic structure of reality is modelled. The epistomological assumptions of the test are described in the defining of the variable.

Critical systems thinking provides methods for examining the issues of power, responsibility and service. Ulrich's (1983) proposal that all those who will be

affected by a design need to be included in the debate is an interesting one as it is difficult to include young children in this debate although they are the specific clients. The ultimate person for whom the test will serve is the child. Yet, it will be the adults within the child's environment who will have the responsibility and the power to provide appropriate services for them.

Thomas (1989) suggests that power is complex. It is intangible and dynamic, therefore simple definitions should be avoided. He proposes a framework for examining the power structure within an organisation which will have the responsibility for implementing a project. 1) To differentiate between different motives for power action. Power action includes decision making, non-decision making, agenda shaping. This also includes the ability to exclude issues and people and issues arising in the organisation (Lukes 1974). 2) To establish whether action is overt or covert in nature. Overt use of power is generally used in the decision making process while covert use of power creates an environment where certain issues are never questioned (Hardy 1985). 3) To identify the basis or bases of power action. The sources of power examined are to mete out rewards or (coercive) punishments, the (legitimate) authority of a person, the (referent) persuasiveness of a person, and the (expert) special knowledge and skill of a person (French and Raven (1959).

Flood (1990) states that power is involved in the technical, organisational, social and political elements of the environment. Diamond and Ellis (1989) state that an understanding of how change is managed by the intergration of individuals and technology is required. Especially in the situation where technological change is designed around human perceptions. They view it in terms of new patterns for social relationships which is a network of interests and attitudes emerging from a set of beliefs. These social relationships include employment roles, work methods and behavioural control. Within the technical aspect of power, the content-oriented,

expert-dominant approach needs to play a supporting role to the individual client who is the true centre of the design (Maguire-Vyhnalek, 1989).

3.11. SUMMARY.

In this chapter a critical review of the literature was presented and an operational definition of communicative competence has been stated. The literature is rich in detail but clinicians have had to make use of it solely through the use of descriptive methods of analysis to provide a diagnosis and to plan and monitor therapy. A formal standardised assessment would provide a much needed clinical tool. The type of psychometric assessment that is required to implement the Model of Communicative Competence in therapy has been outlined as one that combines the benefits of a psychometric assessment with the benefits of the descriptive methods of analysis. A method of mathematical modelling which would transform the operational definition into a clinical tool of this nature has been discussed. The methodologies of systems science have been reviewed as means for addressing the issues involved in assessing child language and in designing a research project to implement those issues. In Chapter 4 systems thinking will be utilised so that the mathematical model can be used to construct a variable which will effectuate the given definition.

CONSTRUCTING THE VARIABLE

4.0. INTRODUCTION.

In chapter 3, a review of the literature was presented in order to produce a synthesis of the areas relevant to the Communicative Competence Model (CCM). The review outlined the structure of developing communicative competence in children between the ages of one and seven years. This structure is defined by discrete observable items of behaviour which are its elements and by laws of transition which provide the patterns by which the elements are organised and by laws of change which provide the means for the structure to evolve through a series of states. The series of states are comprised of qualitatively different items of behaviour. The review of the literature also discussed a method of test construction which would provide the measurement model needed to organise the information about the development of communicative competence in such a way that it can be measured through a series of states. In this chapter, the information in the literature about the observable items of behaviour and laws of transition will be used to design a procedure in which data can be collected and analysed so that the items of behaviour can be placed on a line of inquiry thereby constructing a variable. The construction of a variable requires a systematic and reproducible format in which the relative strengths of persons and items are connected together. The Rasch model of test construction will be used as the psychometric method of analysis to collect the observations and transform the observations into a variable.

4.1. THE AIMS AND OBJECTIVES.

4.1.1. THE AIMS.

There are two aims put forward which constitute the objectives of this project:

1. As there now exists in the literature enough information to devise an operational definition of the Communicative Competence Model, the literature will be reviewed so that a synthesis of the relevant areas can be presented. From this synthesis an operational definition will be devised.

2. Through the use of the Rasch mathematical model, the operational definition will be transformed into a clinical tool which can be used to assess the pattern of performance of a child in various communicative contexts.

4.1.2. THE OBJECTIVES.

To achieve these aims, seven objectives need to be satisfied:

Objective 1. To critically review the literature so that an operational definition of the Communicative Competence Model can be devised.

Objective 2. To devise a Table of Specifications.

Objective 3. To devise a hierarchy of structured tasks from 1;00 to 7;00 years within the CCM.

Objective 4. To obtain person and item scores for the tasks.

Objective 5. To analyse the scores so that a variable is constructed.

Objective 6. To define the variable.

Objective 7. To use the variable to assess the pattern of performance within communicative contexts of two children with language learning difficulties.

4.1.3. TEST CONSTRUCTION VOCABULARY.

Before the method of data collection is presented a brief description of vocabulary terms will be given.

A **line of inquiry** is a line that is marked in linear units. Through the use of the Rasch analysis procedure the observation scores will be transformed and this line of inquiry becomes a **variable** along which the performance of people within communicative contexts can be measured. The **person scores** (how many items a person performed correctly) and the **item scores** (how many times an item was performed correctly) are used to construct the variable. The scores obtained for the people are analysed into **measures** and the scores obtained for the items are analysed into **calibrations.** The person measures and item calibrations are the substance of the variable which is in fact an abstraction of reality.

A **Test** is a group of items that will elicit a pattern of performance from a child. A **content domain** is an area of development that has been determined as theoretically important. **Scales** or **Activities** are the specific sets of materials, the method of their presentation, the items of behaviour and the scoring criteria. An **item** or **behaviour** is the specific stimulus and response action within the activity. A scale or activity is the observational procedure from which the scores will be obtained.

4.2. OBJECTIVE 1, THE OPERATIONAL DEFINITION.

The literature has provided an operational definition of communicative competence. Language is a collection of meaningless sounds that is given meaning through a system of interrelated and interacting levels (phonology, morphology, syntax, semantics and pragmatics). Each child learns this system while developing other behavioural systems; those of cognitive, motor, social and emotional. These developing systems are interrelated and interacting. The child is born with a potential for development that

interacts with the environment in ways that either fosters or hinders its growth. The environment is also a system of culturally bound rules. The interrelatedness and manners of interacting of the systems are further defined by a structure.

There are three dimensions to the structure of communicative competence. The first dimension is the composite of elements which comprise the structure through the wholeness of their ordered interplay. These are the observable categories of behaviour that have been outline so minutely from the research results. The next dimension consists of the two parts to the laws of transformations. The first part is the interplay of the elements which are the child's context sensitive rules (or 'wobbly competencies') that make the child perform in the variety of manners that he or she does. The other dimension to the laws of transformation is that of the change mechanisms that facilitate the movement to the next stage. The third dimension is the concept of self-organisation which means that the child will behave in a pattern of performance that has a definition to it.

This pattern of performance provides the means by which communicative competence can be measured. Through investigating the child's performance in different communicative contexts an interpretation can be made about the context sensitive rules that the child is using. The communicative contexts are activities which are deemed to be important for the culture of the child. The inferences about the child's context sensitive rules and knowledge of the child's culture provide a basis from which decisions can be made as to the type of intervention that is necessary for the child.

Intervention takes place through practising 'the art of

scaffolding'. This happens by providing support for the person to perform and then by gradually removing the support so that they can perform independently. In intervention with communicative competence the scaffolding is provided through the application of various situational variables such as the topic of interaction, the goal or task structure, the participants present, preceding events, the setting or time, place and physical arrangements. Within the practice of 'scaffolding' a dialogue situation is created where 'fine-tuning' and 'sensemaking' are occurring. This allows the child to extract the required meaning and follow self-organisational rules.

With this definition the premises of the Communicative Competence Model as outlined by Rice (1986) can be implemented. The disability does not reside solely in the child as the environment plays an important part and is culturally bound and the child's performance is generated by context-sensitive rules. The therapist is an information gatherer and plays the part of a decision maker. The type of treatment that is required for a disability can vary between children.

The operational definition can be used to devise a unit of measurement.

4.3. OBJECTIVE 2, TO DEVISE A TABLE OF SPECIFICATIONS.

The first step in test construction is to construct a Table of Specifications (ToS). A ToS is a two dimensional matrix. Typically a ToS is comprised of content domains and 'scales.' The content domains provide the theoretical basis while the scales are a cluster of items which are presented together. When the two dimensions are placed on the matrix the items are then coordinated by them. This provides a blueprint to assure that the test has a desired balance of items within scales and content domains.

The ToS that was created for this project consisted of the content domains as the first dimension and activities, rather than scales, as the second dimension. The word 'activities' will be used rather than scales. Typically test 'scales' are a set of items which are unidimensional and cumulative. Some of the following test situations are similar in format to scales but other situations are more like a play situation and the types of behaviour observed in one situation cross several dimensions. The word activities will be the term used for all the situations including those which resemble a traditional test scale format.

The activities were chosen so that the language would be in context and the presentation of the materials would form a communicative routine in which the child could participate. The activities were selected for the Table of Specifications based on theory and professional use. The areas presented in the review of the literature were used as the nine content domains. Thirty two activities were then created to elicit behaviour representing the nine content domains. In the thirty two activities there are five hundred and twenty one items and one entry criterion item. A description of the Content Domains and Activities is given below.

4.3.1. CONTENT DOMAINS.

This is the first dimension of the Table of Specifications. The following nine categories are the same ones that were presented in the review of the literature. They are listed below with their demonstrable behaviour.

(1) Other Behavioural Domains. This domain includes the behaviour of tracking objects, manipulating, cause and effect, combining objects: grading, inserting objects, matching picture to object, matching details in pictures, symbolic representations with objects and using world knowledge to describe events in pictures and to make inferences and predictions.

(2) Early Communicative Interactions. This domain includes the child's ability to behave in a manner which is easily interpreted, the child's ability to make different noises, different sounds, to vocalise in different situations, to vocalise in sequence with actions and to use performatives (non-word sounds which have linked to a situation).

(3) Symbolic Communications. This domain includes the child's ability to use protowords (non-word like sounds which are used to represent objects or events), gestures and words (single and two word utterances) with an intention to represent objects or events.

(4) Comprehension. This domain includes the child's ability to involve the adult in routines, the ability to let the adult involve themselves within the child's activities and specific interactions within routines. This domain also includes specific word comprehension within activities such as following commands: points to body parts and action pictures, to do simple actions, to do specific actions with an object prepositional placement of two objects, identifying pictures by function definition or description. The comprehension domain also includes answering questions about a story or events in a picture such as finding the characters, stating what the characters are doing, using the pictures to assist in making inferences and predictions, answering questions about an impending event, talking about improbable or

unrealistic events, events that are happening, about to happen, or have happened, stating why a feeling (states and emotions) has occurred, making predictions and explaining how a goal could be achieved.

(5) Rule Based Linguistic Development. The appropriate responses given are then analysed for their syntactic development. The number of basic sentences (those which contain a three element clause structure) are counted. The number of complex sentences is also counted (two basic sentences joined with a conjunction). The type of conjunction used is also noted (and,and then, then; or, but; because, so). Relative clauses with 'when; which, who, that' are noted. Complex sentences noting an hypothetical state with 'and...if' are noted. The structural cohesiveness of narratives is noted by 1) a repetition of a word, 2) whether noun/pronoun changes are made and 3) whether the indefinite article is used and then replaced by the definite article.

(6) Interactive Dialogue. This domain includes a pretend play sequence between the adult and the child and the question answer format of the rest of the activities. The type of interactive dialogue is restricted in these activities. However, the type of picture stimuli and questions answered correctly would provide guidelines for structuring other activities at the level of comprehension and expression of the child.

(7) Oral Style And Literary Style Language. This domain uses the information gained in Domain 5: Rule Based Linguistic Development so that the child's ability to use literary style language can be judged by comparing his use of formal language structures to that of his peer group.

(8) Narrative Development. This domain includes the child's ability to organise his own story. The structural elements looked at are decontextual theme development,

topic focus, no unrelated utterances, logical-temporal structures, cohesive harmony, event elaboration, the use of story markers, character development, the type of ideas expressed in the story that are represented in the pictures, the use of given concrete information and the use of inferred information. The activities cover a range of narrative tasks from retelling a sequence-picture story, to telling a simple action sequence-picture story, to telling action sequence-picture stories with inferred information and abstract events such as 'thinking', 'missing him' and 'dreaming'.

(9) Aesthetics of Language. This domain does not includes any items at the present. The criteria suggested by Grice (1975) can be judged after a developmental profile of the items in the above content domains are gathered.

4.4. OBJECTIVE 3, THE ENTRY LEVEL AND TEST ACTIVITIES.

4.4.1. THE DESIGNING OF THE ACTIVITIES.

Activities were designed to provide an opportunity to observe specific items of behaviour. Thirty-two activities were devised so that there would be a series of age related elicited behaviour which would represent the content domains in a balanced manner. One entry level criterion item also was devised.

The designing of the activities took place over an eight year period. A collection of activities was first put together by the investigator to use in the clinic. The collection was then revised through use with various care groups of children presenting with language learning difficulties. It was also revised through discussion with professionals working with children and through specific piloting of the final choice of activities.

The various care groups of children presenting with language learning difficulties were moderate learning difficulties, specific language difficulties, children

presenting with developmental delay, children in mainstream education who were having difficulties accessing the curriculum due to language problems, children who were on the 'at risk' register due to social and emotional problems within the home. The activities were used to assess the children for diagnosis and therapy planning.

The discussions with professionals working with children took place in workshops which were run by the investigator from 1984 to 1990 (Gerard, 1990a, 1990b, 1990c, 1990d, 1990e). During these years over 1000 people from the backgrounds of speech therapy, psychology, education and nursery care provision, health care other professions related to child care participated in the workshops. The workshops took place in over 25 health authorities, educational authorities, universities, and other establishments of higher education throughout England. The course participants were from throughout Great Britain and Eire. Few course participants were from other countries.

The investigator was hired to run the workshops for the purpose of disseminating information and for providing a means by which the course participants could work with each other in developing the information for their own use in their work establishments. They did not attend to help the investigator develop the activities, although there was a presentation about this work at each of the workshops. The workshops began when the investigator started work on this project and continued through until the variable was defined. The results of the variable were presented for discussion at the last workshops.

The participation activities utilised the philosophy and methodologies of Soft System Thinking. Diagrams, root definitions, rich pictures, brainstorming, the building of hierarchies, item creation, large group discussion, and small group work were but some of the methods used to elicit and develop the perspectives of the group members. The group participants were also presented with tasks to

come up with intervention or assessment solutions. This was either through the use of real case studies on video or through simulated case studies which were presented verbally. Several checklists were presented, discussed and expanded. The ages of 0-7 were under investigation in the workshops.

In the first years of the workshops much of the information that was being worked with came directly from the literature. However, as the subsequent workshops built upon the work of the previous ones the later workshops were working with material that was not in the literature and were creating new material.

It was from the information gained in the workshops and from information gained by working with children in the clinic that the activities were designed. The activities were then specifically piloted in a health centre clinic and day nursery centre for nine months.

4.4.2. THE PERSPECTIVE OF THE TASKS.

The tasks were designed with the issues of culture factors, developmental models and clinical/educational practice at the forefront.

4.4.2.1. Cultural Factors.

The cultural bias of the test is that mainstream British life is depicted and success in mainstream British education is aimed for. No class or cultural group was overly presented and the events depicted were ones of which children in Britain would have some experience and knowledge. The scenes are of life in Britain and not of another country. The scenes were also chosen to be non-offensive and known cultural taboos were avoided.

The people were drawn to promote a positive self image for for Black and White children, both male and female. Black

and White people, males and females were presented in various types of roles. The tasks were selected to represent a child's life and the type of ideas and events they would be interested in.

4.4.2.2. Developmental Models.

The tasks were chosen to represent the Developmental Model of language development. Although a few items were drawn from the Information Processing Model and the type of data collected could be used for Error Analysis, these two other models were not used in the designing of the activities.

The activities were chosen to represent the main areas of development as presented in the literature. They represent object play, means-end play, symbolic play, and specific language tasks such as talking about events depicted in picture books and making up narratives. The activities were selected to represent the cognitive level of the child at periods of development, in terms of the degree of concrete-abstractness within the task. Therefore, the developmental levels of both thought and language are progressive through the materials.

4.4.2.3. Clinical/Educational Practice.

The tasks were chosen as they have been considered within the literature and on the workshops as being representative of tasks relevant to communicative competence. In the literature it has been put forth that activities such as these would identify children who are having difficulty with language and the information gained from the activities would be useful for setting goals and planning therapy. Within the literature and workshops the premise has been that success on these activities would predict having the language abilities to cope with mainstream education. Both the aims and working practice of speech therapists working with a developmental model and of teachers were considered.

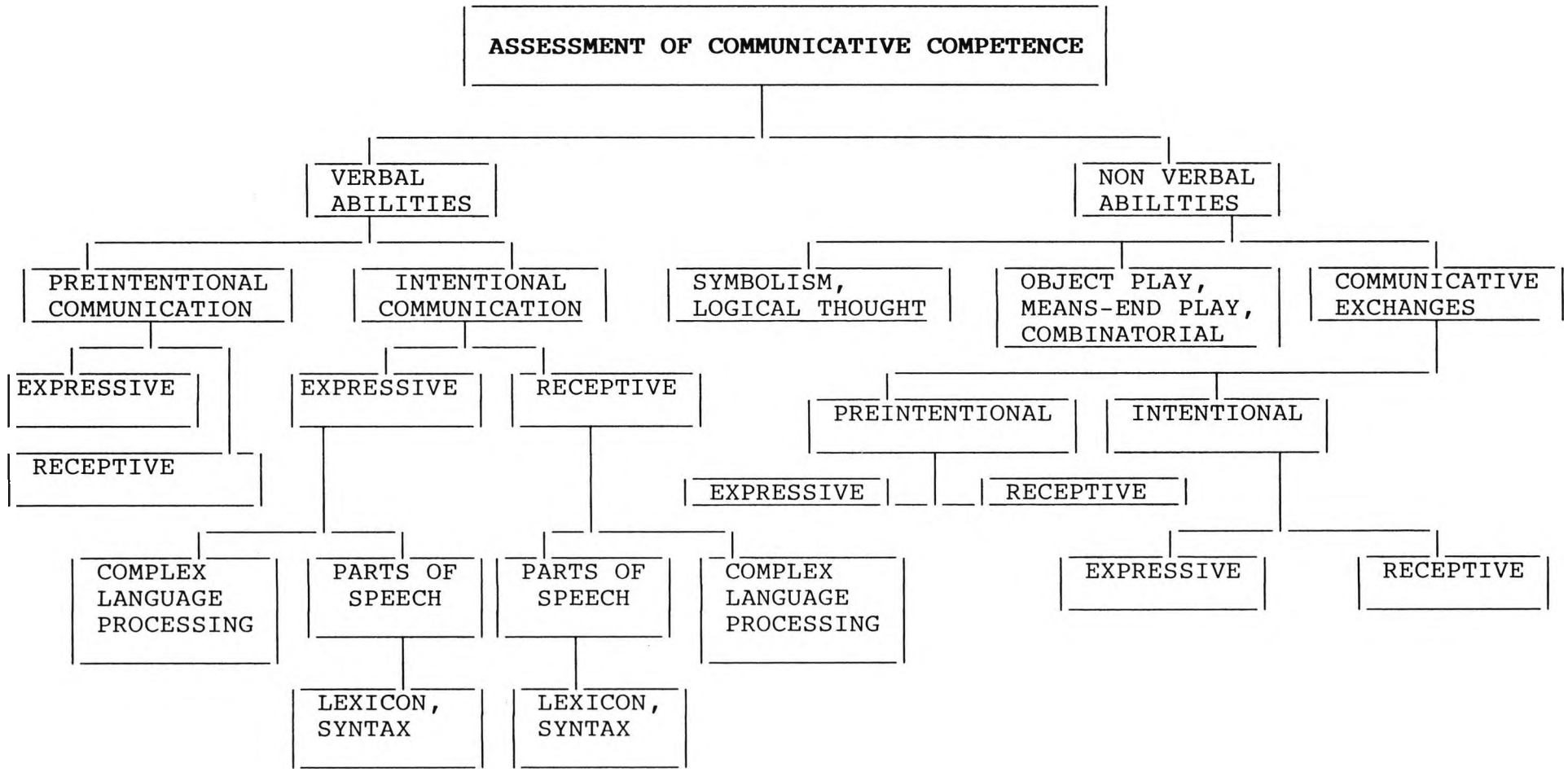


FIGURE 4.1. THE DIAGNOSTIC MODEL FOR ASSESSING COMMUNICATIVE COMPETENCE.

4.4.2.4. Diagnostic Model.

The diagnostic model which underlies the activity and item selection derives from the literature on child language development, from professional nomination as put forward in the workshops and from clinical and educational practice. The normal continuum of child language development has been selected as the basis for making comparisons. The items have been selected to represent abilities within the areas of verbal and non-verbal, preintentional and intentional communication, expressive and receptive communication, complex language processing and parts of speech, lexicon and syntax. Figure 4.1. presents the diagnostic model for the assessment. It is to be used as a guide for making judgements and inferences about a child's pattern of performance. The activities and items selected have relevance to diagnosing a child's unique pattern of strengths and weaknesses in communicative competence.

4.4.3. THE TASK HIERARCHY.

The activities were developed from theoretical constructs, operational constructs and professional nomination. The activities are presented with a description of the task purpose and the materials in Appendix 2. In this section the activities are described in terms of the language and language-related dimensions that are involved in performing them.

4.4.3.1. Entry Level Criterion.

There is one entry level criterion: the child will hold an object.

4.4.3.2. Test Activities.

The activities and the types of behaviour that they were designed to elicit are listed below.

(1) Rolling Rattle; Exploratory play behaviour with objects and interactive play behaviour.

(2) Pop Up Cone; Exploratory play behaviour, object manipulative play behaviour and cause-and-effect play behaviour.

(3) Wind Up Moving Toy; Tracking of an object, object manipulative play and cause-and-effect play behaviour.

(4) Graded Doll; Specific combining of objects.

(5) First Words Puzzle; Specific combining of objects.

(6) Matches Object To Pictures; Specific combining of objects.

(7) Large Doll Play; Global combining of objects, specific combining of objects, symbolic representation with objects and interactive play.

(8) Miniature Toy Play; Symbolic representation with objects.

(9) Follows Simple Directions; Comprehension: actions with an object.

(10) Points To Body Parts; Comprehension: single words.

(11) Does Actions; Comprehension: verbs.

(12) Points To Action Pictures; Comprehension: verbs.

(13) 'Where's Teddy?'; Comprehension: gestures, single words, simple phrases, words related to a picture. Symbolic communication. Rule based linguistic development--basic sentence structure. Oral style: words and gestures which rely on the situation for their meaning. Interactive Dialogue: a pretend play sequence.

(14) Early Communication. and (15) Early Comprehension. 'Activities 14 and 15' are not activities within themselves but are communicative and comprehension items which are to be scored from items of behaviour in the other activities.

(16) 'Stripey Kitten Gets Stuck'; Interactive dialogue: question and answer format. Oral and literary styles. Rule based linguistic development. Comprehension: relating questions to the progression of events represented in the pictures and making inferences and predictions about the events.

(17) 'The Dragon And The Birthday Party'; A narrative: making up a story from a picture depicting a familiar event (a birthday party) but with an unusual guest.

(18) Prepositional Commands; Comprehension: single words within a sentence--prepositions.

(19) Selects By Function; Comprehension: definitions and descriptions.

(20) Points To Small Action Pictures; Comprehension: verbs.

(21) Matching Preposition Pictures; Matching detail in pictures.

(22) Broken Cup And Broken Bed; Comprehension: world knowledge.

(23) Sequence Pictures: 'Running and Falling'; A narrative: telling a simple action story with actions clearly depicted in three pictures.

(24) Picture Description Book; Comprehension. Oral and literary expressive styles. Rule based linguistic development.

(25) Green Cross Code; Comprehension: world knowledge. Rule based linguistic development. Oral literary style.

(26) Sequence Picture: 'Balloon'; A narrative: telling a simple action but the actions are less clearly depicted and one event has to be inferred.

(27) Sequence Picture: 'Finds A Dog'; A narrative: re-telling a longer action story where all the actions are clearly depicted.

(28) Sequence Picture: 'Dog Follows Him To School'; A narrative: telling a simple but more abstract action story where feelings and thoughts are depicted and provide the motives.

(29) Sequence Picture: 'Dreams A Space Flight'; A narrative: telling an abstract story with few actions depicted and the last picture suggests that it was all a dream.

FORM	AGE GROUP
A	1;00 to 2;11
B	3;00 to 4;11
C	5;00 to 7;09

(Age is presented in year; month.
e.g. 2;11 is two years, eleven months.)

TABLE 4.1.: THE FORMS AND THEIR AGE GROUPS.

FORM			ACTIVITY
A	B	C	
X			1. ROLLING RATTLE
X			2. POP UP CONE
X			3. WIND UP MOVING TOY
X			4. GRADED DOLL
X			5. FIRST WORDS PUZZLE
X			6. MATCHES OBJECTS TO PICTURES
X			7. LARGE DOLL PLAY
X			8. MINIATURE TOY PLAY
X			9. FOLLOWS SIMPLE DIRECTIONS
X	X		10. POINTS TO BODY PARTS
X	X		11. DOES ACTIONS
X	X		12. POINTS TO ACTION PICTURES
X			13. WHERE'S TEDDY
X			14. EARLY COMMUNICATION
X			15. EARLY COMPREHENSION
X	X	X	16. THE STRIPEY KITTEN GETS STUCK
X	X	X	17. DRAGON'S BIRTHDAY PARTY
X	X		18. PREPOSITIONAL COMMANDS
X	X		19. SELECTS BY FUNCTION
X	X		20. POINTS TO SMALL ACTION PICTURES
	X		21. MATCHING PREPOSITION PICTURES
	X		22. BROKEN CUP/BROKEN BED
	X		23. RUNNING AND TRIPPING
	X	X	24. PICTURE DESCRIPTION BOOK
	X	X	25. GREEN CROSS CODE
	X	X	26. BALLOON
		X	27. FINDS A DOG
		X	28. DOG FOLLOWS HIM TO SCHOOL
		X	29. DREAMS OF A SPACE FLIGHT
		X	30. MAN FIGHTING A DRAGON
		X	31. STORY COMPLETION
		X	32. RELATING A PERSONAL STORY

This chart presents the activities and shows in which forms they appeared.

TABLE 4.2.: THE FORMS AND ACTIVITIES.

(30) 'Man Fighting A Dragon'; A narrative: making up a story from a picture in which no cues are given. The child must develop the characters and plot.

(31) Story Completion; A narrative: making up a story after the introduction is provided for them.

(32) Relating A Personal Story; A narrative: relating a true event in which they have participated.

4.4.3.3. The Task Structure.

In a formal assessment, the task structure for each of the activities is specific and given in the same manner to each of the subjects. The task structure is make up of the materials, the order and manner in which the materials are presented to the child and what the examiner says. Also included in the task structure are the success criteria which is the list of specific items of behaviour that are being elicited and how they are to be scored. Appendix 1 presents the Table of Specifications. Appendix 2 presents the task structure for the thirty two activities and the entry level criterion. Photo examples of the materials used are presented in Appendix 3.

4.4.4. THE CREATION OF THE DATA COLLECTION FORMS.

From the thirty two activities, three forms which were to be used in collecting the data were devised. Activities were selected for inclusion in a form so that there would be a progression of difficulty between them over the three forms. The forms were created so that they could be used with the three age groups and then later through analysis linked to one to a line of inquiry to form a continuum. Because of this, some activities appeared in all three forms, some activities appeared in both Forms A and B, some were in both Forms B and C and some were in either A, B, or C. The aim was to create forms which would elicit age related behaviour. Table 4.1. presents the forms and their age groups. Table 4.2. presents the forms and their activities.

4.5 OBJECTIVE 4, OBTAINING PERSON AND ITEM SCORES.

4.5.1. SUBJECTS.

4.5.1.1. Subject Selection.

One hundred and forty one children were selected for the data collection procedure. The criterion for inclusion was that there were no concerns about their language development or their hearing. (The children had passed their audiological tests.) The instructions given to the teachers and nursery personnel were that the purpose of the research was to develop materials for use in the speech therapy clinic. Children with a 'good standard of English language development' were wanted for the research so that their language could be analysed. The results from the research would then be used as a standard for developing materials which would be used when working with children who had difficulties with their language development. Children from multilingual homes and children with English as a second language were included as long as they met the requirement that teachers and nursery personnel thought they had a good level of English that could be used as a standard.

The children selected were mainly tested in schools and day nurseries, and in a community creche although two children were tested in a health centre and two in their homes. The day nurseries included three private nurseries, one Social Services' nursery and a Barnardos' nursery. The community creche was attached to the Barnardos' nursery. The schools were one nursery school and four schools. All the establishments were located in London apart from one private nursery which was located on the outskirts of greater London. All the places were helpful and provided rooms for the testing to take place. With the younger children staff support was provided by accompanying the children.

AGE RANGE	No. per 6 months	No. per year
1;00--1;05	11	
1;06--1;11	9	20
2;00--2;05	11	
2;06--2;11	9	20
3;00--3;05	12	
3;06--3;11	9	21
4;00--4;05	10	
4;06--4;11	10	20
5;00--5;05	11	
5;06--5;11	9	20
6;00--6;05	13	
6;06--6;11	7	20
7;00--7;05	13	
7;06--7;09	7	20
TOTAL	141	141

TABLE 4.3.: THE DISPERSION OF THE NUMBER OF CHILDREN WITHIN THE AGE RANGES.

The day nurseries and creche were all very similar with a good standard of care and the activities provided for the children encouraged their growth in all developmental areas. The nursery school was open plan with a high ratio of staff to children and extreme care given to monitoring the individual children's development. The four schools were all well respected and considered to be successful in providing a good education with good staff morale but each were very different in their educational approach. The first school (S1) was a Church of England school and very formal with closed classrooms and with small tables and individual places for each child. Written work was considered extremely important and most of the materials consisted of paper and pencil. The second school (S2) was also a Church of England school but was less formal. The classrooms were still closed but were open plan within. The children moved around activity centres and hands on work predominated. The third school (S3) was a Roman Catholic school and prided itself in taking problem children. The classrooms were a mixture of formal and open plan with a high level of support staff coming into the school. Throughout the day in every niche and cranny of the building there were small groups of individual work being carried out. The fourth school (S4) was a state school located on an estate and completely open plan. The classrooms were so small that much of the work had to be located outside them and the whole school appeared to be a cluster of activity and study centres which various age groups would share at the same time.

The ages of the children ranged from 1;00 months to 7;09 months with 20 children in each year group. A balance of 10 children per each 6 months was aimed for. The dispersion of the children's ages are as noted in Table 4.3. The children were ordered within their age group and coded to preserve confidentiality. The code consisted

RACE/ETHNIC CATEGORIES:

1. Black: Afro-Caribbean.
2. Black: African.
3. Arabic.
4. Asian.
5. White: European.

HOUSEHOLD ECONOMIC BACKGROUND:(Data collected in 1990)

1. Below average:--less than £14,000 p.a.
2. Average £14,000--£30,000 p.a.
3. Above Average: more than £30,000 p.a.

VERBAL REQUIREMENTS OF PARENTAL OCCUPATION:

1. Little or moderate verbal communication required.
2. Verbal communication is essential.
3. Verbal communication is a high requirement.

ONLY ENGLISH IS SPOKEN AT HOME.

Y= YES
N= NO

LOCATION: THE ESTABLISHMENT IN WHICH THE CHILD WAS TESTED.

PN1, PN2, PN3: Private Nurseries.
BN: Barnardos Nursery.
BC: Barnardos Creche.
SN: Social Service Nursery.
H: Home.
HC: Health Centre.
NSch: Nursery School.
S1: Formal School.
S2: Less Formal School, closed classrooms but open plan within.
S3: School, Mixture of formal and open plan.
S4: School, Completely open plan.

TABLE 4.4: THE DEMOGRAPHIC CATEGORIES.

of two or three numbers. The first number represented the age group and the following number(s) represented the child's placement in the age ordering so that the subjects coding consisted of 11...120 in age range 1;00--1;11 through to 71...720 in age range 7;00--7;09. Throughout this study the subjects will be referred to by their code numbers.

4.5.1.2. Demographic Details.

In order to define the variable, a range of normal ability was required. As one criticism of research with children has been that the population sampling was narrow and often confined to children from white, economically well off, university educated families, it was considered important to note certain demographic details. In selecting the children a balance of sex, racial/ethnic, economic, and verbal requirements of parental occupations was wanted. 'Race/ethnic' was divided into five categories, economic background was divided into three categories and verbal requirements of parental occupations was divided into three categories. These categories are presented in Table 4.4. The reason for itemising these three areas was to ensure that the balance of the children was not largely white and from well off, professional and highly verbal families. A mix of children was wanted that would represent the variety of home-backgrounds that can be found in classrooms in London (or greater London) but also ensuring that all the children were reported by the professionals working with them as to having a good standard of language. Except for a larger number of boys than girls in the four year old range and no school aged children from above average economic backgrounds or with high verbal requirements in the parent's occupation a balance has been maintained. Table 4.5 provides a summary of the details by age group whilst Appendix 4 provides a complete summary of the demographic information for each individual.

AGE RANGE	SEX		ECONOMIC			VERBAL REQ.			ONLY ENGLISH AT HOME	
	Male	Female	1	2	3	1	2	3	Y	N
1;00--1;11	10	10	6	7	7	7	9	4	17	3
2;00--2;11	11	9	10	8	2	10	8	2	17	3
3;00--3;11	9	12	8	13	0	8	13	0	18	3
4;00--4;11	15	5	10	7	3	10	9	1	12	8
5;00--5;11	8	12	9	11	0	9	11	0	19	1
6;00--6;11	9	11	7	13	0	8	12	0	13	7
7;00--7;09	12	8	12	8	0	12	8	0	11	9
TOTALS	73	68	62	67	12	64	70	7	107	34

	RACE/ETHNIC				
AGE RANGE	White Europ.	Black Caribb.	Black African	Asian	Arabic
1;00--1;11	11	6	1	2	0
2;00--2;11	12	5	0	1	2
3;00--3;11	11	7	2	1	0
4;00--4;11	10	3	5	1	1
5;00--5;11	14	5	0	0	1
6;00--6;11	12	2	0	5	1
7;00--7;09	12	1	1	0	6
TOTALS	82	29	9	10	11

TABLE 4.5.: SUMMARY OF DEMOGRAPHIC DETAILS BY AGE RANGES.

4.5.2. COLLECTING THE DATA.

The children were tested in one creche, four day nurseries, one nursery school and four schools. Two children were tested at home. The children were seen in a quiet room on a one to one basis and the test procedure was carried out by the investigator. Sometimes an adult did accompany the child but they remained quiet throughout the situation.

One three year old child (person 32) did not finish the test as his mother came to pick him up during it. He was replaced with another child although his part-finished test was used in some stages of the data analysis. Two four year olds (46 and 417) refused to finish the test. They were not replaced as this was their own choice and their part-finished tests were used for some of the data analysis. Person 66 was very shy and as the test situation went on she became less forthcoming with her responses although they still were of a high level.

All the children approached the testing situation as if it were a selection of games that they were keen to do. Apart from the children 46 and 417 all of the children kept that attitude and wanted to keep 'playing with the toys' even when we were finished. Person 46 found the situation difficult and refused to go further when the activities became more verbal. Person 417 found the activities very easy and was doing very well but suddenly decided that he would rather go play elsewhere. (The scores of persons 46 and 417 were eliminated from the data analysis.)

Due to the children's attitudes when taking the test, through discussions of their abilities with the professionals who teach or care for them and through observing them in their schools and nurseries, it can be confidently assumed that the responses are representative of their ability levels except for person 66 who was so reticent due to shyness. (Her scores were eliminated from the data analysis.)

4.5.3. DATA RECORDING.

The activities on the forms were presented in the same order for all the children except those that were younger than 1;08. With the younger children a play situation was initiated, keeping to the order as much as possible, to maintain their interest. The children older than 1;08 were able to wait and follow the adult's lead in the presentation of the activities.

The data collection procedure for Form A (1;00--2;11 years) was videotaped. The videotape was transcribed and scored later. Form B (3;00--4;11 years) and Form C (5;00--7;09 years) were tape recorded. The recordings were transcribed and scored later. The 'action command' parts of Form B were scored at the time of testing.

4.5.4. DATA SCORING.

The test forms were scored in a dichotomous manner; 0 = no score when a behaviour was not present, 1 = one point when the behaviour was present. The the scoring criteria is given in Appendix 2. The data scores are presented in appendix 5.

4.5.5. INTER-RATER RELIABILITY.

The activity 'The dragon and the birthday party' was selected for interrater reliability studies. This activity was selected due to the fact that scoring narratives can be influenced by interrater judgements. A total of fourteen narratives (10% of the sample) representing each of the age groups was randomly selected. They were re-scored by the investigator for intrarater reliability and they were independently scored by two speech therapists. Neither speech therapist was familiar with

narrative analysis. The item definitions presented in the appendix 'Task Structure' (Appendix 2) were given to the therapists, with the selected narratives and a photocopy of the stimulus picture. No training was given for the task and the two therapists did not discuss the task with each other.

The reliability analysis was calculated using the following formula (Prutting and Kirchner, 1987):

$$\frac{\text{Agreements}}{\text{Agreements + Disagreements}} \times 100 = \text{Reliability Results}$$

The relibility results were:

1. The intrarater reliabilty was 98.25%.
2. Interrater reliability between the investigator and Speech Therapist 1 was 94.25%.
3. Interrater reliability between the investigator and Speech Therapist 2 was 92.85%.
4. Interrater reliability between the two Speech Therapists was 88.15%.

4.6. OBJECTIVE 5. DATA ANALYSIS.

The scores obtained represent the children's performance in activities which have as items, the observable categories that have been presented in the literature. The purpose of the data analysis is to now expose and evaluate these observed relationships between the items and the children.

The Rasch mathematical model has been selected for analysing the data. Through the application of an algebraic formula, the item and person scores will be transformed into an interval scale. Both the person and item scores will be located on this scale. The analysis procedures of Wright and Stone (1979) will be used.

The procedure of PROX will be used to analyse the data. It achieves the aims of Rasch item analysis, 'namely linearisation of a latent scale and adjustments for the local effects of sample ability distribution' (Wright and Stone, 1979: 28) Through the use of PROX the person and item scores will be turned into person ability measures and item calibrations. These will be located on the interval scale in the numerical form of logits. Logits are the symbols used in the algebraic formula which is a logistic response model that specifies the estimated probability of a correct response by a person and the estimated difficulty of an item.

The procedure of PROX will allow for the linking of tests onto the same variable. This means that tests with completely different items of behaviour can be devised for different ability groups within the latent trait and then linked onto an interval scale. This allows an in depth assessment at any one point of the latent trait to be compared to an in depth assessment of another point even though the same items of behaviour have not been used.

The result of the PROX analysis is a constructed and defined variable. The definition of the variable provides the criterion validity through the creation of an item bank and individual performance profiles. This choice of methodology follows the chosen philosophies of this project--those of the Developmental Model within the Communicative Competence Model.

4.6.1 THE DATA MATRIX.

The procedures for analysing the data begins with compiling a person by item response matrix. The item and person responses are ordered from low to high score. The data is then edited to remove the persons and items with all correct or all incorrect responses. Some items were eliminated due to 0 or 100% scores. No person had an all correct or incorrect score, so no one was eliminated at this stage. The data also is edited for unusual score patterns. Six items showed an unusual pattern: they did not receive a score on Form C which the five to seven year olds took, but did receive scores on Forms A or B which the younger children took. These were eliminated from further item calibration analysis as they did not fit the underlying assumption that the probability of gaining a correct answer is greater with the higher ability level. These items were evaluated separately and suggestions as to why this pattern occurred are presented in the discussion. Table 4.6 presents the eliminated items. Only one person (66) was eliminated. This was because of an erratic score pattern.

TABLE 4.6

ELIMINATED ITEMS.

All Correct	None Correct	Only A or B Correct
1/ 1,2,3,4 (A)	23/ 12,13 (B)	17/ 10,17,21
2/ 1,2 (A)	26/ 16,17 (C)	26/ 3,5,8
14/ 1 (A)	28/ 14 (C)	
15/ 1,2,3 (A)	30/ 11,22,26 (C)	
21/ 17 (B)		
22/ 1 (B)		
25/ 6 (C)		
27/ 5,4,10 (C)		
28/ 11 (C)		
30/ 1,31 (C)		
32/ 1,7 (C)		

TOTALS	
100%:	21
0:	8
A or B:	6

4.6.2. PARCEL ITEMS INTO LINK FORMS.

At this point a new step was introduced into the analysis procedure. In the test situations that were presented by Wright and Stone (1979), all their items were separate from each other and could be given in any order during testing. Therefore, they could make up initial test forms that were easy and hard, give the two forms to two different groups--one less able and one more able--and then link the two forms. However, in this procedure the items were presented within communicative contexts and the difficulty level of the items within some of the contexts ranged between the forms.

The items needed to be separated from the contexts in which they were collected on Data Collection Forms A, B and C (DCFA, DCFB, DCFC respectively), and treated as individual items for the purpose of analysis. The separated items needed to be parcelled into three analysis forms based on the difficulty level of the scores that they had received. This created Analysis Forms A, B and C (AFA, AFB and AFC respectively) which were progressive in item difficulty. This procedure was carried out by comparing how the item scores in one form related to the item scores within the other Data Collection Forms. Using the items that appeared in each of the forms as the guide, the three score matrices used in the above analysis were scanned to find the points at which DCFA and DCFB overlapped and the points at which DCFB and DCFC overlapped. When the overlapping points were identified the other scores then ordered into AFA, AFB or AFC.

Item scores solely on DCFA ranged from scores 39 to 14 with DCFA item scores overlapping with DCFB from 13 to 2. On DCFB item scores 37 to 32 overlapped with DCFA and item scores 31 to 22 were solely in DCFB. DCFB item scores 21 to 4 overlapped with DCFC. On DCFC item scores 57 to 30 overlapped with DCFB and item scores 29 to 1 were solely

in DCFC. This eliminated one hundred sixty items from further analysis. (Items in DCFA that received a score less than 14 and were not also on DCFB, items on DCFB that received a score above 31 and were not on DCFA, items on DCFB that received a score less than 22 and were not on DCFC, and items on DCFC that received a score above 31 but were not also on DCFB were eliminated.) Three hundred twenty two items remained for analysis and the data was now prepared for obtaining item calibrations and person measures for each of the individual analysis forms. This would then prepare the three forms to be linked onto one variable. Appendix 6 presents the Analysis Forms A, B and C.

4.6.3. ANALYSIS OF ITEM DIFFICULTY AND PERSON ABILITY.

With the item scores now parcelled into the analysis forms the forms were now ready for estimating item calibrations and person measures. The item analysis procedure 'PROX' was used (Wright and Stone, 1979). This method of estimation was carried out by hand with the use of a hand-held calculator.

The next aim was to obtain the initial item calibrations. Tables 4.7A, 4.7B, 4.7C present the following item calibration steps for AFA, AFB and AFC. Step 1: In column 1 the item score is given. In column 2, the frequency of distribution of this score is given. In column 3, the scores are rendered as proportions of their maximum possible value. Step 2: In column 4, the proportions are converted into the proportions incorrect. Step 3: In column 5, the proportions incorrect are converted into log odds or logits. Step 4: Column 6 is the product of the item frequency and logit incorrect. Step 5: Column 7 is the product of the item frequency and the logit incorrect squared. Step 6: The mean and variance for the item

logits in column 5 are computed from the values in columns 6 and 7. Step 7: The mean item logit is used to centre the item logits at zero. Column 8 is the initial item calibration which is computed by subtracting the mean from the logits incorrect presented in column 5.

The next step is to obtain the initial person measures. Tables 4.8A, 4.8B and 4.8C present the following person measure steps for AFA, AFB and AFC. Step 1: Column 1 gives the person scores and column 2 gives their frequency distributions. Column 3 gives the score distributions rendered as proportions of their maximum value. Step 2: In Column 4, the proportions correct are converted into log odds or logits. Step 3: Column 4 is the product of the person score frequency and logit correct. Step 4: Column 5 is the product of the person score frequency and logit correct squared. Step 5: The mean and variance for the distribution of score logits for persons are computed from the values in columns 4 and 5. The initial person measures are given in column 4.

The item and person logit variances are used to calculate the two expansion factors--one for item difficulty and one for person ability. The expansion factors are then used to correct the initial item calibrations and person measures for sample spread. Column 9 on Tables 4.7A, 4.7B and 4.7C gives the corrected item calibration. This is the product of the initial item calibration (column 8) and the item difficulty expansion factor. Column 7 on Tables 4.8A, 4.8B and 4.8C gives the corrected person ability measure. This is the product of the initial person measure (column 4) and the person ability expansion factor.

The final procedure in estimating the calibrations and measures for AFA, AFB and AFC is to calculate the standard errors for the item calibrations and person measures. They are presented in column 10 on Tables 4.7A, 4.7B and 4.7C in column 8 on Tables 4.8A, 4.8B and 4.8C.

1 SCORE	2 FREQ.	3 PROPORT. CORRECT	4 PROPORT. INCORRECT	5 LOGIT INCORRECT	6 LOGIT X FREQ.	7 LOGIT SQD X FREQ.	8 INITIAL CALIB.	9 CORRECTED CALIB.	10 STANDARD ERROR
39	3	.98	.02	-3.89	-11.67	45.39	-3.70	-6.48	1.34
38	3	.95	.05	-2.94	- 8.82	25.92	-2.75	-4.81	0.96
37	7	.93	.07	-2.59	-18.13	46.97	-2.40	-4.20	0.79
36	2	.90	.10	-2.20	- 4.40	9.68	-2.01	-3.52	0.70
35	3	.88	.12	-1.99	- 5.97	11.88	-1.80	-3.15	0.63
34	3	.85	.15	-1.73	- 5.19	8.97	-1.54	-2.70	0.59
33	1	.83	.17	-1.59	- 1.59	2.53	-1.40	-2.45	0.55
32	1	.80	.20	-1.39	- 1.39	1.93	-1.20	-2.10	0.52
31	4	.78	.22	-1.27	- 5.08	6.44	-1.08	-1.89	0.50
30	3	.75	.25	-1.10	- 3.30	3.63	-0.91	-1.59	0.48
29	5	.73	.27	-0.99	- 4.95	4.90	-0.80	-1.40	0.47
28	2	.70	.30	-0.85	- 1.70	1.44	-0.66	-1.16	0.46
27	1	.68	.32	-0.75	- 0.75	0.56	-0.56	-0.98	0.45
26	3	.65	.35	-0.62	- 1.86	1.14	-0.43	-0.75	0.44
24	2	.60	.40	-0.41	- 0.82	0.34	-0.22	-0.38	0.43
23	2	.58	.42	-0.32	- 0.64	0.20	-0.13	-0.23	0.42
21	2	.53	.47	-0.12	- 0.24	0.02	+0.07	-0.12	0.42
20	2	.50	.50	0.00	0.00	0.00	+0.19	+0.33	0.42
19	5	.48	.52	+0.08	+ 0.40	0.05	+0.27	+0.47	0.42
18	6	.45	.55	+0.20	+ 1.20	0.24	+0.39	+0.68	0.42
17	5	.43	.57	+0.28	+ 1.40	0.40	+0.47	+0.82	0.42
16	5	.40	.60	+0.41	+ 2.05	0.85	+0.60	+1.05	0.43
15	8	.38	.62	+0.49	+ 3.92	1.92	+0.68	+1.19	0.43
14	10	.35	.65	+0.62	+ 6.20	3.80	+0.81	+1.42	0.44
13	1	.33	.67	+0.71	+ 0.71	0.50	+0.90	+1.58	0.45
12	1	.30	.70	+0.85	+ 0.85	0.72	+1.04	+1.82	0.46
11	2	.28	.72	+0.94	+ 1.88	1.76	+1.13	+1.98	0.47
9	3	.23	.77	+1.21	+ 3.63	4.38	+1.40	+2.45	0.50
8	4	.20	.80	+1.39	+ 5.56	7.72	+1.58	+2.77	0.52
7	6	.18	.82	+1.52	+ 9.12	13.86	+1.71	+2.99	0.55
6	3	.15	.85	+1.73	+ 5.19	8.97	+1.92	+3.36	0.59
5	4	.13	.87	+1.90	+ 7.60	14.44	+2.09	+3.66	0.63
4	1	.10	.90	+2.20	+ 2.20	4.84	+2.39	+4.18	0.70
2	1	.05	.95	+2.94	+ 2.94	8.64	+3.13	+5.48	0.96
	114				-21.65	245.03		x. = 0.00	
								S.D. = 2.57	

x. = -0.19 U = 2.13 Y = 1.75

TABLE 4.7A.: THE ITEM CALIBRATION STEPS FOR AFA.

1 SCORE	2 FREQ.	3 PROPORT. CORRECT	4 PROPORT. INCORRECT	5 LOGIT INCORRECT	6 LOGIT X FREQ.	7 LOGIT SQD X FREQ.	8 INITIAL CALIB.	9 CORRECTED CALIB.	10 STANDARD ERROR
37	3	.97	.03	-3.48	-10.44	36.33	-2.75	-3.36	1.12
36	6	.95	.05	-2.94	-17.64	51.84	-2.21	-2.70	0.80
35	6	.92	.08	-2.44	-14.64	35.70	-1.71	-2.08	0.66
34	2	.89	.11	-2.09	- 4.18	8.74	-1.36	-1.66	0.58
33	5	.87	.13	-1.90	- 9.50	18.05	-1.17	-1.43	0.53
32	4	.84	.16	-1.66	- 6.64	11.04	-0.93	-1.13	0.49
31	13	.82	.18	-1.52	-19.76	30.03	-0.79	-0.96	0.46
30	5	.79	.21	-1.32	- 6.60	8.75	-0.59	-0.72	0.44
29	5	.76	.24	-1.15	- 5.75	6.60	-0.42	-0.51	0.42
28	7	.74	.26	-1.05	- 7.35	7.70	-0.32	-0.39	0.41
27	10	.71	.29	-0.09	- 9.00	8.10	-0.17	-0.21	0.40
26	4	.68	.32	-0.75	- 3.00	2.24	-0.02	-0.02	0.39
25	5	.66	.34	-0.66	- 3.30	2.20	-0.07	+0.09	0.38
24	8	.63	.37	-0.53	- 4.24	2.24	-0.20	+0.24	0.37
23	3	.61	.39	-0.45	- 1.35	0.60	+0.28	+0.34	0.37
22	7	.58	.42	-0.32	- 2.24	0.70	+0.41	+0.50	0.36
21	7	.55	.45	-0.20	- 1.40	0.28	+0.53	+0.65	0.36
20	4	.53	.47	-0.12	- 0.48	0.04	+0.61	+0.77	0.36
19	1	.50	.50	0.00	0.00	0.00	+0.73	+0.89	0.36
18	5	.47	.53	+0.12	+ 0.60	0.05	+0.85	+1.04	0.36
17	1	.45	.55	+0.20	+ 0.20	0.04	+0.93	+1.13	0.36
16	6	.42	.58	+0.32	+ 1.92	0.60	+1.05	+1.28	0.36
15	2	.39	.61	+0.45	+ 0.90	0.20	+1.18	+1.44	0.37
14	2	.37	.63	+0.53	+ 1.06	0.56	+1.26	+1.54	0.37
13	2	.34	.66	+0.66	+ 1.32	0.88	+1.39	+1.70	0.38
12	1	.32	.68	+0.75	+ 0.75	0.56	+1.48	+1.88	0.39
11	1	.29	.71	+0.90	+ 0.90	0.81	+1.63	+1.99	0.40
10	1	.26	.74	+1.05	+ 1.05	1.10	+1.78	+2.17	0.41
9	1	.24	.76	+1.15	+ 1.15	1.32	+1.81	+2.29	0.42
7	2	.18	.82	+1.52	+ 3.04	4.62	+2.25	+2.75	0.46
6	3	.16	.84	+1.66	+ 4.98	8.28	+2.39	+2.92	0.49
5	2	.13	.87	+1.90	+ 3.80	7.22	+2.63	+3.21	0.53
4	3	.11	.89	+2.09	+ 6.27	13.11	+2.82	+3.44	0.58
	137				-99.57	270.53		x. = 0.00 S.D. = 1.47	

x. = -0.73 U = 1.45 Y = 1.22

TABLE 4.7B.: THE ITEM CALIBRATION STEPS FOR AFB.

1 SCORE	2 FREQ.	3 PROPORT. CORRECT	4 PROPORT. INCORRECT	5 LOGIT INCORRECT	6 LOGIT X FREQ.	7 LOGIT SQD X FREQ.	8 INITIAL CALIB.	9 CORRECTED CALIB.	10 STANDARD ERROR
57	3	.97	.03	-3.48	-10.44	36.33	-4.27	-4.57	.74
56	2	.95	.05	-2.94	- 5.88	17.28	-3.73	-3.99	.61
55	1	.93	.07	-2.59	- 2.59	6.71	-3.38	-3.62	.54
54	1	.92	.08	-2.44	- 2.44	5.95	-3.28	-3.46	.48
53	1	.90	.10	-2.20	- 2.20	4.84	-2.99	-3.20	.45
52	1	.88	.12	-1.99	- 1.99	3.96	-2.78	-2.97	.42
51	2	.86	.14	-1.82	- 3.64	6.62	-2.61	-2.79	.39
50	2	.85	.15	-1.73	- 3.46	5.98	-2.52	-2.70	.37
49	2	.83	.17	-1.59	- 3.18	5.06	-2.38	-2.55	.36
47	2	.80	.20	-1.39	- 2.78	3.86	-2.18	-2.33	.33
46	4	.78	.22	-1.27	- 5.08	6.44	-2.06	-2.20	.32
45	1	.76	.24	-1.15	- 1.15	1.32	-1.94	-2.08	.32
44	2	.75	.25	-1.10	- 2.20	2.42	-1.89	-2.02	.31
42	3	.71	.29	-0.90	- 2.70	2.43	-1.69	-1.81	.30
41	1	.69	.31	-0.80	- 0.80	0.64	-1.59	-1.70	.29
40	2	.68	.32	-0.75	- 1.50	1.12	-1.54	-1.65	.29
37	2	.63	.37	-0.53	- 1.06	0.56	-1.32	-1.41	.28
36	4	.61	.39	-0.45	- 1.80	0.80	-1.24	-1.33	.28
35	1	.59	.41	-0.36	- 0.36	0.13	-1.15	-1.23	.27
34	5	.58	.42	-0.32	- 1.60	0.50	-1.11	-1.19	.27
31	1	.53	.47	-0.12	- 0.12	0.01	-0.91	-0.97	.27
30	1	.51	.49	-0.04	- 0.04	0.00	-0.83	-0.89	.27
29	3	.49	.51	+0.04	+ 0.12	0.00	-0.75	-0.80	.27
28	2	.47	.53	+0.12	+ 0.24	0.02	-0.67	-0.72	.27
27	1	.46	.54	+0.16	+ 0.16	0.03	-0.63	-0.67	.27
26	3	.44	.56	+0.24	+ 0.72	0.18	-0.55	-0.59	.27
25	1	.42	.58	+0.32	+ 0.32	0.10	-0.47	-0.50	.27
24	1	.41	.59	+0.36	+ 0.36	0.13	-0.43	-0.46	.27
22	3	.37	.63	+0.53	+ 1.59	0.84	-0.26	-0.28	.28
21	4	.36	.64	+0.58	+ 2.32	1.36	-0.21	-0.22	.28
20	4	.34	.66	+0.66	+ 2.64	1.76	-0.13	-0.14	.28
19	2	.32	.68	+0.75	+ 1.50	1.12	-0.04	-0.04	.29
18	2	.31	.69	+0.80	+ 1.60	1.28	+0.01	+0.01	.29
17	3	.29	.71	+0.90	+ 2.70	2.43	+0.11	+0.12	.30
16	3	.27	.73	+0.99	+ 2.97	2.94	+0.20	+0.21	.30
15	3	.25	.75	+1.10	+ 3.30	3.63	+0.31	+0.33	.31
14	3	.24	.76	+1.15	+ 3.45	3.96	+0.36	+0.39	.32
13	1	.22	.78	+1.27	+ 1.27	1.61	+0.48	+0.51	.32
12	4	.20	.80	+1.39	+ 5.56	7.72	+0.60	+0.64	.33
11	4	.19	.81	+1.45	+ 5.80	8.40	+0.66	+0.71	.35
10	4	.17	.83	+1.59	+ 6.36	10.12	+0.80	+0.86	.36
9	3	.15	.85	+1.73	+ 5.19	8.97	+0.94	+1.00	.37
8	5	.14	.86	+1.82	+ 9.10	16.55	+1.03	+1.10	.39
7	5	.12	.88	+1.99	+ 9.95	19.80	+1.20	+1.28	.42
6	7	.10	.90	+2.20	+15.40	33.88	+1.41	+1.51	.45
5	3	.08	.92	+2.44	+ 7.32	17.85	+1.65	+1.77	.48
4	5	.07	.93	+2.59	+12.95	33.55	+1.80	+1.93	.54
3	2	.05	.95	+2.94	+ 5.88	17.28	+2.15	+2.30	.61
2	8	.03	.97	+3.48	+27.84	96.88	+2.69	+2.88	.74
1	8	.02	.98	+3.89	+31.12	121.04	+3.10	+3.32	1.04
	141				110.72	526.39		x. = 0.00 S.D. = 1.90	

x. = 0.79 U = 3.13 Y = 1.07

TABLE 4.7C.: THE ITEM CALIBRATION STEPS FOR AFC.

