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# Language acquisition in low-income Black children.

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# LANGUAGE ACQUISITION IN LOW-INCOME BLACK CHILDREN

A Thesis Presented

By

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## GENERAL INTRODUCTION

The purpose of this study is to describe the early productive language of some low-income Black (LIB) children, and to describe some features of their language environments. The data consist of one to three hours of mother-child interaction tape recorded by the mother in the home, for four LIB mother-child pairs. The report is organized as follows. First, there is this general introduction, outlining the motivation for the study and a description of how the data were collected. This will be followed by three chapters presenting data: Chapter 2 - Children's Speech, Chapter 3 - Mothers' Speech, and Chapter 4 - Mother-child Interaction. Each of these chapters will contain its own introduction, methods, and results. Finally, there will be a summary of the major findings.

The topic of language development in LIB children has been an area of considerable controversy, with claims being made both for and against the existence of a developmental deficiency in language skills. In the 1960's, a position which has become known as the 'cultural deficit' hypothesis (Cole and Bruner, 1975; Ginsburg, 1972) became popular as a way of accounting for the cognitive - and

linguistic - profiles of low-income children. This hypothesis stated that young low-income children suffer from a variety of cognitive deficiencies, and that these deficiencies could be traced to inadequate stimulation in the early years of life. The cultural deficit hypothesis was applied to language development by such investigators as Bereiter and Engleman (1966), Blank and Solomon (1968), Deutsch et al (1967), and Hess and Shipman (1965). All of these investigators claimed to have found evidence of serious language deficiencies in low-income children, and all fest these could be traced to inadequacies in the verbal environments of these children. Such claims had a significant impact upon preschool programs for low-income children. Indeed, in 1968, an SRCD monograph was published which took as a given that low-income children have deficient language, and presented the views of a variety of psychologists and educators on how best to remedy those deficiencies (Brottman, 1968).

The cultural deficit hypothesis has received some strong criticism, both on a general level (Cole and Bruner, 1975; Ginsburg, 1972), and for language in particular (Labov, 1972). Labov charged those who had found language deficiencies in LIB children with making two kinds of errors. First, previous investigators had sometimes treated such things as past tense -ed deletion, third

singular -s deletion, and double negation as being signs of deficient language, when in fact they appear to be features of a Black Dialect. Second, Labov argued that other investigators had often been guilty of a sociolinguistic insensitivity. In his studies, Labov found that 'test' situations typically led to LIB children becoming very brief and evasive in their speech, which could give the impression of a language deficiency. Labov suggested that researchers need to be especially sensitive to the conditions under which speech is produced (or not produced) before making conclusions about relative language competence. Cazden (1970) has make a similar argument.

Labov's work on Black Dialect and on the uses of language by LIB children was done primarily with young teenagers as informants. Very little research has been done on early language development in LIB children. The present study is an attempt to begin such research. The procedure of having the mothers tape record their children's speech in the home during times when speech was likely was adopted in order to get as natural a sample of the children's and mothers' speech as possible. The presence of an observer is known to have substantial effects on the speech of middle class (MC) mothers to their children (Graves and Glick, 1978), and it was felt

that such distortions of usual patterns would, if anything, be even more severe for LIB mothers. These mothers probably have especially high concerns about being perceived as 'good' mothers, and having their children perceived as being 'intelligent'. It was hoped that the less intrusive tape recorder would lead to more natural mother-child interactions, though this assumption is in need of testing.

A serious limitation on the study was that no middle class mother-child pairs were sampled. Therefore, the data for the LIB subjects could be evaluated only with respect to MC results published in other studies. This procedure is a dangerous one, in that other studies have not used the same method of collecting speech samples. This caution on social class comparisons will have to be repeated in several places in the report.

Given the above limitation, the present study addressed the following questions. Were the LIB children acquiring language at the same rate and in the same way as MC children (Chapter 2)? Were the LIB mothers accomodating their speech to their children in the same way as MC mothers do, and could any variations in types of accomodations be related to individual or class differences in language development (Chapters 3 and 4)?

The following is a description of how the data were

collected.

The subjects were sampled from an infant-toddler daycare center in Springfield, Massachusetts. This day-care center admitted only children whose mothers were low-income and also were enrolled in some kind of educational or training program, and who thereby qualified for state assistance to place their children in a daycare center.

Originally, nine mothers were contacted and paid. But, only four supplied usable data. Two mothers returned blank tape. One mother returned a tape that was too noisy to transcribe, due to the presence of siblings. One mother's daughter appeared not to be speaking yet, and the majority of the interaction was blatantly directed towards producing a performance for the tape recorder. Finally, one mother returned only twenty minutes of material.

The remaining four mothers returned one to three hours of recorded speech. The children were 20-21 months (1), 26-27 months (2), and 33-34 months (1). The ages could not be determined exactly because of the long delay between when mothers were supplied tape recorders and when they returned them.

The mothers were told that this was a study in how children learn language. They were instructed to turn the tape recorder on at home during times when the child

was likely to be speaking, such as meal times, bath times, and play times. The mothers were given three hours of blank tape and nine dollars in advance for recording all three hours.

There are some general limitations on the data collected which need to be noted. First, with only four subjects, this can hardly be considered a 'normative' study. Second, relatively little data was collected per subject. Third, there was no description of the interactions independent of what was recorded. The seriousness of this last deficiency varied with the types of analyses being done, being the most serious in the analyses of the mother-child interactions. These three limitations - as well as the lack of an MC group - mean that the present results should be considered only tentative.

Very briefly, the major results were that there did appear to be a delay in the rate of language development in this sample of LIB children, though they seemed to be following the same course of structural development as MC children. There was a variety of evidence showing that the LIB mothers were accomodating their speech to their children, though some differences from MC mothers were found. It is not known whether those differences were powerful enough to account for the apparent social class difference in rates of language development. The

finding of an apparent language delay in the low-income children suggests that a larger study, with a more detailed description of LIB and MC children's language environments is needed.

# C H A P T E R II

## THE CHILDREN'S LANGUAGE

### Introduction

The major issue addressed by this study was whether there are differences in early language development between low-income Black (LIB) children and middle class (MC) children. It was suggested in Chapter 1 that existing data on this issue are both scarce and problematic. This chapter will report the results of analyses of the speech of the present sample of LIB children, and will, wherever possible, compare these with results typically obtained from MC children. A limitation on all of the results in this section is that they are based on the children's productions. To the extent that comprehension precedes production, the results here will underestimate syntax competencies. The various types of measures used are described below.

First, the question of whether there is a difference in rate of syntax development between two groups can be translated into the question of whether the function relating age and some global measure of syntax competence is the same for the two groups. The global measure of syntax competence selected for use in this study was mean length of utterance (MLU). MLU was chosen because it has been almost exclusively the measure of choice among other investigators

of early language, and was therefore the measure for which the most MC data could be found. It is well known that age and MLU do not correlate especially highly, so any comparison of an MC sample with the small LIB sample in this study (N=4) must be considered only tentative.

Some variations of the standard MLU were also calculated for the LIB children, since it was felt that MLU has some unfortunate properties as an estimate of syntactic competence. Specifically, it seems too sensitive to one-morpheme utterances, which show no evidence of at least a surface syntactic structure, and to some phenomena such as exact utterance repetitions, which do not appear to be syntactically creative utterances. These problems, and the proposed alternative global measures of syntactic ability, will be described in more detail in the Methods section.

In addition to the global measures of syntax development, there were four codes for generating structural descriptions of the utterances the children produced. These types of results allowed us to ask the question - given that we equate LIB and MC children on MLU, do the LIB children show any differences in the types of syntactic constructions they use? So, for example, if the LIB children are shown to lag behind the MC children in their overall rate of syntax development, is it nonetheless true that they are going through the same kinds of developmental

changes, or does their development follow some other path?

A structural description code for characterizing one-morpheme utterances was constructed for the present data, for which there were no comparable MC data. It was included to provide a desription of the language of one of the children (Bobby), who was in the one-morpheme stage, and because it provided some useful data on individual differences among the children.

Two of the other structural description codes were taken from Roger Brown's summary and synthesis of research on early language development (Brown, 1973), namely his 'Stage 1' and 'Stage 2' codes. There were two reasons for making use of these codes. First, of the LIB children producing multi-morpheme utterances, two (Luanne & Thomas) were solidly within the boundaries of Brown's Stage 1, and the third child (Jackson) was solidly within the boundaries of Brown's Stage 2. Second, at least for Stage 1, Brown reported results for what is in early language research a substantial number of children (N=12). Social class information was not reported on all of the children, but I can only assume Brown would have mentioned whether any of the children were low-income. A more serious problem was that seven of Brown's subjects were from non-English speaking countries. Brown did not find any differences among the children as a function of country or language, and used

that fact to suggest universality of the 'Stage 1' period of early language development. Though the size of Brown's sample was clearly insufficient to support conclusions regarding universality, the suggested universality of Stage 1 implies that any divergent results found for the sample of LIB children would be quite surprising. As for Stage 2, Brown reported data only for three children, and only one other study (deVilliers & deVilliers, 1973) presents additional relevant data (providing five more MC subjects). Clearly, for both stages the social class comparisons will have to be considered tentative.

'Stage 1' was designed to apply to the period of language development bounded by MLU's of one and two morphemes. It consists of a core set of eight two-term semantic relations, plus two ways of structurally elaborating sentences composed of those basic relations (see Tables 6 and 7). The eight basic relations consist of such things as Agent-Action, Action-Object, Possessor-Possessed, Entity-Location, and Entity-Attributive. The two means of expanding upon these basic two-term relations were (1) expansion of an NP by adding an article, possessive, or attributive, and (2) concatenation of the relations.

The Stage 2 code was designed to apply to the period of language development bounded by MLU's of 2 and 2.5 morphemes. It is concerned with the child's control over

fourteen different grammatical morphemes - such things as plural noun inflection, some verb inflections, and auxiliary verbs. The Stage 2 code can also be used to assess some possible impacts of Black Dialect on language development. As Brown (1973) has pointed out, Black Dialect is known to involve deletion of certain of the grammatical morphemes - in particular the contractable copula, auxiliary be, and regular past -ed. In this study we will be able both to describe the mothers' tendencies to delete those morphemes, and to look for any deleterious impacts of deletion on the children's acquisition of those morphemes.

The Stage 1 code accounted for an average of 70% of Brown's MC children's utterances. This meant an average of 30% of the utterances were relegated to what Brown called the 'Other constructions' category. Since it was important in the present study to provide some description of the remaining utterances, an 'Other Constructions' (OC) code was designed. Basically, the code was meant to classify utterances in terms of how 'distant' they were in principle from acceptable Stage 1 utterance types. For example, some utterance types (Vocatives, Nominations) are commonly found in early speech but were not included in the Stage 1 code. Hence, these would be assigned zero distance. Other utterances might differ by the presence of some Stage 2 grammatical morpheme. And, other utterances might involve

constructions not found in either Stage 1 or Stage 2.

To sum up, the major questions asked about the LIB children's speech were:

1) Do the LIB children differ from the MC children in their overall rate of syntax development?
2) Do different measures of overall syntax competence lead to different estimates of the relative syntax competencies of the LIB children?
3) Given that LIB and MC children are equated on MLU, do the LIB children show the same structural types in their utterances?
4) If the mothers are speaking Black Dialect to some degree, does that influence the children's rate of acquisition of any of the grammatical morphemes?

## Methods

In the Introduction, the need for measures of overall language competence as well as for some sort of structural description of child utterances was described. This section will describe the measures selected for use in this study.

Global measures of language competence. The most popular measure of language development has been MLU, and within certain limits it appears to be a useful description of language development. In his review of child language,

Brown (1973) concluded that for values of MLU between one and four, that statistic functioned well in diagnosing significant developments in children's syntax. For the children in the present study, MLU was calculated using a slightly modified version of the rules given by Brown (see Appendix 1).

Though it was necessary to rely on MLU for comparative purposes, it was felt that the measure had two significant weaknesses. For one thing, exact immediate repetitions of an utterance were included in the calculation. MLU is often used (and was used in this study) to estimate level of syntax competence. When used for such a purpose, it seems desirable to exclude phenomena which are likely to reflect non-competence-related processes. Exact repetition seems to be a good candidate for just such a process - rather than reflecting some fresh attempt at sentence creation, it is more likely drawing upon immediate memory for such purposes as emphasis, or making oneself heard better. Exact repetitions occurred rather frequently in the speech corpora, so MLU was recalculated excluding exact repetitions.

A second weakness of MLU is that it includes one-word utterances, which in the present study accounted for a clear majority of each child's utterances. On the one hand, one-word utterances are a striking comment on the syntactic

immaturity of an individual, and so should be represented in any global measure of language competence. On the other hand, these individuals are producing multi-word utterances, and one might want a measure which gets at the language competence of an individual given that he/she is going to put together a multi-word utterance. The concern is that the frequency of one-word utterances might be substantially affected by factors outside of competence in sentence grammar, and if so those utterances should be devalued somehow in a global measure of language competence. That concern was assuaged in this study by calculating the 'upper bound' (UB) on utterance length, which was defined as the mean length of the top 10% of the utterances when utterances are ranked according to length. The UB was calculated both with and without repetitions.

It was possible for the purpose of this study to generate a regression function relating age and MLU based on a relatively large amount of data (81 child-MLU pairs). The data were collected by reviewing recent studies of early language development which reported both age and MLU for each subject (Bloom, Lightbown, and Hood, 1975; Bowerman, 1973; Brown, 1973; deVilliers and deVilliers, 1973; Goldin-Meadow, Seligman, and Gelman, 1976; Greenfield, 1977; Leonard and Schwartz, 1978). It was intended that the data be for MC children, but not all studies reported social

class information. It was decided that data from a study would be used if it either explicitly reported that its subjects were MC, or if it did not report any information about class. The assumption was that if the children were low-income, that fact would have been explicitly reported given the well-known possible links between social class and language development. A further difficulty in obtaining MLU data was that most studies did not provide the rules used for calculating MLU. While there are alternative ways, and these various ways can differentially affect the outcome, it was decided not to demand that all studies be known to use the same rules for calculating MLU. The reasons were that differences would probably be attenuated in the averaging process, and most studies probably used something similar to Brown's (1973) rules anyway.

One-morpheme utterance code. So far as the goal of assessing competence in syntax is concerned, one-morpheme utterances are something of a nuisance - they tend to obscure a child's abilities in systematically putting morphemes together into 'sentences'. Yet, the high frequency of these short utterances tells us that the child relies heavily on them, and surely we would learn a great deal about a child's language system by understanding the conditions on the production of one-morpheme utterances. Unfortunately,

because the method of data collection in this study resulted in confining knowledge about context to that which could be inferred from verbal-vocal interactions between mother and child, the present data are not well suited to investigating these highly telegraphic utterances. Nonetheless, a rough coding scheme was devised to get at the general types of functions served by one-morpheme utterances. Its purpose was only to give an overall impression of what kinds of things were going on when the children used one-morpheme utterances. There were no middle class norms available for comparative purposes.

The code was designed to make two kinds of distinctions. First, a substantial proportion of one-morpheme utterances consisted of a small set of words, each of which occurred frequently, and each of which essentially defined a speech function. These were: yes/OK/right - Affirmation, no - Negation, what - Get Clarification, Mommy - Get Attention, and hi/thankyou/etc. - Social Recognition (for lack of a better term). One distinction, then, is to separate these from speech functions which potentially have a more open vocabulary membership (Command, Label object, Label object property). The distinction is of interest because the 'non-open' functions seem to represent a use of one-morpheme utterances which is quite 'natural' - natural in the sense that the same functions occur in adult-adult speech, and

the same morpheme types are typically used to fulfill the functions. The 'open' functions seem to be less natural in that sense. This is not to say one would never observe one-morpheme utterances in adult-adult speech which serve Labelling or Commanding functions, but only that relative to the non-open functions, the situations which give rise to such utterances are distinctly more rare. Essentially, the suggestion is that the non-open speech functions represent a usage of one-morpheme utterances which is not at all peculiarly unique to immature language, whereas the open speech functions do represent usage of one-morpheme utterances that is more commonly characteristic of early language.

The other major distinction in the one-morpheme code was between the Labelling (Object and Object property) and Command uses of one-morpheme utterances. The motivation for this was to separate those which served to regulate activity from those which seemed to be more of a cognitive exercise.

Brown's Stage 1 code. The characteristics of this stage have already been described in the intoduction to this chapter, and a listing of the utterance types it contains can be found in Tables 6 and 7. The use of this classification scheme requires what Brown (1973) has called 'rich interpretation'. That is, classifying a particular

utterance may require knowledge of the immediate behavioral context in order to disambiguate it. The now-classic example of such ambiguity is Bloom's (1970) Mommy sock, where 'Mommy' can receive three different functional interpretations (Agent, Possessor, or Object), and only context can allow an oberver to choose among the three. In this study contextual information was not directly recorded, so the capacity for 'rich interpretation' was to some degree compromised. By and large, however, there were few cases of structurally ambiguous utterances. Admittedly, it was sometimes necessary to assume that a child was following adult conventions when he/she used some particular word order, and this type of assumption suggests a circular argument. However, there were sufficiently many occasions on which context was available (usually consisting of the mother's response) and the assumption proved to be correct, to make extension to the remaining cases warranted.

Brown's Stage 2 code. A listing of the Stage 2 grammatical morphemes can be found in Table 7. The procedure for describing morpheme usage is to locate all utterances in which one or more of the morphemes are obligatory, count up the number of obligatory contexts in which a particular type of morpheme was actually used, and express that number as a percentage of the total number of obligatory contexts

for that morpheme. Context can be either linguistic (e.g., a third person singular subject obligates present tense verb to be inflected) or behavioral (e.g., reference to ongoing action requires use of the progressive inflection). It is probable that the lack of independent description of nonverbal behavioral context in this study resulted in relatively fewer identifications of obligatory contexts. But, it was still possible to generate a sufficient number of these cases for analytic purposes.

Other Constructions code. The purpose of this scheme was to describe all those utterances which failed to meet the criteria for Brown's Stage 1. In particular, it attempted to express in some way how 'distant' any non-Stage 1 utterance was from typical Stage 1 language. Consequently, the code was built up out of clusters of utterance types, with each cluster having some particular relative 'distance' from typical Stage 1 constructions. Seven clusters were defined, and are described below.

Category 1. Firstly, there are some utterance types which Brown and others usually find in Stage 1 speech, but which Brown did not include in his Stage 1 classification scheme. Some of these were just too simple to be included: nomination (article + noun), vocatives (noun of direct address + X), greetings, and I put all gone here because it

was probably just a single morpheme. There is no evidence that children of this age have an independent and creatively used concept of 'all' in their lexicon. Some other utterance types were too 'complex' to be included in the code, because they were types whose genesis Brown was going to focus on in discussions of the later stages of language development. These were simple Wh-questions and simple negatives.

Before describing the remaining major categories in the Other Constructions code, it is necessary to consider what the major features of Stage 1 are, around which some rough notion of 'distance' from Stage 1 can be defined. Brown seemed to ascribe two major properties to Stage 1 speech. First, it expresses a limited set of semantic relations. Brown put eight basic two-term relations in his code, and he recognized seven other relations as occurring occasionally (e.g., experiencer, classificatory, etc.). Second, Stage 1 speech is 'telegraphic' - it consists almost exclusively of content words, with the small grammatical morphemes being very rare. Distance from Stage 1 can, then, be expressed as a condition of differing on one or the other or both of these defining features.

Category 2. This category consists of four cases which appear to violate one or the other of the above two features but for which it can be argued that the violations are only

apparent - not real. Now, it must be admitted that for none of the four cases will there be conclusive evidence that they really do conform to the features of Stage 1 language. The criteria for proposing an utterance type as being a 'pseudo-exception' to Stage 1 language were the following: (1) the utterance type occurs with moderately high frequency ($n \leq 5$) in at least one child; (2) the tokens of the utterance type counted towards meeting criterion 1 must be telegraphic - that is, contain none of the grammatical functors illegal in Stage 1; (3) the utterance type must semantically be describable entirely in terms of the Stage 1 repertoire of semantic relations; (4) a plausible argument can be made which structurally reinterprets the pseudo-exception into an acceptable Stage 1 format. The first two criteria are sufficiently straightforward, but the latter two are the weak links in that intuitive plausibility is the strongest form of proof that can be offered. However, as further defense for the general category, it should be noted that the number of cases found to meet the criteria was rather small ($n=4$) - admittedly if a large number were found, one would rightfully be suspicious that a real divergence from Stage 1 language was being papered over. The following are the four cases permitted into the code.

The first case is use of want to make a request involving possession of an object or getting an action. This took the forms: 'Subject + want', 'Want + Object', and 'Subject + want + Object'. Getting an object or action is a type of event codable within the semantics of Stage 1 language, but these utterances are excluded from Stage 1 by virtue of want, which is technically an experiencer verb conveying a fact about the speaker's mental state. Only Action verbs are permitted in Stage 1. However, it is suggested that the request use of want could be learned as such without explicitly learning its experiential aspect. In this regard, it should be noted that experiencer verbs were rare, and, when they occurred, were primarily perceptual (e.g., hear, see, smell). In one sense it makes little difference whether want is treated as a pseudo-exception, since Brown did include experiencers within the extended range of semantic relations occurring Stage 1 speech. However, use of want was not a rare occurrence in this sample, and plausoble arguments can be made that it is not, at this early age, a true experiencer.

The second case is use of what I have called 'verb + motion particle'. These are phrases such as sit down, get down, get up, move over, etc., in which there is a verb describing some kind of motion, immediately followed by a particle (a preposition-type word) which seems to modify

the nature of the motion. These utterances take the form of 'Verb + Motion particle', or 'Subject + Verb + Motion particle'. Because of the particle, these utterance types are excluded from Stage 1. It is suggested that these Verb(V) + Motion particle(MP) strings could be learned as single morphemes, in which case they would not be exceptions to Stage 1. The data are consistent with other interpretations, however. The above examples show down being combined with two different verbs. From this observation one might propose that this child has a lexical rule which creates new verbs by adding MP's to the various verbs of motion. Data to rule out this alternative interpretation are not to be found in the present study. Essentially, the decision was made here by choosing the 'conservative' position - from what we know about Stage 1 language (via Roger Brown), lexical or syntactic rules for generating V + MP constructions are less likely than learning such things as unanalyzed strings.

The third case is possessive use of got. These took the form 'Subject + got + Object'. The coding of possession in Stage 1 is permitted expression only through direct juxtaposition of the Possessor and the Possessed. It is suggested that no violence is done to the defining features of Stage 1 if got is permitted as an alternative means of expressing possession - this form is both semantically

permissable and telegraphic in structure.

The fourth case is imperative use of look at. This takes the form 'Look at + NP'. Semantically, the action involved - a person performing a simple, concrete action with respect to a named object - is within the Stage 1 repertoire. The at disallows this type of construction from Stage 1, however. Look at is akin to the V + MP constructions, except that it is likely that in mature syntax at is a true preposition, whereas the MP's are not. As in the case of the V + MP constructions, the argument here is that to choose the alternative interpretation (i.e., interpreting at as a preposition) is to choose, without the benefit of conclusive evidence, the more unlikely interpretation.

These, then, are the four cases which appear to be vocabulary based 'pseudo-exceptions' to Stage 1 language. To sum up: two cases require reinterpreting two morphemes as just one (V + MP, look at); one case involves claiming a verb does not mean exactly what it technically means (want); and one case involves permitting in a non-Action verb which otherwise meets the semantic and structural conditions on Stage 1 language (got).

