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Although the relationship between language and intellectual development in children is often ambiguous, language retardation appears to be one of the main ways that a disadvantaged environment hinders achievement. While American research has indicated that nursery education may effectively extend language experience, few studies have been done in England to investigate how much early social experience can influence a child's intellectual functioning by way of his development and use of language. The present longitudinal study established four groups of 3-year-olds matched for intelligence and sex by crossing the two variables of home background and nursery school experience. Children's speech was recorded in a natural setting session. Complex operations were then run on the data and the different groups were compared on such aspects of their language as representation, information loss, anaphoric and exophoric use of pronouns, mean length of utterances, complexity, noun-verb phrase indices, and function. These comparisons demonstrated the superior development of the environmentally favored group over the unfavored group, and while a few cases showed the nursery group's superiority to the no-nursery group, the results were less clear. (MH)

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LANGUAGE AND ENVIRONMENT

AN INTERIM REPORT ON A LONGITUDINAL STUDY

THE PROBLEM

Environmental factors, achievement and ability

Much evidence now supports the view that environmental factors have an important, and for some a crucial, effect upon educational achievement. The importance of social factors and the educational background of parents has been demonstrated (Douglas, 1964; Elder, 1965; Fraser, 1959; Halsey, 1961; Rogoff, 1961). Ability and achievement are influenced by practices and attitudes within the home which tend to be associated with the social and educational background of parents (Swift, 1967). It has been shown that the aspirations of parents are closely associated with academic success (Fraser, 1959; Floud, Halsey and Martin, 1956) and that parental attitudes to their children's education are related to progress in schools (Fraser, 1959; Douglas, 1964; Wiseman, 1966).

The problem lies deeper than this; the gap between the measured intelligence of the children of manual workers, and children of middle class parents begins to widen at an early age (Hindley, 1961) and the polarisation continues during the primary school period (Douglas, 1964). Genetic factors alone cannot account for this divergence: Hunt (1961) summarises the evidence which supports the conclusion that intelligence is affected by early experience. McCarthy (1954) summarises the evidence from studies of children brought up in the poorly stimulating environments of institutions which supports the view that general ability tends to be depressed by such conditions. The development of language and ability appear to be particularly affected by early institutionalisation, and general deprivation is found to have the same effect (Pringle and Tanner, 1958; Pringle and Bossio, 1958). Lack of opportunities to learn may account for such depression (Dennis and Najarian, 1957). Where children are in such understimulating conditions from the first weeks of life onwards the effect is seen to be related to the length of stay within them: the earlier the child is moved to a more stimulating environment the less extreme are the persisting effects on ability and attainment (Skeels, 1966).

Studies of children from cross sections of the population, both in this country and in America, generally show that although differences exist between the upper and lower socio-economic groups in language skills, they are matched by differences in measured intelligence. (Moore, 1966: Sampson, 1959; Templin, 1957). A survey in New York by Deutsch (1965), however, indicates that differences in language skill are more closely related to practices within the home than to measured intelligence, and the differences become more associated with social background as children grow older.

Language and intellectual development

The relationship between language development and intellectual development is complex and difficult to study. The evidence so far is conflicting. Many see language as playing a crucial role in the thought processes (Brown, 1958; Bruner, 1964; 1966; Church, 1961; Luria and Yudovitch, 1959, Luria, 1961; Vygotsky,1962). Piaget and his associates on the other hand conclude that while language facilitates a system of communication such a system is made possibly only as the result of the formation of concepts: language is not basically responsible for the growth of concepts. Although language undoubtedly facilitates thinking they find no evidence to suggest that language plays a central role, at least at the pre-formal level (Inhelder and Piaget, 1958; Bovet, Inhelder, Sinclair and Smock, 1966). Sinclair (1967) however, although not moving from this position, concedes that on seriation tasks language seems to play a more decisive role. A good deal of evidence suggests that the use of language assists the process of problem solving (Gagne and Smith, 1962; Judson, Cofer and Jeland, 1956; Kendler, Kendler and Carrick, 1956; Marks, 1951; Saugstad and Raaheim, 1960).

The effect of the linguistic component of the child's total experience is difficult to test. The normal child, even when confronted with non-verbal tasks, operates always with a receptivity and orientation resulting from a history of linguistic experience and development: linguistic naivety is only met in those seriously deprived of language. Currently great importance is being attached to studies of deaf children, but the evidence is conflicting. Several studies find deaf children to be seriously retarded in conceptual development (Oleron, 1957; Vincent, 1957; Borelli, 1951; Kendall,1953). Furth (1966), however, indicates that deaf children form many concepts with little less efficiency than hearing children; however, it appears that these children had developed some language system, in spite of being seriously deprived of speech experience.