1 SCORE	2 FREQ.	3 PROPORT. CORRECT	4 LOGIT CORRECT	5 LOGIT X FREQ.	6 LOGIT SQD X FREQ.	7 PER. AB. MEASURE	8 STANDARD ERROR	9 ADJUSTED P.A. MEAS.
13	1	.11	-2.09	-2.09	4.37	-3.78	.40	-8.68
15	2	.13	-1.90	-3.80	7.22	-3.44	.37	-8.34
16	1	.14	-1.82	-1.82	3.31	-3.29	.36	-8.19
18	1	.16	-1.66	-1.66	2.76	-3.00	.35	-7.90
19	1	.17	-1.59	-1.59	2.53	-2.88	.34	-7.78
27	1	.24	-1.15	-1.15	1.32	-2.08	.30	-6.98
31	1	.27	-0.99	-0.99	0.98	-1.79	.28	-6.68
32	1	.28	-0.94	-0.94	0.88	-1.70	.28	-6.60
35	1	.31	-0.80	-0.80	0.64	-1.45	.27	-6.35
37	1	.32	-0.75	-0.75	0.56	-1.36	.27	-6.26
39	1	.34	-0.66	-0.66	0.44	-1.19	.27	-6.09
40	1	.35	-0.62	-0.62	0.38	-1.12	.26	-6.02
42	1	.37	-0.53	-0.53	0.28	-0.96	.26	-5.82
43	1	.37	-0.53	-0.53	0.28	-0.96	.26	-5.82
44	1	.39	-0.45	-0.45	0.20	-0.81	.26	-5.71
45	1	.39	-0.45	-0.45	0.20	-0.81	.26	-5.71
46	1	.40	-0.41	-0.41	0.17	-0.74	.25	-5.64
52	1	.46	-0.16	-0.16	0.03	-0.29	.25	-5.19
57	1	.50	0.00	0.00	0.00	0.00	.25	-4.90
58	1	.51	+0.04	+0.04	0.00	+0.07	.25	-4.83
63	1	.55	+0.20	+0.20	0.04	+0.36	.25	-4.54
64	1	.56	+0.24	+0.24	0.06	+0.43	.25	-4.47
69	1	.61	+0.45	+0.45	0.20	+0.81	.26	-4.09
70	2	.61	+0.45	+0.90	0.40	+0.81	.26	-4.09
77	1	.68	+0.75	+0.75	0.56	+1.36	.27	-3.54
78	1	.68	+0.75	+0.75	0.56	+1.36	.27	-3.54
79	1	.69	+0.80	+0.80	0.64	+1.45	.27	-3.45
80	1	.70	+0.85	+0.85	0.72	+1.54	.28	-3.36
83	1	.73	+0.99	+0.99	0.98	+1.79	.28	-3.11
90	1	.80	+1.39	+1.39	1.93	+2.52	.31	-2.38
91	1	.80	+1.39	+1.39	1.93	+2.52	.31	-2.38
93	1	.82	+1.52	+1.52	2.31	+2.75	.33	-2.15
94	1	.83	+1.59	+1.59	2.53	+2.88	.33	-2.02
101	1	.89	+2.09	+2.09	4.37	+3.78	.40	-1.12
103	1	.90	+2.20	+2.20	4.84	+3.98	.43	-0.92
105	1	.92	+2.44	+2.44	5.95	+4.42	.47	-0.48
108	2	.95	+2.94	+5.88	17.28	+5.32	.56	+0.42
	40			5.07	71.85			

y. = 0.13 V = 1.82 X = 1.81

TABLE 4.8A.: THE PERSON MEASURE STEPS FOR AFA.

1 SCORE	2 FREQ.	3 PROPORT. CORRECT	4 LOGIT CORRECT	5 LOGIT X FREQ.	6 LOGIT SQD X FREQ.	7 PER. AB. MEASURE	8 STANDARD ERROR	9 ADJUSTED P.A. MEAS.
35	1	.26	-1.05	-1.05	1.14	-1.39	.23	-1.22
38	1	.28	-0.94	-0.94	0.88	-1.24	.22	-1.07
42	2	.31	-0.80	-1.60	1.28	-1.06	.21	-0.89
51	1	.37	-0.53	-0.53	0.28	-0.70	.20	-0.53
61	1	.45	-0.20	-0.20	0.04	-0.26	.20	-0.09
65	1	.47	-0.12	-0.12	0.01	-0.16	.20	+0.01
68	1	.50	0.00	0.00	0.00	0.00	.19	+0.17
71	1	.52	+0.08	+0.08	0.01	+0.1	.20	+0.28
72	1	.53	+0.12	+0.12	0.01	+0.16	.20	+0.33
74	1	.54	+0.16	+0.16	0.03	+0.21	.20	+0.38
76	1	.55	+0.20	+0.20	0.04	+0.26	.20	+0.43
77	1	.56	+0.24	+0.24	0.06	+0.32	.20	+0.49
82	2	.60	+0.41	+0.82	0.34	+0.54	.20	+0.71
84	1	.61	+0.45	+0.45	0.20	+0.59	.20	+0.76
86	1	.63	+0.53	+0.53	0.28	+0.70	.20	+0.87
90	2	.66	+0.66	+1.32	0.88	+0.87	.21	+1.04
92	1	.67	+0.71	+0.71	0.50	+0.94	.21	+1.11
96	1	.70	+0.85	+0.85	0.72	+1.12	.22	+1.29
98	1	.72	+0.94	+0.94	0.88	+1.24	.22	+1.41
99	2	.72	+0.94	+1.88	1.76	+1.24	.22	+1.41
100	1	.73	+0.99	+0.99	0.98	+1.31	.22	+1.48
102	1	.74	+1.05	+1.05	1.10	+1.39	.23	+1.56
103	1	.75	+1.10	+1.10	1.21	+1,45	.23	+1.62
108	2	.79	+1.32	+2.64	3.50	+1.74	.24	+1.91
110	4	.80	+1.39	+5.56	7.72	+1.83	.25	+2.00
115	1	.84	+1.66	+1.66	2.76	+2.19	.27	+2.36
118	1	.86	+1.82	+1.82	3.31	+2.40	.28	+2.57
120	1	.88	+1.99	+1.99	3.96	+2.63	.30	+2.80
122	1	.89	+2.09	+2.09	4.37	+2.76	.31	+2.93
129	1	.94	+2.75	+2.75	7.56	+3.63	.42	+3.80
	38			25.51	45.77			

y. = .67 V = .78 X = 1.32

TABLE 4.8B.: THE PERSON MEASURE STEPS FOR AFB.

1 SCORE	2 FREQ.	3 PROPORT. CORRECT	4 LOGIT CORRECT	5 LOGIT X FREQ.	6 LOGIT SQD X FREQ.	7 PER. AB. MEASURE	8 STANDARD ERROR	9 ADJUSTED P.A. MEAS
26	2	.18	-1.52	-3.04	4.62	-2.28	.27	+1.74
30	1	.21	-1.32	-1.32	1.75	-1.98	.25	+2.04
31	2	.22	-1.27	-2.54	3.22	-1.91	.25	+2.11
32	1	.23	-1.21	-1.21	1.46	-1.82	.25	+2.20
36	1	.26	-1.05	-1.05	1.10	-1.58	.24	+2.44
37	1	.26	-1.05	-1.05	1.10	-1.58	.23	+2.44
38	2	.27	-0.99	-1.98	1.96	-1.49	.23	+2.53
39	1	.28	-0.94	-0.94	0.88	-1.41	.23	+2.61
40	3	.28	-0.94	-2.82	2.64	-1.41	.23	+2.61
44	2	.31	-0.80	-1.60	1.28	-1.20	.22	+2.83
45	2	.32	-0.75	-1.50	1.12	-1.13	.22	+2.89
46	2	.33	-0.71	-1.42	1.00	-1.07	.22	+2.95
47	1	.33	-0.71	-0.71	0.50	-1.07	.22	+2.95
48	2	.34	-0.66	-1.32	0.88	-0.99	.22	+3.03
49	3	.35	-0.62	-1.86	1.14	-0.93	.22	+3.09
50	1	.35	-0.62	-0.62	0.38	-0.93	.22	+3.09
51	2	.36	-0.58	-1.16	0.68	-0.87	.21	+3.15
52	1	.37	-0.53	-0.53	0.28	-0.80	.21	+3.22
53	1	.38	-0.49	-0.49	0.24	-0.74	.21	+3.28
54	4	.38	-0.49	-1.96	0.94	-0.74	.21	+3.28
55	2	.39	-0.45	-0.90	0.40	-0.68	.21	+3.34
56	1	.40	-0.41	-0.41	0.17	-0.62	.21	+3.40
57	3	.40	-0.41	-1.23	0.51	-0.62	.21	+3.40
58	2	.41	-0.36	-0.72	0.26	-0.54	.21	+3.48
59	1	.42	-0.32	-0.32	0.10	-0.48	.21	+3.54
60	1	.43	-0.28	-0.28	0.08	-0.42	.21	+3.60
61	1	.43	-0.28	-0.28	0.08	-0.42	.21	+3.60
63	1	.45	-0.20	-0.20	0.04	-0.30	.21	+3.72
66	1	.47	-0.12	-0.12	0.01	-0.18	.21	+3.84
67	3	.48	-0.08	-0.24	0.03	-0.12	.21	+3.90
69	2	.49	-0.04	-0.08	0.00	-0.06	.21	+3.96
70	1	.50	0.00	0.00	0.00	0.00	.21	+4.02
72	1	.51	+0.04	+0.04	0.00	+0.06	.21	+4.08
74	1	.52	+0.08	+0.08	0.01	+0.12	.21	+4.14
77	1	.55	+0.20	+0.20	0.04	+0.30	.21	+4.32
79	1	.56	+0.24	+0.24	0.06	+0.36	.21	+4.38
90	1	.64	+0.58	+0.58	0.34	+0.87	.21	+4.89
	59			-32.76	29.32			

y. = 0.56 V = 0.19 X = 1.50

TABLE 4.8C.: THE PERSON MEASURE STEPS FOR AFC.

4.6.4. THE ANALYSIS OF FIT.

The Rasch model makes certain assumptions about the score patterns--as the items get harder fewer persons will answer them correctly and as the person ability increased fewer items will be answered incorrectly. The 'analysis of fit' procedure is designed to make specific and objective decisions about items or persons who have implausible response patterns. An implausible response pattern would be one where an item was answered correctly by less able persons but answered incorrectly by more able persons or when a person answers the difficult items correctly but answers the easy items incorrectly. While editing the data matrix the extreme implausible response patterns were noted and items 17.10, 17.17, 17.21, 26.3, 26.5 and 26.8 and person 66 were eliminated.

Wright and Stone provide a procedure to analyse further the response plausibility in a more specific manner. This more detailed Analysis of Fit was not carried out for three reasons. First, a small sample exaggerates the impact of misfitting persons. Secondly, the items were drawn on purpose from many of the multidimensional aspects of language. Unevenness of score patterns is expected and an examination of the unevenness will be carried out.

The third reason for not doing a specific analysis of fit at this stage is due to the 199 items that were eliminated. The elimination of data could cause an appearance of misfitting when in fact it was not occurring. In its present form the data would reveal important information. The 322 calibrated items could be placed on their estimated locations on the variable then the non-calibrated 199 items could be placed according to their scores in locations on the variable in relation to the calibrations.

At this stage it was necessary to continue with the

construction of the variable as it would be defined with the inclusion of both calibrated and non-calibrated items. The type of item bank identified by this study then could be used to create new data collection forms which could be used to collect data from a larger sample with the confidence that the originally selected items would all be calibrated. As a larger sample reduces the exaggerated effects of misfitting persons but does not obliterate them, it would be important to carry out an analysis of fit at that stage.

4.6.5. LINKING THE ITEM CALIBRATIONS.

The procedure used to link the three forms was the 'common item equating' method. AFA was linked to AFB through twenty six common items. If the items are providing a usable link their residuals should distribute around 0. In Table 4.9 the mean of their standardised residuals is -0.09 which approximates to 0. Figure 4.1 is a plot of the AFA calibrations of the link items against their AFB calibrations. Twenty four of the item points are well within the 95% control lines and two of the item points are placed on the quality control lines demonstrating that the shift estimated from this link can be used to connect the two forms. Table 4.10 presents the final common item scale for AFA and AFB (AFAB). The two forms are now linked onto one variable and are ready to be linked with AFC.

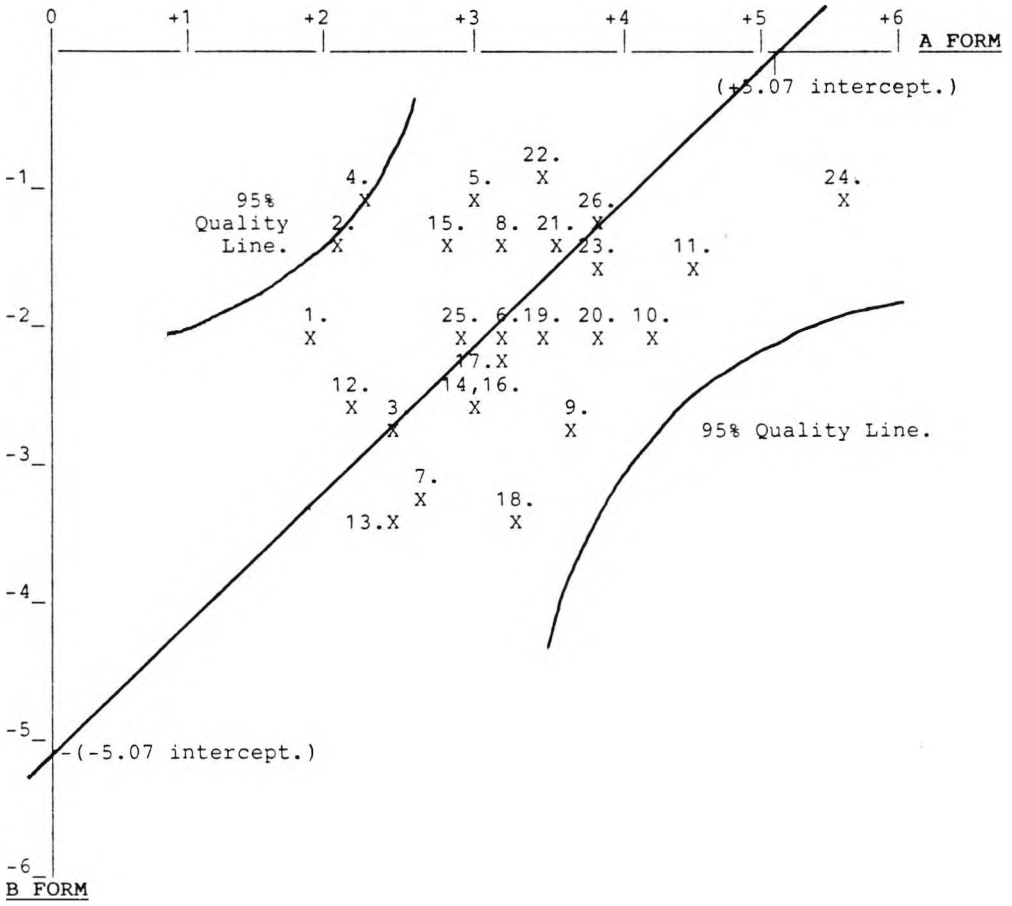
AFAB was linked to AFC through forty-four common items. In Table 4.11 the mean of their standardised residuals is -0.25 which approximates to 0. Figure 4.2 is a plot of the AFAB calibrations of the link items against their AFC calibrations. Thirty four items fall within the 95% quality lines demonstrating that the shift estimated from this link can be used to connect the two forms. Table 4.12 presents the final common item scale for AFAB and AFC

which can now be known as 'the variable'. The person ability measures were then aligned on the variable by adding each form's item mean to the form's person ability measures. The adjusted person measures are in column 9, on Tables 4.8A, 4.8B, 4.8C. Table 4.13 presents the task contexts with the item logits. By locating the 322 items on an interval scale the variable can now be defined in a more explicit manner.

1 ITEM NAME	2 A ITEM SCORE	CAL.	SE	3 B ITEM SCORE	CAL.	SE	4 DIFF. D = A - B	5 RES. DIF D - 5.07	6 SE OF REDISUAL	7
16.1	13	1.58	.45	35	-2.08	.66	3.66	-1.41	.80	-1.76
16.13	11	1.98	.47	33	-1.43	.53	3.41	-1.66	.71	-2.34
16.17	11	1.98	.47	36	-2.70	.80	4.68	- .39	.93	+ .42
16.11	9	2.45	.50	32	-1.13	.49	3.58	-1.49	.70	-2.13
16.9	7	2.99	.55	32	-1.13	.49	4.12	- .95	.74	-1.28
16.30	7	2.99	.55	35	-2.08	.66	5.07	0.00	.86	0.00
17.1	9	2.45	.50	37	-3.36	1.12	5.81	+ .74	1.23	+ .60
17.4	7	2.99	.55	33	-1.43	.53	4.42	- .65	.76	- .86
17.32	5	3.66	.63	36	-2.70	.80	6.36	+1.29	1.02	+1.26
17.2	5	3.66	.63	35	-2.08	.66	5.74	+ .67	.91	+ .74
17.33	4	4.18	.76	34	-1.66	.58	5.84	+ .77	.91	+ .85
19.6	12	1.82	.46	36	-2.70	.80	4.52	- .55	.92	- .60
19.24	9	2.45	.50	37	-3.36	1.12	5.81	+ .74	1.23	+ .60
19.18	8	2.77	.52	36	-2.70	.80	5.47	+ .40	.95	+ .42
19.15	8	2.77	.52	33	-1.43	.53	4.20	- .87	.74	-1.18
19.16	8	2.77	.52	36	-2.70	.80	5.47	+ .40	.95	+ .42
19.20	7	2.99	.55	36	-2.70	.80	5.67	+ .62	.97	+ .64
19.7	7	2.99	.55	37	-3.36	1.12	6.35	+1.28	1.25	+1.02
19.17	7	2.99	.55	35	-2.08	.66	5.07	0.00	.86	0.00
19.21	6	3.36	.59	35	-2.08	.66	5.44	+ .37	.89	+ .42
19.10	6	3.36	.59	33	-1.43	.53	4.79	- .28	.79	- .35
19.9	6	3.36	.59	32	-1.13	.49	4.49	- .58	.77	- .75
19.25	5	3.66	.63	34	-1.66	.58	5.32	+ .25	.86	+ .29
19.14	2	5.48	.96	32	-1.13	.49	6.61	+1.54	1.12	+1.38
18.9	8	2.77	.52	35	-2.08	.66	4.85	- .22	.84	- .26
10.6	5	3.66	.63	33	-1.43	.53	5.09	+ .02	.82	+ .02
$\bar{x}$		3.00			-2.08		5.07	0.00		- .09
S.D.		.82			.72		.87	.87		1.01

$-.09 \simeq 0$
$1.01 \simeq 1$

TABLE 4.9.: FORM A TO FORM B LINK ANALYSIS.



LEGEND: THE NUMBERS REPRESENT THE FOLLOWING ITEMS:

1.	16.1	1.11	14.	19.18	1.32
2.	16.13	1.00	15.	19.15	1.05
3.	16.17	1.27	16.	19.16	1.32
4.	16.11	.99	17.	19.20	1.35
5.	16.9	1.04	18.	19.7	1.67
6.	16.30	1.21	19.	19.17	1.21
7.	17.1	1.62	20.	19.21	1.25
8.	17.4	1.08	21.	19.10	1.12
9.	17.35	1.43	22.	19.9	1.08
10.	17.2	1.29	23.	19.25	1.21
11.	17.36	1.28	24.	19.14	1.45
12.	19.6	1.26	25.	18.9	1.18
13.	19.24	1.62	26.	10.6	1.16

(24 ITEMS ARE WITHIN THE QUALITY LINES.)

FIGURE 4.2.: PLOT ANALYSIS OF FORMS A TO B LINK.

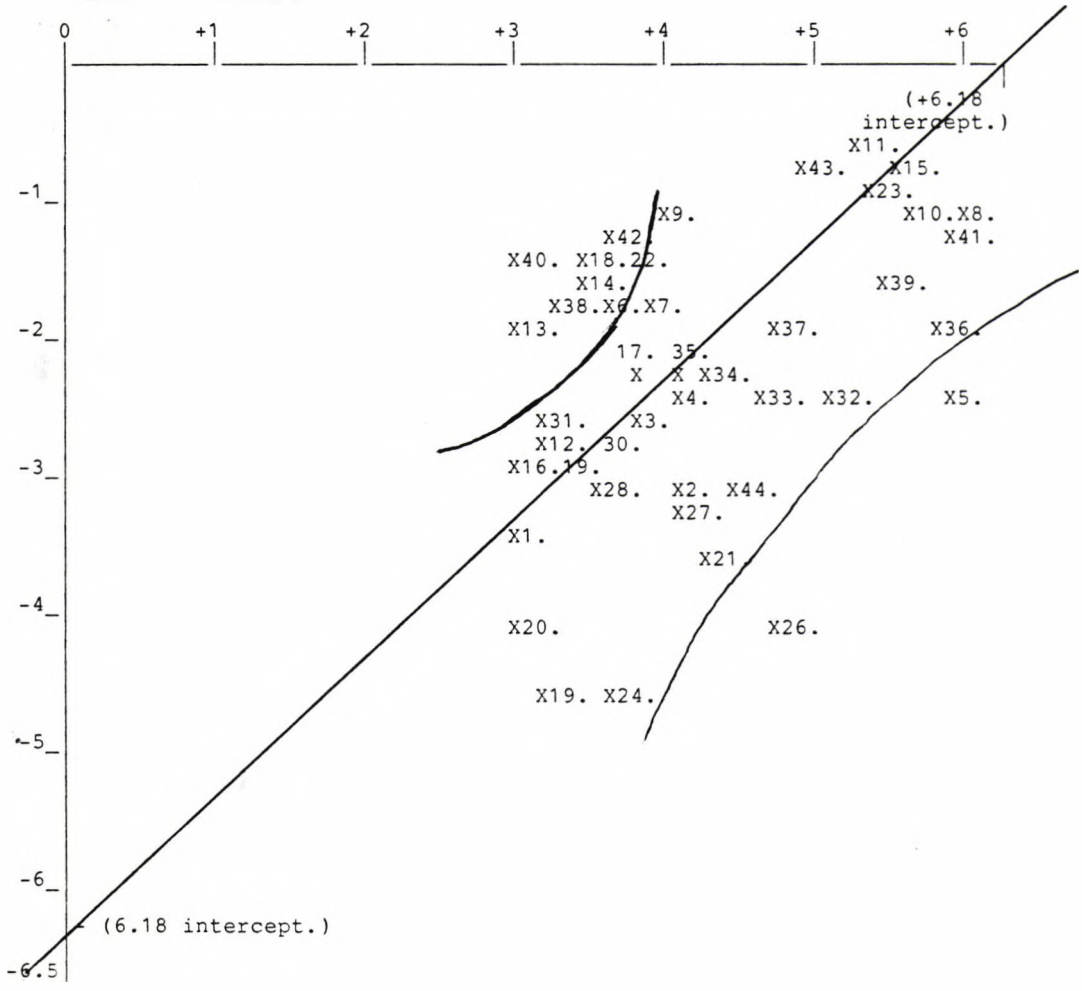
FORM A		FORMS A-B LINK		FORM B	
SCORE	LOGIT	ITEM NAME	LOGIT	SCORE	LOGIT
39	- 9.22	17.1, 19.24	- .66	31	+ 1.37
38	- 7.55	19.6	- .64	30	+ 1.61
37	- 6.94	16.17	- .56	29	+ 1.82
36	- 6.26	16.1	- .45	28	+ 1.94
35	- 5.89	19.7	- .39	27	+ 2.12
34	- 5.44	19.18,19.16	- .17	26	+ 2.31
33	- 5.19	19.20	- .06	25	+ 2.42
32	- 4.84	16.13	+ .07	24	+ 2.57
31	- 4.63	18.9	+ .14	23	+ 2.67
30	- 4.33	16.28,19.17	+ .25	22	+ 2.83
29	- 4.14	17.32	+ .28	21	+ 2.98
28	- 3.90	19.21	+ .44	20	+ 3.07
27	- 3.72	16.11	+ .46	19	+ 3.22
26	- 3.49	16.15	+ .47	18	+ 3.37
24	- 3.12	17.4	+ .58	17	+ 3.46
23	- 2.97	17.2	+ .59	16	+ 3.61
21	- 2.86	16.9	+ .73	15	+ 3.77
20	- 2.41	19.10	+ .76	14	+ 3.87
19	- 2.27	19.25	+ .80	13	+ 4.03
18	- 2.06	19.9, 10.6	+ .91	12	+ 4.14
17	- 1.92	17.33	+ 1.06	11	+ 4.32
16	- 1.69	19.14	+ 1.97	10	+ 4.50
15	- 1.55			9	+ 4.62
14	- 1.32			7	+ 5.08
				6	+ 5.25
				5	+ 5.54
				4	+ 5.77
x = 0.00			S.D. = 3.42		

TABLE 4.10.: FINAL COMMON ITEM SCALE FOR AFA AND AFB.

1 ITEM NAME	2 AB ITEM SCORE	CAL.	SE	3 C ITEM SCORE	CAL.	SE	4 DIFF. D =AB - C	5 RES. DIF D - 6.18	6 SE OF REDISUAL	7
16.22	21	2.98	.36	54	-3.46	.48	6.44	+ .26	.60	+ .43
16.3	16	3.61	.36	51	-2.79	.39	6.40	+ .22	.53	+ .42
16.15	16	3.61	.36	47	-2.33	.33	5.94	- .24	.49	- .49
16.12	14	3.87	.37	46	-2.20	.32	6.07	- .11	.49	- .22
16.4	4	5.77	.58	46	-2.20	.32	7.97	+1.79	.66	+2.71
16.23	18	3.37	.36	40	-1.65	.29	5.02	-1.16	.46	-2.52
16.7	16	3.61	.36	40	-1.65	.29	5.26	- .92	.46	-2.00
16.5	4	5.77	.58	35	-1.23	.27	7.00	+ .82	.64	+1.28
16.31	13	4.03	.38	34	-1.19	.27	5.22	- .96	.47	-2.04
16.8	5	5.54	.53	34	-1.19	.27	6.73	+ .55	.59	+ .93
16.16	6	5.25	.49	30	-0.89	.27	6.17	- .01	.56	- .02
17.12	20	3.07	.36	49	-2.55	.36	5.62	- .56	.51	-1.10
17.11	21	2.98	.36	42	-1.81	.30	4.79	-1.39	.47	-2.96
17.15	18	3.37	.36	37	-1.41	.28	4.78	-1.40	.46	-3.04
17.36	6	5.25	.49	31	-0.97	.27	6.22	+ .04	.56	+ .07
26.12	21	2.98	.36	50	-2.70	.37	5.68	- .50	.52	- .96
26.6	16	3.61	.36	44	-2.02	.31	5.63	- .55	.48	-1.15
26.4	18	3.37	.36	36	-1.33	.28	4.70	-1.48	.46	-3.22
25.3	21	2.98	.36	57	-4.57	.74	7.55	+1.37	.82	+1.67
25.2	21	2.98	.36	56	-3.99	.61	6.97	+ .79	.71	+1.11
25.5	15	3.77	.37	55	-3.62	.54	7.39	+1.21	.65	+1.86
25.10	17	3.46	.36	36	-1.33	.28	4.79	-1.39	.46	-3.02
25.12	7	5.07	.46	34	-1.19	.27	6.27	+ .09	.54	+ .17
24.25	20	3.07	.36	57	-4.57	.74	7.64	+1.46	.82	+1.78
24.15	18	3.37	.36	57	-4.57	.74	7.94	+1.76	.82	+2.15
24.17	12	4.14	.39	56	-3.99	.61	8.13	+1.95	.72	+2.71
24.14	16	3.61	.36	53	-3.20	.45	6.81	+ .63	.58	+1.09
24.36	18	3.37	.36	51	-2.79	.39	6.16	- .02	.53	- .04
24.42	21	2.98	.36	50	-2.70	.37	5.68	- .50	.52	- .96
24.7	20	3.07	.36	49	-2.55	.36	5.62	- .56	.51	-1.10
24.32	20	3.07	.36	47	-2.33	.39	5.40	- .78	.53	-1.47
24.21	9	4.62	.42	46	-2.20	.32	6.82	+ .64	.53	+1.21
24.31	11	4.32	.40	46	-2.20	.32	6.52	+ .34	.51	+ .67
24.1	14	3.87	.37	45	-2.08	.32	5.95	- .23	.49	- .47
24.27	15	3.77	.37	44	-2.02	.31	5.79	- .39	.48	- .81
24.23	5	5.54	.53	42	-1.81	.30	7.35	+1.17	.61	+1.92
24.30	10	4.50	.41	42	-1.81	.30	6.31	+ .13	.51	+ .25
24.26	19	3.22	.36	41	-1.70	.29	4.92	-1.26	.46	-2.74
24.5	6	5.25	.49	37	-1.41	.28	6.66	+ .48	.56	+ .86
24.28	21	2.98	.36	36	-1.33	.28	4.31	-1.87	.46	-4.07
24.18	4	5.77	.58	36	-1.33	.28	7.10	+ .92	.64	+1.44
24.8	16	3.61	.36	34	-1.19	.27	4.80	-1.38	.45	-3.07
24.35	7	5.08	.46	34	-1.19	.27	6.27	+ .09	.54	+ .17
24.34	13	4.03	.38	52	-2.97	.42	7.00	+ .82	.57	+1.44
$\bar{x}$		3.94			-2.23		6.18	0.00		- .25
S.D.		.94			1.03		.97	.99		1.78

$-.25 \simeq 0$
$1.78 \simeq 1$

TABLE 4.11.: FORM AB TO FORM C LINK ANALYSIS.



1.	P22 (.84)	12.	Q12 (.72)	23.	Y13 (.73)	34.	X1 (.69)
2.	P3 (.75)	13.	Q11 (.66)	24.	X25 (1.10)	35.	X27 (.68)
3.	P15 (.69)	14.	Q15 (.64)	25.	X15 (1.10)	36.	X23 (.83)
4.	P12 (.69)	15.	Q39 (.76)	26.	X17 (1.00)	37.	X30 (.71)
5.	P4 (.90)	16.	Z12 (.73)	27.	X14 (.81)	38.	X26 (.65)
6.	P23 (.65)	17.	Z6 (.67)	28.	X36 (.75)	39.	X5 (.77)
7.	P7 (.65)	18.	Z4 (.64)	29.	X43 (.73)	40.	X28 (.64)
8.	P5 (.85)	19.	Y4 (1.10)	30.	X7 (.72)	41.	X18 (.86)
9.	P33 (.65)	20.	Y2 (.97)	31.	X32 (.75)	42.	X8 (.63)
10.	P8 (.80)	21.	Y6 (.91)	32.	X21 (.74)	43.	X35 (.73)
11.	P16 (.76)	22.	Y11 (.64)	33.	X31 (.72)	44.	X34 (.80)

(34 ITEMS ARE WITHIN THE QUALITY LINES.)

FIGURE 4.3.: PLOT ANALYSIS OF FORMS AB TO C LINK.

FORM A		A TO B LINK		FORM B		AB TO C LINK		FORM C	
SCORE	LOGIT	ITEM NAME	LOGIT	SCORE	LOGIT	ITEM NAME	LOGIT	SCORE	LOGIT
39	-11.38	17.1, 19.24	- 2.82	31	- .79	25.3	+ .14	29	+ 3.22
38	- 9.71	19.6	- 2.80	30	- .55	24.25	+ .18	28	+ 3.30
37	- 9.10	16.17	- 2.72	29	- .34	24.15	+ .33	27	+ 3.35
36	- 8.42	16.1	- 2.61	28	- .22	25.2	+ .43	26	+ 3.43
35	- 8.05	19.7	- 2.55	27	- .04	16.22	+ .69	25	+ 3.52
34	- 7.60	19.18, 19.16	- 2.33	26	+ .15	16.5, 14.17	+1.01	24	+ 3.56
33	- 7.35	19.20	- 2.22	25	+ .26	26.12, 24.42	+1.07	22	+ 3.74
32	- 7.00	16.13	- 2.09	24	+ .41	24.14	+1.14	21	+ 3.80
31	- 6.79	18.9	- 2.02	23	+ .51	17.12, 24.7	+1.19	20	+ 3.88
30	- 6.49	16.28, 19.17	- 1.91	22	+ .67	24.36	+1.22	19	+ 3.98
29	- 6.36	17.34	- 1.88			24.32	+1.30	18	+ 4.03
28	- 6.06	19.21	- 1.72			16.3	+1.34	17	+ 4.14
27	- 5.88	16.11	- 1.70			24.34	+1.46	16	+ 4.23
26	- 5.65	19.15	- 1.69			26.6	+1.50	15	+ 4.35
24	- 5.28	17.4	- 1.58			17.11	+1.52	14	+ 4.41
23	- 5.13	17.2	- 1.57			16.15	+1.57	13	+ 4.53
21	- 5.02	16.9	- 1.43			24.26	+1.69	12	+ 4.66
20	- 4.57	19.10	- 1.40			24.28	+1.76	11	+ 4.73
19	- 4.43	19.25	- 1.36			16.12	+1.77	10	+ 4.88
18	- 4.22	19.9, 10.6	- 1.25			16.23	+1.79	9	+ 5.02
17	- 4.08	17.33	- 1.10			24.27	+1.81	8	+ 5.12
16	- 3.85	19.14	- .19			24.1	+1.83	7	+ 5.30
15	- 3.71					16.7, 17.15	+1.91	6	+ 5.53
14	- 3.48					26.4	+1.95	5	+ 5.79
						24.31	+1.99	4	+ 5.95
						25.10	+2.00	3	+ 6.32
						24.21, 24.8	+2.14	2	+ 6.90
						24.30	+2.28	1	+ 7.34
						16.31	+2.35		
						16.4	+2.72		
						24.23	+2.80		
						24.5	+2.85		
						25.12, 24.35	+2.88		
						17.36	+3.07		
						16.8, 16.16	+3.11		
						24.18	+3.15		
						16.5	+3.20		

$\bar{x}$ = 0.00 S.D. = 4.41

TABLE 4.12.: FINAL COMMON ITEM SCALE FOR AFAB TO AFC.

TABLE 4.13: ITEMS AND RESULTS WITHIN CONTEXTS (520) (322)

Beside each item the logit and item score are given. The number of items per form are presented at the bottom of the context. The numbers in the parentheses are the total number of items and the number of calibrated items.

ENTRY CRITERION

(40/A)	1. Holds item.

1. ROLLING RATTLE (5) (1)

(40/A)	1. Looks at it.
(40/A)	2. Turns.
(40/A)	3. Shakes.
(40/A)	4. Fingers ball.
- 7.60 34/A	5. Rolls to adult.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	1	0	0	0	0	TOTAL: - 7.60

2. POP UP CONE (4) (2)

(40/A)	1. Looks at it.
(40/A)	2. Watches it come and go.
-11.38 39/A	3. Pushes puppet in and pulls out.
- 9.71 38/A	4. Pushes stick in and out.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	2	0	0	0	0	TOTAL: -21.09

3. WIND UP MOVING TOY (5) (5)

-11.38 39/A	1. Looks at it.
- 9.71 38/A	2. Watches it move.
- 8.42 36/A	3. Makes noise or movement for it to go again.
- 8.42 36/A	4. Tries to do it by him or herself.
- 6.49 30/A	5. Asks for help to wind it up.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	5	0	0	0	0	TOTAL: -44.42

4. GRADED DOLL (4) (3)

-11.38 39/A	1. Takes off.
- 7.60 34/A	2. Puts on.
- 6.30 29/A	3. Puts head on.
(6/A)	4. Grades.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	3	0	0	0	0	TOTAL: -25.28

5. 1ST WORDS PUZZLE (6) (6)

- 9.10	37/A	1. Child takes them out.
- 6.06	28/A	2. Puts back on own.
- 9.10	37/A	3. Takes out 1--5 pieces.
- 6.49	30/A	4. Takes out 6--8 pieces.
- 6.06	28/A	5. Puts back 1--5 pieces.
- 5.02	21/A	6. Puts back 6--8 pieces.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	6	0	0	0	0	TOTAL: -41.83

6. MATCHES OBJECTS TO PICTURES (12) (0)

(8/A)	1. Bed.
(11/A)	2. Cat.
(12/A)	3. Spoon.
(8/A)	4. Apple.
(8/A)	5. Teapot.
(6/A)	6. Chair.
(7/A)	7. Shoe.
(5/A)	8. Cup.
(4/A)	9. Indicates.
(4/A)	10. Comments on missing item.
(4/A)	11. Searches for missing item with help.
(4/A)	12. Searches for missing item on own.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	0	0	0	TOTAL: 0

7. LARGE DOLL PLAY (26) (23)

- 6.49	30/A	1. Plays with teddy.
- 7.35	33/A	2. Plays with jug.
- 8.05	35/A	3. Plays with spoon.
- 7.60	34/A	4. Plays with cup.
- 5.88	27/A	5. Plays with saucer.
- 5.13	23/A	6. Puts cup on saucer.
- 6.30	29/A	7. Relates spoon to saucer/cup/jug.
- 5.28	24/A	8. Relates spoon/cup to adult.
- 5.65	26/A	9. Relates spoon/cup to teddy.
- 5.65	26/A	10. Relates jug to cup/saucer.
- 5.65	26/A	11. Relates toys to self.
- 8.05	35/A	12. Container play.
- 7.00	32/A	13. Moves items from one cup to another.

- 5.02	21/A	14. Sequences stirring up the food and feeding it to teddy.
- 3.71	15/A	15. Pours out more and gives it to adult.
- 6.79	31/A	16. One::one single.
- 6.30	29/A	17. One::one repetitive.
- 6.30	29/A	18. Several one::one.
- 6.30	29/A	19. Two steps.
- 5.28	24/A	20. Several two steps.
- 4.43	19/A	21. Three+ steps.
	(10/A)	22. When adult says 'hot' child blows on it and serves adult.
- 4.57	20/A	23. Single word utterances.
- 4.08	17/A	24. Two word utterances.
	(9/A)	25. Basic sentences.
	(1/A)	26. Mature sentence forms.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	23	0	0	0	0	TOTAL:-136.86

8. MINIATURE TOY PLAY (17) (9)

- 3.48	14/A	1. Relates table and chair.
- 4.43	19/A	2. Sits doll in chair.
	(12/A)	3. Sets bath apart.
	(10/A)	4. Flies plane.
- 3.48	14/A	5. Sets plane apart.
- 4.22	18/A	6. Puts baby in bath.
	(10/A)	7. Puts tea pot on table.
	(8/A)	8. Puts cup on table.
- 4.08	17/A	9. Feeds baby.
- 4.43	19/A	10. Child watches.
	(13/A)	11. Child tries to make it work too.
- 3.71	15/A	12. Other toys remain intact.
- 4.22	18/A	13. Child lets toy go back and turns attention to other toys.
- 3.71	15/A	14. Feeds doll with food and spoon, scrapes then feeds.
	(12/A)	15. Pours and then feeds doll.
	(8/A)	16. Covers baby in bath.
	(4/A)	17. Washes baby.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	9	0	0	0	0	TOTAL: -35.76

9. FOLLOWS SIMPLE DIRECTIONS (9) (2)

- 3.48	14/A	(38/B)	1. Put it on the floor.
	(12/A)	(38/B)	2. Put it on the chair.
	(13/A)	(38/B)	3. Put it on the table.
	(10/A)	(38/B)	4. Put it on your head.
	(13/A)	(38/B)	5. Give it to me.

- 3.48	14/A	(38/B)	6. Two correct.
	(12/A)	(38/B)	7. Three correct.
	(11/A)	(38/B)	8. Four correct.
	(9/A)	(38/B)	9. Five correct.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	2	0	0	0	0	TOTAL: - 6.96

10. POINTS TO BODY PARTS (15) (9)

- 4.08	17/A	(38/B)	1. Nose.
- 3.71	15/A	(38/B)	2. Ear.
- 3.71	15/A	(38/B)	3. Eye.
- 3.85	16/A	(38/B)	4. Mouth.
	(11/A)	(38/B)	5. Finger.
- 1.25	5/A	33/B	6. Thumb.
- .55	(5/A)	30/B	7. Chin.
- .79	(2/A)	31/B	8. Elbow.
	(2/A)	(11/B)	9. Nostril.
- 3.85	16/A	(38/B)	10. Two correct.
- 3.48	14/A	(38/B)	11. Four correct.
	(11/A)	(38/B)	12. Five correct.
	(4/A)	(31/B)	13. Seven correct.
	(1/A)	(28/B)	14. Eight correct.
	(0/A)	(11/B)	15. Nine correct.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	6	1	2	0	0	TOTAL: -25.27

11. DOES ACTIONS (11) (1)

	(13/A)	(38/B)	1. Clap.
- 3.48	14/A	(38/B)	2. Close your eyes.
	(9/A)	(38/B)	3. Stamp feet.
	(9/A)	(38/B)	4. Pat head.
	(8/A)	(38/B)	5. Jump.
	(7/A)	(38/B)	6. Walk.
	(6/A)	(38/B)	7. Run around.
	(13/A)	(38/B)	8. Two correct.
	(10/A)	(38/B)	9. Four correct.
	(8/A)	(38/B)	10. Five correct.
	(4/A)	(38/B)	11. Seven correct.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	1	0	0	0	0	TOTAL: - 3.48

12. POINTS TO ACTION PICTURES (LDA) (7) (7)

- 4.22	18/A	(38/B)	1. Bathing.
- 4.43	19/A	(38/B)	2. Drinking.
- 4.08	17/A	(38/B)	3. Sitting.
- 3.48	14/A	(38/B)	4. Standing.
- 4.22	18/A	(38/B)	5. Two correct.
- 3.85	16/A	(38/B)	6. Three correct.
- 3.48	14/A	(38/B)	7. Four correct.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	7	0	0	0	0	TOTAL: -27.76

13. WHERE'S TEDDY (15) (7)

- 4.43	19/A	1. Points to Teddy.
- 4.22	18/A	2. Imitates adult gestures.
- 3.85	16/A	3. Talks about picture with speech/gesture.
- 5.13	23/A	4. Sits and listens to story being read: one-five pages.
- 4.22	18/A	5. Sits and listens to story being read: six plus pages.
- 4.57	20/A	6. Single words utterance.
- 4.08	17/A	7. Two word utterances.
	(8/A)	8. Basic sentences.
	(5/A)	9. Mature sentence forms.
	(10/A)	10. Imitates adult speech.
	(7/A)	11. Puts hands in water.
	(10/A)	12. Washes.
	(10/A)	13. Takes towel.
	(8/A)	14. Pretends to dry hands.
	(8/A)	15. Throws away.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	7	0	0	0	0	TOTAL: -30.50

14. EARLY COMMUNICATIONS (9) (8)

	(40/A)	1. Uses actions that are easily interpreted.
- 9.10	37/A	2. Makes different noises.
- 9.10	37/A	3. Makes different sounds.
- 9.10	37/A	4. Vocalises during different situations.
- 9.10	37/A	5. Vocalises in sequence with actions.
- 6.79	31/A	6. Uses performative.
- 6.79	31/A	7. Uses protowords.
- 8.05	35/A	8. Uses gestures and nonverbal expressions.
- 6.79	31/A	9. Uses gesture with speech.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	8	0	0	0	0	TOTAL: -64.82

15. EARLY COMPREHENSION (5) (2)

	(40/A)	1. Looks at adult.
	(40/A)	2. Takes object from adult.
	(40/A)	3. Lets adult assist in their game.
- 9.71	38/A	4. Brings adult into game.
- 9.10	37/A	5. Plays a to and fro, reciprocal or repetitive type game with the adult.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	2	0	0	0	0	TOTAL: -18.81

16. STRIPEY KITTEN GETS STUCK				(37)	(37)
- 2.61	13/A	35/B	(58/C)		1. Points to kitten.
- .22	(3/A)	28/B	(57/C)		2. A mouse.
+ 1.34	(4/A)	16/B	51/C		3. Chasing, running after it.
+ 2.72	(1/A)	4/B	46/C		4. Making a mess.
+ 3.20	(0/A)	4/B	35/C		5. Making a mess because of the cat/mouse.
- .22	(7/A)	28/B	(55/C)		6. Dog chasing the cat.
+ 1.91	(2/A)	16/B	40/C		7. Stuck.
+ 3.11	(0/A)	5/B	34/C		8. Stuck in the tree.
- 1.43	7/A	32/B	(56/C)		9. To get the cat.
+ .41	(3/A)	24/B	(50/C)		10. No.
- 1.70	9/A	32/B	(58/C)		11. Him, the man.
+ 1.77	(1/A)	14/B	46/C		12. The firemen.
- 2.09	11/A	33/B	(57/C)		13. Yes.
+ .41	(1/A)	24/B	(57/C)		14. A ladder.
+ 1.57	(0/A)	16/B	47/C		15. Long ladder.
+ 3.11	(0/A)	6/B	30/C		16. '-er' ladder.
- 2.72	11/A	36/B	(59/C)		17. Yes.
+ .15	(1/A)	26/B	(58/C)		18. Because he got the cat down.
+ .41	(8/A)	24/B	(53/C)		19. Run.
+ .41	(4/A)	24/B	(49/C)		20. Chase the mouse.
+ .26	(8/A)	25/B	(54/C)		21. 'No', 'Don't', 'Stop'.
+ .69	(3/A)	21/B	54/C		22. Be good.
+ 1.79	(0/A)	18/B	40/C		23. Don't chase the mouse.
+ 4.14	(0/A)	(13/B)	17/C		24. Go inside.
+ .51	(2/A)	23/B	(55/C)		25. Be good, go inside, chase the mouse, get stuck in the tree.
- 3.71	15/A				26. Single word utterances.
- 3.71	15/A				27. Two word utterances.
- 1.91	7/A	35/B	(59/C)		28. One basic sentence.
- .04	(4/A)	27/B	(48/C)		29. Three or four basic sentences.
+ 4.35	(1/A)	(14/B)	15/C		30. Five or more basic sentences.
+ 2.35	(1/A)	13/B	34/C		31. One complex sentence.
+ 4.14	(0/A)	(8/B)	17/C		32. Two complex sentences.
+ 3.43			26/C		33. 'And, and then, then'.
+ 5.95			4/C		34. 'Or, but'.
+ 4.88			10/C		35. 'Because, so'.
+ 7.34			1/C		36. 'When'.
+ 7.34			1/C		37. 'Which, who, that'.
FORM	A	AB	B	BC	C
TOTALS:	2	6	10	11	8

LOGIT TOTAL: +47.33

17. THE DRAGON AND THE BIRTHDAY PARTY (41) (35)					
- 2.82	9/A	37/B	(59/C)	1.	Decontextual language.
- 1.57	5/A	35/B	(59/C)	2.	Topic focus.
- .04	(7/A)	27/B	(59/C)	3.	No unrelated utterances.
- 1.58	7/A	33/B	(59/C)	4.	States one action.
- .34	(5/A)	29/B	(59/C)	5.	States or lists action(s).
- .22	(4/A)	28/B	(55/C)	6.	States related actions.
+ .67	(1/A)	22/B	(50/C)	7.	Event-time sequence.
+ 3.43	(1/A)	(15/B)	26/C	8.	'So/because', a causal link.
+ 5.95	(0/A)	(1/B)	4/C	9.	Goal based causal without obstacle.
	(0/A)	(1/B)	(0/C)	10.	Goal based causal with obstacle.
+ 1.52	(2/A)	21/B	42/C	11.	A word is repeated.
+ 1.19	(2/A)	20/B	49/C	12.	Noun--->pronoun.
+ 4.88	(1/A)	(2/B)	10/C	13.	Indefinite--->definite (a--->the).
- .04	(2/A)	27/B	(55/C)	14.	Event elaboration.
+ 1.91	(1/A)	18/B	37/C	15.	Subject + verbs.
+ 3.35	(1/A)	(15/B)	27/C	16.	Subject + three different actions.
	(1/A)	(14/B)	(0/C)	17.	Repetition of actions.
+ 3.30	(2/A)	(21/B)	28/C	18.	Introduction of a 'problem'.
+ 5.53	(1/A)	(14/B)	6/C	19.	Consequences.
+ 5.02		(4/B)	9/C	20.	Actions.
		(2/B)	(0/C)	21.	Plans.
+ 6.90		(2/B)	2/C	22.	Reactions.
+ 5.02		(3/B)	9/C	23.	Resolution.
+ 5.53		(1/B)	6/C	24.	Contrary.
+ 6.90		(1/B)	2/C	25.	'and...if'.
+ 3.52		(4/B)	25/C	26.	Story Introduction.
+ 5.95		(3/B)	4/C	27.	Story ending.
+ 4.03		(3/B)	18/C	28.	Reported Speech.
+ 5.30		(1/B)	7/C	29.	Deixis.
	(13/A)	(0/B)		30.	Single word utterances.
	(8/A)	(0/B)		31.	Two word utterances.
- 1.88	5/A	36/B	(59/C)	32.	One basic sentence.
- 1.10	4/A	34/B	(59/C)	33.	Two basic sentences.
+ .41	(3/A)	24/B	(57/C)	34.	Three basic sentences.
+ .51	(2/A)	23/B	(56/C)	35.	One complex sentence.
+ 3.07	(1/A)	6/B	31/C	36.	Two complex sentences.
		(0/B)	(55/C)	37.	'And, and then, then'.
+ 4.66			12/C	38.	'Or, but'.
+ 4.03			18/C	39.	'Because, so'.
+ 5.30			7/C	40.	'When'.
+ 5.53			6/C	41.	'Which, who, that'.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	5	7	4	19	TOTAL: +93.82

18. PREPOSITION COMMANDS: (13) (7)

- 3.85	16/A	(38/B)	1. Put the cat in the bath.
- .04	(2/A)	27/B	2. Put the cat under the bath.
	(1/A)	(17/B)	3. Put the cat on the bath.
- .04	(3/A)	27/B	4. Put the cat beside the bath.
+ .67	(4/A)	22/B	5. Put the cat behind the bath.
	(0/A)	(4/B)	6. Put the cat above the bath.
	(3/A)	(21/B)	7. Make the cat jump over the bath.
- .79	(4/A)	31/B	8. Make the cat run around the bath.
- 2.02	8/A	35/B	9. Two correct.
- .34	(3/A)	29/B	10. Four correct.
	(0/A)	(14/B)	11. Six correct.
	(0/A)	(8/B)	12. Seven correct.
	(0/A)	(4/B)	13. Eight correct.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	1	1	5	0	0	TOTAL: - 6.41

19. SELECTS BY FUNCTION: (27) (22)

- 3.71	15/A	(38/B)	1. Drink out of.
	(13/A)	(38/B)	2. Sleep in.
- 3.48	14/A	(38/B)	3. Sit on.
	(13/A)	(38/B)	4. Draw with.
- 3.48	14/A	(38/B)	5. Eat.
- 2.80	12/A	36/B	6. Throw.
- 2.55	7/A	37/B	7. Live in.
- .79	(6/A)	31/B	8. Talk on.
- 1.25	6/A	32/B	9. Play on.
- 1.40	6/A	33/B	10. Wear.
- .79	(4/A)	31/B	11. Bites.
- .55	(7/A)	30/B	12. Swims.
- .79	(5/A)	31/B	13. Flies.
- .19	2/A	32/B	14. Take a picture with.
- 1.69	8/A	33/B	15. Goes in the water.
- 2.33	8/A	36/B	16. Says 'meow'.
- 1.91	7/A	35/B	17. Goes on the road.
- 2.33	8/A	36/B	18. Goes in the sky.
- .79	(5/A)	31/B	19. Burns.
- 2.22	7/A	36/B	20. Bounce.
- 1.72	6/A	35/B	21. Read.
	(13/A)	(38/B)	22. Five correct answers.
	(11/A)	(38/B)	23. Eight correct answers.
- 2.82	9/A	37/B	24. Ten correct answers.
- 1.36	5/A	34/B	25. Sixteen correct answers.
+ .67	(1/A)	22/B	26. Twenty correct answers.
	(1/A)	(20/B)	27. Twenty one correct answers.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	3	13	6	0	0	TOTAL: -38.28

20 POINTS TO SMALL ACTION PICTURES (7) (0)

(10/A) (38/B)	1. Eating.
(9/A) (38/B)	2. Standing.
(9/A) (38/B)	3. Sitting.
(11/A) (38/B)	4. Sleeping.
(11/A) (38/B)	5. Two Correct.
(9/A) (38/B)	6. Three Correct.
(7/A) (38/B)	7. Four Correct.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	0	0	0	TOTAL: 0

21. MATCHING PREPOSITION PICTURES (24) (12)

- .55 30/B	1. Big teddy in car.
- .34 29/B	2. Big teddy on car.
- .34 29/B	3. Little teddy in car.
- .04 27/B	4. Little teddy on car.
(34/B)	5. Teddy on table.
(32/B)	6. Teddy under table.
(33/B)	7. Baby on table.
(33/B)	8. Baby under table.
- .79 31/B	9. Cat on table.
- .79 31/B	10. Cat under table.
(33/B)	11. Cup on table.
- .79 31/B	12. Cup under table.
(35/B)	13. One correct.
(32/B)	14. Two correct.
+ .41 24/B	15. Three correct.
+ .41 24/B	16. Four correct.
(38/B)	17. One correct.
(36/B)	18. Two correct.
(34/B)	19. Three correct.
(33/B)	20. Four correct.
(32/B)	21. Five correct.
- .79 31/B	22. Six correct.
- .04 27/B	23. Seven correct.
+ .15 26/B	24. Eight correct.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	12	0	0	TOTAL: - 3.50

22. BROKEN CUP/BROKEN BED (6) (2)

BROKEN CUP	
(38/B)	1. Says 'broken' ' got a hole'.
- .79 31/B	2. It will come out, go on the table.
(17/B)	3. Clean it up.
BROKEN BED	
(35/B)	4. Broken.
(32/B)	5. Mend it.
+ .41 24/B	6. With glue.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	2	0	0	TOTAL: - 0.38

23. SEQUENCE PICTURES: RUNNING (19) (3)

	(35/B)	1. Running, chasing.
	(34/B)	2. Falling.
	(16/B)	3. Helping up.
	(12/B)	4. Hurt/cry.
- .22	28/B	5. All utterances are about the topic.
- .55	30/B	6. All utterances are spoken as if telling a story.
	(36/B)	7. States one action.
	(34/B)	8. States or lists action(s).
	(32/B)	9. States related actions.
- .79	31/B	10. Event-time sequence.
	(21/B)	11. 'So/because': a causal link.
	(0/B)	12. Goal based causal without obstacle.
	(0/B)	13. Goal based causal with obstacle.
	(6/B)	14. A word is repeated.
	(14/B)	15. Noun changes to pronoun.
	(1/B)	16. Indefinite changes to definite.
	(34/B)	17. Event elaboration.
	(18/B)	18. Subject plus verbs.
	(6/B)	19. Subject plus three different actions.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	3	0	0	TOTAL: - 1.56

24. PICTURE DESCRIPTION BOOK (48) (42)

'FIRST...THEN'		
+ 1.83	14/B 45/C	1. One 'then'.
CAT CHASING THE MOUSE: MAKING A MESS		
+ .15	26/B (59/C)	2. 1-4 verbs.
+ 4.73	(2/B) 11/C	3. 5-6 verbs.
	(32/B) (57/C)	4. 1-4 nouns.
+ 2.85	6/B 37/C	5. 5-6 nouns.
IN THE PARK: WHAT'S SILLY?		
+ .67	22/B (51/C)	6. Duck with a boot on his head.
+ 1.19	20/B 49/C	7. Boat in the sky.
+ 2.14	16/B 34/C	8. Cat on the water.
- .22	28/B (59/C)	9. A bike going up the tree.
IN THE GARDEN: WHAT'S GOING TO HAPPEN?		
- .22	28/B (57/C)	10. Two accurate descriptions.
	(21/B) (54/C)	11. A prediction: uses future tense.
IN THE GARDEN: WHAT HAPPENED?		
- .04	27/B (56/C)	12. Accurate description: uses past tense.

