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SOCIAL CLASS DIFFERENCES IN SOME ASPECTS OF THE VERBAL AND NONVERBAL COMMUNICATION BETWEEN MOTHER AND PRESCHOOL CHILD

by

(C) TERENCE HORE

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

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EDMONTON, ALBERTA

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FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "SOCIAL CLASS DIFFERENCES IN SOME ASPECTS OF VERBAL AND NONVERBAL COMMUNICATION BETWEEN MOTHER AND PRESCHOOL CHILD" submitted by Terence Hore in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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August 29, 1968.
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ABSTRACT

Preverbal children communicate their wants, desires and intents nonverbally. The present study centres around the question: "What happens to nonverbal communication when language develops?" On the basis of related literature, a model embodying the relationship between the verbal and nonverbal aspects of communication was set up. It hypothesized a negative relationship, implying that the people who have mature, complex language available to them employ the nonverbal channels less and less.

The operational hypotheses, that there are differences in verbal and nonverbal behaviour relative to the high and low socio-economic (SES) groups, were derived from the model and tested using 30 mother-child pairs from two contrasting SES areas. The children, matched for age and IQ, were to begin formal schooling the following academic year.

Videotape recordings were made during two situations, one mainly verbal and the other largely manipulative. The verbal measure (Average Number of Words per Communication Unit) and the nonverbal measures (Mutual Glances, Physical Contact and Physical Proximity) were taken from the videotape recordings. The experimenter instructed the subjects via a videotaped film and observed the proceedings on a television monitor outside the testing area.

The contrasting SES groups were compared statistically, using individual t tests on each measure. The majority of the results did not support the proposed negative relationship. They suggested instead that the relationship was, in fact, positive. People who use more

mature language also use the nonverbal channels to a greater extent.

The results of the main and a secondary investigation of unreciprocated glancing behaviour were discussed in relation to future research in child development, child-rearing practices and teaching.

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THE PROBLEM

> Most human communication is incredibly rich - closer to poetry than to mathematics. (Pittenger et al, 1960, p.7)

The classical approach to psychological experimentation was to take a monadic view of the 'subject'. More recently, the works of Rosenthal (1966) and Friedman (1967) have led to an extension of the limits of inquiry to include not only the conscious but also the unconscious effects of a person's behaviour upon others. As Watzlawick et al (1967) stated, the focus has shifted from the isolated monad to the relationship between parts of a wider system. The relationship examined in this study was the often intimate one which exists between a mother and her pre-school child, wherein

> "The participants offer to each other definitions of their relationship, or, more forcefully stated, each seeks to determine the nature of the relationship" (Watzlawick et al, 1967, p.132).

One can see that this information must be communicated in some way between the members of the dyad. In the past the study of communication has been used synonymously with the study of language. Mead (in Sebeok et al, 1964) traced the roots of the European and American linguistic research methodologies. To Mead, the European tradition has evolved from the meticulous analysis of written texts, whereas the American tradition has sprung from an emphasis on the speech of non-literate peoples and its subsequent movement from this to the analysis of the spoken language of literates. It is not surprising therefore, that from the observation of non-literate people in the act of speaking

has developed the broader science of semiotics, which deals with a study of signs irrespective of whether they are linguistic or extralinguistic. Mead (ibid, p.285) continued:

> "The impetus for studies of this kind has come in part from pure science, in the sense that an anthropologist like Birdwhistell or a linguist like Trager has found an unexplored area of complex patterning which has repaid exploration in terms of specific skills of eye and ear and pattern recognition... This enterprise is grounded in a belief that a fuller knowledge of patterned but unarticulated parts of the communication system will advance our understanding of teaching, learning and human behavior in general."

Jaffe (1966) said that

> "The expansion of linguistics from the study of the language system per se to its study in the context of a social communication system has laid the basis for a true psychology of language as a scientific discipline" (p.692).

Communication, therefore, can now be seen to include the nonverbal aspects as well as the verbal aspects of the interaction of a mother and her child. There is little doubt of the existence and importance of the nonverbal channel of communication in the life of the preverbal child, not only for transmitting his wants, desires and feelings to others, but also for the comprehension of the feelings of those who are near him.