Category 3. The third category of the OC code consists of utterances which express one of the 'rarely observed' semantic relations that Brown (1973) described, with the

constraint that the utterance be telegraphic in structure. Brown's listing of these rare semantic relations, together with his examples, is reproduced below (Brown, 1973, p.179):

1. Instrumental (Sweep broom)
2. Benefactive (For Daddy)
3. Indirect object datives (Give me book)
4. Experiencer or person affected datives (Adam see)
5. Comitatives (Go Mommy)
6. Conjunctions (in the sense of simply naming present objects, as when Kendall said, Kimmy Phil)
7. Classificatory (Mommy baby)

Brown hedged on whether these semantic relations should be excluded from Stage 1, saying that perhaps larger samples might result in justifying their inclusion.

To sum up the first three categories of the OC code: the first category encompasses utterance types which are uncontroversially found in Stage 1 level language; the second category encompasses utterance types which, given some plausible (but not proven) assumptions, can also be assigned Stage 1 status; the third category brings in some semantic relations which Brown found, but found only rarely, in Stage 1 speech. All three of these categories can be considered to be within Stage 1, though the third

one is somewhat peripheral.

Category 4. The fourth category consists of utterances which meet all the Stage 1 criteria or the conditions set down in Categories 1 and 2, except that they contain one or more of the Stage 2 grammatical morphemes.

Category 5. The fifth category consists of utterances which meet all the conditions of Category 3, except that they also have one or more grammatical morphemes embedded within them.

Both Categories 4 and 5 are more distant from Stage 1 language than Categories 1-3, with Category 5 perhaps being somewhat more distant than Category 4. The remaining two categories are 'garbage' categories.

Category 6. The sixth category is a hodge-podge of utterance types. The constraints were: (1) there be at least three tokens of something that looked like a type; and (2) except for the type itself, all other semantic relations be ones which are permitted in Stage 1 or Categories 1-5. The purpose of this category is to communicate in a rough way what types of things were going on in the children's utterances not captured by the preceding categories. No other use will be made of the results. It will include such utterance types as complement constructions, complex Wh-questions, yes-no questions, and so on.

Category 7. The seventh category is the 'left-over'

category - all remaining multi-morpheme utterances not captured by Categories 1-6 are put here. The utterances here were of varying complexity, but in every case the number of tokens per type was too small to warrant any categorization.

## Results

The description of results will begin with the global indices of language development, and proceed through the four structural classification schemes: one-morpheme, Stage 1, OC, and Stage 2.

Global indices. Table 1 gives the means and upper bounds for utterance length in morphemes, with repetitions included and excluded. The 95% confidence intervals are shown in Table 2. MLU's ranged from 1.02 (1.04 without repetitions) for a 20.5 month-old, to 2.26 (2.32 without repetitions) for a 33.5 month-old. The upper bound varied from 1.18 (1.38 without repetitions) for the 20.5 month-old, to 4.70 (4.70 without repetitions) for the 33.5 month-old. From Table 2 it can be seen that the four children were all significantly different from one another on three of the measures (MLU without repetitions, both Upper Bound measures), and nearly so for the fourth (for MLU with repetitions, the difference between Luanne and Thomas just

Table 1

Children's MLU's and Upper Bounds, with and without repetitions

| Name | Hours of speech | Age in months | MLU With rep. | MLU No rep. | Upper Bound With rep. | Upper Bound No rep. |
|---|---|---|---|---|---|---|
| Bobby | 2 | 20-21 | 1.02 | 1.04 | 1.17 | 1.38 |
| Luanne | 3 | 26-27 | 1.54 | 1.59 | 3.16 | 3.22 |
| Thomas | 1 | 26-27 | 1.64 | 1.85 | 3.84 | 4.27 |
| Jackson | 3 | 33-34 | 2.26 | 2.32 | 4.70 | 4.81 |

Table 2. Confidence intervals for MLU and UB.

MLU: With repetitions

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Lower | .998 | 1.464 | 1.541 | 2.131 |
| Mean | 1.017 | 1.542 | 1.639 | 2.257 |
| Upper | 1.037 | 1.620 | 1.737 | 2.383 |

MLU: Without repetitions

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Lower | .996 | 1.492 | 1.716 | 2.167 |
| Mean | 1.037 | 1.586 | 1.849 | 2.324 |
| Upper | 1.078 | 1.681 | 1.983 | 2.481 |

UB: With repetitions

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Lower | .974 | 3.009 | 3.576 | 4.398 |
| Mean | 1.176 | 3.162 | 3.829 | 4.702 |
| Upper | 1.379 | 3.315 | 4.083 | 5.008 |

UB: Without repetitions

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Lower | .942 | 3.052 | 3.996 | 4.398 |
| Mean | 1.375 | 3.222 | 4.269 | 4.702 |
| Upper | 1.808 | 3.392 | 4.542 | 5.008 |

missed significance at the .05 level).

Because Luanne and Thomas were about the same age, the difference between them in overall language development is of some interest. The difference was not in the direction one would expect from the literature on sex differences in rate of language development (see Schacter et al, 1978), which has typically given the advantage (should any exist) to the girls. So, we can look for other differences between Luanne and Thomas, such as differences in how their mothers spoke to them, to come up with possible reasons for the difference between them in rate of language development. These matters will be explored in more detail in the analyses of the mothers' speech and of the mother-child interactions.

Comparison of the various global measures revealed that the net effect of including repetitions in a global index was to depress the estimates of language competence. Table 3 shows for both MLU and UB the difference score: 'Without repetitions - With repetitions', hereafter called the Repetition Effect. It can be seen that the mean difference was positive for both indices (.08 for MLU, .21 for UB). Of particular interest is that the Repetition Effect varied from individual to individual. Thomas showed a higher Repetition Effect than any of the other three children, having scores three to four times those of the

Table 3

Effect of repetitions on MLU and Upper Bound, expressed as the difference score: 'Without repetitions' - 'With repetitions'.

| | MLU | Upper Bound |
|---|---|---|
| Bobby | .02 | .21 |
| Luanne | .05 | .08 |
| Thomas | .21 | .43 |
| Jackson | .06 | .11 |
| Mean | .08 | .21 |

other children.

If the overall Repetition Effect was relatively constant from one individual to the next, then it would not matter much whether repetitions were or were not included in a global index of language development. The relative spacing of individuals would be unaffected, and hence correlations with other language development parameters would be unaffected. However, this constancy across individuals was not found. If repetitions reflect ways of using language more than they reflect just language competence per se, and if one wants global measures which reflect language competence as much as possible, then these data suggest that repetitions should be excluded from the calculations.

Table 1 reveals another interesting fact about ways of calculating global indices of language development, namely that the estimate of the relative language competence of a child can change as a function of the index used. If we look just at the results for when repetitions are excluded (only for the sake of example, not argument), we can see that Thomas' position with respect to Luanne and Jackson varied markedly. Using MLU, Thomas was relatively closer to Luanne than to Jackson in his 'language competence'. Using Upper Bound, however, there was a clear reversal, with Thomas now being much closer to Jackson than to Luanne.

So, the suspicion that the large pool of one-morpheme utterances produced by young children may at least sometimes obscure their competencies in putting together multi-morpheme utterances received some validation.

The results for the Repetition Effect and the effect of UB versus MLU create an ambiguity as far as the present study is concerned. Just what was Thomas' degree of language development with respect to Luanne and Jackson? The 'official' rules for MLU showed Thomas and Luanne relatively close together - they differed by 1/10 of a morpheme. Excluding repetitions from the calculations of MLU increased some the separation between Thomas and Luanne; using UB (without repetitions) pushed Thomas even farther from Luanne, to the point where he was actually closer to Jackson. Because comparisons will be made between this sample and a middle class sample where Brown-like calculation rules for MLU were used, we must continue to use that figure. However, the possibility of misrepresentation of Thomas' language competence must be kept in mind when interpreting other results in this study, and will in fact have to be referred to again in later sections.

Comparison between MC and LIB children. Based on a sample of 81 MC children, regression equations were calculated relating children's MLU with their age. The correlation between age and MLU was only moderate (r=.64). Two

estimates were generated for each child in the present sample: an estimate of the child's age in months given his/her MLU, and an estimate of the child's MLU given his/her age. Table 4 shows the differences between estimated values and actual values. All four children lagged noticeably behind the norms, and moreover the lag widened substantially as a function of age. For example, while Bobby was about ½ morpheme behind the norm for MLU, Luanne and Thomas were about 3/4 morpheme behind, and Jackson was more than one morpheme behind. All of these discrepancies put the MC estimates well outside the 95% confidence intervals (see Table 2) for the LIB children.

There are reasons for being cautious about accepting at face value the apparent developmental lag on the part of the LIB children. The nature of the sample (no observer present), or sampling error (only four LIB children, and the correlation between age and MLU is only moderate) could lead to a spurious indication of developmental lag. On the other hand, we cannot be sure that the lag is not real.

<u>One-morpheme utterances</u>. No hypothese were proposed concerning the pattern of use of one-morpheme utterances, and the code was generated primarily to provide a general idea of what types of uses were being made of one-morpheme

Table 4

Comparison of the MC children with the LIB children on the age-MLU relation

| | Observed MLU | Estimated MLU | Difference score: MLU | Observed age | Estimated age | Difference score: Age |
|---|---|---|---|---|---|---|
| Bobby | 1.02 | 1.47 | -.44 | 20.5 | 17.33 | 3.17 |
| Luanne | 1.54 | 2.31 | -.77 | 26.5 | 21.00 | 5.50 |
| Thomas | 1.64 | 2.31 | -.67 | 26.5 | 21.72 | 4.78 |
| Jackson | 2.26 | 3.28 | -1.02 | 33.5 | 25.28 | 8.22 |
| Mean | 1.60 | 2.34 | -.74 | 26.75 | 21.45 | 5.30 |

utterances by the subjects. The results are shown in Table 5. From Table 5 it can be seen that the overall proportion of utterances which were one morpheme long declined considerably as MLU (and child age) increased.

First the results for Bobby will be desribed. The majority of Bobby's one-morpheme utterances (67%) served 'non-open' speech functions - functions which are virtually defined by just one or a few words. Also, even those utterances serving the 'open' functions were not diverse (type/token = .20). Thus, the overall diversity of Bobby's one-morpheme utterances was quite low (type/token = .19). Since Bobby produced only three recognizable multi-morpheme utterances, the data in Table 5 supplies as complete a description of his language as will be provided anywhere in this study. Essentially, Bobby showed only glimmerings of combinatorial syntax, and a small, though fairly often used vocabulary. Moreover, the bulk of that vocabulary was not substantive (i.e., content nouns, verbs, or adjectives) but rather items one might call 'conversational function words' - words which are useful in conversations largely regardless of topic (e.g., yes, Mommy, hi). Within the open functions, Bobby's productions were equally split between Labeling and Command functions.

The only other aspects of the one-morpheme results that will be commented on are some differences between

Table 5

Classification of one-morpheme utterances

| | Bobby (n=78) | | Luanne (n=154) | | Thomas (n=134) | | Jackson (n=91) | | $\bar{X}$ |
|---|---|---|---|---|---|---|---|---|---|
| | type/ token | % | type/ token | % | type/ token | % | type/ token | % | % |
| 'Non-open' functions: | | | | | | | | | |
| Affirmation | 2/5 | 6 | 5/24 | 16 | 2/3 | 2 | 2/8 | 9 | 8 |
| Negation | 1/1 | 1 | 1/25 | 16 | 1/11 | 8 | 1/4 | 4 | 7 |
| Get atten. | 2/41 | 53 | 1/27 | 18 | 1/17 | 13 | 2/4 | 4 | 22 |
| Get clarif. | 0 | 0 | 1/2 | 1 | 0 | 0 | 3/19 | 21 | 6 |
| Soc. recog. | 1/5 | 6 | 1/2 | 1 | 2/3 | 2 | 1/1 | 1 | 3 |
| Subtotal | 6/52 | 67 | 9/80 | 52 | 6/34 | 25 | 9/36 | 40 | 46 |
| 'Open' functions: | | | | | | | | | |
| Command | 2/5 | 6 | 13/22 | 14 | 12/26 | 19 | 3/7 | 8 | 12 |
| Label | 2/15 | 19 | 15/21 | 14 | 18/41 | 31 | 26/27 | 30 | 24 |
| Object | 2/15 | 19 | 11/14 | 9 | 18/41 | 31 | 22/22 | 24 | 21 |
| Object prop. | 0 | 0 | 4/7 | 5 | 0 | 0 | 4/5 | 5 | 3 |
| Subtotal | 4/20 | 26 | 28/43 | 28 | 30/67 | 45 | 29/34 | 37 | 35 |
| Numbers | 0 | 0 | 9/13 | 8 | 10/22 | 16 | 0 | 0 | 6 |
| Other (unanalyzable) | 4/6 | 8 | 13/18 | 12 | 10/11 | 8 | 19/21 | 23 | 13 |
| Total | .19 | 100 | .37 | 100 | .42 | 100 | .63 | 100 | |

Luanne and Thomas, who were the same age. On the Open versus Non-open distinction, Luanne showed more use of the Non-open functions than did Thomas (52% of her one-morpheme utterances vs. Thomas' 25%; $X_1^2 = 13.807$, $p < .001$). Concerning the Open functions, Luanne did not differ significantly from Thomas in production of Commands ($X_1^2 = 1.053$, N.S.), but she did produce significantly fewer Labels ($X_1^2 = 11.356$, $p < .001$). These differences suggest the nature of Luanne's interaction with her mother was quite different in some respects from Thomas' interaction with his mother. At least for the one-morpheme utterances Luanne showed a less object-oriented use of such utterances than did Thomas, as shown by her relatively less frequent production of Labels.

Stage 1 results. Tables 6,7, and 9 take the same format as Brown's (1973, pp.174-176) for reporting the proportion of Stage 1 utterances to the total number of multi-morpheme types. Tables 6 and 7 give the relative frequencies of utterances in the various categories of the Stage 1 code (Bobby has been left out of the tables because he produced only three multi-morpheme utterances in total). In terms of the relative distribution of frequencies according to type, there is little to say. Brown observed a good deal of variability across individuals on distribution among the

Table 6

Brown's Table 22: Prevalent semantic relations of 2, 3, and 4 terms expressed as percentages of the total number of multi-morpheme types

| | Luanne | Thomas | Jackson |
|---|---|---|---|
| MLU | 1.54 | 1.64 | 2.26 |
| # multi-morpheme utt. types | 91 | 103 | 152 |
| Two-term relations | | | |
| Agent and Action | 02 | 00 | 01 |
| Action and Object | 05 | 05 | 05 |
| Agent and Object | 00 | 00 | 00 |
| Action and Loc | 01 | 02 | 03 |
| Entity and Loc | 00 | 01 | 01 |
| Possessor and Possessed | 03 | 01 | 02 |
| Entity and Attribute | 07 | 04 | 05 |
| Demonstrative and Entity | 03 | 00 | 00 |
| Subtotal | 22 | 13 | 16 |
| Three-term relations | | | |
| Agent, Action, Object | 01 | 04 | 07 |
| Agent, Action, Loc | 00 | 00 | 01 |
| Agent, Object, Loc | 00 | 00 | 00 |
| Action, Object, Loc | 00 | 00 | 01 |
| Four-term relations | | | |
| Agent, Action, Object, Loc | 00 | 00 | 00 |
| Subtotal | 01 | 04 | 09 |
| Total | 23 | 17 | 25 |

Table 7

Brown's Table 23: Prevalent semantic relations, with one term (NP) expanded, expressed as percentages of the total number of multi-morpheme utterance types

| | Luanne | Thomas | Jackson |
|---|---|---|---|
| MLU | 1.54 | 1.64 | 2.26 |
| # multi-morpheme utt. types | 91 | 103 | 152 |
| Two terms with NP expanded | | | |
| Agent and Action | 01 | 00 | 00 |
| Action and Object | 01 | 03 | 01 |
| Agent and Object | 00 | 00 | 00 |
| Action and Loc | 00 | 00 | 00 |
| Entity and Loc | 00 | 01 | 00 |
| Possessor and Possession | 00 | 00 | 00 |
| Entity and Attribute | 00 | 01 | 01 |
| Demonstrative and Entity | 00 | 00 | 00 |
| Three terms with NP expanded | | | |
| Agent, Action, Object | 00 | 01 | 00 |
| Agent, Action, Loc | 00 | 01 | 01 |
| Total | 02 | 07 | 03 |

eight basic two-term relations (Table 6). Since he decided on those grounds not to make any committment to one pattern of distribution as universal, no normative comparisons will be made with his sample on this dimension. Brown did point out that elaborated utterance types are much less frequent than the basic two-term types, but that later Stage 1 children show a higher proportion of elaborated types than do earlier Stage 1 children. Table 8 displays that both of these findings were true for the present sample of LIB children. It should be pointed out however, that the age result comes out more as expected if one assumes Thomas was closer to Jackson than to Luanne in his language competence, an issue about which there was some ambiguity.

The truly surprising result is found in Table 9, which summarizes the proportions of multi-morpheme utterance types which are Unintelligible, Stage 1, or Other Constructions. For his sample, Brown obtained an average of 70% for the Stage 1 constructions. For the two Stage 1 LIB children (Luanne and Thomas), the proportions of Stage 1 constructions were 25% and 23%, respectively. Jackson showed a low proportion as well (28%), but then he was in Brown's Stage 2 and might have been expected to have had a lower proportion (Brown never reported Stage 1 analyses on Stage 2 children, so there is no basis for evaluating Jackson's proportion). The three children did not differ

Table 8

Number of Stage 1 utterances of the elaborated types, expressed as percentages of the total number of multi-morpheme utterance types

| | Luanne | Thomas | Jackson |
|---|---|---|---|
| Three-term relations | 01 | 04 | 08 |
| Four-term relations | 00 | 00 | 00 |
| Two terms with NP expanded | 01 | 05 | 01 |
| Three terms with NP expanded | 00 | 02 | 01 |
| Total | 02 | 11 | 11 |

Table 9

Brown's Table 24: Percentages of multi-morpheme types expressing prevalent relations and falling into other categories

| | Luanne | Thomas | Jackson |
|---|---|---|---|
| MLU | 1.54 | 1.64 | 2.26 |
| # multi-morpheme utterances | 91 | 103 | 152 |
| Prevalent relations | 25 | 23 | 28 |
| Other constructions | 68 | 67 | 69 |
| Uninterpretable | 07 | 10 | 03 |

among each other on relative frequency of Stage 1 constructions versus Other Constructions ($X^2_2$ = .225, N.S.). Luanne's and Thomas' low proportions of Stage 1 constructions were not a consequence of especially high proportions of Unintelligible utterances (4% and 10%, respectively), but rather an honest consequence of abnormally high proportions of Other Constructions (73% and 67%, respectively - Brown's sample showed an average of 27%). These abnormally low proportions of Stage 1 constructions for the two Stage 1 children make the results for the 'Other Constructions' code especially important, and we turn to them now.

Analysis of the Other Constructions. The OC code was designed to express several degrees of difference an utterance could have from Stage 1.

Table 10 gives the results for Category 1 - utterance types which are typically found in Stage 1 speech but which were not included by Brown in his Stage 1 code. Table 11 shows the effect of including these with the 'Stage 1' utterances in terms of percentage of multi-morpheme utterances accounted for. From Table 11 we can see that including Category 1 utterances for Luanne and Thomas approximately doubled the proportions of utterances accounted for. But, the total proportions were still just under 50%. The proportion of utterances in Category 1 did not differ

Table 10

Category 1 of the OC code - utterance types typically found in Stage 1 level speech, but excluded from Brown's classification scheme, expressed as percentages of all multi-morpheme types

| | Luanne | Thomas | Jackson |
|---|---|---|---|
| Simple nomination | 08 | 14 | 03 |
| Vocatives/Greetings | 02 | 00 | 02 |
| All-gone | 01 | 01 | 00 |
| Subtotal | 11 | 15 | 05 |
| Simple negation | 10 | 05 | 02 |
| Simple Wh-question | 02 | 03 | 01 |
| Subtotal | 12 | 08 | 03 |
| Grand total | 23 | 22 | 08 |

Table 11

Successive addition of OC categories to the 'Stage 1' utterances, expressed as percentages of the total number of multi-morpheme utterances

| | Luanne | Thomas | Jackson |
|---|---|---|---|
| 'Stage 1' | 25 | 23 | 28 |
| Category 1 | 23 | 22 | 08 |
| Subtotal | 48 | 46 | 36 |
| Category 2 | 20 | 13 | 11 |
| Subtotal | 68 | 58 | 46 |
| Category 3 | 04 | 03 | 06 |
| Subtotal | 73 | 61 | 52 |
| Category 4 | 09 | 04 | 15 |
| Subtotal | 81 | 65 | 67 |
| Category 5 | 01 | 03 | 01 |
| Subtotal | 82 | 68 | 68 |
| Category 6 | 00 | 05 | 16 |
| Subtotal | 82 | 73 | 84 |
| Category 7 | 13 | 17 | 13 |
| Total | 95* | 90* | 97* |

*The total is less than 100% because the remaining utterances were not fully intelligible.

between Luanne and Thomas ($X_1^2$ = .015, N.S.), but did differ between Luanne and Thomas versus Jackson ($X_1^2$ = 13.735, $p < .001$), with Jackson showing relatively few Category 1 utterances (8%).

As a caution - the cumulative percentages reported in Table 11 are not strictly comparable with the 70% average Brown found for Stage 1 utterances. The comparable figure for Brown's subjects would have had to include the Category 1 (and other) types as well, so their average would have been pushed above 70%. Brown did not break down the Other Constructions for his sample though, so we do not know by how much the average would have been inflated. Therefore, as categories are added to the kernel of 'Stage 1' relations we cannot know for sure when the present sample of LIB children would have caught up with Brown's sample.

In his sample Brown had two children who showed abnormally low proportions of 'Stage 1' utterances (30% and 44%). From those children's transcripts, Brown noticed there was an abnormally high proportion of nominations (he did not give the proportions), and he attributed this to unnatural mother-child interaction caused by the mothers' discomfort over having an observer present. This source of low proportions of Stage 1 utterances could not account for Luanne's and Thomas' results, however, since simple nominations accounted for only 8% and 14%, respectively, of their

multi-morpheme utterances. If only these utterances were included with the 'Stage 1' utterances, the resulting proportions, 33% and 37% respectively, would still have to be considered alarmingly low by Brown. To cement the argument that the very simplest multi-morpheme constructions were not responsible for very many types, we can pool the other elementary constructions (Vocatives, Greetings, all gone) with the nominations and 'Stage 1' utterances. The total proportions are still far from high: 35% for Luanne, and 38% for Thomas.

In Table 12 are shown the results for Category 2 - utterances which technically are excluded from Stage 1, but which, with lexical reinterpretation, can be argued to fall within the general syntactic and semantic constraints of Stage 1 language. This category accounted for moderate proportions of Luanne's and Thomas' utterances, with Luanne showing a somewhat larger proportion than Thomas (20% vs. 13%, respectively; $X_1^2 = 1.844$, N.S.). Table 11 shows the total number of utterances accounted for when Category 2 is combined with Stage 1 and Category 1. Luanne has now had 68% of her utterances accounted for, Thomas has had 58%, while Jackson lags behind at 46%. The difference between Luanne and Thomas was not significant ($X_1^2 = 2.021$, N.S.), but Luanne and Thomas did differ significantly from Jackson ($X_1^2 = 9.779$, $p < .005$).