WHY IS HE HAPPY?			
	(18/B)	(59/C)	13. Gives a reasonable event.
+ 1.14	16/B	53/C	14. He has a present.
WHY IS HE SAD?			
+ .33	18/B	57/C	15. Gives a reasonable event.
+ 3.88	(3/B)	20/C	16. His balloon popped.
WHY IS HE CROSS?			
+ 1.01	12/B	56/C	17. Gives a reasonable event.
+ 3.15	4/B	36/C	18. The dog chewed his shoe.
WHY IS SHE COLD?			
- .04	27/B	(59/C)	19. Because its raining.
+ 3.56	(6/B)	24/C	20. Because she has no jacket.
WHY IS SHE NOT WELL?			
+ 2.14	9/B	46/C	21. Because she is ill, cold.
+ 3.80	(3/B)	21/C	22. Because she ate too much.
WHY IS SHE TIRED?			
+ 2.80	5/B	42/C	23. Because she had a busy day.
+ 3.88	(1/B)	20/C	24. Because she has been running.
WHY IS SHE WATERING THE PLANTS?			
+ .18	20/B	57/C	25. They might die, They're thirsty.
WHY IS SHE COOKING?			
+ 1.69	19/B	41/C	26. They are hungry. It's dinner time.
WHY IS HE PUTTING HE CLOTHES IN THE WASHING MACHINE?			
+ 1.81	15/B	44/C	27. To make them clean.
WHY ARE THEY TAKING OUT THE RUBBISH?			
+ 1.76	21/B	36/C	28. For the dustmen, to clean the house.
WHY ARE THEY WEARING RAINCOATS?			
+ .67	22/B	(57/C)	29. Because it's raining.
WHY IS SHE SITTING ON THE BOOKS?			
+ 2.28	10/B	42/C	30. So she can reach.
WHY SHOULDN'T THEY DO THIS?			
+ 1.99	11/B	46/C	31. They might get run over, hurt.
WHY SHOULDN'T HE DO THIS?			
+ 1.30	20/B	47/C	32. It will hurt the cat, the cat will scratch you.
WHY SHOULDN'T SHE DO THIS?			
+ .67	22/B	(55/C)	33. The bird might fly away.
WHY SHOULDN'T HE DO THIS?			
+ 1.46	13/B	52/C	34. The rain will come in.
+ 2.88	7/B	34/C	35. You will get dirty socks.
HOW CAN YOU GET THE BOAT BACK FOR THE LITTLE GIRL?			
+ 1.22	18/B	51/C	36. Suggests a reasonable method.
HOW CAN YOU GET THE KITE DOWN FOR THE LITTLE BOY?			
+ .67	22/B	(46/C)	37. Suggests a reasonable method.

SYNTAX ANALYSIS

	(37/B)		38.	Phrase structure.
	(37/B)	(59/C)	39.	One basic sentence.
+ .51	23/B	(58/C)	40.	Ten+ basic sentences.
+ 3.74	(11/B)	22/C	41.	Twenty+ basic sentences.
+ 1.07	21/B	(50/C)	42.	One complex sentence.
+ 4.23	(3/B)	16/C	43.	Four+ complex sentences.
		(49/C)	44.	'And, and then, then'.
+ 4.73		11/C	45.	'Or, but'.
+ 5.30		7/C	46.	'Because, so'.
+ 5.95		4/C	47.	'When'.
+ 7.34		1/C	48.	'Which, who, that'.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	11	20	11	TOTAL: +90.18

25. GREEN CROSS CODE (18) (16)

	(33/B)	(44/C)	1.	Boy is going to be hit.
+ .14	21/B	56/C	2.	No.
+ .43	21/B	57/C	3.	Stop.
- .04	27/B	(59/C)	4a.	Ambulance will come, he will die.
			4b.	To the hospital
+ 1.01	15/B	55/C	5.	The lollypop lady/man.
	(15/B)	(60/C)	6a.	Reasonable description of what he or she does.
			6b.	They cross the road.
+ .26	25/B	(58/C)	7.	Walk.
+ .26	25/B	(58/C)	8.	Stop.
+ .15	26/B	(59/C)	9.	One basic sentence.
+ 2.00	17/B	36/C	10.	Two basic sentences.
+ 3.88	(11/B)	20/C	11.	Three basic sentences.
+ 2.88	7/B	34/C	12.	One complex sentence.
+ 4.35	(1/B)	15/C	13.	Two complex sentences.
+ 3.43		26/C	14.	'And, and then, then'.
+ 5.95		4/C	15.	'Or, but'.
+ 6.90		2/C	16.	'Because, so'.
+ 4.66		12/C	17.	'When'.
+ 7.34		1/C	18.	'Which, who, that'.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	4	5	7	TOTAL: +43.60

26. BALLOON (17) (11)

+ .26	25/B	(53/C)	1.	Has a balloon.
+ .26	25/B	(53/C)	2.	Lets go, it goes away.
	(2/B)	(0/C)	3.	Sad.
+ 1.95	18/B	36/C	4.	Can't reach it.
	(1/B)	(0/C)	5.	Trying to reach it on tiptoes.
+ 1.50	16/B	44/C	6.	Got a step ladder.
- .22	28/B	(56/C)	7.	Got the balloon back.
	(2/B)	(0/C)	8.	Happy.
- .55	30/B	(58/C)	9.	All utterances are about the topic.
- .79	31/B	(57/C)	10.	All utterances run

- .79	31/B	(57/C)	10. All utterances run smoothly as if telling a story.
- .34	29/B	(59/C)	11. One basic sentence.
+ 1.07	21/B	50/C	12. One complex sentence.
	(21/B)	(48/C)	13. 'And, and then, then'.
+ 5.53		6/C	14. 'Or, but'.
+ 4.88		10/C	15. 'Because'.
		(0/C)	16. 'When'.
		(0/C)	17. 'Which, who, that'.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	6	3	2	TOTAL: 13.55

27. FINDS A DOG (17) (3)

	(51/C)	1. Boy saw a dog.
	(47/C)	2. Lost.
	(54/C)	3. Come home.
	(44/C)	4. Be quiet.
	(59/C)	5. Hide in the cupboard.
	(56/C)	6. Mother finds him.
	(56/C)	7. Boy pleads.
	(56/C)	8. Builds a home.
	(59/C)	9. All utterances are about the topic.
	(59/C)	10. All utterances run smoothly as if telling a story.
	(58/C)	11. One basic sentence.
	(55/C)	12. One complex sentence.
	(51/C)	13. 'And, and then, then'.
	(31/C)	14. 'Or, but'.
+ 3.98	19/C	15. 'Because'.
+ 5.79	5/C	16. 'When'.
+ 4.41	14/C	17. 'Which, who, that'.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	0	0	3	TOTAL: 14.18

28. DOG FOLLOWS HIM TO SCHOOL (17) (7)

	(45/C)	1. Boy goes to school.
+ 3.88	20/C	2. Dog thinks of him.
+ 4.23	16/C	3. Dog missed him.
	(37/C)	4. Dog follows him/tries to find him.
+ 4.14	17/C	5. Dog sniffs, looking for him.
	(38/C)	6. Peeps through the window.
	(50/C)	7. Jumps in the window.
+ 4.41	14/C	8. Teacher cross.
	(57/C)	9. All utterances are about the topic.
	(56/C)	10. All utterances run smoothly as if telling a story.

					(59/C)	11.	One basic sentence.
					(56/C)	12.	One complex sentence.
					(55/C)	13.	'And, and then, then'.
					(0/C)	14.	'Or, but'.
+ 4.66					12/C	15.	'Because'.
+ 6.32					3/C	16.	'When'.
+ 7.34					1/C	17.	'Which, who, that'.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	0	0	7	TOTAL: +34.98

29. DREAMS A SPACE FLIGHT (16) (8)

	(42/C)	1.	Washes face, gets ready for bed.
	(33/C)	2.	Puts on space helmet.
	(34/C)	3.	Goes to a planet.
+ 3.74	22/C	4.	Sees creatures.
+ 5.53	6/C	5.	Goes out of the spaceship.
+ 7.34	1/C	6.	Creatures hide.
+ 3.22	29/C	7.	It's all a dream.
	(52/C)	8.	All utterances are about the topic.
	(50/C)	9.	All utterances run smoothly as if telling a story.
	(58/C)	10.	One basic sentence.
	(56/C)	11.	One complex sentence.
	(55/C)	12.	'And, and then, then'.
+ 5.53	6/C	13.	'Or, but'.
+ 5.30	7/C	14.	'Because'.
+ 5.79	5/C	15.	'When'.
+ 6.90	2/C	16.	'Which, who, that'.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	0	0	8	TOTAL: +43.35

30. MAN FIGHTING A DRAGON (35) (19)

(59/C)	1.	Describes scene in the picture.
(51/C)	2.	Adds more than is represented in the picture.
(51/C)	3.	Story has a theme.
(51/C)	4.	No unrelated utterances.
(46/C)	5.	One action.
(45/C)	6.	Two or more actions unrelated to each other.
(43/C)	7.	Two or more actions related to each other.
(36/C)	8.	Time relationship between propositions.

+ 3.30	28/C	9. Causality.
+ 5.30	7/C	10. Goal to achieve.
	(0/C)	11. Goal with obstacle to overcome.
	(36/C)	12. A word is repeated.
	(43/C)	13. Noun changes to pronoun.
+ 3.80	21/C	14. Indefinite article changes to definite.
	(43/C)	15. Event elaboration.
+ 3.80	21/C	16. Subject plus verbs.
+ 4.73	11/C	17. Subject plus three different actions.
+ 7.34	1/C	18. Several actions are happening to a direct object.
	(31/C)	19. Introduction of a 'problem'.
+ 6.32	3/C	20. Consequences.
+ 3.80	21/C	21. Actions.
	(0/C)	22. Plans.
+ 5.12	8/C	23. Reactions.
+ 4.41	14/C	24. Resolution.
+ 5.12	8/C	25. Contrary.
	(0/C)	26. 'and...if'.
+ 3.74	22/C	27. Story Introduction.
+ 7.34	1/C	28. Story ending.
+ 5.02	9/C	29. Uses reported speech.
+ 6.90	2/C	30. Uses deixis in direct speech.
	(59/C)	31. One basic sentence.
	(52/C)	32. One complex sentence.
	(51/C)	33. 'And, and then, then'.
+ 4.35	15/C	34. 'Or, but'.
+ 4.73	11/C	35. 'Because'.
+ 6.90	2/C	36. 'When'.
+ 5.53	6/C	37. 'Which, who, that'.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	0	0	19	TOTAL: 97.55

31. STORY COMPLETION (14) (6)

	(57/C)	1. States one action.
	(53/C)	2. States or lists action(s).
	(52/C)	3. States related actions.
	(51/C)	4. Event-time Sequence.
	(44/C)	5. 'So/because: a causal link.
+ 3.22	29/C	6. Goal based causal without obstacle.
+ 5.12	8/C	7. Goal based causal with obstacle.
	(57/C)	8. One basic sentence.
	(50/C)	9. One complex sentence.
	(50/C)	10. 'And, and then, then'.

+ 4.23				16/C		11. 'Or, but'.
+ 4.66				12/C		12. 'Because'.
+ 5.12				8/C		13. 'When'.
+ 6.90				2/C		14. 'Which, who, that'.
FORM TOTALS:	A 0	AB 0	B 0	BC 0	C 6	LOGIT TOTAL: +29.25

32. RELATING A PERSONAL STORY (13) (7)

	(59/C)	1. States the day.
	(54/C)	2. Lists activities.
	(36/C)	3. Describes an event.
+ 3.22	29/C	4. Time ordering to the activities.
+ 3.98	19/C	5. Causality.
+ 4.53	13/C	6. Expectations.
	(59/C)	7. One basic sentence.
	(55/C)	8. One complex sentence.
	(55/C)	9. 'And, and then, then'.
+ 5.12	8/C	10. 'Or, but'.
+ 4.88	10/C	11. 'Because'
+ 5.79	5/C	12. 'When'.
+ 6.90	2/C	13. 'Which, who, that'.

FORM	A	AB	B	BC	C	LOGIT
TOTALS:	0	0	0	0	7	TOTAL: +34.42

4.7. SUMMARY.

An initial test was made up of thirty two activities representing nine content domains and designed to elicit specific behaviour from children between the ages of one and seven years. Within the activities there were five hundred and twenty one items which represented specific behaviour. The items selected were from current research on child communicative-language development and from activities that have been used in the clinic and classroom. The activities were grouped into a series of three different test forms. The forms A-C were designed to elicit specific behaviour which would demonstrate a progression of development in communicative abilities. The child's age was the criterion for the selection of which form to use. The test forms were given to one hundred and forty one children. The children selected provided a balanced range for sex, racial/ethnic, economic and verbal requirements of parental occupations. The criterion used for selection was that the professionals working with the child considered him or her to have a good standard of English language development which could be used as a benchmark. The scores obtained from the data collection were analysed using the item analysis method PROX (Wright and Stone, 1979). PROX can be applied by hand but achieves the basic aims of Rasch item analysis which are linearisation of the latent scale and adjustments for the local effects of sample ability distribution. The three forms each had some overlapping activities as well as activities that were specific only to it. This progression and overlapping of activities allowed the three forms to be linked into a continuum. This continuum is the variable. The next step is to further construct the variable through defining it. Chapter 5 will present the results of the analysis and, through that presentation, define the variable.

DEFINING THE VARIABLE

5.0. INTRODUCTION.

In Chapter 4, the method used to obtain and evaluate the observed relationships between the items and the persons was presented. This method constructed a variable through the application of a mathematical model which transformed the person and item scores into person measures and item calibrations. The next step, OBJECTIVE 6, is to define the variable so that it can be used to measure a child's pattern of performance within communicative contexts. In Chapter 5, a critical examination of the person measures and calibrated items is presented. The purpose of this examination is to investigate the type of generalisations that the observed measures and calibrations imply about this variable. The results will be examined as to the variable that they define, the item bank that they create and the individual profiles that can be created from this information.

5.1. OBJECTIVE 6, DEFINING THE VARIABLE.

A variable is a line of inquiry that through the analysis of person ability measures and item difficulty calibrations has been marked off in linear units. The variable under investigation here has been constructed with the person ability measures of 137 children and the item difficulty calibrations of 322 items. The children ranged in age from 1;00 to 7;09 years and the items were selected to demonstrate a progression of ability in language and language related behaviour. The PROX method of item analysis (Wright and Stone, 1981) was used to analyse the person and item scores. During the initial preparation of the data for analysis 199 items were eliminated from further analysis. However, as they are items which are still deemed to be of importance they will

be used as well to help define the variable. The task at hand now is to use the item calibrations, person measures and non-calibrated items to unravel just how the developing language and language related behaviour interconnect with each other on the variable.

5.1.1. THE DEGREE TO WHICH THE DATA GIVES A DIRECTION TO THE VARIABLE.

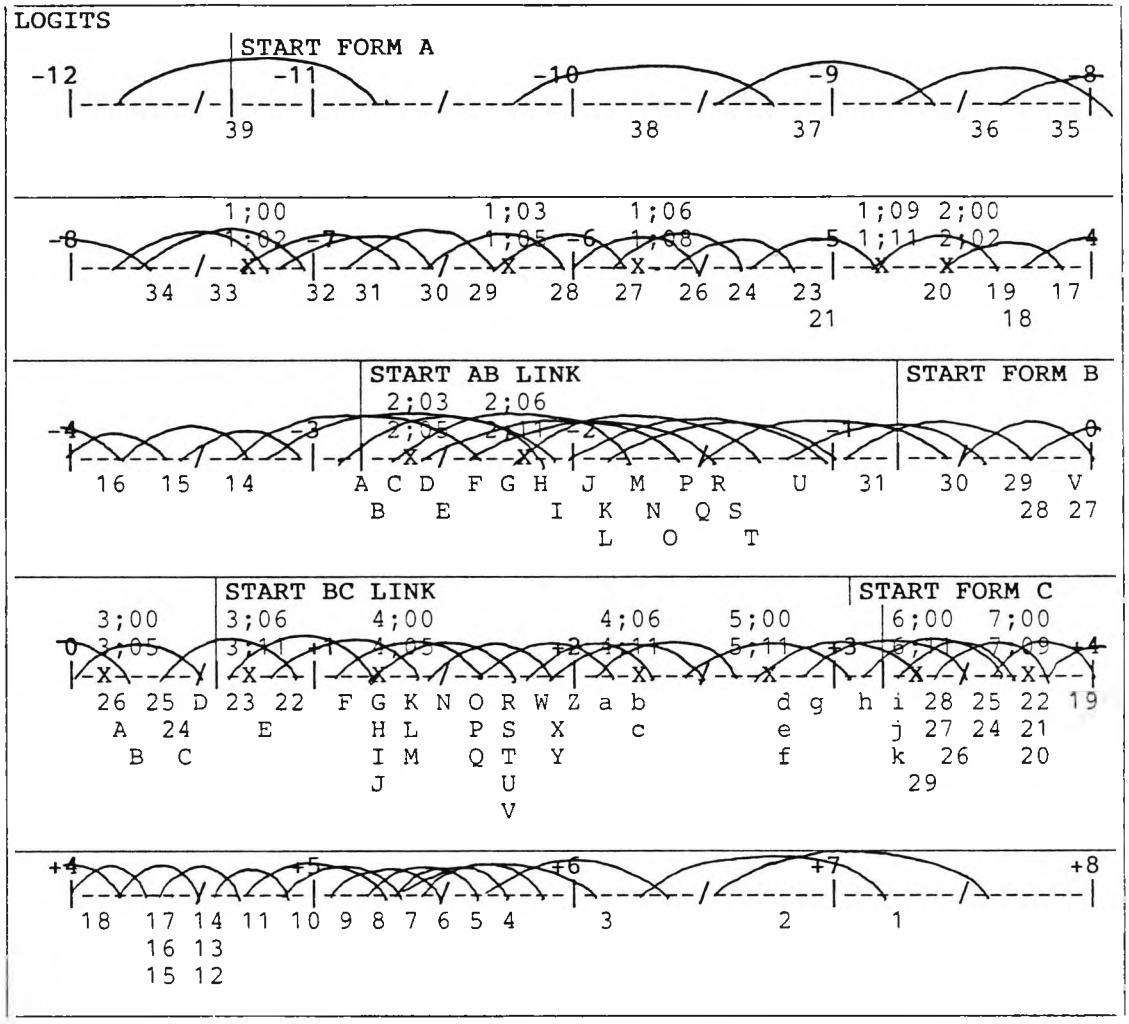
The first step, in defining a variable, is to examine the standard error of the estimates. In order for items to define a line between them, they must be separated by several standard errors to suggest a direction for the variable which they define.

5.1.1.1. The Spread of Item Difficulty Calibrations and Person Ability Measures with Their Standard Errors.

Table 5.1 presents the item scores and their standard errors. A direction for the variable has been suggested showing the items to be evenly spread over a difficulty range of from -11.38 logits to +7.34 logits. Table 5.2 presents the standard errors for the person ability measures this also shows an even spread over an ability range from -8.68 logits to +4.89 logits.

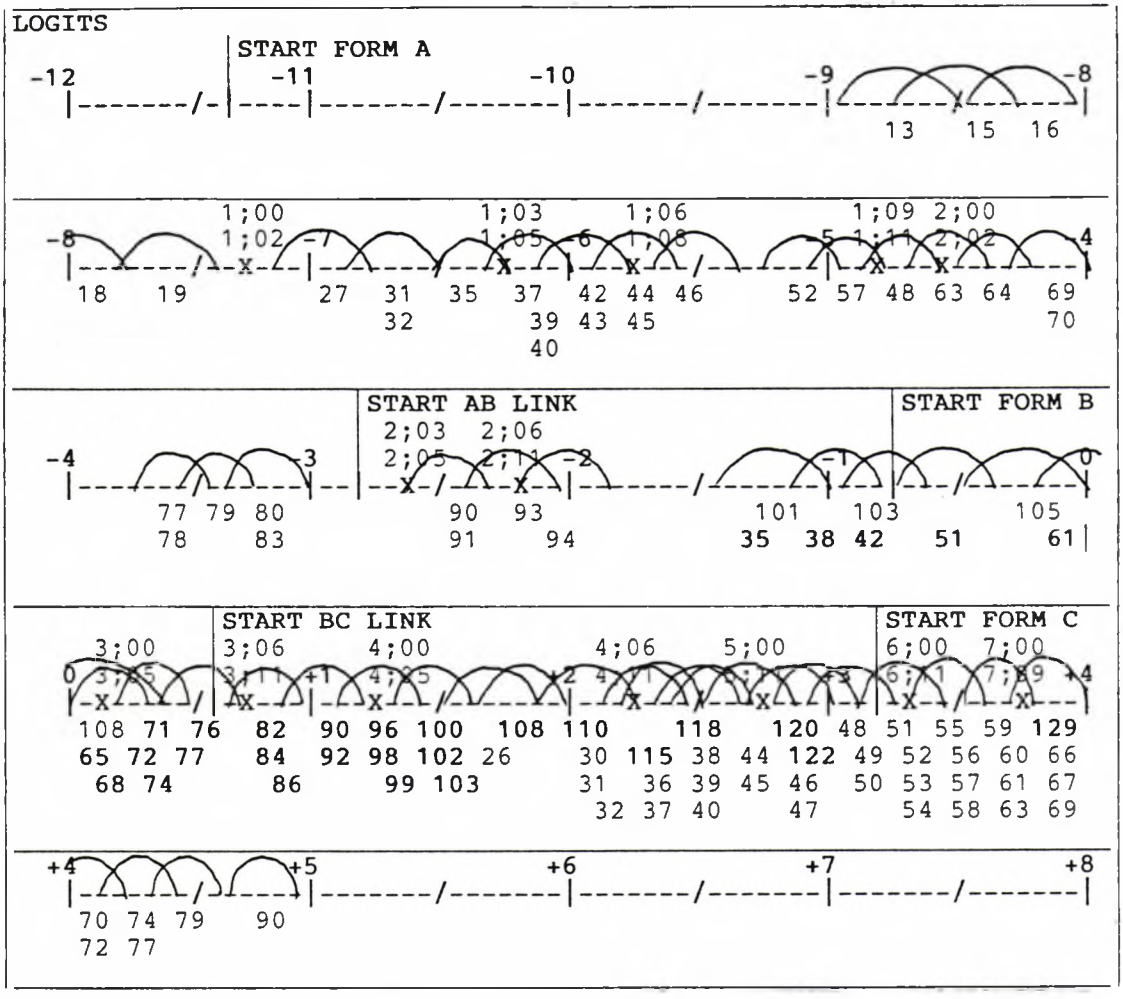
5.1.1.2. The Spread of Item Difficulty Calibrations' and Person Ability Measures' Frequencies.

The frequencies of the item difficultly calibrations and person ability measures are useful in defining the variable. An investigation of the spread of the frequencies will highlight any gaps in the spread of items over the logit range. Table 5.3 presents the frequencies of the item difficulty calibrations. Table 5.4 presents the frequencies of the person measures.



LEGEND
The item scores for the three test forms are placed at their logit location on the variable. Form B is presented in boldtype.

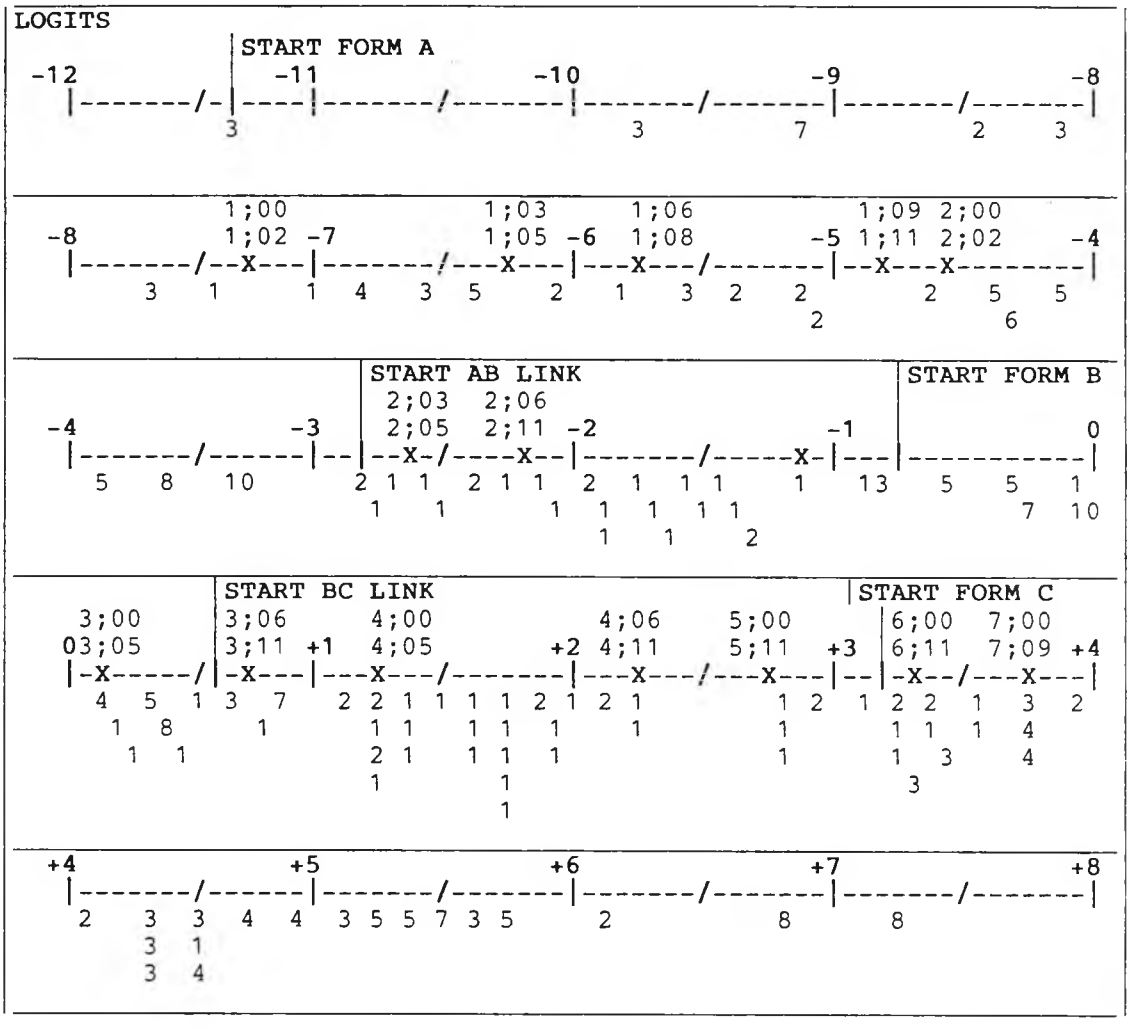
TABLE 5.1.: ITEM DIFFICULTY CALIBRATIONS AND STANDARD ERRORS.



LEGEND

The person scores for the three test forms are placed at their logit location on the variable. Form B is presented in boldtype.

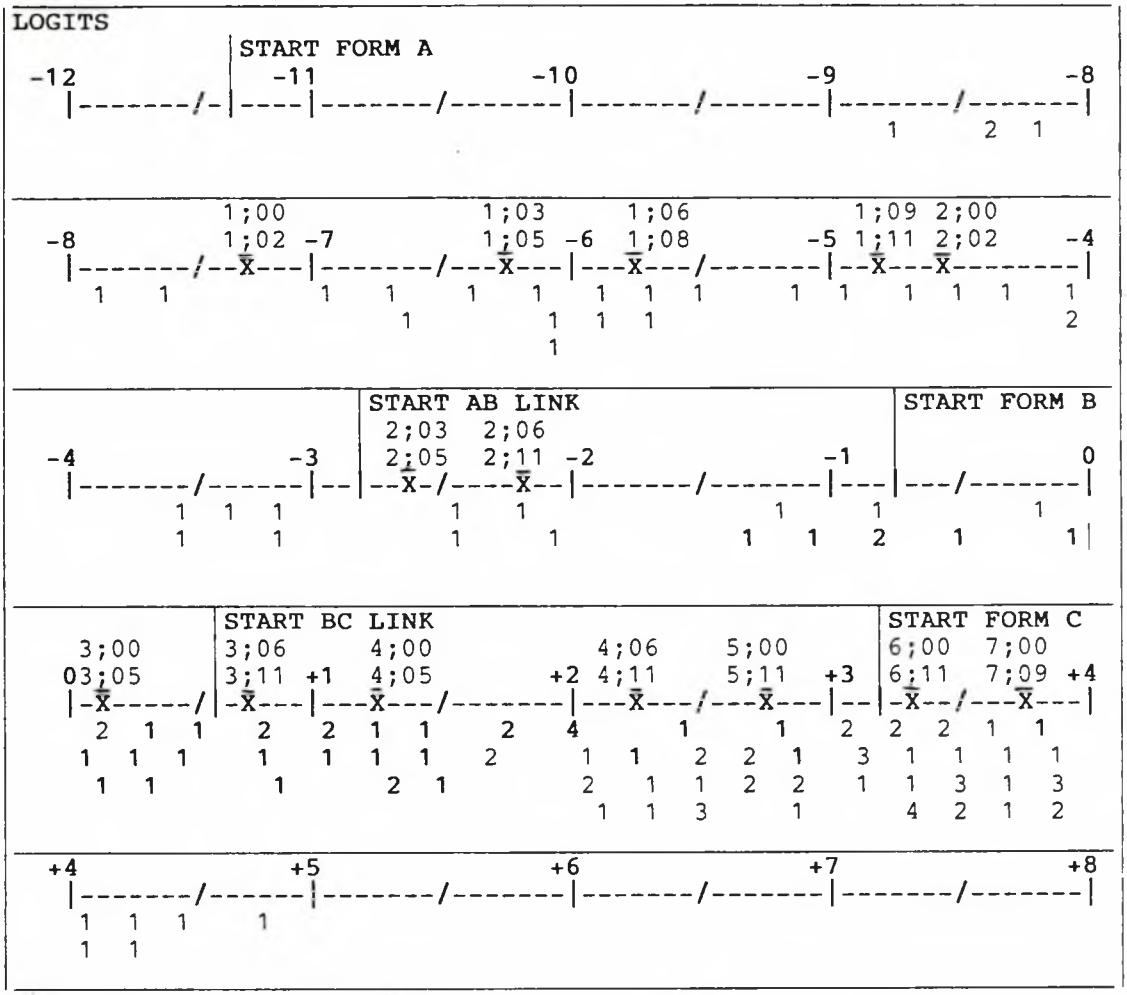
TABLE 5.2.: PERSON ABILITY MEASURES AND STANDARD ERRORS.



LEGEND

The frequencies of the scores for the three test forms are placed at the score's logit location on the variable.

TABLE 5.3.: FREQUENCIES OF THE ITEM CALIBRATIONS.



LEGEND
The frequencies of the scores for the three test forms are placed at the score's logit location on the variable.

TABLE 5.4.: FREQUENCIES OF THE PERSON MEASURES.

5.1.2. AGE GROUP CHARACTERISTICS: LOCATION OF THE NORMS.

Whilst norms are not used in the Rasch method to calibrate item difficulty or measure person ability to construct a variable, it is still useful to know various demographic characteristics of a variable. A knowledge of the age group characteristics is necessary in this study as constructing a variable that has a progression in age related behaviour is one of the objectives.

5.1.2.1. Patterns of Age Group Norms.

Table 5.5 gives the means of person ability measure by age group. The figures in bold typeface show a progression of increasing scores for the means. Between 1;00 and 2;05 years the means increased at three monthly intervals. However, at 2;06 variations between individual's measures started to show and a steady increase in means then occurred every six months between 2;06-4;11. At five years the individual's measures showed variations in the means at six monthly intervals but twelve monthly intervals showed a steady increase in the means between 5;00 and 7;09 years.

5.1.2.2. Location of the Age Group Norms on the Variable.

The age group means shown in bold typeface on Table 5.5 are located on the variable in Table 5.6. This plots a steady progression of means from -7.30 to +3.66 logits.

5.1.2.3. Location of the Forms on the Variable.

The first and last of the item difficulty calibrations for each of the forms are used to plot AFA, AFB and AFC on the variable in Table 5.6.

AGE GROUP	3 MONTHS NO.	MEAN	S.D.	6 MONTHS NO.	MEAN	S.D.	12 MONTHS NO.	MEAN	S.D
1;00--1;02	(9)	-7.30	1.14						
1;03--1;05	(3)	-6.27	.16	(12)	-7.04	1.10			
1;06--1;08	(4)	-5.90	.77						
1;09--1;11	(4)	-4.61	1.03	(8)	-5.26	1.09	(20)	-6.33	1.39
2;00--2;02	(6)	-4.51	2.08						
2,03--2;05	(6)	-2.69	1.42	(12)	-3.60	2.00			
2;06--2;08	(3)	-1.29	1.56						
2;09--2;11	(5)	-2.91	1.26	(8)	-2.30	1.59	(20)	-3.08	1.95
3;00--3;02	(7)	-0.14	0.78						
3;03--3;05	(4)	0.68	0.50	(11)	0.16	0.81			
3;06--3;08	(4)	0.49	0.87						
3;09--3;11	(5)	1.22	0.61	(9)	0.89	0.81	(20)	0.48	0.89
4;00--4;02	(6)	1.28	0.71						
4;03--4;05	(3)	1.18	0.64	(9)	1.25	0.68			
4;06--4;08	(7)	1.97	0.73						
4;09--4;11	(2)	3.30	0.50	(9)	2.26	0.89	(18)	1.76	0.93
5;00--5;02	(5)	2.77	0.68						
5;03--5;05	(6)	2.74	0.64	(11)	2.76	0.63			
5;06--5;08	(6)	2.61	0.33						
5;09--5;11	(3)	2.72	0.66	(9)	2.65	0.45	(20)	2.71	0.56
6;00--6;02	(4)	3.12	0.17						
6;03--6;05	(9)	2.84	1.03	(13)	2.93	0.86			
6;06--6;08	(1)	3.28	0.04						
6;09--6;11	(6)	3.21	0.53	(7)	3.22	0.49	(19)	3.19	0.34
7;00--7;02	(7)	3.82	0.53						
7;03--7;05	(6)	3.36	0.71	(13)	3.61	0.65			
7;06--7;09	(7)	3.75	0.49	(7)	3.75	0.49	(20)	3.66	0.65

TABLE 5.5.: PERSON ABILITY MEANS BY AGE GROUP.

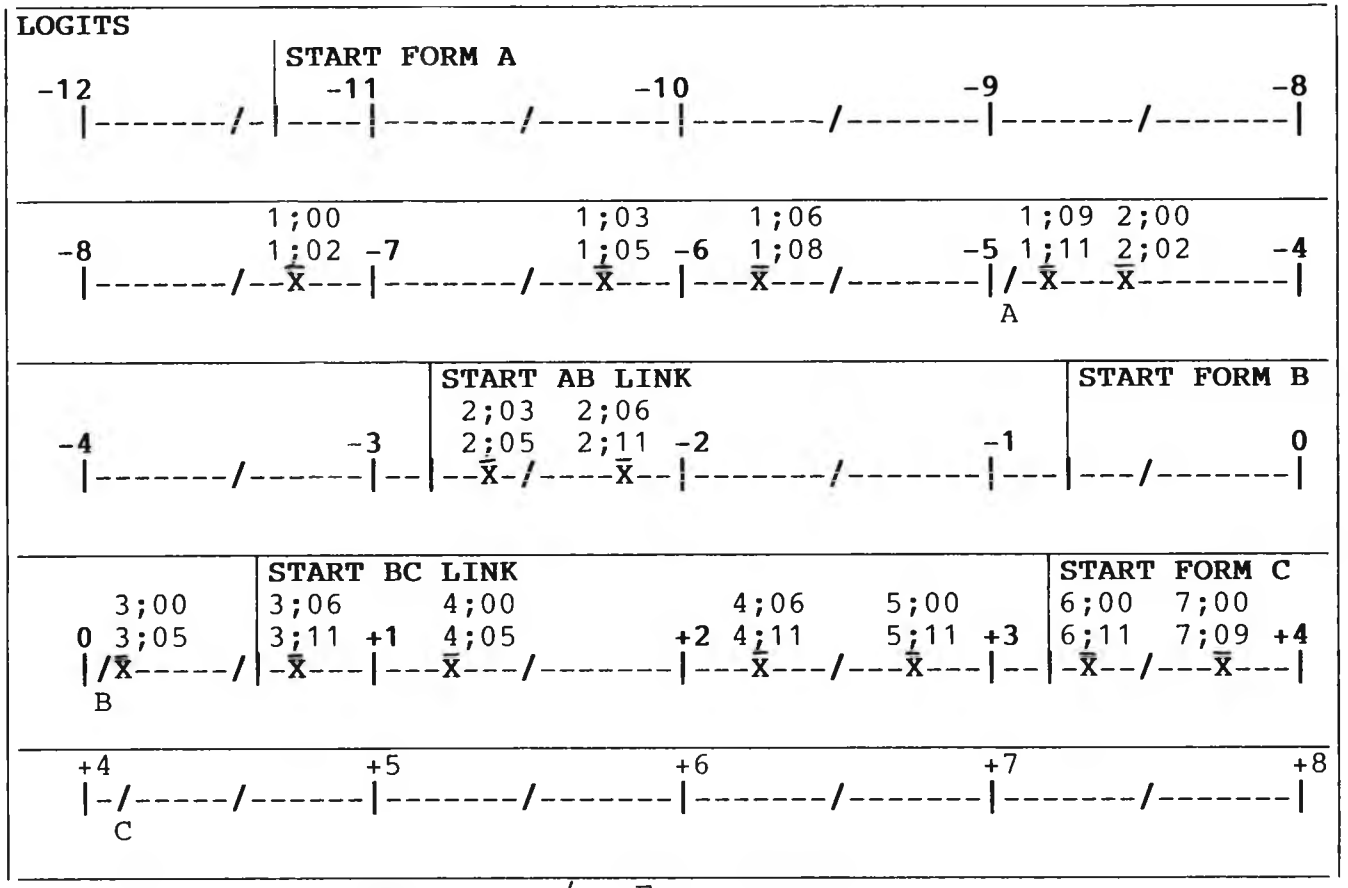


TABLE 5.6 : LOCATIONS OF AGE AND FORM MEANS ON THE VARIABLE

5.1.2.4. Location of Forms Means.

The form means are located on Table 5.6. Form A has a mean of -4.90, Form B +0.17 and Form C +4.02.

5.1.2.5. The Range of the Forms and the Age Group Means.

In Table 5.7., the forms are presented with their logit range and the age group means that fall within this range.

TABLE 5.7.: Forms with logit range and age group means.

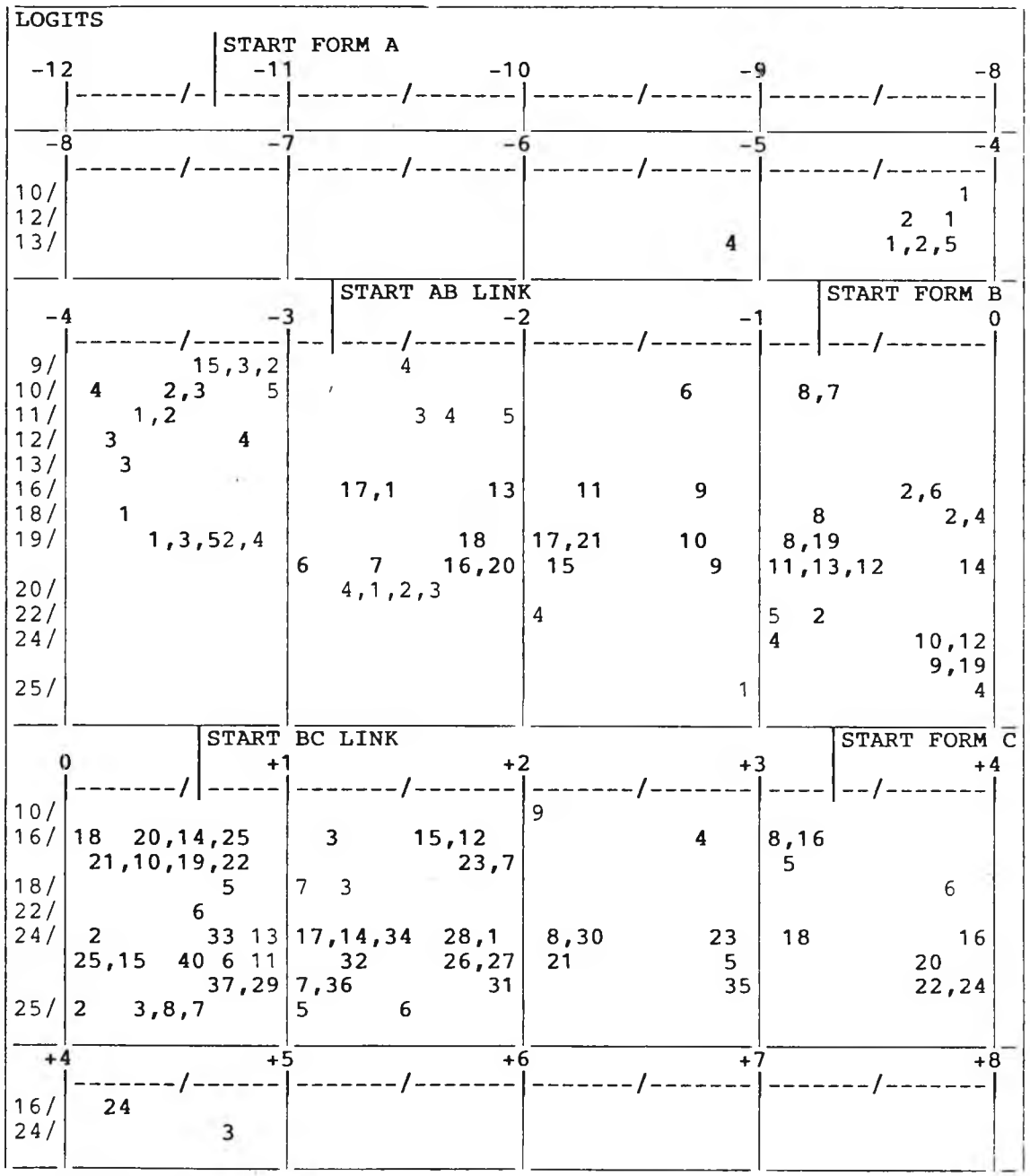
Form	Logit Range of Forms	Age Group Means
A	-11.38 to - 3.48	1;00-2;02
AB	- 2.82 to - .19	2;03-2;11
B	- .79 to + .67	3;00-3;05
BC	+ .14 to + 3.20	3;06-4;05
C	+ 3.22 to + 7.34	4;06-7;09

5.1.3. PLACING THE ITEMS AT THEIR CALIBRATED POSITIONS.

The placement of the item difficulty scores on the variable makes it possible to be explicit as to where each item is located. This allows one to investigate how the content of the test is located on the measurement line. The placement of the items will be shown with reference to the Table of Specifications, the Item Bank and in the Individual Performance Profiles.

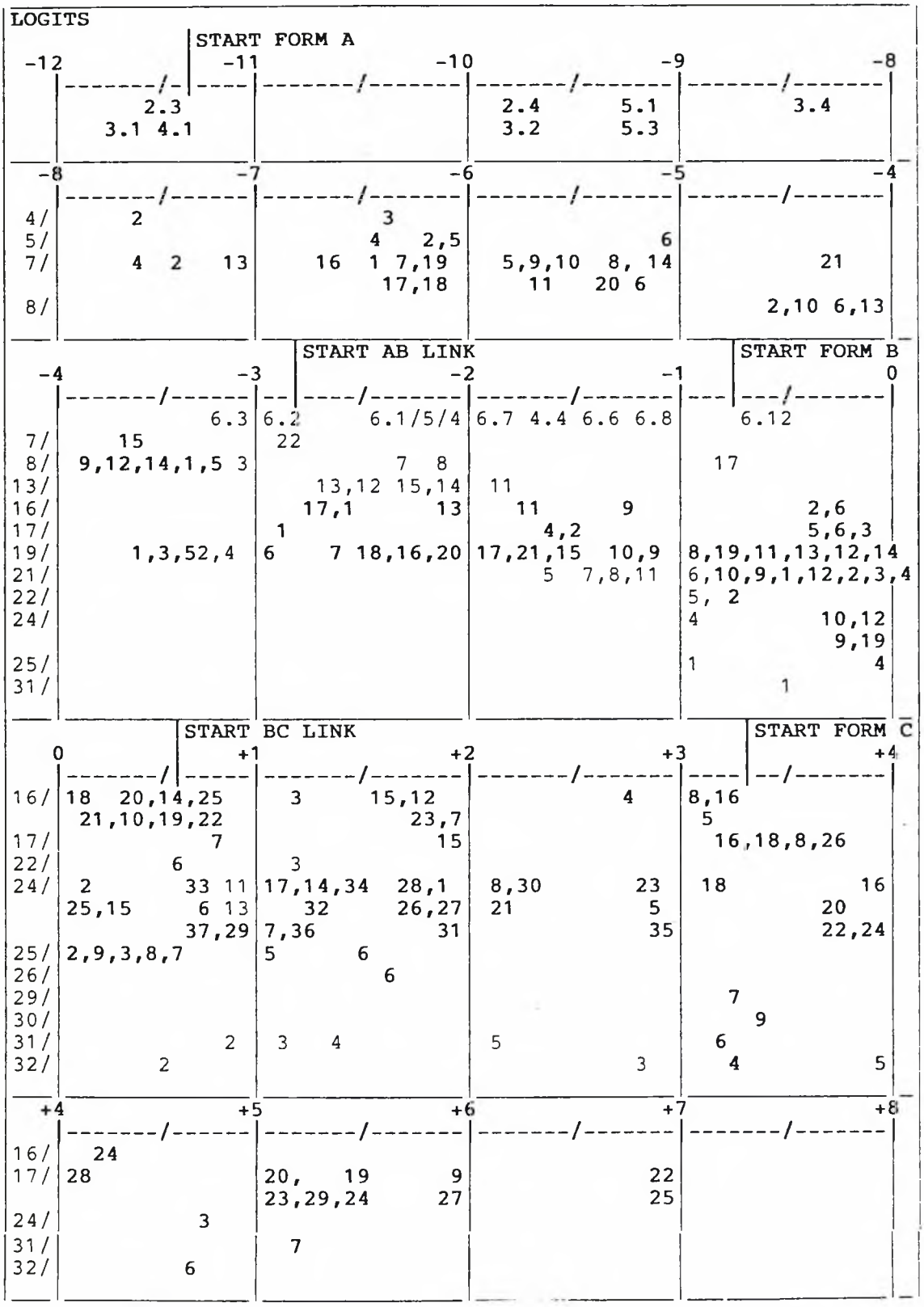
5.1.3.1. The Table of Specifications.

Now that the items have been placed on the variable the Table of Specifications can be clarified even further. The logits provide a new dimension to the previous matrix and in Table 5.8 each of the content domains is presented with the activities and items that represented them. The items have been located on the variable.