Vygotsky (1962) demonstrates that the language of the adult plays an important role in helping the child to develop concepts: it is the adult's language which stimulates the child to search for aspects of the situation to which reference has been made. Carroll and Casagrande (1958) suggest that

language features initiate the focussing of attention on particular aspects of an experience. Bruner (1964, 1966) considers that language allows the child to make a representation of his experience, and that by inspecting his language the child can then recognise contradictions between what he says and what he sees. This re-examination provokes him to return to reality and restructure his experience. Thus the use of language stimulates the recognition of relationships which makes possible a higher level of thinking.

Linguistic experience and intellectual development

Language is a system by which experience can be represented, and experience is dependent on perception. Differencesin "the ability to perceive" might be expected to affect the range or the quality of experience, and to produce differences within the system of representation. The adult's language may influence the direction of the child's attention to the content of his environment: the child's awareness of particular features is likely to be displayed in the language he uses. Thus a circular system of reinforcement might be established between perceptual orientation and linguistic practices in the home. Klein (1965) marshals the evidence which supports this view, and in discussion demonstrates the way in which Hebb's (1949) notions of "central" and "sensory" dominance in perception, and Luria's (1961) concept of "central control" of behaviour together support the socio-linguistic account of learning proposed by Bernstein (1965). Lawton (1968) has summarised Bernstein's research and theory and has added evidence in support of it. "Predispositions to perceive" within social groups lead to a different ordering of perception, and produce different cognitive modes of expression, which in turn give rise to different outlooks and attitudes. Bernstein suggests that this accounts for the different functioning of language in different social groups, and for the differences in usefulness of such functioning for the kind of learning and thesystem of control which is generally promoted in schools. The theory is of interest to educationists since it offers an explanation of the route by which a child's ability to learn can be shaped by his early social experiences, including the linguistic expression and interaction by which these come to be codified for him.

Close examination of the practices within the family offers some evidence by which such a theory might be tested. Generally studies of the way in which mothers control and teach their young children seem to support the view that different attitudes are induced by different methods (Kohn, 1959; Sears, Maccoby and Levin 1957; Newson, 1963; Goldberg, 1958; Klein, 1965). Middle class mothers appear to give more information with greater accuracy, and with fewer irrelevancies than working class mothers in response to their children's questions (Robinson and Rackstraw, 1967). Mothers' teaching styles induce control by different systems, and dependency tends to be on rules concerned with status in the unfavoured homes and on reflection and attention to the characteristics of

the specific situation in more favoured homes: the meaning of deprivation is shown to be a deprivation of meaning (Hess and Shipman, 1968). Bernstein's most recent work (Bernstein and Henderson, 1969) suggests that middle class mothers place greater emphasis on the use of language for transmitting the understanding of feelings and of the principles underlying approved behaviours, whilst working class mothers place greater emphasis on language for the teaching of skills. So far, however, there is no direct evidence to support the view that linguistic experiences within the home affect intellectual functioning.

Nursery education as a language extending experience

It is generally agreed that the period of most rapid development of language is between the ages of about eighteen months and four years. Differences in the use of language due to home background have been shown to exist by the age of five or six (Deutsch, 1964; Rackstraw and Robinson, 1967). Extension of the child's linguistic experiences would appear likely to have the most effect during the pre-school years. Opportunity for regular linguistic interaction with adults can have an extending effect upon children at about the age of three years (Cazden, 1965; Dawe, 1943), which, if continued through the pre-school period, may lead to a facilitation of "internal mental manipulations of experience" and marked gains in measured ability (Blank and Solomon, 1968). Some evidence from America suggests that the intellectual functioning of culturally deprived children can be improved by structured nursery school programmes (Bereiter, 1966); Deutsch; 1963; Gray and Klaus, 1965). Such improvement may result from the reduction of the effects of debilitating motivational factors rather than to changes in the rate of intellectual development (Zigler and Butterfield, 1968). There has been little study in this country of the effect which nursery education has on language development or on general ability. Douglas and Ross (1964) show that experience in a nursery is advantageous in the early school years, but that the advantage is lost at later stages. In this survey, however, types of nursery care were not distinguished, and no account was taken of the length of nursery experience, or the reasons for which the child was accepted for such care.

The problems, then, which stimulated the present study are concerned with the extent to which early social experiences may influence the child's intellectual functioning by way of his development and use of language.

THE PROJECT

The work reported here is the first stage of a longitudinal study which aims to test the following hypotheses:

i) that differences in the language of children attributable to environmental factors can be identified by the age of three years.

ii) that nursery education will reduce the differences attributable to environmental factors to be found in the language of children at the ages of five and seven years.