> "Within a few weeks after birth the baby's cries of distress, and then of anger and aversion, change from the symptomatic to the expressive and communicative... Further, he devises ways to tell people that he wants something and what it is he wants. He does this by a process of CONCRETE ENACTMENT: to be picked up he holds out his arms... At a more advanced level of communication...if he wants to go out he brings his coat" (Church, 1966a, p.58-59).

One can assume that communication by nonverbal means is a primitive

method of communication which precedes active speech. At this point a formulation of Werner and Kaplan (1964) is pertinent concerning the "fate" of the genetically earlier mode of functioning when higher functions have emerged. In the present case, what happened to the nonverbal channels of communication when language proper appeared.

> "At least with regard to humans it must be maintained that with the attainment of higher levels, lower levels of functioning are not lost. Under normal circumstances, such lower levels of functioning... are subordinated to more advanced levels of functioning; they may come to the fore again under special internal or external conditions..." (p.8).

If the nonverbal mode is not lost it appeared important to study both the verbal and nonverbal channels of communication between mother and preschool child in two different experimental situations. Two such situations were selected. One task required that the mother and child make up stories and the second task was primarily a manipulative one, in which one might expect language utterances to play a lesser role.

In order to assure variability of language development and in view of the work of Templin (1957), Bernstein (1960) and Hess and Shipman (1966) for example, on the superiority of the language development of mothers and children from the higher socio-economic status (SES) groups over their lower SES peers, it appeared suitable to select samples from divergent social classes.

> "Socio-economic status was thus used as a selection criterion to assure variability of social, cultural and cognitive experience... It is too gross, however, to be considered a variable. Rather, social class is a statement of probability--expressing in a gross way the likelihood that certain experiences have occurred, or will occur in the life of the individual. It is these more specific experiences that the project attempted to identify and study" (Hess and Shipman, 1966, p.2).

The relationship suggested by the literature between the verbal and nonverbal aspects of the communication process appeared to be a negative one, providing one is dealing with the same task situation. That is, the more there is of one the less there will be of the other; the more the verbal channels are used the less need there will be for the nonverbal channels to be employed. If this suggestion is put into the context of two widely divergent SES samples it may be presented diagramatically, as follows:

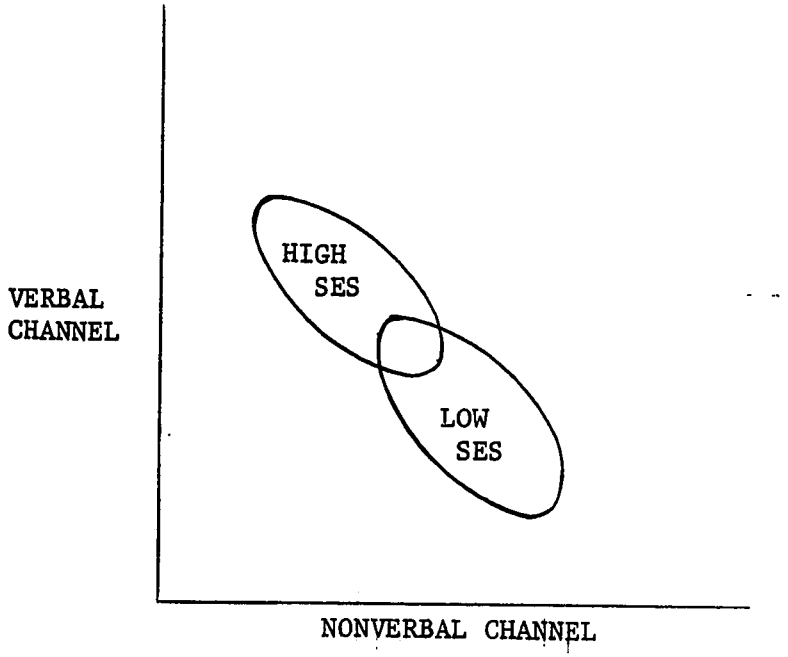

FIGURE 1

MODEL OF THE HYPOTHESIZED RELATIONSHIP
BETWEEN THE VERBAL AND NONVERBAL CHANNELS OF COMMUNICATION

One of the major problems in previous investigations of nonverbal acts has been the acquisition of a permanent record (Ekman, 1964). The present study sought to overcome this problem through the complete videotape recording of the subjects during both tasks.

