

CONVERSATIONS BETWEEN CHILDREN AGED
EIGHTEEN MONTHS TO THREE YEARS AND
THEIR MOTHERS

BY

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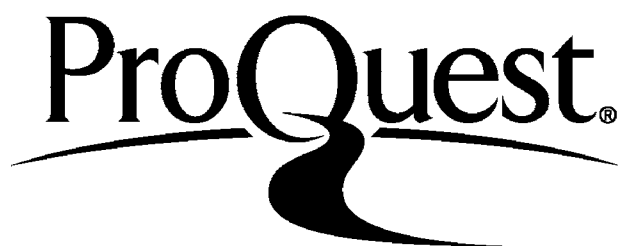
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ABSTRACT

A study was made of the conversational patterns used by 24 children aged eighteen months to three years and their mothers. Tape recordings were made of the mothers and the children both in a free speech situation and while they were talking about a picture book. The mean length of utterance, frequency of usage of different types of utterance, and the way that these different types of utterances formed conversational units were examined, and related to the child's age, social class, sex, and whether the conversation was directed towards the picture book or was in a free situation. It was found that the child's mean length of utterance was related both to his age and to the situation. The patterns of utterances which made up the conversations were also related to both age and situation. It was also found that in the book situation the mother's and the children's speech became less complex and similar in form to the free speech of younger children and their mothers. The patterns of utterance types within conversational units was found to be very stereotyped with a small number of patterns repeated frequently. Computer sorting of these patterns showed that they did not often consist of more than two items, and higher order patterns consisted of repetitions of shorter frequently occurring patterns. The mother's

speech was found to be related to their child's own level of complexity, but to be slightly in advance of the child's own competence. It was proposed that this kind of simplified speech would be a highly appropriate setting for language learning to take place.

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1. INTRODUCTION

1.1. Theories of language development

Children's language development was considered in great detail by many European psychologists at the end of the last century and the beginning of this one. Although the approach was rather different from that of today many of the problems discussed then still sound familiar. Seventy years ago the Sterns wrote "The main issue concerning language acquisition can be formulated as follows: what part of the developmental process is accounted for by external factors and what part by internal factors?" (Stern and Stern, 1907) This is probably still the most important question in the field of language acquisition, although modern concepts of interaction would demand a restating of the issue.

Most of the early work consisted of descriptions of the development of language in one of the authors young relatives, and the chief area of concern was imitation. During this early research it became clear that children's utterances could not be classified according to the existing traditional grammars, but it was left to later workers to propose new forms of grammar which were appropriate to the child's level of language development. Several studies of this period were concerned with children who were delayed in their language development but appeared normal in other respects. Language learning

was not seen as an interactive process so that explanations of the delay were either that the child had been ill in infancy, or in terms of the inborn personality of the child (e.g. the child was excessively stubborn). This early work in psycholinguistics is reviewed by Blumenthal (1970).

In the 1930's and 40's much of the European work was interrupted by the political upheavals of the time. In America child psychology was concerned either with psychoanalytic theory or with the measurement of the normal rate of development. At the end of the war American psychologists overlooked the earlier European work. Linguistics had become a separate field from psychology but was much influenced by the behaviourism of the time, and psychologists interest in language was typified by Skinner's work on verbal learning.

The war had led to great developments in the field of communications engineering, and at the beginning of the 1950's psychologists, linguists and communications engineers began to consider the contribution that one discipline could make to the others. However, throughout the 1950's psychologists became progressively less enchanted with the possibilities of a strictly behaviourist approach. This change of emphasis was forcefully expressed by Chomsky (1959) in his review of Skinner's book 'Verbal Behavior'. Chomsky's work since

then has been mainly concerned with establishing a grammatical structure which could then be used to account for the speaker's ability both to understand and to produce novel utterances. Brown used these concepts directly in his early work of developing suitable grammars for specific stages of a child's linguistic development. The weakness of this approach is two-fold. First of all the behaviour is used to define the grammar, which is in its turn used to describe the behaviour, so that what has sometimes been presented as an explanatory concept is probably only a description. Second, the use of, for example, the pivot-open grammar in the two word stage is now seen to be misleading as the child's rather simple performance does not reflect the child's much greater competence. Bloom (1970) gives a full discussion of the problems found in trying to develop an appropriate grammar for a child at this stage of development.

However, underlying the current interest in language development is the long-standing problem of the relationship between cognition and language: is one dependent for its development on the other, or do they develop upon separate but parallel paths? Piaget (1973) maintains that basic language structures are neither innate nor learnt according to the laws of behaviourism, but are acquired towards the end of the sensori-motor stage when the appropriate psychological structures have been established. It seems, however, most likely that at any

particular stage of language development the next step is dependent upon both the existing cognitive structures, and also on previously acquired linguistic abilities. A full discussion of the present status of this controversy can be found in an article by Cromer (1974).

At the beginning of the 1960's there was a great deal of interest in the child's acquisition of the rules of language. It was realised that children could not possibly learn every new utterance on a simple stimulus-response learning theory basis, or solely by imitation, as this could not account for the creativity of speech, nor the understanding of previously unheard utterances. It would also not explain why small children occasionally regularise irregular cases e.g. "mouses" for "mice" and "ranned" for "run". A 'rule learning theory' rather than a 'sentence learning theory' was obviously a fruitful approach. (It should be noted that the learning of the initial vocabulary may well be best accounted for by the learning theory approach.) The first study of the 'rule learning' type was that by Braine (1964) who showed how children at the two-word stage of language development were using a grammar consisting of only two classes, namely the pivot and the open class. This type of research was developed by Brown and his co-workers throughout the 1960's and the results of this work are brought together in Brown's recently published book 'A First Language' (1973). Brown collected a great deal of tape recorded speech of three children called Adam,

Eve and Sarah, visiting the children regularly from the ages of one to five years. This extensive data has been examined in great detail covering all facets of the children's linguistic development.

A second field of interest during this time is represented by the work of Lenneberg (1967) who regards the development of language as being part of the overall biological development of the child. He says that speech develops in all children except the most handicapped, given a basic minimum of speech in the child's environment. This type of work was not concerned with the fine details of language development, but with the presence or absence of the ability to communicate.

The third approach is that of Bernstein (1971) which led to the work of Hess and Shipman (1968). Bernstein's work is sociological in its orientation and grew from various studies of social class differences which had been made during the 1950's. He was particularly concerned with social class membership and the linguistic codes most habitually used by members of that social class. Most of Bernstein's early work was done with school age children and adolescents from different social groups showing the differences in the ways they tackle tasks with a high verbal content. He has never been concerned directly with language acquisition and has been frequently criticized for appearing to make evaluative judgments about social class linked dialect usage. For an example of this type of critical approach see Labov (1973).

Campbell and Wales (1970) suggest that the Chomskian view of linguistic competence could more properly be regarded as being composed of three separate types of competence. They suggest that competence (a) is the innate predisposition to language development which is discussed by Lenneberg; competence (b) is the grammatical competence studied by Brown et al.; and competence (c) is what they call communicative competence. This is the ability to produce appropriate utterances which are not necessarily grammatically correct but convey information relevant to the needs of the child. It is probable that the development of this type of competence is directly related to the style of interaction between the child and his world.

In Brown et al.'s studies mentioned above there is the assumption that children hear only very complex, ill-formed, adult speech. The child is then considered to have an almost impossible task constructing his own set of linguistic rules from this highly complex input. This view has also been put forward by Chomsky (1965) to support his theory of innate language structures. Labov (1973) showed that most ordinary conversations, as opposed to transcripts of academic conferences, were quite grammatical and well formed. In the present study the language the child hears from his mother during the testing session is examined to see if it is as complex as it has sometimes been held to be.

If brief, the field of the present research is the way the child interacts with his mother, and the relationship between the type of interaction and his age, sex, and social class. There are many studies reported in the last few years which have influenced the design of this research. Details of some of these are given in section 1.2 to section 1.4 below.

1.2. The effects of the environment on the language development of the child

The following discussion of the effects of the environment on the development of linguistic competence in the child is in two parts. In the first-part the influence of the general environment on the child will be considered. The second part is concerned with more specific linguistic influences.

1.21 The effects of the general environment

It has been shown frequently that children in long-term institutional care may suffer profound retardation in language development. Tizard (1974) has shown that the amount of retardation is related to the amount of stimulation provided within the institution. This highlights the fact that it is the nature and quality of the care the children receive which is important rather than the fact of being reared away from parents.

This process is reversible to a certain extent. Haywood (1967) reviews research which shows that children adopted after being in poor residential care have a good chance of catching up on their home-reared peers. This remedial treatment must, however be started early in the child's life to be effective.

1.22 Language development and social class

Hess and Shipman (1968) report their study of maternal influences upon early learning. Their research plan is based on the theories proposed by Bernstein (1973). Hess and Shipman define three maternal control styles: the 'imperative-normative' based on appeals to social norms, the 'personal-subjective' where the child's attention is drawn to the feelings and intentions of others or of themselves, and the 'cognitive-rational' where the child is directed towards a long term goal or to the reason that the mother has for demanding certain sorts of behaviour and not others. They also use Bernstein's well known distinction between the restricted and elaborated code. They define the restricted code as being "stereotyped, limited, and condensed, lacking in specificity and the exactness needed for precise conceptualisation and differentiation. Sentences are short, simple, often unfinished; there is little use of subordinate clauses for elaborating the content of the sentence; it is a language of implicit meaning, easily

understood and commonly shared. The basic quality of this mode is to limit the range and detail of concept and information involved." (Hess and Shipman 1968)

The elaborated code is defined as that "in which communication is individualized and the message is specific to a particular situation, topic, and person. They are more particular, more differentiated, and more precise. They permit expression of a wider and more complex range of thought, tending to discrimination among cognitive and affective content." (Hess and Shipman 1968).

The third aspect of Hess and Shipman's work is the differing ways that mothers prepare their children for school. They attempt to relate the maternal control styles discussed above to the way the child reacts to the school situation. This part of their work is not directly relevant to this research and will not be discussed in detail.

Hess and Shipman's research was carried out with four groups of black mothers and their four year old children. There were 40 mother-child pairs in each group and equal numbers of boys and girls. Group A were upper middle class professional workers, Group B were skilled manual workers, Group C were unskilled manual workers, and Group D were lone mothers living on Social Security Benefit. The interviews with the families were all held at the University so that the sessions were uninterrupted by noise, callers etc.

The researchers asked the mothers how they would prepare their children for starting school, how they usually controlled the child, assessed their intelligence using the WAIS, and looked at their teaching styles. The children's intelligence was assessed using the Stanford-Binet Test, they were also rated for their performance on the Sigel Sorting Test, and their performance in the maternal teaching sessions. In the 'attitudes to school' sessions the mothers in Group A were found to have a lower percentage of imperative responses than the other groups. They also found that the mothers who gave more imperative responses had children who made more non-verbal responses in the Sigel Test. The maternal teaching sessions used an 'Etch-a-Sketch' toy as the basic equipment. The mother was given one knob and the child the other. The mother was then given five designs which were to be reproduced by mother and child together on the toy. One of the most efficient ways of tackling the task is for the mother to show the child the designs. Although 68% of the Group A mothers did this for four out of the five pictures, only 13% of Group B, 11% of Group C, and 6% of Group D did so. The performance of the children showed the expected differences. Another of the maternal teaching situations involved the mother teaching her child a concept using the 8 block task. They found in this, as well as in the other teaching tasks that statistically the best single predictor of the child's achievement was maternal teaching style, this being higher than either social class,

mother's I.Q. or child's I.Q. and only slightly lower than all the factors combined.

Hess and Shipman propose that the learning styles and information processing strategies which the child acquires from the mother may set limits to the potential mental growth of the child.

1.23 Language development and sex differences

Brown's work, being based on a very small sample of three children, could not illuminate the question of sex differences in language development. It has been consistently reported that girls are more advanced than boys (McCarthy 1954). A longitudinal study of 76 children from birth to eight years of age showed rather similar results (Moore 1967). The girls were more advanced in their language development and also showed less variation over time than the boys did. Moss (1966) has shown that mothers of girls spend more time talking to and playing with their daughters than do mothers of boys. He suggests that this may be due to the fact that boys are more irritable and less easily pacified than girls, and are hence less rewarding to their mothers. He suggested that the mothers of boys felt confused because they were less able to control and predict their babies behaviour.

1.24 Language development and age differences

It is obvious that children are able to use language in a more sophisticated way as they get older. A frequently used method of measuring a child's progress is the mean length of the utterance in morphemes. This will be discussed in more detail in section 4 with reference to the present research. In most of the work done before the 1960's attempts were made to measure vocabulary size, but this becomes rapidly impossible even with a three year old. This also gives no measure of the grammatical sophistication of the child. The mean length of utterance (MLU) has been found to discriminate well between children at different levels of grammatical development, particularly up to the age of four years (Brown 1973). After the age of four, when grammatical development is very advanced, the utterance length is governed by other facts as well as grammatical ability.

1.25 Birth order and family size

There are few consistent relationships between family size and early language development (Rebelsky et al. 1967), but it has been shown that school age children from large families do less well on tests of vocabulary size and verbal I.Q. than children of a similar age from small families. (Douglas et al. 1968) It has been suggested that this difference in ability, which is at its highest

at about eight years old is due to the fact that children in big families get less individual attention from an adult and are more likely to spend a good part of the day with other small children than do children in small families. This relationship between family size and language has been found across social classes but is more marked in the working class than in the middle class children.

Twins have been shown to have delayed linguistic development (Mittler 1970). This retardation has also been found across social classes but this time the middle class twins were found to be more retarded when compared to a control group than were the working class group.

1.26 The context of the language

In most of the reported longitudinal studies of language development the situation in which the corpus of language is collected is usually uncontrolled. In these studies many separate recordings are made on many different occasions so that a range of domestic activities are covered. There is however, some evidence that the situation that the children are in effects the complexity and type of language. These studies have been described by Cazden (1970) in an interesting review article called "The situation: a neglected source of social class differences in language use."

She reports several studies where the extent of the child's own emotional involvement was related to the complexity of the language produced. Strandberg and Griffith (1968) gave children aged four and five years old colour film cameras and let them take photographs both under the supervision of the experimenter and at home by themselves. They found that the children talked in longer and more complex utterances about the pictures they took at home of things that were important to them than they did about the photos taken at the experimenter's instigation. Cowan et al. (1967) showed a group of elementary school children ten coloured pictures taken from a magazine. They found that some pictures consistently provoked longer or shorter utterances than the average regardless of the age of the child, its sex or socio-economic status. Cowan concludes "the implicit assumption that the magnitude of the mean length of response is a property of the subject independent of his setting should be permanently discarded."

The importance of the situation has also been shown in Labov's work (1973). Labov has been working mainly with low socio-economic status black boys in the USA, and has produced a very interesting set of reports on the linguistics of "Nonstandard Negro English". He stresses that the children he works with feel threatened in a typical psychological interview situation and react

by saying very little and appearing to be far less competent with language than they are shown to be in a more relaxed situation. The linguistic work, however, is not directly relevant to the English situation. The difference in language between a working class group living in inner London, and a professional middle class group living in the suburbs is nothing like as big as the difference found in the USA between the very poor speaking basically a Southern dialect, and the educated professionals.

So far this survey of the effects of the environment on language development has covered rather broad sociological and family factors. The next section reviews the effects more specifically linguistic influences.

1.3. The effects of the linguistic environment

1.31 Verbal enrichment

Irwin (1960) studied the effects of verbal enrichment on babies from 13 to 30 months old. The experimental group mothers read to their children for 20 minutes each day, and from 18 months onwards it was found that the experimental group produced more spontaneous babble. Casler (1965) showed that an increase in meaningless noise does not act as verbal enrichment. Casler found that children who received a "verbal enrichment session" consisting of a string of numbers being read aloud did not show any differences in their verbal abilities from a control group.

1.32 The language the child hears at home

In the studies by Brown and his co-workers (1973) correlations were found between the frequencies with which certain linguistic forms were used by the child's mother and their order of acquisition by the child. For example, Eve's mother used 'in' and 'on' about three times more frequently than she used 'for', 'with', 'to' or 'of' during the three month period when Eve was 18 to 20 months old. Later, when Eve was 22 to 24 months old she used 'in' and 'on' correctly 90% of the time whereas the other prepositions were used correctly between 67% and 77% of the time.

Frequency of usage has also been looked at in the field of semantics. When considering the use of the 'Wh-?' questions Brown found that "Where - - ?" was the most frequently used of the 'Wh-?' forms by the mothers, and the most appropriately used by the children. Cazden (1972) suggests that "Where - - ?" is the easiest of the 'Wh-?' forms to use, so that here

complexity, frequency of usage by the mother, and appropriateness of the child's language are confounded with each other.

1.33 Approval or disapproval of the Child's language

Brown, Cazden and Bellugi (1969) discuss the influence of the expression of approval or disapproval by adults on the Child's acquisition of language. They found no evidence

of parental corrections of incorrect syntactic use by the children. They point out that they frequently find corrections of facts but never of form. As they write: "It seems, then, to be the truth value rather than syntactic well-formedness that chiefly governs explicit verbal reinforcement by parents - which renders mildly paradoxical the fact that the usual product of such a training schedule is an adult whose speech is highly grammatical but not notably truthful." (Brown, Cazden and Bellugi 1969).

1.34 Parental expansions of child language

Many workers in the field of child language have been interested in the 'expansion'. An expansion is defined as the adult imitating the child's grammatically immature utterance, keeping the words in the order that the child uses them, but adding the necessary parts which are missing in the child's utterance so that it is transformed into a complete, correct sentence. For example, the child might say "Brick gone" and the adult would say "The brick has gone". This is what is meant by an expansion. It seems quite possible that these expansions could hold a place of great importance in the child's language learning, but the evidence on this is rather confused and contradictory. Brown and Bellugi (1964) point out that the use of expansion and imitation decreases as the child gets older. This leads

Slobin (1967) to propose that there may be a "critical age" for expansions, i.e. an age at which they are most useful to the child as a teaching device. Slobin also suggests that there may be social class differences in the frequency of expansions. This has been investigated in the present research.

Cazden (1972) carried out a manipulative experiment to investigate the effects of expansions of the development of speech. Her subjects were twelve children, aged from 28 to 38 months who were cared for in an inadequately staffed day nursery for eight to ten hours per day. Four matched groups of three were formed and within each group the children were randomly assigned to one of two experimental groups or to the control group. The first experimental group received 40 minutes each day of intensive and deliberate expansions. If the child said 'Dog bark' when the dog barked, then the tutor said 'Yes, the dog is barking'. The second experimental group received an equal number of well formed sentences that were not expansions. This she called the 'modelling' situation. As before, if the child said 'Dog bark' the tutor in this group might say 'Yes, but he won't bite'. In a discussion of this study Cazden (1972) says that she feels this title (i.e. modelling) to be seriously inaccurate. The tutors were instructed to make their responses to the children in the "modelling" group relevant to what the child had just said, without giving an expansion.

Cazden maintains that what this group's tutor was in fact doing was to presuppose the expansion and to build from this to a related idea. In Cazden's later publication she calls this 'extension' rather than 'modelling'. Children in the control group received no special attention, but were brought into the treatment rooms every few days so that they remained familiar with the tutors and the materials. Contrary to her basic hypothesis she found that the modelling - extension group had made more progress during the three months of the experiment than had the expansion group. Several explanations have been proposed for this surprising result: first, the expansion group did not receive as rich a language as the modelling group and this may have made a critical difference to the development of the children's language ability. McNeill (1970) suggests another explanation. He says that parents generally only expand what they are fairly certain that they understand, but in the experimental situation of intensive expansion the tutors almost certainly expanded some of the children's utterances 'wrongly'. This would have hindered the child rather than helped him in his acquisition of syntax. A third possible explanation is that the elevation of the expansion rate may have bored the child so that he no longer paid any attention to the tutor.

1.4. Adult's speech to children of different ages

There was an implicit assumption in some of the very early work on language development in children that children hear the same type of conversation as adults hold with each other. As Fraser and Roberts (1974) say "it seems inconceivable that normally socialized mothers could talk to their two year old children in the way they would talk to their husbands." Several studies have been made of very small numbers of children and the way that the speech of the mother varies according to the age of the child. (Drach et al. 1969). Two larger scale studies on this topic have been made by Granowsky and Krossner (1970) and Snow (1972). Gronowsky and Krossner compared the conversation of kindergarten teachers with their five and six year old pupils with their conversations with other kindergarten teachers. They conclude that the conversation with the children was simpler, composed of shorter utterances and containing more popular words. It must be remembered that the topics of the conversation varied as would be expected and there is no way of knowing how this affected the complexity of the utterances used in each situation. Snow (1972) showed that speech of middle class mothers was simpler and more redundant to their two year old children than to their ten year old children. The mothers modified their speech less when they were tape-recording instructions for their children than they did when talking directly to them.

Snow interprets this as evidence that the mothers speech is controlled to a certain extent by the presence of the child. She also found that experienced mothers were only slightly better at modifying their speech than were women without children. Snow concludes her study "The present findings strongly suggest that middle class children such as those included in this study do not learn language on the basis of a confusing corpus full of mistakes, garbles and complexities. They hear, in fact a relatively consistent, organised, simplified and redundant set of utterances which in many ways seems quite well designed as a set of 'language lessons'." The present study attempts to extend these findings of Snow's to extend them to a greater social class range and to look at the effects of much smaller differences in age than Snow's eight years. However, her results with the non-mothers is also very interesting and will be discussed again later in this report.

Fraser and Roberts (1974) have studied the speech of 32 middle class mothers to their children aged $1\frac{1}{2}$, $2\frac{1}{2}$, 4 and 6 years old. (There were eight children in each of the four groups.) They found that the complexity of speech increased as the age of the children increased, the most marked differences being found between the $1\frac{1}{2}$ and $2\frac{1}{2}$ year olds. The sex and birth order of the children was not found to be related to the mothers' speech. Phillips (1970) carried out a similar study. He

recorded the speech of 30 middle class mothers to their children and to the experimenter. The children were all first born boys and fell into three age groups - i.e. they were either 8 months, 18 months or 28 months old. He found that the mothers simplified their speech to their children as compared with their speech to the experimenter. This effect was greater with the eight and eighteen month old groups than it was with the oldest children. Nelson (1973) has also shown that mothers use longer MLUs when talking to adults than they do to their own children.

The research discussed above suggests that the child learning to talk is influenced by, and himself influences, his linguistic environment. The present study concentrates on the patterns of interaction between the mother and the child, relating these patterns to the factors which had been found to be important in earlier work.

2. CONVERSATIONS BETWEEN MOTHERS AND THEIR CHILDREN

2.1. Introduction to the present study

The aim of this research is to look at the ways that mothers and their small children talk to one another. When this study started there was very little published work on the effects that the child had on the mother's language. This study looks at the relationship between the complexity of the child's speech and the mother's speech during the period when the children were making rapid progress in their ability to talk. It was decided to take a sample large enough to allow comparisons of class and sex differences to be made. This meant that the analysis of the individual protocols could not be as detailed as that done by Brown and his co-workers.

From the work reported in the introduction it was considered that there were four main factors which should be controlled in any study of language development. These were:

- the sex of the child,
- the social class of the child's family,
- the age of the child,

and the situation in which the language for analysis was recorded.