This longitudinal study seeks to examine the use of language in groups of children from educationally advantaging and educationally disadvantaging home environments (designated "favoured" and "unfavoured" groups). It seeks also to compare the use of language by children from unfavoured home background who receive nursery education with those from similar home background who do not receive nursery education. Four groups, matched for age, intelligence and sex, form the population, and two variables, home background and nursery experience are under examination.

The favoured-unfavoured distinction

The quality of linguistic fostering provided by the home seems likely to be reflected in the following:-

1) Attitudes towards the use of language in the home, the importance attached to language skills, and the opportunities offered to the child for developing and practising language skills.

2) The attitude of parents towards education generally and their aspirations for the child's education.

3) The use of books in the home by both children and adults. The attitudes towards the use of books by children and towards the initiation of children in the use of a library.

Parents who provided a linguistically favouring environment, it was anticipated would display positive attitudes, whereas those who provided a linguistically unfavouring environment would display neutral, negative or hostile attitudes towards such matters.

Conventionally, level of education and occupation of the father are associated in determining social class. The way in which mothers use language with their children may be closely related to social class (Robinson and Rackstraw, 1967; Hess and Shipman, 1965.) Maximally fostering linguistic environments would appear likely to be found amongst homes where at least one parent has received some form of higher education and follows an occupation which presupposes skill in the use of language i.e. amongst teachers, doctors and other comparable professions. Minimally fostering or unfavouring linguistic environments seem likely to be found amongst homes where both parents have completed their education at the minimum age, and where the occupations followed require no particular linguistic skill i.e. amongst unskilled and semi-skilled manual workers.

The structured interview

The quality of linguistic fostering within the home was assessed by means of an interview with the mother of any possible subject. The interview was based

on a questionnaire which tested the attitudes and practices listed above, collected information on child rearing practices, milestones in the child's general and linguistic development, and on the extent and variety of experiences offered to the child. It also provided an example of the linguistic model which the mother set for the child.

Nursery Groups

Children for these groups were selected in L.E.A. nursery schools and classes which were in the charge of qualified teachers and they were expected to have a stay of two years before transferring to infants' schools. The age for inclusion in the project was set at three to three and a half years. Children were also selected in the nursery school attached to the Institute of Education.

Non-nursery groups

Children for the favoured non-nursery group were found amongst the children of teachers and colleagues and amongst the play fellows of these children. Finding children for this group was unexpectedly difficult, and there was no guarantee that the children would not have some nursery or play group experience if accommoation were found.

The unfavoured non-nursery group was found through introductions made by head-teachers of infants' schools, in areas where nursery education was not available, to parents known to have three year old children. In one school such mothers were invited to bring their children to a play session one afternoon each week during one term. All mothers of children in the unfavoured non-nursery group would have welcomed a place in a nursery school for the child.

Criteria for selection

Children were selected according to the following criteria.

i) Children should be from either favoured or unfavoured (as defined above) homes.

ii) Children should be between the ages of three years and three years six months.

iii) Children should be of above average intelligence. (Close association has been found between measured intelligence and language development (Moore, 1966; Sampson, 1959; Templin, 1957). Children whose basic ability might limit language development were therefore excluded).

iv) Children should be from families of not more than six children. (It has been shown that children of large families are particularly disadvantaged (Nisbet, 1953).

v) Children should not be from homes where neglect or emotional stress might have serious effects on development.

vi) Children should have mothers whose first language was English.

vii) Children should not be shy or withdrawn.

viii) Children for the nursery groups should be happily settled in school.

ix) Children should speak clearly enough for transcriptions to be made.

Selection of the nursery groups

Teachers were asked to select children who appeared to fit the criteria. When the investigator had established an easy relationship with the child the Stanford-Binet Test of Intelligence (1960 Revision) was administered. The mothers of those children whose I.Q. was 105 or more were then interviewed either at home or at school (whichever the mother preferred). As these interviews proceeded it became clear that the operation of criteria 4 and 5 had excluded the least favoured of the population. The groups were then described as favoured and less favoured (that is for advantage in education). Following the interview an assessment of the quality of the home for linguistic fostering was made. Those children were retained whose home environments fitted either the favoured or less favoured criteria.

Selecting the non-nursery groups

Introductions to mothers were followed up where the criteria for selection appeared to be met. The mother was interviewed and the intelligence test was taken with the child when a friendly relationship had been established. Children were retained where the intelligence of the child and quality of the home met the requirements.