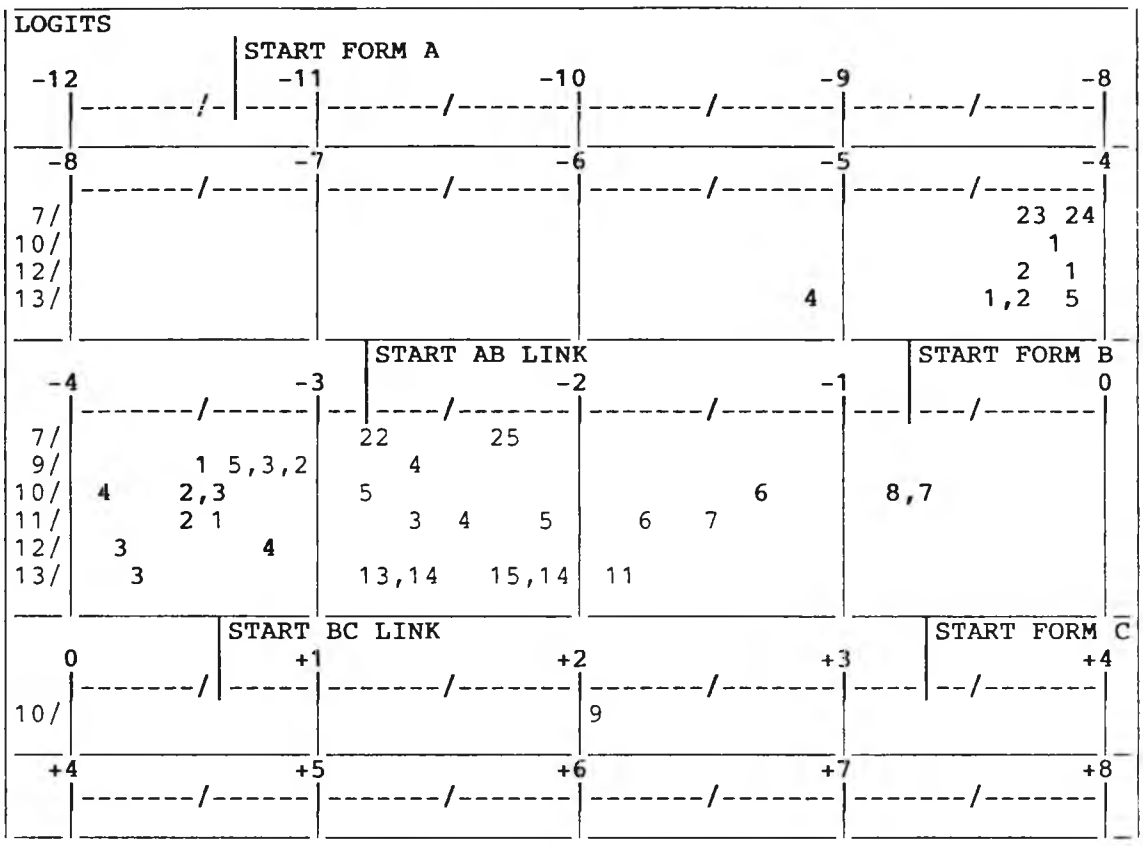


CONTENT DOMAIN 3.: COMPREHENSION

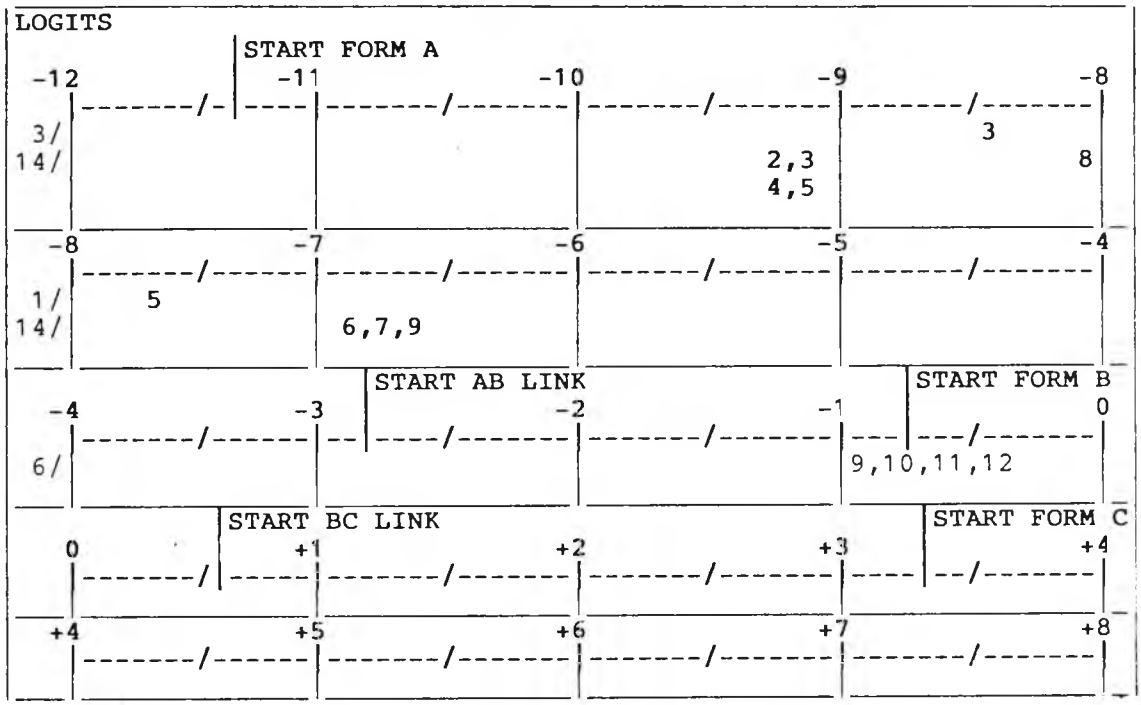
TABLE 5.8.: THE TABLE OF SPECIFICATIONS WITH THE ITEMS LOCATED ON THE VARIABLE



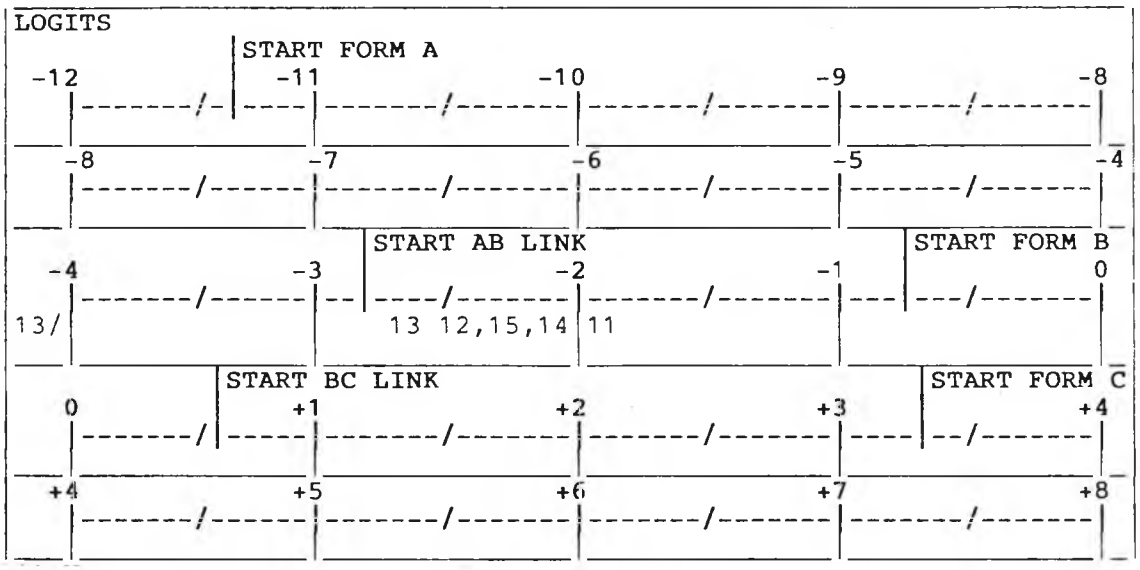
CONTENT DOMAIN 1.: OTHER BEHAVIOURAL DOMAINS



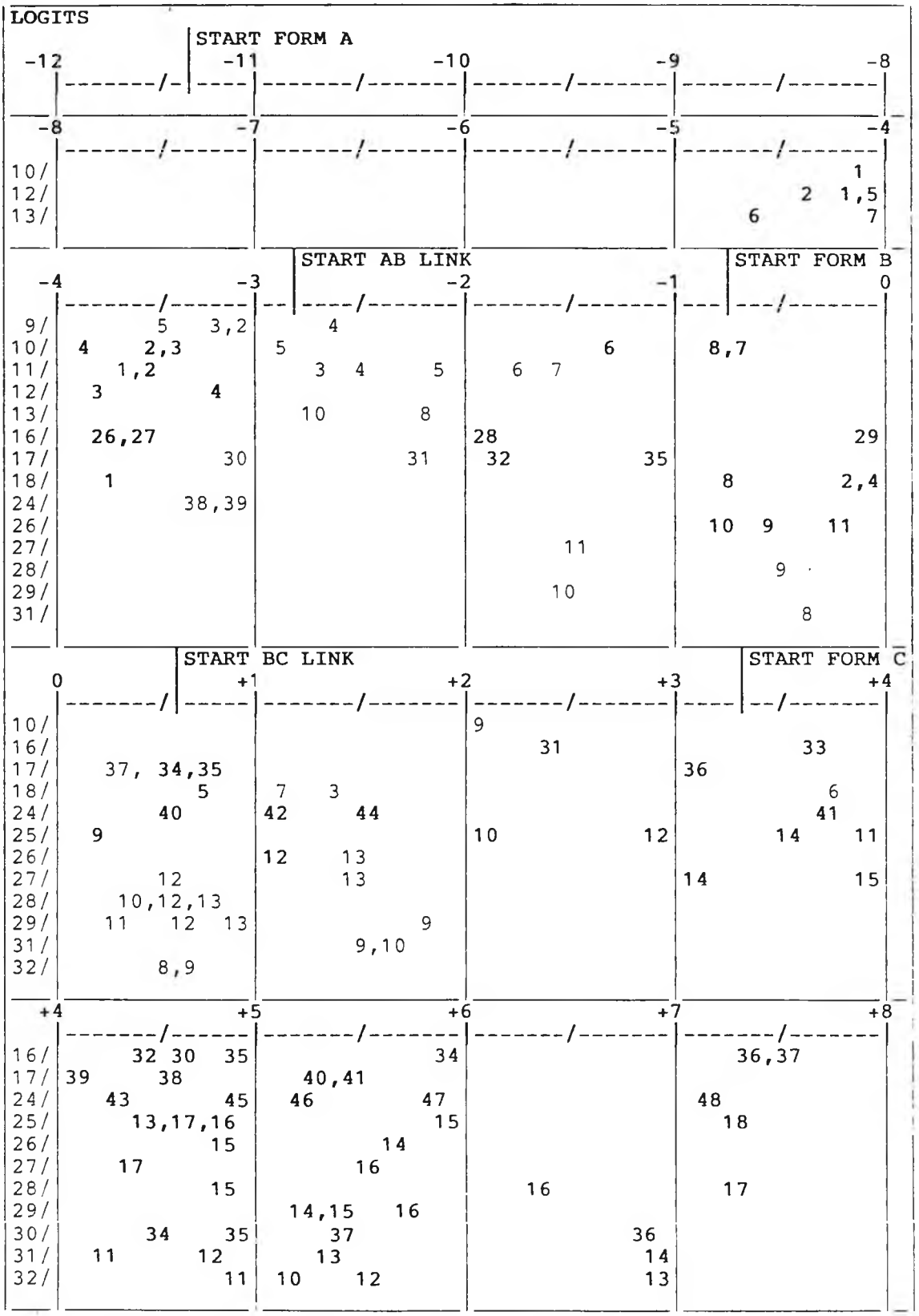
CONTENT DOMAIN 4.: SYMBOLIC COMMUNICATIONS



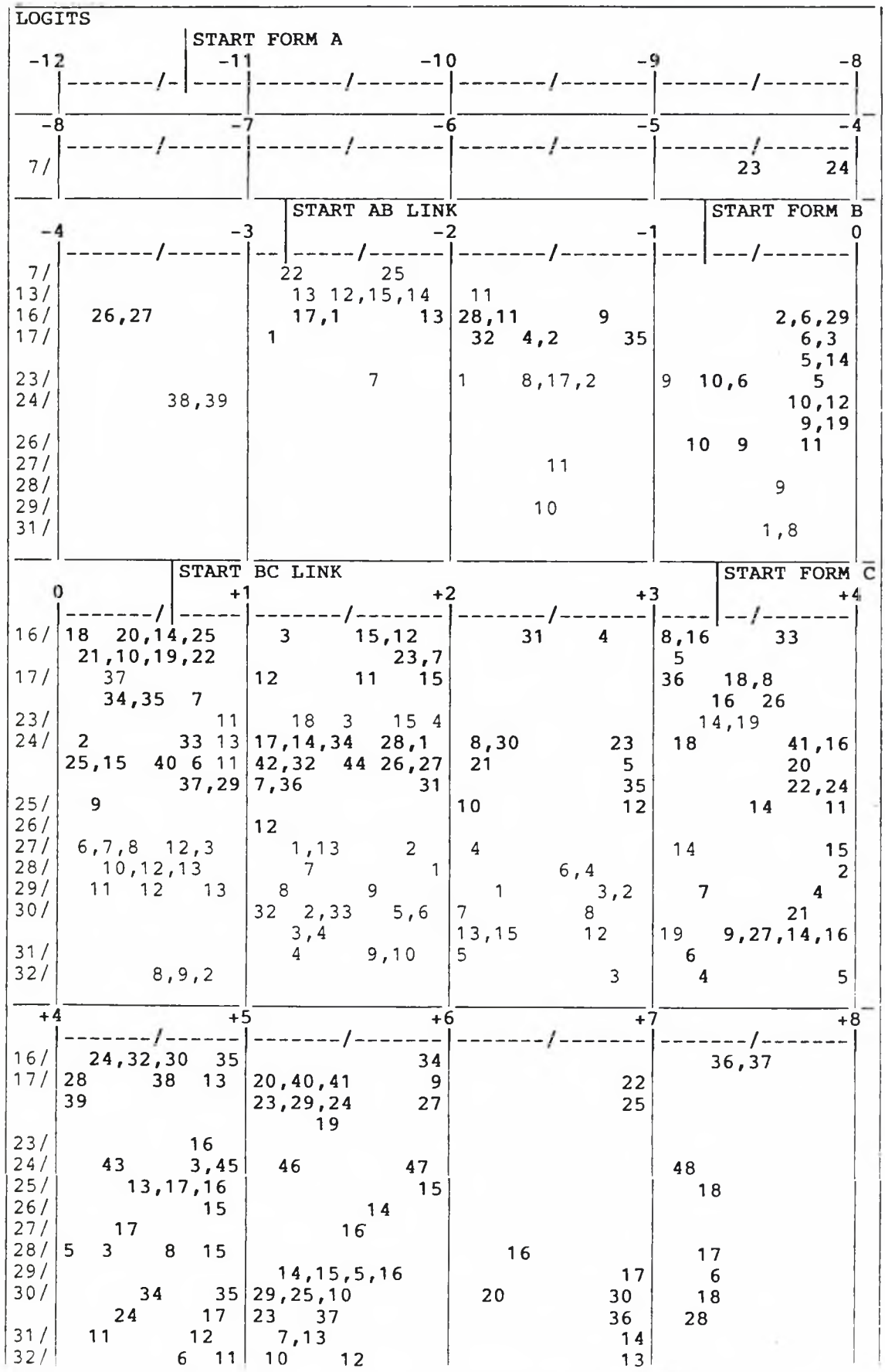
CONTENT DOMAIN 2.: EARLY COMMUNICATIVE INTERACTIONS



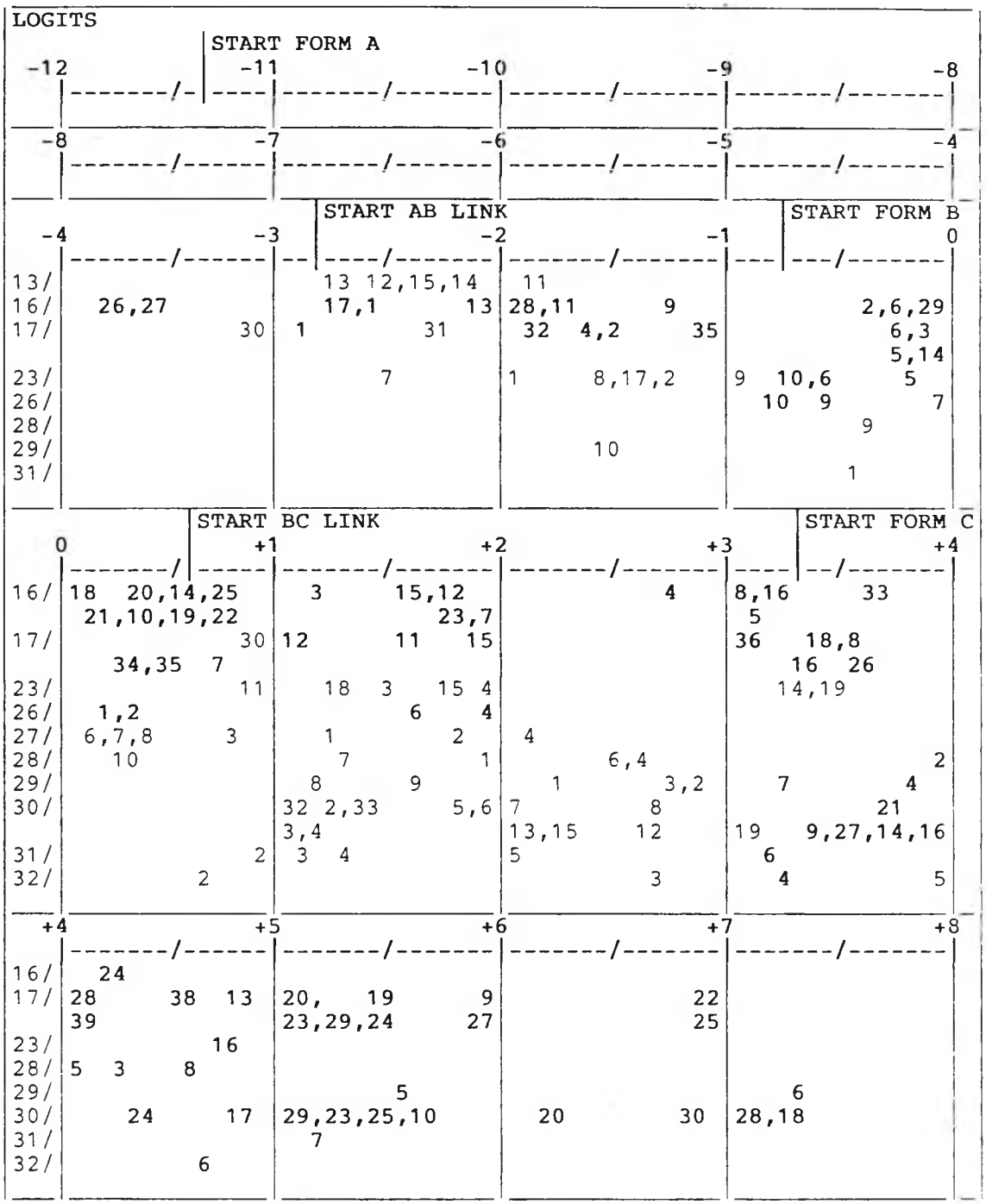
CONTENT DOMAIN 6.: INTERACTIVE DIALOGUE



CONTENT DOMAIN 5.: RULE BASED LINGUISTICS ELEMENTS



CONTENT DOMAIN 7.: ORAL AND LITERARY STYLE LANGUAGE



CONTENT DOMAIN 8.: NARRATIVE ABILITIES

5.1.3.2. The Item Bank.

By placing the item difficulty calibrations on the variable an item bank has been created. Through the Rasch method of constructing tests a variable can be established and extended thereby the creation of an Item Bank. An item bank is a pool of calibrated items from which items can be drawn to design specific tests. When the three forms A, B and C were linked onto one variable an item bank was established. An item bank provides a unity for the three test forms, however each test form can still be given separately. An item bank also provides a method for examining the content of the variable in order to make further decisions as to the usefulness of items and activities or whether additions to the variable need to be made.

The calibrated items constitute the item bank, however the items that were eliminated from calibration also provide information. Table 5.9. presents the item bank along with the eliminated items. The position of the non-calibrated items is only a suggestion as to where they would fall in the item bank. This information can be used when devising new data collection forms. The calibrated items are given in bold typeface.

Table 5.9. presents the variable with the items located on it. The variable is presented in four logit units and after each unit is a descriptive account of how a child would perform with the data collection form if their score were to fall within that logit range.

TABLE 5.9.: THE ITEM BANK

ENTRY CRITERIA

One behaviour, 'holds object', was used as the 'entry criterion'. Before being accepted as a subject the child would have to do that behaviour. Now, ten more items of behaviour can be added to the entry criterion as they were performed by all of the children. With a toy that can be explored such as the rolling rattle the child will look at it, turn it, shake it and finger the little ball that is inside it. With a toy that is manipulated by the adult the child will look at it and watch the movement that the adult is causing it to make. The child's body movements are non intentionally communicative as it is easy for the adult to interpret what it is that the child wants or wants to do with the objects. The child is able to look at the adult and will let the adult assist in the game such as letting the adult move them or the toys so that the child is better able to play with the toys in the manner that the child is setting up.

ENTRY CRITERIA:

1. Holds object.

1. ROLLING RATTLE:
    1. Looks at it.
    2. Turns it.
    3. Shakes.
    4. Fingers rattle ball inside.
2. POP UP CONE:
    1. Looks at it.
    2. Watches the clown pop in and out.
3. EARLY COMMUNICATIONS:
    1. Uses actions that are easily interpreted by the adult.
4. EARLY COMPREHENSION:
    1. Looks at adult.
    2. Takes object from adult.
    3. Lets adult assist in their game.

LOGITS -12 / -11 / -10 / -9 / -8				
FORM/PERSON SCORES				
A/				13 15 16
B/				
C/				
ACTIVITY/ITEMS				
1/				
2/	3		4	
3/	1		2	3,4
4/	1			
5/			1,3	
6/				
7/				3,12
8/				
9/				
10/				
11/				
12/				
13/				
14/			2,3 4,5	8
15/			4 5	
16/				
17/				
18/				
19/				
20/				
21/				
22/				
23/				
24/				
25/				
26/				
27/				
28/				
29/				
30/				
31/				
32/				

LOGIT RANGE -12.00 TO -11.00

This logit range is below the first year level and a child whose score falls in this range can begin to manipulate toys by pushing the clown in and out of the cone while the adult is holding it. They will look at a mechanical toy that is moving and making noise, and they can take the rings off of a stick.

LOGIT RANGE -11.00 TO -10.00

No items of behaviour fell in this range.

LOGIT RANGE -10.00 TO -9.00

This logit range is still below the first year level and now, the child is able to take the toy and manipulate it with two hands by themselves. They will take the pop up cone from the adult and try to push the stick in and out. The stick and the act of pushing it in and out is the centre of their attention--they will not focus on the the clown which is poking in and out because of their actions on the stick. The child can focus on a moving object and will watch the wind up moving toy as it moves across the table or floor. They are able to control their actions to remove one to five puzzle pieces. While they are playing, they will make different noises reflecting their concentration span, their purposeful movements and their emotions about the efforts and results of their play. They have a range of different speech like sounds which are occurring in their play and they will vocalise in different types of situations. Their vocalisations are in sequence with their own actions during play. Now, they are bringing the adult into their games and will play a reciprocal or repetitive type game with the adult.

LOGIT RANGE -9.00 TO -8.00

This logit range is at the one year level. The child is able to control the environment by trying to make the wind up toy move again once it has run down, or by indicating to the adult that the adult is to make the toy work again. With the large doll toys the child plays with the spoon and plays with the containers by stacking, inserting and piling them on another but no pretend sequences are happening yet. The child is using gestures and nonverbal expressions to communicate.

LOGITS	1;00		1;03	1;06		1;09 2;00	
-8	1;02 -7		1;05 -6	1;08	-5	1;11 2;02	-4
	/ X		/ X	X /		X X	
FORM/PERSON SCORES							
A/	18 19		27 31 32 35	40 42 46	52	57 58 64	70
B/							
C/							
ACTIVITY/ITEMS							
1/	5						
2/							
3/			5				
4/	2		3				
5/			4 2,5		6		
6/							
7/	4 2 13		16 1 7,19 17,18	5,9,10 8, 14 11 20 6		23, 21,24	
8/						2,10 6,13,9	
9/							
10/						1	
11/							
12/						2 1,5,3	
13/					4	6 1,2,5,7	
14/			6,7,9				
15/							
16/							
17/							
18/							
19/							
20/							
21/							
22/							
23/							
24/							
25/							
26/							
27/							
28/							
29/							
30/							
31/							
32/							

LOGIT RANGE -8.00 TO -7.00

This logit range is at the one year to one year two month level and the child has very controlled movements now. They are able to participate in a reciprocal game with the adult by rolling the rattle to the adult. They can put the rings on the stick and they can move objects from one container to the other. In the large doll play they have started playing with the cup and jug as well as the spoon. They will use the spoon to transfer objects from one container to the other. Still no pretend play is present.

LOGIT RANGE -7.00 TO -6.00

This logit range is at the one year three months to one year five months period. There is a lot of controlling of the environment now, as the child is able to request specific actions from the adult such as asking for help to wind it up. The child is able to put the head on the

graded doll and can remove six to eight puzzle pieces and put back one to five pieces. Pretend play is present and the child plays with the objects by relating them to each other appropriately. The child now begins to play with teddy. The child also is able to make up sequences of pretend play. Several types of sequences in pretend play emerged together. First, one pretend action is present. Then one pretend action is repeated to several objects. Then there are several different pretend actions. Then there is a two step sequence such as scraping cup and feeding teddy or pouring into cup from jug and drinking out of the cup. All of the child's communications are with performatives, protowords or gestures with vocalisations.

LOGIT RANGE -6.00 TO -5.00

This logit range is at the one year six months to one year eight months level. The child is able to sit and play in a very concentrated manner. The child can take out and put back six to eight puzzle pieces. The pretend play has developed considerably so that all the toys can be related to each other in an appropriate manner and the toys are related to teddy, themselves and to the adult in an appropriate manner. There are several two step sequences of pretend play (such as pouring into cup and then drinking out of the cup). The child can sit with the adult and listen to a story being read for a short period of between one to five pages.

LOGIT RANGE -5.00 TO -4.00

This logit range falls in the one year nine month range to the two year two month range. The child is able to play with the large doll toys with pretend sequences of three steps (such as pouring from the jug into the cup, stirring with the spoon and then offering the cup to the adult). The child is using single or two word utterances during their pretend play. They can play with the miniature toys and will sit the doll in the chair, put the baby in the bath and feed the baby with the bottle. They also have very good concentration skills. When their game is interrupted by the adult who has brought out another toy,

they can turn from their play, play with the new toy and then return to their game. The child can begin to follow some 'commands' by pointing to their nose and pointing to two action pictures. The baby drinking, bathing and sitting were pointed to correctly the most frequently. They can sit and listen to a story being read for six or more pages and will use single words or two word utterances to talk about the pictures. They can find the main character of the story in the pictures in response to 'where's teddy?' and they will imitate the gestures that the adult is making while reading the story.

LOGITS -4 / -3	2;03 2;05 X̄	2;06 2;08 X̄ / -2	/ -1	/ 0
FORM/PERSON SCORES				
A/	77 79 83	90 94	101	103 105
B/			35 38 42	51 61 65
C/				
ACTIVITIES/ITEMS				
1/				
2/				
3/				
4/			4	
5/				
6/	3	2 1,5,4,7	6 8	9,10 11,12
7/	15	22 25		26
8/	12,14,1,5,3 11,15	7 8 4 16		17
9/	1,5,2 6,3,7	8 4 9		
10/	4,10,2,3,11	5,12	6	8,7,13 14
11/	2,1,8	9 3 4 5,	10,6 7	11
12/	6 4,7			
13/	3	10,12 8,14 13 15	11 9	
14/				
15/				
16/	26,27	17,1 13	28,11 9	2,6,29
17/	30	1 31	32 4,2 33	6,3 5,14
18/	1	9		8 10 2,4
19/	1,3,5,2,4 22	23 18, 6,24,7 16,20	17,21 10, 15 25,9	8,19 11,13,12 14
20/		5,4,1,2,3,6	7	
21/		18	13 5 8,11 19 7,20	21,22,9,1,2,4 6,14,10,12 3,23
22/			4	5 2
23/		7	1 8,17,2	9 10,6 5
24/	38,39			4 10,12 9,19
25/			1	4
26/				10 9 11,7
27/			11	
28/				9
29/			10	
30/				
31/				1,8
32/				

LOGIT RANGE -4.00 TO -3.00

This logit range is still at the two year two month level and the child is able to match objects to pictures. The most frequently matched object to picture was the spoon. With the large doll play toys, the child is able to pour out 'more' and give another drink to the adult, either spontaneously or upon request. With the miniature doll toys, the child is able to feed the doll with with spoon by first scraping the plate and then feeding. The toy space is arranged with the table and chair together and the bath and aeroplane set apart. While the adult is distracting the child with another toy the child is able to play with the new toy while maintaining order with the pretend toys. They are able to carry out more 'commands' now. When they are given an object, they can follow two or three commands such as put it on the floor (or table, or chair) or 'give it to me'. They can point to two or four body parts such as the mouth, ear and eye and they can carry out a simple action such as close your eyes or clap. They can point to three or four action pictures correctly and can point to 'baby standing'. They can select up to five pictures when the objects are defined by function ('Drink out of, eat, sit on, draw with and sleep in' were identified correctly the most frequently.) When given a cat and a bath they can follow the prepositional command of put the cat in the bath. They can look at pictures and describe them correctly by using either a phrase structure or a basic sentence structure. While a story is being read to them they can talk about the picture with speech and gesture. They can sit and concentrate while a picture sequence story is being presented in a question-answer format. They are able to answer at least one of the questions correctly using a single or two word utterance. They also can begin to make up a story about a picture when they are asked to, by using single word utterances. However, their 'story' is mainly just labelling the items in the picture.

LOGIT RANGE -3.00 TO -2.00

This logit range is at the two year three month to two year eight month level. The child can match several objects to pictures correctly. The child can bring in the adult's language into pretend play (such as when the adult says 'hot' the child will blow on the cup to cool the drink before offering it to the adult). The child also is using basic sentences in their play. The play with the miniatures is more specific. Now, the tea pot and cup are arranged with the doll and the table and chair. The plane will be flown through the air before being placed separately from the table setting. However, when given a towel and asked to give baby a bath the child will just cover the baby in the bath. The child is able to follow many directions now, and will follow some silly directions such as 'put the cat on your head'. The child can point to their finger and will pat their head, stamp their feet and jump. When the adult is reading the 'Where's Teddy?' book the child will use basic sentences to talk about the pictures and will imitate the adult's speech. They are able to carry out some pretend ideas with the pictures such as washing their hands in the sink. They will wash their hands, take the offered 'pretend' towel, dry their hands and throw it in the bin. They are able to answer, correctly, questions in the picture sequence story 'The Stripey Kitten gets Stuck' by pointing to the kitten, and saying yes to 'Do you think they will be able to get the kitten down?' and 'Did they get the kitten down?' They can use two word utterances to make up a story about the dragon and the birthday party and their story will be a simple representation of the events. They can follow two prepositional commands with the cat and the bath. The first command is always put the cat in the bath but then one of the commands using the prepositions 'run around', 'beside' or 'behind' can be followed correctly. They can identify up to ten pictures by definition and will identify correctly 'throw, live in, says meow, goes in the

sky and bounce'. They can point to small action pictures getting three out of four correct by identifying either eating, standing, sitting or sleeping. They can match pictures by discriminating detail such as the differences in the location of objects by correctly matching two out of the twelve prepositional pictures. A sequence picture story ('Running and Falling') can be related by stating one of the actions.

LOGIT RANGE -2.00 TO -1.00

This logit range is at the two year eight month level. The child is able to grade the wooden doll, match all the objects to their pictures and identify all the small action pictures. They can follow most of the commands and point to their 'thumb'. They can select up to sixteen objects by function and can identify correctly 'goes on the road, read, goes in the water, wear and play on'. They can correctly match up to four preposition pictures with the most frequently correct pictures being 'teddy on the table, baby on the table, baby under the table and cup on the table'. They can look at a broken cup and answer the question of 'what's the matter with this cup?'. They can talk about the events in a simple sequence picture story by stating the main actions and elaborating on one of the actions. In retelling or relating a more complex sequence story they can use one basic sentence. In an action picture depicting an impending accident they can state what is about to happen. They can answer correctly questions about the sequence picture story using a basic sentence pattern and can answer the questions 'Who comes to help?' and 'What are they trying to do?'. They can make up a story from a picture stimulus using one or two basic sentences by stating one action and having a topic focus to their story.

LOGIT RANGE -1.00 TO 0.00

This logit range is at the two years eight months to three years level. They can indicate that one of the objects is missing, when they are matching objects to pictures and will comment on it, search for it and ask for it. When playing with the large doll toys they will use mature sentence forms. When playing with the miniature toys they will perform a true to life imaginary routine of washing the baby. They can point correctly to eight body parts and correctly identify their elbow and their chin. They can do seven out of seven actions commands correctly. They can do four prepositional commands, performing 'make the cat run around the bath, put the cat under the bath and put the cat beside the bath' correctly. They can select objects by function answering 'talk on, bites, flies, burns and swims' correctly. They can match up to seven preposition pictures. When shown the broken bed they can answer the question of 'what will we have to do with it?' and when shown the broken cup they can answer the question of 'what would happen if I put water in it?'. When relating a story, by using a simple story sequence pictures they can state related actions which have an event-time sequence. They can relate the story in a story-like manner with all utterances about the topic. With the more complex story sequence pictures they can use basic sentences and maintain the topic. In the picture description tasks they can use one to four specific nouns, describe a silly picture, give two accurate descriptions using the present tense, give an accurate description using the past tense, and answer the question about why a person is feeling (state) they way they are: 'Why is she cold?'. In talking about a picture in which an accident is about to happen they can predict what will happen after the impending accident happens. When answering questions

about a sequence story, they can name items in the picture and state what is happening to the cat. They can use three or four basic sentences. In making up a story about a picture they can state or list actions, state related actions and elaborate on an event that is happening in their story. Now they will maintain their story topic with no unrelated utterances. They can begin to complete a story by stating one action and use one basic sentence.

LOGITS	3;00 3;06	4;00	4;06 5;00	6;00 7;00
	0 3;05 3;11 +1	4;05 +2	4;11 5;11 +3	6;11 7;09 +4
	X / X	X /	X / X	X / X
FORM/PERSON SCORES				
A/	108			
B/	68 71 77 82 86	90 96 101 108	110 115 118 122	129
C/		26	30 32 38 47	48 52 59 63 69
ACTIVITIES/ITEMS				
1/				
2/				
3/				
4/				
5/				
6/				
7/				
8/				
9/				
10/			9,15	
11/				
12/				
13/				
14/				
15/				
16/	18 20,14,25 21,10,19,22	3 15,12 23,7	31 4	8,16 33 5
17/	37 34,35 7	12 11 15		36 18,8 16 26
18/	5	7 3 11	12	6,13
19/	26,27			
20/				
21/	24 15,16			
22/	6	3		
23/	11	18 3 15 4		14,19
24/	2 33,11 25,15 40 6,13 37,29	17,14,34 28,1 42,32 44 26,27 7,36 31	8,30 23 21 5 35	18 41,16 20 22,24
25/	2,9,3,8,7	5 6	10 12	14 11
26/	1,2	12 13,6 4		
27/	6,7,8 12,3	1,13 2	4	14 15
28/	10,12,13	7 1	6,4	2
29/	11 12	8 9	1 3,2	7 4
30/		32 2,33 3,4	5,6,7 8 13,15 12	21 19 9,27,14,16
31/	2	3 4 9,10	5	6
32/	8,9,2		3	4 5

LOGIT RANGE 0.00 TO +1.00

This logit range is at the three years to three years eleven months level. The child can select by function all the twenty one objects and can place an object correctly following the prepositional command with 'behind' in it. They can match most of the preposition pictures correctly. They can state how the broken bed can be mended. When describing pictures in the picture book they can use verbs specifically and can answer questions about why a person is doing a specific action, such as 'Why is she watering the plants?' They can answer, correctly , more questions about people's feelings and they can predict the consequences of events. They will use up to ten basic sentences. In relating a simple story using sequence pictures they will present a causal link between events. In re-telling or relating a story from pictures they are able to present most of the relevant ideas depicted in the pictures when the stories are straight forward action events. In the stories which depict people's emotions or abstract ideas they will tell the story as if it were an action story and not mention the emotions or abstract elements. The event-time sequence is marked with the use of 'and', 'and then' or 'then'. They can answer, correctly, questions about more abstract elements when talking about the picture depicting the impending accident or when talking about the sequence story picture. Their story about the dragon and the birthday party will have event-time sequence and the use of up to three basic sentences and one complex sentence. When completing a story they will state or list actions and when relating a person story they will list the activities and use one complex sentence.

LOGIT RANGE +1.00 TO +2.00

This logit range is at the four years to four years six months level. The child can, not only state what will happen when water is put into the broken cup, but also state what will then need to be done afterwards. They can perform six of the eight prepositional commands and place an object 'on' and make 'the cat jump over the bath'. When describing pictures in the picture book they will use 'and', 'and then', 'then' and they will be able to state why a person is feeling (emotion) the way he does. They are able to answer correctly more questions about the silly pictures, why people are doing the actions and forecast consequences as well as explain how an event can be accomplished. In relating and re-telling the action stories using sequence pictures they will use well formed sentences and include more of the relevant details. In relating the abstract sequence stories they will include more detail and their stories will be told in a story-like manner with all utterances pertaining to the story topic. When talking about the picture of the impending accident they can talk about what a lollypop man/woman does. They can answer questions about events relevant to the story which are not depicted in the sequence pictures. When making up their story about the dragon and the birthday party they can use well formed basic sentences. They can start to make up an action story about a picture which gives very few cues. They can use a complex sentence and their story will have a theme. When completing a story they will state related actions and have event-time sequencing to their story.

LOGIT RANGE +2.00 TO +3.00

This logit range is at the four years six months to five years eleven months level. The child is able to point to body parts such as 'nostril' and will get seven out of eight prepositional commands correct. When describing the pictures in the picture book they can describe more abstract ideas and use more specific vocabulary. In relating the story from sequence pictures, the more

abstract ideas which are depicted in the pictures are brought into the story. More complex language is used when talking about the picture of the impending accident and in answering questions about the sequence story. When making up a story about the man and dragon fighting, there is event elaboration, an event-time relationship and more specific syntax is used. In completing a story there is a causal link between propositions and when relating a personal story they will describe an event.

LOGIT RANGE +3.00 TO +4.00

This logit range falls in the six years to seven years level. The child can answer eight out of the eight prepositional commands and can 'put the cat above the bath'. When describing the pictures in the picture book they can match the picture of why a person is feeling the way they do with the picture which depicts a person's feelings. They will use mainly complete sentences now, with few elliptical sentences. When relating the simple action pictures a subject is highlighted in the topic and the actions are related to the subject. When talking about the picture of the impending accident complex sentences will be used and more basic sentences are used few elliptical sentences are used. When answering questions about the sequence story, specific vocabulary is used as well as complex sentences. When they make up their stories about the dragon and the birthday party or about the man and dragon fighting they use a causal link to the propositions and the story has an introduction. A 'problem' which needs to be overcome is stated. When relating the more complex stories depicted in the sequence stories a causal link is introduced as well as the depicted abstract ideas are brought into their story topic. When they making up a story for the story completion task, they bring in a goal based proposition to the story topic. When relating a personal story there is time ordering to the activities and a causality link between the propositions.

LOGITS	+4	+5	+6	+7	+8
FORM/PERSON SCORES					
A/					
B/					
C/	70 79 90				
ACTIVITIES/ITEMS					
1/					
2/					
3/					
4/					
5/					
6/					
7/					
8/					
9/					
10/					
11/					
12/					
13/					
14/					
15/					
16/	24,32,30 35	34			36,37
17/	28 38 13 39	20,40,41 9 23,29,24 27 19		22 25	
18/					
19/					
20/					
21/					
22/					
23/	16				
24/	43 3,45	46 47			48
25/	13,17,16	15			18
26/	15	14			
27/	17	16			
28/	5 3 8 15		16		17
29/		13,14,5,15		16	6
30/	34 35 24 17	29,25,10 23 37	20	30 36	18 28
31/	11 12	7,13		14	
32/	6 11	10 12		13	

LOGIT RANGE +4.00 TO +5.00

This logit range falls in the seven years six months to seven years nine months level. The syntax is more specific in all the activities and causal links between propositions occurs regularly. Relative clauses appear with 'which, who and that'. The more complex sequence stories are told with complete sentences, specific syntax and the abstract ideas. Contrasting ideas are talked about with the use of 'or', 'but'. Direct speech is used when making up stories. When relating a personal story, 'expectations' about the day are talked about and there is a causal link between propositions.

LOGIT RANGE +5.00 TO +6.00

This logit range is above the seven years nine months level. In all the activities 'or', 'but' is used to express contrast between propositions. The made up stories are more advanced in structure with goal based actions, consequences, contrary actions, and resolutions. There is the use of deixis (such as 'here/there' or appropriate use of personal pronouns) in direct speech. Relative clauses are used frequently. When they are completing a story there is a goal based causal proposition but no obstacle to overcome.

LOGIT RANGE +6.00 TO +7.00

This level is above the seven years nine months level. In the made up stories there are reactions on the part of the characters to other actions or to the consequences. There is more use of relative clauses, especially in the complex sequence stories, story completion and relating a personal story.

LOGIT RANGE +7.00 TO +8.00

This logit range is above the seven years nine months level. Relative clauses are used when answering questions about the impending accident, the sequence story and in describing pictures in the picture book. The made up stories have plans to accomplish the goal and there is a story ending mentioned.

5.1.3.3. The Individual Performance Profiles.

The data collection forms were devised so that a series of communicative contexts could be presented. The contexts varied between them as to which language abilities were being tapped and within some of the contexts several language abilities were drawn upon. The test was designed to be multidimensional as it was felt that the child's performance in these contexts was important and in particular identifying the pattern of performance within and between contexts was important. The individual profiles show each child's pattern of scoring.

The score profiles use only the calibrated items placed within their activities. The age means, logit range and person measures are also given. Each child's score pattern can then be plotted on a profile so that an individual pattern of performance can be noted. Table 5.10 presents an individual profile.

A line is drawn across the profile at the child's score point indicating the level of ability that the score indicates that the child has achieved. The number of items below the line and up to 0.30 logits above the line add up to the score level. All the age means had their score point occurring within one standard deviation above the mean. In Table 5.10, one child's pattern of performance is presented. This profile demonstrates an uneven pattern of performance which shows strengths and weaknesses appearing up to two standard deviations from the score point.

Legend:
The horizontal line is located at the score point. The items that were correct are circled. PERSON 514 is 5;07 years old and attained the mean score for the 5;00--5;11 age range.

PERSON: 514 AGE: 5;07 SCORE: 44

AGE MEANS	LOGITS	PERSON SCORE	16 (7)	17 (6)	24 (19)	25 (5)	26 (4)	27 (0)	28 (1)	29 (1)	30 (0)	31 (0)	32 (1)
	0				25								
4;00-			22		15	2							
4;05						3							
	+1			12	14,17	5	12						
					42,7								
			3		36								
				11	32,34								
							6						
			15										
	+1.7	26	12		26,28								
			7,23	15	31,27		4						
	+2	30			1,8	10							
4;06-		32			21								
4;11					30								
		31											
		38											
5;00-	$\bar{X}$												
5;11		47	4		23								
					5,35	12							
	+3	48		36									
6;00-			8,16		18								
6;11		52	5							7		6	4
				18,16,8		14					9		
	+3.5	59											
			33		20								
		63		26							27		
		69											
7;00-					41					4	21		
7;09					22						14,16		
					16,24								
									2				5
						11		15					
	+4	70	24,32						5				
		79		39,28	43				3			11	
			30			13					34		
								17	8		24		
													6
				38		17			15			12	
					45,3						17,35		
			35	13			15						11
	+5	90		20,23							29		
											23,25		10
				29,40	46					14	10	7,13	
				19,24,41			14			5,13	37		
								16		15			12
			34	9,27	47	15							
	+6										20		
				22,25		16			16	16	30,36	14	13
	+7		36,37		48	18			17	6	28,18		

TABLE 5.10.: AN INDIVIDUAL PERFORMANCE PROFILE

Uneven patterns of performance, similar to the one examined in Table 5.10 were demonstrated by 75.9% of the children in this study. Although the children, who were selected as subjects, had a very good standard of English, there still were gaps or strengths occurring more than two standard deviations from their score point. This pattern was more prevalent in the older age groups. The number of children within each age group who presented with this uneven pattern of performance is given in Table 5.11.

TABLE 5.11: Children with Uneven Patterns of Performance.

Year	Month Range		
	0;00-0;05	0;06-0;11	TOTAL
1	5	2	7
2	2	3	5
3	All	All	All
4	8	5	13
5	All	All	All
6	All	All	All
7	All	All	All

The number of children per age group who had strengths or weaknesses occurring more than two standard deviations from their score point.

5.2. SUMMARY.

In Chapter 5, the variable was defined by investigating the type of information that the item difficulty calibrations and person ability measures implied. A line of inquiry was defined through the spacing of the items and through their standard error scores. The age group details defined the variable through the locating of the forms, the form means and the age group means on the line of inquiry. Through the defining of this variable an item bank was created and individual performance profiles have been presented. The person ability measures and item difficulty calibrations were used to define the variable for the application of the premises presented in the communicative competence model.

However, the modelling of the interaction between person and item is an idealisation and is only an approximate of experience. The value of this approximation can only be judged in terms of its usefulness. Its usefulness can only be determined by demonstrating its relevance to the situation under study. Chapter 6 will present the defined variable in use in two case studies of children who have demonstrated difficulties in developing language.

USING THE VARIABLE

6.0. INTRODUCTION.

In chapter 4, observations were collected from children who were deemed to have a very good standard of English, that could be used as the benchmark for measuring other children's language abilities. The observations were then transformed through the use of the Rasch mathematical model into a variable which could be used as a measurement continuum. In chapter 5 this variable was defined. This definition could then be used to measure children's language performance within several language contexts so that the premises of the Communicative Competence Model could be applied in therapy. In this chapter the variable will be used to measure two children's patterns of performance. The first case study is longitudinal and demonstrates the child's developing abilities. All three assessment forms are used. This provides an example of 'score invariance', which is one of the characteristics of the Rasch model. In the second case study, Form C is used to demonstrate the child's unique pattern of performance. It highlights the necessity for having a test which can profile an individual's performance within contexts. This case study demonstrates 'item invariance', which is another characteristic of the Rasch model. In both case studies the application of of the premises of the Communicative Competence Model will be discussed.

6.1. CASE STUDY 1, SHAUN.

In this case study, a child's therapy is followed for eighteen months. The progress made was such that the three assessment forms could be used to assess the child's developing abilities and the measures obtained from the variable were used to plan and monitor the therapy programme.

6.1.1. INITIAL ASSESSMENT: MARCH 1989.

When Shaun was first assessed, he was age 3;09 and was attending a nursery full time. He had attended the nursery for a year and was on a behaviour modification programme to help him through the daily routine. His interaction skills were poor and he did not participate well in the nursery activities. He would become confused by the everyday routine of the nursery and would either be very clingy or burst into tears. Although he had good, well formed sentences, very few of his nonverbal or verbal behaviour were related to the situation at hand. He confused the 'I' and 'you' pronouns and did not follow instructions or commands very well and would end up imitating the adult's gestures. Shaun had been assessed by the regional child development centre and had been diagnosed as having 'semantic--pragmatic' problems with a poor prognosis. It had been recommended that he go to a school for children with severe learning difficulties.

For the first assessment, Form A (for 1;00--2;11 years) was used. Shaun was 3;09 years old and attained a Raw Score of 86, with a Standard Deviation of -4.5 and a Mean Age Equivalent of 2;03-2;05.

6.1.1.1. Test Performance:

1. Early Object Play: (Activities 1-5)
   Shaun could play with objects appropriately and include the adult in a simple turn taking game with objects.
2. Doll Play: (Activities 7-8)
   Large Doll Play: Shaun could relate all the toys to each other appropriately and made up sequences of pretend play which had three or more sequential steps.
   Miniature Doll Play: Shaun related all the miniature toys to each other appropriately and made up pretend sequences. He did have difficulty in maintaining the organisation of the toys and the adult constantly had to put the toys back in place so that he could continue with his play ideas.

3. Following Directions: (Activities 9-12,18-20)
   Shaun was able to complete one direction with placing an object in a specific place which is at the age level of 2;03--2;05 years. He was able to complete two prepositional commands which is at the age level of 3;00--3;05 years. He was able to perform the actions and point to body parts and pictures of actions. Shaun was able to identify two objects when they were defined by their function. This is at an age level of less than 2;03--2;05.
4. Early Communication and Comprehension:
   Shaun was able to do all of these.
5. Stories and Narratives: (Activities 13, 16, 17)
   Shaun found it difficult to sit and listen and talk about stories in a structured manner. He did not imitate adult's gesture and could only answer a few questions before halting the activity. Shaun was not able to make up a story using a picture as a stimulus.

6.1.1.2. Qualitative Analysis:

The manner in which Shaun approached the test, played with the toys and performed on the items demonstrated that he still played with objects in immediate action that represented everyday basic care routines with no planning of play and no use of language to direct actions or add to the play event. There was no out of situation language stimulated by the play such as talking about his own daily routines or sharing of real events. There was no abstract thought represented in his actions or language--all actions and language were very concrete related to his own actions. His listening skills were poor. He did not respond to any of the adult's **language** during his play although he did respond to the adult's **actions** and would include them in his play. He became distressed when the test items became solely verbal. Only in large doll play did he become really spontaneous except that he still did not expand on any of the adult's language.

6.1.1.3. Test Interpretation:

Shaun enjoys and is very good at pretend play. However his pretend themes are still very immature and are about basic daily care routines (such as: eating, combing hair, bathing). Shaun has a very low tolerance level for listening type activities and halts the activity before doing very much of it. His listening skills are actually at a higher level than the level at which he will halt the activity. He will only cooperate to do one or two items which will be at the 2;03--2;05 level but the type of language he understands and responds correctly to will be within his age range. In his spontaneous play he would build upon the adult's actions but would not respond to the adult's speech.

6.1.1.4. Therapy Aims:

1) Extend the range of play behaviour in exploratory and symbolic play with special emphasis on sound and language play.
2) Increase the amount of turn taking sequences in which Shaun builds on the adult's actions and language.
3) Move from large doll play to miniature doll play.
4) Move from pretend play about daily living scenes to scenes representing the roles of people in the world.
5) Increase the themes in play.

6.1.1.5. Therapy Management:

Therapy activities consisted mainly of exploratory play with the use of 'messy play' games and large doll toys with a combining of the two, such as bathing dolly but playing with the soapsuds as well. The game routines within these activities centred around taking turns with actions and language between Shaun and the adult. The most successful routines were when his actions and language regulated the adult's actions. His favourite effect was when he would stir up the flour dust while making playdough and the adult would pretend to 'sneeze'. Some

abstract ideas were built into this play by varying the loudness of the 'sneeze'. When Shaun would stir up a lot of dust the adult would sneeze loudly and when there was only a little of dust there would only be a little sneeze. Shaun was fully in control of this situation and correctly knew which type of sneeze was called for and would ask for the correct 'sneeze' if the adult did not get it right. There was frequent repetition of these games.

6.1.1.6. Changes Which Occurred:

As changes took place Shaun became very confused. At first he loved therapy and would find it difficult to go back into the room. The behaviour modification programme had ceased to be effective, as Shaun was learning to organise his own behaviour in the room, but he appeared not to be able to cope with all the activity and noise level. After two months of therapy, life became very difficult for everybody as Shaun would cry all day when he returned to the room. This went on for three weeks. He then refused to attend speech therapy and behaved as if he were afraid of it. He refused for three weeks. He then decided to attend therapy again, and, although he would become stressed in the room and cry, it would be a short outburst. He was entering into more activities within the nursery room. After three months of therapy he moved on to playing with miniature toys. He would set up events which included sequences of play, and the dolls would have appropriate roles. His play was demonstrating de-centred play and the dolls would relate to each other within the play such as nurses pouring drinks into the patient's cup. He would set up a scene for each of the dolls, taking their perspective, such as turning the television around for the patient to see. Shaun had sorted out the pronouns 'I' and 'you'. However, any change in activity, regardless of how the change was introduced, would still bring on a crying fit.

6.1.2. SECOND ASSESSMENT: SEPTEMBER 1989.

For the second assessment Form B (age 3;00--4;11 years) was used and Shaun was 4;03 years old. He attained a Raw Score of 47, with a Standard Deviation of -3.00 and a Mean Age Equivalent of 3;06.

6.1.2.1. Test Performance:

1. Following Directions: (Activities 10-11, 18-21)
   Shaun was able to do all the actions and point to all the body parts. He was able to do four prepositional commands which is at an age level of 3;06--3;11. In the Selects By Function activity Shun did the first 11 items correctly and then refused to do the rest. The number of items he did correctly was at the age level of 2;03--2;05. The type of items he did correctly range between the age levels of 2;03--2;05 and 3;00--3;06. Shaun was able to identify the action pictures and match the preposition pictures.
2. Stories and Narratives: (Activities 16, 17, 23, 24)
   Shaun was able to follow the sequence picture story and answer questions about it. He was able to make up a story using a picture as a stimulus. Shaun was able to make up a story relating the gist of the actions using sequence pictures as the stimulus, but he did not tell it as if he were telling a story.
3. 'Talk About' Activities: (Activities 22, 24 and 25)
   Shaun was able to answer questions related to two broken objects. Shaun was not able to talk about an event that was about to happen in a picture nor was he able to answer questions about pictures depicting abstract ideas.

6.1.2.2. Qualitative Analysis:

Shaun appeared more like a 3-4 year old during this test. He could sit and attend well and did not need to play. The duration of time, that he could listen to adult language in the form of instructions, was longer but he still found it very difficult. There were more sequences of ideas and

he could incorporate the adult's language into his responses. There was more sound play and reference to sounds during the test situation, but he still baulked at the tasks that used solely language and needed visual cues to help him to understand. He was much better at organising himself and the materials so that the task could be carried out.

6.1.2.3. Test Interpretation:

Shaun had moved away from needing to always play in action and could enjoy pictures and stories. However the ideas depicted in the pictures needed to be familiar and concrete. Shaun still found it difficult to tolerate language tasks for very long and still would not complete the highly structured verbal language tasks.

At this time Shaun was reassessed at the CDC. They were both surprised and pleased at the progress he had made. They recommended that he attend a language unit and now they were sure that he had normal intellect.

6.1.2.4. Therapy aims:

1) Build tolerance for listening to language.
2) Build interaction skills with adults and children.
3) Participate successfully in language activities which have rules and turns.

6.1.2.5. Therapy Management:

At this time Non-directive play therapy techniques were brought into therapy. He would play in the play room and the adult would sit near him, quietly making a running commentary that stated what he was doing. At first this amount of verbalness coming from another person scared him and he became tense, but very quickly he began to like it and he relaxed. He seemed to enjoy the social contact without the requirement to respond. The sessions did build up his vocabulary and understanding of language. He

started correcting the adult. If the description of what he was doing did not suit him he would alter it--such as when the adult said he was pressing the clown's nose he said 'no, I'm squeezing it.' He became very calm during these sessions but the adult was not to ask questions or in any way act as if a response was required.

6.1.2.6. Changes Which Occurred:

Although Shaun was interacting very well with the children and within the activities he was still a problem in the room and when he became distressed he would cry. He had moved up to the room with the pre-school children and although in this room, school preparation activities were carried out, the staff wanted to do the same type of activities with Shaun that were being done in therapy. One of the staff members started carrying out the non-directive play sessions with Shaun. This improved the situation in the room.

The therapy sessions then changed so that Shaun was required to interact with the other children within a game routine that had rules. At first the games were played between Shaun and the adult with a second adult beside Shaun prompting him to respond. This left the first adult to provide the interactive situation without the need to leave that role to help Shaun with his. As Shaun became independent in this type of structure, a very sensitive child was selected to 'play' with Shaun. This child, Cheidu, would play with Shaun but he would follow the adult's cues to help Shaun interact and even started his own prompting and explaining to Shaun what he was supposed to do. Shaun was then paired in play situations with a less sensitive child in which Shaun would have to interact with no help from the child. Later Shaun was then paired with another child who was attending speech therapy--when the communication broke down they would have to help each other out to repair it.

By this time Shaun was an effective communicator who could could carry on a conversation with both adults and children. He was no longer afraid of other people's language and could answer questions without becoming distressed. Shaun would extend the adult's speech to elaborate ideas.

6.1.3. THIRD ASSESSMENT: JULY 1990.

For the third assessment Form C (ages 5;00--7;09 years) was used and Shaun was 5;00 years old. He attained a Raw Score of 34, with a Standard Deviation of -0.25 and a Mean Age Equivalent of 4;11-5;00.

6.1.3.1. Test Performance:

1. 'Talk About' Activities: (Activities 24, 25)
   Shaun was able to accurately describe pictures depicting abstract ideas in the form of actions which were about to happen, 'silly' events and events that have just happened. He could explain why people had certain feelings and why they were doing certain actions. However, he could not predict the consequences of an event nor explain how something could be accomplished. He could talk about an event that was about to happen.
2. Stories and Narratives: (Activities 16, 17, 26, 27, 28, 29, 30, 31, 32)
   Shaun was able to answer questions following the plot of a sequence story. He was able to use basic and complex sentences. Shaun was able to make up a story about the more simple action picture but the actions in his story did not have time sequencing. With the more complex action picture he described the scene in the picture. Shaun was able to tell a story using sequence pictures but as the ideas in the picture became more abstract he could not talk about them. He was unable to retell a story. Shaun could not complete a story or relate a personal event and as there were no visual cues in these activities he became upset and wanted to see the pictures.

6.1.3.2. Qualitative Analysis:

Throughout the test Shaun was able to listen and respond appropriately and enjoyed the test situation. He very much appeared to be a school aged child who was ready for the type of language tasks that would be presented in school. Although Shaun did very well on the test and even did extremely well on some of the subtests a weakness in auditory skills still persisted. He did not like the activities that were purely auditory and became distressed that there were no pictures.

6.1.3.3. Test Interpretation:

Shaun was performing at average age level, but he still demonstrated a low tolerance for auditory tasks and a preference to participate in activities which were supported with visual cues.

6.1.3.4. Therapy Aim:

1) Build up tolerance level for purely auditory tasks.

6.1.3.5. Educational Recommendations:

Shaun was reassessed at the child development centre where they recommended that Shaun attend normal school, but that he would probably need some assistance such as an individual support teacher and speech therapy.

6.1.4. SUMMARY OF CASE STUDY 1.

In this case study the three test forms were used to collect information about Shaun's performance in various communicative contexts. The first test score compared to his age group indicated a severe delay in his communicative development. He had obtained a standard score of -4.5. The second test score indicated that progress had been made during the six months and his standard score was now -3.00. This score indicated that a severe delay still existed compared to his age group. The

third test score indicated that good progress had been made during the ten months. His standard score was -0.25 and was within normal limits. Table 6.1 presents the variable with the three test scores located on it.Table 6.2 presents the individual performance profiles for the three tests.

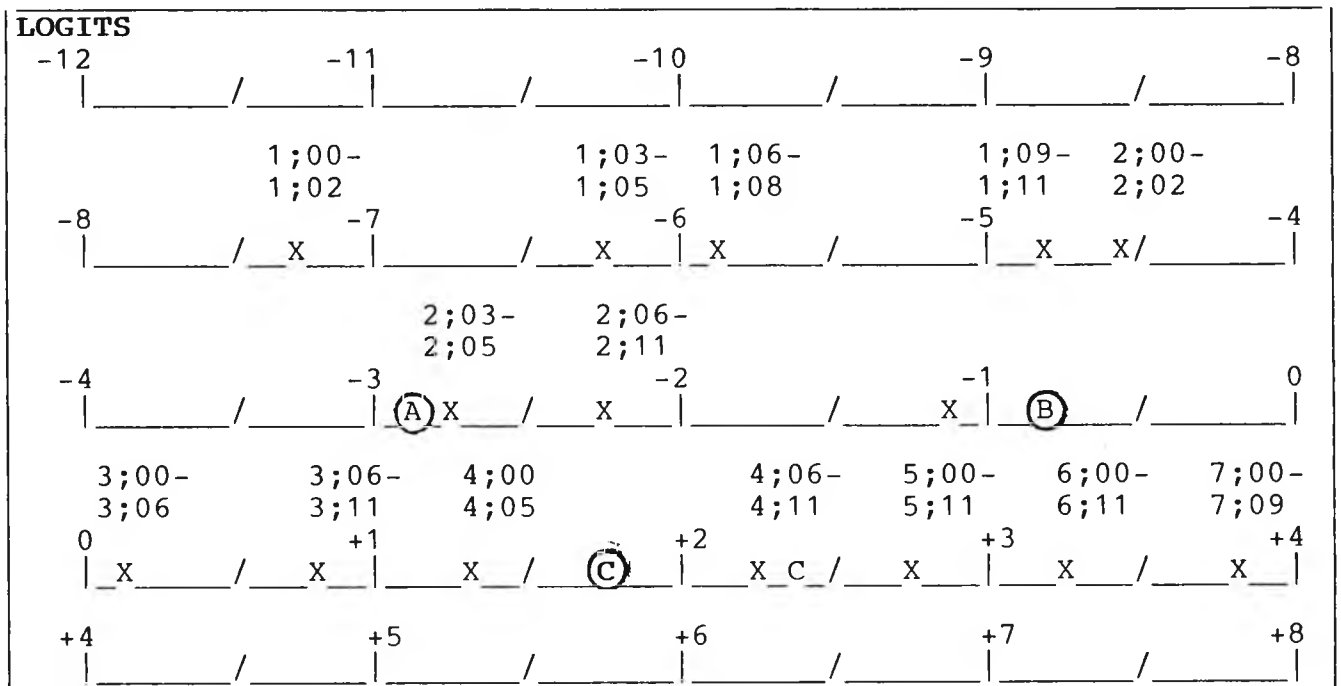
Each of the three forms was different, the activities that were used included different items which could assess behaviour comprehensively at that relevant age level. Yet, due to the three tests having been linked onto one variable the scores were statistically related. Score invariance is a characteristic of the Rasch Model. The person scores are located on a variable which is marked in linear units and through the linking of tests easy items can be created to assess an ability which can be linked onto more difficult but different items. The standard deviations obtained on the different test forms are then statistically related and indicate true development.

The manner in which Shaun took the test also was important. The weakness, for organising meaning from auditory input was interpreted from his response pattern. Shaun would halt an activity that was purely auditory even though he was succeeding. He was also getting difficult items right that were at a higher age level than the total number of items he would participate in. This performance indicated that another test should be included in the battery of assessments--one for assessing the processing of information.

On the first assessment Shaun answered all the play items correctly. However, he wanted to play with the toys and the manner in which he played contributed to the development of therapy aims. The features of his play that were diagnostically important were: 1) playing with the objects in immediate action rather than planning any of the play, or use of language to direct the play or add to the theme, 2) the themes were all about everyday basic care such as eating, washing, going to bed, 3) there was

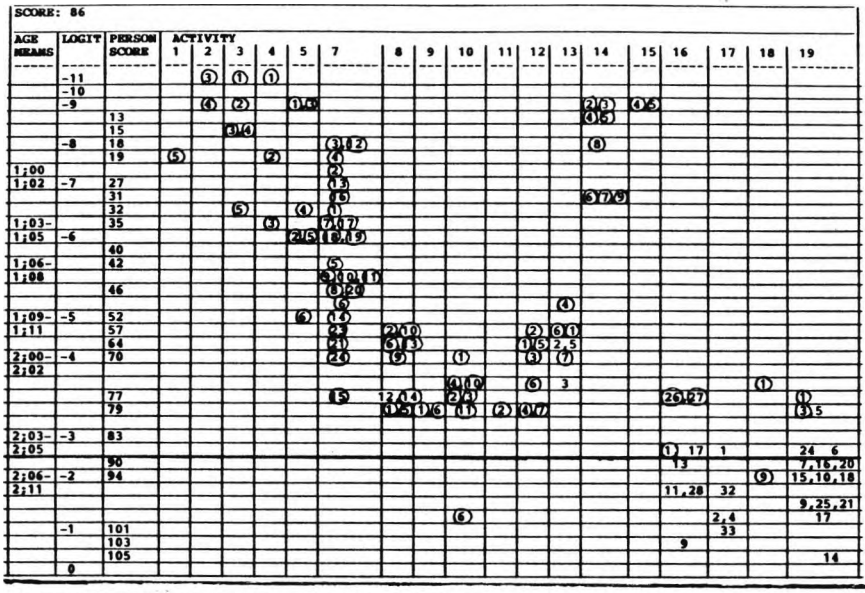
no out of immediate situation use of language to relate the play to his own life, 4) all his actions were concrete, there was no presence of abstract representation, 5) he did not respond to the adult's language although he responded to the adult's actions. Therapy management was planned around this information.