The fifth possible factor was that of birth order. This was not controlled as it was felt that

the effects of birth order on language development in the pre-school child were not clearly established.

If birth order had been taken into account the number of children involved would have to have been doubled, and this would have meant a reduction in the amount of analysis that could have been undertaken. It was not considered that this was justified. However, the birth position of all the children was known so that some comparisons can be made even though rigorous conclusions cannot be drawn. There were no twins in the sample.

The mother's and children's conversations were studied in two different conditions, and this was related to the factors listed above. The frequency of use of different semantic types was calculated, and this comparison of types led to the second part of the research. It was apparent that the conversations between mothers and their children were very repetitive in style. This sequential dependence from one item of the conversation to the next was studied in detail, with special attention being given to the beginnings and endings of conversations.

This will be described in detail in the rest of this report.

2.2. Description of the children in the study

The children who took part in the study were selected according to their sex, social class and age.

2.21 The sex of the children. It was decided that there should be equal numbers of boys and girls in each age group and in each social class so that age, sex and social class differences could be identified.

2.22 The social class of the children. Two different groups of families took part in the research project. They came from two distinct socio-economic groups, one being mainly semi-skilled and unskilled working class and the other being upper middle class.

i) The clinic group. The working class group were contacted through a local authority Health Centre. The Senior Health Visitor at the centre was very interested in the project and allowed the researcher to visit the centre whenever she wanted, so that she became a familiar figure to the families who used it. The researcher attended the playgroup and the mother and baby sessions which were held twice a week. The mother and baby clinic were attended by mothers and their pre-school children, more or less frequently according to the needs of the child. Tea and biscuits were provided at these sessions and many of the mothers came to meet their friends while their children played around the tearoom with the other children. The doctors and nurses present at the sessions checked on the children's development, and gave advice on childrearing etc., but all the staff realised the importance of the

tearoom to the mothers. Every morning the tearoom was used for a small playgroup, two mornings a week for the under three's and three mornings a week for the three to five year olds. The research also attended most of these playgroup sessions and met many of the mothers who later joined in the study. She was also very fortunate that the clinic had an untrained assistant who had lived in the area all her life and was very well known. This assistant helped a great deal by knowing which families had a child of the right age and sex, and whether they might be interested in joining the research group. She was not considered to be a 'person in authority' by the families using the centre so an approach to the family through her did not make the families feel compelled to join in. The researcher spent six months at the clinic and around the neighbourhood and became quite well known to both the children and their parents.

The area which the Health Centre served was very close to the centre of London. The area was being rebuilt, and the community at that time consisted of people living in old blocks of Victorian 'industrial dwellings', and more prosperous people living in the modern blocks which were being put up. There was a small shopping centre with a street market, and several schools and churches, and the Health Centre. Most of the families in the group knew that they were going to be rehoused, and most were hoping for a house or flat with a garden a little further out of the city.

However, when the research was done most of the families lived in old blocks of flats, five or six stories high surrounded by a paved yard. There frequently was no proper kitchen, bathroom or hot water supply, and access was difficult as the staircases were narrow and had frequent turns. The flats themselves were usually small, only two or three interconnected rooms; two of the families had already moved into new flats: this is noted in Appendix A where the details of the families are given.

The creche group. The middle class group were contacted through a creche which the mothers run for their own under-three's. This creche was very simply organised; for one morning each week the children were taken to a members house. One third of the mothers were 'on duty' each week so that each mother got two mornings every three weeks free. The numbers in the creche varied but it averaged about twelve to fifteen children. Their ages ranged from a few months up to three years as there was ample nursery school provision in the district and most children left the creche at three to go to nursery class or playgroup. However, it was generally agreed that the younger children were only left the whole morning if they were completely happy. The researcher visited the creche for about six months to get to know the mothers and the children well. Most of these families had fairly high incomes. They lived in an expensive

suburban area on the edge of London, and all the families had houses with gardens, cars, washing machines etc. Most of the parents had a university education or its equivalent, and all the fathers held "management" jobs. Details are given in Appendix A.

2.23 The ages of the children. It was decided to study children during the period when they had been reported as making the most rapid progress in their language development. Most workers agree that the eighteen month to three year old period was the relevant age range, and so three six month periods were taken.

The main factors were:

Two sexes

Two social classes

Three age groups,

giving $2 \times 2 \times 3 = 12$ categories in total. There were two children in each of these categories giving a total sample of 24 children.

The experimental design is shown below. The numbers refer to the code numbers of the children, so that child no. 1 was a boy, aged between 31 and 36 months from the clinic group.

<u>Age in months</u>	<u>Clinic group</u>		<u>Creche group</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
31 - 36 ("old")	1, 2	3, 4	13, 14	15, 16
25 - 30 ("middle")	5, 6	7, 8	17, 18	19, 20
19 - 24 ("young")	9,10	11,12	21, 22	23, 24

Table 1: Age, sex, and group of 24 children in the study.

2.24 Other factors

All the children had some factors in common so that gross distortions of the data were less likely. All the children lived in stable families where the fathers were regularly employed. Details of the parents education and employment are given in appendix A. As far as the researcher could tell there were no families who were under stress because of disagreements between the husband and wife. This was considered to be important because the researcher did not want to increase the stress on a family already in difficulties. Also in a family where the parents are permanently in dispute the mother-child relationship may well be affected. It must be remembered that the clinic group families were on the whole living more stressful lives because of their very bad housing. Details of housing are given in Appendix A.

It was decided at the beginning of the research that all the children in the study should be looked after by their mothers for at least half of each day i.e. that none of the mothers worked more than half time.

Only two of the mothers worked, and neither of the children spent this time at day care centres. Details of substitute care are given in Appendix A.

All the parents and children were born in Great Britain and spoke only English at home.

2.25 Uncontrolled differences between the families

Although the ages of the parents was not recorded, it is the researchers definite impression that the creche group parents were older than the clinic group. This is partly explained by the definition of the middle class group. They were all living in large expensive houses and could not have afforded to do this had they been younger and less well advanced up the professional ladder. The converse was true of the clinic group parents. They were younger and had, at that time, smaller families because if they had had larger families and/or more money they would have had much better GLC accommodation. Details of family size and birth position are given in Appendix A.

One child was adopted, and several children had step brothers and sisters, but all the children (except the one who had been adopted at a few weeks of age) were living with their natural parents. Details are given in Appendix A.

It was noticed that the fathers of the clinic group of children were much more involved with their children in a day to day sense. Most of these fathers worked close to their homes and some worked shifts. Both these factors contribute to this difference. The middle class fathers generally travelled to London to work, and this plus the fact that many stayed at work in the evenings meant that many of them did not see their children during the week. The clinic group fathers were reported as taking their children out at the weekends to local parks, whereas the creche group mothers said that their husbands were not very interested in their children and at the weekends they either went out by themselves to play golf etc. or complained that the children were in the way if they tried to do things at home. This difference in attitude to wives and children may be explained by the age difference discussed above, reflecting the change in attitude to women and the family which have occurred over the last few years.

Finally, it must be pointed out that none of these children were 'deprived'. In much of the recent literature on early child development there seems to be a confusion between the child being 'deprived' and the child not being middle class.

Wedge and Prosser (1973) define the 'disadvantaged' child in their study as coming from a poor family, living in bad housing and either in a very large or a one-parent family. None of the children in the present study would be considered by Wedge and Prosser to be 'disadvantaged' as none of them come into all three of the categories given above. As discussed earlier, the housing of the clinic group was generally of poor quality and approaching Wedge and Prosser's definition of overcrowding (i.e. 1.5 persons per room). The only child in a very large family (at least five children) came from one of the most prosperous middle class families. None of the children were in single parent families and in no case was the family income at supplementary benefit level.

2.3. The use of a picture book to change the context of the conversation

The paper reviewing work on the effects of the situation on children's language performance has been discussed in the introduction to this report (Cazden 1970). The present research looked at these situational effects on both the child and the mother's speech by attempting to produce a situation which was different from the on-going domestic business of the family, and could be repeated with each family. It was decided to give each mother and child a picture book to look at together. This was quite an acceptable way of controlling the situation for a short time. All the children had picture

books of their own, so it was not a novel experience for any of them. There was no way of knowing how frequently the mothers and children read picture books together in their everyday life, but they all seemed to regard the situation as quite normal and natural.

Before starting the research the author gave the picture book to some mothers with children of the appropriate age to get their reactions. She found the overwhelming one was that of anxiety. The picture book chosen (Matthiesen 1967) was an ordinary hard-back book with colour photographs of everyday objects printed on ordinary paper. There was no writing in the book at all. The mothers anxiety was that the child would tear the book and so they wouldn't let the children handle it. Even if the researcher reassured the mother that she had another copy etc. the mothers could not relax. For this reason it was decided to cut the pages out of the book and mount them in a plastic display book which had twenty four transparent envelopes inside. This was very successful as the mothers could see that the book was now virtually indestructable and they were happy to let their children handle it freely. The pictures chosen were, in order of appearance:

a cat's face, a toy trumpet, a wooden model boat, a child's tricycle, a lit candle, a cut orange, a dozen wax crayons of various colours, scissors with some cut paper, trees in a park, twenty glass marbles of various colours, a spoon, a dog's face, a green parrot, a butterfly on a flower, a mug of milk, a small chair with a ball underneath it, a zebra, a toy bucket and spade on a beach, a brightly coloured inflatable beach ball, a toothbrush with paste and a glass of water, a hair brush and comb, some goldfish in a pond, ten wooden building bricks in a pile.

The pictures were all very naturalistic and were 8" x 6" in size. The photographs are shown in Plate 1. One disadvantage of mounting the pictures in the folder was that it was rather heavy for the small children, but this minor disadvantage was far outweighed by the fact that the mothers allowed their children to handle it without close supervision.

An added advantage of using the book was that it gave the researcher a way of involving the mother during the recording session. When the families co-operation was initially sought the researcher said that she was interested in the child's language. If the mother asked whether her contribution was important the researcher said that she wanted to record the child in normal home surroundings so, of course, the mother was important.

Plate 1 The picture book



However, most mothers assumed that the child was of major importance, and it was hoped that this made them feel relaxed and not under any stress during recording. There was one problem with this approach as frequently the mothers left the researcher talking to the child and went to the kitchen to do some work. If the mother did not come back the researcher gave the book to the child and asked the child to show it to its mother. This usually brought the mother back into the room where the recording was being done. If the child then started showing the book to the researcher she then told the child that she knew the pictures and he should show them to his mother. This approach nearly always succeeded in getting the mothers involved in the situation so that they usually sat down and left their chores until the end of the recording session.

The book also acted as a stimulus to get conversation in general going. It encouraged the child to bring out his own toys etc., and was a very useful tool.

2.4. The recording procedure

The recording of the children was not proposed until mothers and children appeared to be at ease with the researcher. All the recording was done in the children's own homes and, as a general rule only the child, its mother and the researcher were present. However, in thrée families this was not possible. Child 3 and child 9 were both recorded with older sibs in the flat but this did not

interfere with the planned recording as the sibs were encouraged to play quietly in a corner and this was reasonably successful. Child 12 had an old grandmother who lived with the family. The grandmother rarely went out, spending most of her time in a chair in the living room, but she talked very little.

All the recording was done with a small Philips cassette recorder. A reel-to-reel Uher recorder was considered initially but it was found that the children were fascinated by the moving tape, and this disturbed the whole session. The quality of recording from the cassette recorder was slightly lower than from the Uher but its unobtrusiveness far outweighed this minor disadvantage. Long-play cassettes with one hour of recording time on each side were used throughout the research.

The recordings were normally made in the mornings. The researcher arrived at the child's home at about ten a.m. and immediately turned the recorder on and left it under a chair in the living room so that it would be as unobtrusive as possible. Of course all the families knew that they were being recorded but it was felt to be undesirable to constantly remind them of it. Also, children of this age are extremely curious and the researcher was concerned that the microphone should not get damaged by an exuberant two year old. The only time that the recorder was touched was halfway through the morning when the

cassette was turned over. Most of the mothers were very busy and had a meal to prepare at mid-day, so the researcher left at about noon. Many of the mothers seemed to be very lonely and to enjoy having someone to talk to about their children and their husbands. It was frequently found quite difficult to leave, and the researcher tried to listen patiently to the mothers problems. Most mothers seemed quite unconcerned that fairly intimate problems were being taped, but they were assured that only things said to and by the child would be put into written records. The middle class mothers were more reticent, and more concerned that their child's verbal ability was being 'assessed' and compared with other children.

The recording sessions were very relaxed. Generally the researcher and the mother played with the child, the researcher tried to keep fairly quiet but obviously had to talk to a certain extent to appear normal and friendly. When the child was occupied and not involved with the mother, researcher and mother talked together, but when the child came to its mother for something the researcher tried to keep out of the conversation. The picture book was usually introduced at the middle of the session,

when the mother and child were getting a bit bored; or else it was used to bring the mother back into the living room if she had gone off to the kitchen to wash dishes etc. Both mothers and children appeared to enjoy being part of a research project and all the families

were most co-operative. Mothers frequently asked the purpose of the research and the researcher said that she was trying to find out how ordinary children in ordinary families learn to talk. She explained that she visited several families with children of different ages, the children were all taped and then the written records were analysed. Other than the fact that the project was based in the university there appeared to be very little interest in the final fate of the recordings.

It was found very important for the foundation of good easy relationships between the researcher and the families to stress that she had her own children. This appeared to reassure the mothers and made the whole research project very much easier. It was a frequent topic of conversation and the mothers felt that the researcher had gone through all their problems of feeding, potting, sleeping, etc., herself and was hence an acceptable person to discuss these with.

2.5. Transcribing the recordings

The recordings were all transcribed by the researcher by hand. The possibility of using an audio-typist was considered at the start of the project but it was not considered feasible given the quality of the recordings and the difficulties a person who was not present at the recording sessions would have in understanding what was going on. The recordings were written out in ordinary

script; no attempt was made to produce a phonetically correct transcript. No records were made of conversations between the mother and the researcher, or between the mother and the occasional visitors such as the milkman. Although a great deal of time was spent by the researcher on the transcription there were a very few short periods of recording which were finally considered to be unintelligible. These patches, and the occurrence of conversation between the mother and either the researcher or a visitor were noted on the transcript.

The recordings were written out on standardised recording sheets, each utterance being given a new line. There was very little difficulty in identifying the beginnings and ends of utterances as the conversations were very simple but the system used is very similar to that used by Brown (1973) and also Loban (1963). The conversation with the book was marked so that it could be easily identified. The total number of utterances for mother and child in the general conversation and with the book are given in Appendix B. Child No. 19 was not interested in the book, probably because she was very advanced in her language development, so no score is given for her. The averages for the creche group are computed from the other 11 scores.

Extracts from the transcripts of three children of different ages are given in Appendix C.

3. SOCIAL CLASS AND ITS RELATIONSHIP TO BIRTH ORDER AND FAMILY SIZE

As explained in section 2.1 the birth order and family size of the children in the study was not controlled.

For this reason it is necessary to be sure that neither of these uncontrolled factors were significantly related to social class.

3.1. Birth order and social class

The number of first and other children in each group is given below.

	<u>First</u>	<u>Other</u>
<u>Clinic</u>	5	7
<u>Creche</u>	2	10

There are more first children in the clinic group but this difference is not significant. ($\chi^2 = .81$ d.f. 1)

3.2. Family size and social class

The number of large families (i.e. with three or more children) was counted for each group.

	<u>Small family</u>	<u>Large family</u>
<u>Clinic</u>	9	3
<u>Creche</u>	7	5

This difference was not significant ($\chi^2 = .3$ d.f. 1)

In both the above calculations the χ^2 test was used, corrected for continuity. (Siegel 1956 p. 107)

The details of family structure are given in Appendix A.

There were no significant class differences in family structure. By inspection, there do not appear to be any differences between family structure and either age or sex.

4. ASSESSMENT OF THE CHILD'S STAGE OF LANGUAGE DEVELOPMENT

4.1. The Mean Length of Utterance (MLU) as a measure of complexity

The Mean Length of Utterance in morphemes has been used as a measure in language development work for the last ten years. Brown and Fraser (1963), Bellugi (1965) and other projects reported by Brown and his co-workers have shown that the MLU and grammatical complexity are highly related, at least up to the age of four years.

Utterance length is always considered in morphemes; a morpheme being defined as the smallest meaningful unit in a sentence. Morphemes can be of two kinds, either 'free' (e.g. 'go' and 'cat'), or 'bound' (e.g. '-ed' and '-ing'). Within the age range of the children being studied in the present project it is impossible to be certain if bound morphemes are being used as modifiers to other morphemes or not. For example, if a child used the word 'came' it is impossible to know if he is using it in the adult way (i.e. 'come' plus past tense) when it would be scored as two morphemes, or as a completely separate word from 'come' and hence one morpheme. In the present study all inflections were treated as developments of the simple form. The result of this is probably to overestimate the child's MLU score, but the effect on the final MLU score is likely to be quite small.

To compute the MLU for any particular piece of transcribed speech the number of morphemes in each utterance is counted, and the average for the total number of utterances is computed.

Dale (1970), in a review of the use of the MLU says "Although MLU appears to be a very crude measure, it may well be the best single indicator of language development (if a single measure is necessary), at least for children of age five and under."

The main problem encountered in the use of the MLU as a measure of language development is that of complexity in relationship to informativeness. In the majority of cases one would expect these to be highly related to each other, but a possible source of error arises when one considers differences in style between children. Cazden (1972) discusses this problem in detail taking examples from her own work. Many children, when listening carefully to another person talking may say "Yes" or "Hu" or something similar every time the speaker pauses. If all these items are included in the computation of the mean the final MLU score will be artificially depressed. Mothers may also have very similar speech habits. They seem to serve as a reassurance to the speaker that the listener is still concentrating on the conversation and has not started to do something else.

Other workers are also aware of the problem involved here. In all Brown's published work before Brown (1973) it is implied that everything the child says is included in the computation of the MLU, but Brown (1973) in his 'Rules for Calculating the MLU' says "Do not count such fillers as 'mm' or 'oh', but do count 'no', 'yeah' and 'hi'." Dale (1970) says "Single word utterances should be excluded unless they are of particular interest for some other reason." This shows an awareness of the problem but is rather too vague to be of much use in actually computing an MLU.

4.2. Calculation of the MLU in the present study

In the present study, it was decided to exclude the "fillers" from the protocol but this was found very difficult to do in practice, so it was decided that all confirmations such as "no", "yes" and "good boy" would be excluded from the calculations. It was realised that this also excluded the meaningful confirmations but there seemed no way to distinguish between them. This adjusted MLU is called the MLUA throughout this report.

This problem of definition has however, a very small influence on the scores in the present project. The author, working on this problem before Brown's (1973) set of rules were published, calculated the MLUA for her sample and also the MLU as described by Brown in his earlier work

(i.e. with no deletions) and the correlations between the two scores was, of course, very high (.99 for the clinic group and .98 for the creche group). These high scores are to be expected as two very similar sets of data are being correlated. Brown's post-1973 scoring system would give even higher correlations with the MLUA. Thus it seems valid to say that although the method of scoring used in the present research is not identical to Brown's the results are probably quite comparable.

The items excluded from the calculation of the MLUA's are called the 'Yes/No etc. 's', and they are considered in more detail later in this report.

Thus the following scores were obtained for each mother and child.

MLUA for the general conversation

MLUA for the book situation

MLUA for the whole protocol

% Yes/No etc items in the general conversation

% Yes/No etc items in the book situation

% Yes/No etc items in the complete protocol.

These scores are given in Appendix D.

Their relationship of these scores to each other, and to the main factors of age, sex and social class will be examined in sections 4.3 to 5.8.

4.3. The lengths of the protocols in utterances and social class

The length of the protocols was not determined in advance, so the average lengths in utterances for each social class group was examined.

4.31 For the general conversation (children)

Average length for the clinic group = 179.83

Average length for the creche group = 186.50

In both cases the 'Yes/No etc' utterances were excluded. (see section 4.2)

There was no significant difference between the lengths of the protocols ($t = 0.19$ d.f. 22).

4.32 For the book condition (children)

Average length for the clinic group = 45.75

Average length for the creche group = 66.00

In both cases the 'Yes/No etc' utterances were excluded. (see section 4.2)

There was no significant difference in the lengths of the protocols for each group ($t = 1.25$ d.f. 21)

4.33 For the general conversation (mothers)

Average length for the clinic group = 206.33

Average length for the creche group = 233.08

The 'Yes/No etc' utterances were excluded
(see section 4.2).

There was no significant difference between the
two groups ($t = 0.22$ d.f. 22).

4.34 For the book condition (mothers)

Average length for the clinic group = 69.33

Average length for the creche group = 88.82

The 'Yes/No etc' utterances were excluded
(see section 4.2).

There was no significant difference between the
two groups ($t = 0.93$ d.f. 21).

Details of protocol lengths are given in Appendix B.

There were no significant class differences in the
length of protocols.

4.4. Examination of the excluded utterances

As explained in section 4.2 it was decided to exclude
the 'Yes/No etc' utterances from the calculations so as not
to depress the MLU score of a child or mother who produced
a lot of 'social confirmations' to keep the conversation

going. It was considered interesting to look at the frequency of this type of utterance to see if its use was related to any of the other variables of interest in this research.

Throughout this research the 'Yes/No etc' score is given as a percentage of the total number of utterances. These percentages are given in Appendix D.

4.41 The relationship between social class and the percentage of excluded utterances

For the children the average scores were

In the general section:

for the clinic group = 20.7

for the creche group = 21.6

There were no significant differences between these two groups ($t = 0.12$ d.f. 22).

In the book section:

for the clinic group = 13.8

for the creche group = 19.5

There were no significant difference between these two groups ($t = 0.94$ d.f. 21).

For the mothers the average scores were

In the general section:

for the clinic group = 16.9

for the creche group = 19.0

There was no significant difference between the two groups ($t = 0.79$ d.f. 22).

In the book section:

for the clinic group = 18.7

for the creche group = 21.7

There was no significant difference between the two groups ($t = 1.06$ d.f. 21).

In summary, there were no significant differences between the social class groups, for either mothers or children in the frequency of usage of the 'Yes/No etc' category.

4.42 The relationship between the percentage of excluded utterances in the general and the book situations

It has already been shown above that there is no relationship between the social class groups and the percentage of excluded items. The following discussion considers the possibility that the frequency of usage of this category is a matter of individual linguistic style. This hypothesis would be supported if there was evidence that the usage of the category remained similar

in different conditions, i.e. does the child/mother who scores highly in relationship to the rest of the group in one situation also score highly in the other situation. To test this hypothesis a rank correlation coefficient was calculated for both children and mothers, keeping the groups separate.

The Spearman rank correlation coefficient was calculated for each group of children, relating the score for the general conversation to the score in the book situation.

The correlation coefficients were:

for the clinic group = 0.75 (d.f. 11)

for the creche group = 0.78 (d.f. 10)

Both these correlations were significant at the 1% level.

Similar calculations were made for the mothers in each group and in this case the correlation coefficients are:

for the clinic group = 0.58 (d.f. 11)

for the creche group = 0.28 (d.f. 10)

The correlation for the clinic group mothers is just significant at the 5% level. The correlation for the creche group mothers is not significant. This suggests that the clinic group mothers are more consistent in their use of the 'Yes/No etc' category than the creche mothers, but nothing like as consistent as their children.