Sampling the child's use of language

Studies of the language of young children have relied upon a variety of techniques for acquiring samples of the child's language skill. Early work recorded the responses to similar pictures, book and toys, and this appears to be accepted as a useful method (McCarthy, 1953: Sampson 1956 and 1959; Smith, 1933; Strickland, 1962 and Templin, 1957). Many have used vocabulary tests and other tests of linguistic ability (Deutsch, 1964; Loban, 1963; Moore, 1966, Sampson, 1959; Templin, 1957). The interview in which children respond to similar questions, with or without materials, has also been widely used (Loban, 1963; Robinson and Rackstraw, 1967; Strickland, 1962). Berko (1958) has stimulated research which examines the order in which the child acquires the rules of morphology (Miller and Ervin 1964; Lovell and Bradbury, 1967). A further examination of this question indicates that children are first able to imitate correctly, before they can comprehend the rule, and comprehend before they can themselves apply the rule in the production of sentences (Fraser, Bellugi,and Brown, 1963; Lovell and Dixon, 1967). This approach was not considered suitable for the present study. Menyuk (1963) recorded the whole of a child's speech during the course of two half days in school to provide the data for analysis. This method secures perhaps the most representative sample of a child's speech but was not considered appropriate for the present study because half the children in the sample were not in schools.

Few studies have compared the output and quality of speech in different types of situation. Matteson and Williams (1943) found that the greatest amount of speech was stimulated when two or three familiar companions played together in the presence of an interested adult. Since three year olds can be particularly intolerant of test situations, and since interest lay in the range of linguistic skills which the child had learned to operate, this latter method, using the same set of play materials for all children, was adopted.

The speech recording session

A set of play materials which had appeal for both girls and boys, and encouraged a range of activities, was used. This material was presented on a table to the child and his chosen companion. Speech was recorded on tape and notes were made about the accompanying behaviour. The notes were expanded immediately following the session and then the speech was transcribed and provided with a running commentary on the accompanying behaviour. Sessions lasted for as long as the child remained interested, or for an hour, whichever was the shorter.

The role of the investigator was difficult to control since children need different amounts of encouragement and support. Differences were examined and taken into account at the time of selection of the final groups, and before analysis of the data.

A check was made on the nursery group to see whether representative samples of the child's speech had been obtained. Observations were made of individual children by students from a college of education and all speech was recorded during several sessions. No child was included in the study for whom the recorded samples did not appear to be a fair representation of his general language behaviour. It was not possible to make such a check with the non-nursery groups.

The final groups

More than eighty children were seen in all, and interviews were taken with more than sixty mothers. Four groups of twelve children, each composed of six boys and six girls who satisfied all criteria and for whom adequate speech samples had been recorded, were established. These were comparable both on age, intelligence, and amount of recorded speech. It is the speech data from these forty eight children which forms the basis of the following analysis. Table I provides information on the composition of these groups.

The data

Some preparation of the data was necessary. Utterances which were incomplete because of inaudibility and overlap of voices were excluded. All single word answers to the adult's questions were excluded as they seemed likely to distort the child's performance on certain measures (e.g. mean length of utterances). All identical repetitions, either of the child's own utterance, or of another's,

were excluded, as were any lines of songs, nursery rhymes and jingles. The final data for each group provided an unequal basis (i.e. number of words) for making direct comparisons and so the final scores were adjusted proportionately.

Table 1

Median age at recording and median I.Q. of groups

Group	Favoured		Less favoured	
	Nursery	Non-nursery	Nursery	Non-nursery
Number in group				
Girls	6	6	6	6
Boys	6	6	6	6
Total	12	12	12	12
Median age in months at recording				
Girls	39.5	38.0	41.5	41.0
Quartile deviation	1.5	.75	1.75	1.75
Boys	39.5	40.0	37.5	39.5
Quartile deviation	1.5	1.25	2.0	.75
Total Group	39.5	38.5	40.0	40.0
Quartile deviation	1.5	1.0	2.5	1.0
Median I.Q. (S.B.1960)				
Girls	122.0	118.0	132.0	121.5
Quartile deviation	7.0	4.5	8.75	7.25
Boys	125.5	125.0	121.5	129.5
Quartile deviation	10.5	3.5	5.25	9.0
Total group	123.0	124.0	126.5	123.0
Quartile deviation	11.0	6.5	9.0	10.0

Analysis of the data

Several established methods were used to analyse the data and others were devised. The findings are summarised on the following page.

1. a) Representation

The physical responses of the young child demonstrate his growing awareness of objects and events within his environment. From his second year onwards he learns to represent differentiated aspects of his experience by spoken words and so his language develops.