In providing an account of the relationship between the verbal and nonverbal aspects of the intimate communication between mother and preschool child it was hoped to illuminate variables which constituted a method of communication, of which we are usually not aware. This, in turn could lead to a better understanding of that nebulous process referred to as empathy. Church (1966a) saw an empathic-like process underlying all communication. Moreover, if there are differences in methods of communicating with some individuals placing greater emphasis on the nonverbal aspects, then parents, counsellors and teachers should be made aware of this important channel of communication for the transmission of intentions, wants, feelings and desires.

The present study investigated the relationship of the verbal and nonverbal aspects of the communication between mothers and children from two divergent social classes, by an analysis of the videotaped recordings of the interactions of each dyad during a story telling and manipulative task.

CHAPTER II

THEORETICAL ORIENTATION AND REVIEW OF RESEARCH

In order to test the proposed theoretical model (Figure 1) it was necessary to select groups which showed some variability in language development. This selection could have been accomplished on the basis of age, by taking one group two or more years older than the other. To go above five years of age would have meant taking into account the effects of a standardized school experience. Pilot studies with children under five years of age were not particularly successful for two reasons. First, they tended to be too active to sit in a chair within the pre-set focus of the television camera for a sufficient length of time, secondly, it was difficult to devise tasks or provide materials to stimulate language flow.

Alternatively the selection could have been done by means of a longitudinal study but matters of expediency prevented the consideration of this possibility.

Another alternative was to select samples from two divergent social classes. Hess and Shipman (1965) and Havighurst (in Eells et al, 1951) indicated the superiority of the higher SES mothers, in terms of total amount of verbal output and in size of the vocabulary they possessed, over their lower SES peers. Many studies have examined the relationship of verbal performance to SES measures (Milner, 1951; McCarthy, 1953; Templin, 1957; Alexander, 1961; Curry, 1962; John, 1963; Deutsch, 1965) and have concluded that the high SES child is superior to his low SES peer in terms of production of varied sound

types (Irwin, 1960), higher ability as measured by reading readiness tasks (Milner, 1951) reading comprehension (Alexander, 1961; Curry, 1962) and finally in regard to the more abstract forms of language (John, 1963; Deutsch, 1965). The evidence seemed to indicate that the selection of extreme samples based on a measure of SES should provide the diversity of language required. A sensitive language measure was required to test the veracity of this assumption. Loban (1963) made use of an index which could be used by a non-specialist in the area of linguistics, and which approximated the more complex analyses of syntax. Loban (1963, p.82) demonstrated the sensitivity of the measure, "average number of words per communication unit" (one complete predication)[1], to language differences in two divergent SES groups. As the present study did not intend to examine the linguistic differences between the SES groups in minute detail, but sought a reliable, relatively simple index of language maturity, the "average number of words per communication unit" was accepted as the language measure to be used for the analysis of the mothers' and the children's oral speech during the two different tasks.

So far we have been concerned only with the verbal aspects of communication and have ignored a method of communication which has been elaborated upon for many years (e.g. Darwin, 1877), but which is usually treated superficially in descriptions of the development of language in infants (e.g. Ervin-Tripp, 1966), viz, the communication which occurs

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[1]See the more complete definition of this measure in the next chapter.

in the infant prior to the emergence of codified verbal language. Recent records of the behaviour of infants (Luria and Yudovich, 1959; Church, 1966b) provided adequate examples of young children expressing their desires and intents nonverbally. The synpraxic speech (incomprehensible without the concrete practical situation) of the twins described by Luria and Yudovich became insufficient for communication with other people. However, the synpraxic nonverbal speech was sufficient in the early life of the twins for communication between themselves. Church (1966a) noted that not only did the child advance through various levels of communication in the verbal sphere alone, but that there appeared to be levels within the nonverbal communication also,

> "The baby's cries...change from the symptomatic, to the expressive and communicative..." (p.58).