Hence there is evidence of an individual style in the use of this category, particularly for the children and less so for the mothers.

4.43 The relationship between the percentage of excluded utterances for the mother and her child

It has been established in the above section that children have fairly consistent frequency of usage of the 'Yes/No etc' category across different situations. It is possible that this style is learnt from the mother, so that children with a high frequency of usage would have mothers with a similar high frequency.

Spearman correlation coefficients were calculated relating each mother to her child for the complete protocol scores.

These correlation coefficients were:

for the clinic group = 0.15 (d.f. 11)

for the creche group = 0.19 (d.f. 11)

Neither of these values were significant so there is no evidence that mothers who had a high frequency of 'Yes/No etc' utterances have children who were similarly inclined.

4.44 The relationship between the MLUA of the child
and the percentage of excluded utterances

It would perhaps be expected that the more advanced children would use less 'Yes/No etc' utterances than the less advanced, and to test this hypothesis the rank correlation coefficient was calculated between the child's MLUA score for the whole protocol and the score for the 'Yes/No etc' for the two groups.

The correlation coefficients were:

for the clinic group = 0.48 (d.f. 11)

for the creche group = -0.18 (d.f. 11)

Neither of these correlations was significant at the 5% level (5% = 0.51). However, the correlation of 0.48 is quite large and this suggests that, for the clinic group only, there was a slight tendency for the more advanced children to use less 'Yes/No etc' utterances than the less advanced children.

The frequency of utterances in the 'Yes/No etc' category seems to be unrelated to other possible factors considered in the research. However, the children, and to a lesser extent the clinic mothers do show evidence that the use of this type of utterance tends to persist regardless of the situation. On the present evidence it is impossible to regard the use of this 'social speech' as anything other than a manifestation of personal style.

5. THE RELATIONSHIP BETWEEN THE CHILD'S MLUA, THE SITUATION, HIS AGE, SEX, AND SOCIAL CLASS, AND THE MLUA OF THE MOTHER AND THE RESEARCHER

In section 4.1 the MLUA as a measure of complexity was discussed. Various workers were reported as saying that the value of the MLU for any child depended both on the child's linguistic development and on the situation in which the language was recorded. The effects of a change in situation on both the mother and the child are investigated below.

The MLUA scores for each condition were considered in relation to the main variables of social class, age and sex for both mothers and children. This is given in sections 5.2 and 5.3.

The relationship found in previous studies between adult and child language has already been discussed in section 1.4. It was shown that adults modified their speech to children of different ages, and this modification is investigated in the present research (section 5.6).

The relationship between the researcher's language and the child was also investigated (section 5.8). The researcher usually seems to be ignored in this type of research, but it was felt that a brief examination of her 'linguistic reactions' to the child might be informative.

5.1. The effect of the situation on the child's MLUA

The MLU for children has been reported by several workers to be highly sensitive to the situation in which the sample of language is recorded. In order to attempt to control the situation so that results from different mother-child pairs could be compared the children were given a picture book to show to their mothers. The book has been described in detail in section 2.3.

5.11 Comparison between the MLUA in the general conversation and with the book

Two sets of MLUA were computed, one for the ordinary domestic conversation of the mother and the child and one for the conversation with the picture book. It was likely that the scores in the two situations would show consistent differences, and this was tested using a paired 't' test to see if the mean value of MLUA (general) - MLUA (book) was significantly different from 0.

The mean differences were:

for the clinic group = 0.41 (t = 3.63 on 11 d.f.)

for the creche group = 0.33 (t = 3.27 on 10 d.f.)

Both these mean differences were significantly different from 0 at the 1% level.

The average value of the MLUA were:

	<u>General</u>	<u>Book</u>
<u>Clinic group</u>	2.31	1.90
<u>Creche group</u>	2.30	1.97

The finding in previous work that a child's MLU is affected by the situation is also found in the present research. It seems a very similar phenomenon in both groups and is significant at the 1% point.

5.12 The changes in MLUA for the individual child

The evidence presented above about the decrease of the average MLUA in the book situation does not throw light on the effects on individual children. It might be expected that the children who were advanced relative to the group in the general conversation would also be advanced relative to the same group of children in the book situation. To test this the product-moment correlation between each child's MLUA in the general and the book situation was calculated for the groups separately. These correlations were:

for the clinic group 0.84 (on 11 d.f.)

for the creche group 0.76 (on 10 d.f.)

Both these correlations were significant at the 1% level.

This shows that, relative to the group of children, the child who uses more complex speech in the general situation also tends to use complex speech in the book situation, even though the absolute value of the MLUA has decreased.

5.2. The relationship between the child's MLUA in the general conversation and his age, sex, and social class

The child's MLUA score as a measure of his language development was related to his age, sex and social class group. It is to be expected that there are significant differences in the MLUA with age, but also possibly with sex and social class. Previous work reported in section 1.22 and 1.23 might suggest that:

- a) the creche group would be more advanced than the clinic group, and
- b) the girls would be more advanced than the boys.

To investigate these possibilities an Analysis of Variance was carried out on the MLUA scores. The variance in the scores was related to the main factors of age (A), sex (S) and social class (C) and their higher order interactions, the general conversation and the book condition being considered separately.

<u>Source</u>	<u>SS.</u>	<u>d.f.</u>	<u>M.S.</u>	<u>F</u>	<u>Sig.</u>
Between ages	13.98	2	6.99	17.05	0.1%
sexes	0.00	1	0.00		
classes	0.06	1	0.06		
A x S	0.22	2	0.11		
A x C	0.38	2	0.19		
S x C	0.18	1	0.18		
A x S x C	1.49	2	0.74	1.80	N.S.
Error	4.94	12	0.41		
Total	21.25	23			

Table 2. Analysis of Variance summary table for
MLUAs in the general conversation.

The analysis of variance shows that the only factor which is related to the MLUA in the general conversation is the age group of the child. This is of course to be expected as the MLUA is being used as a measure of development. There are no significant differences involving either the sex or social class group of the child. The Scheffe test on the differences in the age group means shows that there are significant differences between the youngest age group and the other two older groups but that the middle and oldest groups are indistinguishable from each other. The data in this analysis is shown graphically in Fig. 1 (a), the implications of this analysis will be discussed later.

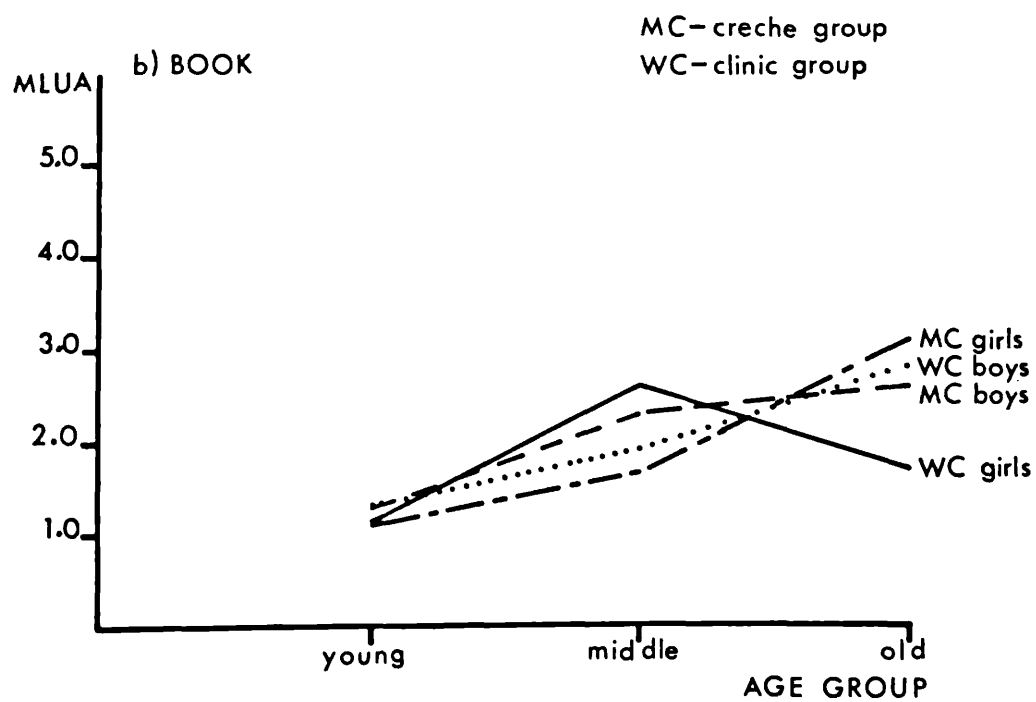
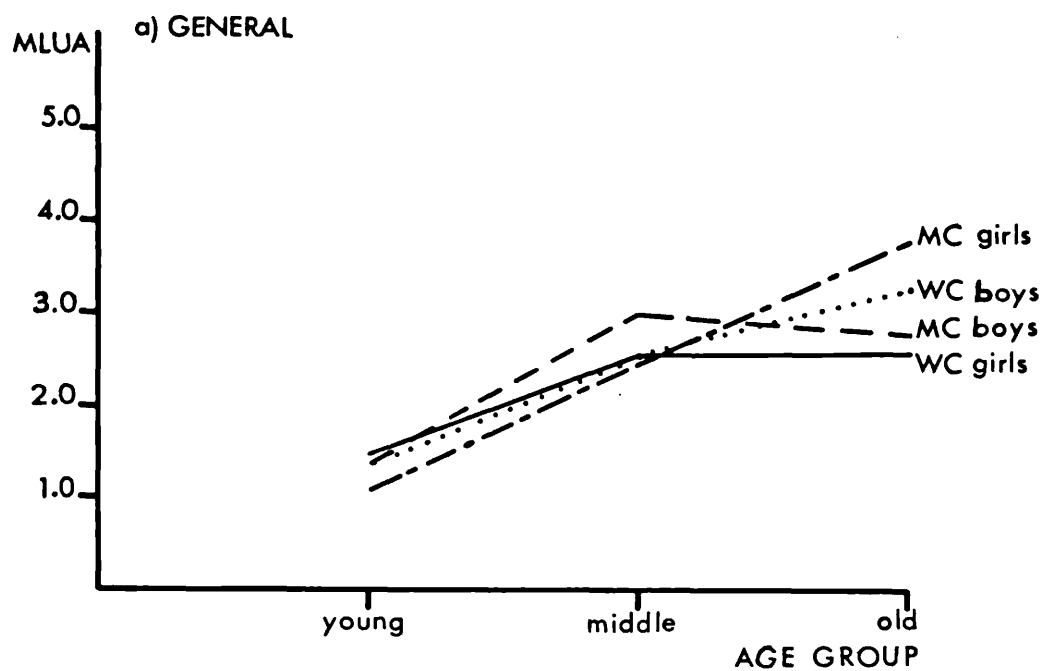


FIG.1. AVERAGE MLUA FOR EACH AGE GROUP

5.3. The relationship between the child's MLUA in the book condition and his age, sex and social class

A similar analysis to that described in section 5.2 above was carried out using the MLUA scores in the book condition. The analysis of variance table is shown below.

<u>Source</u>	<u>SS.</u>	<u>d.f.</u>	<u>M.S.</u>	<u>F.</u>	<u>Sig.</u>
Between ages (A)	7.45	2	3.72	13.29	0.1%
sexes (S)	0.15	1	0.15		
classes (C)	0.05	1	0.05		
A x S	0.07	2	0.03		
A x C	0.81	2	0.40	1.43	N.S.
C x S	0.00	1	0.00		
A x S x C	2.29	2	1.14	4.07	5%
Error	3.34	12	0.28		
Total	14.16	23			

Table 3. Analysis of Variance summary table for MLUAs in the book condition

The analysis of variance of the book section was very similar to that for the general conversation. The Scheffe test shows that as before the only significant differences in the age group means was between the youngest group and the other two.

However, in this case the second order interaction was significant at the 5% level. It showed that in the oldest age group the creche girls are the most advanced, the clinic girls the least advanced and the boys lying between these two extremes. This is shown graphically in Fig. 1 (b).

This type of interaction must be treated with caution, but it is interesting to note that a similar sex x class interaction has been found both by Hindley (1965) and Kagan (1971) in their studies of the cognitive development of young children. Explanations of this interaction are usually sociological in nature and a more detailed study would be both interesting and productive.

5.4. Discussion of the factors found to be related to the child's MLUA.

In conclusion, the analyses in this section have shown that:

- a) The situation affected the complexity of the speech produced by the child. The less constrained situation of 'domestic chat' permitted the child to use longer utterances than the more defined 'book conversation'.
- b) Children who were advanced in language development relative to the other children in the general conversation were also advanced in the book situation.
- c) The younger children were less advanced than the older children. This would, of course, be expected.

However this is not a straightforward linear relationship for all the children. Fig. 1 shows development from the 'young' to the 'middle' group was very similar across sex and social class. However, the development during the 'middle' to 'old' age appeared much more complicated and related to both sex and social class. These relationships were similar in both the general and the book situation but only statistically significant in the book situation.

5.5. The relationship between the MLUA's of the mothers in the general and the book conditions

Similar analyses were made on the data from the mothers as have been reported above for their children.

The effect of the situation on the mothers speech was investigated. The differences between the MLUA for the general and book situation was calculated for each mother, and these differences were tested to see if they were significantly different from 0 using the paired 't' test.

For the clinic group mothers the mean difference in the MLUA (general) - MLUA (book) was 0.69. This was significant at the 1% level.

For the creche group mothers the mean difference was very similar, 0.65, but because of the much greater variability in the scores of this group of mothers this difference was not significant. This variability will be discussed later.

Thus there was a tendency for mothers as well as children to shorten their utterances in the book condition, but this was not significant for the creche group.

5.6. The relationship between the MLUA of the mothers and that of their children

The evidence for a relationship between the MLUA of mothers and their children in previous studies has been presented in section 1.4. However, all the studies discussed have much larger age ranges than those in the present research, and it might be expected that mothers were not sufficiently sensitive in their conversations with their children to respond differently to very small differences in the MLUA of the child. To investigate this the product-moment correlation was calculated for each group between the MLUA of the mother and her child.

5.61 MLUA of mother and child in the general conversation

The correlations were:

for the clinic group 0.85 (df. 11)

for the creche group 0.57 (df. 11)

The clinic group correlation was significant at 1% and the creche group at 5%. These correlations showed a highly sensitive interaction between the mothers and their children. An interesting point is that the mean MLUA's for the mothers (4.20 for the clinic group and 4.59 for the creche group) were just over two morphemes greater than the means for the children (2.31 and 2.41). The mothers were not only reacting to their child's linguistic development, but were producing models for the child which were just in advance of his own performance. This seems an ideal way of both teaching and learning a language.

5.62 MLUA of mother and child in the book condition

The correlations were:

for the clinic group 0.58 (d.f. 11)

for the creche group 0.76 (d.f. 10)

The correlation for the clinic group was significant at the 5% level and for the creche group at the 1% level.

The means for these two groups were, for the mothers 3.51 and 3.95 and for the children 1.90 and 1.97. These means showed the expected decrease in the book situation, but the difference between the mothers and the children was just under two morphemes.

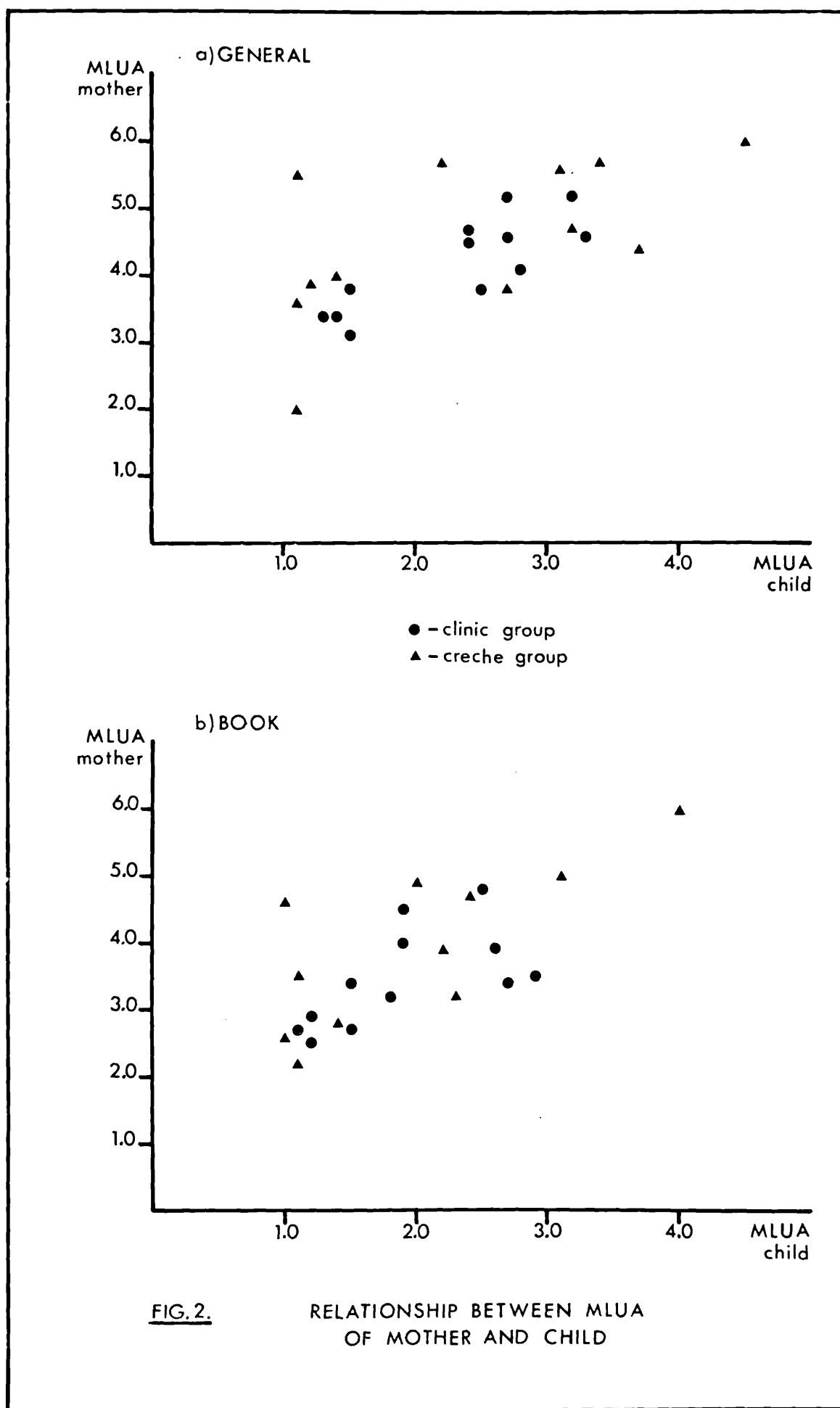
5.7. Examination of social class differences in correlations between the MLUAs of mothers and their children

The correlations between the MLUA's of the mothers and their children was tested to see if the apparent differences between the social class groups in each situation was significant.

Fisher's 'z' transformation was used (given in Snedecor 1956) and it was shown that there was no evidence that the correlations were significantly different from each other. The weighted average values of the correlation coefficients was calculated and these were:

for the general situation	0.74
for the book situation	0.67

These relationships between the MLUA's of mothers and their children is shown graphically in Fig. 2.



5.8. The relationship between the MLUA's of the
researcher and the children

The relationship shown above between the MLUA's of the mothers and their children might well be explained by the life-long interaction between the mother and her child. The present research was not longitudinal, and it is only by longitudinal studies that changes in the interaction can be properly investigated. However, a brief look at the relationship between the child's speech and that of a visitor to the home (i.e. the researcher) might show if the child and his mother had any immediate effect upon someone who had not been familiar with the child over a long period of time.

A product-moment correlation coefficient was calculated between the MLUA of the researcher and the MLUA of the child in the general conversation. (The researcher deliberately was not involved in the book situation.) The correlations were:

for the clinic group 0.76 (d.f. 11)

for the creche group 0.58 (d.f. 11)

The correlation for the clinic group is significant at 1%, and for the creche group at 5%. The MLUA scores for the researcher are shown in Appendix E.

These correlations were very similar to those of the mothers. It is perhaps surprising that they are only slightly lower, but it might be explained by the fact that the researcher has children herself and her ability to adjust to the speech of the children might have been learnt from them. The mean scores for the researcher were slightly higher than those of the mothers: 4.57 for the clinic group and 4.98 for the creche group. These are approximately 0.3 of a morpheme longer than the MLUA's of the mothers in each group. This, again, might be a result of the researcher's familiarity with older children. Snow (1972) found that mothers were only slightly better than non-mothers in modifying their speech when talking to children, but Snow's child subjects were either two year olds or ten year olds and one might expect the modifications required in this case to be easier to make than in the present study.

5.81 The relationship between the researcher's early MLUA and the child's MLUA

The relationship between the researcher and child in MLUA score shown above was rather unexpected so it was decided to look at it in more detail. It was interesting to know if the researcher's adjustment to the child happened quickly, or if it developed throughout the conversation. To investigate this a product-moment correlation between the child's MLUA (general) and the researcher's MLUA based on her first 20

utterances were computed. These are given in Appendix E.

The correlations were:

for the clinic group 0.41 (d.f. 11)

for the creche group 0.56 (d.f. 11)

The first of these correlations was not significant, and the second was significant at the 5% level. Both these correlations show that the researcher adjusts to the children quite quickly, but this adjustment is not at its maximum by 20 utterances. It also showed that the researcher 'tuned-in' more quickly to the creche group children. This was probably a reflection of her own middle class background.

6. DISCUSSION OF THE RESULTS REPORTED IN
SECTIONS 3, 4 AND 5.

The research reported so far shows some very interesting relationships between the child, his mother, the researcher and the linguistic situation.

In section 3 it was shown that family size and birth order were not related to any of the main factors in this research. As family structure was not controlled in the experimental design, and the relationship with language development uncertain it was essential to show that differences in family structure were not confounded with either age, social class or sex. It is of course impossible to separate family size and birth order given the age of the children being studied. A first child aged two years is automatically in a small family as it is very unlikely that he will have more than two younger sibs at the most. Thus there were no first children from large families in the study.

The work reported in section 4 considered the utterances which were excluded from the calculation of the MLUA's. Most of these utterances seem to be used in conversations to assure the speaker that the listener is still attending to the conversation. The frequency of usage of this category was unrelated to social class or to the stage of the child's language development, but remained relatively constant in changing situations.

The tendency to use this type of utterance frequently can probably be regarded as a facet of individual linguistic style. It might be expected that this style would be similar for mother and child but there is no evidence that children with a tendency to use many of these utterances had mothers who also did so. It is very likely that this sort of encouragement from listener to speaker is given in many different ways other than the purely verbal. People nod their heads, smile and make a variety of gestures which would not be recorded by an audio tape recorder. A video tape recording would give much more information on this type of response, but the installation of the recorder in the child's home would probably distort the behaviour recorded. Moving the family into the laboratory from their home makes videotape recording technically easier but being away from home in rather strange surroundings would probably distort the way the mother and child react to each other.

The work reported in section 5 showed that the present work confirmed the previous finding, discussed in section 1.26, that a child's mean length of utterance was related both to the child's own level of linguistic development and to the situation in which the language was recorded. In this research the conversation using the picture book was less complex than the general domestic conversation. In the book situation the absolute value of the MLUA was

depressed, but the advanced children were still more advanced than the other members of the group even though all the scores were lower. It was shown that the change in situation did affect the MLUA scores, but in a quite specific way.