It might be predicted from a theory that claims that between social groups there are differences in "predispositions to perceive" (Bernstein,1958) that children from different social environments will learn to give attention to different aspects of the environment, and that such differences will be reflected in the kind of information which they learn to represent. The first analysis was in the form of an exploratory exercise to discover whether this might be so, and to reveal aspects which might repay further attention. An array of categories of experiential phenomena was drawn up which covered the identification of objects, persons, attributes, actions and states, recall and anticipation of events, aspects of time and space, recognition of similarity and difference, and a range of relationships - causation, dependency, contradiction and possibility. The data was examined and all items of information represented by linguistic items or features (and not by gesture alone) were scored.

Results

There was little difference in the total of items scored between the favoured and less favoured groups, and on several categories the differences were so small as to suggest no differences in orientation. On the other hand there were differences in some categories which were so large that differences in orientation are suggested. Differences are shown on the next page in Table 2a for those categories where the score of one group is at least twice as high as for the other group.

Table 2a Favoured and less favoured groups

Items of representation

Representation	Favoured Groups	Less favoured Groups	Relative frequency(approx)
of instruction to persons	224	623	5 : 14
qualitative attributes	274	105	5 : 2
recall	183	29	6 : 1
anticipation	265	124	2 : 1
purpose or function	71	31	7 : 3
relationships	325	46	7 : 1

This appears to support the prediction that differences in orientation towards particular aspects of the environment would be reflected in the child's use of language. The recognition of relationships, of qualitative attributes and of readiness to project beyond the ongoing situation appear to distinguish the favoured groups from the less favoured groups.

Table 2b Less favoured groups:

Items of representation

Representation	Nursery Group	Non-nursery group	Relative frequency (approx)
recall and anticipation	103	51	2 : 1
qualitative attributes	77	28	8 : 3
relationships	38	8	5 : 1

Table 2b shows that differences also exist between the two less favoured groups. These particular items, however, occur infrequently in the speech of all the three year olds, and too much importance should perhaps not be attached to the differences which are found between the two less favoured groups.

1. b) Information loss

The linguistic item chosen for representation can affect the efficiency of the communication of information. The selection of pronouns often appears as a representation of gesture towards objects and actions rather than of the objects and actions themselves. When this happens the support of the concrete situation is necessary for communication to be effective.

The data was re-examined over the information array and all items were scored which did not require the support of the concrete situation to effect communication. This component of representation was termed the "ideational" component since it remained communicative in the absence of the concrete. The items of representation which were not ideational are referred to as the "concrete" component of representation and are regarded as a loss in communication effectiveness.

The use of the information array and the scoring of representation and information loss were tested by an independent marker over a random sample of the scripts. A correlation greater than .99 was found between the two markers

on twenty two out of thirty four categories, and greater than .8 on a further four categories. The remaining categories provided too few instances for a comparison to be made.

To estimate the loss of information in the speech of each child, and of each group the concrete component score is calculated as a percentage of the score for all representations.

Table 3. Communication loss: favoured and less favoured groups

Scores \ Group	Favoured Nursery	Favoured non-nursery	All favoured	Less favoured nursery	Less favoured non-nursery	All less favoured
Representation	5,949	5,249	11,208	6,257	4,427	10,684
Ideational component	4,807	4,063	8,870	4,387	2,781	7,168
Concrete component	1,142	1,196	2,338	2,040	1,646	3,686
Communication loss	19.2%	22.7%	20.9%	32.6%	37.2%	34.5%

Table 3 shows that communication loss is 65% greater in the less favoured group than in the favoured group.

The communication loss for each child was also taken as a basis for comparison between the groups and the Mann Whitney U test (Siegel 1956 p.116) was applied. The difference between the favoured and less favoured groups is found to be significant beyond the level of $p = .001$.

The differences between the two favoured groups and between the two less favoured groups are small but consistent and are also found to be statistically significant though they are perhaps not significant in any other way.

The Problem of Reference

Examination of the data using the representation array suggests that efficiency of communication is affected by the choices made of linguistic items of reference. The child's facility in using language is tremendously increased between the ages of about two and a half and three years by the acquisition of the small closed set of pronouns. It is on the one hand an important triumph in generalisation, but on the other hand it relieves him of searching for reference through the more extensive class of nouns. Since the child's speech at this stage is almost wholly attached to the ongoing situation the fact that he more often chooses pronouns for reference may not hinder his communication with others. It may be that choosing in this way often excludes the possibility of representing attributes however.

This question of choice of reference has received some attention in the study of the language of five year olds which is being carried out at the Sociological Research Unit at the Institute of Education, University of London, under Professor Bernstein (Hawkins 1968).