Table 12

Category 2 of the OC code - pseudo-exceptions to Stage 1 language, expressed as percentages of total number of multi-morpheme utterances

| | Luanne | Thomas | Jackson |
|---|---|---|---|
| Request use of want | 11 | 04 | 03 |
| Verb + Motion particle | 08 | 03 | 02 |
| Simple use of got | 01 | 01 | 05 |
| Simple use of look at | 00 | 05 | 01 |
| Total | 20 | 13 | 11 |

Table 13

Category 3 of the OC code - rare semantic relations in Stage 1 level speech, expressed as percentages of all multi-morpheme utterances

| | Luanne | Thomas | Jackson |
|---|---|---|---|
| Experiencer | 04 | 03 | 04 |
| Classificatory | 00 | 00 | 02 |
| Total | 04 | 03 | 06 |

In Table 13 are shown the results for Category 3 - basic semantic relations that Brown observed, but only rarely, in his sample of Stage 1 children. It seems reasonable to say that those semantic relations were rare in this sample as well, with only a few Experiencer constructions appearing for Luanne and Thomas (4% and 3%, respectively).

Categories 1-3 of the OC code represent types of utterances which would fall within an expanded notion of Stage 1 level language. The syntax of utterances in these categories is telegraphic. The semantics encompass the eight basic relations of Brown's formal classification system, his seven rarely observed basic relations, and simple negation and Wh-questions. The total percentages of multi-morpheme utterances accounted for by these three categories together with the regular 'Stage 1' utterances were 72% for Luanne, 61% for Thomas, and 52% for Jackson. The difference between Luanne and Thomas is only marginally significant ($X_1^2 = 2.800$, $p < .10$), while the difference between Luanne and Thomas versus Jackson was significant ($X_1^2 = 7.495$, $p < .01$).

As mentioned earlier, there are no comparable figures for MC children, but we can for now make a few speculations about such a comparison. Firstly, the Stage 1 LIB children in this study would fall below the MC average on this liberal measure of Stage 1 language, since the MC average

for the 'strict' measure was already up at 70%. Secondly, the range of scores for Brown's MC children on the 'strict' Stage 1 index was wide - 51% to 81%. Perhaps the range on the liberal Stage 1 measure would also be large, in which case the two LIB children might not fall outside the 'normal' MC range. Thirdly, the scores for the LIB children on the liberal Stage 1 measure were undoubtedly underestimates of their true values. For all the children there were constructions which semantically were in the purview of Stage 1, but which syntactically were not. Category 2 in the OC code was an attempt to pull out those cases in which it could plausibly be argued that the syntactic violations were not substantive. However, for some utterance types there was insufficient data for them to be included in the category, even though they might actually have belonged there. The following are examples, and they all have the feature that there is some non-adult segmentation which could bring them into the syntactic purview of Stage 1 (or of one-morpheme utterances): Let's go (L), Go to sleep (L), Don't get up (L), I want sit down (L), I'll do that (T), I finish up (T), Hurry up (T), Let's see (T).

The preceding three comments about a hypothetical comparison of Luanne and Thomas with Brown's MC children suggest that though it is not obvious that they would have come out the same, it is certainly still possible. Jackson,

with a total of 52%, would have come out different from Stage 1 MC children, but then he was in Stage 2.

Categories 4 and 5 of the OC code encompass all those utterances which are Stage 1 (in the expanded sense) but which have one or more of Brown's Stage 2 grammatical morphemes embedded in them. Table 14 shows the frequencies of the utterances which had a 'kernel' that was semantically limited to the eight basic relations (Category 4). Category 5 - utterances with grammatical morphemes which otherwise express only Brown's rare semantic relations - is also shown in Table 14. As might be expected from the rarity of the kernel forms alone (see Table 13), there were relatively few utterances in Category 5. Concerning the totals for Categories 4 an 5, Jackson, as would be expected, showed the largest proportion (15%), though Luanne (10%) and Thomas (7%) followed closely behind. Thomas and Luanne did not differ significantly ($X_1^2 = .611$, N.S.), but Luanne and Thomas versus Jackson was significant ($X_1^2 = 5.630$, $p < .025$).

Table 11 shows the total proportions of utterances accounted for by 'Stage 1' and Categories 1-5 of the OC code. The figure for Jackson is 68%, for Thomas it is also 68%, while for Luanne it is 82%. The difference between Thomas and Luanne is significant ($X_1^2 = 5.349$, $p < .025$). Given the low syntactic-semantic resolving power available in the study, it seems reasonable to say that most of

Table 14

Categories 4 and 5 of the OC code - Stage 2 morphemes embedded in Stage 1 utterances containing either the basic semantic relations or the 7 rarely observed semantic relations, expressed as percentages of all multi-morpheme utterance types

| | Luanne | | Thomas | | Jackson | |
|---|---|---|---|---|---|---|
| | Basic | Rare | Basic | Rare | Basic | Rare |
| in/on | 00 | 00 | 00 | 00 | 03 | 00 |
| Plural | 08 | 00 | 00 | 03 | 01 | 00 |
| Progrss. -ing | 00 | 00 | 00 | 00 | 03 | 00 |
| Past irreg. | 01 | 00 | 00 | 00 | 01 | 01 |
| Contract. cop. | 00 | 00 | 03 | 00 | 06 | 00 |
| Third pers. reg. | 00 | 01 | 01 | 00 | 01 | 00 |
| Total | 09 | 01 | 04 | 03 | 14 | 01 |

Luanne's utterances have been accounted for. The remaining utterances did not look like they contained any real surprises. For both Thomas and Jackson, there has been substantial, but noticeably less, success (once again, Thomas appears more like Jackson in linguistic competence than the 'traditional' MLU implied). In Jackson's case there were hints that he was branching out both syntactically and semantically (see Category 6). In Thomas' case, the hints at such branching out were less clear - his remaining utterances were diverse. Again, whether these figures for the LIB children are lower than what might be expected from a MC sample cannot be determined here. Luanne probably would not be low; whether Thomas and Jackson would fall outside the MC 'normal' range of variability is difficult to say.

Categories 6 and 7 of th OC code report in a loose way the remaining utterance types. Category 6 is simply a list of utterance types (see Table 15) which were frequent enough to catch the observer's eye, and which stayed fairly close to Stage 1 and 2 semantics and syntax except for their distinctive peculiarities. Jackson showed a number of these quasi-patterns. They show him experimenting with modality (Wh- and yes-no questions), complement constructions, some new locative prepositions, and other miscellania. Thomas

Table 15

Category 6 of the OC code - quasi-types of syntactic constructions not present in either Stage 1 or 2, expressed as percentages of all multi-morpheme utterance types

| | Luanne | Thomas | Jackson |
|---|---|---|---|
| Complement constructions | 00 | 05 | 03 |
| Wh-questions | 00 | 00 | 04 |
| Yes-no questions | 00 | 00 | 03 |
| Locative prepositions | 00 | 00 | 03 |
| 'on' TV/record | 00 | 00 | 02 |
| 'right (t)here' | 00 | 00 | 02 |
| Total | 00 | 05 | 16 |

showed some fairly frequent use of complement constructions, but no other quasi-patterns emerged. Category 7 is composed of all the left-over utterances, and can be found in the appendices which list examples of the children's multi-morpheme utterances.

Stage 2 grammatical morphemes. The final analysis of the structure of the children's language is an application of Brown's Stage 2 system: locating the obligatory contexts for 14 grammatical morphemes and expressing the percent occurrence of a given morpheme in its obligatory contexts. The results are shown in Table 16. One important result is that all of the children showed some usage of the contractible copula - a grammatical element which can be deleted in Black Dialect. On the other hand, none of the children showed usage of auxiliary be, third person regular, or past regular - all elements subject to deletion in Black Dialect. However, these are all forms which are acquired relatively late (Brown, 1973; deVilliers & deVilliers, 1973). Using one of the deVilliers' rank orderings of acquisition (their 'Method 2'), the grammatical morphemes just mentioned were all ranked seventh or later. So, Luanne or Thomas might not be expected to show control over these morphemes.

What should be expected from Jackson? Unfortunately, the only relatively large-scale study which explicitly

Table 16

Children's productions of obligatory grammatical morphemes*

| | Luanne | Thomas | Jackson |
|---|---|---|---|
| MLU | 1.54 | 1.64 | 2.26 |
| No. of multi-morpheme utt. | 112 | 125 | 158 |
| Present progressive | 0 (0/2) | 0 | .78 (7/) |
| In | 0 | 0 (0/4) | 0 (0/1) |
| On | 0 (0/1) | 0 | .80 (4/15) |
| Plural | .25 (2/8) | 1 (5/5) | .67 (6/9) |
| Past irregular | 0 (0/1) | 0 | .36 (4/11) |
| Possessive | 0 (0/1) | 0 | .33 (3/9) |
| Uncontractable copula | 0 (0/1) | 0 | 1 (6/6) |
| Articles | .17 (2/12) | .42 (8/19) | .19 (3/16) |
| Past regular | 0 (0/4) | 0 | 0 (0/4) |
| Third person regular | 0 (0/2) | 0 | 0 (0/1) |
| Third person irregular | 0 | 0 | 0 |
| Uncontractable auxiliary | 0 | 0 | 0 |
| Contractable copula | .20 (2/10) | .58 (7/12) | .72 (26/36) |
| Contractable auxiliary | 0 | 0 | 0 |

*There must be at least 5 obligatory contexts before the ratio 'No. produced'/'No. obligatory' is computed.

related MLU and degree of usage of the grammatical morphemes was that by the deVilliers (1973), and their sample contained only three children at all close to Jackson in MLU (MLU's of 2.08, 2.24, and 2.31, compared to Jackson's 2.26). Some comparisons between Jackson and these three children are shown in Table 17. Jackson came out looking quite similar to the other three children: he is relatively high on the average percent usage of morphemes and on the number of morphemes that were used to any degree at all; he did not look deficient in the production of morphemes often deleted in Black Dialect - in each case at least two of the three other children showed the same tendency to use or not to use the morpheme in question. As for Luanne and Thomas, it will only be remarked that the two most similar children to them (on MLU) in the deVilliers study showed non-zero usage of just three grammatical morphemes, as did both Luanne and Thomas. Hence, they also appear 'normal', given their MLU.

One of the concerns of this study was to search for any effects mothers' use of Black Dialect might have had on syntax development. The above results suggest that the children in this sample were not showing any selective deficiencies in acquisition of grammatical morphemes deleted in Black Dialect (there may have been an across the board lag in syntax development, but no lags peculiar

Table 17

Some comparisons of grammatical morpheme usage between Jackson and 3 children with similar MLU's from the deVilliers' (1973) study

| | Jackson | H | Ca | Chr |
|---|---|---|---|---|
| Mean % usage of morphemes | 61 | 46 | 60 | 61 |
| No. morphemes with non-zero entry | 8 | 7 | 7 | 7 |
| Use of contractable copula | Yes | Yes | Yes | Yes |
| Use of past regular -ed | No | No | No | Yes |
| Use of third person regular -s | No | No | Yes | No |
| Use of contractable auxiliary | No | Yes | No | No |
| Total proportion of above morphemes used | 1/4 | 2/4 | 2/4 | 2/4 |

Table 18

Mothers' use of Black Dialect, expressed as percentages of possible environments*

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Deletion of auxiliary be | 42 (8/19) | 21 (27/129) | 48 (11/23) | 10 (7/23) |
| Deletion of copula | 05 | 03 | 08 | 05 |

*There is no ratio given for copula deletion because all mothers produced large numbers of copulas

to forms deleted in Black Dialect). The interest of this result depends upon whether the children were hearing Black Dialect. So, in Table 18 the mothers' tendencies to delete grammatical morphemes in accord with Black Dialect have been expressed as percent deletion on obligatory contexts. It is immediately apparent that none of the mothers were strong speakers of Dialect. The mothers virtually never deleted the past -ed inflection or the third person regular -s inflection. Deletion of the contractible copula was marginally present in all of the mothers (3% to 8% of obligatory environments). The only grammatical morpheme deleted with much frequency was the contractible auxiliary (10% to 48%). None of the children showed any usage of the contractible auxiliary, but then, as noted above, it was not clear that this was out of the ordinary, given their MLU's. Perhaps a selective lag would have become apparent as the children's MLU's increased.

Table 18 reported data on only a few of the features of Black Dialect - the features most easily quantified. However, there were occasionally other types of instances of dialect - such as use of be (You be sick that means you'll have to stay), double negatives, and other turns of phrase that seemed to be Dialect (You think you catch you a little snooze, You not comb my hair with that). These

various forms are difficult to quantify, but in any case they were quite rare.

## Summary

The following is a summary of the major results from the analyses of the LIB children's language.

Global index results.

1.) Inclusion of repetitions depressed estimates of syntax competence, and, moreover, the magnitude of the depression varied across children.

2.) Use of Upper Bound, in contrast to MLU, led to different relative distances among the children in estimated syntax competence.

3.) Because of results #1 and #2 above, Thomas' position with respect to the two children on either side of him (Luanne and Jackson) in syntax competence was ambiguous. Under MLU-With repetitions, Thomas appeared quite close to Luanne (1.64 vs. 1.54, respectively), while under Upper Bound-Without repetitions, Thomas was closer to Jackson than to Luanne. The other two global measures put Thomas somewhere in the middle.

4.) A comparison of the age-MLU relation for this

LIB sample with that of a MC sample showed the LIB children lagging substantially behind the MC children. Moreover, the lag apparently increased with child age.

<u>One-morpheme code results</u>.

5.) Bobby's speech, which was primarily composed of one-morpheme utterances, was (a) primarily in the Non-open category (67% of his utterances were such things as <u>Yes</u>, <u>No</u>, <u>Mommy</u>, etc.), and (b)very low in overall type-token ratio (.19).

6.) Luanne showed a greater proportion of one-morpheme utterances in the Non-open category than did Thomas (52% vs. 25%, respectively).

7.) Luanne showed fewer utterances than Thomas in the Open category (28% vs. 50%, respectively), a difference which was accounted for by a significant difference in the frequency of the sub-category Label.

<u>Stage 1 results</u>.

8.) The two children (Luanne and Thomas) who were solidly in the Stage 1 period showed substantially fewer Stage 1 utterances than Brown's sample of children (25% and 23% vs. 70% for Brown's sample).

Other Constructions results.

9.) The utterances of Luanne and Thomas which did not meet the Stage 1 criteria did not turn out to be clearly different in principle from Stage 1 language. A substantial proportion of their Other Constructions (47% and 38%, respectively) were either utterance types common in early language but not included in Brown's code, instances of Brown's rare semantic relations (and which were also rare here), or utterance types which could plausibly be re-analyzed structurally to meet the Stage 1 criteria. Additional proportions of the two children's utterances (10% for Luanne, 7% for Thomas) were composed of utterances suggesting some rudimentary knowledge of Stage 2 grammatical morphemes. The remaining utterances for both children (13% for Luanne and 22% for Thomas) suggested little or nothing in the way of other types of syntactic knowledge.

Stage 2 results.

10.) There was no evidence that, given their MLU's, LIB children were lagging behind MC children in the acquisition of grammatical morphemes.

11.) The mothers of the LIB children used some Black Dialect, but not very much. No effects on the children's syntax acquisition of the Dialect that was used could be detected, but that could have been because the children were still too linguistically immature overall for any effects to be very detectable.

# C H A P T E R III

# THE MOTHERS' LANGUAGE

## Introduction

Thus far we have been concerned with structural characterization of the children's speech. We now turn to analyses concerned with some structural aspects of the mothers' speech to their children (hereafter, 'mother's speech' will sometimes be referred to as 'motherese', following the terminology of Newport, Gleitman, and Gleitman, 1977).

In the 1960's a prominent view (e.g., Chomsky, 1965) on the nature of motherese was that it constituted a poor basis for inducing the grammar of a language because, like speech among adults, it was believed to be dysfluent, full of errors, and structurally complex. In the early 1970's, several studies were done which refuted that type of characterization (Phillips, 1973; Snow, 1972). Summarizing the various studies of that period, Snow (1977) concluded that motherese has very few dysfluencies and errors, is quite short - rarely having more than one clause per sentence, is highly redundant, and is typically in the present tense. The impact of those findings was to promote some skepticism of the innatist models of language acquisition that had

arisen in the 1960's. The early studies of motherese did not demonstrate either in practice or in theory how the various speech simplifications and other accomodations might actually interact with a language learning system, but they did cast a more favorable light on the possibility that at least in an implicit way children receive some good language lessons from their parents. And, if parents differ from one another in the types or degree of accomodations they make in speech to their children, there might be corresponding differences in the types or quality of language lessons they (implicitly) provide their children. It was in this spirit that some of the 'traditional' motherese indices were calculated for the mothers in the present sample.

What, though, might these indices mean for language acquisition? Subsequent research has tempered the earlier optimism. Perhaps not so surprisingly, global descriptions of motherese, which ignore distinctions among the various contexts in which mother and child interact, do not in general correlate well with measures of children's syntactic development. For example, Snow (1977) cited several studies which showed no change in mothers' MLU over a 15 month period (4-19 months). Phillips (1973) found that several measures of complexity of maternal speech (MLU, verbs per utterance, modifiers per utterance, and number of verb forms) did not increase over the children between 8

and 18 months of age, though it did for children between 18 and 28 months of age. Newport et al (1977), using somewhat older children (12-27 months), found only low positive correlations between some complexity measures of maternal speech with children's MLU: r = .22 for maternal S-nodes per utterance with child's MLU; r = .40 for maternal MLU with child MLU. Both Snow and Newport et al suggested that mothers are primarily concerned with communicating effectively with their children, and that this concern is only partly influenced by a valid perception of a child's current syntactic competence.

For present purposes, what these results mean is that for certain motherese indices - particularly many of those concerned with sentence complexity - the results for the present sample of LIB children would have to differ quite markedly from any available middle class 'norms' in order to be able to infer a linguistically significant difference.

However, not all the global motherese indices have fared so poorly as MLU in predicting syntax development. Newport et al (1977) suggested that we separate the aspects of syntax development into those which are universal across languages and those which are more language-specific. They offer, for example, number of nouns per sentence as a measure of a child's language-general knowledge. All children are faced with the problem of packing enough

nouns (or 'arguments') into a sentence so as to express some proposition fully and coherently. Newport et al suggested that this development is paced primarily by cognitive development. As support for their position they reported that number of nouns per utterance in the child's speech does not correlate significantly with any measures of complexity or structure of maternal speech (after child age and MLU have been partialled out). This result is consistent with the predictive weakness of some global indices as suggested in the preceding paragraph. On the other hand, a language-specific feature such as the child's verbal auxiliary system was found to correlate significantly with a few aspects of maternal speech - positively with the mother's tendency to ask yes-no questions (which front the auxiliary), and negatively with her tendency to use imperatives (which, except when negative, have no auxiliary verbs). Hence, there are some measures of maternal speech - those which clearly exhibit some language-specific information - which we can look at with specific syntax developments in mind. From Newport et al, these will be: yes-no questions, expansions, imperatives, and deixis ('deixis' as used by Newport et al being an utterance of the form, 'This is an X', or 'That is an X', and so on).

There are only a few studies which have applied the 'traditional' motherese indices to the speech of lower-

class mothers. A study by Ringler (1973) compared mothers' speech to their children (12 and 24 months) with their speech to another adult in a sample of low-income Black mothers. Unfortunately, no comparable middle-income group was included in this study. In general, Ringler found clear evidence of structural changes and simplification in the speech to children. A study by Snow et al (1976), done in the Netherlands, sampled mothers with two-year-old children from three socio-economic classes. On the majority of motherese indices they found no social class differences, but they did find that working class mothers (the lowest class in their sample) used more imperatives, less substantive deixis, fewer expansions, and more modal verbs than did the other mothers. It has already been mentioned that Newport et al found that maternal imperatives correlated negatively with acquisition of the verb auxiliary system, though this may not be the case for Dutch. They also found maternal expansions negatively correlated (to a marginal degree) with the acquisition of the verb auxiliary system, and deixis positively correlated with growth of vocabulary. However, Snow et al did not analyze the children's language, so we do not know if the working class children had different language development profiles from the other children in the study. Newport et al's results suggest there might have been some particular kinds of

difference, though what these might have been would have depended on the syntax of Dutch (presumably deixis would continue to correlate positively with vocabulary growth).

It can be seen that the research on motherese as a function of social class has been quite patchy. While the present study adds only another patch, it does cover some different ground.

The present study has been limited to using the published data on motherese among middle-income mothers to make social class comparisons. It has turned out that this limitation is a severe one: some studies do not report the MLU's of the children (Phillips, 1973; Snow, 1972; Snow et al, 1976), one involved a different language group (Snow et al, 1976), and none of the available studies used a comparable sampling situation. Data was collected either in the laboratory in a structured (Snow, 1972) or 'free play' format (Phillips, 1973; Snow et al, 1976), or with observers present in the home. This last difference may be a serious one in that a study by Graves and Glick (1978) has shown that structural and functional indices of maternal speech are quite sensitive to the presence of an observer. In their study, the structural indices showed greater simplification of speech when an observer was present. It is not clear that this would always be the effect an observer would have on mother-child interaction . Graves and Glick

were contrasting brief periods of unobserved behavior in a laboratory setting with brief periods of observed free play, and any of several things could have led to a different pattern of contrasts between 'observed' and 'unobserved' conditions (e.g., different setting, greater rapport with the investigators, a different presentation of the rationale for observation, or longer periods of observation). In any case, their study has at least shown that some motherese features can be influenced by intrusive sampling techniques. If tape recorders are less intrusive than people or laboratory settings, then the motherese data in the present study could differ in significant ways from data in other studies.

When the criterion of using only those studies with reasonably comparable sampling techniques was employed, only Newport et al (1977) proved to be at all appropriate for comparative purposes. Though their data collection procedure did involve the presence of human observers, it did take place in the home, and it did not otherwise impose any format on the mother-child dialogue. Specifically, they collected four hours of speech from each of 15 mother-child pairs, with two hours from one age, and two hours more six months later. The age range sampled (12-27 months) was centered at a lower age range than the age range sampled in the present study (20.5-33.5 months), but the

mean child MLU for their sample was nearly identical to that for the present study - 1.65 versus 1.60 morphemes, respectively. This discrepancy in the children's ages despite the similarity in their MLU's echoes an observation made in the section describing the LIB children's language, namely, that the LIB children were lagging behind MC children in their syntax development.

In view of the difficulties in finding comparable middle class motherese data, only the very striking differences and similarities will warrant interpretation. While the quantitative social class comparisons will be problematic, we will at least be able to obtain an impression of the structural accomodations made by LIB mothers in their speech to their young children in a relatively natural setting.

The following were the major questions asked of the motherese data:

1) Is there evidence for some degree of simplification and accomodation in the mothers' speech?
2) What kinds of individual differences are there among the LIB mothers?
3) Can any differences which do appear be related to differences among the children in their language?

4) Do the LIB mothers differ from MC mothers on any of the motherese indices?

5) Can any such differences be related to the possible social class differences pointed out earlier in rate of syntax acquisition?

## Methods

The following information on maternal speech was generated for each mother based upon the entire corpus of her utterances directed to her child.