The analysis of variance of the MLUA scores in both situations was interesting. The MLUA appeared to increase in much the same way for all four groups (2 ages x 2 sexes) in the first two age groups but the position in the oldest group was much more complicated. The interaction between age and class (shown in Diagram 1) is similar to other sex x class interactions found in the study of the cognitive development of small children (Kagan 1971). It would be very interesting to have data on the next age group, but without this and a larger sample the interaction must be regarded with caution.

The mothers' length of utterance was also affected by the change in the situation. In a similar way to their children, the mothers' language in the book situation became less complex. The creche group mothers showed much greater variability in their scores than the clinic group. This is shown in Fig. 2. It is rather difficult to account for this difference, but the researcher felt that the creche group mothers were much more aware of their own speech to their children.

This group of mothers seemed to be divided into two contrary schools of thought: either they tried to deliberately simplify their speech because it was 'better' for the child, or they decided to treat the child 'like an adult' because, again, it was 'better' for the child. It was the researchers impression that the creche group mothers felt themselves to be 'on trial' during the research, whereas the clinic group mothers were more detached from their children and did not see themselves as being totally responsible for the child's development. This might account for the fact that the clinic group mother's speech was more closely related to their childrens performance, than the creche group mothers' speech was.

The researcher also appeared to adapt her language to the on-going conversation between the mothers and their children. This rapid adjustment in the researcher's own level of complexity was rather a surprising finding. The researcher was well known to the families but had not spent a great deal of time with them individually before the recording session.

Some recent research by Shatz and Gelman (1973), published since the present research was carried out, showed that 4 year old children were quite capable of adjusting their speech to a listener. The children had to tell an adult and a two year old about a toy, and it

was found that the 4 year olds adjusted their speech appropriately regardless of whether they had two year old sibs or not. In this study the MLU was used as the measure of complexity. This adjustment was also found in the free speech of the same children to adults and two year olds.

The ability to alter speech complexity appropriately seems to be a readily available skill, even to a four year old, and with this in mind, the researchers ability to adapt to the children seems rather less remarkable.

Shatz and Gelman (1973) also show that the four year olds reduce the complexity of their language from approximately 5.5 morphemes per utterance when they are talking to adults, to about 4 when they are talking to the two year old children. The authors point out that this is an intermediate position between their 'adult conversation' level and the two year olds level. In fact the four year olds in this study are acting very like the mothers in the present study.

Relevant to this finding is the work of Shipley, Smith and Gleitman (1969). In their study of response to commands they found that two year olds responded best to instructions which were presented at a level of speech just in advance of the child's own performance.

In summary, it has been shown that children hear speech which is just in advance of their own performance. It is unlikely that this type of adjusted speech is constantly spoken to the child, but it seems very possible it occurs quite frequently. All the recordings were made in as naturalistic a situation as could be arranged, and it seems likely that the speech recorded was fairly typical of the mother-child interaction at that time. The combined evidence from the present study, from Snow (1972) and Shatz and Gelman (1973) all point to the existence of a highly appropriate interactive process between the child learning to talk and others in his environment. The level of complexity in this interaction appears to be controlled by the child's own performance, but it is impossible to say who is controlling who. Even in a longitudinal study it is not possible to separate the mother's influence over the child's performance, and the child's control over the mother's performance. Nelson (1973) has shown that mothers tested twice with a six month interval between tests (i.e. with her child at 24 and 30 months of age) were using more complex speech with the older children than they were with the younger ones. Snow (1972) reports that mothers actually talking to a child modify their speech more than they do when they are making a tape recording for the same child. Both these studies suggest strongly that the child's own performance makes a major contribution to determining the complexity of the mother's speech.

7. IMITATION AND EXPANSION BETWEEN MOTHERS AND THEIR CHILDREN

It has already been shown in section 5.6 that the mothers' and children's MLUA scores were correlated. This relationship could be accounted for if the mother's spent an appreciable part of their time expanding their children's utterances. However, it was the researchers impression that there was very little expansion in the conversations, and that imitation was much more frequent. This is looked at in detail in this section.

7.1. Definition of imitation and expansion

An imitation was defined as an utterance which was either identical to the one which immediately preceded it, or was a partial repetition of the preceding utterance; in both cases the imitation being made by a different person from the speaker of the initial utterance.

The following examples would be considered imitations:

Mother: "It's a car"

Child: "It's a car"

or Child: "Car".

The following examples would not be considered imitations:

Child: "It's a ball It's a ball"

Mother: "It's a car"

Child: "Car red".

An expansion was defined as being an imitation in which the imitater repeated what the speaker had said adding only whatever was necessary to turn the utterance into one which was grammatically correct. For example:

Child: "Car red"

Mother: "The car is red".

This definition was the same as that used by Cazden (1972).

7.2. Frequency of imitation and expansion

The number of imitations and expansions used by each mother to her child and child to his mother was counted and then expressed as a percentage of the total number of utterances made by the speaker. The mean scores for each group for mothers and children are shown below in Tables 4 and 5.

	<u>Mothers</u>		<u>Children</u>	
	<u>Clinic</u>	<u>Creche</u>	<u>Clinic</u>	<u>Creche</u>
<u>General</u>	4.0	6.7	11.9	9.8
<u>Book</u>	7.4	6.5	21.9	16.2

Table 4. Mean percentages of mothers' and children's total utterances which were imitations.

	<u>Mothers</u>		<u>Children</u>	
	<u>Clinic</u>	<u>Creche</u>	<u>Clinic</u>	<u>Creche</u>
<u>General</u>	1.6	2.0	0.3	0.0
<u>Book</u>	1.6	2.4	0.1	0.5

Table 5. Mean percentages of mothers' and children's total utterances which were expansions.

The percentages shown above in tables 4 and 5 were quite small, particularly for the expansions. There is a great deal of individual variation within each group, but the analysis of these scores is not followed up as they are not considered to be a true reflection of the prevalence of expansion and imitation. The factor of importance is the percentage of the child's utterances which were expanded and imitated by the mother, and the percentage of the mother's utterances which were imitated by the child. It is possible that some of the disputes in the literature about the relative importance of imitation and expansion in language learning may spring from a failure to distinguish between these two scores.

7.3. Imitation of the mothers' utterances by their children

The scores for the percentage of the mothers utterances which were imitated by their children are given in Appendix F (table 1). The scores are arranged so that the children are in descending order of MLUA and it can be seen by inspection that the less advanced

children vary in their behaviour when compared to the more advanced. To investigate this further it was decided to divide the children into two categories according to their level of development. These groups were defined using the MLUA score for the whole protocol, with 2.3 morphemes per utterance being chosen as a convenient cut-off point. Half the children in each group came above this level and half below it. These two groups were called the more- and less-advanced children.

The scores for the more- and less-advanced children were compared separately for each group and in each situation. All the non-parametric tests used in the following sections of this report are taken from Siegel (1956).

7.31 Comparison of the frequency of imitation by the children according to their level of development

The clinic group showed significant differences in their frequency of imitation. In both the general conversation and the book situation the more advanced children showed less imitation. This difference was significant at the 5% level in the general conversation and at the 1% level in the book situation. (Mann Whitney test).

The creche group showed no significant differences.

7.32 Comparison of the frequency of imitation by
the children related to the situational context

The differences in the scores in the general and the book condition were examined in each group of children using the Sign test. The only significant difference was found in the scores of the less-advanced clinic group children where there was more imitation in the book condition. This difference was significant at the 5% level.

7.4. Expansion of the children's utterances by their
mothers

It has frequently been stated (e.g. Brown and Bellugi 1964) that expanding a child's ill-formed utterances would appear to be an ideal way of teaching a small child the correct surface structure of an utterance. This form of parental utterance has been reported as occurring as a response to a child's utterance in up to 30% of the total utterances (Slobin 1967). This high rate of usage of expansions is discussed in detail by Slobin who proposed that the frequency may be affected by factors such as age, social class and level of development. These factors are investigated below.

The frequency of expansion is given for each mother in Appendix 7 (table 2).

7.41 Relationships between expansion, level of
development and the situation

There were no significant differences between the more- and less-advanced children and their mothers' expansion rate (Mann Whitney test). There were no significant differences between the expansion rate of the mothers in the general conversation and the book condition (Sign test).

The average percentage of children's utterances which were expanded by the mother is in the order of 5%. This is very much lower than that reported by Brown and his co-workers in the Adam, Eve and Sarah study, and perhaps reflects a cultural difference between the American and English mothers in the way that they talk to their children. The low frequency of expansion found in the present study implies that expansion cannot be considered to be very important in the language learning process. Also, eight of the mothers out of the 24 in the study did not expand their children's speech at all. These children appear to be divided equally between the age groups, sexes, and social classes and seem quite indistinguishable from the other children. The possibilities of a personal style in expansion and imitation will be considered later.

7.5. Imitation of the children's utterances by their mothers

The percentage of the child's utterances which were expanded by their mothers is given in Appendix 7 (table 3). The first point of interest is that imitation was more frequent than expansion and varies from 0% to 27% in the general conversation and 36% in the book condition. The only significant difference between the less- and more-advanced children was that the more-advanced clinic group children received significantly less imitations than the less-advanced clinic group in the general conversation. (The Mann Whitney test was significant at the 5% level).

As before, the Sign test was used to test if the book condition promoted more imitation than the general conversation. This difference was found to be significant for the more-advanced clinic group children only.

Mothers in the present study on average imitated their children about twice as much as they expanded their utterances, but the rate of imitation and expansion appear to be unrelated to either the factors of social class and language development, or to the conversational context except in a few instances. For this reason it was decided to investigate any possible relationships between the frequency of imitation and expansion for each mother-child pair and hence reveal any consistent patterns of interaction.

7.6. The possibilities of a consistent mother-child style in expansion and imitation

There was a great deal of variation in the scores for expansion and imitation shown in Appendix F, and a series of rank correlations was carried out to see if a child or mother who scored highly on one measure did so on any of the other measures. This series of correlations is shown in Table 6.

These correlations are based on a very small number of cases and the 5% level of significance requires a correlation coefficient of 0.83. The one significant correlation: the less-advanced clinic group children who imitated their mothers most also received the most expansions in the book situation. There is no overall pattern except perhaps for the more-advanced creche group children in the book condition. Here there are three quite large positive correlations showing that mothers who tend to imitate also expand their children's utterances and have children who imitate them.

There is very little evidence of a consistent mother-child style in imitation and expansion. The small numbers of children in each group does not permit a detailed analysis of this question. It is very interesting to note that this study shows a much lower rate of expansions than has been previously reported, and an appreciable amount of imitation.

<u>Group</u>	<u>Im. (child) x</u> <u>Ex. (mother)</u>	<u>Im. (child) x</u> <u>Im. (mother)</u>	<u>Ex. (mother) x</u> <u>Im. (mother)</u>
<u>General conversation</u>			
Clinic (Advanced)	0.13	-0.07	-0.73
Clinic (Less-advanced)	-0.31	-0.26	0.66
Creche (Advanced)	-0.10	-0.66	0.36
Creche (Less-advanced)	0.09	0.26	0.60
<u>Book situation</u>			
Clinic (Advanced)	-0.03	0.09	0.14
Clinic (Less-advanced)	0.93	0.09	-0.01
Creche (Advanced)	0.70	0.80	0.70
Creche (Less-advanced)	-0.37	0.26	-0.60

Table 6. Correlations between frequency of mothers' imitations and expansions, and the frequency of the children's imitations.

8. THE SEQUENTIAL ANALYSIS OF CONVERSATIONS

The analyses of imitations and expansions given in section 7 were considering a specific aspect of the sequential dependencies within the conversations. Only two utterances were being considered at a time: the utterance which was being imitated or expanded and the imitation or expansion itself. It was decided to broaden this type of analysis to include all the utterances in the protocols, and to look at strings of utterances up to five items in length. This involved an enormous number of combinations of items and could not possibly be done by hand, so all the data was coded and the frequency of the repetitive sequences were counted by computer. This gave information about the ways in which the conversations were patterned, and the variations in this patterning.

8.1. Coding procedures for the sequential analysis of conversations

To carry out the computer analysis it was necessary to code all the utterances in two ways. The first factor which had to be coded was that of the speaker, and the person to whom the speaker was speaking. There are four possible combinations of speaker and listener:

1. Mother to child
2. Researcher to child
3. Child to researcher
4. Child to mother

The conversations between the mother and any other adults other than the researcher were not transcribed or recorded. Throughout this analysis the general conversation was considered separately from the conversation inspired by the book.

Secondly, every utterance was classified as belonging to one of ten categories. The first four of these categories were questions. These are similar to those used by Holzman (1972). Unfortunately Holzman's paper was not published until after this analysis had been made so that the categories used were not comparable even though the analysis is on similar lines.

Questions were considered to be important both because they were used so much by both mothers and children, and also as Holzman says "The use of the interrogative form functions as a signal from the speaker that he wants the hearer to respond with attention and thought to what the speaker is saying." There were four categories of questions and these were:

Utterance 0: the 'tag' question. The tag question is the short rhetorical question which is often used at the ends of sentences, for example, "That's a dog, isn't it?" Tag questions have been investigated in detail by Brown and Hanlon (1970), who have considered the evidence that the use of tag questions gives about the grammatical ability of the child. To produce correct

tag questions requires a high level of grammatical sophistication, particularly in negative instances, for example "The cat didn't bite the dog, did she?" The present author considered that the tag question might not be such a feature of the speech of English mothers and their children as it was in the U.S.A. It must also be remembered that the children in the study were rather young to be using tag questions.

Utterance 1: a simple question demanding the answer "Yes" or "No". A typical example of this type of utterance would be "Do you want a drink?"

Utterance 2: a more complex question demanding a answer other than "Yes" or "No". This category includes the majority of the questions that mothers and children use to each other such as "What's that?", "What do you want for dinner?", "Why are you crying?", "Who is coming to play today?" and "Where are your shoes?"

Utterance 3: a question used as a request for behaviour, for example "Will you please pick that up?"

The remaining six categories are defined below.

Utterance 4: confirmations and disconfirmations. This category was used for utterances such as "Yes", "No", "That's a good girl", and were basically the utterances excluded from the calculation of the MLUA.

Utterance 5: the expansion as defined in section 7.1.

Utterance 6: the simple instruction such as "Sit down", "Come here", and "Don't touch that". This was distinguished from category 3 and did not include questions used to influence behaviour.

Utterance 7: the simple statement which was used for giving information to the listener, such as "It's an orange", and "My name is Peter".

Utterances 8 and 9 were both concerned with imitation. It was decided to divide the utterances defined as imitations in section 7.1 into two different categories. Utterance 8 was a reduced imitation, so that if the mother said "It's a ball" and the child said "Ball" this would have been considered to be a type 8 utterance. Utterance 9 was a complete imitation so that in this case the relevant response to the mother's statement would have been "It's a ball".

It was sometimes difficult to be absolutely precise in assigning an utterance to a category, particularly as a child's intention is not always clear from the recording alone. Bloom (1970) discusses this problem in great detail, explaining how it is necessary to use information from the on-going situation of the child to help determine the meaning of some utterances. This was done in the present study in an informal way but there was no attempt made to keep systematic records during the tape recording sessions.

The mean percentage frequency for each group of mothers and children for each utterance type is given in Appendix G and also shown diagrammatically in Figs. 3 and 4.

8.11 Coding the speaker

Using the above coding categories it was possible to give every utterance two numbers. The first was either 1, 2, 3 or 4 indicating the speaker and the person who was being spoken to, and the second was either 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9 to show what type of utterance was being used. In this way each utterance could be given a number from 10 to 49 which coded both the speaker, the person being spoken to and the type of utterance; for example, an utterance coded 16 was one in which the mother gave the child an instruction.

8.2. Frequency of usage of different types of utterance

The frequency of usage of the ten different utterance categories for mother to child and child to mother are shown in figures 3 and 4. These scores were the average percentages for the group for each utterance type.

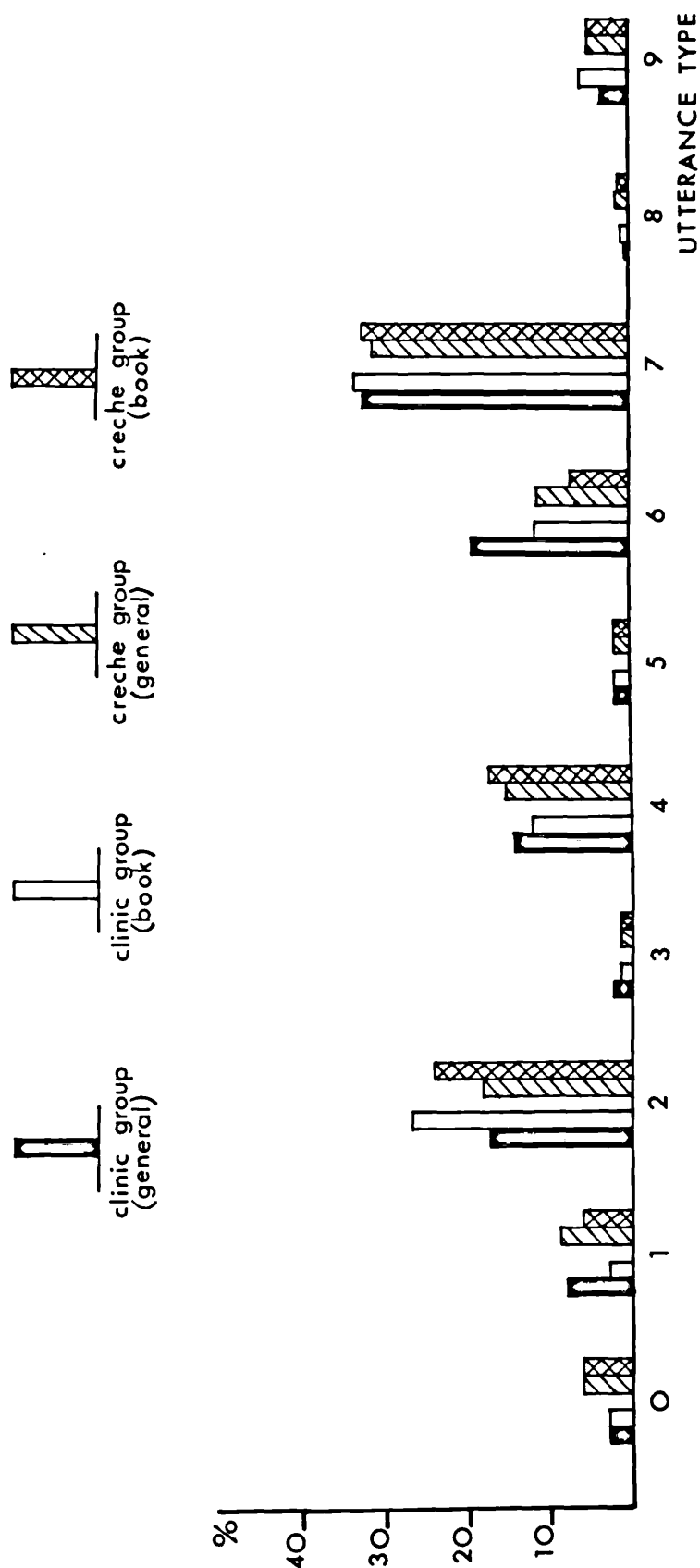


FIG. 3.
PERCENTAGE FREQUENCY OF USAGE OF DIFFERENT
UTTERANCE TYPES BY MOTHERS TO THEIR CHILDREN

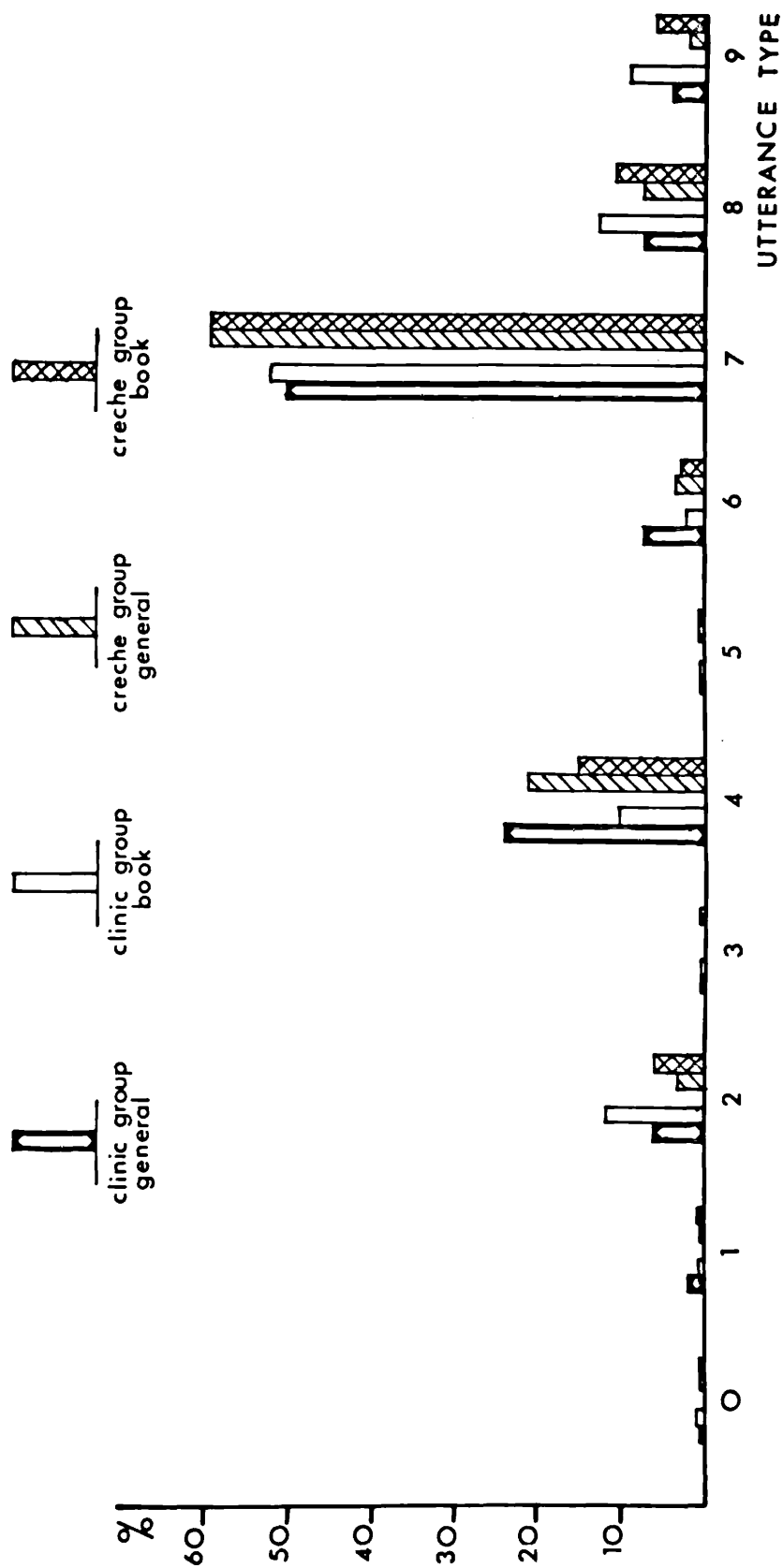


FIG. 4. PERCENTAGE FREQUENCY OF USAGE OF DIFFERENT UTTERANCE TYPES BY CHILDREN TO THEIR MOTHERS

8.21 Discussion of the mother's utterances to her child

Six points of interest emerge from Fig. 3.