In the first assessment, therapy was directly planned from the test results but the test items were not part of therapy. However, Shaun's communicative abilities developed and that development was indicated in later assessments. In the second assessment a weakness in auditory tasks was noted. Therapy was planned to provide opportunities for learning how to use verbal input from others. Again therapy was directly planned from the test results but the test items were not part of the therapy programme. Shaun's communicative abilities continued to develop and this was indicated by the test.



TEST DATE	CHRON. AGE	TEST FORM	RAW SCORE	AGE EQUIV.	S.D.	S.D. DIFF.	TIME DIFF.
MARCH 1989	3;09	A	86	2;05	-4.50		
SEPT. 1989	4;03	B	47	3;00	-3.00	1.50	0;06
JULY 1990	5;00	C	35	4;11	-0.25	2.75	0;10

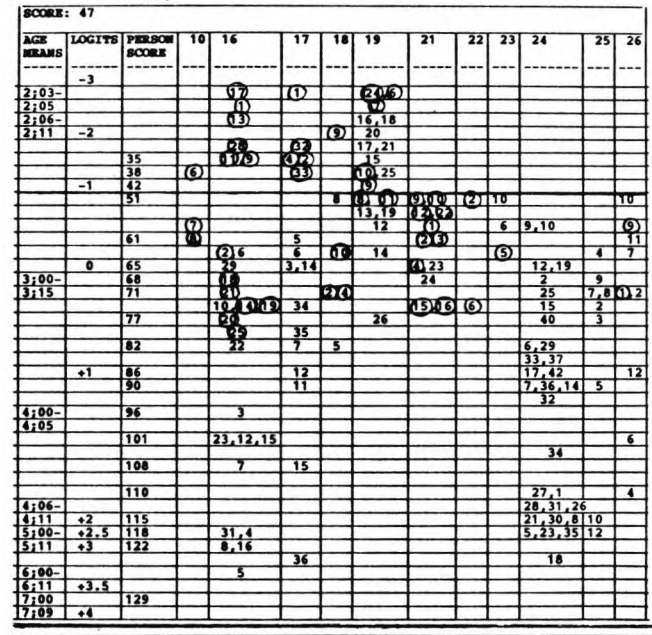
TABLE 6.1.: CASE STUDY 1: TEST SCORES AND AGE MEANS.



SCORE: 86

AGE MEANS	LOGIT	PERSON SCORE	ACTIVITY 1	2	3	4	5	7	8	9	10	11	12	13	14	15	16	17	18	19
	-11			3	1	1														
	-10																			
	-9			4	2		1,10								2,10	4,6				
		13													10,5					
		15			3,4															
	-8	18						3,8,2							8					
		19	5			2		6												
1;00								2												
1;02	-7	27						13												
		31						16							6,7,9					
		32			5		4	1												
1;03-		35				3		7,17												
1;05	-6						2,5	18,19												
		40																		
1;06-		42						5												
1;08								9,10,11												
		46						8,20												
								6						4						
1;09-	-5	52					6	14												
1;11		57						23	2,10				2	6,1						
		64						21	6,3				1,5	2,5						
2;00-	-4	70						24	9		1		3	7						
2;02																				
										4,10			6	3					1	
		77						15	12,14	2,8							26,27			1
		79							1,25,1,6		11	2	6,7							3,5
2;03-	-3	83																		
2;05																	1	17	1	24,6
		90															13			7,16,20
2;06-	-2	94																	9	15,10,18
2;11																	11,28	32		9,25,21
											6							2,4		17
	-1	101																33		
		103															9			
		105																		14
	0																			

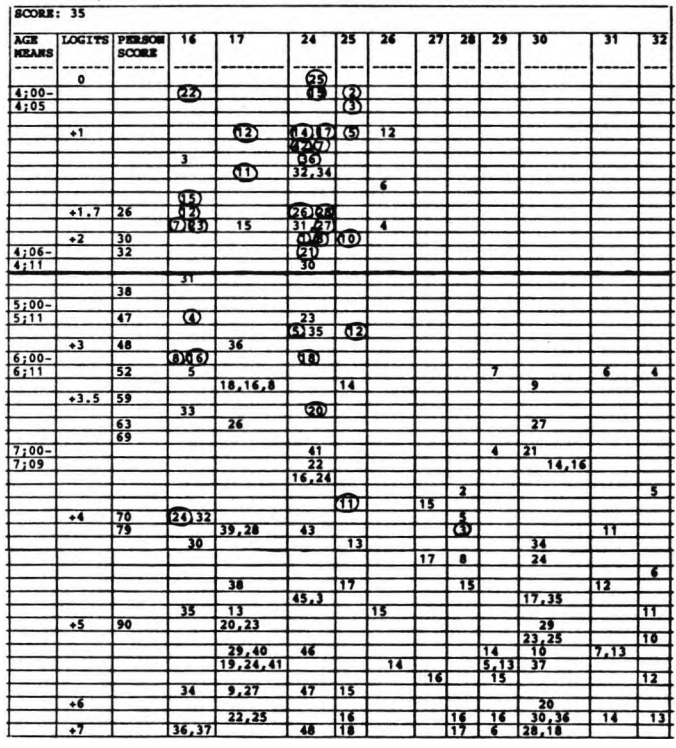
FORM A.



SCORE: 47

AGE MEANS	LOGITS	PERSON SCORE	10	16	17	18	19	21	22	23	24	25	26
	-3												
2;03-				17	1		20,6						
2;05				1			7						
2;06-				13			16,18						
2;11	-2					9	20						
				28	32		17,21						
		35		17,5	4,12		15						
		38	6		33		10,25						
	-1	42					9						
		51				8	4,11	9,10	2	10			10
							13,19	2,2,2					
			7				12	1		6	9,10		9
		61	10		5			2,13					11
				2,6	6	10	14			5		4	7
	0	65		29	3,14			4,23			12,19		
3;00-		68		18				24			2	9	
3;15		71		21		2,4					25	7,8	1,2
				10,4,1,13	34			15,16	6		15	2	
		77		20			26				40	3	
				25	35								
		82		22	7	5					6,29		
											33,37		
	+1	86			12						17,42		12
		90			11						7,36,14	5	
											32		
4;00-		96		3									
4;05													
		101		23,12,15									6
											34		
		108		7	15								
		110									27,1		4
4;06-											28,31,26		
4;11	+2	115									21,30,8	10	
5;00-	+2.5	118		31,4							5,23,35	12	
5;11	+3	122		8,16									
					36						18		
6;00-				5									
6;11	+3.5												
7;00		129											
7;09	+4												

FORM B.



SCORE: 35

AGE MEANS	LOGITS	PERSON SCORE	16	17	24	25	26	27	28	29	30	31	32
	0				25								
4;00-			22		18	2							
4;05						3							
	+1			12	14,17	5	12						
					4,20,7								
			3		26								
				11	32,34								
							6						
			15										
	+1.7	26	12		26,26								
			7,13	15	31,27		4						
	+2	30			28,8	10							
4;06-		32			21								
4;11					30								
			31										
		38											
5;00-													
5;11		47	4		23								
					5,35	12							
	+3	48		36									
6;00-			8,16		18								
6;11		52	5							7		6	4
				18,16,8		14					9		
	+3.5	59											
			33		20								
		63		26							27		
		69											
7;00-					41					4	21		
7;09					22						14,16		
					16,24								
									2				5
						11		15					
	+4	70	24,32						5				
		79		39,28	43				3			11	
			30			13					34		
								17	8		24		
													6
				38		17			15			12	
					45,3						17,35		
			35	13			15						11
	+5	90		20,23							29		
											23,25		10
				29,40	46					14	10	7,13	
				19,24,41			14			5,13	37		
								16		15			12
			34	9,27	47	15							
	+6										20		
				22,25		16			16	16	30,36	14	13
	+7		36,37		48	18			17	6	28,18		

FORM C.

TABLE 6.2.:
CASE STUDY 1:
THE PERFORMANCE PROFILES.

6.2. CASE STUDY 2, IAN.

The measurement of Ian's performance provides an example of of how the individual score pattern can be used to diagnose language learning difficulties. Ian's test score is below the mean for his age group and his score pattern is patchy. The individual profile presents an interesting pattern of ability. Ian's score also provides an example of the 'item invariance' characteristic of the Rasch model.

6.2.1. ASSESSMENT: JULY 1990.

Ian, 5;07 years, was assessed on Form C (age range 5;00--7;09 years) and attained at Raw Score of 25 with a Standard Deviation of -2.50 and a mean age equivalent of 4;00--4;05.

6.2.1.1. Test Performance:

1. Stories and Narratives: (Activities 16, 17, 26, 27, 28, 29, 30, 31, 32)

   In the sequence story activity, Ian only answered a few of the questions correctly. However, he was able to answer correctly the question which asked about what the mother and the boy wanted the cat to do. This question was at the seven year level. The story that Ian made up for the 'Dragon and the Birthday Party' demonstrated simple time event sequencing but not causality links. Ian made up a story for the more complex action pictures but did not score any items on the Form C score sheet. His story only described what was in the picture but he did use a complex sentence. Ian was able to carry out the task of making up stories with the assistance of sequence pictures but most of the items that he scored correctly were at the level of score Form B at the 3;06 to 3;11 year level. However, again he was able to use the abstract ideas in his story which were at the 7;00--7;09 year level.

2. 'Talk About' Activities: (Activities 24, 25)

   Ian was able to talk about pictures depicting abstract

ideas and could answer questions about actions that were happening, actions that were about to happen and actions that had just happened. He could state what was happening that was silly. He could explain what caused the people's feelings. He could also state why a person was doing an action and he could forecast the consequences of an action. Ian could talk about an event which was about to happen. However he did get very few items correct: most of his answers fell in the Form B section.

6.2.1.2. Qualitative Analysis:

Ian did all the activities with great interest and with a lot of correct ideas. The main problems that he had were in expressing his ideas with succinct speech. Most of his sentences were run together with 'and'. There was also a lot of revision of ideas within a sentence. As the sample was tape recorded and looked at later it was easy to pick out the ideas and score, but at the time that he was talking, it was difficult to follow his thoughts. If an adult had been required to respond, they would have found it difficult to do so. This manner of expression very much resembled a 3;06 year old who was not yet fluent with good sentence structure but had a large vocabulary and alot to say. Many of his answers were in the 3;06 range on Form B. Ian also made a considerable number of errors in his choice of vocabulary and parts of speech.

6.2.1.3. Test Interpretation.

The most interesting pattern was that the more abstract ideas of 'thinking about the boy', 'wanting the cat to go inside' and 'the boy is dreaming of the space flight' which were at the 7;00 year old level were brought into Ian's expression very naturally and spontaneously. Although the raw score that Ian attained was at the 4;00--4;06 year level his actual abilities range from 3;06 to 7;00.

6.2.1.4. Therapy Aims:

1) To respond to the message in the adult's speech.
2) To become more fluent using just basic sentences to express his own ideas.
3) To have a main topic and to have all other utterance relate only to it.
4) To be able to answer correctly more questions about abstract ideas.
5) To be able to tell stories using sequence pictures bringing in relevant details in the pictures into the story.
6) To reduce the number and type of errors.

6.2.1.5. Therapy Management Plans.

The plans for Ian are to use the contexts in which he participated easily and had the most items correct. These were: answering questions about pictures, talking about a composite picture and telling a pictured sequence story which had very concrete actions depicted. All the pictures would be about events in his daily life.

Suggested activities with the pictures would include:

1) The adult talking about the picture and then Ian retelling the story or description.
2) Ian would describe the sequence pictures one by one before they were presented in a sequence.
3) Ian would tell the sequence story with the aim of telling it smoothly with time sequencing and few errors.
4) The adult would ask questions about the pictures.
5) The adult would ask questions about the routine depicted in the pictures so that Ian could talk about his own activities.

6.2.2. SUMMARY OF CASE STUDY 2.

In diagnosing Ian's communicative competence a close scrutiny of his performance within the test's communicative contexts was needed. It revealed some information about the type of context sensitive rules that

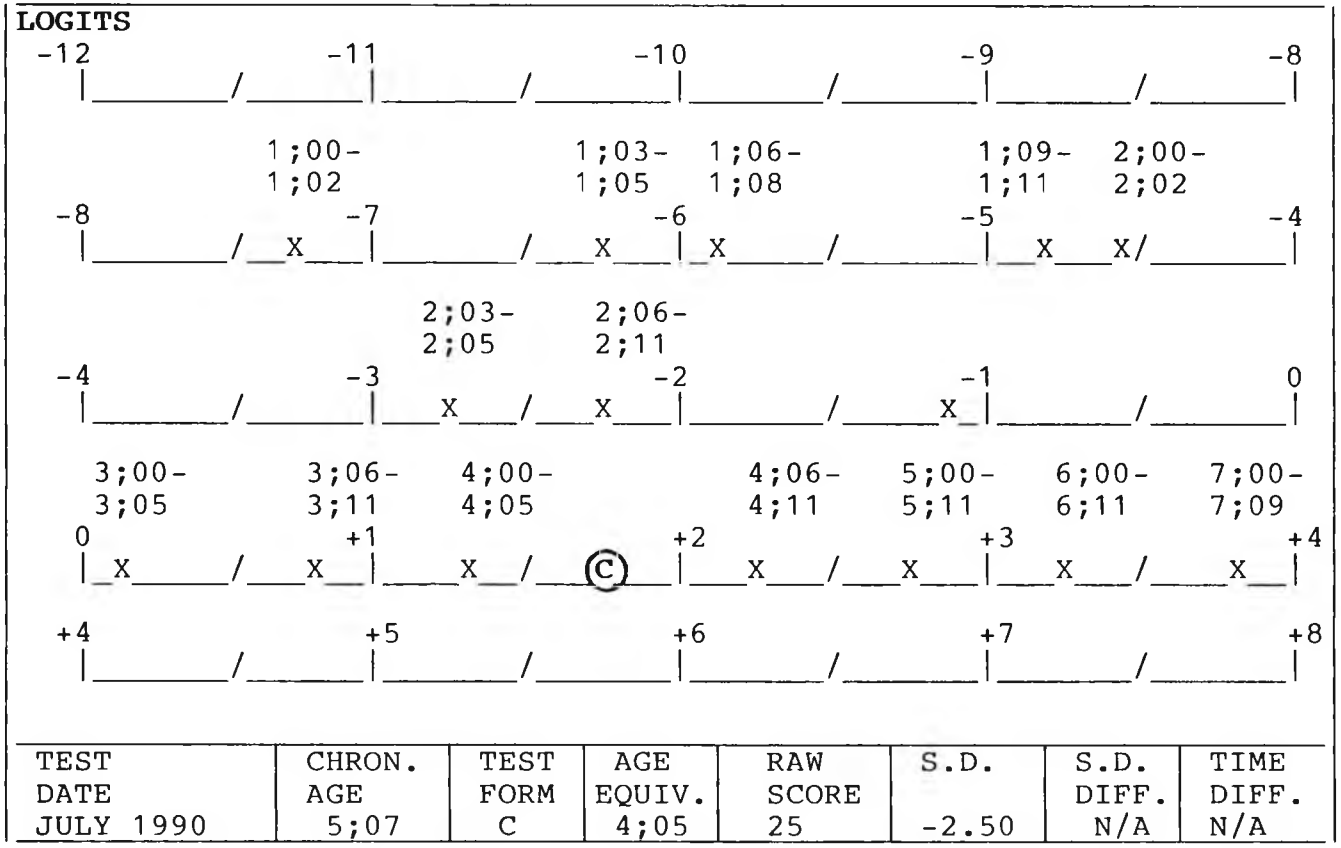
he was applying. His score and its location on the variable contributed little information which could be used to diagnose the type of problem that was occurring. Table 6.3. presents the variable with the test score and means. Table 6.4. presents his performance profile.

His score was below the mean but only just below the worst 5 year old and this population was all of a very good standard. If the means had been taken from a population that was more representative of his classroom peers then his score would have more likely fallen near the -1.0 S.D. range. At this level a problem would not have been indicated by the standard score. However, the profile of performance does indicate a need for intervention.

The profile of his individual score pattern presented a wide range of abilities demonstrating that his ability to use symbolic logic and imagination were the highest scoring abilities and syntax was the lowest scoring ability. The sparse score pattern was unusual. The children who had scored correctly on high items had also scored more items correctly. However, the range of the unevenness was not unusual compared with the other 5-7 year olds. The fact that his correct items ranged over such a wide age range (3;06-7;09 years) with so few items correct was odd. A further profiling of his pattern of performance into ability dimensions would be useful. Ian's unique pattern of performance within contexts indicates a need to profile his abilities within language dimensions. A cross referencing of performance between contexts and ability dimensions would provide a detailed descriptive analysis.

A characteristic of the Rasch model is 'item invariance'. A person's standard score may change due to the population that was used for the norming however the items location will remain the same. The child's pattern of performance on the variable is a more realistic indicator of ability than a score which ranks his performance within the population used to construct the test.

Neither his score nor the performance profile indicates the level of unintelligibility of his language production. His intelligibility was hindered by the delayed level of syntax that he was using, combined with his circumlocution, the tendency to string all the ideas together with 'and', and the number and type of errors he was making. Assessing the type and number of errors would be useful. An analysis of error pattern was indicated as an appropriate test to include in a test battery for this assessment.



TEST DATE	CHRON. AGE	TEST FORM	AGE EQUIV.	RAW SCORE	S.D.	S.D. DIFF.	TIME DIFF.
JULY 1990	5;07	C	4;05	25	-2.50	N/A	N/A

TABLE 6.3.: CASE STUDY 2: TEST SCORE AND AGE MEANS

Legend:
The horizontal line is located at the score point. The items that were correct are circled. (Table 5.10 presents another child age 5;07 who has attained the mean score for the 5;00--5;11 age range.)

TABLE 6.4.: CASE STUDY 2: THE PERFORMANCE PROFILES.

PERSON: IAN		AGE: 5;07												SCORE: 25
AGE MEANS	LOGITS	PERSON SCORE	16 (5)	17 (1)	24 (10)	25 (5)	26 (1)	27 (0)	28 (1)	29 (2)	30 (0)	31 (0)	32 (0)
	0				25								
4;00-			22		15	2							
4;05						3							
	+1			12	14 17	5	12						
					42 7								
			3		36								
				11	32 34								
							6						
			15										
	+1.7	26	12		26,28								
			7,23	15	31 27		4						
	+2	30			1 8	10							
4;06-		32			21								
4;11					30								
			31										
		38											
5;00-													
5;11		47	4		23								
					5 35	12							
	+3	48		36									
6;00-			8,16		18								
6;11		52	5							7		6	4
				18,16,8		14					9		
	+3.5	59											
			33		20								
		63		26							27		
		69											
7;00-					41					4	21		
7;09					22						14,16		
					16,24								
									2				5
						11		15					
	+4	70	24 32						5				
		79		39,28	43				3			11	
			30			13					34		
								17	8		24		
													6
				38		17			15			12	
					45,3						17,35		
			35	13			15						11
	+5	90		20,23							29		
											23,25		10
				29,40	46					14	10	7,13	
				19,24,41			14			5,13	37		
								16		15			12
			34	9,27	47	15							
	+6										20		
				22,25		16			16	16	30,36	14	13
	+7		36,37		48	18			17	6	28,18		

6.3. SUMMARY OF CHAPTER 6

How a variable is defined provides the manner in which it can be applied. In Chapter 6 the variable was applied in two case studies. The first case study was longitudinal and demonstrated how the variable could be used for objective assessment, measurement, therapy planning and monitoring. This case study also demonstrated the use of the Rasch model characteristic 'score invariance'. The second case study presented a unique pattern of communicative competence which highlighted the importance of profiling performance within communicative contexts as a means for diagnosing communicative competence. This case study demonstrated the use of descriptive analysis which was linked to an interval scale. This case study also demonstrated the Rasch model's characteristic of 'item invariance'. In Chapter 7 the aims and seven objectives of the project will be further discussed.

ADOPTING A MODEL OF COMMUNICATIVE COMPETENCE

7.0. INTRODUCTION.

In this project a variable for assessing language development from one to seven years has been constructed and defined. The variable was then piloted in two case studies. In Chapter 7 the issues which this project has highlighted will be discussed. This chapter is divided into four parts. Part One will present the objectives and aims of the project and discuss how well they were achieved. In Part Two a summary of how the aims were met are presented and the contributions that this variable can make to intervention practice is discussed. Part Three discusses the contributions this variable can make to the development of intervention practice in terms of the test battery that can be constructed and the type of research that can be implemented. Part Four then reviews the systems methods used in the project and discusses the contributions that systems thinking has made to the development of this work. The final section of Part Four then reviews the difficulties of reducing a complex system such as language development onto a linear variable and how this project has dealt with them.

7.1. THE AIMS AND OBJECTIVES OF THE PROJECT.

The invention of a variable begins with an idea of a latent trait. 'Latent Trait' is the term used to describe an attribute that is shared by individuals for which a continuum is assumed to exist. In this project the latent trait was the normal continuum of language development. An idea that there is a latent trait to language development has been under intense investigation for the last forty years. The results of these efforts have produced a rich body of knowledge which describes items of behaviour in detail and describes the laws of transition in a somewhat nebulous fashion. The structure of an intervention setting also has been outlined in the research.

During this period there has been a paucity in the development of psychometric assessments which could be used to examine the newly described abilities of the latent trait. The major area of new assessments has been to directly extend the methodology used in the research programmes into the clinic setting. Descriptive taxonomies have flourished while only a few psychometric assessments were being developed. None of the assessments are statistically related and the battery of assessments available to the clinician to assess all the levels of language and all the areas of language related behaviour has become too cumbersome to use efficiently.

The two main assessment methods, descriptive and psychometric, were used as separate assessment procedures and each had their benefits and shortcomings. Descriptive assessments were time consuming to administer but they provided a picture of a child's developing repertoire which could be used for goal setting and planning of activities for intervention. Psychometric assessments compressed the child's test performance into a score which provided little information needed for goal setting and intervention planning, but it did provide a means for comparing the child's performance to a peer group and it could be used for monitoring intervention.

What was needed was a comprehensive psychometric assessment method which also would provide the benefits of the descriptive assessment. This project was designed to create a unit of measurement of that type. There were two aims to the project which were constituted by seven objectives, which were presented in the introduction:

"1) As there now exists in the literature sufficient information to devise an operational definition for the Model of Communicative Competence, the literature will be reviewed so that a synthesis of the relevant areas can be presented. From this synthesis an operational definition will be devised."

"2) Through the use of the Rasch mathematical model, the operational definition will be transformed into a clinical tool which can be used to assess the pattern of performance of a child in various communicative contexts."

To achieve these aims there were seven objectives which needed to be satisfied. The first aim was fulfilled by Objective 1. A synthesis of the literature established that a latent trait of developing communicative competence existed for children and an operational definition was devised for the latent trait. The second aim was constituted by the other six objectives. By completing objectives 2 through 7 a variable for the definition of language as a complex system was established. Part One of this chapter will review the objectives and aims as to how well they have been achieved by presenting the strengths and weaknesses of the results and the type of opportunities and challenges the results present to current practice.

7.1.1. OBJECTIVE 1: TO DEVISE AN OPERATIONAL DEFINITION FOR THE COMMUNICATIVE COMPETENCE MODEL.

7.1.1.1. The Definition.

The first objective was to review the literature on language development to devise an operational definition. This operational definition would then be used to create a clinical tool for assessing a child's development of language abilities.

The operational definition, which was subsequently devised from the literature, described language with a duality of structure, in which meaning was provided by a system of interrelating language levels. This language system developed in tandem and interrelated with other developing behavioural systems. There was an overriding structure to this developing system of systems which included wholeness, laws of transformation and self-organisation.

The literature supplied categories of behaviour and observable items of behaviour, which were the elements of the system and it provided nebulous guidelines as to laws of transformation. The specific rules that were being applied in the laws of transformation could be inferred from observing the child's performance in various communicative context. The mechanism for change was the child's ability to extract meaning from the environment and make use of it. Intervention would occur through providing an environment from which the child could extract meaning. The procedures of 'communicative scaffolding' and 'fine-tuning and sensemaking' set the stage for providing the necessary meaningful communicative exchanges.

7.1.1.2. Was the Objective Achieved?

An operational definition was devised which could be used to develop a clinical tool. The literature was able to supply a very detailed account of the elements of language which could be outlined into content domains. There also was sufficient information of the laws of transformation to devise a definition that would provide the theoretical guidelines to create a unit of measurement.

This definition provides a view of language development as a complex system. This view provides a framework which can synthesise the information in the literature. This rich body of information has been collected through in depth analytical means with little view given to its synthesis. By placing the detail in the literature into the framework the strengths in the literature are highlighted. The literature is very strong on presenting a very detailed account of the items of behaviour of language development in terms of comparing the average of variables between groups. The framework also highlights the areas of language development where the known elements are sparse such as in the age groups of children between four and seven. (This study only

investigated the development of language up to the age of seven, but as children grow older even less is known about their development.) The framework also highlights the weaknesses of the information in the literature: the area of the laws of transformation is set out in a nebulous form and it is easily missed. The definition also allowed the guidelines of language intervention to be placed within the structure of the laws of transformation. However, these guidelines were the weakest point in the literature. Clear steps as to how to monitor whether the child is extracting meaning from the environment is not set out at all.

The definition also allowed the investigator to keep a holistic view in mind while applying a reductionist strategy to achieve the aims of the project. The definition then provided a means for the investigator to locate the results of the project into the wider complexity of language development.

The operational definition is at the level of a philosophy. It provides guiding principles rather than clear systematic steps that provide standard results. Whilst it is not yet totally refined to provide guidelines in all the areas that it represents, it also is not a closed definition. As more new information is known the definition can incorporate the information and then can be developed further.

Test construction is an iterative process and the results of this project have contributed more information to the original operational definition of the Communicative Competence Model. The use of the variable to assess children's patterns of performance within communicative contexts has demonstrated an age related progression of items of behaviour; therefore, the idea of 'stages' now needs to be incorporated into the definition.

Stage development theory has viewed 'stages' as being a level that is intrinsic to the child and indicative of a particular state of development. They are often viewed as an all or nothing point in development. The concept of stage that is presented here views a 'stage' as being part of a dialectual pattern. The child's knowledge system and the constraints of the communicative context work together to elicit a pattern of performance. Therefore, the use of 'stage' in this model is not a concept of a static level of developing abilities. Moving from one stage to the next is not a cumulative, sequential process but is part of a dynamic context sensitive process in which variations of performance occur.

Stages have frequently been associated with intelligence. As viewed in this model (which is looking at how knowledge is organised, how it can be accessed and how its further development can be facilitated), learning is not a static accumulation of further skills and abilities, but is a process. The stages or levels presented in the unit of measurement are not meant to indicate the child's I.Q. ('intelligence quotient') but aim to give a starting point for determining the pattern of organisation of knowledge and how it is organised into performance within communicative contexts. This starting point is to be used for guiding the child in learning. **The stage (logit levels) presented on the variable are not meant to be identifying intrinsic states of development within the child, but are to be used as a conceptual means for examining the context sensitive rules that the child uses in accessing knowledge.**

'Horizontal decalage' is unevenness in development. A sequence of development of items of behaviour was established on the variable, yet, unevenness of performance appears to be the rule in this study, even in people deemed, not only to be normal, but also, to be of a very good standard. The identifying of the child's pattern of performance within communicative contexts is

the key to identifying the stage the child is at in language learning.

Although the concept of stage, has now in this newly presented model, changed to patterns of performance due to the child's level of self-organisation, it can still be used as an explanatory construct. This study has provided some information to help define the concept as an explanatory construct. Brainerd (1978) put forward three criteria that must be met:

1. It must describe some behaviour that undergo age change.
2. It must posit antecedent variables believed to cause the changes.
3. It must provide procedures where by the behavioural changes and the antecedent variables can be independently measured.

In this study, discrete items of behaviour were identified as undergoing age change. Now the next step is to take children who are presenting similar patterns and posit the antecedent variables believed to cause the changes. Then the procedures for independently measuring the antecedent variables can be devised. Only when these procedures have been developed will the change mechanism be explicitly explained. The operational definition can then be further devised to include more specific information about the intervention process.

Bruner (1978a) stated that language acquisition is a situation that relies on species specific abilities and on the child's interaction with the environment. In intervention practice more attention will need to be given to the type of communicative environment that is being provided in therapy situations and to the type of context sensitive rules that the child is applying. In order to function within this definition therapists will have to examine the constraints of the communicative contexts that they use. A clear understanding is needed of how these constraints operate to influence the specific item of behaviour that they have targeted as the

intervention goal. A therapist who wishes to work in this manner will find little to support the effort. There is little information in the research literature and few if any materials and equipment to help the therapist in this analytical task. Nor will the therapist easily find a peer group, as the prominent view of language development is that abilities are normally learned in an 'across the board' fashion. Variations from an even state of ability level is labelled as 'disordered' (College of Speech Therapists, 1988).

7.1.2. OBJECTIVE 2: TO DEVISE A TABLE OF SPECIFICATIONS.

The second objective was to use the theoretical guidelines to devise a Table of Specifications (ToS). A ToS is a transition stage between the literature and the constructed test. The purpose of a ToS is to provide a blueprint to ensure that the items are sufficiently balanced within the activities and content domains. Table 5.8 presented the content domains and the items as they are located on the line of inquiry. Each of the content domains will be discussed as to the balance of items, whether any gaps occur and whether there are any suggestions for refining the Table of Specifications. The indicators of a balanced progression of item calibrations within the content domains are:

1. There will be a logit and age range.
2. The items must show a progression within the logit and age range.
3. The logit range must be more than 0.30 logits.

7.1.2.1. The Content Domains.

1. Other Behavioural Domains.

This content domain includes items of behaviour that have been demonstrated in the literature to emerge and relate to language development. The calibrated items within this content domain fall within the -12.0 to +7.0 logit range which covers the 1;00 to 7;09 year range. There is a balance of items throughout the range with no

gaps occurring. The items are located within the age ranges suggested by the literature.

2. Early Communicative Interactions.

This content domain includes items of behaviour that are presented in the literature as demonstrating early communicative abilities. The items in this category mainly fall within the -9.0 to -7.5 logit range covering an age range of 1;00 to 1;03 years. Four items which were considered early communicative interactions actually fall outside of the range of the others. These items, from Activity 6, were: 9) indicating that an item was missing, 10) commenting on the missing item, 11) searching for the item with help of adult and 12) searching for the missing item by oneself. They fall within the logit range of -1.0 and 0.0 and within the age range of 2;06 to 3;00. This indicates that these four items are not as early appearing communicative interactions as the other items are and would be better placed with the symbolic communications. The other items fall within the same age range as suggested by the literature and provide a good indication of the location of early communicative interactions on the variable.

3. Comprehension.

This content domain includes behaviour that has been described as indicating comprehension abilities in children. The items in the comprehension category fall within the -9.17 to +5.0 logit range, covering the age range of below 1;00 to 7;09 years. The early comprehension items are at the below 1;00 range and the later comprehension items range from 1;09 to 7;09. The items are evenly spaced throughout this range. However, more comprehension items could be added to bridge the gap between the early ones appearing at less than a year and the ones appearing at 1;09 year. The age ranges are similar to those presented in the literature.

4. Symbolic Communications.

This content domain includes behaviour that has been

described as demonstrating an expressive language ability that has a symbolic knowledge base. The items in the symbolic communications category fall within the -5.0 to 0.0 logit range covering an age range of 1;09 to 3;00. The items are balanced throughout this range and fall within the same age range suggested by the literature.

5. Rule Based Linguistic Development.

This content domain includes behaviour that has been described in the literature as indicating the ability to use language according to rules of grammar. The items in this category fall within the -5.0 to +7.5 logit range covering an age range of 1;09 to 7;09. The items are balanced throughout the logit range and fall within the same age range suggested by the literature.

6. Interactive Dialogue.

This content domain includes behaviour described in the literature as indicating an ability to participate in interactive dialogue. The items in this range fell in the -3.0 to -2.0 logit range covering the age range of 2;03 to 2;11. A sparse number of items were created for this content domain but the location of them suggests further areas that can be filled in. More 'talk about' and 'interactive pretend play items' can be added using the information in the Tables 5.1--5.10 for guidance.

7. Oral Style and Literary Style Language.

This content domain includes behaviour described in the literature as indicating a use of oral or literary style discourse ability. The items in this range fell in the -4.5 to +7.5 logit range covering the age range of 2;00 to 7;09. The items were balanced throughout the range. There could be some additions of oral style language ability at the less than 2;00 year level.

8. Narrative Development.

This content domain includes behaviour that was described as indicating an ability to produce narratives. The items in this range fell in the -3.5 to +7.5 logit range covering an age range of 2;02 to 7;09. In this domain the

literature was less specific about exact developmental ages for emerging behaviour. The items were well balanced throughout the range and are similar to the ages suggested by the literature.

9. Aesthetics of Language.

This content domain was created for the inclusion of items that indicated that the child was using language to a very good degree to express thoughts. No items were created for this section. Now that each logit stage has been defined by the type of language abilities that appear within it, each logit stage can have its own criteria for aesthetics. When the next Table of Specifications is developed items can be created for this section using the information in Tables 5.1--5.10.

7.1.2.2. Was the Objective Achieved?

A Table of Specifications was created which presented the content domains and activities. There was sufficient information in the literature to provide items of behaviour for all of the content domains except for that of Aesthetics.

Now that the items have been placed on an interval scale of measurement the strength of the Table of Specifications can be observed in terms of the range and balance of the items along the scale. The literature supplied a wealth of information and there were very few gaps along the variable, but these now can be filled in with newly created items. By placing the items along the variable several opportunities have presented themselves for refining the detail within the Table of Specifications.

On the whole this Table of Specifications has a good range of items that are balanced throughout the variable and cover each of the content domains adequately. For each of the content domains there is a progression within the logit and age range and the logit range is more than

0.30 logits. This establishes a strong line of inquiry for the content domains.

The location of the calibrated items on the variable were similar to the ages given in the literature and these will be discussed more specifically in Objective Three when the activities are presented. In the creation of this variable, milestones have been presented for some items of behaviour where only suggestions of ages were given in the literature. In the content domain of Narrative Development, this was particularly true.

Now that the items have been located on the variable, a few areas within the content domains show some gaps, although these are few. In the domains of Comprehension and Interactive Dialogue there are some areas on the variable that are sparse. In the Oral Style Language domain, there are very few items of behaviour at less than the 2;00 year level. These gaps can now be filled in with new items to provide a balance through out the content domains.

In the Table of Specifications, the content domain of Aesthetics did not have any items created for it. Now that items within the other content domains have been specifically located on the interval scale, items can be created for this domain. Grice's maxims (that utterances can be judged for their truth, relevance, clarity and perspicuity) had provided a philosophy to which precise guidelines now can be applied. Table 5.9 presents the Item Bank. This Item Bank provides a description of how children who had been deemed to have a good standard of language development had communicated. The judgements of truth, relevance, clarity and perspicuity can be applied to each logit range or each age norm range. By doing this a standard for each logit range or each age norm range can be established. This means that the standard for Aesthetics is child language development at each stage rather than using the adult model as the comparison.

A specific area of Aesthetics is the number of errors that the children make. Although error analysis was not part of the original Table of Specifications, a careful reviewing of the data shows that the children made a number of errors in their choice of lexical, syntactic and morpheme elements; even at the age of 7;09. The type of errors were interesting and demonstrated some unexpected events such as, even the children with very high scores were making errors in 'he/she' pronoun distinction. Therefore, a review of the data for type and number of errors should take place and a section created within the Aesthetics content domain should be made for them. This would allow for an analysis of the developmental progression of error production within specific contexts to be made.

In the original selection of items, the only measurement guide that could be used was age. This measurement guide was used in two ways: 1) when items were selected from the literature, age norms were used to place the items within the Table of Specifications, and 2) upon selection, the children were grouped within an age range and the data was reviewed for emerging behaviour within this classification. Now that the person measures and item calibrations have been located on the variable the subjects and items can be re-grouped by their score location on the variable. This makes it possible to use logit groups as a measurement guide. Now, the subjects can be re-ordered by their scores and the original data can be reviewed to search for the emergence and disappearance of behaviour occurring over the range of the variable. This type of data review would be of specific value when analysing the developmental progression of the type and frequencies of error production that was occuring.

The Table of Specifications can be further refined through a redevelopment of the matrix so that the logit ranges are included. A matrix can be created from the logits and activities. The content domains can become

13. Where's Teddy?

	-5	-4	-3	-2	-1
	1;09-1;11 X X	2;00-2;02	2;03-2;05 X	2;06-2;08 X	
Syntax		6 7	10	8	
Comprehension	1 2 5	3			
Interaction	1 2 5	3	13 12 15 14 11		
Pretend Play			13 12 15 14 11		

TABLE 7.1: ACTIVITY MATRIX OF LOGIT AND ABILITY DIMENSIONS.

NON-VERBAL: COMBINING OBJECTS

LOGITS	-8	1;00 1;02 -7	1;03 1;05 -6	1;06 1;08	-5	1;09 2;00 1;11 2;02	-4
		X	X	X		X X	
FORM/PERSON SCORES							
A/		18 19	27 31 32 35	40 42 46 52		57 58 64 70	
B/							
C/							
ACTIVITY/ITEMS							
4/		2	3				
5/			4 2,5			6	
7/		13					
21/							

ACTIVITIES: 4/ Graded Doll; 5/ First Words Puzzle; 7/ Large Doll Play (container play only); 21/ Matching Prep. Pics.

TABLE 7.2: MATRIX FOR DIAGNOSTIC MODEL

subdivisions of the activities. These sub-divisions will be the ability dimensions that are being examined within the activities. The ability dimensions can then be examined to ensure a balanced and even spread of items over the logit range within each activity (see Table 7.1).

This would create a very precise Table of Specifications which would provide the descriptive means for very specific initial item selection and creation. Table 7.1 shows that this type of Table of Specifications highlights that the activity 'Where's Teddy?' falls within the age range of 1;09 to 2;08. The data from the subjects who are of this age range and of the subjects whose score is within this logit range can be reviewed to find the type of behaviour which is occurring at this stage. Not only the data from this activity but also the data from other activities might suggest other important items which should be included in scoring this activity.

As one of the aims of the project was to use the information in the literature to devise a clinical tool, the original Table of Specifications was designed for the theoretical constructs. However, now that the variable has been constructed, it is easier to summarise that wealth of information. It also is possible to devise a second Table of Specifications and use two Table of Specifications in conjunction. A Table of Specifications can be devised for the Diagnostic Model presented in Table 3.1 (see Table 7.2) and used with the Table of Specifications for the Theoretical Constructs (Table 7.1). With the information summarised specifically onto a linear variable two Tables of Specifications could easily be used in conjunction.

These two Tables of Specifications describe the data in terms of a comprehensive profile. This profile can be used for designing a score system that will describe, in psychometric terms, the variations in a child's performance. Howlin and Kendall (1991) suggested that

what was needed was a test battery that profiled a child's ability across several language dimensions. The type of scoring procedures that can be developed from these two Tables of Specifications would provide the means for profiling a child's performance across several verbal and non-verbal dimensions and across several communicative contexts within one test. To use this type of test effectively, people working in language intervention would need to accustom themselves to interpreting a profile battery. However, a test that would be devised from these Tables of Specifications would summarise the information more succinctly than a battery of individual assessments which were not statistically related.

7.1.3. OBJECTIVE 3: TO DEVISE A HIERARCHY OF STRUCTURED TASKS.

The third objective was to devise a hierarchy of structured tasks from 1;00 to 7;00 years. The tasks were selected to fit the communicative competence model.

The indicators of a balanced progression of item calibrations: within the activities are:

1. There will be a logit and age range.
2. The items must show a progression within the logit and age range.
3. The logit range must be more than 0.30 logits.
4. The Standard Errors of the item calibrations and person measures must indicate a line of inquiry.

The indicators of a balanced progression of item calibrations between activities are:

1. An age range from 1 to 7 years.
2. Logit range more than 0.30 logits.
3. The Standard Errors of the item calibrations and person measures must indicate a line of inquiry.

7.1.3.1. Entry Criteria Items Range.

There was one entry criterion item for data collection purposes but eleven more items have been added to it as they were passed by all the 40 children taking Form A. Their logit range is less than -11.38 and their age range is less than 1;00. This set is comprised of a variety of items that indicate that a child is aware of objects and people and is able to interact with each of them separately but is not yet coordinating people and objects together in play. This is similar to the object play, people play and object-people play age range suggested in the literature (Sugarman-Bell, 1978).

7.1.3.2. Test Activities.

The proceeding test activities then go on to demonstrate an increasing sophistication of being able to interact with objects and people, to combine people and objects together in play and an ability to communicate to people in various contexts and in various manners.

1. Rolling Rattle.

This activity was devised to observe early object play behaviour and early reciprocal object-people play with a noise making toy. Its logit range is -7.60 and its age range is 1;00. It has only one calibrated item: rolling the rattle to the adult. All the other items fell within the entry criteria range. This age range is similar to those presented in the literature by Bates (1979).

2. Pop Up Cone.

This activity was devised to observe early exploratory play with a toy that can be manipulated. Its logit range is -11.38 to -9.71 and its age range is 1;00 to 1;02. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. Two of its items were calibrated (Pushes puppet in and out, pushes stick in and out). The other two items fell within the entry level. These age ranges were

similar to those presented in the literature by Bates (1979).

3. Wind Up Moving Toy.

This activity was devised to observe means-end play and early 'request' making communicative behaviour. Its logit range is -11.38 to -6.49 and its age range is 1;00 to 1;05. The logit range has a difference of more than 0.30 logits, indicating a direction of movement on the line of inquiry. All items were calibrated with a good range. All fell within the 1;00 to 1;05 range. This was the expected age range as suggested by the literature (Bates, 1979).

4. Graded Doll.

This activity was devised to observe simple structured play with objects that fit together. Its logit range is -11.38 to -1.75 and its age range is 1;00 to 2;11. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The first three items (takes objects off stick, puts on, puts head on) all fell within the 1;00 to 1;05 range. Grading the rings was located at the 2;11 range. This was the expected age range as suggested by the literature (Bates, 1979).

5. 1st Words Puzzle.

This activity was devised to observe structured play with objects that fit together. Its logit range is -9.10 to -5.02 and its age range is 1;00 to 1;08. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. There is a good balanced range of behaviour all falling within the 1;00 to 1;08 year level. No specific ages had been given in the literature for this type of activity.

6. Matches Object To Pictures.

This activity was devised to observe specific matching behaviour and 'requesting' communicative behaviour. Its logit range is -4.90 to -0.75 and its age range is

2;03 to 2;11. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. It has a good range of behaviour that builds gradually from 2;03 to 2;11 years. The 'requesting' behaviour was at the 2;11 which complements the 'requesting' behaviour in Activity 3 which was at the 1;05 year level. The items generally follow the ages given in the literature (Piaget and Inhelder, 1969; Nicolich, 1975; Bates, 1979,) except for the 'request' behaviour which show up at earlier ages in the literature. This discrepancy is probably due to the differences in experimental design. In the literature early requesting behaviour is observed in natural settings while this is a formal testing situation and probably somewhat inhibiting.

7. Large Doll Play.

This activity was devised to observe play behaviour with large doll toys. The play behaviour includes early combining play, functional play, social play and pretend play. Its logit range is -9.90 to 0.00 and its age range is 1;00 to 2;11. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. This activity had a good balance of behaviour that built from simple object play to more interactive pretend play with the majority of items falling within the 1;03 to 2;02 year range. The items that were above the 2;02 year level were the more interactive pretend behaviour such as pouring out 'more' or blowing because the drink was 'hot'. Basic sentences and mature sentence forms were at the 2;11 year level. These ages were similar to those presented in the literature (Nicolich, 1975; Bates, 1979).

8. Miniature Toy Play.

This activity was devised to observe symbolic representation play when playing with miniature people toys, to observe the organisation of play space and the child's maintenance of that play space even when disruptions and adult comments occur. Its logit range is

-4.43 to -0.80 and its age range is 1;09 to 2;11. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items in this activity showed a balanced progression from 1;09 to 2;11 months with the majority falling in the 1;09 to 2;05 year range. No specific ages were given for these particular items, however, the ages fall within the general ages suggested in the literature by Piaget and Inhelder (1969).

9. Follows Simple Directions.

This activity was devised to observe the child's ability to respond accurately to specific commands from the adult. Its logit range is -3.48 to -2.75 and its age range is 2;03 to 2;08. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. Even though the items in this activity fell into less than one logit range they still demonstrated a progression of item difficulty. This age range was similar to that indicated in the literature by Chapman (1978).

10. Points To Body Parts.

This activity was devised to observe the child's ability to point to named body parts. Its logit range is -4.08 to +2.25 and its age range is 2;03 to 4;11. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items demonstrated a balanced progression of item difficulty with the majority of items falling within the 2;03 to the 2;11 age range. Only two items fell in the 4;00 to 4;11 range and those were 'point to your nostril' and 'nine correct answers'. The items fell into age ranges that had been indicated in the literature by Chapman (1978).

11. Does Actions.

This activity was devised to observe the child doing physical actions accurately to specific commands from the adult. Its logit range is -3.48 to -0.50 and its age

range is 2;03 to 3;05. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. These items demonstrated a balanced progression of item difficulty from 2;03 to 3;05 years. The items fell into age ranges that had been indicated in the literature by Chapman (1978).

12. Points To Action Pictures.

This activity was devised to observe the child's ability to identify action pictures by pointing to the actions when they are named by the adult. Its logit range is -4.43 to -3.48 and its age range is 2;03 to 2;11. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items fall within 1.00 logit but they demonstrate a progression of difficulty. The age range is similar to that described in the literature by Chapman (1978).

13. 'Where's Teddy?'

This activity was devised to observe the child's ability to look at a book, listen to the story being read and talk about the pictures and the story. Its logit range is -5.13 to -2.85 and its age range is 1;09 to 2;11. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items show a steady progression of difficulty. No age ranges had been given in the literature.

14. Early Communication.

This activity was devised to observe early communicative behaviour. Its logit range is -9.10 to -6.79 and its age range is 1;00 to 1;08. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items cluster in two main groups with one item falling in between. The first cluster is at the -9.10 logit which falls below the mean of the 1;00-1;02 age range. This

cluster has to do with making a range of sounds. The second cluster is at the -6.79 logit which is below the mean of the 1;03-1;05 age range. This cluster has to do with using sound as meaning. The item that falls between has to do with using gestures and nonverbal expression. Although the items cluster in two groups no gap is apparent and a balanced progression of item difficulty is indicated. The age ranges are similar to those given in the literature by Bates (1979).

15. Early Comprehension.

This activity was devised to observe early comprehension behaviour. Its logit range is -9.71 to -9.10 and its age range falls below the mean of the 1;00-1;02 age range. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. A balanced progression is indicated and the age range is similar to that given in the literature by Bates (1979) and Chapman (1978).

16. Stripey Kitten Gets Stuck.

This activity was devised to observe the child's ability to sit and listen to a sequence story picture that is being presented in a question and answer format. Its logit range is -2.61 to +7.34 and its age range is 2;03 to 7;09. The logit range has a difference of more than 0.30 logits, indicating a direction of movement on the line of inquiry. This is the first activity to be administered where a complex set of integrated behaviour is presented and expected. The item difficulty scores indicate a balanced steady progression throughout the logit range. The easiest items were replying in single and two word utterances, answering 'yes' to the question 'Did they get the cat down?' and pointing to the kitten in response to 'Where's the stripey kitten?' These fell in the 2;03-2;11 age range. The majority of the questions were answered correctly by the 3;00-3;11 age range (with the use of non-specific vocabulary and elliptical sentence structures). In the 4;00-4;11 age range, the answers became more specific with precise vocabulary. In

the 5;00-5;11 and 6;00-6;11, year age range the questions that required making inferences by linking details in the pictures were answered correctly. In the 7;00-7;09 plus age range, complex sentences were used more frequently in the answers. No specific ages had been given in the literature for this type of task.

17. The Dragon And The Birthday Party.

This activity was devised to observe the child making up a story when presented with a picture. Its logit range is -2.82 to +6.90 and its age range is 2;03 to 7;09. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items demonstrate a balanced progression of difficulty. The easiest items are using single word utterances and indicating the beginning of a narrative through the use of decontextualised language. In the age range of 2;03 to 2;11, the children demonstrated an ability to use two word utterances and basic sentences, to focus on a topic, to have no unrelated utterances, and to state related actions which elaborated the topic event, but they did not indicate a time sequence. In the 3;00-3;11 age range, they were able to use the conjunction 'and', to indicate a time sequence for the events and use complex sentences. In the 4;00-4;11 age range, they were able to use cohesive syntax markers to help tie the meaning together in the story. The event was further elaborated by the subject doing several actions that were related to the topic. In the 6;00-7;09 age range, there was an introduction of a problem and a story introduction, the story events had a causal link. In the range that fell above the 7;00-7;09 age mean, the children were able to use direct speech, their conjunctions became more specific, their use of vocabulary became more specific, and the events became goal based with story resolutions and character reactions. Although many articles compare the narratives of age groups no specific ages had been given for the majority of the items in this activity.

18. Prepositional Commands.

This activity was devised to observe the child responding accurately to commands which have prepositions in them. Its logit range is -3.85 to +3.90 and its age range is 2;03 to 7;09. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items show a balanced and steady progression of difficulty. One item 'Put the cat in the bath' appears much earlier than the others at a logit point below the mean of the 2;03-2;05 age range. The next item 'Two correct answers' appears at the logit point of the mean of the 2;06-2;11 age range. The majority of the items fall between -0.79 and +3.90 logit range and 3;00-7;09 age range. These age ranges follow those given in the literature by Chapman (1978).

19. Selects By Function.

This activity was devised to observe the child's ability to select and point to a picture when it is described by its object function. Its logit range is -3.71 to +0.90 and its age range is 2;06 to 3;11. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items fall in a balance and steady progression of difficulty. The items are similar to those given in the literature by Chapman (1978).

20. Points To Small Action Pictures.

This activity was devised to observe the child's ability to select and point to small pictures depicting actions. Its logit range is -2.90 to -2.25 and its age range is 2;03 to 2;11. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. These items fall within a very narrow logit band but still indicate a balanced progression of difficulty. The age range is similar to that presented in the literature by Chapman (1978).

21. Matching Preposition Pictures.

This activity was devised to observe the child's ability

to match pictures which depict the same subject in two different places. Its logit range is -2.45 to +0.75 and its age range is 2;06 to 3;05. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items show a balanced and steady progression within the 2;06 to 3;05 year range. The picture card with eight pictures depicting a cup, cat, baby and teddy either on or under a table was easier than the four picture card depicting a big or little teddy in or on a car. The teddy and the baby placed on or under the table and five correct answers with the eight picture card were the easiest. These items fell within the AB link. The cat and cup on or under the table and six correct answers with the eight picture card were the next easiest. The big or little teddies on or in the car were the hardest. The ability to achieve three or four correct with the big/little teddies in/on the car distinction pictures fell near the four year old range. No age ranges are given in the literature for this type of activity.

22. Broken Cup/Broken Bed.

This activity was devised to observe the child's ability to answer questions about two broken objects. The objects provide a focus of attention but the answers are drawn from the child's knowledge about the world. Its logit range is -1.79 to +1.25 and its age range is 2;06 to 4;05. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items demonstrated a steady progression of difficulty. Stating that the items were broken was the easiest. Stating the consequences and how to mend the item was the next most difficult, with stating what they would do about the consequences being the most difficult item. The ages are similar to those presented in the literature by Chapman (1978).

23. Sequence Pictures: Running.

This activity was devised to observe the child's ability to relate a simple action story when the main events are

depicted in three pictures. Its logit range is -2.50 to +4.80 and its age range is 2;06 to 7;09. The logit range has a difference of more than 0.30 logits, indicating a direction of movement on the line of inquiry. The items indicate a balanced and steady progression of difficulty. The abilities that were located below the mean for the 3;00-3;05 age group were: elaborating the event; all utterances were spoken as if telling a story; all utterances were about the topic; the actions had an event-time sequence with the main ideas of running and falling present. The abilities that fell between the means of 3;00-3;05 and 4;00-4;05 were: the events had a causal link and the main ideas of 'helping up' and 'hurt' were present. At the 7;00-7;09 age level, the child was able to state the subject and have them do three different actions that were related to the topic. No specific ages were given in the literature for this type of activity.

24. Picture Description Book.

This activity was devised to observe a child's ability to talk about pictures which require different types of cognitive ability to understand. Its logit range is -3.25 to +7.25 and its age range is 2;03 to 7;09. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items show a steady progression of difficulty but they mainly fall between the 0.00 and +4.00 logits with an age range of 3;00 to 7;09. Below the mean for the age group 3;00-3;05 the abilities were: using a phrase structure or basic sentence, stating 1-4 nouns in a simple picture description, describing one of the silly pictures, stating what's going to happen and what happened and stating why a person is cold. Between 4;00 and 5;11 the majority of the questions are answered correctly. After 5;11 years the children used more specific vocabulary and syntax and longer sentences. Although these type of activities are used frequently in therapy no specific ages were given in the literature.

25. Green Cross Code.

This activity was devised to observe the child's ability to use his or her knowledge about the world to talk about a picture of an impending event. Its logit range is -2.90 to +7.25 and its age range is 2;06 to 7;09. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items show a balanced and steady progression of difficulty. The easiest item was located near the mean for the 2;06-2;11 age range and that was responding 'The boy is going to be hit' to 'What's going to happen?' The next most difficult was 'What will happen?' ('The ambulance will come'). The majority of questions are then answered correctly between the ages of 3;00 and 4;05. The older children used longer sentence structures and more specific vocabulary. No specific ages were given in the literature for this type of activity.

26. Sequence Picture: Balloon.

This activity was devised to observe the child's ability to relate a story which is depicted in four pictures and to observe the ability to make inferences. Its logit range is -0.75 to +5.75 and its age range is 3;00 to 7;09. The logit range has a difference of more than 0.30 logits, indicating a direction of movement on the line of inquiry. The items show a balanced steady progression of item difficulty. The majority of the items fall within the 3;00 to 4;05 age range but two items, the use of 'or, but' and 'because' are located above the 7;00-7;09 age mean. No specific ages were given in the literature for this type of activity.

27. Sequence Picture: Finds A Dog.

This activity was devised to observe the child's ability to retell a story which is depicted in pictures. Its logit range is -1.60 to +5.50 and its age range is 2;06 to 7;09. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items show a balanced and steady progression of item difficulty. The majority of

items are located between the 3;00 and 4;05 age means. The use of a basic sentence is located near the 2;11 age mean and the use of specific conjunctions are located above the 4;05 age mean. No specific ages were given in the literature for this type of activity.

28. Sequence Picture: Dog Follows Him To School. This activity was devised to observe the child's ability to relate a story which is depicted in five pictures. This story has abstract ideas depicted in the drawings. (The dog sniffing to search for the boy, the dog is missing the boy and the dog is thinking about the boy.) Its logit range is -0.50 to +7.25 and its age range is 2;06 to 7;09. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items show a steady and balanced progression of item difficulty. The item 'all utterances are about the topic' is located below the 3;00-3;05 age mean. The majority of items are located between the means for the 3;00-7;09 age groups. The items that pertain to abstract ideas are located above the 7;00-7;09 age mean. The items that are located as the most difficult are the specific conjunctions. No specific ages were given in the literature for this type of activity.