MLU. This was calculated using both morphemes and words as the basic elements, and excluding Interjections, exact Repetitions, and Imitations. Words and morphemes were both used because the difference between the two values of MLU is a general index of use of noun and verb inflections. The utterance types excluded were ignored because it was felt that they represented either non-syntactic phenomena (Interjections) or blatantly noncreative uses of syntax (exact Repetitions and Imitations). It was felt that the MLU measure should reflect sentence complexity under conditions of relatively creative use of syntax. However, other studies to which the present data will be compared have not excluded any utterance types, so MLU was also calculated on words using all intelligible child-directed utterances.

Interjections. These are short, typically one-morpheme utterances which are not sentences or fragments of sentences, and which serve one of a small set of communicative functions. They are such things as affirmatives (Yeah, OK), negations (No), get attention (Jackson!), question (What), label, and social expressions (Hi, Thankyou).

Ungrammatical utterances. These are classified into Syntactic Errors, Fragments (sentences which are incomplete, but otherwise syntactically correct), Ellipses (subject + auxiliary verb, with the main verb understood from speech context), and False Starts (sentences which were cut off either in order to start again or due to interruption, also sentences in which a word or phrase is repeated). If an utterance was scored as ungrammatical, it was included in the MLU calculations, but was not included in any of the other analyses.

Sentence modality. Imperatives, question, and declaratives were counted, both including and excluding exact Repetitions and Imitations.

Repetitions. Repetitions were scored as exact, as adding to the utterance, as leaving out part of the utterance, or as partial (in the sense of repeating part of the utterance and adding new material).

Imitations. Imitations were exact copies of a child's utterance, except that changes from a declarative to an

interrogative pitch pattern (or vice versa) were allowed.

Expansions. These were utterances which included some or all of a child's utterance, but which also filled in some syntactic gaps in the child's utterance.

Recasts. These were utterances which were based on a child's utterance, but which changed the subject (e.g., from the child to mother), the voice, or the modality (Nelson, 1973).

Clause structure. This included number of clauses per utterance, and types of additional clauses (complements, relative clauses, and others).

NP statistics. These included number of NP's per utterance, number of elements per NP, types of nouns used (personal pronouns, impersonal pronouns, common nouns, and proper nouns), and types of modifiers and inflections in NP's.

VP statistics. These included morphemes per VP, and types of non-main verb morphemes in VP's.

Prepositional phrases. Frequency of prepositions per utterance was scored, as well as which prepositions were used and how often they were used.

Adverbs. This was to a certain extent a 'garbage' category - essentially it included all words which did not link clauses or clearly belong to any of the other categories scored.

Black Dialect forms. These were cases either of deletion of morphemes (such as contractible copula, auxiliary be, and third person singular verb inflection), or other syntactically clear cases (use of infinitive form of be instead of inflected forms, use of double negative). These cases did not exhaustively cover the manifestations of Black Dialect, but rather only its more countable features.

## Results

The results for the motherese indices will be organized as follows. First, a few of the indices will be cited in order to show that on intuitive grounds it is clear that all mothers in the sample showed some simplification and accomodation in the structure of their speech to their children. Second, some individual differences will be described. Third, where possible, performance by this sample will be compared with data on performance by middle class mothers.

Evidence for a 'motherese'. Table 19 shows the proportions of Interjections in the mothers' speech. If we consider only utterances composed of words, Interjections accounted for an average of 22% of all utterances; if we include stereotyped vocalizations (e.g., un-hn, un-un) they account-

Table 19

Occurrence of Interjections in the mothers' speech

| Word-type | Bobby % of verbal utterances | Luanne % of verbal utterances | Thomas % of verbal utterances | Jackson % of verbal utterances |
|---|---|---|---|---|
| Affirmative | 04 | 12 | 04 | 04 |
| Negative | 02 | 04 | 03 | 03 |
| Attention | 06 | 03 | 05 | 02 |
| Question | 02 | 02 | 04 | 02 |
| Label | 04 | 01 | 07 | 01 |
| Other | 06 | 03 | 02 | 02 |
| Total | 24 | 25 | 25 | 14 |
| **Nonword-type** | **% of all utterances** | **% of all utterances** | **% of all utterances** | **% of all utterances** |
| Affirmative | 01 | 02 | 02 | 05 |
| Negative | 00 | 01 | 01 | 00 |
| Question | 09 | 05 | 13 | 03 |
| Other | 00 | 00 | 00 | 00 |
| Total | 10 | 07 | 15 | 08 |
| Grand total (% of all utterances | 31 | 31 | 37 | 21 |

ed for an average of 30%. Interjections, then, constituted a substantial proportion of the utterances the children in this sample heard.

Turning to the mothers' syntactically productive language, scanning a few of the measures of structural complexity (see Appendix 2) shows, on intuitive grounds, that there was substantial simplification in the speech to the children: the overall MLU was less than 5 morphemes; an average of 78% of the sentences had only one clause; there were less than 1.5 NP's per sentence; and 83% of the verbs were in the present tense. Maternal speech was also quite redundant, with an average of 20% of the utterances being either complete or partial repetitions, and was quite well-formed (see Table 20). While an average of 16% of the utterances (excluding Interjections) were ungrammatical, only 17% of the ungrammatical utterances contained syntax errors. The remaining ungrammatical utterances were composed of Fragments (65%), Ellipses (11%), and False Starts (6%). In other words, only 3% of all sentences were syntactically incorrect. Table 21 shows the distributions of sentence modalities for the mothers. As can be seen, the Declarative mode described an average of only 35% of the sentences. The majority of the mothers' sentences were cast in the Imperative and Interrogative modes - modes which overtly require some sort of behavioral or linguistic

Table 20

Types of ungrammatical utterances in the mothers' speech, expressed as percentages of the total number of ungrammatical utterances, and of D*

| | Bobby | | Luanne | | Thomas | | Jackson | |
|---|---|---|---|---|---|---|---|---|
| Child's MLU | 1.02 | | 1.54 | | 1.64 | | 2.26 | |
| Ungrammaticl type: | % ungram. | %D | % ungram. | %D | % ungram. | %D | % ungram. | %D |
| Fragment | 59 | 09 | 61 | 08 | 84 | 16 | 57 | 11 |
| Syntactic error | 30 | 05 | 19 | 03 | 10 | 02 | 10 | 02 |
| Ellipsis | 07 | 01 | 11 | 01 | 04 | 01 | 23 | 04 |
| False start | 05 | 01 | 09 | 01 | 01 | 00 | 09 | 02 |
| Total | 100 | 16 | 100 | 13 | 100 | 19 | 100 | 19 |

*D = (No. grammatical + No. ungrammatical) - (No. Exact repetitions + No. Imitat.)

Table 21

Distribution of sentence modalities in the mothers' speech, expressed as % of grammatical utterances

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Child's MLU | 1.02 | 1.54 | 1.64 | 2.26 |
| Imperative | 40 | 33 | 39 | 36 |
| Declarative | 27 | 49 | 20 | 38 |
| Question | 33 | 18 | 41 | 26 |
| Total | 100 | 100 | 100 | 100 |

response from the listener.

Individual differences. Because the amount of data per subject collected for this study was small, any claims for systematic individual differences will necessarily be problematic. Also, because of the small number of subjects, child age, child MLU, and individual mother were all confounded, and these are all variables one might want to use to look for patterns of differences among the mothers. Additionally, the mother-child pairs may have differed in the distribution of situations in which dialogue was recorded. These confoundings create serious and unavoidable difficulties for resolving patterns and for interpreting any patterns that may appear. With these cautions in mind, however, we can look for hints of patterned variation within the sample.

Even prior to looking at the data, there are two patterns of differences among the mothers one would want to look at: monotonic changes as a function of child MLU or age, and no change as a function of child MLU or age (which is really the null hypothesis condition for individual differences). From the literature review reported in the Introduction to this chapter, it was learned that motherese indices are not very tightly correlated with either child MLU or age. Therefore, we might expect little of interest

to emerge in the way of monotonic changes. Appendix 2 shows indices which did change monotonically as a function of child MLU. They were such things as percentage of utterances which were Recasts or Expansions, percentage of nouns inflected with possessive, and percentage of ungrammatical utterances which were syntactic errors. No noteworthy patterns stand out.

As for the 'no change' relation between motherese and child MLU, it is not clear what to expect, since magnitude of individual variation has not typically been attended to as a variable in studies of motherese. The concern here is with what, if any, motherese indices appear particularly stable across the child age and MLU ranges spanned by the present study. A criterion was arbitrarily chosen in which the maximum between-mother difference permitted was 5% for percentage scales and .05 for ratio scales. The results are shown in Table 22.

Notable for their absence are any global measures of sentence complexity, with the exception of Elements/NP. Some more particular complexity measures did appear in the 'no change' results, however, some of which could be interpreted as representing content that is semantically and/or syntactically too complex to be used successfully in talking with young children - for example, use of the auxiliary verb <u>have</u> and its associated verb inflection

Table 22

Motherese indices showing no change across all four mothers[1]

| | Bobby | Luanne | Thomas | Jackson | Mean |
|---|---|---|---|---|---|
| Child's MLU | 1.02 | 1.54 | 1.64 | 2.26 | |
| % unintelligible | 09 | 06 | 10 | 06 | 08 |
| Interjections: Nonword | | | | | |
| Other | 00 | 03 | 00 | 00 | 01 |
| % ungrammatical[2] | 16 | 13 | 19 | 19 | 17 |
| Utterances contingent on child's utterance: | | | | | |
| Imitations[4] | 02 | 03 | 01 | 01 | 02 |
| Expansions[4] | 00 | 02 | 02 | 01 | 01 |
| Total (include Recasts)[2] | 04 | 05 | 08 | 09 | 07 |
| Repetitions: | | | | | |
| Reduced[3] | 17 | 15 | 14 | 17 | 16 |
| Exact + Reduced[4] | 14 | 15 | 10 | 11 | 13 |
| Add + Partial[4] | 08 | 08 | 05 | 09 | 08 |
| Total[2,4] | 22 | 23 | 15 | 20 | 20 |
| Types of additional clauses: | | | | | |
| Relative clause[7] | 04 | 05 | 00 | 02 | 03 |

Table 22 (cont.)

| | Bobby | Luanne | Thomas | Jackson | Mean |
|---|---|---|---|---|---|
| NP statistics: | | | | | |
| Elements/NP | 1.27 | 1.30 | 1.32 | 1.29 | 1.30 |
| NP types[8]: | | | | | |
| Personal pronoun | 42 | 41 | 39 | 42 | 41 |
| Impersonal pronoun | 25 | 26 | 29 | 25 | 26 |
| Common noun | 27 | 28 | 29 | 25 | 27 |
| Proper noun | 06 | 05 | 02 | 08 | 05 |
| All pronouns | 67 | 67 | 68 | 67 | 67 |
| Non-noun morphemes in NP: | | | | | |
| Article | 35 | 38 | 37 | 33 | 35 |
| VP statistics: | | | | | |
| Grammatical morpheme type[5] | | | | | |
| Third singular | 01 | 04 | 01 | 01 | 02 |
| Particle | 02 | 07 | 06 | 02 | 04 |
| Progressive -ing | 12 | 18 | 17 | 15 | 16 |
| Infinitive to | 14 | 14 | 18 | 13 | 15 |
| Have | 00 | 00 | 00 | 00 | 00 |
| -en | 00 | 00 | 00 | 00 | 00 |

Table 22 (cont.)

| | Bobby | Luanne | Thomas | Jackson | Mean |
|---|---|---|---|---|---|
| VP statistics (cont.) | | | | | |
| Tense[6] | | | | | |
| Future | 02 | 03 | 04 | 01 | 03 |
| Infinitive | 07 | 10 | 08 | 10 | 09 |

[1]'No difference' was defined as no percentage difference greater than 5%, and no ratio scale difference greater than .05

[2]These cases are close to, but not at, criterion

[3]Expressed as % of all Repetitions

[4]Expressed as % of all grammatical and ungrammatical utterances, with Repetitions

[5]Expressed as % of all non-verb morphemes in VP, as defined in this study

[6]Expressed as % of all verbs

[7]Expressed as % of all clauses additional to the main clause

[8]Expressed as % of all NP tokens

(both less than 1%), use of the future tense ($\bar{X}$ = 3%), and use of relative clauses ($\bar{X}$ = 3%). Repetitions may improve the quality of communication between mother and child by allowing the child greater opportunity to understand what is being said to him/her. Imitations ($\bar{X}$ = 2%) and Expansions ($\bar{X}$ = 1%) were uniformly low across the four mothers.

The data on use of nouns versus pronouns showed striking uniformity, with pronouns ($\bar{X}$ = 67%) being used more frequently than common nouns ($\bar{X}$ = 27%). Also, personal pronouns ($\bar{X}$ = 41%) were used more frequently than impersonal pronouns ($\bar{X}$ = 26%). The predominance of pronouns probably reflects the general tendency for dialogue to be restricted to objects and events in the immediate context. The predominance of personal pronouns suggests some tendency for dialogue to focus more on mother and child than on objects.

In summary, while not very many of the motherese indices exhibited constancy across the four LIB mothers, at least some of those which did can plausibly be interpreted as reflecting accomodations by the mothers to the cognitive and linguistic limitations of their children.

The monotonic change and 'no change' functions relating motherese to child MLU were defined prior to inspecting the data. Upon inspection, a third pattern was revealed - namely, Thomas' and Bobby's mothers looked similar, Luanne's

and Jackson's mothers looked similar, and the former pair showed simpler speech than the latter pair (hereafter, Bobby's mother will be referred to as B-M, Thomas' mother as T-M, and so on). Table 23 gives the motherese indices showing this pattern. The criterion for inclusion was that the maximal within-pair difference score for a particular measure be less than the minimal between-pair difference score (i.e., the mothers within a pair had to look more like each other than they were like either of the mothers in the other pair).

Almost all of the global sentence complexity measures appear in Table 23: MLU, clauses per sentence, NP's/sentence, Elements/VP, Adverbs/sentence, and, marginally, preposition/sentence. Only Elements/NP is missing - it did not vary among the four mothers. Table 24 reports significance tests for the above measures. In all cases, there was no overlap between the two pairs - Bobby-Thomas vs Luanne-Jackson, though in some cases the within-group difference did reach significance (MLU-word, MLU-morpheme, NP/sentence, and preposition/sentence).

In one sense, this peculiar 'flip-flop' function points out how global complexity measures of maternal speech do not correlate very highly with child's MLU. Bobby had the lowest MLU, so we would expect his mother to have had relatively simple speech, if we thought there might be some

Table 23

Motherese indices showing the Bobby-Thomas versus Luanne-Jackson pattern[1]

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Child's MLU | 1.02 | 1.54 | 1.64 | 2.26 |
| MLU: | | | | |
| Morphemes | 4.28 | 5.30 | 3.98 | 5.51 |
| Words | 4.14 | 4.99 | 3.80 | 5.12 |
| Morpheme - Word | .14 | .32 | .18 | .39 |
| Interjections[3]: | | | | |
| Affirmative[2] | 18 | 47 | 15 | 30 |
| Label | 19 | 06 | 29 | 06 |
| Repetitions[4]: | | | | |
| Add | 12 | 17 | 14 | 19 |
| Clause statistics: | | | | |
| Clauses/utterance | 1.23 | 1.36 | 1.18 | 1.32 |
| Types of additional clause: | | | | |
| Other[5] | 09 | 21 | 04 | 29 |
| Total complements[5] | 88 | 75 | 96 | 69 |

Table 23 (cont.)

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| NP statistics: | | | | |
| NP's/utterance | 1.30 | 1.57 | 1.29 | 1.73 |
| NP modifiers: Poss. pron. + Article (6) | 73 | 63 | 71 | 50 |
| VP statistics: | | | | |
| Elements/VP | 1.52 | 1.73 | 1.51 | 1.76 |
| Auxiliary <u>be</u>[7] | 07 | 14 | 08 | 13 |
| Adverbs/utterance | .23 | .34 | .18 | .36 |
| Prepositions/utterance[2] | .13 | .19 | .11 | .29 |

[1] The maximal within-pair difference must be less than the minimal between-pair difference

[2] These are cases close to, but not at, criterion

[3] Expressed as % of all Interjections

[4] Expressed as % of all Repetitions

[5] Expressed as % of all clauses additional to the main clause

[6] Expressed as % of all NP modifiers

[7] Expressed as % of all non-verb components of VP

Table 24

Significance tests on measures showing the B-T versus L-J pattern

Confidence intervals:

| | | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|---|
| | Lower | 4.03 | 5.11 | 3.79 | 5.26 |
| MLU - morpheme: | Mean | 4.28 | 5.30 | 3.98 | 5.51 |
| | Upper | 4.53 | 5.49 | 4.17 | 5.76 |

| | | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|---|
| | Lower | 3.91 | 4.82 | 3.63 | 4.89 |
| MLU - word: | Mean | 4.14 | 4.99 | 3.80 | 5.12 |
| | Upper | 4.37 | 5.16 | 3.97 | 5.65 |

| | | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|---|
| | Lower | 1.17 | 1.38 | 1.13 | 1.27 |
| Clauses/utt.: | Mean | 1.23 | 1.36 | 1.18 | 1.32 |
| | Upper | 1.29 | 1.41 | 1.23 | 1.37 |

| | | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|---|
| | Lower | 1.41 | 1.66 | 1.37 | 1.64 |
| Elements/VP: | Mean | 1.49 | 1.72 | 1.44 | 1.70 |
| | Upper | 1.58 | 1.77 | 1.52 | 1.76 |

Chi squares:

Note: These tests contrasted proportions of mothers' sentences with adverbs (or prepositions) vs. proportion of mothers' speech without adverbs (or prepositions).

(Continued on next page)

Table 24 (cont.)

Chi squares (cont.)

Adverbs:

| | | |
|---|---|---|
| B-M vs. T-M | $X_1^2 = .588$ | N.S. |
| L-M vs. J-M | $X_1^2 = .095$ | N.S. |
| B-M + T-M vs. L-M + J-M | $X_1^2 = 33.787$ | $p < .001$ |

Prepositions:

| | | |
|---|---|---|
| B-M vs. T-M | $X_1^2 = .334$ | N.S. |
| L-M vs. J-M | $X_1^2 = 11.353$ | $p < .001$ |
| B-M + T-M vs. L-M | $X_1^2 = 11.537$ | $p < .001$ |
| B-M + T-M vs. J-M | $X_1^2 = 36.485$ | $p < .001$ |

positive correlation. Jackson had the highest MLU, so we would expect his mother to have had relatively complex speech. The data are consistent with these expectations. Luanne and Thomas had similar MLU's (1.54 and 1.64, respectively) so we would expect their mothers to have been similar in their levels of speech complexity. But, in fact they were very different, with Luanne's mother speaking in a relatively complex way, and Thomas' mother speaking in a relatively simple way. Moreover, while Thomas and Bobby differed by .61 morphemes in their MLU's, their mothers looked similar on the speech complexity indices. Likewise, Luanne and Jackson differed by .66 morphemes in their MLU's, but their mothers also looked relatively similar on the complexity indices.

A different perspective on this 'flip-flop' function is presented, however, if child language is indexed by Upper Bound-Repetitions Excluded (UB-RE; see Table 1). On this measure Luanne differed from Thomas by 1.05 morphemes, while Thomas differed from Jackson by only .57 morphemes. Thus, Thomas is now shown to be substantially more advanced than Luanne. Using UB-RE it is possible to attribute complexity of maternal language more of a role in facilitating, or slowing down, child language development. Specifically, though Thomas and Luanne were the same age, Thomas, whose mother 'continued' to speak at a level of

complexity characteristic of a mother of a younger child, had more advanced language than Luanne, whose mother spoke in a more complex fashion (on all measures listed in Table 23, the differences between L-M and T-M were significant at $p < .05$).

The results from this 'Upper Bound' perspective suggest a model of the relationship between complexity of maternal speech and child syntax development which has the following features. (1) Children beginning to combine words benefit from a simplified input. (2) A given level of simplification provides information about a number of aspects of syntax. Notice, though, that it would not provide information on all aspects of syntax, which would account for the low but positive correlation between complexity of maternal speech and child language that is typically found. (3) For a given aspect of syntax, the language acquisition device is able to tolerate, without loss of efficiency, some limited variability in the complexity of speech input. This feature of the model is to provide a possible reply to Newport et al's (1977) finding that with age and MLU of child partialled out, maternal MLU did not correlate with child language development. Though, without knowing how much variability Newport et al found in maternal MLU, this can serve only as a tentative reply.

To return to the data, we could speculate that Thomas

has enjoyed the benefits of a long term exposure to a simplified input, having had the opportunity to induce a number of aspects of syntax in a relatively efficient manner. Luanne, on the other hand, has been presented with a substantially more complex corpus of speech, with negative consequences for her syntax learning.

The model just given was a product of speculation. Though it is consistent with the known evidence on the relationship between maternal speech and child syntax acquisition, it is admittedly too simplistic to be of much value for a model of language learning. It was outlined however to illustrate two points. First, it shows how the choice of a particular type of global measure of child language competence can strongly influence the nature of the results. Using Brown's MLU, there was little basis for suggesting a relationship between complexity of maternal speech and child language development. Using an Upper Bound measure, however, the possibility of a tighter relationship appeared in a relatively clear way. Secondly, the model will help to illustrate a relationship that can be drawn between social class and tendency to provide a good language-learning environment. The validity of the relationship will depend on the validity of the assumption that the difference between Luanne and Thomas in rate of syntax development was at least in part a consequence of differ-

ences in how their mothers spoke to them (that is, the difference was not just a consequence of biological differences between the children, for example). The model outlined above relating complexity of maternal speech to rate of syntax acquisition represents one possible significant difference between Luanne's and Thomas' mothers. We turn now to considering this social class connection.

Labov (1972) has observed that the degree of usage of Black Dialect forms is not homogeneous among all low-income urban Black people. It reaches a peak of usage among teen-aged gangs, and is found in variably lesser degrees among other segments of the community. Not enough data about the patterns of variability exist to be very confident about what they signify. But, it seems reasonable that individual differences in overall tendency to use Black Dialect forms would be associated with degree of participation in the lifestyle and values of low-income Black urban culture. That is, the more an individual uses Black Dialect forms, the less of a middle class set of values she/he is likely to have. This suggests comparing the mothers in the present sample in terms of their degree of usage of Black Dialect forms, in particular comparing L-M with T-M. A 'cultural deficit' hypothesis would predict that Luanne's mother ould show more usage of Black Dialect forms, since she is apparently less successfully accomo-

dating her speech to her child.

The data on the mothers' usage of Black Dialect forms have already been reported (see Table 18). For the most part, these mothers did not use Black Dialect very much. Nonetheless, if we consider the one Dialect form which did occur fairly frequently - deletion of auxiliary be - the results were that it was Thomas' and Bobby's mothers who showed the most use of Dialect (48% and 42%, respectively), while Luanne's and Jackson's mothers showed substantially less use (21% and 10%, respectively). Thus, it was Thomas' mother who used the most Dialect forms, and it was Thomas' mother who, according to the model, was accomodating her speech more successfully to the linguistic limitations of her child.

It is a rather attractive idea that Black Dialect, which as measured here involves deletion of various functors and inflections, might be well suited to teaching the early, telegraphic syntax. It is also interesting to see that a possible index of participation in urban Black culture may be, if anything, positively associated with more rapid language development. Unfortunately, the above finding must be severly qualified. First, none of the mothers spoke Black Dialect extensively. Since it is not obvious that more is better, the present data must be considered only weakly suggestive. Indeed, auxiliary be

deletion might, for these mothers, actually have been more in the way of 'baby talk'. While I have not seen auxiliary be deletion described as a feature of baby talk, Ferguson (1977) has pointed out copula deletion as a baby talk feature. And, Newport et al (1977) discovered that it was common for mothers to delete the 'are you' or 'do you' before catenatives such as gonna and wanna. Perhaps some (or all) of these mothers came from a language group in which auxiliary be deletion was one of the things one commonly did when talking with babies.