These are:

- a) Both social groups appear very similar in their frequency of usage of the various utterance types.
- b) In both groups just under one-third of the utterances were in category 7, the straightforward giving of information. The next most frequently used category was 2, the question demanding an answer other than "Yes" or "No"; and the next the confirmation, category 4.
- c) The only utterance category which shows social class differences is category 6, the giving of instructions. This difference is not significant (Mann Whitney test).
- d) Very few of the mother's utterances were either expansions or imitations. This has been discussed in greater detail above in section 7.2.
- e) The clinic group mothers use less tag questions than the creche group but this is not a significant difference (Mann Whitney test).
- f) When the book condition is compared with the general conversation the average frequency is very similar for each group. There are less instructions and more questions of the category 2 type.

8.22 Discussion of the child's utterances to his mother

- a) For both the groups approximately half the utterances were simple 'giving of information' types: category 7.
- b) Confirmations were the next most frequently used utterance type.
- c) The next most frequent was the question of the category 2 type, and there were interesting differences in its usage. In both groups they were used significantly less in the general conversation than in the book section (Mann Whitney test significant at 5%).
The clinic group children asked significantly more questions of this type in the general conversations (Mann Whitney test significant at 5%) but although the difference was in the same direction for the book section it was not quite significant at 5%.

8.23 Discussion of child to researcher and researcher to child

Because there was little data in these categories compared with the mother to child categories it was not possible to give statistically precise data, however the pattern of usage by the children to the researcher was very similar to the children talking to their mothers.

As above the clinic group asked more questions than the creche group, but there was less imitation of the researcher than there was of the children's own mothers.

The researcher spoke to the children using very similar proportions of utterances to that used by the children's mothers. She appeared to use slightly more confirmations than the mothers which is perhaps to be expected given her wish to see the recording sessions proceeding as smoothly as possible.

8.3. Discussion of the frequency of usage of different utterance types

Very few differences between social class groups were found. The most frequently used category was 7, the statement, the type 2 questions, and confirmations. It is perhaps surprising that the question demanding the Yes/No answer was not used very often. This was, perhaps, because the mothers knew that the researcher was interested in their children's language, and felt that the open question was more likely to get the children talking.

The clinic group children's inclination to ask questions was an unexpected finding and had not been reported in the existing literature. However, in a recent paper by Wootten (1974) a similar finding is reported. Wootten argues that the working class child

"is left more in charge of its own construction of reality." (Wootten 1974). This proposal would be supported by the discussion in section 6 where it was suggested that the middle class mothers saw themselves as being responsible for the intellectual development of their children.

Imitation and expansion have already been discussed in section 7.

9. CONVERSATIONAL UNITS

Conversations are not, of course, continuous but stop and start in response to a variety of factors. Mothers and children seemed to have bursts of conversation, called here 'conversational units', and it was considered important to include this information about the conversations in the computer analysis.

9.1. Definition of the end of a conversational unit

It was decided to declare conversational units to be at an end on a very conservative basis, so that mere pauses when the child was perhaps organising its next contribution to the conversation would not be treated as 'ends'.

An ending was defined using the following criteria:

- a) If the mother or the child left the room. Sometimes mothers went off to make tea or to pay the milkman; sometimes the child went to the lavatory, or to another room to play.
- b) If the child withdrew from the conversation while still being in the room, by going off into a corner to play.

- c) If the mother started to talk to the researcher about her own interests and, frequently, her anxieties. Most of the mothers were interested in the researcher's own family and this was found to be a good basis for establishing a satisfactory relationship with the families in the research.
- d) If there was a very definite change in the topic of the conversation. This was usually preceded by a period of silence, but as explained above the period of silence was not in itself considered as evidence for the end of a conversation. Conversations which moved gently from one topic to another were not considered to have stopped.

In the computer analysis the end of a conversation was marked as a 0.

9.2. Examination of the average length of the conversational unit

It was decided to look at two aspects of these conversational units: first of all the average length of the unit and the way that this varies relative to the other main factors of this research, and second, the repetitive patterns found within conversational units and the way that these conversational units begin and end.

9.21 The average length of the conversational unit

The average length of the conversational unit was calculated for each mother-child pair in each condition by dividing the total number of utterances (excluding O's) by the number of O's (endings) in the protocol. These average lengths are given in appendix H.

9.22 Conversational unit length and its relationship to the linguistic development of the child

It was considered very possible that the more advanced children might use longer conversational unit lengths, and to investigate this the product-moment correlation coefficient was calculated between the average length of conversational unit and the MLUA of the child in the book and the general conversation sections separately. These correlations were:

	<u>General</u>	<u>Book</u>
Clinic group	.05 (d.f. 11)	.35 (d.f. 11)
Creche group	.15 (d.f. 11)	.56 (d.f. 10)

None of these correlations are significant at the 5% level, but there is a slight tendency for the more advanced children to use longer conversational units in the book situation.

9.23 Conversational unit length and its relationship to the child's age, sex and social class

An analysis of variance was carried out on the mean length of the conversational units to see if the main factors of age, sex and social class were related to the length of unit. The analysis of variance summary table is shown in Table 7 for the general conversation and Table 8 for the book conversation. The summary tables show that none of the main factors are related to the variance in the lengths of conversational units. However, the first order interaction of sex x class is significant at 5% in the general conversation and nearly significant in the book condition. The longest sequences are used by the middle class boys, with the working class boys using the shortest with both groups of girls in a mid position between these two extremes.

This was rather an interesting finding considering the similar but inverted relationship between sex and class found in the MLUA scores and reported in section 5.4. This will be discussed in detail in section 12 below.

9.24 Conversational unit length in the general conversation and the book condition

It appeared that the mothers and children used longer conversational units in the book condition than they did in the general conversation. The mean values for each group were:

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Sig.</u>
Between ages (A)	67.12	2	33.56		
sexes (S)	2.94	1	2.94		
social classes (C)	145.04	1	145.04	3.12	N.S.
A x S	10.29	2	5.18		
A x C	46.68	2	23.34		
S x C	220.83	1	220.83	4.76	5%
A x S x C	291.72	2	145.86	3.15	N.S.
Error	556.06	12	46.34		
Total	1340.68	23			

Mean values (Sex x Class)

	<u>Boys</u>	<u>Girls</u>
<u>WC</u>	13.8	19.1
<u>MC</u>	24.8	18.0

Table 7. Analysis of Variance of average length of
conversational units - general conversation.

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Sig.</u>
Between ages (A)	2770.56	2	1385.28	2.46	N.S.
sexes (S)	152.08	1	152.08		
social classes (C)	333.01	1	333.01		
A x S	1411.49	2	705.74	1.25	N.S.
A x C	288.12	2	144.06		
S x C	1998.30	1	1998.30	3.55	N.S.
A x S x C	1621.83	2	810.91	1.40	N.S.
Error	6751.03	12	562.58		
Total	15326.42	23			

Mean values (Sex x Class)

	<u>Boys</u>	<u>Girls</u>
<u>WC</u>	32.0	47.6
<u>MC</u>	57.7	34.4

Table 8. Analysis of Variance of average length of conversational unit - book condition.

for the clinic group (general)	16.5
(book)	38.6

for the creche group (general)	21.4
(book)	46.1

In each group the difference in the scores was tested using a paired 't' test, and these differences were found to be significant for both groups at the 1% level.

9.25 Consistent mother-child style in conversational unit length

The conversational unit length varied quite considerably in different mother-child pairs. It was considered possible that there might be a tendency for some families to use consistently longer conversational units regardless of the situation than others.

This was investigated by calculating the product-moment correlation between the mean length of the conversational unit in the two conditions.

These correlations were:

for the clinic group	0.60 (d.f. 11)
for the creche group	0.61 (d.f. 10)

Both these correlations were significant at the 5% level, and show that there was a tendency for mothers and children who use relatively long conversational units in one condition to do so in the other condition, and vice versa.

9.3. Summary of the analyses of the average conversational unit length

The average length of the conversational unit appeared to be partly determined by the context of the conversation and partly by the family's own interactive style. The conversation about the book was made up of longer conversational units than the general conversation, but families tended to use either shorter or longer units relative to the others in the study regardless of the situation.

The child's stage of language development was not significantly related to the length of the conversational unit, and the relationship with the child's age and social class appeared to be rather complex. This relationship will be discussed in section 12.

10. THE COMPUTER PROGRAMS

The computer programs were written to count the number of repetitive sequences in the conversations between the children, their mothers and the researcher.

As explained above, every utterance was coded with a number from 10 to 49. This number indicated the identity of the speaker, the person he was speaking to, and a description of the type of utterance. The ends of the sequences were marked with a 0. Thus the conversations could be represented by long strings of two figure numbers with the occasional zero marking the end of the sequence. For example:

Child No. 1 General Conversation

0, 12, 47, 26, 37, 14, 16, 37, 27, 24, 37, 27, 20, 36,

37, 24, 27 and so on to the end

37, 14, 47, 42, 17, 16, 49, 0.

(It must be noted that the general conversation was considered separately from the book condition throughout this analysis.)

The data as shown above was used as the input for the analysis of the repetitive patterns of conversation between individual children and their mothers.

All the items were read in an array, then the first two items (e.g. 0, 12) were selected. The computer searched the rest of the input for similar pairs, and then counted the number of times that this particular pair occurred. If it occurred more than once the frequency was printed out. If it only occurred once it was not printed out.

The next instruction was for the computer to read the next item, and to store it with the previous two. (In the example of Child 1 this is 47, so the items under consideration are 0, 12, 47.) A search was then made to count the number of times this group of three occurred in the data. As before, if it was more than once the frequency was printed out.

The next instruction was to read the next item (in the example 26), and the frequency of the group of four was considered (0, 12, 47, 26). The frequency of occurrence was printed out if it was greater than one.

This procedure was repeated with the subsequent group (0, 12, 47, 26, 37) of five items.

At all times the 0 was treated in exactly the same way as the other items in the list.

At the end of the search for the repetitions of the group of five items, the first item was discarded and the second and third item (12, 47) were treated as a group of two. The whole program was then repeated as above,

using (12, 47, 26) as the group of three, (12, 47, 26, 37) as the group of four, and (12, 47, 26, 37, 14) as the group of five. This is continued to the end of the data.

This analysis was done on the data for all the children separately, giving 48 print outs in all. Part of the print out from Child 1, Condition A is given below:

			<u>Frequency</u>
0	36		10
0	36	36	2
0	44		2
0	16	47	2
0	46	47	3
10	44		3
10	47		3
11	34		4
11	34	37	2
12	47		7

and so on.

This program is shown in detail in Appendix D (i), and in outline in Fig. 5.

The print outs for the individual children were then used as the input for the next stage.

The next step was to combine the data from the individual children in various ways. This was done using a similar program to that shown above.

The grouped data was produced so that any age, class or sex differences in the frequency of patterns would become apparent. The data was grouped in the following ways:

- a) The whole sample of 24 children's data was combined to give overall frequencies for the whole group. This gave two outputs, one for condition A and one for condition B.
- b) The boys and girls data was separated, giving four outputs.
- c) The three age groups were treated separately, giving six outputs.
- d) The social class groups were treated separately, giving four outputs.

The program also printed the number of items input on each run. This was printed at the top of each print-out and was used for comparing the frequencies of occurrence of any particular pattern. (The total possible number of repetitive patterns is directly proportional to the length of the input.)

The beginning and end of conversations were of special interest. The beginnings of sequences were obtained from the analysis described above as each beginning started with a 0 and could be easily identified.

The endings were slightly more difficult to collect together. Endings can be seen as a sequence ending with a 0, so it was decided to reverse the data and then count only the sequences which started with a 0. All other repetitive patterns were ignored. This program is shown in Appendix D (ii).

In the study of beginnings and endings the data was grouped as before, keeping the A and B conditions separate. This resulted in 32 sets of print-out.

Copies of the programs are given in Appendix D (i) and (ii).*

A diagram of the main program is shown in Fig. 5.

* Both programs used in this research were written by Dr. P. Pal, Bedford College, University of London.

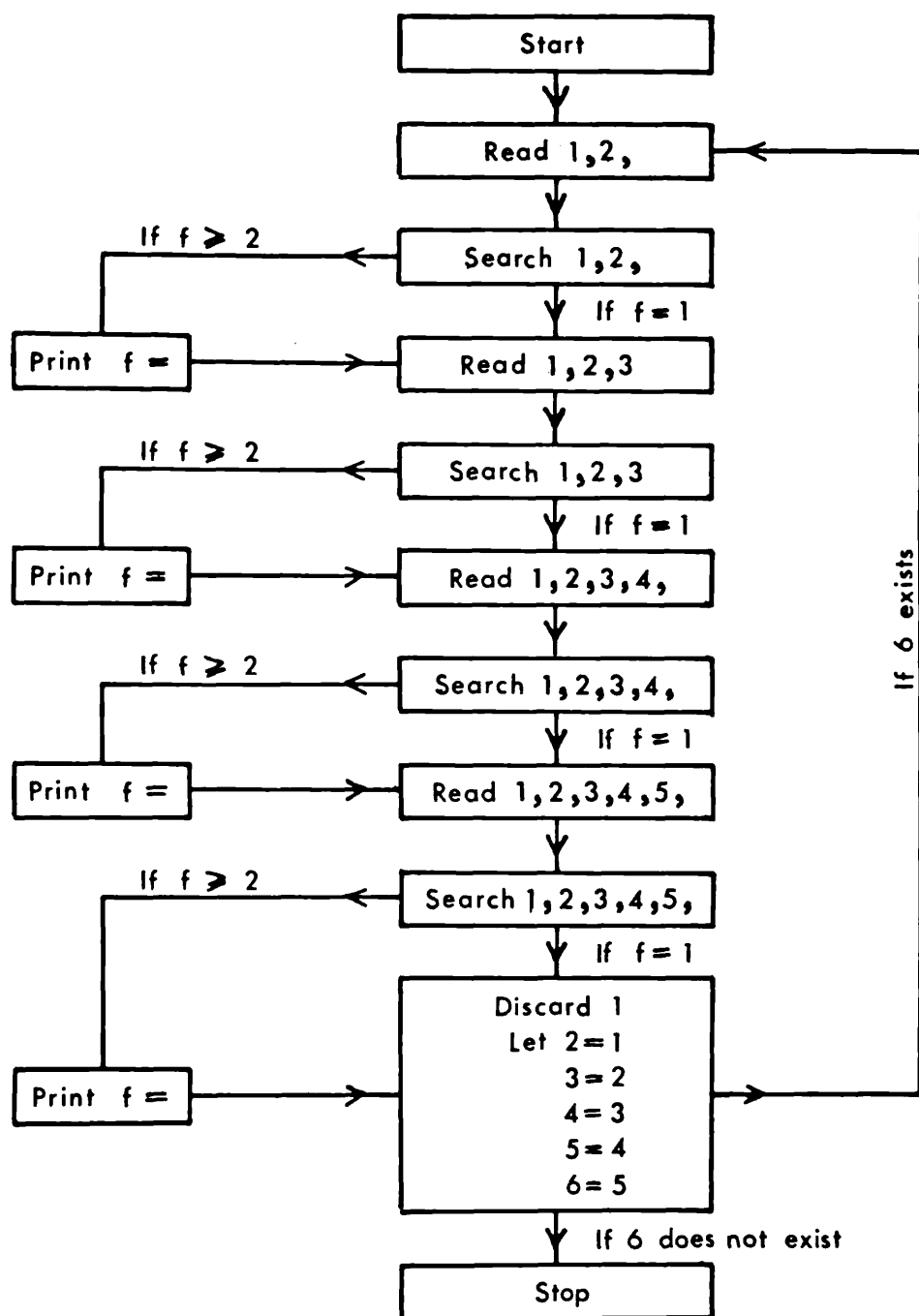


FIG.5. PRINCIPLES OF THE COMPUTER PROGRAMS

Note: 1,2,3,4,5,6,etc are the items of input in their original order

11. THE ANALYSIS OF PATTERNS OF UTTERANCES WITHIN
CONVERSATIONAL UNITS

The coding system and the computer analysis of the patterns of utterances have already been described in sections 8 and 10. The computer print out showed every group of two, three, four, and five consecutive items which occurred more than once. An example is given below of part of the print out obtained by combining all the subjects data in the general conversation.

	<u>f</u>	
..... 10 44	41	
10 47	18	
11 34	4	
11 34 37	2	
12 47	278	
12 37	4	
12 47 14	52	
12 14	11	
14 16	37	
14 37	2	
14 17	163	
14 10	2	
14 46	5	
14 46 47	3	
14 47	69 etc.

For this group of data the computer printed out 1663 repeated patterns of either two, three, four, or five consecutive items. The total input consisted of 3908 items, and the majority of the patterns counted had a frequency of less than 10. Most of the discussion in this section will

be concerned with pairs of utterances as there were relatively few repetitions of patterns with three or more utterances; for example, the most frequently used group of three items for the combined data for all subjects in the general conversation was 47 12 47 which occurred in just under 2% of the total possible number of groups of three. The groups of four and five which appeared more than once were nearly always combinations of frequently occurring groups of two and three. The most frequent group of four was 12 47 12 47 which occurred in just under 1% of the total possible number of groups of four.

There were no previous reports in the literature of a similar analysis to the one described above, so there was no information about the possible sequences which might be found. This meant that the programme used had to have a rather high order of generality, and the results to be merely descriptive. In the light of what was found in this study further programmes could be written which had a greater degree of precision and could be used to test specific hypotheses. The discussion which follows shows the potential of this type of program, but should be considered more as a speculative look at the possibilities of the area rather than as a definitive analysis of it.

11.1. Repetitive patterns of sequences of utterances
for the complete group of 24 mother-child pairs

The frequencies of repetitive patterns of pairs of utterances for all the mother-child pairs are shown in Fig. 6. The general conversation was kept separate from the book section and all the frequencies were expressed as a percentage of the total possible number pairs of consecutive utterances. In all cases the eight most frequently used pairs were considered, and these eight pairs accounted for almost half the total number of pairs.

The most frequently used pair in the general conversation was:

12 47 - a question from the mother followed by a statement from the child. This had a percentage frequency of 7.1.

The next most frequently used pair was:

37 24 - a statement from the child and a confirmation from the researcher. This had a percentage frequency of 5.9.

The researcher tried throughout the recording to avoid being too involved in the conversations, but the children were very keen to talk to her. This probably explains the repetition of 37 37 - a statement from the child to the researcher which was found to have a percentage frequency of 5.5.

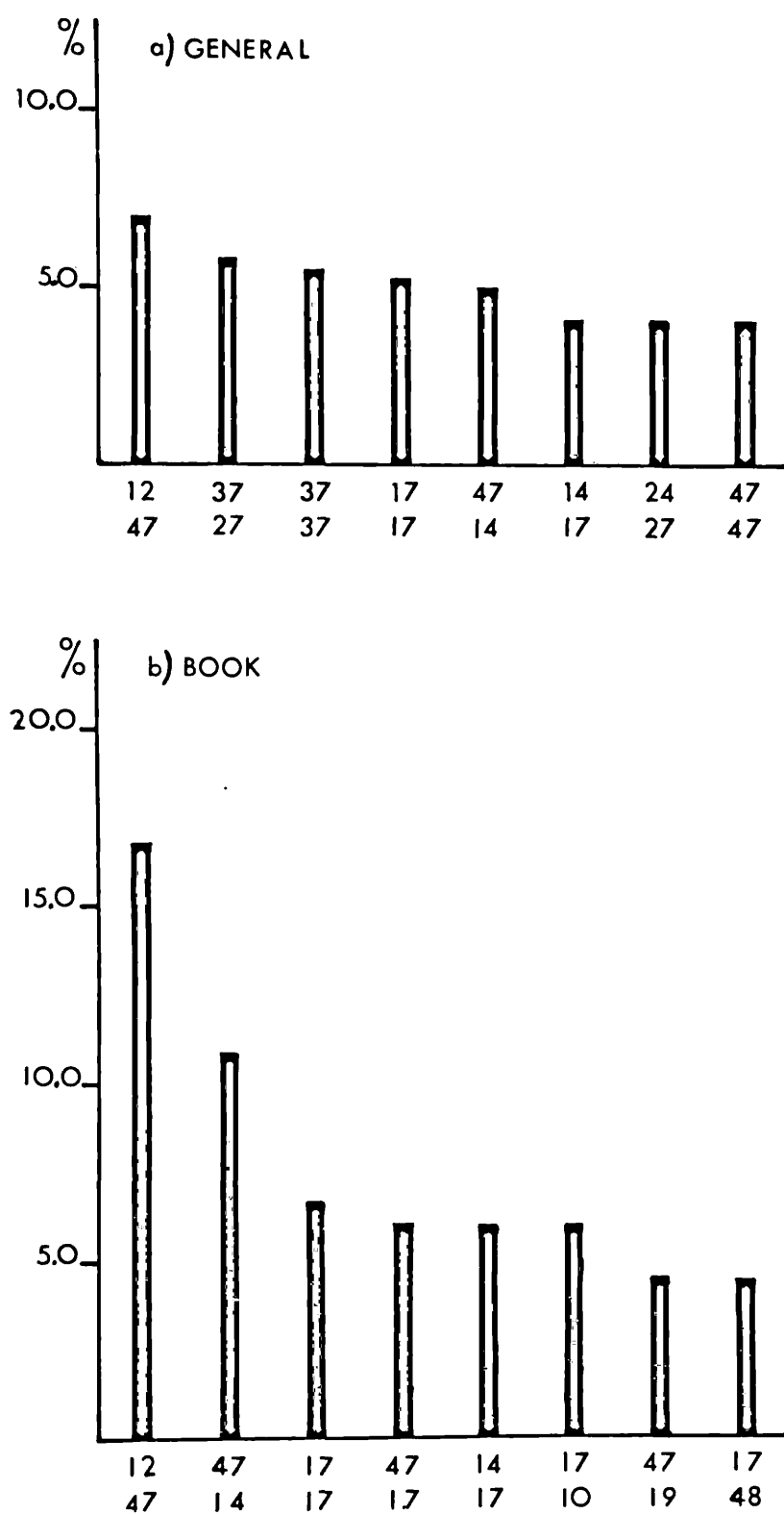


FIG. 6.

PERCENTAGE FREQUENCY OF PAIRS OF
UTTERANCES FOR ALL THE SUBJECTS

The frequency of pairs in the book condition was quite different from that found in the general conversation. The most frequently used pair was:

12 47 - a question from the mother followed by a statement from the child. This had a percentage frequency of 16.8.

The next most frequently used pair was:

47 14 - a statement by the child followed by a confirmation by the mother. This had a percentage frequency of 10.8.

As expected, there were no frequent patterns which included the researcher, there was evidence of the use of 'tag' questions by the mother - 10 , and of imitation in both forms. There were frequent patterns of 47 19 - a complete imitation by the mother of the child's statement, and 17 48 - a reduced imitation by the child of the mother's statement.

There were no frequently repeated higher order patterns.