The concepts of reference and cohesion within and between clauses are taken from a paper by Hasan (1961). Reference can be made forward or backward within the utterances. The terms used here are "anaphoric reference" which refers backwards as in "The boy kicked the ball and it broke the window". A second type of reference termed "cataphoric" which refers forwards as in "It was the ball that broke the windows" is less frequent and did not appear in the data. A third type of reference, termed "exophoric" refers outwards to the context of situation "It broke that" where there is no information in the narrative to identify the referent of "that". Hawkins found little difference between five year olds from middle class and working class homes in the use of "anaphoric" reference but found "exophoric" reference to be used half as often again by working class children as by middle class children. Middle class children more frequently used a noun for reference.

The data was analysed in order to discover whether differences existed between the favoured and less favoured group in the anaphoric and exophoric use of pronouns.

Results

Table 4. The use of pronouns

	Favoured Nursery	Favoured non-nursery	All favoured	Less favoured nursery	Less favoured non-nursery	All less favoured
Instances of anaphoric reference	347	244	591	166	68	234
Instances of exophoric reference	1,142	1,065	2,207	1,525	1,261	2,788
Anaphoric as % of anaphoric + exophoric references	23.3	18.6	22.8	9.8	5.1	7.7

The number of instances of the use of anaphoric reference by each child is calculated as a percentage of the number of instances of both anaphoric and exophoric reference and a ranking test is applied (Mann Whitney U test Siegel 1956 p.116). The difference between the favoured and the less favoured groups is significant beyond the p = .001 level.

Differences which are seen to exist between the two favoured groups and the two less favoured groups are not found to be significant.

3. Utterance length and complexity of structure

Early studies of children's language generally concentrated on the analysis of traditional grammatical elements (Day, 1932; Davis, 1937; McCarthy, 1953; Smith, 1933; Williams, 1937). Templin (1957) uses this method in a normative study of the growth and interrelations of articulation of speech sounds, sound discrimination, vocabulary and sentence structure in children from a representative sample of the urban population of U.S.A. between the ages of three and eight. Three measures were found to distinguish levels of development, mean sentence length, complexity of structure and certain aspects of vocabulary.

In the present project no evidence has yet been found which suggests there is a wide difference in the vocabulary of three year old children from favoured and less favoured background, but this may be a reflection of the artefacts of the speech sampling situation. Differences are seen to exist in the use of adjective and conjunctions. Attention is given to the use of the adjective in the next section and the use of the conjunction is reflected in the analysis of complexity of structure.

The unit for study in the Templin work was the complete sentence. To take this as the unit for this study would have excluded a major part of three year old speech since because of their immaturity they display many irregularities. For this reason the unit was taken as the complete utterance, i.e. the sequence of words which appears to have completeness for the child. Templin distinguishes between compound, complex and elaborated forms and the same protocols have been observed here. Both length and complexity of utterances are found to distinguish the favoured and less favoured groups as shown in Table 5.

Table 5

	FAVOURED							LESS FAVOURED						
	Nursery			Non-nursery			Total fav:	Nursery			Non-nursery			Total less favoured
	Girls	Boys	Group	Girls	Boys	Group		Girls	Boys	Group	Girls	Boys	Group	
No. utterances	642	870	1510	749	663	1412	2922	950	940	1890	734	787	1521	3411
Mean length of utterance	6.2	5.9	6.0	5.3	5.7	5.5	5.8	4.5	4.0	4.3	3.4	3.8	3.6	4.0
Mean length 5 longest utterances	15.1	15.4	15.3	13.3	12.4	12.8	14.1	10.6	8.3	9.5	6.9	7.5	7.2	8.3
No. compound utterances	16	30	46	14	9	23	69	15	3	18	1	2	3	21
No. complex utterances	49	64	133	33	46	79	212	25	12	37	10	5	15	52
No. elaborated utterances	11	15	26	8	8	16	42	1	0	1	0	0	0	2
Total compound complex and elaborated	76	109	205	55	63	118	323	39	15	56	11	7	18	75
Use of clauses	59	85	144	40	52	92	236	25	12	37	10	5	15	52

Mean length of utterances

Mean length of utterance for both favoured groups is found to be 5.8 and for the less favoured groups 4.0. The differences are consistent between members of the groups, and using a Mann Whitney U test on ranks the difference is found to be significant beyond the level of $p = .001$.

Unexpected differences were also found between the two favoured groups and between the two less favoured groups, although the level of significance is less, the former $p = .05$ and the latter $p = .01$

Complexity

Analysis of the data shows that complexity of structure is just beginning to make an appearance in the speech of three year olds. The instances of use are relatively small, and to test the significance of this does not appear appropriate. Nevertheless that the appearance of complexity occurs four times as often in the favoured groups as in the less favoured groups is of interest, as is the fact that considerable difference is seen between the two favoured and the two less favoured groups.