The second qualification is that other evidence suggests that Thomas' mother was probably closer to middle class values and lifestyle than any of the other mothers in the present sample. For one thing, Thomas had to be withdrawn from the Infant-Toddler Center because his parents had too large an income to continue to qualify for state assistance. Also, analyses of the mother-child interactions (which will be reported later) suggested that Thomas' mother behaved more like one would expect a middle class mother to act, while Luanne's mother behaved more like one would expect a lower class mother to act (cf. Hess and Shipman, 1965). For example, there seemed to be more equality in the control of the interaction for Thomas and his mother than for Luanne and her mother.

These facts suggest the initial premise was not met -

that greater usage of Dialect forms indicates less in the way of middle class orientation. This failure of the initial premise could be taken as support for an argument that T-M's apparent use of Dialect forms is really something else - such as a baby talk feature. On the other hand, we could retain the proposal that auxiliary be deletion was a true Black Dialect form for all mothers in the sample, but claim that the initial premise failed because it was too simplistic. Thus, upwardly mobile Black people, especially those that remain in a Black urban area, may experience a conflict between the local culture and the more middle class status which they are beginning to reach. Both cultures will pose demands on values and lifestyle. The result can be a juxtaposition of both orientations within the same persons (Billingsley, 1968).

So, while the correlation between degree of usage of Black Dialect forms and participation in urban Black culture may hold in general, there may also be a number of exceptions. Specifically, Thomas' mother actually could be using Dialect more than Luanne's mother, though Thomas' mother also seems to interact with Thomas in other ways which reflect a more 'middle class' orientation.

This attempt to relate what appeared to be a possible index of Black culture identification with what appeared to be a difference in the quality of syntax learning environ-

ment has ended on an ambiguous note. The possibility remains that Black Dialect usage actually correlates positively with early syntax acquisition in a LIB population. But, this provocative relationship needs substantially more investigation to be verified - or denied.

Social class differences in motherese. In the introduction to this chapter, the difficulty in finding comparable middle class data was described. When the criterion of using only those studies with reasonably comparable sampling techniques was employed, only the Newport et al (1977) study was found to be at all appropriate. Though their sample of mother-child pairs involved a somewhat younger group of children, their mean child MLU was comparable to the mean child MLU for the present study. Any motherese measure for which Newport et al gave a group mean was calculated for the LIB children's mothers, with occasional exceptions when it was unclear how Newport et al actually did the calculations. Because they did not report all of their results, there was only a small set of indices for which comparisons could be made (see Appendix 2).

It was found in the analysis of the LIB children's (hereafter, the four LIB children will often be collectively referred to as BLTJ) language that structurally their language did not differ in any essential way from that of

MC children with comparable MLU's. We can now ask whether their mothers' speech differed in any essential ways from that of the MC mothers of a group of children with comparable MLU's. Any differences would be of particular interest, since these could be taken to be symptomatic of earlier differences that might have led to the divergence in syntax development between the two social class groups. As it turned out, the two groups of mothers showed both similarities and differences on the motherese indices.

Table 25 shows those motherese indices on which Newport et al's mothers and BLTJ's mothers appeared similar (difference in group means $\leq 5\%$). First, the results for grammaticality show that the two groups were well matched both on the total proportion of utterances which were grammatical, and also on the distribution of the three types of ungrammatical utterance - Syntax error, Fragment, and Interjection (as defined by Newport et al). This suggests that BLTJ's mothers were, in one important sense, speaking as carefully as the MC mothers. Second, if Repetitions are thought of as symptomatic of a mother's concern with effectively communicating with her child, then again BLTJ's mothers are shown to be equally careful communicators. Third, from Newport et al's description of their category 'Expansions', it is probable that they included in it what were in this study coded as 'Recasts'. If so, then Expan-

Table 25

Motherese indices with similar values across social class[1]

| | Newport et al | BLTJ | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|---|---|
| Unanalyzable utt.[3] | 04 | 08 | 09 | 06 | 10 | 06 |
| Grammatical utt.[3] | 60 | 58 | 55 | 60 | 54 | 62 |
| Ungrammatical utt.[3] | | | | | | |
| Interjections | 18 | 17 | 19 | 23 | 16 | 11 |
| Syntax errors | 0.7 | 02 | 03 | 02 | 01 | 01 |
| Fragments | 17 | 14 | 14 | 09 | 19 | 12 |
| Repetitions[1,3] | 23 | 17 | 20 | 18 | 14 | 17 |
| Sent. mode: Declar.[4] | 30 | 33 | 25 | 48 | 19 | 38 |
| Expansions[3] | 06 | 04 | 02 | 02 | 06 | 07 |

[1]No mean percent difference greater than 5%

[2]Cases close to, but not at, criterion

[3]Expressed as % of all utterances

[4]Expressed as % of all grammatical utterances

sions did not show a group difference. These data, as well as the data on maternal speech simplification presented earlier, are not consistent with any hypothesis proposing gross verbal neglect on the part of the LIB mothers.

Though the mothers in the two groups showed these similar levels of concern with being clear, effective communicators, their speech did show some structural and functional differences (Table 26). The MC mothers appeared to speak somewhat longer utterances than BLTJ's mothers (MLU = 4.24 words for MC, MLU = 3.68 for BLTJ-M). The LIB mothers showed a clear and consistent tendency to use more Imperatives than the MC mothers (38% vs. 18%, respectively). Snow et al (1976) also found this difference between the lowest and the higher social classes in their sample. The mean proportion of Declaratives was similar across the two groups (30% for MC, 33% for BLTJ-M), but there was quite a bit of variability among the four LIB mothers. MC mothers tended to use more Questions than BLTJ-M (44% vs. 30%, respectively), but again the LIB mothers were not uniformly lower. BLTJ-M were also different from the MC mothers on some of the sytax measures which Newport et al found to correlate with some particular aspects of child syntax development. BLTJ-M showed consistently less use of Deixis (16% vs. 6% - a difference also found by Snow et al, 1976), and consistently less use of Yes-no questions (21% vs. 7%).

Table 26

Motherese indices with different values across social class[1]

| | Newport et al | BLTJ | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|---|---|
| MLU - word | 4.24 | 3.68 | 3.32 | 3.86 | 3.06 | 4.48 |
| Sentence mode[2]: | | | | | | |
| Imperatives | 18 | 38 | 41 | 34 | 39 | 39 |
| Questions | 44 | 30 | 33 | 18 | 42 | 25 |
| Deixis[3] | 16 | 06 | 06 | 06 | 08 | 03 |
| Yes-no questions[2] | 21 | 07 | 06 | 04 | 11 | 06 |

[1]Mean percent differences greater than 5%

[2]Expressed as % of all grammatical utterances

[3]Expressed as percent of all utterances



Table 27

Estimates of sentence length in words as a function of sentence mode

| | Bobby | Luanne | Thomas | Jackson | Mean |
|---|---|---|---|---|---|
| Imperatives | 3.09 | 3.61 | 3.31 | 4.07 | 3.52 |
| Questions | 4.19 | 4.73 | 4.41 | 5.83 | 4.79 |
| Declaratives | 5.31 | 5.24 | 4.42 | 7.31 | 5.57 |

The social class difference in mothers' MLU requires further consideration, because it may be an artifact of the differing distributions of sentence modalities across the two groups. On intuitive grounds, it seems likely that Imperatives will tend to be shorter than the other sentence modes, and that a relatively greater predominance of Imperatives could then depress overall MLU. To test this intuition, the mean lengths of Imperatives, Declaratives, and Questions were calculated for each child's mother in the present study (see Table 27). In fact, Imperatives were uniformly shorter than Questions and Declaratives (overall means were 3.52, 4.79, and 5.57, respectively). In order to determine if the distribution of sentence modes was responsible for the social class difference in maternal MLU, the MLU's for all four LIB mothers were recalculated using the distribution of sentence modes Newport et al found for their MC sample. The results show that the group mean for the LIB mothers does come closer to the MC group mean - 3.90 versus 4.24 words, as opposed to the original 3.68 versus 4.24 words. However, it is still .34 words less, and most of the increase in overall MLU seems attributable to the change for the mother of the oldest child: J-M showed a .67 word increase while the other mothers showed changes varying from -.16 to .22 (the negative change occurred because Luanne's mother had

been using a disproportionately large number of Declaratives, the longest sentence type). Thus, it appears that the LIB mothers were tending to speak relatively shorter utterances, in addition to using relatively more Imperatives.

The question now arises as to whether the social class differences in motherese suggested above might account for the apparently different rates of syntax development between the two classes. Two of the group differences, on Imperatives and Yes-no questions, were in the direction that would be expected given the slower syntax development of the LIB childre. Newport et al found both of these to be associated with acquisition of the verb auxiliary system - the former negatively, and the latter positively. It seems unlikely, though, that these could account for the lag which appeared in the LIB children's syntax development. There was no evidence of a selective deficit in their use of verb auxiliaries, as opposed to tense markers, prepositions, articles, NP inflections, etc. Rather, the lag appeared to be of a general nature. As for the social class difference in Deixis, Newport et al found Deixis to be positively correlated with growth in vocabulary, but not with any syntactic measures.

This leaves the difference in MLU, and the difference in the distribution of sentence modalities, provided the

latter is interpreted more broadly than just in terms of information provided about verb auxiliaries. Newport et al found no significant partial correlations (child age and MLU partialled out) between either of these motherese variables and general syntax development.

If we accept the conclusions of Newport et al concerning the effects on syntax development of Imperatives, Yes-no questions, Deixis, and MLU, then none of the social class differences reported here appear capable of accounting for the apparent social class difference in rate of syntax development.

An alternative perspective, though, is motivated by the possibility that the range of variability in Newport et al's sample was relatively restricted, so as to exclude the motherese values shown by the LIB mothers. If so, it could still be that maternal MLU, Imperatives, etc., negatively influence general syntax development when they take on sufficiently 'extreme' values, such as those shown by the LIB mothers (i.e., 'extreme' relative to Newport et al's range). Since Newport et al did not report variability however, this possibility cannot be verified.

This picture of social class differences in motherese and how they might relate to differences in rates of syntax development is further complicated when we reconsider the differences between Luanne's and Thomas' mothers. Naively,

we might expect Thomas' mother to have appeared more middle class in her motherese, since Thomas appeared to be developing syntax more quickly than Luanne, and MC children in general seem to acquire syntax more rapidly than LIB children. So, we might expect T-M to have a higher MLU, use fewer Imperatives, and use more Yes-no questions than L-M. In fact, while T-M did use more Yes-no questions than L-M (11% vs. 4%; $X_1^2 = 28.11$, $p < .001$), T-M did not significantly differ from L-M in use of Imperatives (34% vs. 39%; $X_1^2 = 2.775$, N.S.), and T-M's MLU was significantly lower than L-M's (see Table 2).

As for the relative frequencies of the Declarative and Question sentence modalities, T-M produced 19% Declaratives and 42% Questions, while L-M produced the opposite pattern of 48% Declaratives and 18% Questions. The MC mothers in Newport et al's sample produced an average of 44% Questions - a figure almost identical to T-M's. Whereas T-M's production of Declaratives was relatively low (19% vs. 30% for the MC sample), this is not unexpected since we have seen that T-M did produce relatively many Imperatives. In one sense, T-M's 'one out of three' on sentence modality is more middle class than L-M's 'zero out of three', but it seems likely that the significane of the overall distribution must be considered in a more wholistic fashion.

We discovered earlier that MC children appear to

acquire syntax more rapidly than LIB children, and that Thomas appeared to be acquiring syntax more rapidly than Luanne. Contrary to what one might expect, however, we have discovered that at least on motherese indices, T-M was not obviously any more middle class than L-M. We might conclude from this that again most motherese indices simply are not very good at predicting rate of syntax developmet. An alternative conclusion, however, deserves consideration.

Suppose that such things as MLU and frequency of Imperatives and Yes-no questions are significant variables enabling us to predict overall rate of syntax development. This supposition requires that we presuppose the existing counterevidence, such as Newport et al's, to be limited in some way (e.g., by the 'restriction of range' problem suggested earlier). Then, the alternative conclusion is that the patterns of motherese indices associated with faster versus slower syntax development may vary as a function of social class. That is, the conditions of life for LIB families may lead to basic differences in the nature of early mother-child interaction, relative to MC families. And given any such basic differences as boundary conditions, the distinctions in what LIB mothers can do in providing good versus less good language learning environments may be different from those for MC mothers, for

whom the boundary conditions are different.

It is tempting to view the uniformly high production of Imperatives by the LIB mothers as a symptom of a basic social class difference. Both a more limited time-energy budget caused by the stress of being poor and having to work, and perhaps different attitudes towards child-rearing in which the child is viewed as being more passive by LIB mothers (Kagan and Tulkin, 1973), may combine to produce a more abruptly directive relationship between mother and child. I am at a loss, however, to give any good explanations of what distinctions there might be between good and poor language learning environments given high frequency of Imperatives - for example, T-M's MLU is significantly less than L-M's, but whether and why this might have facilitated her child's syntax development, I am not able to say.

## Summary

The following are the major results from the analyses of the mothers' speech to their children.

Structural simplification. There was evidence for structural simplification in the mothers' speech, as shown by low MLU's (and low values on other, highly correlated complexity indices), and by avoidance of constructions

that are probably too complex for very young children (such as relative clauses, the perfective, and future tense). There were other types of accomodations in the mothers' speech as well, such as repetitiveness and frequent use of sentence modalities (Imperative and Question) which explicitly require some response from the child.

Individual differences. A pattern of individual differences among the LIB mothers emerged in which Bobby's and Thomas' mothers looked similar on most of the global complexity indices, Luanne's and Jackson's mothers looked similar, while the two pairs were dissimilar from each other. This result gave rise to the suggestion that choice of global measure of child syntax competence is a significant one, and can lead to quite different results. Specifically, using Brown's child MLU measure, it appeared that no clear relationship existed between child syntax competence and complexity of maternal speech. Thus, two children (Luanne and Thomas) of the same age and approximately the same MLU had mothers speaking at very different levels of complexity. However, using an Upper Bound measure, which changed the estimates of the relative syntax competencies of the children, it was possible to attribute complexity of maternal speech a role in regu-

lating syntactic development, and a model of that role was schematically outlined.

Black Dialect and language development. Under the assumption that the apparent difference in rates of syntax development between Luanne and Thomas was at least in part a consequence of differences in their mothers' speech, the two mothers were compared on their tendency to use Black Dialect, where degree of usage of Dialect was taken as an index of degree of participation in urban Black culture. The result was that the mother with the more advanced child (T-M) used Black Dialect significantly more than the other mother. This surprising result was, however, problematic for several reasons: Black Dialect was in general not very heavily used, possibly some of the use of Dialect was actually a 'baby talk' feature, and there was other evidence suggesting Thomas' mother had a more middle class orientation than Luanne's.

Similarities across social class. A comparison between the LIB mothers and Newport et al's (1977) mothers on the motherese indices showed some similarities (percentage of utterances that were grammatical, rarity of syntax errors, high redundancy) which suggested that in a general way, the LIB mothers were as concerned as the MC mothers with being clear, effective communicators.

Differences across social class. The social class comparison also revealed differences on both structural and functional motherese indices. The LIB mothers appeared to be using shorter utterances on the average. And, the LIB mothers used more Imperatives, less Deixis, and fewer Yes-no questions. The differences on Imperatives and Deixis were in the same direction as found by Snow et al (1976) in their social class study of Dutch motherese (Yes-no questions were not a measure in that study), though Snow et al did not find any social class differences in maternal MLU.

Class differences and language development. It was of interest to see if the social class differences in motherese that were found could help account for the apparent social class difference in rate of child syntax acquisition, in which the LIB children appeared to lag behind MC children. The results were problematic in that none of the differences found have been found by other investigators to predict differences in general rate of syntax acquisition (see Newport et al, 1977). Two alternative conclusions were suggested. One, in line with Newport et al's arguments, was that motherese indices are simply not good predictors of general rate of syntax acquisition. The alternative involved assuming that Newport et al's

data suffered from a 'restriction of range' problem, in that their sample was quite homogeneous. Then, perhaps the values of the LIB mothers on such motherese indices as MLU and frequency of Imperatives fell outside the 'normal' MC range, and, perhaps when the differences are that large, MLU and Imperative frequency rate are useful and valid predictors of rate of syntax acquisition.

Social class and individual differences. The results for the social class comparisons were further complicated by the fact that a difference between two of the LIB children (Thomas and Luanne) in rate of syntax development was not paralleled in their mothers by more or less correspondence with MC motherese. The speech of the mother of the more advanced child (Thomas) was not obviously more MC-like than the speech of the other mother, though there were structural and functional differences between the two mothers in their speech. One conclusion, as suggested by #6 above, was that motherese measures just do not predict rate of syntax acquisition at all well. An alternative conclusion was that, at least for the magnitude of individual differences found in the present study, motherese measures are useful, and that how they combine to produce good learning environments may vary as a function of social class.

# C H A P T E R IV

## MOTHER-CHILD INTERACTION

### Introduction

The preceding two sections on the children's language and on the mothers' language have included a limited and indirect discussion of how the mothers and children interacted. None of the measures in those sections considered the mother and child jointly. This section contains an examination of what the mother-child conversations were about, and how language was used in those conversations.

Information on mother-child interaction is very important for understanding both language development and cognitive development. MacNamara (1972) has presented an argument claiming that all aspects of language development (phonology, syntax, semantics) have their optimal learning environments in those situations where the child has available some extra-linguistic information about the situation. Such contextual information helps the child to isolate and attach significance to particular language structures. Following this line of reasoning, a good understanding of the dynamics of language development would require knowledge of how language is used with respect to the objects and events a child apperceives

nonlinguistically.

Hess and Shipman (1965) argued that the way a mother talks to her child and verbally directs her child's activities can have a powerful influence on her child's cognitive development. Using a framework laid out by the sociolinguist Basil Bernstein, they contrasted 'restricted' versus 'elaborated' codes. In their words:

> Restricted codes are stereotyped, limited, and condensed, lacking in the specificity and exactness needed for precise conceptualization 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....

On the other hand:

> Elaborated codes, however, are those in which communication is individualized and the message is specific to a particular situation, topic, and person. It is more particular, more differentiated, and more precise. It permits expression of a wider and more complex range of thought, tending towards discrimination among affective and cognitive content.

Hess and Shipman also identified a correlated distinction in how mothers control their children's behavior. 'Status-based' control relies on appeal to authority figures. 'Person-based' control relies on giving reasons for behavior restrictions which are tailored to the needs of the individuals involved. These various categories have been given here in some detail because Hess and Shipman

claimed that they are strongly correlated with middle versus lower class, with the lower-class mothers tending to use the restricted code and status-based control. In addition, they argued that these two features of interaction are likely to result in deficient cognitive development. They might also be thought to retard language development, using MacNamara's line of argument, since the mother's use of language in the restricted code/status-based authority case is less oriented to the viewpoint of the child.

It must be admitted at this point that the present study will not adequately address the above two perspectives on mother-child interaction. They were cited in order to illustrate the central importance of contingent mother-child analyses, and, by a halo effect, to motivate the limited analyses which were in fact done.

Essentially, two problems prevented an in-depth analysis of the mother-child interactions. One was the lack of a description of the nonverbal behavioral context of the verbal dialogue. Since mothers and their young children talk almost exclusively about the immediate behavioral setting, that setting gives their interaction thematic and temporal structure. Not knowing the details of settings places strong constraints on one's ability to analyze the mother-child verbal interactions. The second

problem was that no middle class data could be found which combined the features of: being broadly descriptive; based on verbal interaction alone; involving children between the ages of 1½ and 3; and having a reasonably large sample size. The Hess and Shipman study used Black mothers of four-year-olds, and it is not clear how to extend their model to mothers of younger children. Motherese has some of the characteristics of the restricted code - it is short, has a fairly large proportion of fragments, little embedding, and is probably more directive than speech addressed to older children. Holzman (1974) compared two MC mothers of suitably young children with two upper-lower class mothers on some measures of how indirect controlling utterances were, and found no class differences. Unfortunately, Holzman's sample was too small (two mothers, and only 100 utterances apiece), and the code was not described well enough to permit use of her data as a standard of comparison.

The above two problems meant that analysis of mother-child interaction had to be relatively superficial. Nonetheless, a few analyses were done in order to obtain some feel for what was going on in the interactions. At least in an intuitive way these analyses can address some of the kinds of influences on child language and cognitive development discussed above, and they will also help

elaborate on the nature of some of the individual differences among the mother-child pairs.

The following is a description of what types of questions were asked of the data. One interesting aspect of the mother-child interactions was their 'thematic choppiness' - that is, the topics of conversation often seemed to change quite rapidly. As children develop cognitively, the choppiness of verbal interaction presumably declines. Perhaps the mother can actually facilitate cognitive development to some degree by tending to hold to a topic, leading the child through various aspects of it. The idea here is that the mother provides her child with a 'cognitive map' of some topic, which the child can then internalize (Hickman, 1978; Wertsch, 1978). If there is some validity to this idea, then thematic choppiness would be an interesting measure on which to make social class comparisons. Thematic choppiness seems to be in the same spirit as Hess andShipman's restricted code, in that the latter is characterized by terseness.

In the course of working out a way of coding thematic choppiness, it was found necessary to segment the verbal dialogue into two levels - one called 'episodes' and the other called 'exchanges'. A good example of this structure is when the mother is combing the child's hair, and there is a relatively continuous dialogue concerning the activity

of combing hair. They might cover such things as: the mother tells the child to stop squirming; the mother asks the child if she likes the way her hair looks; and so on. The entire stream of dialogue would be the 'episode', and its component pieces would be the 'exchanges'. Within this structural framework, several other types of information were obtained. First, were the episodes 'Person-oriented' or 'Object-oriented'? The speculation was that for a smooth transition into a school environment, Object-oriented verbal interactions would be an important class of experiences for a child, and, if so, this would be an interesting measure for making social class comparisons. Second, were the exchanges directive or non-directive? Did the mother direct, the child direct, or both? In a restricted code/status-based authority, one might expect the mother to dominate and direct more than in the case of the elaborated code/person-based authority. Third, were the mothers' directive utterances direct commands, requests, or indirect? This addressed the restricted versus elaborated code, in that indirect commands belong more to the elaborated code-person-based authority, while direct commands belong more to the restricted code/status-based authority.

Finally, a code for utterance function developed by John Dore (unpublished) was applied to the children's

speech. Dore's code was used to provide distributional information on the use of various types of requests, responses, descriptions, and statements. Though the code does not consider mother and child jointly, this section on interaction seemed the most natural one in which to report the results, as the code seeks to capture more of the 'communicative' qualities of utterances.

## Methods

Two coding systems were applied to the tanscripts: one involved isolating 'episodes' and the 'exchanges' embedded within them; the other involved a functional classification of each child's utterances.

The episode-exchange code was originally motivated by an attempt to obtain a measure of the thematic choppiness of the verbal dialogue. It was found that in some cases where there were apparent changes of topic, there was nonetheless an overall thematic continuity (e.g., the hair combing episode described in the Introduction in which a number of verbal exchanges all centered on this activity). It was felt that to ignore such continuity would misleadingly inflate an index of thematic choppiness, and so the episode-exchange code was formulated.