29. Sequence Picture: Dreams Of A Space Flight. This activity was devised to observe the child's ability to relate a story which is depicted in five pictures and has a nonvisual state ('dreaming of the event'). The child has to infer this in order to explain the sequence of events. Its logit range is -1.50 to +7.25 and its age range is 2;06 to 7;09. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items show a steady and balanced progression of difficulty. The majority of the items are located between the age means 3;00 to 7;09. The easiest item is located below the 3;00-3;05 age mean and is the ability to use one basic sentence. The gist of the story is then presented at the 4;00-4;11 age range with the crux of the story--that it

is all a dream--located at the 6;00-6;11 age range. No specific ages were given in the literature for this type of activity.

30. Man Fighting A Dragon.

This activity was devised to observe the child's ability to make up a story. The picture provided a dramatic scene which did not indicate any character development--it was up to the child to decide what was happening and why the characters were fighting. Its logit range is +1.10 to +7.25 and its age range is 4;00 to 7;09. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items show a steady and balanced progression of difficulty with all of the items falling between the 4;00-4;05 age mean point and the end of the scale. No specific ages were given in the literature for this type of activity.

31. Story Completion.

This activity was devised to observe the child's ability to complete a story. Its logit range is -0.50 to +6.90 and its age range is 3;00 to 7;09. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. The items show a balanced and steady progression of difficulty. The logical-temporal structure of the story is established by the 5;00-5;11 age mean. The more difficult items were the more specific use of conjunctions. No specific ages were given in the literature for this type of activity.

32. Relating A Personal Story.

This activity was devised to observe the child's ability to relate something that he or she has done. Its logit range is +0.50 to +6.90 and its age range is 3;00 to 7;09. The logit range has a difference of more than 0.30 logits indicating a direction of movement on the line of inquiry. These items group into three clusters. At the 3;00-3;11 age mean location are the items of 'listing the days activities', using one complex sentence and using

the conjunction 'and'. The items pertaining to the logical-temporal structuring of the day are located at the 5;00-7;09 age mean. The items pertaining to the use of more specific conjunctions and the stating of expectations for the day are located above the 7;00-7;09 age mean. No specific ages were given in the literature for this type of activity.

7.1.3.3. Was the Objective Achieved?

A hierarchy of tasks was developed. The activities all showed a progression of difficulty through the logit range and age range. The spread of the standard errors (shown in Tables 5.1 and 5.2) indicates a line of inquiry. Between activities there was also a progression of difficulty over the 1;00 to 7;00 year range which was shown by the logit range, age range and through the spread of the standard errors. This indicates a line of inquiry for the hierarchy of tasks.

The activities draw upon several dimensions of language and the items represent a wide range of abilities. The discrete items of behaviour in the literature have been well represented and provide a variable that is balanced through the content domains and through the activities. Together they create a well balanced Table of Specifications.

The activities were selected and created so that they would represent life in Britain. No one class or cultural group was overly presented and Black and White people, males and females were represented in various roles in order to promote a positive self image. Several of the Black children who were assessed commented favourably on the roles of the Black people in the pictures. One child was pleased that a Black fireman had rescued the stripey kitten and another child said of the Black man fighting the dragon 'I wish I was him'.

All the schools and the majority of the nurseries were involved in anti-racist practice programmes. The comments from the schools and nurseries about the materials were all favourable and the materials were approved for use within their establishments. Only one negative comment was offered. The comment was about the picture depicting the family trying to reach the kitten stuck in a tree. The person suggested that this depicted a dangerous situation and that it should be redrawn with health and safety issues in mind.

The activities do however only represent mainstream British life and would not be effective for assessing children who were living in a culture that was very different from the wider culture of British life, even if they were living in Britain. This is especially true for the younger children. As the child reached preschool age and the parents wanted the child to attend mainstream school then the activities would become more appropriate to the expectations for the child.

The activities created a communicative situation which easily elicited the desired items of behaviour from the children. There was high degree of 'talkativeness' from the children and they chatted in a lively manner. It was the investigator's impression that the children found the materials acceptable and pleasing (fun). The administration of each of the three forms was easy and not time consuming--generally taking around twenty to thirty minutes. The transcribing and scoring then took another twenty to thirty minutes.

The activities follow a developmental sequence which has been demonstrated through the logit and age ranges for the content domains and for the activities. The activities are varied and this provides on one variable many dimensions of language. This reduces the number of tests that would be needed within a battery of tests. Syntax, semantics, various types of play and thought development have all been assessed. Several features of language development, such as a sequence of emerging

items of behaviour, the variations in the emergence of language forms between contexts and the frequencies of utterance types, have been placed on an interval scale. The activities provide a robust profile of language ability.

The combination of nonverbal and verbal contexts into the same test is not usual. These two domains are generally assessed on separate tests and the tests available for speech therapists to use are limited in content. Yet, a distinction between the two abilities is required for diagnositic purposes (Rutter and Mawhood, 1991). Therefore, an assessment which provides a continuum of the development of abilities in early nonverbal play up to tasks which require logical thought processes in a verbal task is novel. It also fills some of the gaps that have occurred in the current test battery.

The addition of narrative development in a standardised test is also novel. The narrative development section provides some very much needed developmental milestones. The majority of assessments used for language intervention only look at the formation of sentences. An examination of narratives creates the possibility to extend language therapy beyond sentence production and into the type of language that is required in early education. This type of complex language processing has been found to be especially useful in identifying children with language learning difficulties (Bishop and Edmundson, 1987; Howlin and Kendal; 1991). It is also an area that has the least developed psychometric tests in terms of both content and psychometric foundations.

7.1.4. OBJECTIVE 4: TO OBTAIN PERSON AND ITEM SCORES FOR THE TASKS.

The purpose of objective four was to place the hierarchy of tasks into data collection forms, to make observations and record the person and item scores for the tasks.

7.1.4.1. The Data Collection Forms.

The first step was to create three data collection forms that had a progression of item difficulty from 1;00 to 7;00 years. The three forms were created so that each form could be given to one of the age groups and then the three forms would later be linked through analysis. The estimate of where the items would be placed was generally good as 322 of the 521 items were calibrated on to the variable. 199 items were eliminated from the calibration analysis. There were five ways in which the items came to be eliminated: 1) the items were either passed or failed by all of the children, 2) on some of the items, the younger children scored passes but the older children did not, 3) due to underestimating or overestimating the age group that they were given to, 4) due to items falling within the link range but in one of the forms the children all performed the item correctly, and 5) due to inadvertently overlooking the items. In this section the activities with eliminated items will be reviewed to find the reasons as to why items were not calibrated.

1. The items were either passed or failed by all of the children. Seven items were failed by all the children taking Form C; this indicates that these items are beyond the range of this line of inquiry.

2. The younger children scored passes but the older children did not.

17. The Dragon and the Birthday Party

'Item 17. Repetition of actions'. The younger children would introduce an action and then have several of the subjects carry it out. This also happens to be a pattern that shows up in books for younger children. The older children did not state this type of pattern as they went on to evolve the actions rather than just repeat them. This item now can be included but within a rating scale scoring procedure that notes its disappearance.

3. Item elimination due to overestimating the age group. These items should have been presented to the younger children.

21. Matching Preposition Pictures.

The scores for this activity fell within the age range of 2;06 to 3;05. However, the activity was presented on Form B for the 3;00 to 4;11 year olds. The items that were too easy for Form B fell within the AB link range but they could not be used as link items as the activity had not been present on Form A.

22. Broken Cup/Broken Bed.

The scores for this activity fell within the age range of 2;06 to 4;05. However, the activity was only present on Form B. Some of the items were too easy for Form B, falling within the AB link range. Number 3. 'clean it up' was too difficult and fell within the BC range.

23. Sequence Pictures: Running.

The scores for this activity fell within the age range of 2;06 to 7;09. The activity was only present on Form B, however, some of the scores fell in AB and BC range.

24. Picture Description Book.

The scores for this activity fell within the age range of 2;03 to 7;09. The activity was present on Forms B and C, but three items fell in the AB link area.

25. Green Cross Code.

The scores for this activity fell within the age range of 2;06 to 7;09. The activity was present on Forms B and C, but one item fell in the AB link area: 'What's going to happen?'

27. Sequence Picture: Finds a Dog.

The scores for this activity fell within the age range of 2;06 to 7;09. This activity was present on Form C only, but one item fell in the AB range and ten items fell in the BC range.

28. Sequence Picture: Dog Follows Him to School.

The scores for this activity fell within the age range of 2;06 to 7;09. This activity was present on Form C, but one item fell in the Form B range and seven fell in the BC range.

29. Sequence Picture: Dreams of a Space Flight.
The scores for this activity fell within the age range of 2;06 to 7;09. This activity was present on Form C, but one item fell in the AB range and seven fell in the BC range.

30. Man Fighting a Dragon.
The scores for this activity fell within the age range of 4;00 to 7;09. This activity was present on Form C, but thirteen items fell in the BC range.

31. Story Completion.
The scores for this activity fell within the age range of 2;06 to 7;09. This activity was present on Form C, but two items fell in the Form A range and six items fell in the BC range.

32. Relating a Personal Story.
The scores for this activity fell within the age range of 3;00 to 7;09. This activity was present on Form C, but four items fell in the BC range.

Item elimination due to underestimating the age group. These items should have been presented to the older children.

4. Graded doll.
The scores for this activity fell within the age range of 1;00 to 2;11. This activity was only on Form A, however the ability to grade the objects when replacing them on the stick fell in the AB range.

6. Matches Object to Pictures.
The scores for this activity fell within the age range of 2;03 to 2;11. This activity was present on Form A, but all of the items fell in the AB range.

7. Large Doll Play.
The scores for this activity fell within the age range of 1;00 to 2;11. This activity was present on Form A, but two of its items fell within the AB range.

8. Miniature Toy Play.
The scores for this activity fell within the age range of 1;09 to 2;11. This activity was present on Form A, but the items indicating more advanced pretend play (such as 'flying plane', 'putting cup and teapot on table' and 'washing baby') fell in the AB range.

9. Follows Simple Directions.

The scores for this activity fell within the age range of 2;03 to 2;08. This activity was present on Form A, but seven out of the nine questions fell in the AB range.

10. Points to Body Parts.

The scores for this activity fell within the age range of 2;03 to 4;11. This activity was present on Form A, but one of the items fell in the BC range.

13. 'Where's Teddy?'.

The scores for this activity fell within the age range of 1;09 to 2;11. This activity was present on Form A, however, the pretend activities fell in the AB range.

4. Some link items were eliminated due to children on one form scoring all correct on them. The items were then cancelled out of the link analysis.

11. Does Actions.

Form B scored all correct on two of the items which fell in the AB range.

19. Selects By Function.

Four items were scored all correct on Form B but the children taking Form A found them too difficult.

20. Points to Small Action Pictures.

The children taking Form B found them too easy and the children taking Form A found them too difficult.

5. A couple of items which should have been calibrated were accidentally overlooked.

10. Points to Body Parts.

Two items, 13 and 14, were overlooked.

24. Picture Description Book.

Two items, 11 and 13, were overlooked.

7.1.4.2. Subject Selection.

The subjects provided a good basis for calculating person ability. Although the older age groups were lacking people in the higher household economic category and the verbal requirements of parental occupation category the

langauge samples from this group were of a very good standard. The reason for selecting the subjects was that a group of children representing only a middle class professional background was not wanted; a cross section of backgrounds was wanted. This was achieved.

7.1.4.3. Reliability Studies:

Subjective scoring decisions provide an area for the most inter-rater reliability problems (Goldwin, Sawicki and Franzen, 1984). The majority of the tasks did not involve subjective scoring decisions. However, scoring narratives does involve rater judgements. Therefore, one of the narrative tasks, 'The dragon and the birthday party' was selected for inter- and intra- rater reliability studies. The inter-rater reliability study was carried out under difficult circumstances. The investigator had collected the data and transcribed it. The two other raters were given typed copies of the transcripts and the scoring criteria. No training was given for the task, they did not have experience in scoring narratives and they did not discuss their decisions with each other. In spite of these difficulties, the reliability study results were good ranging between 88%-98%. The highest, 98%, was the intrarater reliability result. The lowest, 88%, was the interrater reliability result achieved between the two other speech therapists.

7.1.4.4. Was the Objective Achieved?

The objective 'to obtain person and item scores for the tasks' was achieved. Observations were collected successfully from 137 children representing a cross section of backgrounds and their responses resulted in 521 items being scored with 322 items being calibrated.

The reliability results were good and the difficulties inherent in the conditions under which it was examined indicates that the reliability levels for the other tasks

would be at least as good. Although the speech therapists did not have prior training with the task, they do come from the same training background--that of speech therapy. Whether other professionals, who would be giving a test of this nature to children, would attain the same inter-rater reliability score with out training needs to be investigated.

The social background of the subjects reflected the social status found in schools in London and its surrounding environment. The subject selection provides a good norm for use with children in this area. The fact that the age ranges for the content domains and for the activities are similar to those in the literature suggests that the test is probably more robust than merely representing London and its environs. However, the population used for this test is not merely drawn from white professional classes which was a criticism of the methodology in the literature.

The presentation of the results showed that some of the items of behaviour were not calibrated and indeed some of the activities did not make it onto the variable because of this. The placement of the non-calibrated items with the calibrated items in the item bank (Table 5.9.) presents the suggested ages for the items within the context of this unit of measurement, but the non-calibrated items are not part of the calibrated item pool.

The selection of the items for the forms was guided by the age norms given in the literature on language development. Some of the differences in age norms have occurred due to differences between the contexts of the activities under investigation in this study and the contexts of the experimental designs in the research. It does provide a warning for uncritical acceptance of age norms and applying them outside of the experimental designs in which they were first established. However, by using a precise Table of Specifications, such as the one

described in section 7.1.2.2., the possibilities for making these types of errors would be substantially reduced. In some of the activities, the calibrated items were located above or below the age range they were given to. It is the investigators opinion that these may not be stable locations and should only be used as a guide. It is the investigators opinion that only the items which calibrated within the age range to which they were given are the most stable.

Another reason for items not being calibrated was due to the pattern of emergence and disappearance occurring within the data. Within the data used for this analysis, there were a few examples of items that the younger children passed but the older children failed. The data on language and pretend play collected in the piloting stage strongly demonstrated these traits. These examples of disappearance did not simply occur due to variations in ability within age groups; they did indicate patterns of skill development. Even when the subjects were reclassified into logit groups the items still disappeared as the children grew more skilled. The data which indicated disappearance was removed from the study as it did not fit the underlying assumptions to the Rasch model, but now the data can be reviewed to search for the behaviour which replaces the items that disappear and can this can be included in further test constructions. Rating scale and retrospective scoring is possible with the Rasch model and can account for the traits of emergence and disappearance. Discovering the emergence an disappearance of behaviour is an iterative process but, with the use of logit locations on an interval scale, these events are more easily revealed.

7.1.5. OBJECTIVE 5: TO ANALYSE THE SCORES SO THAT A VARIABLE IS CONSTRUCTED.

In the process of applying the Rasch mathematical model the person and item scores are transformed into person ability measures and item calibrations. These construct the variable. The purpose of constructing the variable is

to create a line of inquiry marked in linear units from which one can make stable generalisations.

7.1.5.1. Constructing the Variable.

Data was collected from one hundred and forty one children. Of these, one hundred and thirty seven children were used in the analysis. The analysis of the scores was straight forward, with the three forms linking to construct a variable.

Wright and Stone (1979) state that test forms can be linked with nine good link items and one hundred subjects. The link analysis of Form A to Form B had 24 good link items. The link analysis of Form AB to Form C had 34 good link items. If the items are providing a usable link the mean of their residuals should distribute around 0.0 and their standard deviation should approximate to 1. The of mean of the residuals for the link of Form A to Form B was -0.09 and the standard deviation was 1.01. THe mean of the residuals for the link of Form AB to Form C was -0.25 and the standard deviation was 1.78. These items provide usable links.

One analysis step was left out. This was the Analysis of Fit. The purpose of this step is make specific and objective decisions about items or persons who have implausible response patterns. At this point it was decided not to carry out this step of analysis due to three reasons, the sample size, the multidimensional aspects of the content domains and activities, and finally due to 199 items not being calibrated. Each of these reasons exaggerates the effects of implausible response patterns. Due to the multidimensional aspects of the content domains and activities an uneven response pattern was expected. It was also expected that an examination of the uneven response patterns would reveal important information.

7.1.5.2. Was the Objective Achieved?

A variable was constructed. This has created a unit of measurement which consists of a procedure in which observations can be collected and a variable to which the observations can be compared.

The link analysis demonstrated a good link between forms. The mean of the residuals should approximate 0.0 and with the standard deviation approximating 1. The two mean residuals were -0.09 and -0.25 and their standard deviations were 1.01 and 1.78 respectively.

An analysis of fit was not carried out because a unidimensional description of language development was not aimed for in the construction of the tasks. A multidimensinal aspect was wanted. Hashway (1978) states that it is possible to obtain Rasch item calibrations from a composite item pool without first performing a subtest breakdown. In fact the item calibrations offer important information to developing unidimensional subtest breakdowns. In section 7.1.2.2. a precise Table of Specifications was outlined. This creation of activity subdivisions of ability dimensions will provide a unidimensional scale within the multidimensional aspect. An even score pattern that fits the assumptions of the Rasch model is then expected within the subtests. The variable would then reflect the multidimensional aspect of language development and the subscoring would demonstrate that the assumptions underlying the Rasch model were fulfilled.

As the analysis of fit was not carried out on this data, it means that at this stage of the research, a test which could be used in the clinic has not been developed. However, the variable is stable enough to move on to the next step which is to define the variable as to the type of generalisations that can be made from it. It also is stable enough to pilot with two assessment case studies to demonstrate the relevance of the variable to the situation under investigation.

7.1.6. OBJECTIVE 6: TO DEFINE THE VARIABLE.

The variable has been constructed through the transformations of person and item scores into person ability measures and item difficulty calibrations. The variable is now a set of items which have been linked by locating them at linear intervals from 1;00 to 7;09 years. This line of inquiry is ready to be operationalised through its definition. A variable is defined through examining how the person measures and the item calibrations are located on it.

7.1.6.1. The Degree to Which the Data Has Given a Direction to the Variable.

A look at the spread of item difficulty calibrations and person measures with their standard errors indicates whether the variable is indeed a line of inquiry. The spread of item difficulty calibrations and person measures with their standard errors demonstrates that a direction is defined by the items and people. The item calibrations and person measures spread evenly over the logit range of -11.38 and +7.34.

7.1.6.2. The Degree to Which the Data Has Created a Balanced Variable.

A look at the spread of frequencies of the item difficultly calibrations and person ability measures demonstrates that, on the whole, the items create a balanced variable. With the item calibrations there is a balanced and steady progression. The person ability frequencies are not as balanced. Although there is not exactly a gap at the -3.00 to 0.00 logits range, it is, however, definitely more sparse there than in other locations.

7.1.6.3. Demographic Details:
The Norms and Standard Deviations.

The patterns of the age group norms present an interesting picture. In Table 5.5 the norms and standard deviations for three, six and twelve month age groups are present. From 1;00 to 2;05 the norms progressively increase at three monthly intervals. After 2;06 individual score variations cause the norms to vary rather than progressively increase. From 2;06 to 4;11 the norms progressively increase at six monthly intervals and from 5;00 to 7;09 the norms progressively increase at yearly intervals. These results are not out of line with other research results where in the early years differences are shown to exist between groups that are different in ages by, as little as, three months. In the toddler years milestones are usually given with six month differences, and in the early school years differences are usually given at a yearly intervals.

7.1.6.4. The Item Bank.

By placing the items at their calibrated positions, a definition of the variable is made explicit. It is the way the items within the activities evolve along the variable that documents what a measure on this variable means in practical terms. The logits indicate the difficulty level and the items placed within their activities along this line of difficulty provides the content and criterion referencing. Table 5.9 provides the line of inquiry with the items located on it. Each table presents 4 logits at a time. Following the table is a description of the language abilities that appear at those logits. An item bank has been established.

7.1.6.5. Individual Profiles.

A matrix was designed with the activities and the logits then the items of behaviour were located within the cells. This provided a chart on which a child's individual score pattern could be plotted (see Table 5.10). An analysis of each of the subjects individual

performance profile demonstrated that 75% of the children did not followed the even pattern that is considered normal by the assumption underlying the Rasch model. The assumption behind the model is that the easy items are more likely to be scored correctly and the difficult items are more likely to be scored wrong. No unevenness in score patterns is accounted for in the model. However, 75% of the children had gaps and strengths up to two standard deviations from their score point. This happened even though the mean for the age group fell half a standard deviation from the mean score point. However, as the test instrument was designed to be multidimensional an even pattern was not expected. The children's score patterns indicate that within normal development children vary as to how and when they develop the various skills that combine to make up their language abilities. This variation was less prominent in the early years but became more prominent in the older age groups.

7.1.6.6. Was the Objective Achieved?

The data indicates that a line of inquiry has been established. This line of inquiry has a steady progression of item calibrations and person measures. The spread of item calibrations and person measures with their standard errors present a balanced and even spread. The spread of frequencies of the item calibrations also presents a balanced and even spread. Only a slight sparseness is indicated at the 2;00-3;06 range by the frequencies of the person measures. Otherwise it is a steady, balanced and strong line of inquiry.

The area of sparseness can easily be taken care of by creating new items. A look at Table 5.4 shows that the AB link was too easy. The end of the AB link should have the age means of 3;00 years. Whereas the 3;00-3;05 mean is closer to the BC link. This indicates that more items need to be created for the 2;00 to 3;06 year level. An examination of the Table of Specification has suggested

that this would be taken care of by introducing more pretend play that uses language to help create the pretend context.

The norms and standard deviations for the age groups follows those found in the research literature. This indicates that the norms can be used as indicators for comparing individual assessment scores to the variable. The norms can also be used as guides for developing the variable further. Although the sample was small (140 children) the constructed variable can still be considered stable. Forster (1976) examined the reliability of item difficulty invariance between sample size when using the Rasch model. He found that groups of 50 compared with groups of 1,400 and 1,800 obtained a correlation of .9471.

In the past twenty years descriptive analysis of language has been advocated as a means of assessment. In fact in some cases some authors have advocated that it is the only meaningful assessment (Lund and Duchan, 1983; Lahey, 1990). They suggest that the ages presented in the literature should be used as norms. However, this is unsatisfactory as the situations in which the language samples have been collected in the research experiment and in the clinic are not the same. With the creation of this Item Bank, a connecting of descriptive analysis and psychometrically based assessment has become possible. This is made possible because both item and person scores are located on the variable. This aspect of item analysis is unique to the Rasch model.

The Item Bank provides the benefits of descriptive analysis. As the Item Bank is part of the variable and the variable is part of a process, it must always be reviewed to make sure that the items that constitute the Item Bank really are useful to intervention practice. As it is part of a unit of measurement, the item bank is not a classification system which can stand on its own. While a variable is the approximate of a latent trait,

the item bank is the means for making a practical application of the variable.

Through the use of an Item Bank, connecting descriptive analysis and formal assessment becomes possible and through the use of profiling, individual patterns now can be linked to the normal continuum as it is presented on the variable. The individual profiles provide the means for programme planning through content and criterion referencing. Each task is specific and the placement of the child's scores on the variable provides an individual pattern that indicates the strengths and weaknesses of the child's performance. This leads to a specific diagnosis which provides a description of abilities and indicates therapy aims. Each activity presents a different communicative context and within each context, different language abilities have been drawn upon. In this study the contexts were profiled but it has become apparent throughout the study that the ability dimensions also need to be profiled.

The creation of subdivisions within the activities for the ability dimensions provides a means for devising a very specific scoring system. Raw scores can be obtained for the total assessment, each of the activities and each of the ability dimensions. Each raw score could have its own norm age related score and standard deviation. This would provide on one variable a very comprehensive statistically related score system within one assessment procedure.

In this study, patchy score patterns on the individual performance patterns were the rule. This means that variation between contexts and ability dimensions was the rule. Rasch (1960, 1980) found the same situation when assessing Reading ability. When assessing a complex skill which is comprised of many abilities, (such as 'reading', 'language' or 'arithmetic skills') patchy score performances are more likely to occur than when assessing a discrete skill using a very tight unidimensional category system. Hashway (1978) stated

that it was possible to obtain Rasch item calibrations from a composite item pool. The unidimensional aspect was sufficiently robust to encompass a global trait such as 'arithmetic skills'. The variable obtained from the item calibrations and person measures was substantial. Rasch solved his problem of patchy score patterns by subscoring a test such as has been suggested in section 7.1.2.2.

Interestingly, Rasch found that the able subjects were prone to patchy score patterns more than the average subjects. This does raise the question of how much variation between tasks is the norm? Or more importantly, which type of variations indicate a need for intervention. If each activity sub-division of ability dimensions were normed and had age related scores with their standard deviations and they were also all located on the same interval scale then the amount of variation could be charted within the normal population. To have a norm and standard deviation for each sub-division would offer the opportunity to determine precisely the amount of variation that is normal and the amount of variation that indicated a problem which warrants intervention. A very precise comparison to the normal continuum of the scores for the ability dimensions of a child with language difficulties could be made. The contexts and the types of behaviour they elicit can be viewed on the profile. The contexts can be noted as to whether the child found them difficult or easy. This would provide a very precise assessment that would identify problems through comparing the variations between contexts and language dimensions. A diagnosis could be made as to what were the child's strengths and weaknesses. The progress of intervention could be monitored through comparing the improvement in the various areas and through comparing the improvement to the normal continuum. This type of information could be used for curriculum planning as well as for intervention planning. Through profiling responses on the individual performance profile a plan for language learning can be interpreted.

The variable has been defined in such a way that it can be used to measure in both a quantitative manner and a qualitative manner. The quantitative manner provides a score and that score can be used to compare the child's performance to other children of the same age. The qualitative manner provides a description of abilities that the child is doing, by profiling the child's performance across tasks. It also provides a means of comparing that profile to the normal continuum so that a descriptive analysis can be carried out as well. A unit of measurement has been created which can be piloted with children who are presenting with language learning difficulties.

7.1.7. OBJECTIVE 7: TO USE THE UNIT OF MEASUREMENT TO ASSESS TWO CHILDREN.

7.1.7.1. Case Study 1.

The first case study was of Shaun, and it provided a longitudinal study of three assessments with therapy management. Shaun first presented as a child whose performance was very much delayed compared to children of his own age but over the eighteen months of therapy he made good progress. His mean age equivalent score started at 2;03-2;05, which was 1;04 months below his chronological age, and developed to 4;11-5;00, which was age appropriate. There were several interesting features to this study. One was the use of standard deviations and the other was the application of score invariance which is a characteristic of the Rasch model.

At the initial assessment Shaun was 3;09 but had an estimated language ability of around 2;05. In fact the over all manner in which he played was so much delayed that he was unable to take the test for three to four year olds. The Rasch model allows for the linking of test forms onto one variable. This means that a comprehensive test can be devised for young children and an equally comprehensive test can be devised for older children. The two test forms would be unsuitable to be given to an age group other than the one for which it was devised.

However the two forms can be linked onto one variable. This means that the 'easy' form and 'difficult' form can be completely different, reflecting the ability levels of each age range. Yet, as they are linked onto the same variable, the scores obtained on one of the test forms can be statistically related to scores obtained on the other test form.

In assessing Shaun this proved to be beneficial. He was given the form for the 1;00 to 2;11 year olds and received a score of 86. Using the standard deviation of his age group this score was located on the variable at the same location as the -4.5 standard deviation. In traditional test construction standard deviations generally are only presented as low as -3.0 and scores below that level have to be presented as 'off of the scale'. Shaun was able to take a test that was different from the type of test taken by his age group yet the standard deviation of his score could still be plotted on the variable.

As Shaun's language abilities improved he was able to be assessed on the form that his age group fell into. He was assessed on Form B which had some similar activities to Form A, but mainly consisted of different activities which reflected his current ability level. He obtained a score of 47 with a standard deviation of -3.0. Although he was assessed with a different set of activities, as the forms had been combined onto one variable this different standard deviation was a true reflection of his movement on the variable. This was an improvement of +1.5 standard deviations in six months. The same situation occurred in the third assessment. Shaun had progressed well and took the test form that was appropriate for his age. He received a raw score of 34 with a standard deviation of -0.25. This was an improvement of 2.75 standard deviations in ten months. Again the difference between the standard deviations reflected the improvement of his scores on the variable. The Rasch model has score invariance as one of its characteristics. This means that

separate tests, with different items, that are drawn from the same calibrated pool, will have scores that are statistically related.

7.1.7.2. Case Study 2.

The second case history was of Ian who demonstrated a unique pattern of performance. Ian's score was delayed but not markedly so. He was 5;07 and had received a score of 25. However, the lowest score for his age group was 26 and the children he was being compared to had been selected because they all had a good standard of English. So he was not very delayed. His score pattern was unique: it ranged from the 3;06 year level to above the 7;09 year level. His poorest performance was on use of syntax whilst his best performance was on the use of logical thought. However, the range of his scores was not very unusual compared with the other five and six year olds. Table 5.10 presents the score pattern of another 5;07 year old whose score of 44 is also the mean score for that age range. The variations in his score pattern indicate gaps at the 4;05 year level and strengths at the 7;09+ level.

Ian was a child who the teachers had found difficult to diagnose. He performed within the normal range on any tests and he was described as bright but having difficulties. The terms delayed and disordered came up frequently but no firm decision was ever made about them. It was actually necessary to profile his performance in differing contexts and then to compare that performance to a normal continuum which had a psychometric foundation before his strengths and weaknesses could be understood. The key to providing help for Ian was to understand the strengths and weaknesses of his performance when it was compared to the normal continuum rather than trying to label his disabilities.

7.1.7.3. Was the Objective Achieved?

The variable was used to assess the language abilities of two children. Each case study features different aspects of diagnosis that have presented problems in assessing children. In Shaun's case study the problem was to use scores that were statistically related even though he was taking different tests at different stages of his development. In Ian's case the problem was how to unravel the mysteries of a unique pattern of development so that adequate education and speech therapy provision could be provided. In both case studies the use of the variable meant that these particular problems were dealt with successfully.

The type of assessment presented in this project raises many issues about the assessment, diagnosis and therapy management procedures. The test performances of the children can be examined in several ways with this type of assessment. First,the fact that the variable is of an interval scale allows various analysis of the raw score to take place which are not possible on other language tests. Second, the location of the item calibrations on the interval scale allows for a profiling of test performance which is not possible with other language tests. Thirdly, the developmental model provides a wealth of information for diagnosis and therapy management. Fourthly, the multidimensional aspect of the test activities allows a large quantity of information to be gained in one assessment and reduces the size of the test battery. (It does not however entirely eliminate the need for a test battery made up of several tests).

In the test situation, the manner in which the children took the test indicated a need for other assessments. In Shaun's case an assessment of information processing abilities was indicated and for Ian an error analysis was needed. Shaun, however, responded well to therapy that was planned from a developmental model and his information processing abilities improved within that type of therapy. Through using a developmental model the abilities that Shaun could use were further developed by

following the progressive order suggested by the Item Bank. Ian, however, would have needed therapy that was directly aimed at reducing the errors he was making rather than increasing the abilities he had. The developmental model still would have provided the guidelines for therapy by contributing important information as to which contexts elicited which error types. This assessment would have also suggested the developmental sequence of language forms within contexts that would have been easiest for Ian to follow. This type of therapy would have consolidated the knowledge that Ian had and increased his ability to use that knowledge within various contexts.

A case study such as Ian's brings into light many questions about the type of classification system that is needed to diagnose language difficulties. The delay or disordered distinction has little to offer when the normal pattern of development shows so much patchyness. A description of abilities is necessary but it also needs the type of road map that a psychometric assessment provides to point the direction that education or therapy is providing. This case study also highlights the importance of profiling ability dimensions, as the 'patchy' development was not only between the communicative contexts but also between language ability dimensions.

Case Study Two demonstrates the 'item invariance' characteristic of the Rasch mathematical model. In traditional psychometric test design, item analysis is used to ensure that an orderly balance is maintained by the items over the line of inquiry however, the method of analysis does not result in a line of inquiry marked in linear units. The items are not located on the line of inquiry, nor are the people. The population to whom the test is given is ranked according to how each other have scored correctly on the test. Later comparisons of scores are made to this ranking of the population.

When populations are ranked, a person's score place will change depending upon the placement of the other scores. In this study norms also were used and Ian was compared to children with a 'good standard of English' . The standard deviation of his score was -2.5. If the population had been representative of his class his score's standard deviation probably would have been -1.0. Yet, his pattern of performance would have stayed the same. In the Rasch method of test construction norms are not used to construct the variable. The item calibrations and person measures are used to do that. The variable can then be used in norming studies on different populations depending on who is to be considered the 'norm'--or the basis of comparison. The norms can be changed but within the variable there will still be item invariance.

The content of this assessment procedure was selected so that non-verbal abilities that have been shown to be relevant to language development could be assessed as well as the selected verbal abilities. Items were selected to represent the non-verbal abilities of symbolism, logical thought, organisation of space, object play, means-end play, combining objects play and non-verbal communicative exchanges. Items were selected to represent the verbal abilities of preintentional communication (expressive and receptive) and intentional communication. In the intentional communication category, the expressive and receptive abilities were further subdivided into complex language processes and individual parts of speech (lexicon and syntax).

Through assessing the child's performance in multidimensional contexts comparisons can be made between non-verbal and verbal abilities, between receptive and expressive and complex language processes and individual parts of speech. This contributed to making further diagnosis than the raw score would provide. In Case Study One it was noted that Shaun would refuse to do tasks that were solely auditory in nature. There was a marked

difference between tasks which were non-verbal and verbal, and in the contexts that provided the least visual support he was the least comfortable.

The design of the test, in particular the presentation of the items also will help to provide diagnostic information. In Case Study One it was noted that Shaun would refuse to participate in tasks that were solely auditory in nature even though he was answering the items correctly. This was specifically noted in Activity 19: Selects by Function. In the order of presentation easy items were interspersed with difficult items. Shaun did the first few and then refused to do any more, even though he was answering them all correctly. When the correct items were marked on the performance profile it was noted that Shaun was answering items with a difficulty level that was age appropriate but the number of items that he finished was well below his age level.

The variable was used to successfully diagnosis the language learning difficulties presented in these two case histories. Through locating both person scores and item calibrations on an interval scale a wealth of diagnostic information becomes available that goes beyond the mere presenting of a raw score. The benefits of a psychometric test has been combined with the benefits of a descriptive test.

7.2. CONTRIBUTIONS OF THE VARIABLE TO INTERVENTION PRACTICE

In Part One of this chapter a summary of how well the objectives were achieved was presented. In Part Two a summary of what was achieved will be presented. The type of standardised test that can be created from the results of this project will be described and then it will be compared with assessments that are in current use. How the test would fit into a battery of tests and function in a clinic setting as part of an assessment and therapy format will be described.

7.2.1. WHAT WAS ACHIEVED?

The objectives were satisfied and the aims were achieved: the information in the literature on child language development was synthesised and an operational definition for the Communicative Competence Model was devised. The operational definition was transformed into a variable of the interval scale of measurement. The Rasch mathematical model was used. This model has many characteristics that are unique to it and they contributed to devising a variable that would assess a child's pattern of performance within various communicative contexts.

The variable that was created enables therapists to assess language development as part of a complex system. This view of language development portrays the abilities that make up communicative behaviour as being multidimensional therefore a person's performance in using them will vary between communicative contexts. This variable allows therapists to assess a child's language performance in a hierarchy of tasks, drawn from the Developmental Model, which describes the items of behaviour as a normal continuum. The various communicative contexts are drawn from the content domains of 1) Behavioural domains related to language development, 2) Early communicative interactions, 3) Symbolic communication, 4) Comprehension, 5) Rule based linguistic communication, 6) Interactive dialogue, 7) Oral style and literary style communication and 8) Narrative Development. The Diagnostic model used divides the items of behaviour into the categories of verbal and non-verbal, preintentional and intentional communication, receptive and expressive communiction and higher language processes and parts of speech.

The Rasch mathematical model was used as the method of item analysis. This procedure of analysis constructed and defined a variable which provided in one assessment method the benefits of both psychometric and descriptive tests. This constructed variable is comprised of both person measures and item calibrations which are located

on it in interval scales of measurement. The person measures were then normed providing an age-group related form of measurement.

Through the locating of the item calibrations on the interval scale, an Item Bank was formed for the items of behaviour. This Item Bank provides the descriptive part of the assessment procedure. Individual performance profiles were also created by devising a two point matrix with the activities and the logit points on the interval scale. The items of behaviour within the activities were located at their logit point. This provides a visual chart to the strengths and weaknesses within and between the communicative contexts. The Item Bank and performance profiles allow the therapist to describe a child's performance and compare that description to the normal continuum of development as provided by the variable.

The Rasch mathematical model provides for the linking of different tests onto one variable. This is important for assessing the development of abilities as tests need to comprehensive for one level but they also need to be related to comprehensive tests of another level. This variable which is constructed of three different tests levels provides a means for comparing the child's score to the peer group. It also provides a means for using standard deviations as an indicator of progress over three different tests.

These combined benefits of psychometric and descriptive assessment methods provide a means for diagnosing the language learning difficulties, identifying therapy goals, planning therapy procedures and monitoring development over time and in comparison to the peer group.

Test construction, and especially item analysis, is an iterative process. An effective clinical tool was created in this project. At this point in the project, the variable could be taken forward and further developed into a standardised test. However, it is the

investigators intention to first review the data as has been suggested in the discussion of the objectives. The results of the project has provided new information which can be used for developing a more refined clinical tool from this variable.

The completion of this project presented, for the first time, items of behaviour for language development on an interval scale. The locating of the items on an interval scale then revealed and summarised a wealth of information as to how these items were related to each other. From this information two Tables of Specifications, one for theoretical constructs and one for diagnostic constructs, can be developed and used conjointly. These will provide the basis for developing unidimensional ability sub-scales. The new data collection forms can then be given to a larger sample and reliability tests can be performed for examiner, administration, scoring and time variance.

7.2.2. THE COMPLETED STANDARDISED TEST.

The standardised test which can be constructed from this variable will be comprised of three parts. Part A will cover the age range of 0;09-1;06. The floor to the test will be from when the child has already established object play and person orientation. It will follow the development of verbal and related non-verbal behaviour up to the coordinating of objects and people into communicative routines in various contexts with the use of two word utterances. Part B, age range 1;06-4;00, will follow the development of syntax and semantics in various pretend play and story book contexts up to when the child is able to create a communicative context through the sole use of language in the form of sentences. Part C, age range 4;00-7;06, will follow the development of the child's ability to form sentences in various contexts up to the development of meaningful structured sequences of sentences in the form of dialogue and narratives. It will follow the developmental model

of The Communicative Competence Model but indicators of difficulties with information processing and error production will be built into it.

The test forms will be easy to administer, taking around 20-30 minutes to administer and 20-30 minutes to score. The scoring information will provide raw scores, normed age related scores and standard deviations for the total test, each activity and each ability dimension. As the item calibrations are located on the variable there will be itemised levels of ability to provide goal setting and intervention planning information.

The scores obtained on the test can be used for the identification of children with language learning difficulties. They will provide a means for making comparisons to a peer group. It will allow for the itemising of areas of strengths and weaknesses in performance within and between communicative competence. The individual strengths and weaknesses also can be compared to the norm of a peer group. The standard deviations for the performance on the test and on the sub-divisions can be used to compare child's performance over time. The descriptive information provided in the performance profiles can be used for targeting goals. Therapy can be planned by comparing the child's performance to the normal continuum provided by the information in the Item Bank. The test scores provide the required psychometric information for the monitoring of progress.

7.2.3. HOW THIS TEST COMPARES TO OTHER TESTS.

This developmental test is novel in several ways. Firstly, it provides a very strong assessment of communication as an integrated process which includes many skills. It is especially strong in assessing the more complex higher processes of language and the assessment of these processes actually starts at an early age level in the test. Secondly, it provides a good psychometric assessment of syntax. Although, the

description it provides is not as detailed as those provided by many descriptive taxonomies, it does provide a more substantial analysis of the frequencies. It does this by locating the frequency with which a particular item was used on an interval scale. Thirdly, it also assesses non-verbal abilities and provides the possibility for comparing a child's performance between non-verbal and verbal tasks. There is a good representation of both the verbal and non-verbal tasks and they represent the type of tasks that are used to make diagnosis in the clinic and are presented in the literature. The items provide a good summary of the verbal developmental milestones.

7.2.4. WHAT CAN SPEECH THERAPISTS DO WITH THIS TEST THAT THEY CANNOT DO NOW?

This assessment procedure is a collection of various tasks in which language or communication occurs, or the tasks elicit non-verbal behaviour that is related to the development of verbal behaviour. Therefore, the assessment procedure is similar to a battery of tests and the score obtained in the various contexts are statistically related. This means that the score structure allows therapists to make certain judgements that cannot be made with other language assessments. It provides for a summary of developmental milestones from one to seven years in psychometric terms. Through the use of the test it is possible to follow the development of play abilities and language development within play activities. It also allows a therapist to compare receptive and expressive skills within the domains of verbal/nonverbal, and intentional/preintentional. It allows for a comparison of performance in various communicative contexts. Performance can be compared specifically between nonverbal and verbal contexts. In scoring the language sample the 'frequencies' for how many times an element appeared have psychometric scores. This is new, as the current taxomomies which use

frequencies do not have anything more than suggestions as to the amount of items which can be considered normal. The content of the test provides new assessment material as well, especially in the areas of very early language development, complex language processing and narrative development.

It does not, however, provide an in depth assessment of vocabulary, spontaneous language, pragmatics or parts of speech. Although this variable provides information which would indicate difficulties with information processing and error production, it does not assess them in depth. Assessments which addressed these areas would need to be included in a full assessment battery for use in conjunction with this developmental test.

Through out the assessment procedure the clinician will be a decision maker who is interpreting a vast amount of information from a variety of sources (Gerard and Carson, 1990). The test under construction in this study is but part of the information gathering procedure. Gerard and Carson provide a flow chart depicting the issues involved in the procedures of assessment and intervention. Information will be gained from the referral, a screen or initial formal assessment, a case history, formal assessments, observation, interviews and informal assessments. Although an assessment can be used to collect and describe information it is ultimately the clinician who will interpret the information so that it is useful. The information gained from this assessment and the tests used with it in a test battery will need to be evaluated with information gained from other pertinent sources.

7.2.5. HOW THIS TEST WOULD OPERATE IN A CLINIC.

The test under construction in this study would be a good initial formal assessment. It is quick and easy to administer and score and it provides a wealth of information about the child's performance compared to the normal continuum. It provides information about both

verbal and non-verbal abilities, receptive and expressive abilities, as well as, syntax, semantics, pragmatics and thought development.

The results can be used to identify children with language learning difficulties, identify the strengths and weaknesses and provides guidelines for goal setting and therapy planning. It also provides a means for monitoring intervention. If intervention is not warranted it still provides information for curriculum adaptation within the mainstream education. The content of the test is relevant to the content of the National Curriculum.

The information gained from the test under construction in this project would be extended with a test battery that was comprised of Blades (Gutfreund, Harrison and Wells, 1989), The Pragmatics Profile of Early Communication Skills (Dewart and Summers, 1988), the ITPA (Kirk, McCarthy and Kirk, 1968), an error analysis, TROG (Bishop 1983), and the SCT (Wheldall, Mittler and Hobsbaum, 1987). Blades, (The Bristol Language Development Scales) could be used to analyse spontaneous language samples along with the language sample gained from this standardised test. The two procedures combined would provide a powerful assessment of a child's language. The Pragmatics Profile would provide a means for interviewing people in the child's life who provide communicative routines. If information processing difficulties were noted a test such as the ITPA (Illinois Test of Psycholinguistic Ability) would be needed. To assess the comprehension of specific items of grammar the TROG (Test of Receptive Grammar) or the SCT (Sentence Comprehension Test) would be useful.

This test battery would provide a wealth of information and it would provide milestone markers into which other information could easily be be fitted. But the test battery would still be statistically unrelated and a therapist would have to be skilled in relating and interpreting the different scores.

7.2.6. THE PREMISES OF THE COMMUNICATIVE COMPETENCE MODEL.

Rice (1986) had stated that the Communicative Competence Model has been advocated by interventionists but that its premises still had not been adopted into practice. The four premises that Rice presented now will be reviewed with suggestions given as to how this variable allows for their adoption into intervention.

1) The first premise stated that language use and development was viewed as being dynamic rather than static and language differences (or disabilities) are seen as being interpersonal in nature and culturally bound, rather than residing solely in the child.

In this study the communicative contexts selected have been deemed to be important for child development and education. There is a cultural bias to them: the tasks selected have been considered in the literature and by professionals as being able to indicate success in school. The child's performance in them is therefore significant to the child's educational world within Britain.

The contexts varied as to how the interpersonal pattern of relating with language behaviour was accomplished. From the child's pattern of performance, inferences can be made as to how well the child was using language and as to how the constraints of the communicative contexts influenced the pattern of performance.

2. The second premise stated that language development is considered to be a continuum of a varying context sensitive rules. In this study a variety of contexts were used and a variety of dimensions of language were observed in them. From this the influences that one dimension is having on another can be inferred (for example the type of visual contextual support on level of syntactic production).

3. The third premise stated that language change can be implemented in a variety of ways. The operational definition stated that the type of intervention structure required will depend on the child's ability to organise meaning from the environment. This ability to organise meaning will be facilitated by providing an intervention structure where fine tuning and sensemaking (Duchan, 1986) will occur. The pattern of performance provides the starting point for devising goals and planning therapy which is specific to the child's ability to organise meaning from the input. The variable provided a method of profiling the child's pattern of performance. The Item Bank provides the normal continuum of item progression from which goals and activities can be established. This unit of measurement presents the means for providing 'facilitative' type intervention. A battery of statistically related tests which covered several models would allow for very specific intervention provision and monitoring.

4. The forth premise stated that within the model the clinician is an information gatherer and decision maker rather than the only source of knowledge. In this study the unit of measurement provides a pattern of performance which is the starting point, but this pattern of performance has to be compared to the child's pattern of communicative performance within the child's life. Interpretations also have to be made as to which contexts are to be used for structuring intervention and which items from the Item Bank are to be incorporated into intervention. The 'scaffold' is suggested by the unit of measurement but it is still up to the clinician to interpret the pattern of performance and make the decisions as to which is the best course of action to take.

7.2.7. THE SOCIAL IMPLICATIONS OF THE TEST.

Ulrich (1983) provides a means for examining the wider issues relating to the implementation of research into practice. He presents twelve questions which are to be used to critically examine the situation for which the research project was designed. The twelve questions are asked twice. The first time the reality of the situation is described and the second time the answers include what **ought** to be happening. In the following section the twelve questions will be asked once but the information necessary for the two sets of answers will be provided.

1. Who is the actual client of the design (who belongs to the group whose purposes (interests and values are served, in distinction to those who do not benefit but may have to bear the costs or other disadvantages?)

The children for whom the test was designed are the actual clients of the test. The test was designed for children from the ages of one to seven who are having difficulty with learning language.

2. What is the actual purpose of the design, as being measured, not in terms of declared intentions of the involved, but in terms of the actual consequences.

The actual purpose of the test is to specifically identify a child's individual abilities so that appropriate intervention or educational provisions can be provided.

3. What, judged by the design's consequences, is its built in measure of success?

The built in measure of success is its ability to identify the strengths and weaknesses within a child's performance in the communicative contexts so that adequate communicative environments can be provided. These are environments which provide the child with input from which he or she can extract meaning and develop communication skills.

4. Who is actually the decision taker, i.e. who can actually change the measure of success?

The adults who provide the services are the decision

makers. These are professionals in the national health service (NHS), social service, education, the voluntary sector and the child's parents.

5. What conditions of successful planning and implementation of the test are really controlled by the decision taker?

The decision taker will be responsible for providing the necessary resources, people, place, time and materials for the assessment to be carried out. The decision taker also is responsible for providing the appropriate intervention and education that the test has suggested is necessary.

6. What conditions are not controlled by the decision taker, i.e. what represents the environment to him?

The effects of bad housing, unemployment, dysfunctional family life, lack of respect for child's development by significant others, attendance in the programme, carrying through goals and acceptance of the problem are all factors which could adversely influence the child's development.

7. Who is actually involved as planner?

The NHS, education, social services and the voluntary sector are actually involved in the planning of intervention programmes. The parents and, as much as possible, the child ought to be part of the planning.

8. Who is involved as 'expert', of what kind is his or her expertise and what role does he or she actually play?

The speech and language therapist and language teachers are considered to be the 'expert'. The speech and language therapist would be the 'expert' who assessed the child and made the recommendations. The therapist would play the role of information gatherer and interpreter as information comes from a variety of sources within and outside of the assessment and treatment room, not just from the formal assessment. The language teachers would also assess and make recommendations. Both would take part in providing intervention. However, they are not the

people who make the decisions about resources nor do they allocate children into appropriate provisions.

9. Where do the involved see the guarantee that their planning will be successful? (e.g. in the theoretical competence of experts? In consensus among experts? In the validity of empirical data? In the relevance of mathematical models or computer simulations? In political support on the part of interest groups? In the experience and intuition of the involved?) can there assumed guarantors secure the design's success, or are they false guarantors?

The guarantee that the test will be successful is in the type of research that can be carried out through its use. The early identification of children with language learning difficulties, the type of programmes which can be designed from the performance patterns, the results from the comparative, evaluative and experimental research will all indicate how successful the test is.

10. Who among the involved witnesses represents the concerns of the affected? Who is or may be affected without being involved?

The NHS, social services, education, the voluntary sector and the parents all represent the concerns of the affected.

11. Are the affected given an opportunity to emancipate themselves from the experts and to take their fate into their own hands, or do the experts determine what is right for them, what quality of life means to them etc, That is to say are the affected used merely as means for the purposes of others or are they also treated as 'ends in themselves'.

The children are the people affected by the test. They are dependent on the adults who will provide the appropriate intervention. However, built into the test is the assessment of the child's 'self-organisational' ability, therefore the test is designed to be sensitive to selecting the type of environment which is important for the child as an individual.

12. What world view is actually underlying the design. Is it the world view of (some of) the involved or of(some of) the affected?

The world view underlying the test is one which requires the adults to have extreme responsibility and sensitivity to the child as an autonomous person who will take his or her place in society. Without the adoption of that underlying philosophy, the effectiveness of the test is greatly reduced.

7.3 CONTRIBUTIONS OF THE VARIABLE TO THE DEVELOPMENT OF INTERVENTION PRACTICE.

In part three of this chapter the opportunities and challenges that the contributions of this study provides to the development of intervention practice will be examined. The first section will describe a test battery that it is possible to develop with the Rasch Model, using this variable as the core assessment procedure. The second section will describe the type of research that is needed in child language development and how this variable and the Rasch Model can contribute to its implementation.

7.3.1. MEASUREMENT AND DIAGNOSIS OF COMMUNICATIVE COMPETENCE.

7.3.1.1. Measurement of Communicative Competence.

An important aspect of the Rasch Model is that tests can be linked onto the same variable. The procedure of 'item equating' is not the same as correlating tests. The procedure of correlating test scores only compares the ranking of the person scores between the two tests. The item equating procedure calculates item difficulty estimates and relates separate tests onto the same variable. 'With careful planning we can introduce additional items systematically and in this way build up a bank of calibrated items useful for an increasing variety of measurement applications' (Wright and Stone, 1979).

In section 7.2 a summary of this variable was provided and the type of standardised assessment procedure which could be developed from it was explained. How it fits in with current assessments was also described. However, the suggested battery of tests would not be statistically related. A statistically related test battery can be constructed. This variable can be used as the beginning of a comprehensive Item Bank. The additional items that are built into this Item Bank can be drawn from differing aspects of language development and selected with the purpose of devising tests for them. The nature of an Item Bank is that items can be selected from it to create different tests. The tests created from a calibrated Item Bank are statistically related. Due to the potentials within the Rasch model there is no longer the constraints of having to work with a large cumbersome battery of tests that do not statistically relate to each other.

In this project the model selected was the Communicative Competence Model and this was further defined by the Developmental Model. It provided a broad definition which could account for a wealth of research data. However, it did not account for all. The variable constructed from this model now can be the core for an Item Bank, to which other items can be introduced. With careful planning a calibrated Item Bank can be devised which takes into account other models of language development, different aspects of language which need to be assessed in another manner, different aspects of language unique to other cultures, and different aspects of language unique to children with disabilities such as deafness.

Within the Communicative Competence Model, the Developmental Model was used as the basis for this study, yet there are two other models which are used successfully in intervention: 1) Information Processing and 2) Error Analysis. Tests could be devised for these models and linked to tests designed from the

Developmental Model. In Case Study One, Shaun demonstrated a weakness for processing auditory information. This was not established by the test but was interpreted from the manner in which he took the test. An assessment of his processing of information was indicated. In Case Study Two, Ian made considerable errors; a test that analysed the errors was indicated. It would have been useful to have been able to include these tests in a statistically related test battery.

Shaun actually made rapid progress in therapy, which could be demonstrated on the normal continuum through the use of standard deviations. However, the situation could have been one in which little progress was noted on the normal continuum for a long period of time while great strides were being made in intervention with his specific weakness in processing auditory information. Whilst it is some consolation, in a situation like that, to be able to say that a child with a considerable delay in language development has made a year's progress in a year's time (as noted by the standard deviation) it would be even more useful be be able to report that the information processing abilities had improved (or that the number and type of errors had reduced). It also would be useful to report that, given the level and manner of information processing and number and type of errors, the child would not be able to cope with these specific types of communicative contexts or language behaviour. A statistically related battery of tests comprised of the Developmental, Information Processing and Error Analysis Models would be able to provide that type of information.

Items also could be introduced to the Item Bank which assessed language development in a completely different manner to the formal structure used in this project. The pragmatic elements of communication could be added to the Item Bank, even though the assessment of them requires observation of a more spontaneous environment or through the use of interview procedures. The information collection procedure would have to be formalised into a

standard collection procedure but once formalised the items could be added to the Item Bank. These different assessment procedures could include very diverse situations such as interviewing the parents/caregivers or professionals who were providing the communicative environment or observing a child on the playground or communicating with peers at the dinner table in school.

The items selected to be included in this variable have a cultural bias. They were chosen to represent behaviour which would indicate success in the British school curriculum. The test possibly would not assess children very well who were not participating within that culture. If the parents wanted their child to enter mainstream school then the assessment items would have relevance. The performance profile would indicate areas of strengths and weaknesses that would be important to target as intervention goals. However, with the ability to add items from separate tests to the same variable there is the opportunity to develop mother-tongue tests which can equate to this core test. This would allow tests to be created which thoroughly assessed a child's development in his or her own language and culture and also indicated that the child was developing the type of skills that would be needed to be successful in a school curriculum which would be presented in a second language.

The idea of equating tests for different languages and cultures can be extended to educational provision for populations with different communicative requirements. In particular the education of children with disabilities such as deafness or physical handicap where a different communication system is required. An assessment which is carried out in their communication system can be devised and equated with this core variable which had as its basis child development and successful educational attainment. Similarly, specific treatment programmes could have their own line of inquiry which could be equated to this and other tests.

Cronbach (1970) stated that the ills of testing would be overcome when tests provided the means for allocating children to the best education and intervention programmes. The Rasch model introduces the possibility of designing specific tests for populations with different needs without isolating them. This would produce a battery of tests which could be specifically relevant for different populations but which also, would have statistically related score structures to those used with children in mainstream school.

7.3.1.2. Diagnosis.

Bloom (1980) states that the diagnosis of language learning disabilities occurs with the careful description of the child's language repertoires. Through using the variable, diagnosis of language disability becomes diagnosis of language learning patterns. This diagnosis describes the child's language in terms of what is there and what is missing and the type of language behaviour that can be expected of him or her in different communicative contexts. The diagnosis also explains the type of activities that can be carried out to facilitate language learning by identifying the areas to be changed and through explaining the type of language behaviour to expect next. This is accomplished through identifying the type of communicative contexts that have gaps occurring in them. The child's performance pattern would indicate the level that the adult needed to pitch the input and indicate the response level that was to be expected. This would allow for 'fine tuning' and 'sensemaking' to occur. The aim of intervention is to provide comprehensible input based on the child's self-organisational ability. Assessment through the use of the unit of measurement provides the information about the child's level of organisation, as it profiles how he or she is performing within the contexts. In many ways this type of diagnosis does away with the idea of disability and provides a statement of the type of environment that the child needs in order to develop language abilities.