4. Expansion within the noun phrase and the verb complex

The gradual increase in the length of utterance is accomplished, it would seem, as the result of three processes, by the increase in the use of clauses,

and by the completion and expansion of two components, the noun phrase and the verb complex. In respect of the speech of these three year olds it seems that the growth in complexity is not sufficient to account for the differences in mean length of utterance between the favoured and less favoured groups. Cazden (1965) has devised a method of measuring the development of the noun phrase and the verb complex in the speech of groups of underprivileged pre-school children. These measures have been extended to accommodate the greater skill and level of development of the children in the present study.

The Noun phrase

The Cazden noun phrase index fixes a score for all elements which can occur within the noun phrase. It is based on complexity in the use of nouns and adjectives, except where there is evidence of a developmental order of appearance.

Using this measure differences are found between favoured and less favoured groups which are significant beyond the level of $p = .001$ (Mann Whitney U test). Differences are also found between nursery and non-nursery less favoured groups which are significant at the same level.

The effect of the difference in frequency of choice of the noun phrase for reference is indicated by relating the instances score to the total number of occasions on which the child made the choice between noun and pronoun. It is possible that children in the less favoured groups use lower scoring noun phrases more often than the favoured groups use the higher scoring noun phrases. This is found not to be the case. In fact the favoured group use more complex noun phrases than the less favoured group use less complex noun phrases. Comparing on instance/opportunity scores the differences are found to be significant beyond $p = .001$ between favoured and less favoured groups and between nursery and non-nursery less-favoured groups. Information is given in Table 6.

Table 6 Noun Phrase Index

	Favoured Groups							Less favoured Groups						
	Nursery			Non-nursery				Nursery			Non-nursery			
	Girls	Boys	Group	Girls	Boys	Group	All fav.	Girls	Boys	Group	Girls	Boys	Group	All lessfav.
No opport-unities	1032	1364	2396	1036	1061	2124	4520	1272	1290	2562	917	960	1877	4439
No.of instances	569	781	1350	542	519	1061	2411	595	680	1275	355	367	722	1997
Score all instances	1257	1825	3082	1138	1127	2265	5347	1160	1399	2559	610	667	1277	3836
Mean instance score	2.21	2.34	2.28	2.10	2.17	2.14	2.22	1.95	2.06	2.01	1.72	1.82	1.77	1.92
Instances x 100 / opportunities	55.24	57.26	56.34	50.99	48.92	49.95	53.3	46.78	52.71	49.77	38.71	38.23	38.47	45.0
Instances score / opportunities	1.22	1.34	1.29	1.10	1.06	1.07	1.18	.91	1.08	1.00	.67	.70	.68	.86

Verb Complexity

It is clear that young children face several problems in developing the use of the verb. There are the problems of observing the morphological rules, and at the syntactic level of using verb auxiliaries which provide the means of encoding particularised meanings.

Cazden has extended the idea of Smith (1933) and Bernstein (1962) in developing a measure of verb complexity. Points are assigned to each element in the verb complex and to each operation, (that is to transformations). This system has been extended to accommodate the more complex verb development in the speech of the three year olds in this project.

Differences are found to exist between the favoured and less favoured groups on the mean score for the verb groups. (Table 7)

Table 7 Verb Phrase Index

Favoured Groups	Number of instances scoring as below 1	5-	6+	8+	10+	Total instances	Mean Score
Nursery girls	82	347	267	65	4	614	4.45
Nursery boys	121	557	276	76	8	833	4.1
Nursery Group	203	904	543	141	12	1447	4.25
Non-nursery girls	77	326	232	59	8	558	4.45
Non-nursery boys	74	369	213	65	3	582	4.38
Non-nursery Group	151	695	445	124	11	1140	4.41
All favoured	354	1599	988	265	23	2587	4.33
Less-Favoured Groups							
Nursery girls	210	560	241	52	4	801	3.64
Nursery boys	158	511	204	34	0	715	3.73
Nursery Group	368	1071	445	86	4	1516	3.68
Non-nursery girls	163	425	63	13	0	488	2.79
Non-nursery boys	166	454	93	21	0	547	3.1
Non-nursery Group	329	879	156	34	0	1035	2.95
All unfavoured	697	1950	601	120	4	2551	3.32

Using the Mann Whitney U test the difference between the favoured and less favoured groups is of a significance beyond the level of p = .001. On this measure the non-nursery favoured group has a higher mean score than the nursery favoured group but the difference is not found to be significant. The nursery less favoured group is found to have a higher mean score than the non-nursery less favoured group and significance of the difference lies beyond the level of p = .001.