Episodes and exchanges are not tight categories. To some degree they are artificial in that they are segmented

without much knowledge of the nonverbal behavioral interactions. In view of these constraints, a strict operational definition cannot be given, but rather only a 'central tendency'. An episode is some relatively continuous verbal dialogue (no silent pauses longer than ten seconds permitted) in which all conversation is centered around some specific object, activity, or situation. An exchange is a verbal interaction which is either identical to or embedded in an episode (i.e., an episode is composed of mutually exclusive exchanges), and which fulfills some limited function.

The clearest cases of exchanges are directive ones - such as when the mother attempts to get her child to sit down, come over, stop squirming, and so on. There are considerable less clear cases. For example, non-directive episodes which have the character of being 'chit-chat' can be difficult to segment into exhanges. Another example is a 'labeling game' sequence, in which the mother is requesting the names of a series of things. If the game is going smoothly, then the mother proceeds from one object to the next almost at an utterance-by-utterance rate. In this case, it seems artificial to consider each object-plus-label cycle an exchange. On the other hand, sometimes the child does not know a label, and the mother will break her rhythm in order to make sure the child

learns the right answer. In this case, where the game is no longer preceeding smoothly, it seems to make more sense to isolate the object-response-counterresponse (etc.) as one exchange. This type of dilemma, where there is a contrast between an interaction going smoothly versus otherwise, occurs in other contexts as well. Appendix 3 provides several examples of application of the episode-exchange code to mother-child interaction.

Episodes were classified according to whether they were Concrete or Abstract. Concrete episodes concerned something within the ongoing behavioral setting. Abstract episodes concerned information about things not in the ongoing behavioral setting.

Concrete episodes were classified according to whether they were Person-oriented, Object-oriented, or Situation-oriented. Person-oriented episodes were concerned with such things as location of a person (PLoc), a person performing some intransitive action (PA), a person performing some action on another person (PAP), some physical or psychological property of a person (PProp), being polite, verbal games, getting someone's attention (Get Attn), and bodily maintenance activities (BMA - activities such as combing hair, washing up, etc.). Object-oriented episodes were concerned with such things as possession of an object (Obj Poss), location of an object (Obj Loc), some property

of an object (Obj Prop), or a person performing some action on an object (PAO). Situation-oriented episodes, which were rare, were concerned with such things as room temperature, lighting, weather, and so on.

There was no double-coding with respect to the above subcategories, even though there were cases where several of them seemed to be within the same episode. In these cases, the subcategory that seemed to describe the episode in the most focal way was used. The reasons for this procedure were: (1) the occasions where double-coding seemed appropriate were not very common - indeed the subcategory systems were designed to avoid that problem, and (2) there was not enough concern with the relative distributions of the subcategories to warrant the increased complexity brought about by double-coding.

Exchanges were subdivided into Directive and Non-directive. Directive exchanges involved one or both partners trying to get the other partner to do something in particular. Non-directive exchanges were verbal games and, for lack of a better term, 'chit-chat'.

Directive exchanges in which the mother produced at least some of the directives were further characterized according to whether the mother's directives were Direct commands (i.e., imperatives, or similarly forceful utterance types), Direct requests, or Indirect attempts at

getting compliance.

In addition to the episode-exchange code, a coding system developed by John Dore (unpublished) was used to describe in a general way the types of functions the children's utterances served. Dore developed the code in order to characterize the speech of older children but its categories were useful for describing speech functions in younger children. Speech functions were split into six main types - Requests, Responses, Descriptions, Statement, Calls, and Miscellaneous, with further subtypes of each. Appendix 4 describes the code in more detail.

## Results

The results for the episode-exchange code will be reported first, followed by the results for the Dore code.

Episode-exchange code results. Concerning the proportion of all episodes which were Concrete, the results were: B-MCI = 98%, L-MCI = 99%, T-MCI = 95%, and J-MCI = 81% ('MCI' stands for 'mother-child interaction'). So, for the three youngest children, almost all of the episodes concerned something in the immediate environment. The relatively higher frequency of Abstract episodes for Jackson probably came from his being older and more mature cognitively, as well as from his being linguisti-

cally more advanced than the other children. These high proportions of Concrete episodes can be taken as another sign of the accomodation by the mothers to the cognitive-linguistic abilities of their children. Because of the relatively few cases of Abstract episodes, the remaining analyses will be concerned only with the Concrete episodes.

Table 28 shows the distribution of topics for Concrete episodes for each mother-child pair, with topics broken down according to Person-orientation, Object-orientation, and Situation-orientation (for a more complete presentation, see Appendix 5). For all pairs, Person-oriented episodes were in the majority (58% to 73%), Object-oriented episodes were next in relative frequency (25% to 42%), while Situation-oriented episodes were distinctly uncommon (0% to 2%). Within the Person-oriented episodes, a focus on psychological states was rare (1% to 5% of all episodes). So, in general, most episodes were concerned with the immediate physical environment, often as it concerned people, or were stereotyped verbal exchanges such as verbal games.

Whether the high proportion of Person-oriented episodes is also high relative to what middle class mother-child pairs would produce cannot be determined here, of course. It should be noted, though, that his measure would be very sensitive to sampling conditions. This is

Table 28

Topics of concrete conversational episodes, expressed as percentage of total number of concrete episodes

| | Bobby | | Luanne | | Thomas | | Jackson | |
|---|---|---|---|---|---|---|---|---|
| | sub total | total | sub total | total | sub total | total | sub total | total |
| Body maintenance activities | | 11 | | 28 | | 29 | | 06 |
| Person focus | | 50 | | 45 | | 29 | | 53 |
| Physical | 27 | | 31 | | 13 | | 27 | |
| Mental | 03 | | 01 | | 02 | | 05 | |
| Politeness | 01 | | 01 | | 02 | | 00 | |
| Verbal game | 07 | | 11 | | 09 | | 19 | |
| Get attention | 12 | | 00 | | 04 | | 01 | |
| Other | 00 | | 00 | | 00 | | 01 | |
| Subtotal: Person-orientation | | 62 | | 73 | | 58 | | 59 |
| Object-orientation | | 38 | | 25 | | 42 | | 41 |
| Situation-orientation | | 01 | | 02 | | 00 | | 00 |
| Total no. of concrete episodes | 117 | | 290 | | 104 | | 157 | |

because Body Maintenance Activities (BMA) were included as being Person-oriented. These kinds of episodes are generally a matter of necessity, not of preference, and they tend to occur at set times. If one's sampling procedure permits those kinds of interactions (e.g., laboratory free-play situations generally would not permit them, and perhaps an observer present in the home might discourage them somewhat), and if it includes the appropriate times of day, then the Person-orientation index will be boosted.

In an attempt to get at just those episode topics that might be more a matter of preference, BMA's were excluded from the set of Person-oriented episode types (see Table 29). Not surprisingly, the resulting pattern of individual differences was not the same as when BMA were included (a test of the distribution of BMA episodes vs. all other episode types as a function of mother-child pair showed highly significant differences among the pairs; $X^2_3 = 41.168$, $p < .001$). With BMA excluded, only three of the mother-child pairs showed a majority of Person-oriented episodes (B-MCI = 56%, L-MCI = 62%, J-MCI = 56%); T-MCI showed a majority of Object-oriented topics (59%). The bias towards Person-oriented episodes was thus less clear with BMA excluded. However, if LIB mothers as a group tend to have less free time to spend with their children that do MC mothers, then, regardless of preference,

Table 29

Topics of concrete episodes, with BMA excluded, expressed as percentage of the quantity, 'No. concrete episodes - No. BMA'

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Person orientation | 56 | 62 | 41 | 56 |
| Object orientation | 43 | 35 | 59 | 44 |
| Situation orientation | 01 | 03 | 00 | 00 |
| Total no. of concrete episodes excluding BMA | 104 | 208 | 74 | 147 |

proportionately more episodes would be Person-oriented in LIB mothers because of the universal necessity of the bodily maintenance activities.

The difference between L-MCI and T-MCI was particularly striking ($X_1^2 = 12.608$, $p < .001$). The nature of the difference is reminiscent of a distinction which Katherine Nelson (1973) found among children at the one-word stage - namely, what she called a social-emotional expressive versus a referential orientation. This difference between Luanne and Thomas is consistent with the result obtained in the analysis of the children's one-morpheme utterances that Thomas produced more object labels than Luanne. The Person- versus Object-orientation difference can be added to the other differences between Luanne and Thomas discovered earlier, which were correlated with a difference in rate of syntax development.

No trends as a function of child age/MLU were apparent in the episode topic data.

The next set of results to be considered are those concerned with 'thematic choppiness'. This was indexed in two ways: median number of utterances (both mother's and child's) per episode, and median number of exchanges per episode. The median exchanges/episode was an artificial median in that it's calculation assumed zero was a possible score. This was done because otherwise the

median would have been the same for all four pairs (viz, one), and because the alternative - a mean value - was felt not to deal adequately with the skewness of the distribution of exchanges/episode. Because for all four mother-child pairs a majority of the episodes were only one exchange long, linear interpolation between zero and one was used to generate median values.

The results in Table 30 show, just on intuitive grounds, that the mother-child verbal interactions were thematically choppy, with the average median being 4.68 utterances/episode. In other words, for half of the episodes, there was either a relatively long silence or a change in the topic of conversation after less than five utterances. The exchange/episode results partially offset this image of choppiness in that the average median value was actually less than one - viz., .67 exchanges/episode. Table 31 elaborates on the exchanges/episode results by showing the cumulative frequency distribution of exchanges/episode. Between 67% and 81% of the episodes were only one exchange long. Thematic choppiness did not show any clear change as a fucntion of child age/MLU except that Bobby's (the youngest child) interactions with his mother appeared the most choppy.

In calculating the median utterance/episode, record was kept of the mother's median and of the child's median.

Table 30

Indices of thematic choppiness of verbal dialogue

| | Median utt./episode | Median exchange/episode |
|---|---|---|
| Bobby | 2.79 | .62 |
| Luanne | 5.38 | .62 |
| Thomas | 5.20 | .69 |
| Jackson | 5.34 | .74 |
| Mean | 4.68 | .67 |

Table 31

Cumulative relative frequency distributions of exchanges/ episode, expressed as percent of total number of episodes

| No. exchanges/ episode: | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| 1 | 81 | 80 | 73 | 67 |
| 2 | 92 | 93 | 85 | 86 |
| 3 | 94 | 98 | 91 | 93 |
| 4 | 97 | 98 | 93 | 95 |
| 5 | 97 | 99 | 95 | 97 |
| 6 | 99 | 99 | 98 | 97 |
| 7 | 99 | 99 | 98 | 98 |
| 8 | 99 | 99 | 98 | 99 |

The difference between the two figures is one measure of the degree of equality between mother and child in their conversations. The results are shown in Table 32. Overall, the mothers showed more utterances/episode than the children (M - C = .88 utterance), an unsurprising result. However, in Thomas' case, Thomas and his mother showed practically equal numbers of utterances/episode (M - C = -.07). This was in marked contrast to Luanne and her mother, where the difference was 1.29 utterances. This contrast cannot be explained by Thomas' greater syntax competency alone, since for Jackson, who was more advanced syntactically, the M - C index was also relatively large (.97 utterances).

It is tempting to see this difference between Luanne and Thomas as significant in accounting for their different rates of syntax development - Thomas' mother was eliciting (or at least tolerating) relatively more speech from Thomas, and perhaps thereby increasing his opportunities to practice formulating utterances. It does seem consistent with the tendency for T-M to use shorter, less 'complex' utterances than L-M, in that for someone with very limited syntax knowledge, it is probably easier to comprehend short utterances than long utterances, and with greater probability of comprehension there is likely associated a greater probability of a thematically related

Table 32

Median episode length in utterances, for mother and for child

| | Bobby | Luanne | Thomas | Jackson | Mean |
|---|---|---|---|---|---|
| Mother | 1.89 | 3.03 | 2.06 | 2.77 | 2.44 |
| Child | .58 | 1.74 | 2.13 | 1.80 | 1.56 |
| Difference (M - C) | 1.31 | 1.29 | -.07 | .97 | .88 |

reply.

The next set of results to be considered is the categorization of the exchanges. The relative proportions of exchanges which were Directive were as follows: B-MCI = 78%, L-MCI = 68%, T-MCI = 79%, J-MCI = 69%, $\bar{X}$ = 74%. Clearly most of the exchanges were Directive in character. There were no trends as a function of child age/MLU. T-MCI showed somewhat more Directive exchanges than L-MCI ($X_1^2$ = 7.273, $p < .01$). Whether these proportions for Directive exchanges are high relative to what would be the case for MC mother-child pairs is not clear. Newport et al (1977) observed that almost all the utterances of their MC mothers could be construed as being Directive, so perhaps the frequency of Directive exchanges for the LIB mother-child pairs was not exceptionally high.

Within the Directive exchanges, record was kept of who, overall, seemed to be doing the directing. Exchanges with both partners issuing directives were uncommon. That is, loosely speaking, there was either compliance or refusal, but not very much countersuggestion. Table 33 summarizes these results by reporting the total proportion of mother-dominated exchanges. A person could dominate a Directive exchange by issuing all the directive utterances, or by issuing at least more than half of them. Not surprisingly, the mothers were taking the initiative ($\bar{X}$ = 76%

Table 33

Breakdown of Directive exchanges according to who was doing the directing, expressed as percentage of all Directive exchanges

| | Bobby | | Luanne | | Thomas | | Jackson | | Mean | |
|---|---|---|---|---|---|---|---|---|---|---|
| Director: | sub tot. | tot. | sub tot. | tot. | sub tot. | tot. | sub tot. | tot. | sub tot. | tot. |
| Mother | | 76 | | 74 | | 64 | | 76 | | 73 |
| Child | | 21 | | 17 | | 19 | | 18 | | 19 |
| Joint | | 02 | | 08 | | 11 | | 06 | | 07 |
| M ½ | 01 | | 05 | | 02 | | 04 | | 04 | |
| C ½ | 01 | | 03 | | 09 | | 02 | | 03 | |
| Mother-dominated | 78 | | 79 | | 67 | | 81 | | 76 | |
| Total no. of directive interactions | 135 | | 277 | | 157 | | 227 | | | |

of Directive exchanges). In line with the suggestion of relatively greater equality between Thomas and his mother than between Luanne and her mother, mother-domination was relatively less for T-MCI (67%) than for L-MCI (79%; $X^2_1 = 8.383$, $p < .005$).

Another structural measure taken on Directive exchanges was what proportions of the mothers' directive utterances were Direct Commands, Direct Requests, or Indirect Commands. The results are shown in Table 34. Direct Commands accounted for an average of 59% of all directive utterances. Direct Requests were reletively rare ($\bar{X}$ = 8%), while the group mean for Indirect Commands was 33%. Collapsing Direct Requests and Indirect Commands into one category - 'Nondirect', there were no significant differences among the mother-child pairs in the relative proportions of Direct and Nondirect Commands ($X^2_3 = 5.369$, N.S.).

In order to give more meaning to the total number of Nondirect Commands, the proportion of Nondirect Commands per Directive exchange is shown in Table 35. In an average of 50% of the Directive exchanges, Nondirect Commands were rare (i.e., less than 25% of the directive utterances in those exchanges were classified as Nondirect). On the other hand, 50% contained some usage of Nondirect Commands (proportionately between 25% and 100% of the directive

Table 34

Directness of mothers' directive utterances, with categories expressed as percent of all of mother's directive utterances

| | Bobby | Luanne | Thomas | Jackson | Mean |
|---|---|---|---|---|---|
| Direct commands | 58 | 57 | 57 | 64 | 59 |
| Direct requests | 03 | 05 | 18 | 06 | 08 |
| Indirect commands | 39 | 38 | 24 | 30 | 33 |
| Non-direct (Req + Indir) | 42 | 43 | 43 | 36 | 41 |
| Total no. of directives | 174 | 625 | 160 | 374 | |

Table 35

Proportion of non-direct commands to total number of directive utterances, per Directive exchange

| Proportion non-direct | Bobby | Luanne | Thomas | Jackson | Mean |
|---|---|---|---|---|---|
| $0 \leq x < .25$ | .48 | .42 | .50 | .62 | .50 |
| $.25 \leq x \leq .75$ | .32 | .33 | .22 | .24 | .28 |
| $.75 < x \leq 1$ | .21 | .25 | .28 | .14 | .22 |

utterances/exchange). One possible distribution of Nondirect Commands would have been bimodal - either a Directive exchange would contain all Direct Commands or all Nondirect Commands. The actual distribution was bimodal, but not to such an extreme degree. Rather, at least half the time the mother used Direct and Nondirect Commands within the same exchange. This is evidence of the mothers showing some flexibility in their choice of sentence types in trying to get their child to do something.

What the middle class figures would be on these measures of directness of commands are not known, but it is probably significant that, as was discovered in the motherese analyses, these LIB mothers showed consistently more frequent use of Imperatives than a sample of MC mothers. So, by inference, the proportions of Direct Commands were probably relatively high for the LIB mothers, and the proportions of Nondirect Commands were probably relatively low.

One type of Directive exchange of some interest is that which could be called 'Instructional' - that is, in which one partner appears to try explicitly to teach the other some particular information. Instructional exchanges were subdivided according to whether they concerned the properties of objects or of persons. Typically this meant instruction on the name of some object, person, or

body part. With the exception of Expansions and Recasts, which were not included here, there were no instances of explicit instruction in syntax or phonology. Not surprisingly, the mother was doing the instructing. However, it was possible for the child to play an active role by volunteering information or asking questions. In those exchanges where the child did play an active role, it nonetheless appeared, in the present results, that the mother was still to some degree imposing a lesson plan on the child. Hence, such exchanges were classified as being jointly directed.

The results are shown in Table 36. The mean percentage of all exchanges which were Instructional was 6%, with 4% being Person-oriented and 2% being Object-oriented. Whether this figure is lower than would be the comparable MC figure is not known. But, in the analysis of motherese it was seen that the LIB mothers used substantially fewer Deictic utterances than did a sample of MC mothers. Such utterances would probably often occur in Instructional exchanges, suggesting that the occurrence of Instructional exchanges was relatively low in the present sample of LIB mothers.

Turning to some individual differences, T-MCI showed somewhat more Instructional exchanges than L-MCI (12% vs. 4%, respectively; $X^2_1 = 11.689$, $p < .001$), which seems

Table 36

Occurrence of Instructional exchanges, classified according to focus and person dominating the exchange, expressed as percent of total number of exchanges

| Instructional focus | Bobby | | Luanne | | Thomas | | Jackson | | Mean | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M[1] | J[2] | M | J | M | J | M | J | M | J |
| Object property | 05 | 00 | 02 | 00 | 00 | 00 | 01 | 00 | 02 | 00 |
| Person property | 03 | 00 | 02 | 00 | 08 | 04 | 00 | 00 | 03 | 01 |
| Subtotals | 08 | 00 | 04 | 00 | 08 | 04 | 01 | 00 | 05 | 01 |
| Grand total | 08 | | 04 | | 12 | | 01 | | 06 | |

[1]M = mother-dominated

[2]J = jointly dominated

consistent with the other data pointing to more verbal accomodation by T-M to her child. In the present case, the accomodation is to her child's limited vocabulary. Also, Thomas showed more active involvement in the Instructional exchanges than did Luanne (4% vs. 0%, respectively).

Thus far, only the results for the Directive exchanges have been reported. The following are the proportions of exchanges which were Nondirective: B-MCI = 22%, L-MCI = 32%, T-MCI = 21%, J-MCI = 31%. The major subcategories were Verbal Games ($\bar{X}$ = 32% of Nondirective exchanges) and chit-chat ($\bar{X}$ = 64% of Nondirective exchanges). Because of the marked variability across the four mother-child pairs on the subdivisions of Verbal Games and chit-chat, no attempt will be made to interpret the group data, which are given in Appendix 5.

Dore code results. The final set of results on mother-child interaction comes from the application of the Dore code for utterance function (see Appendix 9). In applying this code, one product was a tabulation of all those utterances which were unintelligible, vocalizations, cries, imitations, repetitions, or utterances which were used in stereotyped ways. The latter were: 'Hn?' as a general query; Dore's CDCA (Conversational Device: Calls - such as Mommy), CDBM (Conversational Device: Boundary

Markers - such as Hello, Goodbye), and CDRE (Conversational Device: Returns - semantically empty forms which simply acknowledge another's utterance); and some utterances occurring in verbal games, where the game specified just what was to be said (as in jointly singing "Happy Birthday"). These various categories together comprise an index of what proportion of a child's utterances are uninteresting from a syntax development point of view - either because of unintelligibility, unoriginality, or stereotyped use. The coding of vocalizations and unintelligible utterances was problematic, however. Since they cannot always be told apart, the two will be reported together. Also, it was sometimes unclear how to segment an unintelligible stream of 'utterances'. Hence, those figures should be viewed as only approximate.

The results are shown in Table 37. As shown by the high group mean ($\bar{X}$ = 69%), data on child syntax was proportionately rare in the transcripts. In large part this was due to high proportions of non-understandable utterances ($\bar{X}$ = 41%), though 'non-creative' uses of words were also prevalent ($\bar{X}$ = 25%). There were individual differences on intelligibility, but these are impossible to interpret, because the figures are a consequence of the child, circumstances of recording, and limitations of the tape transcriber. For the same reasons, social class

Table 37

Children's utterances which were non-intelligible or non-creative, expressed as percent of total number of utterances

| | Bobby (n = 408) | Luanne (n = 1457) | Thomas (n = 565) | Jackson (n = 998) | Mean |
|---|---|---|---|---|---|
| Unintelligible and vocalization | 50 | 40 | 30 | 43 | 41 |
| Cries | 02 | 02 | 04 | 00 | 02 |
| 'Hn?' | 01 | 07 | 01 | 03 | 03 |
| Imitations | 06 | 08 | 07 | 05 | 07 |
| CDCA | 24 | 02 | 05 | 00 | 08 |
| CDBM | 00 | 00 | 00 | 00 | 00 |
| CDRE | 00 | 00 | 00 | 00 | 00 |
| Game | 05 | 08 | 08 | 11 | 08 |
| Total | 88 | 67 | 55 | 64 | 69 |

comparisons should not be attempted on such data.

In Table 38 are shown the classifications of utterances according to their functions, with the Conversational Device category (comprised of CDCA, CDBM, and CDRE) excluded since it was considered more appropriate to report that category in Table 37 along with other less creative utterance types. It can be seen that Statements were generally quite rare ($\bar{X}$ = 5% of the quantity: RQ + RS + DS + ST). This category is cognitively the most complex, including as it does such utterance functions as explanation, attributions concerning perceptually nonavailable things, statements of rules, and so on. The remaining three function categories - Requests, Responses, and Descriptions - showed a great deal of individual variation. No attempt will be made to elaborate on the profile of each child, except to comment on a few differences between Luanne and Thomas. Of Luanne's coded utterances, 42% were Responses (mainly Compliance), while only 14% of Thomas' utterances were in this category ($X_1^2$ = 56.928, $p < .001$). This is consistent with the other evidence that Thomas played a more equal role in verbal interactions than did Luanne. In the same vein, 43% of Thomas' utterances were Requests, compared to 27% for Luanne ($X_1^2$ = 18.947, $p < .001$). And, for the Descriptions category, Thomas and Luanne differed significantly (37% vs. 25%, respectively; $X_1^2$ =

Table 38

Utterance functions in the LIB children's speech, expressed as % of total number of utterances coded as Request, Response, Description, Statement, and Other

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Request | 02 | 27 | 43 | 27 |
| Response | 21 | 42 | 16 | 36 |
| Description | 77 | 25 | 37 | 29 |
| Statement | 00 | 05 | 05 | 09 |
| Other | 00 | 02 | 01 | 00 |

11.146, $p < .001$).