11.11 Repetitive patterns of sequences of utterances for the clinic and creche groups separately

The data for the complete group of 24 mothers and children was split into two social class groups with 12 mother-child pairs in each group. The most frequently used pairs are shown in Fig. 7. The scores are given as a percentage of the total number of possible pairs.

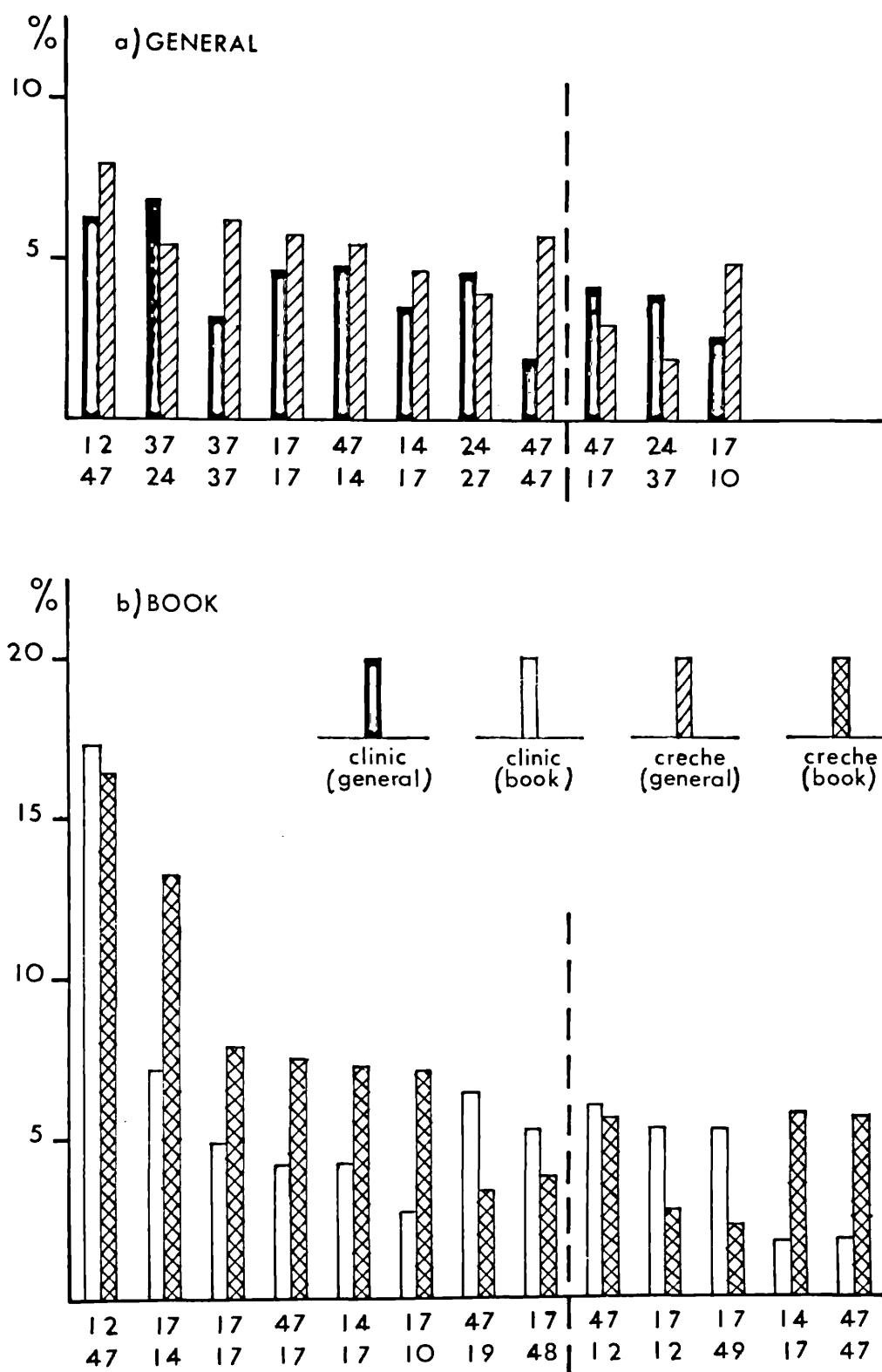


FIG.7.

PERCENTAGE FREQUENCY OF PAIRS OF UTTERANCES
FOR THE CRECHE AND CLINIC GROUPS

More than eight pairs were considered in this section as the eight previous pairs were considered along with the eight most frequent pairs in the clinic and the creche groups. The first eight pairs, reading from left to right, are in the same order as they are in the combined data shown in Fig. 6 .

In the general conversation there were differences between the groups in the frequency of usage of pairs of items, but none of these differences were greater than 2%. Throughout this discussion differences of less than 2% are ignored. This value of 2% was chosen as a cut-off point in order to compare the most important differences between the groups. Using this criteria the patterns of utterances used in the two social class groups in the general conversation appeared to be very similar.

In the book condition there were three pairs which were more frequent in the clinic group than the creche group. These were:

- 47 19 - A statement by the child followed by a complete imitation by the mother
- 17 12 - statement by the mother followed by a complete imitation from the child.

There were seven pairs which were more frequent in the creche group than the clinic group. These were:

- 47 14 - statement by the child followed by a
confirmation by the mother
- 17 17 - two statements by the mother
- 17 10 - statement by the mother followed by a
tag question from her
- 14 47 - confirmation by the mother followed by
a statement from the child, and
- 47 47 - two statements by the child to the mother.

These differences in the book condition showed that the creche group mothers and children used a greater variety of pairs, whereas the clinic group used fewer pairs more intensively.

There were no frequently repeated higher order patterns.

11.12 Repetitive patterns of sequences of utterances considered by sex

Fig. 8 shows the most frequently used pairs of utterances for the boys and girls separately. In the general conversation there were no sex differences greater than 2%. In the book condition the boys showed more variety in their interactions with their mothers than the girls with five pairs of utterances used more frequently. These pairs were:

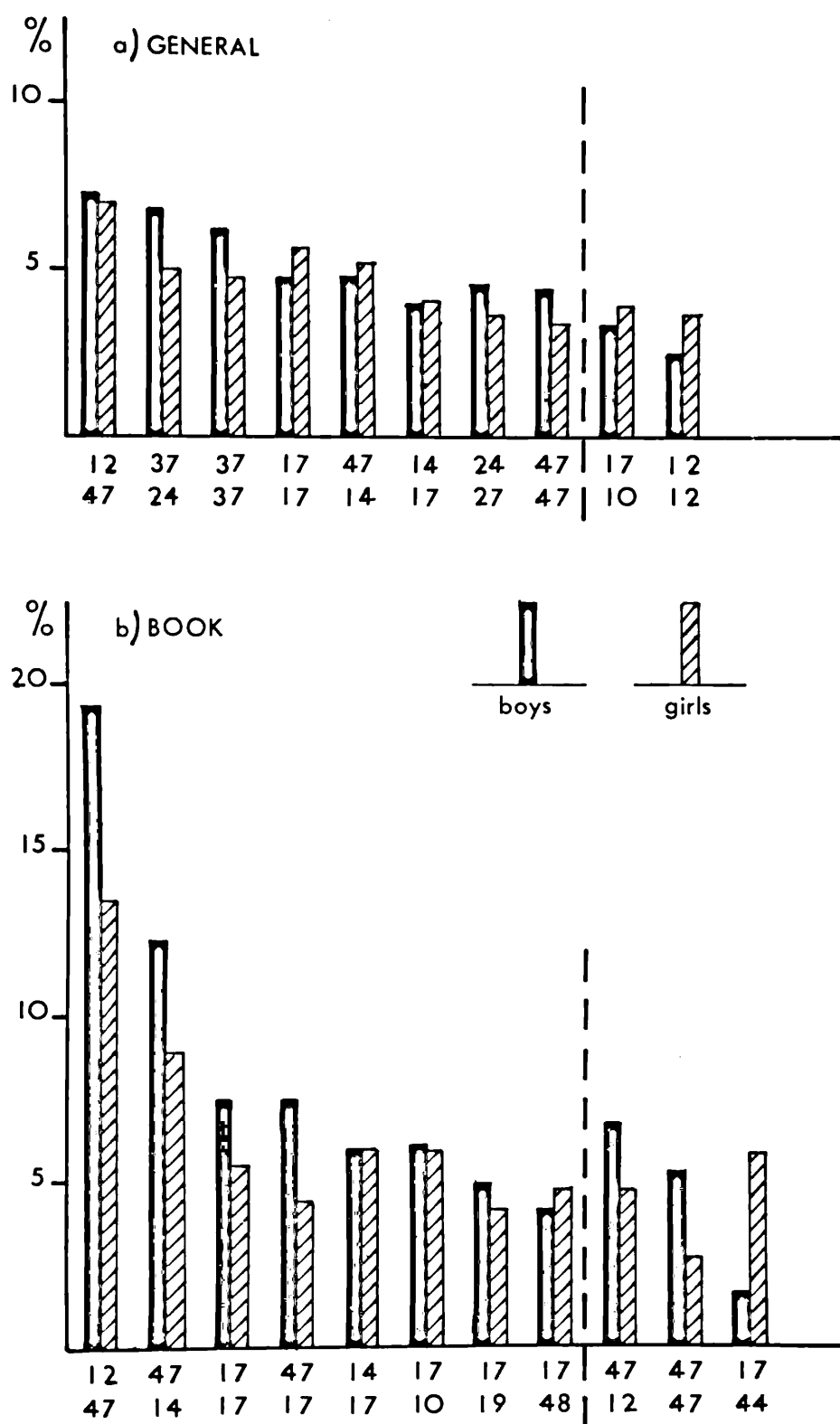


FIG.8.

PERCENTAGE FREQUENCY OF PAIRS OF
UTTERANCES FOR BOYS AND GIRLS

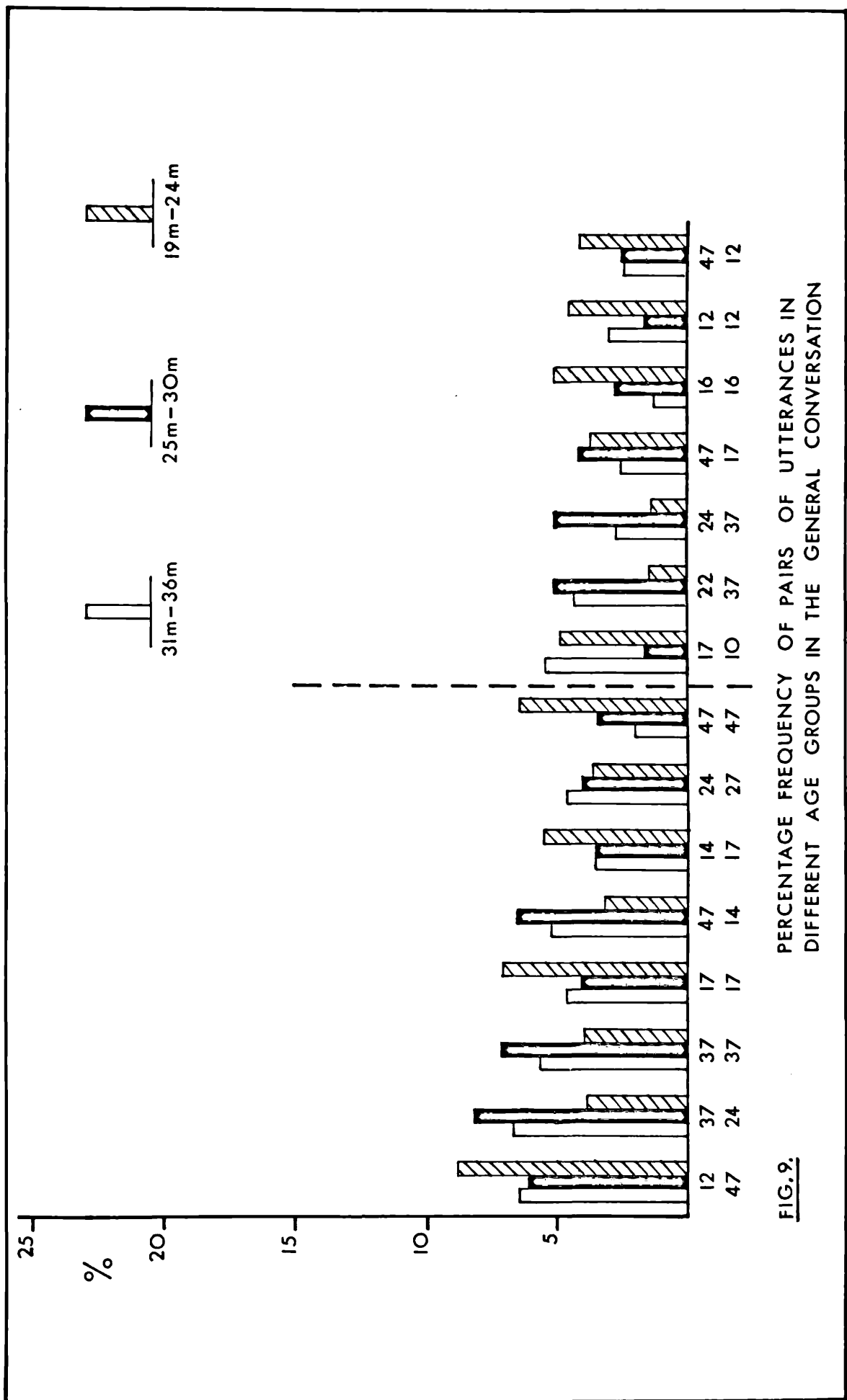
- 12 47 - a question by the mother followed by a statement by the child
- 47 14 - a statement by the child followed by a confirmation by the mother
- 17 17 - two statements by the mother
- 47 12 - a statement by the child followed by a question from the mother
- 47 47 - two statements by the child

In the book condition the boys were behaving in a similar manner to the creche group children using more categories less intensively than the girls.

There were no frequently repeated higher order patterns.

11.13 Repetitive patterns of sequences of utterances considered by age

Figs. 9 and 10 show the most frequently used pairs of utterances as used by the three different age groups. In the general conversation there are few differences greater than 2% between the oldest and the middle age group, but there are many differences between these two groups and the youngest group. These are shown below.



PERCENTAGE FREQUENCY OF PAIRS OF UTTERANCES IN
DIFFERENT AGE GROUPS IN THE GENERAL CONVERSATION

FIG. 9.

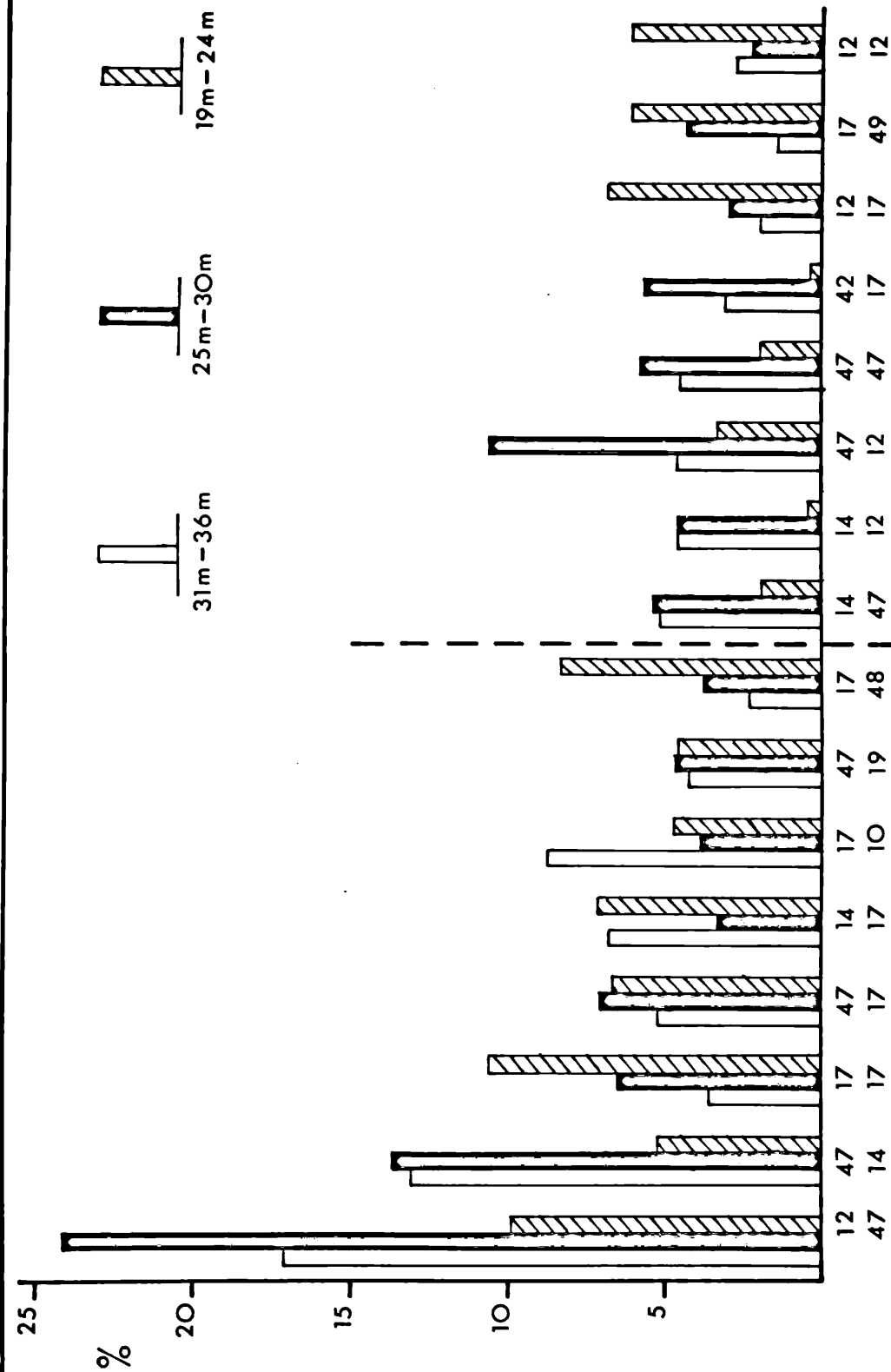


FIG. 10.
PERCENTAGE FREQUENCY OF PAIRS OF UTTERANCES IN
DIFFERENT AGE GROUPS IN THE BOOK CONDITION

- 'Old' > 'Middle' 17 10 - a statement by the mother
followed by a tag question
from her
- 'Middle' > 'Old' 24 37 - a confirmation from the
researcher followed by a
statement from the child
- 'Old' > 'Young' 37 24 - a statement by the child
followed by a confirmation
by the researcher
- 'Middle' > 'Young' 37 24 - a statement by the child
followed by a confirmation
by the researcher
- 37 37 - two statements by the child
to the researcher
- 47 14 - a statement by the child
followed by a confirmation
by the mother
- 22 37 - a question by the researcher
followed by a statement by
the child
- 24 37 - a confirmation by the researcher
followed by a statement by the
child

- 'Young' > 'Old' 12 47 - a question by the mother
 followed by a statement
 by the child
- 17 17 - two statements by the mother
- 47 47 - two statements by the child
- 16 16 - two instructions by the
 mother
-
- 'Young' > 'Middle' 12 47 - a question by the mother
 followed by a statement
 by the child
- 17 17 - two statements from the mother
- 47 47 - two statements by the child
- 17 10 - a statement by the mother
 followed by a tag question
- 16 16 - two instructions by the
 mother
- 12 12 - two questions by the mother

The most interesting differences in the age comparisons are, first the way that mothers repeat more to the younger children compared with the other two groups. In this analysis no distinction was made between identical repeats such as "Bring me the ball", "Bring me the ball" and non-identical ones such as "Sit down", "Stop banging your spoon". It would be worthwhile including this distinction in any subsequent analysis of this type. The second point

of interest is that the middle and old age groups are the ones who include the researcher in their conversation most.

In the book condition the similarities between the oldest and the middle age groups were again apparent. The differences between the three groups are shown below.

- | | | |
|------------------|-------|---|
| 'Old' > 'Middle' | 14 17 | - a confirmation by the mother followed by a statement from her |
| | 17 10 | - a statement by the mother followed by a tag question from her |
| 'Middle' > 'Old' | 12 47 | - a question by the mother followed by a statement by the child |
| | 47 12 | - a statement by the child followed by a question by the mother |
| 'Old' > 'Young' | 12 47 | - a question by the mother followed by a statement by the child |
| | 47 14 | - a statement by the child followed by a confirmation by the mother |
| | 17 10 | - a statement by the mother followed by a tag question from her |

- 'Middle' > 'Young' 12 47 - a question by the mother
 followed by a statement
 by the child
- 47 14 - a statement by the child
 followed by a confirmation
 by the mother
- 14 47 - a confirmation by the mother
 followed by a statement by
 the child
- 47 12 - a statement by the child
 followed by a question by
 the mother
- 47 47 - two statements by the child
- 42 17 - a question by the child
 followed by a statement by
 the mother
- 'Young' > 'Old' 17 17 - two statements by the mother
- 17 48 - a statement by the mother
 followed by a partial
 imitation by the child
- 12 17 - a question by the mother
 followed by a statement by her
- 17 49 - a statement by the mother
 followed by a complete
 imitation by the child
- 12 12 - two questions by the mother

'Young' > 'Middle'

- 17 17 - two statements by the mother
- 14 17 - a confirmation by the mother followed by a statement by her
- 17 48 - a statement by the mother followed by a partial imitation by the child
- 12 17 - a question by the mother followed by a statement by her
- 12 12 - two questions by the mother

The book condition showed similar age group differences to that found in the general conversation, except for the involvement of the researcher. In both cases the greatest difference is between the youngest age group and the other two age groups. There is more repetition of utterances and imitation in the book condition in the youngest group than in the other two groups, also the mothers of the youngest children in the book condition ask questions and answer them themselves i.e. 12 17 .

There are no frequently repeated higher order patterns.

11.2. Examination of the beginnings of conversational units

The beginnings of conversational units, including the first, were preceded by a zero in the input to the computer so that the beginnings of conversational units could be easily identified. As before the general conversation and that with the book were considered separately. The data was analysed in groups as before, so that comparisons could be made between social class groups, boys and girls, and age groups. There were virtually no frequently occurring sequences of more than three utterances, counting the 0 as the first item of the sequence.

11.3. Beginnings in the complete sample of 24 mothers and children

The five most frequent utterances used to start conversational units in the general conversation are shown below with their frequency of occurrence.

<u>Utterance</u>	<u>% of total starts</u>	
47	18.5	statement by the child to the mother
37	13.2	statement by the child to the researcher
12	9.5	question by the mother
16	8.0	instruction by the mother
17	7.0	statement by the mother

The five most frequent utterances used to start conversational units in the book condition are shown below with their frequency of occurrence.

<u>Utterance</u>	<u>% of total starts</u>	
12	20.5	question by the mother
47	13.1	statement by the child to the mother
17	4.9	statement by the mother
16	4.1	instruction by the mother
37	3.3	statement by the child to the researcher

In contrast to the general conversation the mother's use of a question to start a conversational unit is much more frequent. It is interesting to note that in both conditions the children do not start the conversational units by asking questions.

11.31 Beginnings of conversational units in the creche and clinic groups

The beginnings in the general conversation were very similar in both social class groups, with very similar frequencies to those found in the combined data for all 24 mother-child pairs. However, social class group differences became apparent in the book condition. The relative frequencies of the two most frequent utterances used to start the conversational units are shown below for each group separately.