7.3.2. RESEARCH INTO INTERVENTION PRACTICE.

Eastwood (1988) states that the profession of speech pathology lacks core paradigms and lays the blame for this at the feet of experimental design. An important core paradigm in intervention is **CHANGE.** Traditional experimental design offers little when investigating this core paradigm. It can indicate that change has occurred but it can not elucidate the path of the change or how one is to proceed to move down that path. The methods for making Rasch measurements provides a means for addressing the issue of Change.

An important contribution of this study is the provision of a detailed example of how the Rasch mathematical model can work for making measures in language development. The method of analysis, PROX by Wright and Stone (1989), does not only need to be used for test construction. It can be used as the method of analysis in experimental designs that intend to establish a line of inquiry. If it were to be used as a method of inquiry, the literature then would become rich with a data bank of related items of behaviour located on interval scales. These sequences of behaviour would have more application to the establishment of sequences of change in therapy than a comparison of variables through traditional statistical design.

In section 7.1.1.2., it was stated that this study has provided some information to help define the concept of **stage** as an explanatory construct through satisfying Brainerd's (1978) first criterion.

1. It must describe some behaviour that undergo age change.

It was also stated that the next step is to take children who are presenting similar patterns and posit the antecedent variables and describe the experiences believed to cause the changes. Then the procedures for independently measuring the antecedent variables and experiences can be devised. It is through this type of

research that Brainerd's other two criteria will be satisfied.

2. It must posit antecedent variables that describe the experiences believed to cause the changes.
3. It must provide procedures where by the behavioural changes and the antecedent variables can be independently measured.

The variable created in this study and the use of the Rasch method of measurement as an experimental method offers the opportunity for developing research which will provide information towards satisfying the other two criteria. The practice of intervention with child language development is rich with intervention methods, many of which have never been published. What is needed now is a development of an epistemology of therapy methods. The therapy methods then need to be linked to the appropriate system of change. The precise description must include a method of measuring the input that is being provided. The therapy methods also could have their own line of inquiry.

The psychometrics used to construct this variable provide score information which can be used in comparative and evaluative research. The psychometric and descriptive basis of the variable can be used to identify and allocate children to appropriate programmes as well as provide valuable information for curriculum design. The study of content validity begins with a well defined theoretical orientation and Table of Specifications but further studies can be carried out to ensure that the items on the test are measuring the intended trait in the manner that matches the purpose of using the test. Criterion validity would need to be examined in the light of how well the test can be used to make predictions. Much of the validity studies will be carried out in clinics and research programmes as the variable is used to identify children and allocate them to intervention programmes and the subsequent comparative outcome and evaluative research is carried out. Both traditional

experimental design and the Rasch model can be used in these studies. The variable constructed in this project can be used within traditional experimental design (Hashway, 1978) and the Rasch model can be used as an experimental design which charts the developmental path through the treatment programme.

7.4. A SYSTEMS APPROACH TO ASSESSING CHILD LANGUAGE.

7.4.1. THE SYSTEMS THINKING USED IN THIS PROJECT.

Throughout this project, systems methodologies were used, from the initial stages of viewing child language as part a complex system through to thinking about how the results of the project could be implemented.

The definition of child language development began with two main philosophies, those of Piaget's structuralism and the cybernetics of Laszlo. The hard systems methodology of operations research was used to provide the systematic investigative structure of the project. In the early stages of the project soft systems methodologies were used in Workshops (Gerard 1990a,b,c,d,e) to elicit and summarise the perspectives of professionals working with children. The practical reason approach (Ulrich, 1983) of critical systems thinking was then used to outline the presuppositions that needed to be addressed to see the variable implemented.

Jackson (1989) stated that there were problems that needed to be addressed when applying systems thinking to human activity. In the arena of human activity, there are multiple perceptions of reality and the fact that it is often difficult to agree on goals. Therefore, any model produced will be only one view and probably highly biased. There are also problems with the model becoming a substitute reality. The work may only serve the status quo.

This variable does have a bias to it. The main model

selected was the Communicative Competence Model and within it the content domains and activities were devised to elicit behaviour which could be used to describe language development. This description would then be used to make specific diagnoses. In particular the items of behaviour were selected because they represented behaviour which would indicate success at school. However, the Rasch model provides methods so that further items can be added to a calibrated item bank. This means that items of behaviour drawn from different perspectives can be added in the future. A test battery has been described which allows for that. Wright and Stone (1979) also suggest that Item Banks should be periodically reviewed to ensure that the items within the bank have continuing validity. As further knowledge is gained about the latent trait some items may lose value.

It is always inherent that a test may be taught rather than used as the means for assessment, thereby becoming a substitute reality. In Case Study One, the therapy activities were distinctly different from those used in the assessment and the three consecutive assessments indicated progress. However, until an epistemology of therapy methods is developed and they are linked to the patterns of change that they induce, the problem of the test being taught in therapy is a very real problem. Only through having a battery of tests which tests language development in many different situations and through various means (structured one-one assessment, interviews with the providers of communicative environments and through observation) will this problem be completely eliminated.

This work did not entirely defend the status quo. It, mainly, did have similar findings to the age norms in the literature, but there were also some age norms that differed from those in the literature. The findings also show that some premises in current practice will need to be reflected upon further. In particular the delay/disorder distinction needs to be further defined

from the one that is presented by the College of Speech Therapists (1988). In order that therapists can use the models of language development presented in the literature effectively, the models of Development, Information Processing and Error Analysis need to be synthesised into an overriding model of Communicative Competence and not viewed as opposing schools of thought. Diagnosis of language abilities needs to be viewed as describing the strength and weaknesses of a child's performance within various communicative contexts. This type of diagnosis does away with the idea of disability and replaces it with the idea of diagnosing language learning patterns. This type of diagnosis would be as appropriate for a child who is excelling in learning language as it would be for a child who is having difficulty.

It was the view of Diamond and Ellis (1989) that mathematics can model the systemic structure of reality. Using the functionalist framework, mathematics would represent the structure of reality and validate what is observable. The task was to delineate boundaries between variables while avoiding the use of linear notions of change. In constructing this variable, a linear description of the observations was created. It was through the defining of the variable that a linear notion of change was avoided. The Item Bank presented the items in a linear description but the performance profiles provided the means by which individual patterns of change could be targeted. This meant that, the child would not need to be put through the orderly progression of learning the skills of language as the variable described them, if it were not his or her way of learning.

7.4.2. ASSESSING CHILD LANGUAGE AS PART OF A COMPLEX SYSTEM.

In the final section of this chapter a return look will be given to the complexities that are involved in attempting to reduce the complex system of language development for the purpose of assessment.

This project began by using the literature on child development to devise an operational definition of the Communicative Competence Model so that its premises could be implemented in intervention. Communicative competence is presented as a complex system which includes language, its use as a form of communication, the person, the environment and the culture of the environment. In this definition language development is viewed as a developing system that is species specific but also specific to the individual. In its course of development, it interrelates and interacts with other developing behavioural systems. The facilitation of its development occurs within an interactional setting within the environment. The environment is also a system that is culturally bound. The interactional setting of the environment provides communicative contexts which will influence the child's accessing of behaviour. The child will perform with specific patterns as the child is developing a context sensitive rule system for behaviour.

The idea of measurement begins with the idea that there is a latent trait that is species specific and every member of the species has some amount of this trait and this amount can be measured. This idea of measurement then changes to the idea that there is a line along which people and items can be positioned. The intention behind the Rasch model of making measures is to mark off this line in equal units so that distances between points can be compared. This creates a linear variable for the latent trait which is at the interval scale of measurement. Whilst a latent trait is a concept about reality, a constructed variable is an abstraction of that concept. However, the variable has a substance, as it is comprised of observations.

In this project, assessing child language takes place through the collecting of observations in various communicative contexts. These communicative contexts were devised to elicit the child's performance. These contexts are similar to using 'natural observations' with the use

of a descriptive method of analysis through a devised taxonomy. The contexts are standardised and through the use of the Rasch model, the observations were transformed into a variable. From the child's performance within these various communicative contexts, interpretations about the child's context sensitive rule system can be made. The generalisations made from the unit of measurement can be used to compare performance to a peer group, to set goals, plan intervention and monitor development.

Although this makes a useful unit of measurement which provides both a descriptive account of development as well as an objective one, compressing the multidimensional aspect of language development into linear units on one line of inquiry has its difficulties. The reality of language development is, that it is not linear. The latent trait under investigation in this project, the Communicative Competence Model, does not present language development as linear. It is presented as a complex system. The task of constructing a variable is to approximate the reality of the latent trait, so the task in this project was to transform observations, made for a non linear idea about reality, into a linear line of inquiry.

As children will behave differently in different contexts (Johnson, 1974) and unique patterns of performance have been found in 75% of the children in this study it is important to examine the use of this Rasch mathematical model with the operational definition devised in Objective 1. The assumption behind the Rasch model is that items and people are located on the variable. At the person's score location on the variable, all items below that point are easy and will have been passed, and all items above the point on the line will be difficult and will have been failed. Yet, the results of 75% of the children in this study do not fit this assumption. They had passed and failed items up to two standard deviations

from their score point. This was due to assessing the many dimensions of language development at the same time.

Wright and Stone (1979) state that the more unidimensional a test is, the more stable the analysis of fit will be. However, this multidimensional pattern provides the most information for education and intervention planning. A profiling of performance across dimensions is the most practical estimate of a child's ability (Howlin and Kendall, 1991). Yet, it is also important to maintain the assumption that the person score obtained reflects the persons true position on the variable. This allows one to make stable generalisations.

Traditional test construction methodology is totally reductionist, in that its item selection analysis procedures create unidimensional lines of inquiry. However, this method has created problems for the therapist. Through out the past twenty years many assessment methods, taxonomies and formal assessments have been devised. The aim in creating these assessments was to select an area and devise a unidimensional line of inquiry for it. However, as language development is a vast area and these individual assessments are narrow in scope, the comprehensive test battery has become too numerous to use effectively. In order to assess development over several age periods a clinician is left to select tests that will provide a continuum of development. Yet, the tests are not statistically related. The clinician is also left to select tests that will provide an in depth assessment of a particular point in time of development, which will highlight the strengths and weaknesses of a child's language repertoire. Again the tests are not statistically related. These numerous assessments can only be used in an eclectic manner.

What is new about the unit of measurement constructed in this project is that a pattern of performance with language and language related behaviour is recorded over

several communicative contexts within one test. This means that the score patterns of these communicative contexts are statistically related. This pattern is then compared to a normal continuum which is provided by the variable. These many dimensions of language which are statistically related provide an in depth examination at a point in time and over time. The wealth of information gained from this one assessment procedure would require a large test battery.

The Rasch mathematical model is robust enough to calibrate items selected to represent a global trait, such as the complex system of language development, without having to first breakdown the trait into unidimensional subdivisions. In fact the calibrations then can be used to identify the unidimensional strands within the global trait.

Identifying the unidimensional strands within the multidimensional global trait would provide a scoring system for the total test as well as for each communicative context and ability dimension. The score for the total test would be unlikely to reflect the underlying assumption to the mathematical model, but the individual profile scores would reflect the assumption--in the normal population. Within the subscore system the data will fit the assumption--at the point of the score placement all easy items will be passed and all difficult ones failed. This would provide an adequate description of a child's performance with their language behaviour which could be used in goal setting and intervention planning. These individual profile scores also would have standard deviations which would provide a more exacting method for allocating to education and intervention provisions, as well as for the monitoring of progress. This means that a variable can be constructed for a latent trait which describes language development as multidimensional so that the variations that children have with learning the various dimensions can be identified.

The piloting of this variable in two case studies has demonstrated the usefulness of a profile of performance within communicative contexts and now a scoring system needs to be devised for the variable which provides the profiling of the pattern of performance but which also fits the assumption behind the model. This study highlights the need to define the dimensions of language development into profiles clearly at the Table of Specification stage. Now that the sample of items which constitute this variable have been located on a variable it possible to do this.

The type of scoring system which it is possible to create using the Rasch mathematical model maintains the idea that language development is part of a complex system and at the same time fulfils the assumption of unidimensionality. This scoring system would provide the method from which a valid measure can be made, leading to stable generalisations about peer group comparisons and about the child's performance over time.

7.5. SUMMARY.

In the unit of measurement that was created in this study a variable was constructed to approximate the complex system of language development--which was defined within the Communicative Competence Model. The variable under investigation here was constructed through the use of the Rasch mathematical model and it provides much of what is needed to diagnose and monitor treatment. It accomplishes this by combining in one test procedure the benefits of what have appeared to be two differing forms of assessment: that of psychometric assessment and that of descriptive assessment. Through this variable's construction and defining, it provides: 1) A normal continuum that is capable of providing objective measurement numbers to which other numbers such as scores, norms and standard deviations can be statistically related; 2) A descriptive account of

developing abilities that have been located on a normal continuum which can be used as a frame of reference; and 3) A means for profiling the performance pattern of each individual between the differing communicative contexts. In the creation and piloting of this unit of measurement seven objectives were completed. In this chapter an overview of the achievement of each of the objectives was given, outlining the strengths and presenting suggestions for improvements. This unit of measurement now can be used to devise formal, standardised assessments of communicative competence.

CHAPTER 8 CONCLUSIONS

This project was devised to create a unit of measurement which would assess the pattern of language performance within various communicative contexts in children aged between one and seven years. The Communicative Competence Model was used and communicative competence was viewed as being part of a complex system. The methodologies of systems science were required to design the project so that the complex system could be reduced to a manageable problem without losing sight of the holistic view of the complexities of the issues under study. There were two aims to the project, as presented in Chapter One:

"1. As there now exists in the literature sufficient information to devise an operational definition of the Communicative Competence Model, the literature will be reviewed so that a synthesis of the relevant areas can be presented. From this synthesis an operational definition will be devised."

"2. Through the use of the Rasch mathematical model, the operational definition will be transformed into a clinical tool which can be used to assess the pattern of performance of a child within various communicative contexts."

To achieve these aims, seven objectives needed to be satisfied. First, a synthesis of the literature was made so that an operational definition of the Communicative Competence Model (CCM) could be devised. The information in the literature was then used to devise a Table of Specifications. This was a blueprint that ensured a balance of items throughout the selected content domains and test activities. A hierarchy of structured tasks which covered the age range of 1;00 to 7;00 years was created. From this hierarchy, three data collection forms covering the ages 1;00-2;00, 3;00-4;00 and 5;00-7;00 years were created and used to obtain person and item scores for the tasks. The Rasch mathematical model was applied, to transform the scores into item calibrations and person measures which would construct a variable. The variable is a linear line of inquiry at the interval level of

measurement. The variable was then defined and piloted in two case studies.

Through the completing of the seven objectives a unit of measurement has been established. This unit consists of two parts: the process in which observations are collected and the variable to which subsequent observations are compared. The defined variable provides: 1) a normal continuum that is capable of providing objective measurement numbers to which other numbers such as scores, norms and standard deviations can be statistically related; 2) a descriptive account of developing abilities that have been located on a normal continuum which can be used as a frame of reference; and 3) a method for profiling the performance pattern of each individual between the different communicative contexts. It combines, in one test procedure, the benefits of what have appeared to be two differing forms of assessment: psychometric and descriptive analysis.

This unit of measurement has provided a means for assessing a child's performance in communicative contexts. It consists of three statistically related test forms which are comprised of different activities. Each form assesses the abilities of a particular age group in depth. This provides a means for assessing a child's developing communicative competence in depth at a particular point in time and comparing the performances over time to each other and to a peer group. As the different test forms are linked onto the same interval scale, the standard scores are statistically related, even though the child participates in different activities at different stages of development.

Through using the variable, diagnosis of language learning disability becomes diagnosis of language learning patterns. This diagnosis describes the child's language in terms of what is there, what is missing and the type of language behaviour that can be expected in different communicative contexts. In many ways this type of

diagnosis does away with the idea of disability and provides, instead, a statement of the type of environment that the child needs in order to develop language abilities.

The assessment procedure devised in this project is novel. It contributes several unique features to the practice of intervention. Firstly, the content of the test presents information which does not presently exist in assessment procedures. Several of the areas are new to standardised assessment, such as the content domain of narrative development, or more fully represented, such as the diagnostic category of complex processing. The fact that language was viewed as part of a complex system and consists of multidimensional aspects is novel to constructing standardised assessments and allows for many more areas to be assessed at the same time. This provides a more comprehensive assessment procedure. It provided, in one assessment procedure, the diagnostic categories of verbal and nonverbal, preintentional and intentional communication, expressive and receptive communication as well as complex processing and parts of speech.

Using the Rasch mathematical model is rare in the field of speech therapy. This model provides a psychometric foundation that is more sound than the methods currently used to construct assessments. It is also a method which has many measurement characteristics that are unique which provide the type of information that is needed to implement intervention. It creates assessments which are on an interval scale of measurement. This is unique to language development tests in speech therapy. The interval scale provides an Item Bank and a performance profile. It also for the first time combines the benefits of psychometric and descriptive analysis into one procedure.

This project also makes a contribution to the field of systems science. The concepts and approaches of systems science were used throughout the research project. The use of these, in the field of speech therapy, is still

relatively new and rare in the field of assessment. However, it was through the application of these concepts and approaches that language development could be viewed as a multidimensional aspect. Through the use of the concepts and approaches of systems science, the complex system of language development could be mathematically modelled so that a linear line of inquiry could be constructed for assessing language development without losing sight of the uniqueness of the individual.

This project also demonstrates the effectiveness of the Rasch mathematical model for investigating a core paradigm of speech therapy--that of **Change.** The discussion chapter presents several suggestions for the type of research that now can be undertaken with the use of this newly constructed variable and with the Rasch model. In particular the area of change mechanisms needs to be addressed. Therapy methods can be shown to be related to the paths of behavioural change that they are causing to occur. Also a related test battery that can be evaluated effectively and easily needs to be developed. Tests that are constructed from different models of language development and for the communicative needs of different populations can be constructed so that they are statistically related.

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ACTIVITIES / DOMAINS	1	2	3	4	5	6	7	8
1. OTHER BEHAVIOURAL DOMAINS	1,2 3,4	1,2 3,4	1,2 4	1,2 3,4	1-6	1-8 12	1-22	1-17
2. EARLY COMMUNICATIVE INTERACTIONS	5		3,5			9-11 12		
3. COMPREHENSION								
4. SYMBOLIC COMMUNICATIONS							22-25	
5. RULE BASED LINGUISTIC ELEMENTS								
6. INTERACTIVE DIALOGUE								
7. ORAL AND LITERARY STYLE LANGUAGE							22-25	
8. NARRATIVE ABILITIES								
9. AESTHETICS								

ACTIVITIES / DOMAINS	9	10	11	12	13	14	15	16
1. OTHER BEHAVIOURAL DOMAINS					11-15			1-25
2. EARLY COMMUNICATIVE INTERACTIONS						1-9		
3. COMPREHENSION	1-5	1-9	1-7	1-4	1-5		1-5	1-25
4. SYMBOLIC COMMUNICATIONS	1-5	1-9	1-7	1-4	1-5 11-15			
5. RULE BASED LINGUISTIC ELEMENTS	1-5	1-9	1-7	1-4	6-10			26-39
6. INTERACTIVE DIALOGUE					11-15			
7. ORAL AND LITERARY STYLE LANGUAGE					11-15			1-25 26-39
8. NARRATIVE ABILITIES					11-15			1-25
9. AESTHETICS								

LEGEND: A MATRIX OF CONTENT DOMAINS BY ACTIVITIES WITH THE ITEMS LOCATED IN THE CELLS.

APPENDIX 1: THE TABLE OF SPECIFICATIONS.

ACTIVITIES / DOMAINS	17	18	19	20	21	22	23	24
1. OTHER BEHAVIOURAL DOMAINS	1-10 14-29		1-21		1-12	2,3 5,6		1-37
2. EARLY COMMUNICATIVE INTERACTIONS								
3. COMPREHENSION		1-8	1-21	1-4		1-6		1-37
4. SYMBOLIC COMMUNICATIONS								
5. RULE BASED LINGUISTIC ELEMENTS	30-48	1-8						38-49
6. INTERACTIVE DIALOGUE								
7. ORAL AND LITERARY STYLE LANGUAGE	1-32 30-34						1-19	1-49
8. NARRATIVE ABILITIES	1-39						1-19	
9. AESTHETICS								

ACTIVITIES / DOMAINS	25	26	27	28	29	30	31	32
1. OTHER BEHAVIOURAL DOMAINS	1-9	6			7	8-11	1-7	1-6
2. EARLY COMMUNICATIVE INTERACTIONS								
3. COMPREHENSION	1-8							
4. SYMBOLIC COMMUNICATIONS								
5. RULE BASED LINGUISTIC ELEMENTS	9-18	9-17	9-17	9-17	9-16	34-40	8-14	7-13
6. INTERACTIVE DIALOGUE								
7. ORAL AND LITERARY STYLE LANGUAGE	9-18	9-17	1-17	1-17	1-16	1-40	4-14	1-13
8. NARRATIVE ABILITIES		1-10	1-10	1-10	1-10	1-33	1-7	1-6
9.AESTHETICS								

LEGEND: A MATRIX OF CONTENT DOMAINS BY ACTIVITIES
WITH THE ITEMS LOCATED IN THE CELLS.

APPENDIX 2.: DESCRIPTION OF TASK STRUCTURE

In a standardised, formal test situation the examiner is constructing an observational situation by presenting materials in a predetermined manner so that specific behaviour can be elicited. The type of materials used and the manner of their presentation make up the predetermined task structure. The task structure for each of the activities used to collect the data is described below in five sections: 1) the purpose of the activity, 2) the materials 3) the method of presentation, 4) the behaviour that the activities are meant to elicit and 5) the procedures used to score the behaviour. The 'Purpose' section describes the underlying intent of the activity and of the elicited behaviour. The 'purpose' provides a basis for interpreting the behaviour into scores. The 'Materials' section describes the toys or pictures used in the activity. The 'Presentation' section describes how the materials are presented to the child and what the adult is to say in order to elicit the desired behaviour. The 'Behaviour' section describes the behaviour that is being elicited from the child. The 'Scoring system' describes how the behaviour is to be scored.

The behaviour is scored on a binomial system. If the behaviour is present a score of 1 is given. If the behaviour is not present a score of 0 is given. However, two types of scoring systems are used. The majority of the behaviour is scored on an individual point system which means they are scored independently of other behaviour. Those scored independently will earn a 1 if they are present irrespective of whether other behaviour is present. Other behaviour is scored on a rating scale system; this means that when some items are scored as present then other items will be scored as present as well even though they were not observed. The reason for having some of the behaviour in a rating scale set is because although the child may not display the behaviour during that activity or may not do the activity, behaviour in

later activities are either displaying the earlier behaviour or are a more complex form it.

Each of the test forms is presented to a child by an adult on a one to one basis. Although observing adults may be present they are not to assist in the presenting of the test. The child may be seated at a table, on the floor, on a sofa or in the case of the very little ones on the adult's lap (either on the examiner's or on a familiar adult's). For forms A and B a table and a chair needs to be near by if the child is not sitting at a table.

Attention control: before each of the items is presented the adult is to have secured the child's attention. The use of 'Look', the child's name and pointing to the object is an acceptable level of control strategy throughout the testing situation. When further control strategies are appropriate within a specific activity they are mentioned in the 'Presentation' section of that activity.

The number in parentheses after the activity title is the number of items in that activity.

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1. ROLLING RATTLE (5)

PURPOSE: To observe early object play behaviour and early reciprocal object-people play with a noise making toy.
MATERIALS: A wooden rattle (manufacturer: Biro) which has a bell in it and can be rolled.
PRESENTATION: 1. Hold the rattle out for the child to take, drawing the child's attention to it by shaking it and saying 'Look'.
BEHAVIOUR:

1. Looks at it. (Child looks at the rattle in the adult's hand.)

While holding the rattle the child:

2. Turns it. (Child turns the rattle while holding it and looking at it.)
3. Shakes it. (Child shakes the rattle.)

4. Fingers bell. (Child puts fingers through the 'bars' and touches the bell.)

If the child does not spontaneously roll the rattle to the adult try to engage the child in a reciprocal game routine of rolling the rattle to the adult by holding your hands in a 'ready to catch' position to catch the rattle when it is rolled. If the child does not roll the rattle then, take the rattle and roll it to the child and hold your hands in a 'ready to catch' position.

5. Rolls to adult. (Child rolls the rattle to the adult.)

SCORING SYSTEM:

1. INDIVIDUAL POINT SYSTEM

Items 1-4 are scored independently.

2. RATING SCALE SYSTEM

If the child does item 5 then items 1-4 are also scored.

---

2. POP UP CONE (4)

PURPOSE: To observe early exploratory play with a toy that can be manipulated.

MATERIALS: A clown on a stick. The clown's head and body are in a cone and can be pushed in and out of the cone by moving the stick up and down.

PRESENTATION: Hold out the clown, saying 'Look', move the clown in and out of the cone slowly to gain and hold the child's attention.

BEHAVIOUR:

1. Looks at it. (Child looks at the clown briefly.)
2. Watches it come and go. (Child watches the clown intently as the clown moves in and out.)
3. Pushes puppet in and pulls out. (Child tries to push the clown in and out of the cone.)
4. Pushes stick in and out. (Child takes the toy and tries to move the stick in and out.)

SCORING SYSTEM:

1. INDIVIDUAL POINT SYSTEM

Items 1-4 are scored independently of each other.

2. RATING SCALE SYSTEM

If items 1-2 are scored then items 1-2 in Activity 1 are also scored.

If items 3 or 4 are scored then items 3 and 4 in Activity 1 are scored.

---

3. WIND UP MOVING TOY (5)

PURPOSE: To observe means-end play and early 'request' making communicative behaviour.
MATERIALS: A wind up moving pair of shoes.
PRESENTATION: Wind the toy up and put it down on the table so that the shoes 'walk' across the table.
BEHAVIOUR:

1. Looks at it. (Child briefly looks at the toy.)
2. Watches it move. (Child watches the shoes walk across the table.)
3. Makes noise or movement for it to go again. (When the shoes stop the child looks at the adult or toy and makes a noise or movement that they want the toy to go again.)
4. Tries to do it by his or herself. (Child picks up toy and tries to get the shoes moving again.)
5. Asks for help to wind it up. (Child gives the toy for the adult to wind.)

SCORING SYSTEM:
1. INDIVIDUAL POINT SYSTEM
Items 1-5 are scored independently of each other.
2. RATING SCALE SYSTEM
If items 1-2 are scored then items 1 in Activity 1 and items 1 and 2 in Activity 2 are scored.
If item 3 is scored then items 2 and 3 in Activity 1 and items 3 and 4 in Activity 2 is scored.
If item 5 is scored then item 4 in Activity 1 is scored.

---

4. GRADED DOLL (4)

PURPOSE: To observe simple structured play with objects that fit together.
MATERIALS: A series of graded wooden circles on a stick with a ball on the top. The toy is painted to resemble a woman.
PRESENTATION: Place the doll on the table in front of the

child. If the child does nothing take the pieces off and put them back on in front of the child.

BEHAVIOUR:

1. Takes off. (Child takes the rings off of the stick.)
2. Puts on. (Child puts the rings on the stick.)
3. Puts head on. (Child puts the rings and the ball on the stick.)
4. Grades. (Child puts the rings and the ball on the stick, grading the rings.)

SCORING SYSTEM:

1. INDIVIDUAL POINT SYSTEM

Items 1-4 are scored independently of each other.

2. RATING SCALE SYSTEM

If items 1-3 are present then items 1-4 in Activity 1 are scored, items 1-4 in Activity 2 are scored and items 1-2 and 4 in activity 3 are scored.

---

5. 1ST WORDS PUZZLE (6)

PURPOSE: To observe structured play with objects that fit together.

MATERIALS: A wooden inset puzzle with eight pieces.

PRESENTATION: Place the puzzle in front of the child. If the child does not take them out, take out a puzzle piece. Ask the child to put all the pieces 'over here' (beside the puzzle). After the child has taken the puzzle pieces out if he or she does not start putting them back ask the child to put them back. If the child still does not start to put them back then demonstrate by putting back one or two and ask the child to put them back.

BEHAVIOUR:

1. Child takes them out. (Child takes the puzzle pieces out.)
2. Puts back on own. (Child puts pieces back.)

On the child's own without help the child takes out or puts back the puzzle pieces.

3. Takes out 1--5 pieces without help.
4. Takes out 6--8 pieces without help.
5. Puts back 1--5 pieces without help.

6. Puts back 6--8 pieces without help.

SCORING SYSTEM:

1. INDIVIDUAL POINT SYSTEM

Items 1-6 are scored independently of each other.

2. RATING SCALE SYSTEM

If items 1-3 and 5 are present then items 1-4 in Activity 1 are scored, items 1-4 in Activity 2 are scored and items 1-2 and 4 in activity 3 are scored.

---

6. MATCHES OBJECTS TO PICTURES (12)

PURPOSE: To observe matching behaviour and 'request' communicative behaviour.

MATERIALS: Three picture cards with pictures on them that match the puzzle pieces.

1. The bed.
2. The spoon and the cat.
3. The cup, teapot, shoe, apple and the chair.

PRESENTATION: Put the first card out and put three puzzle pieces out. Ask the child to find the bed 'like this one'. If the child finds the bed but does not put the puzzle piece on top of the picture do so yourself.

1. Bed.

Put out the second card and three more puzzle pieces and ask the child to 'find these'.

2. Cat.
3. Spoon.

Put out the last card and the others but keep the cup. Ask the child to 'find these'.

4. Apple.
5. Teapot.
6. Chair.
7. Shoe.

Tick how the child registers that one of the pieces is missing.

8. Cup.

COMMENTS ON MISSING ITEM

9. Indicates. (Child looks perplexed or comments or starts to search.)
10. Comments on missing item. (Child says something about the piece.)
11. Searches for missing item with help of adult. (Child starts to hunt with help and guidance from the adult.)
12. Searches for missing item on own. (Child starts looking for the piece.)

SCORING SYSTEM:

1. INDIVIDUAL POINT SYSTEM

Items 1-12 are scored independently of each other.

2. RATING SCALE SYSTEM

No rating scale system applies.

---

7. LARGE DOLL PLAY (26)

PURPOSE: To observe play behaviour with large doll toys. The play behaviour includes early combining play, functional play, social play and pretend play.

MATERIALS: A seven inch high teddy, a plastic toy dinner set comprised of a spoon, a cup, a saucer and a jug.

PRESENTATION: Place the teddy in a sitting position on the table put out the spoon and the cup in front of the teddy. Close to the teddy but to the side put out the jug and the saucer.

BEHAVIOUR:

The child picks up and plays with the object by using early exploratory play, early social play, functional play or pretend play.

TOY CHOICE

1. Plays with teddy.
2. Plays with jug.
3. Plays with spoon.
4. Plays with cup.
5. Plays with saucer.

FUNCTIONAL PLAY

As the child relates the toys together, to the teddy or to the adult tick the behaviour.

6. Puts cup on saucer.

7. Relates spoon to saucer/cup/jug.
8. Relates spoon/cup to adult.
9. Relates spoon/cup to teddy.
10. Relates jug to cup/saucer.
11. Relates toys to self.

CONTAINER PLAY

As the child engages in a particular type of play tick the behaviour.

12. Container play. (Child stacks or inserts cups and items.)

If the child is playing at the container play stage or is not engaged in any type of pretend play put the wooden rings from the graded doll out on the saucer.

13. Moves items from one cup to another. (Child puts rings in one toy and then into another toy.)

PRETEND PLAY

14. Sequences stirring up the food and feeding it to teddy/adult. (Child uses spoon to scrape in cup/jug or on saucer and then takes spoon to teddy's mouth or offers it to the adult.)
15. Pours out another cup and gives 'more' to teddy/adult.

PRETEND PLAY SEQUENCES

As the child uses sequences in the pretend play tick the type of sequence.

16. One::one single (i.e. takes spoon to teddy.)
17. One::one repetitive (i.e. feeds teddy then feeds adult.)
18. Several one::one (i.e. feeds teddy then stirs spoon in cup then pours from jug into cup. The behaviour is not ordered or runs smoothly as if in a sequence of behaviour.)
19. Two step sequence (i.e. pours from jug into cup then stirs with spoon as if stirring the 'liquid' that was just poured, scrapes plate then feeds teddy.)
20. Several two steps (does several two step sequences.)
21. Three+ steps (i.e. pours from jug then stirs with spoon then feeds teddy/self/adult.)

PRETEND PLAY WITH ADULT

22. When adult says 'hot' child blows on it and serves adult.

SYNTAX ANALYSIS (to be taken from both large and miniature doll play).

23. Uses single words (at least two examples to get credit).
24. Uses two word utterance may sound stereotypic (at least two examples to get credit).
25. Uses a basic sentence (at least two examples to get credit).
26. Uses a mature sounding sentence form (at least two examples to get credit).

SCORING SYSTEM:

1. INDIVIDUAL POINT SYSTEM

Items 1-15 and items 22-23 are scored independently.

2. RATING SCALE SYSTEM

Items 16-21 are sequential if one item is present then the items numbered less than it are scored as present.

If item 13 is present then items 1-4 in Activity 1 are scored, items 1-4 in Activity 2 are scored and items 1-2 and 4 in activity 3 are scored.

If the child relates any of the toys to the adult then item 5 in Activity 1 is scored.

---

8. MINIATURE TOY PLAY (17)

PURPOSE: To observe symbolic representation play when playing with miniature people toys. To observe the organisation of play space and the maintenance of that play space even when disruptions and adult comments occur.

MATERIALS: A set of miniature toys (two inches high) consisting of: a table, a chair, a clothed child doll in a sitting position, a bath, a nude baby doll, a small cup and teapot, an aeroplane, a small baby bottle, a small plate with food painted on it, a small spoon, a small flannel and a wooden stringed horse on a pedestal--when the base of the pedestal is pressed the horse collapses.

PRESENTATION: Hand the toys to the child one at a time giving the child time to organise the toys into play

spaces and to play with them, however do not let the child get carried away in play with only a few of the items. A slow pace of giving the objects to the child is needed if the child begins to become too involved in a pretend play simply say the child's name and hand over the next toy.

1. First give: the table, then the chair, then the doll, the bath, the aeroplane, the nude baby doll, the cup and teapot and finally the bottle.
2. Let the child play with these then bring out the horse and demonstrate to the child the way it collapses and stands up again. Give the horse to the child.
3. After the child has played with the horse ask for it to be put away and bring out the dinner plate and the spoon. Ask the child to give the boy some dinner.
4. Bring out the flannel and ask the child to wash the baby.

BEHAVIOUR:

1. Puts chair up to table.
2. Sits doll in chair.
3. Sets bath apart (at least three inches away from the toy table).
4. Flies plane (holds plane up and 'flies' plane through the air).
5. Sets plane apart (at least three inches away from the toy table).
6. Puts baby in bath.
7. Puts teapot on table.
8. Puts cup on table.
9. Feeds baby with the bottle.

BRING OUT HORSE AND MAKE IT WORK

10. Child watches.
11. Child tries to make it work too.
12. Other toys remain intact. (The toys on the table remain in position and the child's manipulation of the horse does not interfere with them.)

PUT TOY HORSE AWAY.

13. Child lets horse be put away and turns attention to other toys.

BRING OUT FOOD AND SPOON

14. Feeds doll with food and spoon, scrapes then feeds.
15. Pours and then feeds doll.

BRING OUT FLANNEL

16. Covers baby in bath. (Child puts the flannel over the baby while the baby is still in the bath.)
17. Washes baby. (Child does a careful washing/drying of the baby.)

SCORING SYSTEM:

1. INDIVIDUAL POINT SYSTEM

Items 1-17 are scored independently of each other.

2. RATING SCALE SYSTEM

If items 2, 4, or 9 are present (the child needs two items out of the three) then items 1-13 in Activity 7 are scored.

If either items 5 or 9 are present then item 14 in Activity 7 is scored.

If item 13 in Activity 7 is scored then items 1-4 in Activity 1 are scored, items 1-4 in Activity 2 are scored and items 1-2 and 4 in activity 3 are scored.

If any item 1-9 is present then score item 16 in Activity 7.

If any two items 1-9 are present then score items 17 and 18 in Activity 7.

If items 14 or 15 are present then score item 19 in Activity 7.

If both 14 and 15 are present then score item 20 in Activity 7.

If the child uses three+ steps in items 14, 15 or 17 then score item 21 in Activity 7.

---

9. FOLLOWS SIMPLE DIRECTIONS (9)

PURPOSE: To observe the child's ability to respond accurately to specific commands from the adult.

MATERIALS: A small plastic cat.

PRESENTATION: Give the cat to the child and ask the child to do the following behaviour. Say the words as they are written below in the 'behaviour' section.

BEHAVIOUR:

1. Put it on the floor. (Child puts the cat on the floor.)
2. Put it on the chair. (Child puts the cat on the chair.)
3. Put it on the table. (Child puts the cat on the table.)
4. Put it on your head. (Child puts the cat on his or her head.)
5. Give it to me. (Child gives the cat to the examiner.)

Count the number of items correct in items 1-5 and score accordingly:

6. Two correct.
7. Three correct.
8. Four correct.
9. Five correct.

SCORING SYSTEM:

1. INDIVIDUAL POINT SYSTEM

Items 1-5 are scored independently.

2. RATING SCALE SYSTEM

Items 6-9 are sequential and when an item is scored then all items with a number less will be scored.

---

10. POINTS TO BODY PARTS (15)

PURPOSE: To observe the child's ability to point to named body parts.

MATERIALS: NONE; the child points to the his or her own body parts.

PRESENTATION: Ask the child to point to his or her body parts by saying 'show me your (nose).' The command may be repeated once. The child must point or show the named part in a clearly demonstrated method such as turning the ear towards the adult for 'ear' or closing the eyes for 'eyes'. (Chin and elbow must be clearly shown not just patted at in the right direction.)

BEHAVIOUR:

1. Nose.
2. Ear.
3. Eye.

4. Mouth.
5. Finger.
6. Thumb.
7. Chin.
8. Elbow.
9. Nostril.

Count the number of items correct in 1-9 and score accordingly:

10. Two correct.
11. Four correct.
12. Five correct.
13. Seven correct.
14. Eight correct.
15. Nine correct.

SCORING SYSTEM:

1. INDIVIDUAL POINT SYSTEM

Items 1-9 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 10-15 are sequential if one item is present then the items numbered less than it are scored.

---

11. DOES ACTIONS (11)

PURPOSE: To observe the child doing physical actions accurately to specific commands from the adult.

MATERIALS: NONE; the child moves him or herself.

PRESENTATION: Give the following commands to the child. Say that now you would like them to do some things for you 'I'd like you to (clap)'. The child must actually do the action not just appear as if he or she understands but is too shy to do them. Encouraging comments and noises are to be made by the adult, especially if the child is shy or hesitant. The commands may be repeated once.

BEHAVIOUR:

1. Clap.
2. Close your eyes.
3. Stamp feet.

4. Pat head.
5. Jump.
6. Walk.
7. Run around.

Count the number of items correct in 1-7 and score accordingly.

8. Two correct.
9. Four correct.
10. Five correct.
11. Seven correct.

SCORING SYSTEM:

1. INDIVIDUAL POINT SYSTEM

Items 1-7 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 8-11 are sequential if one item is present then the items numbered less than it are scored.

---

12. POINTS TO ACTION PICTURES (LDA) (7)

PURPOSE: To observe the child's ability to identify action pictures by pointing to the actions when they are named by the adult.

MATERIALS: Four LDA pictures are used. They are the pictures of the baby bathing, baby drinking, baby sitting and baby standing. (From set 1.)

PRESENTATION: Place three pictures out and ask for the middle one, place three pictures out and ask for the left one, place three pictures out and ask for the right hand one, place three pictures out and ask for the left hand one.

BEHAVIOUR:

1. Bathing (M).
2. Drinking (L).
3. Sitting (R).
4. Standing (L).

Count the number of items that are correct in 1-4 and score accordingly.

5. Two correct.
6. Three correct.

7. Four correct.

SCORING SYSTEM:

1. INDIVIDUAL POINT SYSTEM

Items 1-4 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 5-7 are sequential if one item is present then the items numbered less than it are scored.

---

13. WHERE'S TEDDY? (15)

PURPOSE: To observe the child's ability to look at a book, listen to the story being read and talk about the pictures and the story.

MATERIALS: The book **Where's Teddy?**

PRESENTATION: Sit with the child holding the book. Read the page and talk about the picture asking 'where's Teddy?'

BEHAVIOUR:

1. Points to TEDDY.
2. Imitates adult gestures.
3. Talks about picture with speech/gesture.
4. Sits and listens to story being read: 1-5 pages.
5. Sits and listens to story being read: 6 plus pages.

SYNTAX ANALYSIS

6. Uses single words (at least two examples to get credit).
7. Uses two word utterances which may sound stereotypic (at least two examples to get credit).
8. Uses a basic sentence (at least two examples to get credit).
9. Uses a mature sounding sentence form (at least two examples to get credit).
10. Imitates adult speech.

MIMES WASHING HAND

11. Puts hands in water.
12. Washes.
13. Takes towel.
14. Pretends to dry hands.
15. Throws away.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-15 are scored independently of each other.

2. RATING SCALE SYSTEM

No rating system applies to this activity.

---

14. EARLY COMMUNICATIONS (9)

PURPOSE: To observe early communicative behaviour.

PRESENTATION: This behaviour is scored from the communications that took place in the Activities on Form A.

BEHAVIOUR:

1. Uses actions that are easily interpreted as to what the child wants.
2. Makes different noises.
3. Makes different sounds.
4. Vocalises during different situations (two situations for credit.)
5. Vocalises in sequence with actions.
6. Uses performatives (sounds which represent the event or object that is present).
7. Uses protowords (sounds which represent events or object which are not present).
8. Uses gestures and nonverbal expressions.
9. Uses gesture with speech.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-9 are scored independently of each other.

2. RATING SCALE SYSTEM

No rating system applies.

---

15. EARLY COMPREHENSION (5)

PURPOSE: To observe early comprehension behaviour.

PRESENTATION: This behaviour is scored from the comprehension behaviour that took place in the other Activities on Form A.

BEHAVIOUR:

1. Looks at adult.
2. Takes object from adult.
3. Lets adult assist in their game.
4. Brings adult into game.
5. Plays a to and fro, reciprocal or repetitive type game with the adult.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-5 are scored independently of each other.

2. RATING SCALE SYSTEM

No rating system applies.

---

16. STRIPEY KITTEN GETS STUCK (37)

PURPOSE: To observe the child's ability to sit and listen to a sequence story picture that is being presented in a question and answer format.

MATERIALS: The six picture sequence story 'The Stripey Kitten Gets Stuck'.

PRESENTATION: The six pictures are presented to the child and the adult talks about the story and asks the questions for each of the pictures.

BEHAVIOUR: The acceptable answers are given below.

PICTURE 1.

Q. Can you find the Stripey Kitten?

A. 1. Points to kitten.

Q. What is this?

A. 2. (A) mouse.

Q. What is the kitten (cat) doing?

A. 3. Chasing, running after it.

Q. What are these people doing?

A. 4. Making a mess.

A. 5. Making a mess because of the cat/mouse.

PICTURE 2

Q. What is happening?

A. 6. Dog chasing the cat.

Q. Our story is called the stripey kitten gets stuck. What do you think the kitten is going to do?

A. 7. Stuck.

A. 8. Stuck in the tree.

PICTURE 3

Q. What did he do?

Q. What are they trying to do?

A. 9. To get the cat.

Q. Can they reach him?

A. 10. No.

PICTURE 4

Q. Who comes to help?

A. 11. Him, the man.

A. 12. The firemen.

Q. Do you think that they will be able to get the cat down?

A. 13. Yes.

Q. Why will they be able to get the cat down?

A. 14. A ladder.

A. 15. Long ladder.

A. 16. '-er' ladder.

PICTURE 5

Q. Did they get the cat down?

A. 17. Yes.

Q. Why is the dad shaking the fireman's hand?

Q. 18. Because he got the cat down, to say thank you.

PICTURE 6

Q. Now for our last picture. Here is the cat and here is the mouse--what is the cat going to do?

A. 19. Run.

A. 20. Chase the mouse.

Q. What are mum and the boy saying?

A. 21. 'Don't', 'No', or 'Stop'.

Q. What do they want the cat to do?

A. 22. Be good.

A. 23. Don't chase the mouse.

A. 24. Go inside.

Q. What do you want the cat to do?

A. 25. Be good, go inside, chase the mouse, get stuck in the tree.

SYNTAX ANALYSIS

26. Uses single word utterances (two examples to get credit).

27. Uses two word utterance, may sound stereotypic (two examples to get credit).
28. Uses one basic sentence.
29. Uses three or four basic sentences.
30. Uses five or more basic sentences.
31. Uses one complex sentence.
32. Uses two complex sentences.
33. Uses 'and, and then, then'.
34. Uses 'or, but'.
35. Uses 'because, so'.
36. Uses 'when'.
37. Uses 'which, who, that'.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-3, 6, 9-10, 13, 17, 18, 21, 25, 26-27, 35-37 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 14-16; 7-8; 11-12; 14-16; 19-20; 22-24; 28-30 and 31-32 are in sequential sets. Within a set if a higher item is scored then the lower numbered items are scored.

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17. THE DRAGON AND THE BIRTHDAY PARTY (41)

PURPOSE: To observe the child making up a story when presented with a picture.

MATERIALS: The picture 'The Dragon and the Birthday Party'.

PRESENTATION: The picture is held towards the adult who says 'I have a picture of a Dragon and a birthday party. Can you tell me a story about this Dragon and the birthday party'. The picture is then put before the child. If the child only says one utterance. The adult then repeats the utterance and says 'can you tell me more about the Dragon and The Birthday Party?'

BEHAVIOUR:

STORY CREATION

1. Decontextual language: ideas that are not directly depicted in the picture but related to the events or objects in the picture. (i.e. goes beyond just labelling).

2. Topic focus: the idea of a birthday party is present or an imaginative theme is stated.
3. No unrelated utterances: all utterances are either related to the picture or to each other (no totally off the wall comments that are completely unrelated to each other or to the events pictured.)

CHAINING OF UTTERANCES: LOGICAL-TEMPORAL STRUCTURE

4. States one action
5. States or lists action(s) that are related to the events but which are unrelated to each other. Each could be the beginnings of a narrative and are related to the events in the picture but there is no chaining between them.
6. States actions that are related but they have no time sequence. A sense of unity is there, either through the repetition of an idea or through the centring of an idea.
7. Event-time sequence: the actions are related to the topic and are related to each other in a time sequence i.e. one event has to occur before the other can take place, or they follow the natural pattern of events, or they follow the natural order of the day/year/season: order is important.
8. Uses 'so/because': there is a causal link between events.
9. Goal based causal without obstacle: there are plans to reach the solution.
10. Goal based causal with obstacle. There are plans to reach the solution but there is an obstacle to overcome.

COHESIVE HARMONY

11. A word is repeated.
12. A noun is replaced by a pronoun. Or a pronoun is replaced by a noun.
13. The indefinite is subsequently replaced by the definite ('a' changes to 'the').

EVENT ELABORATION

14. Event elaboration: the topic is elaborated through two+ actions.
15. Subject + verbs: a person or dragon does two different actions that are related to the topic.

16. Subject + three different actions: the subject is doing three different actions that are related to the topic.
17. Repetition of actions: Several actions are happening to a single direct object; the same action is happening to several objects; two or more subjects are doing the same action.

STORY PLOT DEVELOPMENT

18. Introduction of a 'problem ': one of the events has the nature or appearance of being questionable, difficult to deal with, unwanted, causing injury, or causing an unwanted event to happen.
19. Consequences: there is a result due to some other occurrence.
20. Actions: actions are happening to overcome the problem.
21. Plans: there are stated plans to overcome the problem.
22. Reactions: there is an internal state caused by the problem, consequences or solution.
23. Resolution: the problem is solved, overcome or punishment will/has occur(red).
24. Contrary: expresses an event that is contrary to expectation (but, although).
25. 'and...if': an hypothetical state of events is presented.

STORY MARKERS

26. Story Introduction: the child states that the story is beginning, or uses markers such as 'one day...'.
27. Story End: states that the story has finished.

CHARACTER DEVELOPMENT

28. Uses direct speech.
29. Deixis: uses personal pronouns in role shifts in the direct speech.

SYNTAX ANALYSIS

30. Uses single words (two examples to get credit).
31. Two word utterances, may sound stereotypic (two examples to get credit).
32. Uses one basic sentence.
33. Uses two basic sentences.
34. Uses three basic sentences.

35. Uses one complex sentence.
36. Uses two complex sentences.
37. Uses 'and, and then, then'.
38. Uses 'or, but'.
39. Uses 'because, so'.
40. Uses 'when'.
41. Uses 'which, who, that'.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 3, 11-14, 17, 18-31 and 37-41 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 1-2, 4-10, 15-16, 32-34, 35-36 are in rating scale sets. Within a set if a higher item is scored then the lower numbered items are scored.

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18. PREPOSITION COMMANDS: (13)

PURPOSE: To observe the child responding accurately to commands which have prepositions in them.

MATERIALS: A plastic toy white cat and a plastic toy blue bath.

PRESENTATION: The cat and the bath are placed in front of the child. The bath is placed so that the end with the taps is to the child's right.

BEHAVIOUR:

1. Put the cat in the bath.
2. Put the cat under the bath.
3. Put the cat on the bath.
4. Put the cat beside the bath. (Score correct if the child places the cat at the bath's side--the long end.)
5. Put the cat behind the bath. (Score correct if the child places the cat on the bath side opposite to him or herself.)
6. Put the cat above the bath.
7. Make the cat jump over the bath.
8. Make the cat run around the bath.

Count the items which are correct in 1-8 and score accordingly.

9. Two correct.
10. Four correct.
11. Six correct.
12. Seven correct.
13. Eight correct.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-8 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 9-13 are a rating scale set. Within a set if a higher item is scored then the lower numbered items are scored.

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19. SELECTS BY FUNCTION: (27)

PURPOSE: To observe the child's ability to select and point to a picture when it is described by its object function.

MATERIALS: The book of action and object pictures.

PRESENTATION: The book is placed in front of the child and the pictures are then described.

BEHAVIOUR: The child points to the picture as the adult says the following description.

1. Drink out of.
2. Sleep in.
3. Sit on.
4. Draw with.
5. Eat.
6. Throw.
7. Live in.
8. Talk on.
9. Play on.
10. Wear.
11. Bites.
12. Swims.
13. Flies.
14. Take a picture with.
15. Goes in the water.
16. Says 'meow'.
17. Goes on the road.

18. Goes in the sky.
19. Burns.
20. Bounce.
21. Read.

Count the number of items correct in 1-21 and score accordingly.

22. Five correct answers.
23. Eight correct answers.
24. Ten correct answers.
25. Sixteen correct answers.
26. Twenty correct answers.
27. Twenty-one correct answers.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-21 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 22-27 are a rating scale set. Within a set if a higher item is scored then the lower numbered items are scored.

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20. POINTS TO SMALL ACTION PICTURES (7)

PURPOSE: To observe the child's ability to select and point to small pictures depicting actions.

MATERIALS: The book of action and object pictures.

PRESENTATION: The page with the four pictures of actions is placed before the child and the actions are named in the order given below.

BEHAVIOUR:

1. Eating.
2. Standing.
3. Sitting.
4. Sleeping.

Count the number of items correct in 1-21 and score accordingly.

5. Two correct.
6. Three correct.
7. Four correct.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-4 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 5-7 are a rating scale set. Within a set if a higher item is scored then the lower numbered items are scored.

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21. MATCHING PREPOSITION PICTURES (24)

PURPOSE: To observe the child's ability to match pictures which depict the same subject in two different places.

MATERIALS: Two large picture cards and their matching picture cards.

PRESENTATION: First present the card with the teddies on it. Show the child that there is a big teddy and a little teddy and that they are in the car and on the car. Give the deck of cards to the child and ask then to match them to the large picture. When that task is over give the other picture card and show the child that there are babies, teddies, cups and cats and that they are on the table and under it. Give the deck of cards to the child and ask them to match them.

BEHAVIOUR: The child matches the picture of:

1. Big teddy in car.
2. Big teddy on car.
3. Little teddy in car.
4. Little teddy on car.
5. Teddy on table.
6. Teddy under table.
7. Baby on table.
8. Baby under table.
9. Cat on table.
10. Cat under table.
11. Cup on table.
12. Cup under table.

Count the number of items correct in 1-12 and score accordingly.

Big/Little Teddy in/on car.

13. One correct.
14. Two correct.

15. Three correct.
16. Four correct.
Teddy/Baby/Cat/Cup on/under table:
17. One correct.
18. Two correct.
19. Three correct.
20. Four correct.
21. Five correct.
22. Six correct.
23. Seven correct.
24. Eight correct.
SCORING SYSTEM
1. INDIVIDUAL POINT SYSTEM
Items 1-12 are scored independently of each other.
2. RATING SCALE SYSTEM
Items 13-16 and 17-24 are in rating scale sets. Within a set if a higher item is scored then the lower numbered items are scored.

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22. BROKEN CUP/BROKEN BED (6)

PURPOSE: To observe the child's ability to answer questions about two broken objects. The objects provide a focus of attention but the answers are drawn from the child's knowledge about the world.
MATERIALS: Two paper cups of which one has a hole in the bottom. A broken bed. The headboard is broken from the base. Both parts are given to the child.
PRESENTATION: First present the two cups and ask the questions then present the bed and ask the questions. If the child does not get item 5 right do not ask item 6.
BEHAVIOUR:
BROKEN CUP
What is the matter with this cup? Show the broken cup.
1. Says 'broken' 'got a hole'.
What will happen if I put water in it.
2. Come out, go on the table, make a mess.
Then what will I have to do?
3. Clean it up.

BROKEN BED

What is the matter with this bed?

4. Broken.

What will I have to do?

5. Mend it.

How can I do that?

6. With glue (or other reasonable instrument).

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-6 are scored independently of each other.

2. RATING SCALE SYSTEM

No rating scale system applies.

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23. SEQUENCE PICTURES: RUNNING (19)

PURPOSE: To observe the child's ability to relate a story which is depicted in three pictures.

MATERIALS: A three picture sequence story showing a boy and girl running, the boy falling and the girl helping him.

PRESENTATION: Place the pictures on the table in order in front of the child. Say 'This is a story about a little girl and a little boy--can you tell me the story?'

BEHAVIOUR:

IDEAS PRESENTED:

1. Running, chasing.
2. Falling.
3. Helping up.
4. Hurt/cry.

STORY CREATION:

5. All utterances are about the topic.
6. All utterances are sequential and spoken as if telling a story, rather than describing single event pictures.

CHAINING OF UTTERANCES: LOGICAL-TEMPORAL STRUCTURE

Score the temporal structure of the story.

7. States one action.
8. States or lists action(s), unrelated to each other.
9. States actions which are related to each other but which have no time sequence. A sense of unity is there, either through the repetition of an idea or through the centring of an idea.

10. Event-time Sequence: the actions related to the topic are related to each other in a time sequence i.e. one event has to occur before the other can take place, or they follow the natural pattern of events, or they follow the natural order of the day/year/season: order is important.
11. Uses 'so/because': a causal link is stated.
12. Goal based causal without obstacle: there are plans to reach the solution.
13. Goal based causal with obstacle.

COHESIVE HARMONY

14. A word is repeated.
15. A noun is replaced by a pronoun.
16. The indefinite article is replaced by the definite (a--->the).

EVENT ELABORATION

17. Event Elaboration: the topic is elaborated through two+ actions.
18. Subject + verbs: a person does two different actions that are related related to the topic.
19. Subject + three different actions: the subject is doing three different actions that are related to the topic.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-6 and 14-17 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 7-13 and 18-19 form rating scale sets. Within a set if a higher item is scored then the lower numbered items in the set are scored.

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24. PICTURE DESCRIPTION BOOK (48)

PURPOSE: To observe a child's ability to talk about pictures which require different types of cognitive ability to understand.

MATERIALS: A book of pictures which are used for the picture description tasks. There are ten sections which are designed to elicit specific language behaviour:

1. Builds on adult's language.
2. Describes simple action pictures.
3. Describes 'silly' pictures.
4. Describes a picture of an event that is clearly about to happen.
5. Describes a picture of an event that has just happened.
6. Describes why a feeling (emotion) is occurring.
7. Describes why a feeling (state) is occurring.
8. States inferences.
9. States predictions.
10. Explains how a goal could be achieved.