At least some of the individual diversity in use of Requests, Responses, Descriptions, Statements, and the various subtypes thereof could probably be attributed to differences in cognitive/linguistic maturity. But, at least some (e.g., Luanne vs. Thomas) can be attributed to 'stylistic' differences. The latter type of variation is of interest if only because it shows that young LIB children (and, indirectly, their mothers) are not homogeneous in their relative usage of various utterance functions. Recognizing within-class variability is obviously a prerequisite to making cross-class comparisons.

## Summary

The following are the major results from the analyses of the mother-child interactions.

Concreteness of episodes. Excluding the eldest child (Jackson), practically all ( 95%) the episodes were Concrete (i.e., concerned with the immediate behavioral setting). In the case of the oldest child, 81% of the episodes were Concrete.

Topic orientation. Within the Concrete episodes, Situation-oriented episodes were rare ( 5%). Excluding BMA from the totals, three of the mother-child pairs showed a

slight bias towards Person-orientation, while one pair (T-MCI) showed a slight bias towards Object-orientation. From these data it cannot be suggested that there is a strong tendency towards either Person- or Object-orientation in what LIB mother-child pairs prefer to talk about. Though, with BMA included, all pairs showed a slight bias towards Person-orientation.

Thematic choppiness. Mother-child verbal interactions were thematically choppy, having a median of only 4.68 utterances/episode. Partially offsetting this was the fact that the median exchanges/episode was only .67.

Directiveness of exchanges. Most exchanges between mother and child were Directive ($\bar{X}$ = 74%), and mothers dominated 76% of these Directive exchanges.

Directness of commands. On the average, 59% of the mothers' directive utterances were Direct Commands. In half of the Directive exchanges in which the mother participated, the mother used Direct Commands almost exclusively. Though, some flexibility in controlling children was suggested by the fact that in the other half of the Directive exchanges the mothers were using a fair number of Nondirect Commands per exchange (25% to 100%).

Instructional exchanges. Across the four mother-child

pairs, an average of 6% of the exchanges were Instructional, and typically involved the mother supplying labels for various things.

Social class comparisons. Concerning social class comparisons, nothing very definite can be said, since the episode/exchange code has not been applied to MC mother-child pairs. The following are some speculative comments. Certainly some of the results were in a direction one would expect if the mothers were using Hess and Shipman's (1965) restricted code/status-based authority. Interactions were thematically quite choppy; most exchanges were directive in nature; the mothers did most of the directing; and the majority of the mothers' directive utterances were direct commands. However, Hess and Shipman's model was formulated for older children, and it is not clear how it should be extended to mothers with children having more limited language competence. Occasionally, results from the motherese analyses were helpful in evaluating the interaction results. The LIB mothers did use substantially more imperatives than a sample of MC mothers, so perhaps the LIB mothers here did use more Direct Commands. Further, the LIB mothers produced fewer Deictic utterances, so perhaps the occurrence of Instructional exchanges was relatively low. On the other hand, Newport et al (1977)

observed for a sample of MC mothers that almost all of a mother's utterances to her child could be construed as being directive, so perhaps the high frequency of Directive exchanges for the LIB mothers was not exceptionally high, and likewise for the dominance of the mothers in the Directive exchanges. Moreover, on many measures there was some variation across the four LIB mother-child pairs, a fact not to be lost sight of in considering social class comparisons.

L-MCI versus T-MCI. Because Luanne appeared to be acquiring syntax more slowly than Thomas it has been of interest in both the analyses of motherese and the mother-child verbal interactions to keep track of the major differences between Luanne's and Thomas' language environments. The following are the major differences found to exist between their verbal interactions. L-MCI was more Person- than Object-focussed in choice of episode topics, whereas T-MCI was more Object-focussed. Several results appeared to show Thomas playing a more equal role in verbal interaction than Luanne: per episode, Thomas produced as many utterances as his mother, while Luanne produced 1.29 fewer utterances than her mother; T-M dominated Directive exchanges less often than did L-M; and, from the Dore code results it was learned that Thomas produced proportionately

more Requests and Descriptions than Luanne, while Luanne produced proportionately more Responses. Finally, in a measure of explicit teaching, T-MCI showed more Instructional exchanges than L-MCI, and Thomas was more likely to play an active role in Instructional exchanges than was Luanne.

Social class and individual differences. In the report of the motherese results, it was suggested that perhaps good language-learning environments look different in middle versus lower classes, and this was motivated by the observation that T-M did not look uniformly more like MC mothers than did L-M. On intuitive grounds, many of the differences reported above seem to show T-MCI being more 'middle class' than L-MCI. Though, it should be noted that there were other measures where the expected differences did not materialize: thematic choppiness (L-MCI and T-MCI did not differ), and proportion of mother's directive utterances which were Direct Commands (no difference).

# C H A P T E R V

## GENERAL DISCUSSION

This chapter contains a summary and discussion of the major results of this study of language development in LIB children. Since each of the three chapters presenting data had their own summaries of results, the results will be indicated only in a general fashion here. The reader is referred back to pp. 61-64, 109-113, and 146-150 for the more detailed summaries.

The discussion will be focussed on the following questions: Were the LIB children's syntax competencies the same as that of MC children of comparable ages and MLU's? In what ways did the LIB mothers accomodate their speech to their children? Were the accomodations made by the LIB mothers in any way different from the accomodations made by MC mothers of children with comparable MLU's? Can any of the differences among mothers account for any of the differences in rates of syntax development among the children? After these questions have been addressed, some recommendations concerning further research will be offered.

The first question to be addressed concerns how the language of the sample of LIB children compared with that of MC children.

The criteria for specifying 'comparable' MC children were child age and child MLU, since those have been the typical parameters used in the language development literature to globally characterize subjects. However, it was felt that MLU (as operationally defined by Brown, 1973) had a couple weaknesses as a global measure of level of syntax competence, in that it did not devalue such seemingly syntactically noncreative utterances as exact repetitions and one-morpheme utterances. So, as a methodological side study, MLU's and Upper Bounds, both with and without repetitions, were calculated for each child. It turned out that choice of measure had a substantial effect on the prefile of relative syntax competencies of the children, since different measures led to different patterns of similarities and differences among the children in estimated syntax competence. While it is unlikely that the social class comparison on rate of syntax development would have differed significantly depending on choice of measure of syntax competence, such variation in magnitudes of individual differences would be significant for correlational analyses. And, in fact, for purposes of the present study, the estimated competence of one of the children in particular (Thomas) fluctuated substantially across the four types of global measures, creating some

uncertainty for interpreting correlations with other analyses. Until we have a better understanding of the syntax of early language, it seems prudent to try several different global estimates of child syntax competence if correlational analyses are intended.

To return to the main issue of whether the LIB children differed from MC children in rate of syntax development, the matter was investigated by computing regression equations linking age and MLU for a large sample of MC children (drawn from the literature), and generating predicted MLU's (given age) and ages (given MLU) for the four LIB children in the study. The results showed the LIB children lagging substantially behind the MC children (see Table 4).

There are a couple of reasons for doubting this apparent social class difference in rate of syntax acquisition. First, in the MC sample, the correlation between age and MLU was only moderate ($r = .64$). It is not at all inconceivable that LIB children might not lag behind MC children, and the fact that the four LIB children sampled did lag behind may simply have been a result of 'sampling error'. Second, perhaps procedural differences in sampling child speech led to the apparent divergence in rates of syntax development. Most sample of child speech have been gathered with an observer present, whereas the present

samples were collected remotely via tape recorder. The presence of an observer may motivate a mother to make special accomodations in her interaction with her child (Graves and Glick, 1978), which in turn might boost the quality of language sampled from the child. For the above reasons, it should be clear that additional data on both MC and LIB children are needed before more conclusive social class comparisons on rates of syntax development can be made.

Nonetheless, for purposes of analyzing the present data, it was provisionally assumed that the social class differences was a real one, just to see where that would lead.

Supposing the social class difference in rate of syntax development was real, we could ask whether it truly was a simple delay on the part of the LIB children, or whether they might have been following some structurally different course of language development. This was done by equating the LIB children with MC children on MLU, and then comparing syntactic repertoires. The particular structural codes used were Roger Brown's (1973) Stages 1 and 2. The result was that no principled structural differences could be detected.

It did take some re-analyses of the utterances left over after the first application of Brown's Stage 1 code

in order to see that there really was no major departure from Stage 1-like language on the part of the two 'Stage 1' children. This re-analysis involved including utterance types typically found in early language but not included in Brown's code, and reinterpreting some utterance types which apparently violated Stage 1 criteria in such a way that they no longer violated those criteria. It was in no way obvious that the utterance types dealt with in the latter case were a social class phenomenon. Brown's Stage 1 code has not been rigorously applied to very many children, and it would be of interest to see how frequently such 'pseudo-exceptions' to Stage 1 would appear if the MC (and LIB) sample size was enlarged.

It was also of interest to determine whether there might have been any effects of Black Dialect on the children's syntax development. However, it was found that none of the mothers used Black Dialect very extensively. And, because none of the children were very advanced syntactically, it would have been impossible to detect any effects of Dialect with much confidence. It appears, then, that, for purposes of detecting any effects of Dialect on syntax acquisition, it would at least have been necessary to sample more syntactically advanced children, and perhaps necessary to sample mothers who spoke Black Dialect more extensively.

Within the sample of LIB children, there was an interesting difference between two of the children - Luanne and Thomas. Though both children were the same age, Thomas' estimated syntactic competence was significantly in advance of Luanne's (just how far in advance depended on which global measure was used). So, it could be inferred that Thomas was acquiring syntax more rapidly than Luanne. Moreover, this difference was, if anything, in the opposite direction from what one might have expected given findings on sex differences (Schacter et al, 1978). Correlates of this difference in rate were investigated in the other analyses in the study.

Chapters 2 and 3 of this report provided some descriptions of the language environments of the LIB children. Chapter 2 dealt with 'motherese' - that is, some overall measures of maternal speech on the dimensions of well-formedness, complexity, and function. Chapter 3 dealt with mother-child interactions, and provided information on topics of conversation, thematic continuity, and directive qualities of the interactions. These data were used to address the remaining questions indicated at the beginning of this chapter.

In what ways were the LIB mothers accomodating their speech to their children? Unsurprisingly, there was a variety of evidence for accomodation. The content of the

maternal speech was largely resticted to the immediate behavioral setting. It tended to be 'thematically choppy', changing topics quite often. This could be construed as an accomodation to the attentional and cognitive limitations of young children. Maternal speech was highly directive, a feature of speech to young children probably generally necessary for getting them to do what you want them to do. And, the mothers' utterances tended to be short, well-formed (or well-formed fragments), and simple (at least simple in the superficial sense of having few embedded clauses, few NP's/utterance, etc.). Clearly, these LIB mothers were speaking a 'motherese', and moreover a motherese not grossly different from what we would intuitively expect from MC mothers.

Though there were not gross differences from typical motherese, we can ask just how closely the LIB mothers did match MC mothers. It turned out to be very difficult to get comparable MC data. For a few of the motherese measures it was possible to get approximately comparable MC data from a study by Newport et al (1977), which had a sample of MC mother-child pairs matched, as a group, to the present sample on child MLU and on the data being collected in the child's home. Newport et al did have an observer present in the home, though. For the interaction measures, there were no directly comparable MC data.

Therefore, the social class comparison results must be considered tentative. The same problems as arose in interpreting the social class comparison results for the child language came up here - sampling error (perhaps an unusual set of LIB mothers was sampled), and confounding differences in the data collection procedures. In addition, there was no information on precisely how much variability there can be in MC samples. Nonetheless, as with the child language results, it has been provisionally assumed for the sake of argument that the obtained similarities and differences are valid.

The similarities across social class showed all the mothers having, at a general level, similar concerns with being careful, effective communicators. This was indicated by such measures as well-formedness of maternal utterances, rarity of syntax errors, high redundancy, and high maternal directiveness.

There were some apparent differences across social class, though they did not form a tightly coherent package. For one thing, the LIB mothers uniformly produced a relatively high proportion of Imperatives. In terms of the interaction code, this probably meant that the LIB mothers tended to be more direct overall in their attempts to get their child to do something than did the MC mothers. Note that it does not imply the LIB mothers were more

directive than MC mothers, but only that LIB mothers tended to be more explicitly directive. Second, the LIB mothers had a lower mean MLU than the MC mothers. Since it was found in the present study that MLU correlated well with a variety of other 'complexity' measures, this difference in MLU should be interpreted broadly. The direction of the difference was somewhat surprising. Under a 'cultural deficit' hypothesis, one might have expected the LIB mothers not to have accomodated their speech very much to their young children, which in turn would have implied a relatively large MLU. Third, the LIB mothers produced a relatively lower proportion of Deictic utterances, which implies they probably engaged in a lower proportion of Instructional interactions with their children. Fourth, the LIB mothers produced relatively fewer Yes-no questions.

With these social class differences in children's language environments having been identified, we can ask whether they were of any help in accounting for the apparent lag in rate of syntax acquisition in the LIB children. Since so little is known about how children actually discover syntactic patterns, and since the measures at hand are so general, we cannot expect them to provide all that much enlightenment. Newport et al (1977) have, however, provided information of the power of some of

these measures for predicting rate of syntax development for a sample of MC children. None of their motherese measures correlated significantly with general rate of syntax development (after child age and MLU had been partialled out). They did find correlation with some particular syntactic phenomena, such as correlations between maternal Imperatives (negative) and maternal Yes-no questions (positive) on the one hand, with children's acquisition of verb auxiliaries, on the other hand. The latter relationship might have been operating to produce some social class differences, since the classes did differ on Imperatives and Yes-no questions. However, such effects were not detected (the LIB children were not syntactically advanced enough for reliable detection), and in any case they do not seem powerful enough to account for the LIB children's general lag in syntax development.

One might conclude, in line with Newport et al's suggestions, that there are strong, biologically based constraints on children's syntax learning, making that learning very robust in the face of environmental variation, except where language-specific syntactic phenomena are concerned. And, one extension of this interpretation to the present data is that if the social class difference in rate of syntax development was real, then more potent factors than those identified will have to be invoked in

order to account for that difference. For example, perhaps LIB mothers spend substantially less time verbally interacting with their children; or, perhaps there could be a biological explanation stemming from social class differences in nutrition.

An alternative conclusion could be that because Newport et al sampled only MC families, there may have been relatively little individual variation in their sample, which could have led to a 'restriction-of-range' problem for purposes of detecting effects of motherese. Then, it would be possible that the social class differences identified in this study were significant ones.

So, at this point it is not clear whether the social class differences discovered could have been significant in accounting for the apparent social class difference in rates of syntax development. More studies similar to Newport et al's need to be done, using larger and more diverse samples of mothers and children.

Some further information on the significance of the social class differences observed can be gained from a consideration of the language environments of the two children (Luanne and Thomas) who apparently differed in their rates of syntax acquisition. If the differences between their language environments paralleled the social class differences, then that would reinforce the proposal

that there was simething significant about those social class differences. As it turned out, the language environment of the more advanced child (Thomas) did not look uniformly more MC-like than that of the other child. Thomas' language environment was more MC-like in that he had more equality in his interaction with his mother than Luanne had with her mother, his mother initiated more Instructional interactions, and his mother asked proportionately more Yes-no questions. Thomas' language environment failed to look more MC-like in that his mother actually tended to speak shorter and less complex utterances than Luanne's mother, and his mother produced proportionately as many Imperatives as Luanne's mother.

There are several interpretations of the above differences between Luanne and Thomas, but two will be offered which complement the two interpretations offered for the social class results. First, this apparent 'jumbling up' of the relationship between rate of syntax development and measures of language environment could be considered further evidence that the measures of language environment employed simply are not good predictors of rate. The alternative interpretation is that good language-learning environments look different across the two social classes. This alternative again requires assuming that Newport et al's results were limited by a 'restriction-of-range'

problem, and it also requires assuming there are some basic differences in mother-child interaction across the two social classes, which could then differentially affect the appearances of good versus poor language learning environments. As was suggested earlier, more studies such as Newport et al's need to be done with larger and more diverse samples, as well as any studies which can clarify just where it is children are picking up the information allowing them to induce rules of syntax.

The present study, then, has found that a small sample of LIB children apparently lagged behind MC children in their rates of syntax development. This lag was correlated with some class differences in children's language environments, but those differences were not obviously significant variables in accounting for the lag. The existence of a lag could be of considerable educational importance. Language is a major medium for getting and sending information, and any lag in language development in the early years could affect the cognitive and social profiles of LIB versus MC children in the early school years.

But, due to limitations in the research design and in the sample size, all of the major results of the present study must be considered tentative. This study was

one of the first systematic investigations of early language development in LIB children, but clearly many more need to be done.

I would like to close with a caution about doing research on social class differences. In 1970, Courtney Cazden published an article in which she pointed out that the speech children produce can be significantly affected by context, and she decried the lack of attention paid by language development researchers to the role of the 'situation' in influencing the data they collect. That complaint is still largely justified today. One study on the effects of context on motherese has been cited in this report (Graves and Glick, 1978), but little other information exists. To see the significance of this problem for social class comparisons, suppose the present study had been done with both a larger sample size and with a MC group of children as well. Certainly that would have been a better study, but the social class comparisons would still have been problematic - they would still have been open to legitimate doubt as to whether any obtained differences were <u>really</u> 'real', or whether they might not have been in some way artifactual. The reason would be that though the two social classes would have been treated the same, operationally speaking, it is not clear the mothers in both classes would have reacted in the same way to

those operations. For example, perhaps MC mothers would treat the presence of a tape recorder in approximately the same way they would treat the presence of a human observer, and perhpas make special attempts to elicit good-looking language and other types of performances from their child. On the other hand, perhaps the LIB mothers would not treat the two as approximately the same - perhaps under the press of work to be done, a tape recorder would be easier to ignore than a person. This example of a social class difference in reaction to the same observational procedures is purely speculative, and to some degree a caricature. Yet, it should at least serve to illustrate that a researcher's procedures can be operationally identical across groups, but not psychologically.

What this implies is that research on social class differences in early language development will have to be very sensitive to the conditions under which data (whether observational or experimental) are collected. The results obtained when operations are equated across social class are a legitimate first step, but a rather crude one. The present study did not make even that first, crude step. But, it did explicitly attempt to collect samples of speech from LIB mothers and children in such a way as to maximize the naturalness of the samples. And, to the extent that his goal was achieved, the data are of interest

in their own right. Future research will have to determine just how 'natural' the speech samples were, and to provide similarly (to prejudge the matter) natural samples from MC mothers and children.

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## Appendix 1

Amended version of Brown's rules for calculating MLU (from Table 7, in Brown, 1973) used in the present study

1. Only fully transcribed utterances are used; none with blanks. Portions of utterances, entered in parentheses to indicate doubtful transcription, are used.

2. Include all exact repetitions. Stuttering is marked as repeated efforts at a single word; count the word once in the most complete form produced. In the few cases where a word is produced for emphasis or the like (no, no, no) count each occurrence.

3. Do not count such fillers as mm or oh, but do count no, yeah, and hi.

4. All compound words (two or more free morphemes), proper names, and ritualized reduplications count as single words. Examples: birthday, rackety-boom, choo-choo, quack-quack, night-night, pocketbook, see saw. Justification is that no evidence that the constituent morphemes function as such for these children.

5. Count as one morpheme all irregular pasts of the verb (got, did, went, saw). Justification is that there is no evidence that the child relates these to present forms.

6. Count as one morpheme all diminutives (doggie, mommie) because these children at least do not seem to use the suffex productively. Diminutives are the standard forms used by the child.

7. Count as separate morphemes all auxiliaries (is, have, will, can, must, would). Also all catenatives: gonna, wanna, hafta. These latter counted as single morphemes rather than as going to or want to because evidence is that they function so for the children. Count as separate morphemes all inflections, for example, possessive -s, plural -s, third person singular -s, regular past -d, progressive -ing.

# Appendix 2

## Motherese data

Table 39

Some structural measures of the LIB mothers' speech

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Child' MLU | 1.02 | 1.54 | 1.64 | 2.26 |
| Mother's MLU | | | | |
| No. utterances for calculating MLU | 290 | 1021 | 347 | 797 |
| MLU - morpheme | 4.28 | 5.30 | 3.98 | 5.51 |
| MLU - word | 4.14 | 4.99 | 3.80 | 5.12 |
| Difference score | .14 | .32 | .18 | .39 |
| Utterances contingent on surface form of a child utterance (1) | | | | |
| Imitations | 02 (7)[2] | 03 (36) | 01 (6) | 01 (10) |
| Expansions | 00 | 02 (20) | 02 (8) | 01 (9) |
| Recasts | 03 (11) | 01 (12) | 05 (25) | 07 (67) |
| Total | 04 (18) | 05 (68) | 08 (39) | 09 (86) |

| Repetitions | No. | %Rep | %D1[1] | No. | %Rep | %D1 | No. | %Rep | %D1 | No. | %Rep | %D1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Exact | 45 | 48 | | 153 | 51 | | 42 | 54 | | 73 | 37 | |
| Reduced | 16 | 17 | | 45 | 15 | | 11 | 14 | | 34 | 17 | |
| Add | 11 | 12 | | 50 | 17 | | 11 | 14 | | 38 | 19 | |

Table 39 (cont.)

| Repetitions (cont.) | Bobby No. | Bobby %Rep | Bobby %D1 | Luanne No. | Luanne %Rep | Luanne %D1 | Thomas No. | Thomas %Rep | Thomas %D1 | Jackson No. | Jackson %Rep | Jackson %D1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Partial | 22 | 23 | | 52 | 17 | | 14 | 18 | | 51 | 26 | |
| Total | 94 | | 22 | 300 | | 23 | 78 | | 15 | 196 | | 20 |
| Clause structure | | | | | | | | | | | | |
| No. clauses | 301 | | | 1201 | | | 329 | | | 857 | | |
| No. grammatical utterances | 244 | | | 884 | | | 280 | | | 648 | | |
| Clause/utterance | 1.23 | | | 1.36 | | | 1.18 | | | 1.32 | | |
| Types of clauses additional to main clause(3) | | | | | | | | | | | | |
| NP comp | 51 (29)[2] | | | 30 (94) | | | 27 (13) | | | 34 (72) | | |
| VP comp | 37 (21) | | | 45 (143) | | | 69 (34) | | | 35 (73) | | |
| Relative clause | 04 (2) | | | 05 (15) | | | 00 | | | 02 (4) | | |
| Other | 09 (5) | | | 21 (65) | | | 04 (2) | | | 29 (60) | | |
| Total comp | 88 (50) | | | 75 (237) | | | 96 (47) | | | 69 (145) | | |
| NP statistics | | | | | | | | | | | | |
| No. of NP's | 318 | | | 1385 | | | 361 | | | 1120 | | |
| Total elements/NP | 403 | | | 1807 | | | 475 | | | 1450 | | |
| Elements/NP | 1.27 | | | 1.30 | | | 1.32 | | | 1.29 | | |
| NP's/gram. utt. | 1.30 | | | 1.57 | | | 1.29 | | | 1.73 | | |

Table 39 (cont.)