Clinic group (book)

<u>Utterance</u>	<u>% of total starts</u>	
12	18.5	question by the mother
16	7.7	instruction by the mother

Creche group (book)

<u>Utterance</u>	<u>% of total starts</u>	
47	24.6	statement by the child to the mother
12	22.8	question by the mother

As before, in the analysis of the patterning of utterances, there are no social class differences in the general conversation; but in the book condition the creche group children more frequently start the conversation with a statement, although in both groups the mothers tend to start off with a question. The clinic group mothers and children use more categories less intensively than the creche group, in contrast to their use of utterance patterns within conversations.

11.32 Beginnings of conversational units considered by sex

There are interesting sex differences in the way that mother-child pairs started their conversational units. The five most frequent starts used by the boys and girls in the general conversation are shown below.

Boys (general)

<u>Utterance</u>	<u>% of total starts</u>	
46	17.5	instruction by the child to the mother
37	16.6	statement by the child to the researcher
16	8.2	instruction by the mother
12	7.2	question by the mother
17	5.3	statement by the mother

Girls (general)

<u>Utterance</u>	<u>% of total starts</u>	
47	19.6	statement by the child to the mother
12	12.1	question by the mother
37	9.3	statement by the child to the researcher
17	8.9	statement by the mother
16	7.9	instruction by the mother

The boy's frequent use of instructions as a method of starting conversational units is rather surprising as there was no difference of this kind in their utterance patterns within conversations.

In the book condition the two most frequently used starts were very similar in both boys and girls. Details of these similarities are shown below.

· Boys (book)

<u>Utterance</u>	<u>% of total starts</u>	
12	17.7	question by the mother
47	16.1	statement by the child to the mother

Girls (book)

<u>Utterance</u>	<u>% of total starts</u>	
12	23.3	question by the mother
47	10.0	statement by the child to the mother

The boy's use of instructions at the beginning of conversational units does not continue when he and his mother are talking about the picture book.

11.33 Beginnings of conversational units considered by age

There were interesting differences in the way that mothers and children start their conversational units according to the age group of the child. The three most frequent starts in the general conversation for each age group are shown below.

Old (general)

<u>Utterance</u>	<u>% of total starts</u>	
37	12.3	statement from the child to the researcher
12	10.8	question by the mother
47	8.8	statement by the child to the mother

Middle (general)

<u>Utterance</u>	<u>% of total starts</u>	
47	27.3	statement by the child to the mother
37	19.8	statement by the child to the researcher
27	5.8	researcher making statement to the child

Young (general)

<u>Utterance</u>	<u>% of total starts</u>	
17	12.0	statement by the mother
47	10.6	statement by the child to the mother
16	9.6	instruction by the mother

The old and middle age groups of children both include the researcher at the beginning of their conversational units. There is a greater variety of ways of starting among the oldest group compared with the middle group, and the mother's of the youngest children have more patterned starts than the other two groups.

In the book condition the two most frequent starts in each age group are shown below.

Old (book)

<u>Utterance</u>	<u>% of total starts</u>	
47	23.1	statement by the child to the mother
12	15.4	question by the mother

Middle (book)

12	15.8	question by the mother
37	10.5	statement by the child to the researcher

Young (book)

12	28.9	question by the mother
17	13.3	statement by the mother

In the book condition the oldest children tend to start the conversation, whereas the mothers of the youngest make the first utterance. In each age group a question by the mother appeared to be a popular way of starting the conversational units.

11.4. Ends of conversational units

As explained in section 9 the end of one conversational unit and the beginning of the next was marked by a 0 in the computer input. By reversing the input to the computer and treating the data as before it was easy to identify the patterns of utterances which led up to the ends of conversational units. This 'end pattern' data was split up into the same groups as before, namely, social class, sex, and age group. As before there were virtually no frequently repeated patterns of utterances which led up to an end of a conversational unit.

11.5. Ends of conversational units for the complete sample of 24 mother-child pairs

The most frequently used last utterances in the general conversation and the book condition are shown below.

General

<u>Utterance</u>	<u>% of total ends</u>	
17	11.5	statement by the mother
16	9.0	question by the mother
27	8.4	statement by the researcher

Book

<u>Utterance</u>	<u>% of total ends</u>	
17	13.9	statement by the mother
12	12.3	question by the mother

In the complete group of mothers and children it appears that mothers tend to have the 'last word', but this can be interpreted as the child having ultimate control over the ending of a conversational sequence as he did not choose to reply to the mother.

11.51 Ends of conversational units considered by social class

The clinic group mothers and children used the same pattern of endings as the combined data in the general conversation. The frequencies for each group are given below.

Clinic (general)

<u>Utterance</u>	<u>% of total ends</u>	
17	10.6	statement by the mother
16	9.4	instruction by the mother
27	8.2	statement by the researcher

Creche (general)

<u>Utterance</u>	<u>% of total ends</u>	
17	12.6	statement by the mother
47	9.3	statement by the child to the mother
37	8.9	statement by the child to the researcher

In the creche group the children tend to end the conversations with a statement either to the mother or to the researcher.

The frequencies for the book condition are shown below.

Clinic (book)

<u>Utterance</u>	<u>% of total ends</u>	
17	18.5	statement by the mother
27	10.8	statement by the researcher

Creche (book)

<u>Utterance</u>	<u>% of total ends</u>	
47	17.5	statement by child to mother
12	15.8	question by the mother

As in the general condition, the creche group children themselves frequently produce the last utterance, whereas the clinic group mothers usually end their conversations with their children.

11.52 Ends of conversational units considered by sex

The frequencies for the boys and the girls three most frequent endings in the general conversation are given below.

Boys (general)

<u>Utterance</u>	<u>% of total ends</u>	
17	10.7	statement by the mother
37	10.7	statement by the child to the researcher
27	8.8	statement by the researcher to the child

Girls (general)

<u>Utterance</u>	<u>% of total ends</u>	
17	12.5	statement by the mother
16	9.6	instruction by the mother
14	7.9	confirmation by the mother

The girls seem to receive quite a different pattern of final utterances from their mothers when compared with the boys. All the boys frequent endings are statements whereas the girls receive instructions and confirmations as well.

The most frequent ends of conversational units in the book condition for the boys and girls are given below.

Boys (book)

<u>Utterance</u>	<u>% of total ends</u>	
17	14.5	statement by the mother
14	9.7	confirmation by the mother

Girls (book)

<u>Utterance</u>	<u>% of total ends</u>	
12	20.0	question by the mother
47	15.0	statement by the child to the mother

As in the general condition, the girls and boys differed in the pattern of final utterances, with the boys receiving statements and confirmations from their mothers and the girls receiving questions and making statements.

11.53 The ends of conversational units considered by age

The frequencies for the three different age groups of the most frequently used final utterances in the general condition are given below.

Old (general)

<u>Utterance</u>	<u>% of total ends</u>	
37	12.3	statement by the child to the researcher
17	7.8	statement by the mother

Middle (general)

<u>Utterance</u>	<u>% of total ends</u>	
17	14.4	statement by the mother
16	12.3	instruction by the mother

Young (general)

<u>Utterance</u>	<u>% of total ends</u>	
17	12.0	statement by the mother
47	10.6	statement by the child to the mother

The one factor in common between these three age groups is the prevalence of a statement by the mother being the last utterance in a conversational unit.

In the book condition the frequencies in each age group are shown below.

Old (book)

<u>Utterance</u>	<u>% of total ends</u>	
47	15.4	statement by the child to the mother
12	10.3	question by the mother

Middle (book)

<u>Utterance</u>	<u>% of total ends</u>	
17	18.4	statement by the mother
12	18.4	question by the mother

Young (book)

<u>Utterance</u>	<u>% of total ends</u>	
17	15.6	statement by the mother
27	13.3	statement by the researcher

The youngest age group show that a contribution from the researcher seems to stop the conversation. As was shown earlier, the youngest children did not include the researcher in their conversation and perhaps this is a corollary to the finding.

11.6. Discussion of the analysis of conversational units

This part of the study has reported two aspects of the analysis of conversational units. The first topic to be considered was the mean length of the unit. It was reported that the creche boys had on average the greatest mean length, the clinic boys had the shortest, with the two groups of girls having scores between these two extremes. This was a significant interaction in the general conversation but did not reach significance in the book condition. The conversations with the book have already been found (section 5) to consist of utterances which had a shorter mean length than in the free conversation between the same mother-child pair. However, the conversational units were found to be significantly longer in the book condition. In fact, they were on average over twice as long and a difference of this magnitude is rather surprising. The length of the conversational units in the general and the book conversation was significantly correlated so that those mothers and children with long units, relative to the group, in the general conversation also tended to have relatively long units in the book condition. The length of conversational unit was unrelated to either sex, age, social class, or the linguistic ability of the child.

The second topic of interest was the repetitive patterning of utterances within the conversational units, and the way that these units started and ended.

The first point was that patterns of more than two consecutive items were infrequent, and that when they existed these longer patterns were almost always combinations of shorter patterns of utterances.

The patterns in the book conversation were quite different from those in the general conversation with more confirmations by the mother and imitation by the child, particularly in the youngest group. The comparison of the patterns according to the sex and social class of the child showed no differences in the general conversation. However, in the book condition the creche group and the boys used more categories less intensively than the clinic group and the girls. (It was not possible to look at this interaction in the present analysis but it would certainly be interesting to study it in more detail.) The comparison of utterance patterns by age groups showed that the oldest group ($2\frac{1}{2}$ to 3 year olds) and the middle group (2 to $2\frac{1}{2}$ year olds) had similar patterns in both the general and the book conversation but the younger children ($1\frac{1}{2}$ to 2 years old) showed quite different patterns from the older groups in each condition. The conversations of the older children with the book were rather like the patterns of the free conversation of the youngest children. It has previously been shown (section 5) that the MLUA for both mothers and children was reduced in the book situation and these two findings suggest a very sensitive relationship between the mother, child and the situation. During the recording

sessions it seemed that the mothers saw the book session as an opportunity to introduce both new concepts and new vocabulary to the child. This teaching appeared to require a simplified linguistic context with the mother and child behaving as if the child was less competent than he had shown himself to be in the free conversation.

The conversational units in the general conversation were most frequently started by the child making a statement either to his mother or the researcher. There were no social class differences in starting patterns in the general conversation but in the book condition the creche group children were more likely to start the conversation themselves. The boys showed an interesting tendency to ask questions at the beginning of their conversational units when compared with the girls, but this difference was found in the general conversation only. The age groups showed the expected differences between the two oldest groups and the youngest, with the researcher being spoken to at the start of conversations more frequently by the older children.

The study of the ends of conversational units did not reveal any interesting relationships. Considering the complete group of 24 mothers and children the mothers most frequently made the final utterance of the conversational unit. This utterance was either a statement or a question and not a confirmation as might have been expected.

The overall impression of the children's interactive conversational patterns with their mothers is of a lack of variety in the actual patterns used. This lack of variety probably assists the child in the language learning process. The picture book seems to make the mother-child pair converse at a level more typical of a younger child and this no doubt assists the child to learn the new vocabulary and concepts that the mother presents to him in this kind of situation.

This exploratory look at the types of utterance patterns which children and their mothers use has been shown to be an interesting area for further study. As patterns of more than two items appeared to be used infrequently any future work in this field could safely ignore the higher order patterns and reduce the amount of computer sorting required. It would then be possible to automate the testing of various specific hypotheses and to consider the relationship between the child and the groups into which he comes. It would also be very interesting to examine individual types of utterance to see if they are invariably preceded or followed by specific utterances.

This part of the study has shown that patterns of utterances exist; that these patterns vary according to the situation and the age of the child. There does not appear to be any published literature on this topic and it would certainly be worthwhile to pursue it in more detail.

Chapter 12: Summary and Conclusions

The present study has looked at some of the ways that mothers and their children talk to each other. Conversations between mothers and children were recorded, both during ordinary domestic conversation and with a picture book. Many differences were found in the conversations in these two types of conversations, but the most important were that the conversations with the book were made up of shorter utterances, and the pattern of the utterances were more like those found in younger children. Thus young children were found to show less advanced patterns of conversations in the more formal picture book setting. There are two possible implications from this finding. It seemed possible that the mothers and children were using the picture book sessions as an opportunity to learn new vocabulary. It was very striking how almost all the children's free conversation was concerned with the 'here and now'. Occasionally the mothers and children discussed a past event (perhaps a holiday) or an outing they were planning for the immediate future, but this was generally only found with the oldest children. It was the researchers impression that the topics of conversation were very similar in both groups. The picture book forced the families to discuss subjects that were not concerned with the on-going happenings of the family, and the added difficulty of doing this may have contributed to the reduction in the complexity of the language. The second

possible implication for this finding is concerned with testing small children. The picture book situation is similar in many ways to the test situation. One might predict from this work that children would perform at a less advanced level in a test situation than they would be capable of in their free speech. This suggestion is also supported by the fact that, in the free speech, the children tended to initiate conversations, whereas in the book situation the mother was more likely to start the conversation. It appears that children may well perform at their most advanced level in the free conversation when they are able to initiate conversation and presumably choose topics which they find interesting. In the book situation the conversation tends to be initiated by the mother, to be about a topic which is not of the child's choosing, and to result in less well advanced language from the child.

It is impossible in this study to estimate accurately how much conversation occurs between the mother and child in their day-to-day life, and to what extent looking at a picture book together was familiar procedure to both mothers and children. All the children had picture books of their own, and none of the families were too poor to buy their children toys. All the mothers were at home with their children for at least half of each day so it is probable that all the mothers and children talked to each other quite a lot during the daytime. The recordings were all made in a very relaxed manner, and every attempt was made to make the sessions as naturalistic as possible.

It seems very possible that the kind of mother-child interaction found by Hess and Shipman (1965) might have occurred as a direct result of moving the families into a strange university setting. It seems very likely that mothers who were unfamiliar with a college environment would find it rather stressful and this might cause them to talk to their children in a very atypical manner.

It was decided at the beginning of this study that the researcher would not be a passive, silent observer but would behave as a rather subdued visitor to the home, not initiating conversation but responding where necessary. Even with this level of withdrawal from the conversation it was found that the researcher's utterances as well as those of the mother were related in complexity to those of the child.

The close relationship between the speech of mothers and their children shows a very efficient interactive process at work, a process which could be looked at in greater detail. It would be very interesting to watch its development as it seems possible that mother's talk in a very advanced way to babies before they start to talk, then when the child starts talking the mother simplifies her speech to an appropriate level. This might well result in a U shaped curve of speech complexity over the first two and a half to three years.

Macnamara (1972) has proposed that children interpret language as a gloss on the on-going situation where the meanings are already known. The present study supports this proposal as the meanings in the free speech would be better understood by the child. This suggests that a more complex gloss would be more appropriate. In the book conversation mother and child are forced to concentrate on a situation where the meanings are less readily available and hence a simplified gloss is required. This type of interpretation stresses the sensitivity of mothers' interactions with their children.

It has been found that the complexity of the utterances themselves, and the sequential relationship between different types of utterances is partly determined by the child's age, level of linguistic development, sex, and social class; partly by an individual interactive pattern between mother and child; and partly by the situation in which the mother and her child find themselves.

In this study utterances were divided into ten categories covering two different types of area. One group covered the sort of utterance, and the second the way in which that utterance was formed, this latter group consisted of categories 9 and 10 covering imitation and expansion. For this age of child this was quite acceptable, as these imitations and expansions were all statements. Combining these two types of descriptions of utterances was useful as it made it possible to look at both areas using the same coding and programming

procedure. The present method of computer sorting gives no immediate measures of the frequency with which one item was followed by a variety of others. As there were no frequently repeated long chains of items, it would be interesting to rewrite the program to produce probability trees so that each type of utterance could become the target utterance in turn, and then the probability tree for the subsequent items would be calculated. This would make the differences between the age groups more apparent than they are in the present study. This could be done separately for both the type of utterance, and whether it was an imitation or an expansion. It would also be preferable to split some of the categories up to give more detailed information. The 'confirmation' category should be separated into positive and negative instances, and the statements category broken up into much smaller sections to give information about the context of the conversation, for example, are the statements referring to on-going events or not.

The absence of relationships between either the complexity of utterances or their patterns within conversational units and sex and social class is not totally surprising. In many ways there were very few differences between the two social class groups, certainly none as large as those reported by Hess and Shipman (1965). Both groups consisted of stable families living in the same city, and although there were differences in housing and education the clinic group were by no means deprived.

There has been a tendency in some recent work to assume that children whose parents have not been to college are, by definition, deprived, and also to apply the hypotheses developed by Bernstein to a much wider age group than is justified. Recent work by Labov and others has shown that children from varied social class backgrounds perform in similar ways when the approach to the child is made on the child's terms. As discussed above, the present study would support this. The children in this study were all developing normally as far as could be seen, certainly none of them had given rise to any anxieties that they were not, and none of them were deprived.

The children were recorded at home by a researcher who was already known to both mother and child, and it was felt that the slight loss of rigour that this implied was adequately compensated for by the fact that both mothers and children were in an ordinary, non-threatening situation.

There were, however, three interesting sex x class interactions. These were found in the oldest age group, and it was regrettable that the children slightly older (from three to three and a half years old) had not been included in the study so that these interactions could have been followed through. When the length of utterances was considered it was found that the middle class girls were the most advanced, the working class girls the least advanced with the boys between these two extremes.

A similar finding has been reported by Kagan (1971) in a study of the cognitive development of infants. This would also explain the frequently reported finding that girls are ahead of boys in language development, given that much of this kind of language work has been done with children from middle class families. Most of the explanations offered have been sociological, suggesting that the working class mother sees her son as having more possibilities for future advancement than her daughter. Social class is a very broad concept which cannot be adequately used as an explanatory construct; it is necessary to examine in detail factors of family life and to identify which of these factors are responsible for the differences which have been found. One of the most outstanding differences in family style in this study was the ways in which the fathers were reported to interact with their children. This has already been discussed in section 2.25. However, it would be very possible to collect groups of children where social class was controlled, but where father's interaction with the children varied due to both his job or his temperament. In this way one could see if boys whose fathers were more involved with them were more advanced than boys whose fathers were either unwilling or unable to spend time with them. In this study the relatively lower performance of the middle class boys and the working class girls might be partly explained by this type of difference in family functioning.

The interactions between sex and class in the analysis of conversational length were similar to those discussed above, but reversed in order. The middle class boys used the longest units, the working class boys the shortest, and the girls scoring between these two extremes. It seems possible that there might be a common factor in these two interactions. If there was a typical length, in time, of a conversational unit, then those children who used short utterances would use more utterances in each conversational unit than those children who used long utterances. The time-based data needed to examine this further is not readily available in the present research but it would be a very interesting area for further study.

The problem of how a child learns to talk his native language has still not been adequately resolved. The present study has shown that the verbal interaction between mothers and their children are almost ideally designed for language learning to take place. The mother's free speech is simplified to a level just in advance of the child's own level, and in situations such as the conversation with the book when the mother may teach the child new concepts and vocabulary the language is reduced in complexity even more. The mothers and children appear to regress to an utterance pattern more typical of a younger child and this could be considered an ideal way to teach the child. Brown (1973) says "What impels the

child to 'improve' his speech at all remains something of a mystery". He suggests that there are pressures of various kinds, for example: incomplete, ill-formed utterances would be less effective than complete ones. Whatever the motivating pressures on the child we can certainly say that the linguistic environment created by the mother and her child is very appropriate for both teaching and learning a first language.

13.

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APPENDIX A. Details of the children and their families

Education of parents. Yes - education after the age of 18. No - No education after the age of 18.

Age of child - in months.

Child No.	Age	Sex	Housing	Father's Work	Mother's Work	Father's Education	Mother's Education	Mother Working	Subs. Care.
1.	35	M	Old flat	Petrol pumps	Flowershop assistant	No	No	No	No
2.	30	M	Old flat	Football Club assistant	Typist	No	No	No	No
3.	34	F	Old flat	Lorry driver	Shop assist.	No	No	No	No
4.	30	F	Old flat	Clerk	Telephonist	No	No	Yes 3 hrs. day	Grand-mother
5.	28	M	Old flat	Postman	Clerk	No	No	No	No
6.	25	M	New flat	Carpenter	Office worker	Apprenticed	No	No	No
7.	29	F	Old flat	Ambulance driver	Shop assist.	No	No	No	No
8.	29	F	Old flat	House painter	Office worker	No	No	No	No
9.	21	M	New flat	Stonemason	Factory work	Apprenticed	No	No	No
10.	19	M	Old flat	Clerk	Clerk	No	No	No	No
11.	22	F	Old flat	Scaffolder	Shop assist.	No	No	No	No
12.	21	F	Old flat	Barrow in market	Shop assist.	No	No	No	No

Table 1. Clinic group

Child No.	Age	Sex	Housing	Father's work	Mother's work	Father's Education	Mother's Education	Mother Working	Subs. Care
13.	34	M	House	Engineer	Office worker	Yes	No	No	No
14.	31	M	House	Lecturer	Teacher	Yes	Yes	Yes	Friend with one child
15.	34	F	House	Civil Servant	Civil Servant	Yes	Yes	No	No
16.	32	F	House	Banker	Secretary	Yes	Yes	No	No
17.	27	M	House	Teacher	Teacher	Yes	Yes	No	No
18.	25	M	House	Engineer	Office worker	Yes	No	No	No
19.	29	F	House	Economist	Office worker	Yes	No	No	No
20.	25	F	House	Scientist	Personnel Manager	Yes	Yes	No	No
21.	21	M	House	Accountant	Teacher	Yes	Yes	No	No
22.	20	M	House	Doctor	Chemist	Yes	Yes	No	No
23.	23	F	House	Teacher	Teacher	Yes	Yes	No	No
24.	19	F	House	RNO Officer	Teacher	Yes	Yes	No	No

Table 2. Creeche Group

	<u>Child No.</u>	<u>Natural parents</u>	<u>Sibs.</u>	<u>Step sibs.</u>	<u>Position</u>	<u>Comments</u>
CLINIC GROUP	1.	Yes	F 9m	No	1st.	None
	2.	Yes	No	No	1st.	None
	3.	Yes	F 5y M 4y	No	3rd.	None
	4.	Yes	M 6y	No	2nd.	None
	5.	Yes	F 10y F 7y	No	3rd.	None
	6.	Yes	F 4y	No	2nd.	None
	7.	Yes	No	No	1st.	None
	8.	Yes	F 6y	No	2nd.	None
	9.	Yes	No	M 15y	1st.	Mother remarried. Baby treated as 1st child.
	10.	Yes	M 4y	No	2nd.	None
	11.	Yes	M 7m	No	1st.	None
	12.	Yes	F 10y M 6y	No	3rd.	None
CRECHE GROUP	13.	Yes	M 7y F 6y M 4y	No	4th.	None
	14.	Yes	F 5y	No	2nd.	None
	15.	Yes	F 4y	No	2nd.	None
	16.	Yes	M 15y F 13y M 9y F 8y	No	5th.	None
	17.	Yes	F 9m	No	1st.	None
	18.	Yes	M 4y M 9m	No	2nd.	None
	19.	No	No	M 8y M 6y	3rd.	Adopted at 6 weeks.
	20.	Yes	No	F 8y	2nd.	Mother remarried. Children as one family.
	21.	Yes	No	No	1st.	None
	22.	Yes	M 4y	M 17y F 14y	2nd.	Father remarried. 2 younger children as one family.
	23.	Yes	F 6y M 4y	No	3rd.	None
	24.	Yes	No	F 8y M 4y	3rd.	Mother remarried. Children very close.