5. A functional analysis

This is an attempt to analyse the purposes for which the child uses language and is based on functions which have been recognized and examined in the work of Piaget (1926), Vygotsky (1962) and Luria and Yudovitch (1959). It provides a set of broad categories, offering characteristics which can be recognised objectively: a correlation greatern than .9 occurred between the marking of the investigator and of an independent marker or a one-tenth random sample of the scripts. Sub classifications proved to be less reliable, however, and have not been included.

The classification distinguishes

(1) language which functions for the satisfaction of self-needs, and to maintain the status of the self.

(2) language which is closely associated with the child's actions and which (a) supports the child's actions or (b) extends action by anticipation and planning, or by effecting action through collaboration with others.

(3) language which is not so associated with action but serves to provide information (a) as a commentary reflecting only that which is observable in the ongoing situation (b) as an extension, giving information which is not observable in the ongoing situation.

A further distinction is made between language which refers to the real situation and that which is used to support or develop an imaginative or fantasy situation. Thus if categories 2 and 3 above relate to the real situation two further similar categories relate to the imagined situation providing:

(4) language which serves (a) to support action in an imagined or fantasy situation (b) to extend action and the imaginative situation, or by collaboration to effect such an extension.

(5) language which is not closely associated with action, but which (a) supports the imaginative situation by commentary on what is observable or (b) gives information about imagined but not observable extension of the situation (c) provides the language of a role being played.

An attempt was made to distinguish between language which seemed to require no listener other than the self and that which was addressed to other children or to the adult. The less favoured groups used slightly more speech which appeared to be for the self only than the favoured groups (17% and 13.6% of all speech respectively.) The favoured groups on the other hand addressed the

adult more frequently than the less favoured groups (30.9% of 18.9% of all utterances respectively.) There were differences here between the nursery and the non-nursery groups. The favoured non-nursery group addressed the adult almost twice as often as the nursery favoured group (41.2% and 21.1% of all utterances,) and contrary to expectations the less favoured non-nursery group addressed the adult relatively more often than the less favoured nursery group (23.0% and 15.6% of all utterances.)

A final category for analysis is provided by the child's questions. The analysis of questions shows little difference in function between the groups. The one clear difference lies in the number of questions which seek for explanations. Such questions are infrequent, twenty eight are asked by the favoured groups and six by the less favoured groups and account for 6.2% and less than .9% respectively of all the questions asked by the group.

Table 8 summarises the remainder of the findings from this analysis.

Table 8 A CLASSIFICATION OF THE FUNCTIONS OF CHILDREN'S LANGUAGE

		FAVOURED GROUPS			LESS FAVOURED GROUPS		
	Reality based	Nursery	Non Nursery	All fav.	Nursery	Non Nursery	All less fav.
*	Self needs & Self status	81	119	200	293	225	518
**	Supporting Action	145	130	275	497	567	1064
*	extending action: collaboration	66	23	89	27	7	34
*	Commentary (no action)	212	233	445	422	581	1003
*	extension of information	334	291	625	168	87	255
	Totals reality based	838	796	1634	1405	1467	2874
	Imaginative basis						
	Supporting action	227	264	491	256	89	345
**	extending imaginative situation	425	238	663	107	13	120
	language of role	49	26	75	113	2	115
	Commentary (no action)	26	54	80	45	10	55
**	extension of information	69	123	192	34	10	44
*	TOTAL imaginative basis	796	705	1501	555	124	679

* categories in which one group scores twice as often as the other

** categories in which one group scores at least three times as often as the other

Comment

Features which distinguish between the favoured and less favoured groups are:

(a) The less favoured group used speech almost three times as often as the favoured group to secure attention for their own needs and to maintain their own status by defending or asserting themselves in the face of the needs and actions of others.

(b) The favoured groups used language five times as often as the less favoured groups for extending or promoting action, and for securing collaboration with others: language is seen to play a directing or controlling role more frequently.
The less favoured groups used language more often as part of, or as a support to ongoing action: language tended to accompany action rather than to control or direct it.

(c) The favoured groups used language almost three times as often to convey information to the listener which was not apparent from the concrete situation: it is used more frequently for projection from the present situation and for the creation of imagined situations.

(d) The favoured groups used more than twice as much speech for the promotion of imaginative play as the less favoured group, and more than five times as much for projecting beyond the use of concrete materials for creating an imagined situation.

Conclusion

It is clear that the findings support the first hypothesis: differences in the use of language by three year old children from favoured and less favoured home background have been identified. Some small differences in the use of language by the nursery and non-nursery groups have also been found: factors other than that of nursery schooling (a mean length of about eight weeks) may account for this.

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