PRESENTATION: Place the book in front of the child. Each task has its own instructions which are given below.

BEHAVIOUR:

Task 1:

Builds on adult's language.

First he pours a drink and then...

First he helps himself to food...

First she puts on her socks...

1. Uses one 'then' in the descriptions.

Task 2:

Describes simple action picture. Say: 'We have a cat chasing a mouse again and they have made a mess can you tell me the type of mess that they have made?' Point to each of the six pictures in turn saying 'What have they done here?' Count the different correct verbs (other than 'messed') that the child uses in the six picture descriptions.

2. Uses 1-4 different verbs--do not count 'messed'.
3. Uses 5-6 different verbs--do not count 'messed'.

Count the different correct nouns (other than 'thing') that the child uses in the six picture descriptions.

4. Uses 1-4 different correct nouns.
5. Uses 5-6 different correct nouns.

Task 3:

Describes a picture of event that is unlikely to happen. Say: 'Here we have some silly pictures. Can you tell me what's silly?'

6. States an accurate description that there is a boot on the duck's head.
7. States an accurate description that there is a boat in the sky.
8. States an accurate description that there is a cat in the water/pond.
9. States an accurate description that there is a man/bike riding up the tree.

Task 4:

Describes a picture of an event that is clearly about to happen. What are these people doing.

10. States an accurate description of what the people in the garden are doing. Needs two descriptions.

What might happen?

11. States an accurate description of what might happen to them. Needs one description and uses the future tense in the sentence.

Task 5: Describes picture where an event has just happened.

What happened?

12. States an accurate description of what happened to them. Needs one correct description and uses the past tense in the sentence.

Task 6: States why a person is feeling the way they do by selecting a picture that would explain the emotion.

Why is he happy?

13. States a reasonable event of why a person may be happy.
14. States that he is happy because he has a present.

Why is he sad?

15. States a reasonable event of why a person may be sad.
16. States that he is sad because his balloon popped.

Why is he cross?

17. States a reasonable event of why a person may be cross.
18. States that he is cross because the dog chewed his shoe.

Task 7: States why a person is feeling the way they do by selecting a picture that would explain the state.

Why is she cold?

19. States that she is cold because its raining.
20. States that she is cold because she has no jacket.

Why is she not well?

21. States that she is not well because she is ill, cold, has a tummy ache, or other reason.
22. States that she is not well because she ate too much.

Why is she tired?

23. States that she is tired because she has had a busy day.
24. States that she is tired because she has been running.

Task 8: Inferences: States the reason why a person is doing the action.

Why is mother watering the plants?

25. Gives an appropriate answer: i.e. 'because they might die', 'she wants them to grow'.

Why is she cooking?

26. Gives an appropriate answer: i.e. 'because they are hungry, it's dinnertime'.

Why is he putting the clothes in the washing machine?

27. Gives an appropriate answer: i.e. 'to make them clean'

Why are they taking out the rubbish?

28. Gives an appropriate answer: i.e. 'to put in the bin, for the dustmen, to clean the house'.

Why are they wearing raincoats?

29. Gives an appropriate answer: i.e. 'because it's raining'.

Why is the little girl sitting on the books?

30. Gives an appropriate answer: i.e. 'so she can reach'.

Task 9: Prediction: States the likely outcome of the action or event.

Why shouldn't they do this?

31. Gives an appropriate answer: i.e. 'you might get run over, hurt'

Why shouldn't he do this?

32. Gives an appropriate answer: i.e. 'it will hurt the cat, the cat will scratch you'.

Why shouldn't she do this?

33. Gives an appropriate answer: i.e. 'the bird might fly away'.

Why shouldn't he do this?

34. 'the rain will come in'

35. 'you will get dirty socks'

Task 10: Explains how a goal could be achieved.

36. Gives a reasonable method as to how the boat could be rescued.

37. Gives a reasonable method as to how the kite could be rescued.

SYNTAX ANALYSIS

38. Uses phrase structure.

39. Uses one basic sentence.

40. Uses ten+ basic sentences.

41. Uses twenty+ basic sentences.

42. Uses one complex sentence.

43. Uses four+ complex sentences.

44. Uses 'and, and then, then'.

45. Uses 'or, but'.

46. Uses 'because, so'.

47. Uses 'when'.

48. Uses 'which, who, that'.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1, 6-12 and 25-48 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 2-3; 4-5; 13-14; 15-16; 17-18; 19-20 21-22 and 23-24 form rating scale sets. Within a set if a higher item is scored then the lower numbered items in the set are scored.

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25. GREEN CROSS CODE (18)

PURPOSE: To observe the child's ability to use his or her knowledge about the world to talk about a picture of an event which is about to happen.

MATERIALS: A picture of a street scene. A boy is about to step into the road when the light says 'Don't Walk'. He is not looking because he is waving to his friends across the road and a bus is about to hit him.

PRESENTATION: Place the picture in front of the child. Ask the questions about the picture using the auxiliary picture.

BEHAVIOUR:

What is going to happen?

1. The boy is going to be hit.

Should he be crossing the street now?

2. No.

What are they saying?

3. Stop.

Present the picture of the ambulance. If the bus hits him what will happen?

4a. The ambulance will come, he will die.

Where will the ambulance take him?

4b. To the hospital.

Present the picture of the 'lollypop lady'. Who is she?

5. The lollypop lady/man.

What does she do?

6a. She stops the cars.

When she stops the cars what do the children do?

6b. Cross the road.

Present the picture of the 'green man'. What does he mean?

7. Walk.

Present the picture of the 'red man'. What does he mean?

8. Stop.

SYNTAX ANALYSIS

9. Uses one basic sentence.

10. Uses two basic sentences.

11. Uses three basic sentences.

12. Uses one complex sentence.

13. Uses two complex sentences.

14. Uses 'and, and then, then'.

15. Uses 'or, but'.

16. Uses 'because, so'.

17. Uses 'when'.

18. Uses 'which, who, that'.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Questions 1-8 are scored individually.

In questions 4 and 6 the child needs either a or b right

to score one point. If they get both a and b answers right they still only get one point.

2. RATING SCALE SYSTEM

No rating scale system applies.

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26. SEQUENCE PICTURE: BALLOON (17)

PURPOSE: To observe the child's ability to relate a story which is depicted in four pictures and requires that ability to make inferences.

MATERIALS: A four picture sequence story about a little girl who has a balloon but lets go and can not reach it. In the last picture she has it back and there is a stepladder near by.

PRESENTATION: Place the pictures on the table in order in front of the child. Say 'This is a story about a little girl and her balloon can you tell me the story?'

BEHAVIOUR:

IDEAS PRESENTED:

1. Has a balloon.
2. Lets go, it goes away.
3. Sad.
4. Cant reach it.
5. Trying to reach it on tiptoes.
6. Got a step ladder.
7. Got the balloon back.
8. Happy.

STORY CREATION

9. All utterances are about the topic.
10. All utterances run smoothly as if telling a story.

SYNTAX ANALYSIS

11. Uses one basic sentence.
12. Uses one complex sentence.
13. Uses 'and, and then, then'.
14. Uses 'or, but'.
15. Uses 'because'.
16. Uses 'when'.
17. Uses 'which, who, that'.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-17 are scored independently of each other.

2. RATING SCALE SYSTEM

No rating scale system applies.

---

27. FINDS A DOG (17)

PURPOSE: To observe the child's ability to re-tell a story which is depicted in pictures.

MATERIALS: A seven picture sequence story about a little boy who finds a dog and takes him home. He hides the dog in the cupboard but him mother finds the dog.

PRESENTATION: Place the pictures on the table in order in front of the child. Say 'This is a story about a boy who finds a dog. I'm going to tell the story first and then I would like you to re-tell the story.' Tell the story: One day a little boy saw a dog who was lost and lonely. Nobody was looking at him. So the little boy said 'Come on, come home with me'. But when he got home he said 'Shh, be quiet, I don't want my parents to hear you. Here, hide in the cupboard.' But his mother opened the door and saw the dog. So the boy said 'Please, please, can we keep him?' And his mother said 'Alright, but first we must make him a home.'

BEHAVIOUR:

IDEAS EXPRESSED WHEN RE-TELLING THE STORY.

1. Boy saw a dog.
2. Lost.
3. Come home.
4. Be quiet.
5. Hide in the cupboard.
6. Mother finds him.
7. Boy pleads.
8. Builds a home.

STORY CREATION

9. All utterances are about the topic.
10. All utterances run smoothly as if telling a story.

SYNTAX ANALYSIS

11. Uses one basic sentence.

12. Use one complex sentence.
13. Uses 'and, and then, then'.
14. Uses 'or, but'.
15. Uses 'because'.
16. Uses 'when'.
17. Uses 'which, who, that'.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-17 are scored independently of each other.

2. RATING SCALE SYSTEM

No rating scale system applies.

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28. DOG FOLLOWS HIM TO SCHOOL (17)

PURPOSE:To observe the child's ability to relate a story which is depicted in five pictures. The story has nonvisual states which contribute to the motive of the action and an obscure action (sniffing to search for the boy), feelings (missing the boy) and an obscure activity (thinking).

MATERIALS: A five picture sequence story about the little boy leaving for school. His dog misses him and follows him to school.

PRESENTATION:Place the pictures on the table in order in front of the child. Say 'Now the boy is going to school and he says 'bye' to his dog--can you finish the story?'

BEHAVIOUR:

IDEAS EXPRESSED IN THE STORY

1. Boy goes to school.
2. Dog thinks of him.
3. Dog missed him.
4. Dog follows him/tries to find him.
5. Dog sniffs looking for the boy.
6. Dog peeps through the window.
7. Dog jumps in.
8. Teacher is cross.

STORY CREATION

9. All utterances are about the topic.
10. All utterances run smoothly as if telling a story.

SYNTAX ANALYSIS

11. Uses one basic sentence.
12. Uses one complex sentence.
13. Uses 'and, and then, then'.
14. Uses 'or, but'.
15. Uses 'because'.
16. Uses 'when'.
17. Uses 'which, who, that'.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-17 are scored independently of each other.

2. RATING SCALE SYSTEM

No rating scale system applies.

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29. DREAMS OF A SPACE FLIGHT (16)

PURPOSE: To observe the child's ability to relate a story which is depicted in five pictures and has a nonvisual state that the child has to infer in order to explain the sequence of events.

MATERIALS: A five picture sequence story about the little boy and dog going into space and finding space aliens, however, it was all a dream.

PRESENTATION:Place the pictures on the table in order in front of the child. Say 'Now the boy is getting ready for bed, he washes his face--can you finish the story?'

BEHAVIOUR:

IDEAS EXPRESSED IN THE STORY

1. Washes face, gets ready for bed.
2. Puts on space helmet.
3. Goes to a planet.
4. Sees creatures.
5. Goes out.
6. Creatures hide.
7. All a dream.

STORY CREATION

8. All utterances are about the topic.
9. All utterances run smoothly as if telling a story.

SYNTAX ANALYSIS

10. Uses one basic sentence.
11. Uses one complex sentence.

12. Uses 'and, and then, then'.
13. Uses 'or, but'.
14. Uses 'because'.
15. Uses 'when'.
16. Uses 'which, who, that'.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 1-16 are scored independently of each other.

2. RATING SCALE SYSTEM

No rating scale system applies.

---

30. MAN FIGHTING A DRAGON (37)

PURPOSE: To observe the child's ability to make up a story.

MATERIALS: A picture of a man and dragon fighting.

PRESENTATION: Place the picture in front of the child and say 'Now there is another dragon. Can you tell me a story about this dragon?'

BEHAVIOUR: (See The Dragon and the Birthday Party for a full explanation of each of the items.)

1. Describes the scene in the picture.
2. Adds more than is represented in the picture.
3. Story has a theme.
4. No unrelated utterances.
5. States one action.
6. States two or more actions unrelated to each other.
7. States two or more actions that are related.
8. Time relationship between propositions.
9. Causality.
10. Goal to achieve.
11. Goal and obstacle to overcome.

COHESIVE HARMONY

12. A word is repeated.
13. Noun is then referred to by a pronoun.
14. Indefinite article is then changed to the definite.

EVENT ELABORATION

15. Event Elaboration: the topic is elaborated through two+ actions.
16. Subject + Verbs: a person or dragon does two different actions that are related to the topic.

17. Subject plus three different actions: the subject is doing three different actions that are related to the topic.
18. Verbs+Object: several actions are happening to a direct object or Verb+Objects: the same action is happening to several objects or Subjects+verb: two or more subjects are doing the same action.

STORY PLOT DEVELOPMENT

19. Introduction of a 'problem': one of the events has the nature or appearance of being questionable, difficult to deal with, unwanted, causing injury, or causing an unwanted event to happen.
20. Consequences: there is a result of effect due to some other occurrence.
21. Actions: actions are happening to overcome the problem.
22. Plans: there are stated plans to overcome the problem.
23. Reactions: there is an internal state caused by the problem, consequences or solution.
24. Resolution: the problem is solved, overcome or punishment will/has occur(-red).
25. Contrary: expresses an event that is contrary to expectation ('but, although').
26. 'and...if': an hypothetical state of events is presented.

STORY MARKERS

27. Story Introduction: the child states that the story is beginning, or uses markers such as 'one day...'.
28. Story end: states that the story has finished.

CHARACTER DEVELOPMENT

29. Uses direct speech.
30. Deixis: uses personal pronouns in role shifts.
31. Uses one basic sentence.
32. Uses one complex sentence.
33. Uses 'and, and then, then'.
34. Uses 'or, but'.
35. Uses 'because'.
36. Uses 'when'.
37. Uses 'which, who, that'.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 12-37 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 1-11 form a rating scale set. Within a set if a higher item is scored then the lower numbered items in the set are scored.

---

31. STORY COMPLETION (14)

PURPOSE: To observe the child's ability to complete a story.

MATERIALS: An opening sentence to a story that the examiner says.

PRESENTATION: Say the the child 'Now I'm going to start a story and I would like you to finish it: Once upon a time there were a little girl and a little boy who went to the forest to pick strawberries but they got lost--can you finish the story?'

BEHAVIOUR:

STORY CREATION

1. States one action.
2. States or lists action(s), unrelated to each other, each could be the beginnings of a narrative and is related to the events in the picture but there is no chaining between themselves.
3. States actions related but have no time sequence, a sense of unity is there, either through the repetition of an idea or through the centring of an idea.
4. Event-time sequence: the actions related to the topic are related to each other in a time sequence i.e. one event has to occur before the other can take place, or they follow the natural pattern of events, or they follow the natural order of the day/year/season etc.: order is important.
5. 'So/because': a causal link between events is stated.
6. Goal based causal without obstacle: there are plans to reach the solution.
7. Goal based causal with obstacle.

SYNTAX ANALYSIS

8. Uses one basic sentence.
9. Uses one complex sentence.
10. Uses 'and, and then, then'.
11. Uses 'or, but'.

12. Uses 'because'.
13. Uses 'when'.
14. Uses 'which, who, that'.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

Items 8-14 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 1-7 form a rating scale set. Within a set if a higher item is scored then the lower numbered items in the set are scored.

---

32. RELATING A PERSONAL STORY (13)

PURPOSE: To observe the child's ability to relate something that he or she has done.

MATERIALS: None.

PRESENTATION: Say to the child: 'Now, I would like you to tell me about a nice day out that you have had.'

BEHAVIOUR:

1. States the day.
2. Lists the activities.
3. Describes an event.
4. Time ordering to the activities.
5. States causality.
6. States expectations.
7. Uses one basic sentence.
8. Uses one complex sentence.
9. Uses 'and, and then, then'.
10. Uses 'or, but'.
11. Uses 'because'.
12. Uses 'when'.
13. Uses 'which, who, that'.

SCORING SYSTEM

1. INDIVIDUAL POINT SYSTEM

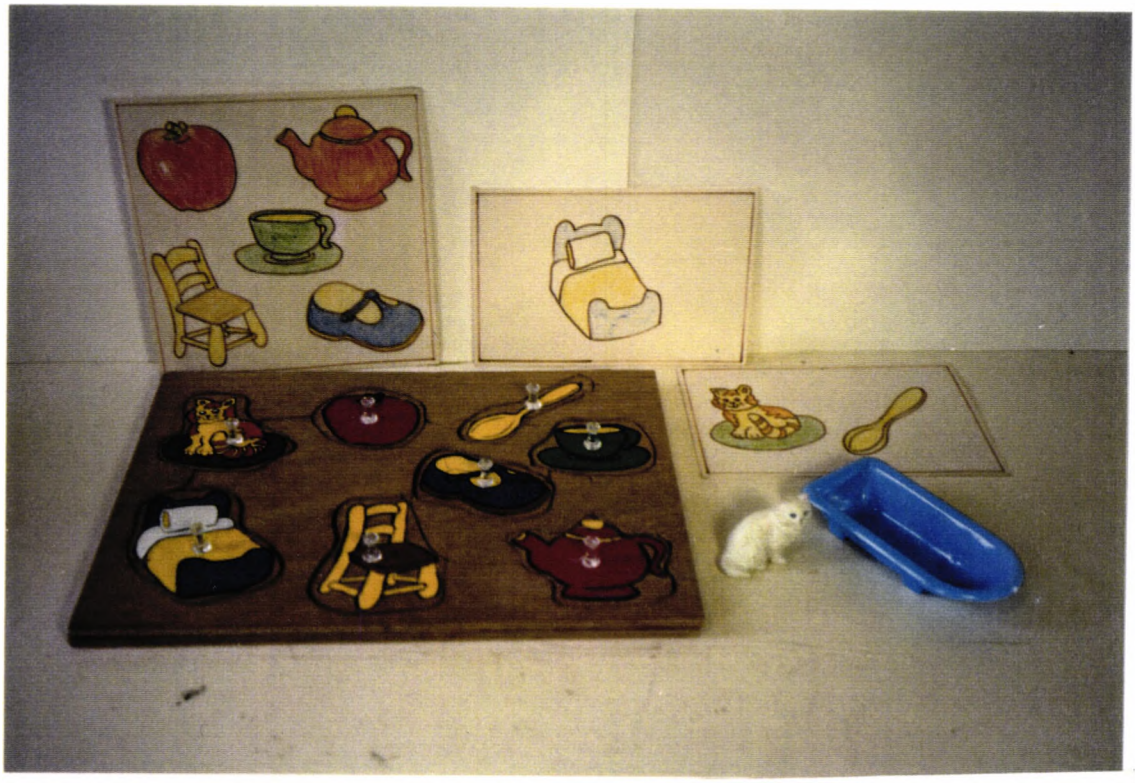
Items 7-13 are scored independently of each other.

2. RATING SCALE SYSTEM

Items 1-7 form a rating scale set. Within a set if a higher item is scored then the lower numbered items in the set are scored.

ACTIVITIES

1. ROLLING RATTLE.
2. POP UP CONE.
3. WIND UP MOVING TOY.
4. GRADED DOLL.



ACTIVITIES

5. FIRST WORDS PUZZLE.
6. MATCHES OBJECTS TO PICTURES.
18. PREPOSITIONAL COMMANDS (CAT AND BATH).

APPENDIX 3.: PHOTO EXAMPLES OF THE MATERIALS.

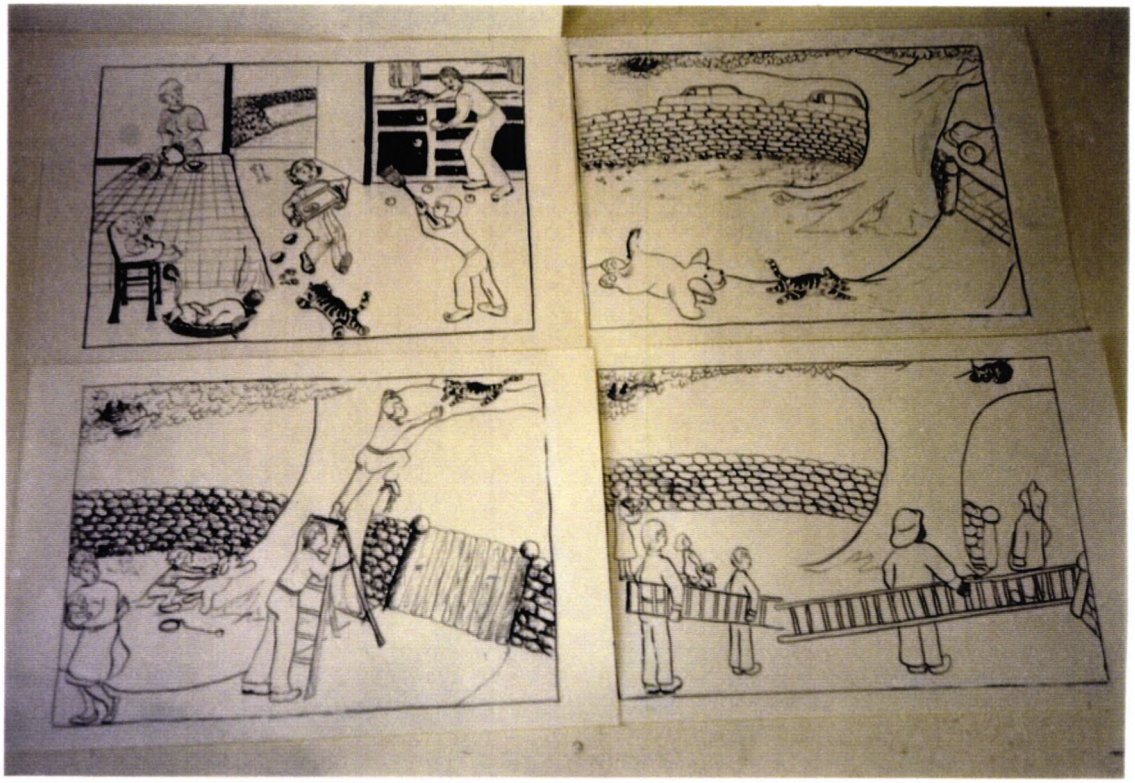
ACTIVITIES

7. LARGE DOLL PLAY.

8. MINIATURE DOLL PLAY.

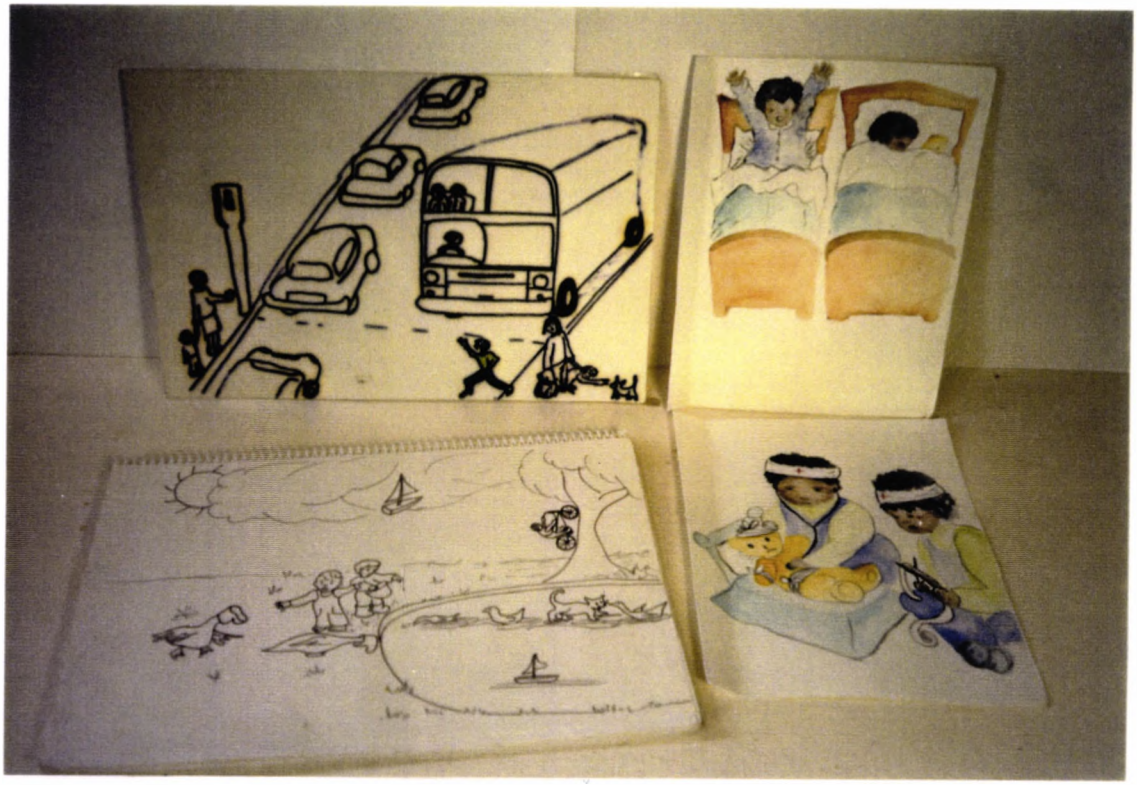
ACTIVITIES

19. SELECTS BY FUNCTION.
21. MATCHING PREPOSITION PICTURES.



ACTIVITIES
16. FOUR PAGES FROM 'THE STRIPEY KITTEN GETS STUCK'.

ACTIVITIES
28. PICTURE SEQUENCE STORY: DOG FOLLOWS HIM TO SCHOOL.
29. PICTURE SEQUENCE STORY: DREAMS OF A SPACE FLIGHT.



ACTIVITIES

13. TWO PAGES FROM 'WHERE'S TEDDY?' BOOK.
24. PICTURE DESCRIPTION BOOK (SILLY PICTURES PAGE).
25. GREEN CROSS CODE PICTURE.

ACTIVITIES

17. THE DRAGON AND THE BIRTHDAY PARTY.
30. MAN FIGHTING A DRAGON.

1;00--1;11 YEARS

Code	Sex	Age	Race/ Ethnic	Economic	Verbal Req. of Parent's Occ.	Only English at Home	Loc.
11	F	1;00	W	2	2	Y	PN1
12	M	1;00	B.C.	2	2	Y	H
13	M	1;00	W	2	2	Y	PN2
14	F	1;01	W	1	1	Y	BC
15	F	1;01	B.C.	3	3	Y	PN2
16	M	1;02	B.C.	1	1	Y	BC
17	F	1;02	W	3	3	Y	PH2
18	F	1;02	ASIAN	1	1	N	SN
19	M	1;02	W	3	3	Y	PN3
110	F	1;04	B.C.	1	1	Y	BC
111	F	1;05	B.C.	1	1	Y	BC
112	M	1;05	B.A	2	2	N	BC
113	M	1;06	W	3	3	Y	PN2
114	F	1;08	W	2	2	Y	PN3
115	M	1;08	W	2	2	Y	BC
116	M	1;08	W	3	2	Y	PH2
117	F	1;10	B.C.	3	2	Y	PN2
118	F	1;11	W	3	2	Y	HC
119	M	1;11	ASIAN	1	1	N	SN
120	M	1;11	W	2	1	Y	PN3

TOTALS

Sex		Race/Ethnic		Economic		Verbal Req.		Only Eng.		Loc.	
Male	10	White	11	Below ave.	6	Low--Mod.	7	Yes	17	PN1	1
Female	10	Black-Carib.	6	Average	7	Essential	9	No	3	PN2	6
		Black-Afric.	1	Above ave.	7	High	4			PN3	3
		Asian	2							SN	2
		Arabic	0							BC	6
										H	1
										HC	1
	20		20		20		20		20		20

2;00--2;11 YEARS

Code	Sex	Age	Race/ Ethnic	Economic	Verbal Req. of Parent's Occ.	Only English at Home	Loc.
21	M	2;00	Asian	1	1	N	BC
22	M	2;00	W	3	2	Y	HC
23	M	2;00	W	2	2	Y	PN2
24	M	2;01	W	2	2	Y	PN1
25	M	2;02	W	2	2	Y	SN
26	F	2;02	W	2	2	Y	PN2
27	M	2;03	W	1	1	Y	BN
28	M	2;03	W	2	3	Y	PN1
29	F	2;03	B.C.	1	1	Y	SN
210	F	2,04	W	2	2	Y	PN3
211	M	2;05	B.C.	1	1	Y	BN
212	F	2;05	W	1	1	Y	BC
213	F	2;06	B.C.	1	1	Y	SN
214	F	2;07	Arabic	3	2	N	PN2
215	F	2;08	W	1	1	Y	BN
216	M	2;09	B.C	1	1	Y	BN
217	M	2;09	Arabic	2	2	N	PN3
218	F	2;09	B.C.	1	1	Y	BC
219	F	2;11	W	1	1	Y	H
220	M	2;11	W	2	3	Y	PN1

TOTALS

Sex		Race/Ethnic		Economic		Verbal Req.		Only Eng.		Loc.	
Male	11	White-Eur.	12	Below ave.	10	Low--Mod.	10	Yes	17	PN1	3
Female	9	Black-Carib.	5	Average	8	Essential	8	No	3	PN2	3
		Black-Afric.	0	Above Ave.	2	High	2			PN3	2
		Asian	1							SN	3
		Arabic	2							BN	4
										BC	3
										H	1
										HC	1
	20		20		20		20		20		20

APPENDIX 4: A SUMMARY OF THE DEMOGRAPHIC INFORMATION FOR EACH INDIVIDUAL.

3;00--3;11 YEARS

Code	Sex	Age	Race/ Ethnic	Economic	Verbal Req. of Parent's Occ.	Only English at Home	Loc.
31	F	3;00	B.C.	1	1	Y	BN
32	M	3;00	W	2	2	Y	PN3
33	F	3;00	W	2	2	Y	PN3
34	M	3;00	W	2	2	Y	PN3
35	M	3;00	W	2	1	Y	PN3
36	F	3;00	W	2	2	Y	PN3
37	F	3;01	W	2	2	Y	BN
38	F	3;02	B.C.	1	1	Y	BN
39	M	3;04	W	2	2	Y	PN3
310	F	3;05	B.C.	1	1	Y	BN
311	M	3;05	B.C.	1	1	Y	BN
312	M	3;05	W	2	2	Y	NSch
313	F	3;06	Asian	2	2	N	NSch
314	F	3;06	B.A.	1	2	N	BN
315	F	3;06	B.C.	1	1	Y	BN
316	M	3;08	W	2	2	Y	PN3
317	F	3;10	W	2	2	Y	NSch
318	M	3;11	B.C.	2	2	Y	SN
319	F	3;11	W	2	2	Y	NSch
320	M	3;11	B.A.	1	1	N	BN
321	F	3;11	B.C.	1	1	Y	BN

TOTALS

Sex		Race/Ethnic		Economic		Verbal Req.		Only Eng.		Loc.	
Male	9	White	11	Below ave.	8	Low--Mod.	8	Yes	18	NSch	4
Female	12	Black-Carib.	7	Average	13	Essential	13	No	3	BN	9
		Black-Afric.	2	Above Ave.	0	High	0			PN3	7
		Asian	1							SN	1
		Arabic	0								
	21		21		21		21		21		21

4;00--4;11 YEARS

Code	Sex	Age	Race/ Ethnic	Economic	Verbal Req. of Parent's Occ.	Only English at Home	Loc.
41	F	4;00	B.C.	1	1	Y	BN
42	M	4;00	W	1	1	Y	BN
43	M	4;00	B.A.	3	2	N	NSch
44	M	4;02	B.A.	1	1	N	BN
45	M	4;02	B.C.	1	1	Y	BN
46	M	4;02	W	1	1	Y	BN
47	M	4;02	W	1	1	Y	BN
48	M	4;03	W	1	1	Y	BN
49	M	4;03	B.A.	1	1	N	BN
410	F	4;04	W	3	2	Y	NSch
411	M	4;06	B.A.	2	2	N	BN
412	M	4;06	Asian	1	1	N	BN
413	F	4;06	W	3	2	Y	NSch
414	M	4;06	W	2	2	Y	NSch
415	F	4;07	B.A.	2	2	N	BN
416	M	4;08	W	2	3	Y	NSch
417	M	4;08	W	2	2	Y	NSch
418	F	4;08	Arabic	2	2	N	NSch
419	M	4;09	B.C.	1	1	N	BN
420	M	4;11	W	2	2	Y	S2

TOTALS

Sex		Race/Ethnic		Economic		Verbal Req.		Only Eng.		Loc.	
Male	15	White	10	Below ave.	10	Low--Mod.	10	Yes	12	NSch	7
Female	5	Black-Carib.	3	Average	7	Essential	9	No	8	BN	12
		Black-Afric.	5	Above ave.	3	High	1			S2	1
		Asian	1								
		Arabic	1								
	20		20		20		20		20		20

5;00--5;11 YEARS

Code	Sex	Age	Race/ Ethnic	Economic	Verbal Req. of Parent's Occ.	Only English at Home	Loc.
51	M	5;01	W	2	2	Y	S4
52	M	5;01	W	2	2	Y	S2
53	F	5;01	W	1	1	Y	S2
54	F	5;02	W	1	1	Y	S4
55	M	5;02	W	2	2	Y	S2
56	F	5;03	B.C.	2	2	Y	S4
57	M	5;03	B.C.	2	2	Y	S3
58	F	5;04	W	2	2	Y	S3
59	F	5;04	W	1	1	Y	SS
510	F	5;04	B.C.	1	1	Y	S2
511	F	5;05	W	2	2	Y	S1
512	F	5;06	Arabic	2	2	N	S4
513	M	5;07	W	2	2	Y	S3
514	M	5;07	W	2	2	Y	S4
515	F	5;08	W	1	1	Y	S3
516	M	5;08	W	1	1	Y	S2
517	M	5;08	B.C.	1	1	Y	S1
518	F	5;10	B.C.	1	1	Y	S1
519	F	5;10	W	1	1	Y	S1
520	F	5;11	W	2	2	Y	S4

TOTALS

Sex		Race/Ethnic		Economic		Verbal Req.		Only Eng.		Loc.	
Male	8	White	14	Below ave.	9	Low--Mod.	9	Yes	19	S1	4
Female	12	Black-Carib.	5	Average	11	Essential	11	No	1	S2	5
		Black-Afric.	0	Above ave.	0	High	0			S3	5
		Asian	0							S4	6
		Arabic	1								
	20		20		20		20		20		20

6;00--6;11 YEARS

Code	Sex	Age	Race/ Ethnic	Economic	Verbal Req. of Parent's Occ.	Only English at Home	Loc.
61	M	6;01	W	2	2	Y	S4
62	F	6;02	Asian	1	1	N	S2
63	F	6;02	Asian	1	1	N	S1
64	M	6;02	B.C.	1	1	Y	S2
65	F	6;03	Arabic	2	2	N	S2
66	F	6;03	Asian	2	2	N	S4
67	F	6;03	W	1	1	Y	S2
68	M	6;03	W	2	2	Y	S2
69	M	6;04	W	2	2	Y	S3
610	F	6;04	W	1	1	Y	S4
611	F	6;04	Asian	2	1	N	S3
612	M	6,05	W	1	1	N	S1
613	M	6:05	W	2	2	Y	S3
614	F	6;06	W	2	2	Y	S3
615	M	6;09	W	1	1	Y	S1
616	F	6;10	W	2	2	Y	S4
617	M	6;10	W	2	2	Y	S4
618	F	6;11	W	2	2	Y	S1
619	F	6;11	Asian	2	2	N	S3
620	M	6;11	B.C.	2	2	Y	S1

TOTALS

Sex		Race/Ethnic		Economic		Verbal Req.		Only Eng.		Loc.	
Male	9	White	12	Below ave.	7	Low--Mod.	8	Yes	13	SN1	5
Female	11	Black-Carib.	2	Average	13	Essential	12	No	7	SN2	5
		Black-Afric.	0	Above ave.	0	High	0			SN3	5
		Asian	5							S4	5
		Arabic	1								
	20		20		20		20		20		20

7;00--7;09 YEARS

Code	Sex	Age	Race/ Ethnic	Economic	Verbal Req. of Parent's Occ.	Only English at Home	Loc.
71	M	7;00	W	2	2	Y	S4
72	F	7;00	W	1	1	Y	S2
73	F	7;00	Arabic	1	1	N	S2
74	F	7;01	W	2	2	Y	S1
75	M	7;02	Arabic	1	1	N	S4
76	M	7;02	Arabic	1	1	N	S2
77	M	7;02	B.A.	1	1	N	S1
78	M	7;03	W	2	2	Y	S2
79	M	7;03	W	2	2	N	S4
710	M	7;04	W	2	2	Y	S1
711	M	7;05	W	1	1	Y	S1
712	M	7;05	W	2	2	Y	S1
713	F	7;05	Arabic	1	1	N	S4
714	M	7;06	W	1	1	Y	S3
715	F	7;06	Arabic	1	1	N	S3
716	F	7;08	Arabic	1	1	N	S4
717	F	7;09	W	1	1	N	S3
718	M	7;09	W	2	2	Y	S2
719	M	7;09	W	2	2	Y	S3
720	F	7;09	B.C.	1	1	Y	S3

TOTALS

Sex		Race/Ethnic		Economic		Verbal Req.		Only Eng.		Loc.	
Male	12	White	12	Below ave.	12	Low--Mod.	12	Yes	11	S1	5
Female	8	Black-Carib.	1	Average	8	Essential	8	No	9	S2	5
		Black-Afric.	1	Above ave.	0	High	0			S3	5
		Asian	0							S4	5
		Arabic	6								
	20		20		20		20		20		20

PERSON SCORES: 1;00--1;11

	11	12	13	14	15	16	17	18	19	110
1	0	0	1	1	1	0	1	0	1	1
2	0	2	1	2	2	2	2	2	2	2
3	2	4	0	5	4	1	2	4	5	5
4	1	2	0	1	3	1	2	3	3	3
5	0	0	2	2	6	2	2	3	6	2
7	6	3	5	2	15	5	18	12	11	19
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	3	0	0	0	7	0
14	4	4	4	4	8	4	8	5	8	8
15	0	0	2	2	2	1	2	2	2	2
16	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0
	13	15	15	19	44	16	37	31	45	42

	111	112	113	114	115	116	117	118	119	120
1	1	1	0	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	5	5	4	5	5	5	5	5	4	5
4	2	3	3	3	2	3	2	3	3	1
5	3	5	6	6	4	6	5	6	3	4
7	9	9	19	0	13	2	23	20	20	17
8	0	0	9	0	0	5	4	5	4	0
9	0	0	0	0	0	2	2	0	0	0
10	0	0	0	0	0	1	6	6	0	6
11	0	0	0	0	0	0	1	1	0	1
12	0	0	0	0	1	7	5	1	0	5
13	0	0	0	0	1	5	5	4	0	6
14	8	8	1	8	8	8	8	8	1	8
15	2	2	2	2	2	2	2	2	2	2
16	0	0	0	0	0	3	7	0	0	0
17	0	0	0	0	0	1	0	0	0	0
18	0	0	0	0	0	1	1	0	0	0
19	0	0	0	0	0	3	4	0	0	0
	32	35	46	27	39	57	83	64	40	58

APPENDIX 5: THE DATA SCORES.

PERSON SCORES: 2;00--2;11

	21	22	23	24	25	26	27	28	29	210
1	0	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	4	5	5	5	5	5	5	5	5	5
4	3	3	3	3	3	3	3	3	3	3
5	6	6	3	5	6	5	6	6	5	6
7	0	18	18	15	8	23	23	21	22	22
8	0	5	7	6	0	9	8	6	4	8
9	0	1	2	2	0	2	1	2	0	2
10	0	7	6	6	0	6	3	6	0	1
11	0	1	1	0	0	1	1	1	0	0
12	0	3	3	7	0	7	7	7	0	7
13	0	1	7	5	6	7	7	7	0	6
14	1	8	8	8	8	8	8	8	8	8
15	2	2	2	2	2	2	2	2	2	2
16	0	0	5	0	0	5	0	7	0	5
17	0	0	0	0	1	0	3	4	0	0
18	0	0	2	1	1	2	1	2	0	0
19	0	0	2	2	0	13	10	15	0	0
	18	63	77	70	43	101	91	105	52	78

	211	212	213	214	215	216	217	218	219	220
1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	5	5	5	5	5	5	5	5	5	5
4	3	3	3	3	3	3	3	1	3	3
5	3	6	6	6	6	3	6	6	6	6
7	23	21	16	23	23	23	23	21	21	22
8	6	9	0	9	8	5	7	8	9	8
9	2	2	1	2	1	0	2	2	0	0
10	7	0	7	6	7	0	7	6	4	0
11	1	0	1	1	1	0	1	1	0	0
12	7	7	7	7	7	0	7	7	7	0
13	7	7	7	7	7	7	6	6	0	0
14	8	8	8	8	8	8	8	8	8	8
15	2	2	2	2	2	2	2	2	2	2
16	6	5	5	7	6	8	6	5	0	8
17	2	0	0	4	0	2	5	3	0	5
18	1	2	2	2	2	0	1	2	1	0
19	7	10	7	13	14	0	16	8	10	0
	93	90	80	108	103	69	108	94	79	70

PERSON SCORES: 3;00--3;11

	31	33	34	35	36	37	38	39	310	311
10	3	1	3	0	3	3	2	3	1	0
16	1	15	18	10	17	18	3	14	15	10
17	11	11	6	5	11	8	12	6	13	12
18	2	6	3	0	6	4	0	2	5	3
19	10	16	19	15	13	19	8	16	18	16
21	4	5	5	2	2	0	9	8	12	4
22	1	1	1	0	2	2	0	1	2	0
23	0	2	1	0	3	3	1	1	2	3
24	0	15	5	1	17	10	2	16	7	6
25	3	5	4	4	5	2	1	2	6	1
26	0	5	6	5	3	8	0	3	5	6
	35	82	71	42	82	77	38	72	86	61

	312	313	314	315	316	317	318	319	320	321
10	3	3	3	1	3	3	3	1	3	3
16	18	13	20	6	16	20	23	18	8	15
17	13	15	4	4	13	15	16	13	10	13
18	6	2	3	4	6	6	5	3	6	6
19	19	15	19	8	15	19	14	15	16	16
21	12	12	8	2	8	12	6	12	12	12
22	2	1	0	0	2	2	2	1	1	2
23	3	3	1	2	3	3	3	3	2	3
24	11	12	10	6	20	16	17	11	4	15
25	4	6	5	3	6	6	5	5	1	5
26	7	8	1	6	7	6	8	8	5	9
	98	90	74	42	99	108	102	90	68	99

PERSON SCORES: 4;00--4;11

	41	42	43	44	45	47	48	49	410	411
10	3	3	0	2	3	3	3	3	3	2
16	12	19	11	20	18	20	22	13	15	8
17	6	14	2	13	14	13	3	0	16	11
18	6	5	5	4	5	6	4	5	6	0
19	19	19	19	19	19	15	18	19	19	4
21	12	12	12	12	7	12	12	12	12	6
22	2	2	1	2	2	2	2	2	2	2
23	0	3	1	3	3	3	3	3	3	3
24	17	17	10	22	9	15	13	14	24	9
25	4	9	1	5	8	7	7	4	4	0
26	3	7	3	8	8	7	5	1	6	6
	84	110	65	110	96	103	92	76	110	51

	412	413	414	415	416	418	419	410
10	3	3	3	3	3	3	3	3
16	19	18	22	19	16	11	27	21
17	16	15	16	16	12	13	14	15
18	5	6	6	6	6	6	6	6
19	19	19	19	19	19	19	19	19
21	8	12	12	8	8	12	12	12
22	1	2	2	1	2	1	2	2
23	3	3	3	3	1	3	3	3
24	23	26	23	26	27	19	25	22
25	5	7	8	8	6	5	9	8
26	8	7	8	6	8	8	9	9
	110	118	122	115	108	100	129	120

PERSON SCORES: 5;00--5;11

	51	52	53	54	55	56	57	58	59	510
16	10	14	8	4	8	9	13	6	11	5
17	3	6	7	3	4	4	9	3	2	8
24	21	19	19	18	7	14	19	19	20	9
25	4	8	5	2	4	5	7	3	7	0
26	1	4	3	2	1	2	4	3	2	2
27	1	0	1	1	0	0	0	1	1	0
28	2	3	1	1	0	2	0	0	2	1
29	0	2	2	0	0	0	2	2	1	1
30	7	0	1	1	0	1	4	3	0	0
31	1	1	1	0	2	0	1	0	2	0
32	4	2	1	0	0	0	4	0	0	0
	54	59	49	32	26	37	63	40	48	26

	511	512	513	514	515	516	517	518	519	520
16	10	8	6	7	6	9	8	13	10	4
17	5	3	5	6	6	2	6	10	0	1
24	18	21	18	19	9	15	16	23	16	20
25	3	9	4	5	5	4	5	5	3	4
26	4	3	3	4	1	3	1	2	1	3
27	1	0	0	0	0	0	0	1	0	1
28	0	1	1	1	0	0	1	0	0	2
29	1	0	1	1	0	1	1	0	0	3
30	0	3	1	0	3	0	1	3	0	0
31	2	1	0	0	1	1	0	0	0	0
32	2	0	1	1	0	1	0	4	0	0
	46	49	40	44	31	36	39	61	30	38

PERSON SCORES: 6;00--6;11

	61	62	63	64	65	67	68	69	610
16	7	11	9	12	9	6	7	5	16
17	0	2	3	5	11	8	13	9	6
24	18	20	21	14	16	23	20	15	16
25	7	9	6	4	8	5	3	5	5
26	2	5	3	3	4	1	0	3	2
27	0	0	1	0	0	0	1	0	3
28	2	1	2	1	1	2	0	0	0
29	1	0	1	2	0	1	1	1	2
30	1	3	3	2	0	7	0	6	7
31	2	5	3	3	2	1	1	1	1
32	4	1	0	2	5	1	0	0	0
	44	57	52	48	56	55	46	45	58

	611	612	613	614	615	616	617	618	619	620
16	10	7	10	8	10	8	9	6	6	11
17	8	7	7	5	5	8	2	12	1	11
24	18	21	21	24	18	17	12	12	19	15
25	4	4	5	6	3	3	6	7	6	9
26	4	2	2	2	3	2	3	5	3	2
27	0	0	1	1	0	1	0	1	1	1
28	1	0	0	3	0	1	1	1	1	2
29	1	1	3	1	0	4	0	1	1	1
30	4	2	4	3	5	7	4	6	2	11
31	1	0	1	0	2	5	1	3	0	4
32	3	3	0	1	3	4	0	4	0	2
	54	47	54	54	49	60	38	58	40	69

PERSON SCORES: 7;00--7;09

	71	72	73	74	75	76	77	78	79	710
16	9	9	9	16	11	11	11	14	13	11
17	8	10	5	13	4	4	13	14	5	14
24	22	24	18	24	26	22	21	25	21	22
25	6	9	7	8	5	7	7	8	4	7
26	2	3	4	4	2	2	3	2	3	2
27	1	1	1	1	0	2	1	1	2	1
28	2	0	3	4	2	2	3	5	2	2
29	3	2	3	3	0	1	2	4	0	2
30	4	9	5	7	0	12	4	6	3	5
31	0	1	2	5	0	2	0	0	0	2
32	0	5	0	5	0	2	4	0	2	2
	57	72	57	90	50	67	69	79	55	70

	711	712	713	714	715	716	717	718	719	720
16	8	8	6	11	12	7	10	14	11	11
17	7	7	6	11	12	6	9	7	11	3
24	25	16	13	20	20	22	23	24	21	24
25	3	5	3	7	7	5	5	8	5	5
26	2	1	2	2	3	0	2	1	3	3
27	0	1	1	2	0	1	1	1	1	0
28	1	3	0	1	2	1	3	6	2	2
29	1	1	0	3	3	0	5	1	4	0
30	4	8	0	8	9	2	10	1	7	2
31	0	0	0	1	4	1	2	1	2	3
32	0	1	0	0	5	0	4	3	0	0
	51	51	31	66	77	45	74	67	67	53

ITEM SCORES: Form A

FREQUENCY	SCORE	ITEM NAME
3	39	2.3, 3.1, 4.1
3	38	2.4, 3.2, 15.4
7	37	5.1, 5.3, 14.2, 14.3, 14.4, 14.5, 15.5
2	36	3.3, 3.4
3	35	7.3, 7.12, 14.8
3	34	1.5, 4.2, 7.4
1	33	7.2
1	32	7.13
4	31	7.16, 14.6, 14.7, 14.9
3	30	3.5, 5.4, 7.1
5	29	4.3, 7.7, 7.17, 7.18, 7.19
2	28	5.2, 5.5
1	27	7.5
3	26	7.9, 7.10, 7.11
2	24	7.8, 7.20
2	23	7.6, 13.4
2	21	5.6, 7.14
2	20	7.23, 13.6
5	19	7.21, 8.2, 8.10, 12.2, 13.1
6	18	8.6, 8.13, 12.1, 12.5, 13.2, 13.5
5	17	7.24, 8.9, 10.1, 12.3, 13.7
5	16	10.4, 10.10, 12.6, 13.3, 18.1
8	15	7.15, 8.12, 8.14, 10.2, 10.3, 19.1, 16.26, 16.27
10	14	8.1, 8.5, 9.1, 9.6, 10.11, 12.4, 12.7, 11.2 19.3, 19.5
1	13	16.1
1	12	19.6
2	11	16.13, 16.17
3	9	19.24, 16.11, 17.1
4	8	18.9, 19.15, 19.16, 19.18
6	7	19.7, 19.17, 19.20, 16.9, 16.28, 17.4
3	6	19.9, 19.10, 19.21
4	5	10.6, 19.25, 17.2, 17.32
1	4	17.33
1	2	19.14

TOTALS
FREQUENCY X SCORE: 2350
NUMBER OF ITEMS: 114

APPENDIX 6.: THE ANALYSIS FORMS

DISTRIBUTION OF PERSON SCORES: Form A

FREQUENCY	SCORE	PERSON CODE	
		1;00--1;11	2;00--2;11
1	13	11	
2	15	12, 13	
1	16	16	
1	18		21
1	19	14	
1	27	114	
1	31	18	
1	32	111	
1	35	112	
1	37	17	
1	39	115	
1	40	119	
1	42	110	
1	43		25
1	44	15	
1	45	19	
1	46	113	
1	52		29
1	57	116	
1	58	120	
1	63		22
1	64	118	
1	69		216
2	70		24, 220
1	77		23
1	78		210
1	79		219
1	80		213
1	83	117	
1	90		212
1	91		27
1	93		211
1	94		218
1	101		26
1	103		215
1	105		28
2	108		214, 217
40		20	20

FREQUENCY X SCORE: 2350
TOTAL NUMBER OF PEOPLE: 40

ITEM SCORES: Form B

3	37	17.1, 19.7, 19.24
6	36	16.17, 17.32, 19.6, 19.16, 19.18, 19.20
6	35	16.1, 16.28, 17.2, 18.9, 19.17, 19.21
2	34	17.33, 19.25
5	33	16.13, 17.4, 10.6, 19.10, 19.15
4	32	16.9, 16.11, 19.9, 19.14
13	31	26.10, 22.2, 21.9, 21.10, 21.12, 21.22, 23.10, 18.8, 10.8, 19.8, 19.11, 19.13, 19.19
5	30	26.9, 21.1, 23.6, 10.7, 19.12
5	29	26.11, 17.5, 21.2, 21.3, 18.10
7	28	24.9, 24.10, 26.7, 16.2, 16.6, 17.6, 23.5
10	27	24.12, 24.19, 25.4, 16.29, 17.3, 17.14, 21.4, 21.23, 18.2, 18.4
4	26	24.2, 25.9, 16.18, 21.24
5	25	25.7, 25.8, 26.1, 26.2, 16.21
8	24	16.10, 16.14, 16.20, 16.19, 17.24, 21.15, 21.16, 22.6
3	23	24.40, 16.25, 17.35
7	22	24.6, 24.29, 24.33, 24.37, 17.7, 18.5, 19.26
7	21	24.28, 24.42, 25.2, 25.3, 26.12, 16.22, 17.11
4	20	24.7, 24.25, 24.32, 17.12
1	19	24.26
5	18	24.15, 24.36, 26.4, 16.23, 17.15
1	17	25.10
6	16	24.8, 24.14, 26.6, 16.3, 16.7, 16.15
2	15	24.27, 25.5
2	14	24.1, 16.12
2	13	24.34, 16.31
1	12	24.17
1	11	24.31
1	10	24.30
1	9	24.21
2	7	24.35, 25.12
3	6	25.5, 16.16, 17.36
2	5	24.23, 16.8
3	4	24.18, 16.4, 16.5

TOTAL ITEMS: 137
FREQUENCY X SCORE: 3335

DISTRIBUTION OF PERSON SCORES: Form B

FREQUENCY	SCORE	PERSON CODE	
		3;00--3;11	4;00--4;11
1	35	31	
1	38	38	
2	42	35, 315	
1	51		411
1	61	311	
1	65		43
1	68	320	
1	71	34	
1	72	39	
1	74	314	
1	76		49
1	77	37	
2	82	33, 36	
1	84		41
1	86	310	
2	90	313, 319	
1	92		48
1	96		45
1	98	312	
2	99	316, 321	
1	100		418
1	102	318	
1	103		47
2	108	317	416
4	110		42, 44, 410, 412
1	115		415
1	118		413
1	120		420
1	122		414
1	129		419
38		20	18

FREQUENCY X SCORE: 3335
TOTAL NUMBER OF PEOPLE: 38

ITEM SCORES: Form C

FREQUENCY	SCORE	
3	57	24.15, 24.25, 25.3
1	56	24.17, 25.2
1	55	25.5
1	54	16.22
1	53	24.14
1	52	24.34
2	51	24.36, 16.3
2	50	26.12, 24.42
2	49	17.12, 24.7
2	47	24.32, 16.15
4	46	24.21, 24.31, 16.4, 16.12
1	45	24.1
2	44	26.6, 14.27
3	42	17.11, 24.23, 24.30
1	41	24.26
2	40	16.7, 16.23
2	37	24.5, 17.15
4	36	26.4, 25.10, 24.18, 24.28
1	35	16.5
5	34	24.8, 24.35, 25.12, 16.8, 16.31
1	31	17.36
1	30	16.16
3	29	29.7, 31.6, 32.4
2	28	17.18, 30.9
1	27	17.16
3	26	17.8, 25.14, 16.33
1	25	17.26
1	24	24.20
3	22	29.4, 24.41, 30.27
4	21	24.22, 30.14, 30.16, 30.21
4	20	28.2, 24.16, 24.24, 25.11
2	19	27.15, 32.5
2	18	17.28, 17.39
3	17	28.5, 16.24, 16.32
3	16	28.3, 31.11, 24.43
3	15	25.13, 30.34, 16.30
3	14	27.17, 28.8, 30.24
1	13	32.6
4	12	28.15, 31.12, 17.38, 25.17
4	11	24.3, 24.45, 30.17, 30.35
4	10	17.13, 26.15, 32.11, 16.35
3	9	17.20, 17.23, 30.29
5	8	30.23, 30.25, 31.7, 31.13, 32.10
5	7	29.15, 17.29, 17.40, 24.46, 30.10
7	6	29.5, 29.14, 17.19, 17.24, 17.41, 26.14, 30.37
3	5	29.16, 27.16, 32.12
5	4	17.9, 17.27, 24.47, 25.15, 16.34
2	3	28.16, 30.20
8	2	29.17, 30.30, 17.22, 17.25, 25.16, 30.36, 31.14, 32.13
8	1	28.17, 29.6, 24.48, 25.18, 30.18, 30.28 16.36, 16.37

NUMBER OF ITEMS: 141
FREQUENCY X SCORE: 3080

DISTRIBUTION OF PERSON SCORES: Form C

FREQUENCY	SCORE	PERSON CODE		
		5;00--5;11	6;00--6;11	7;00--7;09
2	26	55, 510		
1	30	519		
2	31	515		713
1	32	54		
1	36	516		
1	37	56		
2	38	520	617	
1	39	517		
3	40	58, 513	619	
2	44	514	61	
2	45		69	716
2	46	511	68	
1	47		612	
2	48	59	64	
3	49	53, 512	615	
1	50			75
2	51			711, 712
1	52		63	
1	53			720
4	54	51	611, 613, 614	
2	55		67	79
1	56		65	
3	57		62	71, 73
2	58		618, 610	
1	59	52		
1	60		616	
1	61	518		
1	63	57		
1	66			714
3	67			76, 718, 719
2	69		620	77
1	70			710
1	72			72
1	74			717
1	77			715
1	79			78
1	90			74
59		20	19	20

TOTAL NUMBER OF PEOPLE: 59
FREQUENCY X SCORE: 3080