Table 3. Details of Family Structure.

The decision as to whether the step children were considered as part of one family or two depended on several different factors. The mothers own opinion was sought and details and reasons for the decisions are given below.

Child No. 9.

The mother of this child had been a widow for many years and had only recently remarried a man younger than herself. She said that her older son hardly saw the baby, was not very interested in him and was intending to go away to work fairly soon. Child 9 was considered a first child.

Child No. 19.

This child had been adopted at six weeks old, and except that her mother was not her 'biological' mother she was completely part of the family. Hence she was considered a third child.

Child No. 20.

The mother of this child had married her second husband when her first child was four and the two girls were very close, playing a lot together even though there was six years difference in their ages. Hence this child was considered to be a second child.

Child No. 22.

The father of this child had lost his first wife several years before he remarried. He, and his two children had lived alone until he married his second wife who was at least ten years younger than him. They then had two more children and the mother said that she considered the first two children to be a separate family from the second two. The younger children played together during the daytime, and usually went to bed soon after the teenagers came in. The mother seemed very happy with the situation although she found it very tiring, but her own feeling was that she had two separate families to care for. For this reason Child 22 was considered to be a second child.

Child No. 24.

The mother of this child left her first husband soon after her second child was born, and although the oldest child remembered her own father vaguely the mother's present husband was, in all senses except the biological, the father of all three children. This child was considered to be a third child.

APPENDIX B.

<u>Clinic group</u>	<u>General Section</u>		<u>Book Section</u>	
<u>No.</u>	<u>Total</u>	<u>Yes/No etc.</u>	<u>Total</u>	<u>Yes/No etc.</u>
1	378	35	37	2
2	199	11	28	1
3	80	5	28	1
4	329	65	77	11
5	241	44	79	15
6	167	23	59	6
7	366	51	105	11
8	148	16	44	12
9	92	60	16	5
10	192	51	63	6
11	224	11	61	5
12	174	60	53	26

Creche group

<u>No.</u>				
13	261	71	196	53
14	245	49	83	13
15	173	56	90	28
16	205	22	54	6
17	239	31	90	11
18	325	13	170	5
19	106	13	-	-
20	244	31	16	3
21	210	15	40	6
22	330	24	57	4
23	76	33	14	9
24	208	26	60	6

(The averages for each group were computed using the total number of utterances - the number of "Yes/No etc.")

Table 1. Length of children's protocols.

APPENDIX B.

<u>Clinic group</u>		<u>General Section</u>		<u>Book Section</u>	
<u>No.</u>		<u>Total</u>	<u>Yes/No etc.</u>	<u>Total</u>	<u>Yes/No etc.</u>
1		181	34	34	4
2		278	45	30	5
3		188	35	104	23
4		235	28	90	10
5		212	31	95	15
6		278	38	141	18
7		169	32	60	14
8		164	48	17	5
9		354	74	63	15
10		268	60	107	27
11		379	56	117	20
12		299	48	154	24

Creche group

<u>No.</u>					
13		414	107	291	77
14		319	46	76	18
15		307	78	138	43
16		68	12	48	10
17		238	51	123	24
18		203	49	174	39
19		35	6	-	-
20		501	99	30	10
21		400	41	96	11
22		238	50	81	17
23		281	45	93	16
24		432	55	104	12

Table 2. Length of mothers' protocols.

APPENDIX C.

Extracts from the transcript of child No. 1 in

a) general conversation and b) book conversation.

Child No. 1 was a clinic group boy aged 35 months.

a)	<u>Length of utterance</u>	<u>Type</u>
Mother: We've got to go out later on, haven't we?	11	17 10
Child: I'm going to a	6	47
Mother: Who are you going to see?	7	12
Child: I'm going to see my cousin Mark	9	47
Mother: Not Mark	2	14
Child: Not Mark	2	49
Mother: What is it?	3	12
What's his name?	4	12
Child: Richard	1	47
Mother: It's Richard	3	15
b)		
Child: Look	1	46
Mother: What's that?	3	12
Child: Scissors	1	47
Look	1	46
Mother: That's pretty	3	17
What are you doing?	5	12
Child: Look	1	16
Man L---'s got one of them	8	47
Mother: What are they?	4	12
Don't you know?	4	11

Extracts from the transcript of child No. 5 in
a) general conversation and b) book conversation.

Child No. 5 was a clinic group boy aged 28 months.

a)	<u>Length of utterance</u>	<u>Type</u>
Mother: What do you build?	4	12
Child: Sandcastle	1	47
Mother: Yes	(1)	14
Child: And pies	3	47
Mother: And pies	3	19
Child: Mmm	(1)	44
They go down	3	47
Mother: They fall all down	4	17
Child: Mmm	(1)	44
Mother: Do they?	2	11
Child: I bang them	4	47
b)		
Child: What's that?	3	42
Mother: It's a butterfly	4	17
Child: A flower	2	47
Mother: What's this?	3	12
Child: Flower	1	47
Mother: Ah	(1)	14
Child: What's that?	3	42
Mother: It's a parrot	4	17
Child: Parrot	1	48

The utterances in brackets were excluded from
the calculation of the MLUA.

Extracts from the transcript of child No. 24 in

a) general conversation and b) book conversation.

Child No. 24 was a creche group girl aged 19 months.

a)		<u>Length of Utterance</u>	<u>Type</u>
Child:	Cake	1	47
Mother:	Cake	1	19
	Yes	(1)	14
	It's nice, isn't it	6	17 10
Child:	Cake	1	47
	Cake	1	47
Mother:	Sweets?	2	12
	These aren't sweets	5	17
	Some more cake?	3	11
Child:	Cake	1	48
b)			
Mother:	Butterfly	1	17
Child:	Yes	(1)	44
Mother:	What's that?	3	12
Child:	Gonk	1	47
Mother:	Drink	1	17
	Drink	1	17
Child:	A gonk	2	47
Mother:	Mmm	(1)	14
	Another gonk	2	15
Mother:	What's this?	3	12

The utterances in brackets were excluded
from the calculation of the MLUA.

APPENDIX D.

<u>Child</u> <u>No.</u>	<u>MLU</u> <u>(Child)</u>	<u>MLUA</u> <u>(Child)</u>	<u>% (Child)</u> <u>Yes/No etc.</u>	<u>MLUA</u> <u>(Mother)</u>	<u>% (Mother)</u> <u>Yes/No etc.</u>
1	2.98	3.18	9.3	4.90	18.8
2	3.14	3.26	5.5	4.45	16.2
3	2.20	2.28	6.3	4.18	18.6
4	2.02	2.28	19.8	4.14	11.9
5	2.22	2.49	18.3	4.29	14.9
6	2.08	2.26	13.8	4.26	13.7
7	2.39	2.61	13.9	5.06	18.9
8	2.32	2.48	10.8	3.79	29.3
9	1.13	1.38	65.2	3.31	20.9
10	1.21	1.29	26.7	3.17	22.4
11	1.37	1.39	4.9	3.03	14.8
12	1.25	1.39	34.5	3.10	16.1
<hr/>					
13	2.60	3.19	27.2	5.18	25.8
14	1.89	2.11	20.0	5.57	14.4
15	3.20	4.25	32.4	6.09	25.4
16	2.69	2.89	10.7	4.43	17.6
17	2.66	2.91	12.9	4.72	21.4
18	2.45	2.50	4.0	3.19	24.1
19	3.33	3.66	12.3	4.45	17.1
20	1.20	1.23	12.8	3.86	19.8
21	1.38	1.41	7.1	3.95	10.3
22	1.09	1.13	7.3	3.55	21.0
23	1.07	1.12	43.4	2.80	16.0
24	1.11	1.13	12.5	4.72	12.7

Table 1. MLU and MLUA for mother and child
for complete protocol.

APPENDIX D.

<u>Child</u>	<u>MLUA (Child)</u>	<u>% Yes/No etc.</u> <u>(child)</u>	<u>MLUA (mother)</u>	<u>% Yes/No etc.</u> <u>(mother)</u>
1	3.24	9.6	5.15	20.4
2	3.31	5.8	4.56	16.1
3	2.71	7.7	4.62	14.3
4	2.43	21.4	4.72	6.9
5	2.78	17.9	4.09	13.7
6	2.44	15.7	4.53	14.6
7	2.67	15.3	5.17	16.5
8	2.46	10.4	3.83	29.3
9	1.34	72.4	3.43	20.3
10	1.41	34.9	3.44	20.5
11	1.46	3.7	3.07	13.7
12	1.51	33.7	3.78	16.5
13	3.43	27.7	5.67	24.4
14	2.16	22.2	5.75	11.5
15	4.51	33.7	5.98	20.7
16	3.15	10.6	5.62	10.0
17	3.23	13.4	4.73	23.5
18	2.73	5.30	3.80	34.5
19	3.66	12.3	4.45	17.1
20	1.24	12.3	3.93	18.9
21	1.41	5.3	4.05	16.4
22	1.13	7.3	3.58	21.0
23	1.14	38.7	1.94	15.4
24	1.13	13.5	5.53	13.1

Table 1. MLUA and % "Yes/No etc." for mother
and child in the general conversation.

APPENDIX D.

<u>Child</u>	<u>MLUA (Child)</u>	<u>% Yes/No etc.</u> <u>(Child)</u>	<u>MLUA (mother)</u>	<u>% Yes/No etc.</u> <u>(mother)</u>
1	2.63	5.4	3.93	11.8
2	2.96	3.6	3.52	16.7
3	1.52	3.6	3.79	22.1
4	1.82	14.3	3.22	11.1
5	1.89	19.0	4.53	15.8
6	1.94	10.2	4.00	12.8
7	2.47	10.5	4.85	23.3
8	2.67	14.3	3.42	29.4
9	1.45	31.3	2.73	23.8
10	1.10	9.5	2.74	25.2
11	1.18	8.2	2.94	17.1
12	1.21	35.6	2.47	15.6
13	3.11	27.0	4.97	26.5
14	2.03	15.7	4.90	23.7
15	4.02	31.1	6.24	31.2
16	2.17	11.1	3.87	20.8
17	2.38	12.2	4.71	19.5
18	2.29	2.9	3.10	22.4
19	* -	-	-	-
20	1.00	18.7	2.60	33.3
21	1.41	15.0	2.80	11.5
22	1.11	7.0	3.48	21.0
23	1.00	64.3	4.57	17.2
24	1.13	10.0	2.20	11.5

* For the Analysis of Variance (Section 5.3) this child's MLUA score was estimated to be 2.27.

Table 2. MLUA and % "Yes/No etc." for mother
and child in the book condition.

(using the regression method given in Winer 1962)

APPENDIX E.

<u>Child No.</u>	<u>MLUA</u>	<u>MLUA</u> (1-20)	<u>MLUA</u> (20-end)
1	5.41	5.10	5.46
2	5.05	4.80	5.09
3	5.54	6.20	5.34
4	4.90	4.70	4.92
5	5.14	5.50	5.07
6	4.13	4.30	4.08
7	4.79	5.10	4.76
8	3.91	3.4	4.64
9	3.75	4.10	3.66
10	3.73	4.30	3.59
11	4.04	4.20	3.99
12	4.49	5.10	4.16
13	5.78	5.50	6.25
14	4.93	5.70	4.83
15	5.66	5.60	5.68
16	5.00	4.90	5.02
17	5.29	5.70	5.20
18	4.34	4.30	4.35
19	5.59	5.50	5.62
20	4.48	5.10	4.15
21	5.06	4.70	5.15
22	3.97	4.00	3.97
23	5.80	5.20	6.14
24	3.90	3.40	4.14

Table 1. Mean length of utterance
scores for the researcher.

APPENDIX F

<u>Child No.</u>		<u>% of mother's utterances imitated by the child</u>	
<u>Clinic group</u>		<u>In general conversation</u>	<u>In book situation</u>
<u>MLUA</u>	2	0.0	0.0
<u>greater</u>	1	1.4	0.0
<u>than 2.3</u>	7	4.6	2.0
	5	1.9	11.3
	8	10.2	7.1
	3	0.0	0.0
		(3.0)	(3.4)
	4	0.8	22.0
	6	1.9	8.5
<u>MLUA</u>	11	35.0	45.7
<u>less</u>	12	8.3	12.5
<u>than 2.3</u>	9	0.9	11.5
	10	10.8	24.2
		(9.6)	(20.7)
<u>Creche group</u>			
	15	1.2	0.0
	19	16.2	-
<u>MLUA</u>	13	3.8	7.5
<u>greater</u>	17	0.8	1.7
<u>than 2.3</u>	16	20.0	21.6
	18	22.2	16.7
		(10.7)	(9.5)
	14	1.4	2.2
	21	10.0	4.3
<u>MLUA</u>	20	5.4	3.6
<u>less</u>	22	6.2	22.7
<u>than 2.3</u>	24	11.3	15.5
	23	0.6	0.0
		(5.8)	(8.1)

Table 1. . Frequency of imitation by the children

Note: The scores in brackets are the average values for each sub-group.

APPENDIX F

<u>Child No.</u>		<u>% of child's utterances expanded by the mother</u>	
<u>Clinic group</u>		<u>In general conversation</u>	<u>In book situation</u>
	2	0.0	3.7
	1	1.1	3.0
<u>MLUA</u>	7	10.0	4.0
<u>greater</u>	5	3.9	1.6
<u>than 2.3</u>	8	2.2	6.3
	3	12.5	4.3
		(5.0)	(3.8)
	4	4.2	3.8
<u>MLUA</u>	6	5.3	0.0
<u>less</u>	11	0.7	5.0
<u>than 2.3</u>	12	2.9	1.4
	9	0.0	0.0
	10	2.4	2.3
		(2.6)	(2.1)
<u>Creche group</u>			
	15	0.0	0.0
	19	5.3	-
<u>MLUA</u>	13	4.9	6.0
<u>greater</u>	17	10.5	3.4
<u>than 2.3</u>	16	0.0	7.1
	18	8.3	2.6
		(4.8)	(4.8)
	14	1.1	2.3
<u>MLUA</u>	21	4.9	13.3
<u>less</u>	20	0.6	0.0
<u>than 2.3</u>	22	2.7	1.9
	24	5.2	8.6
	23	10.9	15.4
		(4.2)	(6.9)

Table 2. Frequency of expansion by the mothers

Note: The scores in brackets are the average values for each sub-group.

<u>Child No.</u>	<u>% of child's utterances imitated by the mother</u>	
<u>Clinic group</u>	<u>In general conversation</u>	<u>In book condition</u>
2	10.7	18.5
1	1.1	2.2
7	0.0	12.0
5	5.9	9.8
8	5.5	6.3
3	0.0	13.0
	(3.9)	(10.3)
4	14.6	9.0
6	10.5	18.2
11	8.2	10.0
12	14.5	17.8
9	5.6	0.0
10	14.1	34.9
	(11.2)	(15.0)
<u>Creche group</u>		
15	3.5	2.6
19	15.8	-
13	18.0	14.1
17	19.3	0.0
16	14.3	17.9
18	0.0	11.3
	(11.8)	(9.2)
14	1.1	7.0
21	13.2	6.7
20	14.4	36.4
22	6.3	15.1
24	27.0	17.2
23	15.6	7.7
	(12.9)	(15.0)

Table 3. Frequency of imitation by the mother

Note: The scores in brackets are the average values for each sub-group.

Computer ProgramsProgram 1.

```
PROGRAM SEQAL (INPUT,OUTPUT)
INTEGER B(800), BB(800), BBB(800), BBBB(800), BBBBB(800)
INTEGER Z(1,2), X(1,3), Y(1,4), W(1,5), C1,C2,C3,C4
INTEGER A(800,2), C(800,3), D(800,4), E(800,5)
DATA A/1600*0/,C/2400*0/,D/3200*0/,E/4000*0/
L = 0
J = 0
PRINT 104
10 READ 107,N
L = L + N
IF (N.EQ.0)GO TO 1003
READ 100,IC, M, (B(1), I = 1, N)
C PRINT 104
IF(M.EQ.1) M = 2H A
IF(M.EQ.2) M = 2H B
DO 1002 I = 2,N
IF(B(1).EQ.0) GO TO 3
GO TO 1002
3 J = J + 1
A(J,1) = B(1)
A(J,2) = B(1 - 1)
C(J,1) = B(1)
C(J,2) = B(1 - 1)
C(J,3) = B(1 - 2)
D(J,1) = B(1)
D(J,2) = B(1 - 1)
D(J,3) = B(1 - 2)
D(J,4) = B(1 - 3)
E(J,1) = B(1)
E(J,2) = B(1 - 1)
E(J,3) = B(1 - 2)
E(J,4) = B(1 - 3)
E(J,5) = B(1 - 4)
```

```

1002  CONTINUE
      GO TO 10

1003  N = J
      NN = N - 2
      NNN = N - 1
      LL = LLL = LLLL = LLLLL = 0
      DO 6 I = 1, NN
      L1 = L2 = L3 = L4 = 0
      C1 = C2 = C3 = C4 = 1
      II = I + 1
      DO 7 J = II, NNN
      IF(A(J,1).EQ.99)GO TO 20
      IF(A(I,1).EQ.A(J,1).AND.A(1,2).EQ.A(J,2))GO TO 8
      GO TO 7
8      L1 = L1 + 1
      A(J,1) = 99
      IF(L1.GT.1)GO TO 9
      Z(1,1) = A(1,1)
      Z(1,2) = A(1,2)
9      C1 = C1 + 1
20     IF(J.GE.N - 1)GO TO 7
      IF(C(J,1).EQ.99)GO TO 30
      IF(C(1,1).EQ.C(J,1).AND.C(1,2).EQ.C(J,2).AND.C(1,3).
          EQ.C(J,3))GO T
          10 18
      GO TO 7
18     L2 = L2 + 1
      C(J,1) = 99
      IF(L2.GT.1)GO TO 19
      X(1,1) = C(1,1)X(1,2) = C(1,2)X(1,3) = C(1,3)
19     C2 = C2 + 1
30     IF(J.GE.N - 2)GO TO 7
      IF(D(J,1).EQ.99)GO TO 40
      IF(D(I,1).EQ.D(J,1).AND.D(1,2).EQ.D(J,2).AND.D(1,3).
          EQ.D(J,3).AND.1D(1,4).EQ.D(J,4))GO TO 28
      GO TO 7
28     L3 = L3 + 1
      D(J,1) = 99
      IF(L3.GT.1)GO TO 29

```

```

      Y(1,1) = D(I,1)EY(1,2) = D(1,2)EY(1,3) = D(1,3)EY(1,4) =
      D(1,4)
29  C3 = C3 + 1
40  IF(J.GE.N-3)GO TO 7
      IF(E(J,1).EQ.99)GO TO 7
      IF(E(I,1).EQ.E(J,1).AND.E(I,2).EQ.E(J,2).AND.E(1,3).
      EQ.E(J,3).AND.1E(1,4).EQ.E(J,4).AND.E(I,5).EQ.E(J,5))
      GO TO 38
      GO TO 7
38  L 4 = L4 + 1
      E(J,1) = 99
      IF(L4.GT.1)GO TO 39
      W(1,1) = E(I,1)EW(1,2) = E(I,2)EW(1,3) = E(1,3)EW(1,4) =
      E(I,4)EW(1,5) = E(I1,5)
39  C4 = C4 + 1
7   CONTINUE
      IF(C1.GT.1)PRINT 101,Z(1,1),Z(1,2),C1
      IF(C2.GT.1)PRINT 102,X(1,1),X(1,2),X(C1,3),C2
      IF(C3.GT.1)PRINT 103,Y(1,1),Y(1,2),Y(1,3),Y(1,4),C3
      IF(C4.GT.1)PRINT 105,W(1,1),W(1,2),W(1,3),W(1,4),W(1,5)C4
6   CONTINUE
100  FORMAT (4012)
101  FORMAT (25X,213,12X,13,26X,13,A2)
102  FORMAT (25X,313, 9X,13,26X,13,A2)
103  FORMAT (25X,413, 6X,13,26X,13,A2)
105  FORMAT (25X,513, 3X,13,26X,13,A2)
104  FORMAT (1H1,15X, 'SEQUENTIAL ANALYSIS OF BEHAVIOURAL
      PATTERNS OF CHILDREN',5X, 'P PAL BEDFORD COLLEGE,
      LONDON NW1'//)
106  FORMAT (22X, 'CHILD No. ',14,5X, 'TOTAL NO. ',14,5X,
      'GROUP',A3//,25X, 'MULTIPLETS', 8X, 'FREQUENCY'//)
107  FORMAT (14)
108  FORMAT (4X,3812)
99  STOP
      END

```

Program 2.

```

PROGRAM SEQAL (INPUT, OUTPUT, TAPE 1 = INPUT)
INTEGER B(5000), A (5000.5)
DATA NNNN/2H99/
I = 0
1  I = I + 1
  READ (1.101) (A(I,J), J = 1.5), B (I)
  IF (EOF (1) 10.1
10  PRINT 103
    N = I
    PRINT 105, N
105  FORMAT (5X, 'TOTAL NUMBER', 14)
    NN = N - 1
    DO 2 I = 1, NN
      II = I + 1
      DO 3 J = II, N
        IF (A (I,1). EQ. NNNN) GO TO 2
        IF (A (I,1). EQ.A(J,1). AND.A(I,2). EQ.A(J,2).
            AND.A(I,3). EQ.A(J,3). AND
            1A (I,4). EQ.A(J,4). AND.A(I,5). EQ.A(J,5) ) GO TO 4
        GO TO 3
4      B (I) = B (I) + B (J)
        A (J,1) = NNNN
3      CONTINUE
        PRINT 102, (A (I,K), K = 1,5), B (I)
2      CONTINUE
100  FORMAT (14)
101  FORMAT (26X,A2,1X,A2,1X,A2,1X,A2,1X,A2,3X,13)
102  FORMAT (26X,A2,1X,A2,1X,A2,1X,A2,1X,A2,3X,13)
103  FORMAT (1H1,15X,'SEQUENTIAL ANALYSIS OF BEHAVIOURAL
        PATTERNS OF CHILDREN', 5X, 'P PAL BEDFORD COLLEGE,
        LONDON'//, 25X, 'MULTIPLETS', 8X, 2 'FREQUENCY'//)
        STOP
        END

```

APPENDIX H.

<u>Child No.</u>	<u>Average length</u> <u>(General conversation)</u>	<u>Average length</u> <u>(Book condition)</u>
1	13.3	37.0
2	16.4	62.0
3	4.9	10.4
4	19.7	84.5
5	15.7	35.8
6	8.9	17.0
7	29.6	63.5
8	28.6	29.0
9	13.3	14.5
10	15.0	25.8
11	23.1	57.3
12	8.9	26.7
13	23.1	78.6
14	20.5	67.0
15	21.3	52.5
16	19.5	62.0
17	20.3	42.6
18	37.8	105.3
19	16.6	14.0
20	12.3	7.6
21	31.4	17.8
22	15.4	35.0
23	22.3	43.7
24	15.9	26.8

Table 1. Average length in utterances of
conversational units.