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| NP statistics (cont.) | | | | |
| NP types[4] | | | | |
| Personal pronoun | 42 (135)[2] | 41 (563) | 39 (141) | 42 (470) |
| Impersonal pronoun | 25 (78) | 26 (366) | 29 (105) | 25 (277) |
| Common noun | 27 (86) | 28 (385) | 29 (106) | 25 (282) |
| Proper noun | 06 (19) | 05 (71) | 02 (9) | 08 (91) |
| All pronouns | 67 (213) | 67 (929) | 68 (246) | 67 (747) |
| Non-noun morphemes in NP's (5): | | | | |
| Quantifier | 08 (7) | 06 (24) | 04 (4) | 10 (32) |
| Demonstrative | 12 (10) | 10 (42) | 02 (2) | 05 (18) |
| Possessive pronoun | 38 (32) | 25 (105) | 34 (39) | 17 (57) |
| Possessive inflec. | 00 | 04 (9) | 07 (4) | 09 (16) |
| Article | 35 (30) | 38 (160) | 37 (42) | 33 (108) |
| Pre-nominal adj. | 06 (5) | 08 (32) | 02 (2) | 12 (38) |
| Plural -s | 01 (1) | 08 (35) | 12 (14) | 09 (31) |
| Idiom | 00 | 01 (6) | 03 (3) | 05 (17) |
| Poss. pron. + Art. | 73 (62) | 63 (265) | 71 (81) | 50 (165) |

Table 39 (cont.)

| VP statistics[6] | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| No. of VP's | 295 | 1186 | 324 | 850 |
| Total elements/VP | 448 | 2048 | 474 | 1459 |
| Elements/VP | 1.52 | 1.73 | 1.51 | 1.76 |
| Non-verb morphemes in VP (7): | | | | |
| Tense | 08 (12) | 07 (58) | 07 (11) | 19 (113) |
| Third singular | 01 (2) | 04 (36) | 01 (1) | 01 (4) |
| Particle | 02 (3) | 07 (63) | 06 (9) | 02 (12) |
| Auxiliary <u>be</u> | 07 (11) | 14 (119) | 08 (12) | 13 (78) |
| Progressive -<u>ing</u> | 12 (19) | 18 (158) | 17 (25) | 15 (92) |
| <u>Do</u> | 22 (34) | 10 (86) | 15 (22) | 13 (77) |
| Negative | 22 (34) | 17 (149) | 13 (19) | 17 (106) |
| Infinitive <u>to</u> | 14 (21) | 14 (121) | 18 (27) | 13 (82) |
| Modal | 10 (15) | 08 (66) | 16 (24) | 07 (41) |
| <u>Have</u> | 00 | 00 (3) | 00 | 00 (2) |
| <u>en</u> | 01 (2) | 00 (3) | 00 | 00 (2) |

Table 39 (cont.)

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| VP statistics (cont.) | | | | |
| Verb tense[8] | | | | |
| Present | 87 (257) | 82 (978) | 85 (274) | 76 (645) |
| Past | 04 (12) | 05 (57) | 03 (11) | 13 (113) |
| Future | 02 (5) | 03 (30) | 04 (12) | 01 (10) |
| Infinitive | 07 (21) | 10 (121) | 08 (27) | 10 (82) |
| Adverbs | | | | |
| Adverbs/gram. utt. | .23 | .34 | .18 | .36 |
| Types | | | | |
| Location | 29 (16) | 12 (36) | 20 (10) | 16 (37) |
| Time | 14 (8) | 17 (51) | 08 (4) | 19 (44) |
| Manner | 04 (2) | 02 (6) | 00 | 01 (2) |
| Motion particle | 36 (20) | 41 (123) | 48 (24) | 44 (104) |
| Other | 18 (10) | 28 (85) | 24 (12) | 21 (49) |
| Prepositions | | | | |
| Prep./utt. | .13 | .19 | .11 | .29 |
| Types[10]: | | | | |
| Locative | 34 (11) | 64 (108) | 68 (21) | 58 (107) |
| Nonlocative | 66 (21) | 36 (62) | 32 (10) | 42 (79) |

Table 39 (cont.)

[1]Expressed as % of all intelligible, verbal utterances

[2]Number of observed instances

[3]Expressed as % of total number of clauses additional to main clause

[4]Expressed as % of total number of NP's

[5]Expressed as % of total number of non-noun morphemes in NP's

[6]In the present study, 'VP' referred only to a verb and any associated inflections, auxiliaries, or modals

[7]Expressed as % of total number of non-verb morphemes in VP's

[8]Expressed as % of total number of VP's

[9]Expressed as % of total number of adverbs

[10]Expressed as % of total number of prepositions

Table 40

Structural measures in the LIB mothers' speech showing monotonic changes as a function of children's MLU's

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Syntax errors[1] | 30 | 19 | 10 | 10 |
| Utterances contingent on surface form of child's utterance (2) | | | | |
| Recasts[3] | 03 | 01 | 05 | 07 |
| Total | 04 | 05 | 08 | 09 |
| Poss. noun inflection[4] | 00 | 04 | 07 | 09 |
| Verb tense[5] | | | | |
| Present[3] | 87 | 82 | 85 | 76 |
| Past[3] | 04 | 05 | 03 | 13 |

[1]Expressed as % of total number of ungrammatical utterances

[2]Expressed as % of total number of intelligible, verbal utterances

[3]Cases close to, but not at, criterion

[4]Expressed as % of total number of non-noun morphemes in NP's

[5]Expressed as % of total number of VP's

Table 41

Motherese indices on which LIB mothers can be compared to MC mothers (Newport et al, 1977)

| | Newport et al | BLTJ | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|---|---|
| MLU - word | 4.24 | 3.68 | 3.32 | 3.86 | 3.06 | 4.48 |
| % unanalyzable[1] | 04 | 08 | 09 | 07 | 10 | 06 |
| % grammatical[1] | 60 | 58 | 55 | 60 | 54 | 62 |
| % interjections[1] | 18 | 17 | 19 | 23 | 16 | 11 |
| % syntax errors[1] | 0.7 | 02 | 03 | 02 | 01 | 01 |
| % fragments[1] | 17 | 14 | 14 | 09 | 19 | 12 |
| % repetitions | 23 | 17 | 20 | 18 | 14 | 17 |
| Sentence mode[2] | | | | | | |
| Declarative | 38 | 33 | 25 | 48 | 19 | 38 |
| Imperative | 18 | 38 | 41 | 34 | 39 | 39 |
| Questions | 44 | 30 | 33 | 18 | 42 | 25 |
| % expansions[2] | 06 | 08 | 04 | 04 | 11 | 14 |

Table 41 (cont.)

| | Newport et al | BLTJ | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|---|---|
| % deixis[2] | 16 | 06 | 06 | 06 | 08 | 03 |
| % yes-no questions[2] | 21 | 07 | 06 | 04 | 11 | 06 |

[1]Expressed as % of total number of utterances

[2]Expressed as % of total number of grammatical utterances

## Appendix 3

Examples of dialogue divided up into episodes (ep.) and exchanges (exch.)

Example 1

M You want some ice cream?

L Hn?

You want some ice cream?

Ha sit dai in uh bed.

You go get in the bed.

Un-un

You go get in the bed

Un-un

Ep. - Get information

Ep. - Person location

Example 2

M Are you sweet? Are you a sweet little girl?

L Hn? Sweet ( ).

( )

Ho chok-ih chuh bai
(roughly, 'chocolate pie')

Right! Are you, are you sweet?

Ho chok-ih chih bai-ai

Is that right. Are you a sweet little girl?

Omma, ahwuh chih-chih-chay-uh

Will you Luanne.

( )

Do you love your mother?

Ep. - Verbal game

Unintelligible

Next episode

Example 3

M Gee, I don't like that breathing. Luanne.

L Hn?

Why are you breathing like that? — Ep. - Get information

( )
Comb.

No, not that. You not comb my hair with that. — Ep. - BMA

Uh juh

OK, wait. I'm gonna get you some medicine. OK. — Ep. - BMA

Want comb.

No, that hurts. The comb hurts. Here. Thankyou. — Ep. - BMA

Comb?

Thankyou.

Comb.

Say, 'Thankyou, Mommy.' — Unclear

Thankyou.

OK.
No, we're not using the comb.

Example 4

M You want some juice?

T Hn?

Want some juice? — Exch. / Ep. - BMA

Jusa.

Want some?

Some

You gonna drink it?

Drink. Not drink!

Drink it.

Drink.

There.
Want cereal?
There you all oughta go.

(Father starts speaking)

Exch. (cont.)

Exch.

Exch.

Ep. - BMA (cont.)

Example 5

$^{M}$Fish.

$^{T}$Naw fish. Kim.

Bear.

Na bear. Bor.

Bird.

Na bork. Bork.

Deer.

Deer?
(starts crying)

Ep. - Obj. oriented: Information

Example 6

M
No, we're not using the comb. The comb hurts.

Comb.

No, use the brush.

No got brush.

You got a brush in your hand.
Brush your Mommy's hair.
Ow! What are you doing.
That hurts.
You're so busy

Brush ah dah?

OK

Ash.

OK. That feels good.

Good.

Yeah.
You gonna let Mommy brush yours?

Uh brush?

Mm, go ahead.
Uh-oh. Telephone

Exch.
Exch.
Exch.
Exch.
Exch.
Exch.
Exch.
Exch.
Exch.
Exch.
Exch.
Ep. - BMA

# Appendix 4

## John Dore's (unpublished) code for children's communicative intentions

REQUESTS...solicit information, actions, or acknowledgment

RQYN Yes-No Questions...solicit affirmation or negation of the propositional content of the speaker's utterance; e.g., "Is this a birthday cake?"

RQWH Wh-Questions...solicit information about the identity, location, or property of an object, event, or situation; e.g., "Where's John?"

RQAC Action Requests...solicit a listener to perform, not to perform, or cease to perform an action (process, etc.); e.g., "Give me some juice!"

RQPM Permission Requests...solicit a listener to grant permission for the speaker to perform an action; e.g. "Can I go?"

RQRQ Rhetorical Questions...solicit a listener's acknowledgment to allow the speaker to continue; e.g., "You know what I did yesterday?"

RESPONSES...directly complement preceding utterances

RSYN Yes-No Answers...complement Yes-No Questions by affirming or negating or otherwise answering them; e.g., "No, it isn't."

RSWH Wh-Answers...complement Wh-Questions by providing information about the identity, etc. requested; e.g., "John's under the table."

RSAG Agreements...complement previous utterances by agreeing with or denying the content; e.g., "That isn't a car."

RSCO Compliances...complement requests by complying with or refusing to comply with them; e.g., "I won't wash my hands."

RSQL Qualifications...complement utterances by qualifying, clarifying, or otherwise changing their content; e.g., "But I didn't do it."

DESCRIPTIONS...represent observable (or verifiable) aspects of the environment

DSID Identifications...label an object, person, event, or situation; e.g., "That's a house."

DSPO Possessions...indicate who owns or temporarily possesses an object; e.g., "That's John's egg."

DSEV Events...represent the occurrence of an event, action, process, etc.; e.g., "I'm drawing a house."

DSPR Properties...represent observable traits or conditions of abjects, events, or situations; e.g., "That's a red crayon."

DSLO Locations...represent the location or direction of an object or event; e.g., "The zoo is far away."

STATEMENTS...express facts, beliefs, attitudes, or emotions

STRU Rules...express rules, conventional procedures, analytic facts, definitions, or classifications; e.g., "You have to put it there first."

STEV Evaluations...express impressions, attitudes, or judgments about objects, events, or situations; e.g., "It looks like a snowman."

STIR Internal Reports...express internal states (emotions, sensations, etc.), capacities, or intents to perform an act; e.g., "My leg hurts."

STAT Attributions...express beliefs about another's internal state, capacity, intent, etc.; e.g., "He doesn't know the answer."

STEX Explanations...report reasons, causes, motives for acts, or predict states of affairs; e.g., "He did it cause he's bad."

CONVERSATIONAL DEVICES...establish, maintain, end, or otherwise regulate interpersonal contact and conversations

CDBM Boundary Markers...initiate or end contact or conversation; e.g., "Hi", and "Bye"

CDCA Calls...make contact by soliciting attention; e.g., "Hey John!"

CDAC Accompaniments...signal closer contact by accompanying a speaker's action; e.g., "Here you are."

CDRE Returns...acknowledge the listener's preceding utterance , or fill in to maintain the conversation; e.g., "oh"

CDPM Politeness Markers...make explicit the speaker's pliteness; e.g., "Please" and "Thanks"

PERFORMATIVES...accomplish acts by being said

ROLE Role-plays...establish a fantasy; e.g., "This is a train."

PROT Protests...object to the listener's previous behavior; e.g., "No, don't touch that."

JOKE Jokes...produce a humorous effect by a non-literal, playful remark; e.g., "I throwed the soup in the ceiling."

GAME Game-markers...initiate, continue, or end a game; e.g., "You can't catch me."

CLAI Claims...establish facts by being said; e.g., "I'm first."

WARN Warnings...notify the listener of impending harm; e.g., "Watch out."

TEAS Teases...annoy the listener by being provocative or taunting; e.g., "You can't come to my house."

Miscellaneous Codes

UNTP Uninterpretable...for unintelligible, incomplete, or incomprehensible utterances

DOUB Double-coded...for utterances receiving two of the above codes

# Appendix 5

## Data on mother-child interaction

Table 42

Types of Concrete episodes, expressed as % of total number of Concrete episodes

| | Bobby | | Luanne | | Thomas | | Jackson | |
|---|---|---|---|---|---|---|---|---|
| No. of Concrete episodes | 117 | | 290 | | 104 | | 157 | |
| Episode types | sub cat. | cat. | sub cat. | cat. | sub cat. | cat. | sub cat. | cat. |
| Body maintenance activities | | 11 | | 28 | | 29 | | 06 |
| Person focus | | | | | | | | |
| Physical | | | | | | | | |
| PLoc | 08 | | 14 | | 09 | | 16 | |
| PA | 04 | | 06 | | 02 | | 06 | |
| PAP | 06 | | 03 | | 01 | | 01 | |
| PProp | 09 | | 08 | | 01 | | 04 | |
| Subtot. | 27 | | 31 | | 13 | | 27 | |
| Mental | 03 | | 01 | | 02 | | 05 | |
| Politeness | 01 | | 01 | | 02 | | 00 | |
| Verbal game | 07 | | 11 | | 09 | | 19 | |

Table 42 (cont.)

| | Bobby | | Luanne | | Thomas | | Jackson | |
|---|---|---|---|---|---|---|---|---|
| | sub cat. | cat. | sub cat. | cat. | sub cat. | cat. | sub cat. | cat. |
| Person focus (cont.) | | | | | | | | |
| Get attention | 12 | | 00 | | 04 | | 01 | |
| Other | 00 | | 00 | | 00 | | 01 | |
| Total: Person focus | | 50 | | 45 | | 29 | | 53 |
| Total: Person orientation | | 62 | | 73 | | 58 | | 59 |
| Object focus | | | | | | | | |
| Ob poss | 12 | | 04 | | 06 | | 08 | |
| Ob Loc | 04 | | 04 | | 01 | | 02 | |
| Ob Prop | 07 | | 05 | | 19 | | 06 | |
| PAO | 14 | | 11 | | 16 | | 24 | |
| Other | 01 | | 01 | | 00 | | 01 | |
| Total: Object orientation | | 38 | | 25 | | 42 | | 41 |
| Situation focus | | 01 | | 02 | | 00 | | 00 |
| Grand total | | 98 | | 99 | | 95 | | 81 |

Table 43

Types of Non-directive exchanges between mothers and children, expressed as % of total number of Non-directive exchanges

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Total no. exchanges | 172 | 405 | 199 | 328 |
| Total no. Non-directive exchanges | 37 | 128 | 42 | 101 |
| % Non-directive | 22 | 32 | 21 | 31 |

| | Bobby | | | Luanne | | | Thomas | | | Jackson | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M[1] | J[2] | C[3] | M | J | C | M | J | C | M | J | C |
| Verbal games[4] | | 24 | | | 34 | | | 33 | | | 40 | |
| Politeness | 03 | 00 | 00 | 04 | 00 | 00 | 05 | 00 | 00 | 00 | 00 | 00 |
| Chit-chat | | | | | | | | | | | | |
| Person focus | | | | | | | | | | | | |
| PA | 08 | 00 | 00 | 05 | 02 | 00 | 00 | 00 | 00 | 01 | 03 | 04 |
| PAP | 00 | 00 | 05 | 03 | 02 | 00 | 00 | 00 | 00 | 00 | 03 | 01 |
| PLoc | 03 | 00 | 00 | 01 | 00 | 00 | 00 | 02 | 00 | 09 | 00 | 00 |
| PProp - Phys. | 08 | 08 | 08 | 07 | 02 | 00 | 02 | 00 | 00 | 00 | 01 | 01 |
| PProp - Psych. | 11 | 00 | 00 | 07 | 02 | 00 | 02 | 00 | 00 | 01 | 01 | 00 |
| Subtotal | 30 | 08 | 13 | 23 | 07 | 00 | 05 | 02 | 00 | 11 | 08 | 06 |

Table 43 (cont.)

| | Bobby | | | Luanne | | | Thomas | | | Jackson | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | J | C | M | J | C | M | J | C | M | J | C |
| Object focus | | | | | | | | | | | | |
| Ob prop | 03 | 11 | 00 | 06 | 05 | 02 | 05 | 15 | 19 | 02 | 03 | 07 |
| Ob poss | 03 | 00 | 00 | 00 | 02 | 01 | 00 | 00 | 00 | 03 | 00 | 00 |
| Ob loc | 00 | 00 | 00 | 01 | 00 | 00 | 00 | 02 | 03 | 00 | 00 | 00 |
| PAO | 00 | 00 | 00 | 07 | 00 | 02 | 00 | 05 | 07 | 06 | 06 | 05 |
| Subtotal | 05 | 11 | 00 | 14 | 07 | 05 | 05 | 22 | 29 | 11 | 09 | 12 |
| Situation focus | 05 | 00 | 00 | 05 | 00 | 00 | 00 | 00 | 00 | 01 | 01 | 02 |

[1]M = Mother-dominated

[2]J = Jointly dominated

[3]C = Child-dominated

[4]Because of the reciprocity in Verbal Games, they were always scored as jointly dominated.

Table 44

Results of Dore's code for children's communicative intentions, with each category type being expressed as % of total number of coded utterances

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| Total no. coded utterances | 48 | 444 | 237 | 337 |
| <u>Types</u> | | | | |
| RQYN | 00 | 02 | 01 | 13 |
| RQWH | 02 | 00 | 01 | 05 |
| RQAC | 00 | 25 | 41 | 07 |
| RQPM | 00 | 00 | 00 | 01 |
| RQRQ | 00 | 00 | 00 | 00 |
| Total | 02 | 27 | 43 | 27 |
| RSYN | 08 | 07 | 03 | 16 |
| RSWH | 06 | 02 | 02 | 06 |
| RSAG | 06 | 08 | 01 | 07 |
| RSCO | 00 | 25 | 07 | 06 |
| RSQL | 00 | 00 | 01 | 01 |
| Total | 21 | 42 | 14 | 36 |
| DSID | 58 | 16 | 29 | 12 |
| DSPO | 13 | 02 | 00 | 01 |
| DSEV | 06 | 02 | 02 | 10 |
| DSPR | 00 | 03 | 04 | 03 |
| DSLO | 00 | 02 | 01 | 04 |
| Total | 77 | 25 | 37 | 29 |

Table 44 (cont.)

| | Bobby | Luanne | Thomas | Jackson |
|---|---|---|---|---|
| STRU | 00 | 00 | 00 | 00 |
| STEV | 00 | 00 | 00 | 02 |
| STIR | 00 | 04 | 05 | 07 |
| STAT | 00 | 00 | 00 | 00 |
| STEX | 00 | 00 | 00 | 00 |
| Total | 00 | 05 | 05 | 09 |
| PROT | 00 | 02 | 01 | 00 |

# Appendix 6

## Examples of children's utterances

In the following examples, M = Mother, L = Luanne, T = Thomas, and J = Jackson. The child's utterance of interest is underlined. Also, where relevant, the categories are indexed according to which category they belong to in the Other Constructions code described in Chapter II.

Stage 1

1. L Drop it

   M Well pick it up.

2. M Your tummy hurts too?

   L Ooh. Ooh.

   OK

   My stomach

   Yeah, my stomach hurts.

3. T More soda

   M No, there's no more soda. It's all gone

4. M You wash your leg?

   T I wash my leg

5. J Go bathroom

   M I don't need to go to the bathroom.

6. $^{J}$I go dresser

$^{M}$Go put that on the dresser.

Simple nomination (OC Category no. 1)

7. $^{L}$A truck

$^{M}$Oh, that's a truck over there too.

8. $^{M}$There's a airplane.

$^{T}$Na ball

$^{M}$Mm-hmm, here's a ball.

9. $^{J}$Baby brother?

$^{M}$Mm-hm.

$^{J}$Uh baby

Simple negation (OC Category no. 1)

10. $^{L}$No

$^{M}$Come on, it's time to go to bed.

$^{L}$No bed

11. $^{M}$You gonna drink it?

$^{T}$Drink. Not drink!

12. $^{M}$Hurry up or you ain't stayin' here.

$^{J}$No stay here?

Simple Wh-question (OC Category no. 1)

13. (M is talking on the telephone)

L Who dat?

Use of 'want' as a request form (OC Category no. 2)

14. L Water. Water. Want water.

15. L I want cereal

M No, we're gonna eat some food.

16. M Come on. Let's get some juice.

T All gone

M No, there's still more.

T Want more

17. M You're not gettin' none.

J I want gum. Want gum.

Verb + Motion particle (OC Category no. 2)

18. L Get up

M Get up? Want me to turn over?

19. L Get down

M Where are you goin'?

20. M Would you stop.

J Oh sit down

M Well sit down then.

Simple use of 'look at' (OC Category no. 2)

21. $^{T}$A truck. Look at truck.

Simple use of 'got' (OC Category no. 2)

22. $^{M}$You don't have any money.

$^{J}$I got some. I got money.

23. $^{M}$Cause you're scared of the dark, hn.

$^{J}$Billy got ghost

$^{M}$She doesn't.

Experiencer constructions (OC Category no. 3)

24. $^{M}$That stink.

$^{L}$I smell it

25. $^{M}$You like trucks?

$^{T}$I like trucks

26. $^{J}$I see trunk

$^{M}$You saw a elephant's trunk.

Stage 2 (OC Categories 4 and 5)

27. $^{M}$You threw the comb down here last night?

$^{L}$I threw duh comb?

28. $^{M}$What color is that?

$^{T}$That's black

29. M He's gettin' a lollipop cause he's not through with his supper.

J Un-hn

M Un-hn

J He goin' bed

Miscellaneous (OC Categories 6 and 7)

30. L I want sit down. Sit down.

M No, I'm standin' right here.

31. M Luanne, if you don't let it get hot, you won't be able to eat it.

L I want it now

32. L Go

M Hm?

L Go to sleep

33. T I want put pocket

M You wanna put it in my pocket?

34. T Let's go wash up

M Go wash up?

35. T Get out of here

36. J Ghost? There's no such thing ghost?

37. J Sit on you. I gonna it on you.

38. M I said it's not nice to tell fibs and get down.
J I want to climb on back

39. M It's a, valentine is a heart.
J Val at my school? (Val was a teacher at his school.)
M No, it's not Val at your school.