Suggestions as to the relationship between the verbal and nonverbal aspects of communication have varied from gesture being the root from which language and the meaning of specific words have evolved (Johannesson, 1950), to seeing the growth of speech and gesture as being parallel developments (Critchley, 1939). Johannesson commented on the 'fossils' of human speech which he believed were remnants of the unconscious imitation of gestures which occurred at the genesis of human speech. Initially Critchley saw gesture as the forerunner of speech, but later he preferred to consider them as developing side-by-side, with gesture being comparable to "an elder brother of speech" (p.121). Szasz (1961) hinted that the relation of language to what he called 'proto-language', which consisted of bodily signs, was a negative one:

> "Since the use of bodily signs is the simplest communication device known to man, communication of this type varies inversely with knowledge and learning" (p.121).

The same sort of relationship was noted by Reissman (1963) in discussing culturally deprived children who had a definite lack of formal language skills but a high development of informal language and gestures. Ruesch and Kees (1956) commented upon the difficulties which could arise if the nonverbal mode of communication did not receive 'adequate' emphasis.

> "Difficulties arise when parents are not flexible in communicating nonverbally and fail to respond at each age level with appropriate motions. An impoverishment of communication and character development can be observed in those children where the verbal was emphasized too early and where messages expressed in nonverbal terms were left unanswered" (p.17).

Within the conceptual framework of Werner and Kaplan (1956; 1964) it seemed warranted to infer that primitive and more advanced forms of communication could coexist, and also that the more primitive mode may be called upon under special conditions:

> "They (the lower levels of functioning) also, and characteristically may come to the fore when the organism is confronted with especially difficult and novel tasks" (p.8).

A similar movement was envisaged by Szasz (1961) when he said:

> "In general, whenever people feel unable--by means of "normal" mechanisms, such as normal speech, to prevail over the significant objects in their environment, they are likely to shift their pleas to the idiom of protolanguage" (p.130).

It seemed therefore, that the task or situation may have some effect on the occurrence of any particular communicative mode. Further, this assumed that in a situation which engendered verbal communication, the

participants would use that level of language which was normal or typical of their regular language patterns, and one would expect some variability in verbal behaviour along the social class lines indicated earlier. In such a situation it was suggested that there would be some variability in the nonverbal behaviour, presenting an inverse relationship with the verbal channel.

Similar patterns of communication modes may or may not occur when the situation is a practical, manipulative one in which one might expect verbal language to play a lesser role. In order to examine these relationships tasks were sought which did, and did not, emphasize the verbal method of communication. The previous work of Hess and Shipman (1965; personal communication, 1967) indicated the success which they had had in stimulating verbal output in the mothers through the use of drawings or pictures and secondly the wealth of interactional data which accrued from the observation of mothers and children working together on a simple toy. A pilot study by the present writer confirmed the suitability of these two situations for the observation and quantification of the verbal and nonverbal components of mother-child interaction.

There is little doubt that there was a general awareness of the need for an investigation of the nonverbal aspects of human behaviour:

> "Nonverbal communication is of the highest importance in human interaction. Especially is this true in the more intimate forms of interaction such as one finds in the family... It seems quite obvious that interaction on this level plays a particularly important role in the early life of the child..." (Bossard and Boll, 1954, p.71).

Barbara (1956) defined language behaviour as the

> "totality of a person's behavioral and semantic responses" (p.286)

and considered that an awareness of both verbal and nonverbal factors was essential in order to arrive at a more complete understanding of human behaviour.

Sebeok et al (1964) commented upon the need for detailed psychological knowledge about particular child-parent societal interaction to understand with any depth the "intrapsychic and interactive significance of extralinguistic phenomena" (p.105).

The main hindrances to research of nonverbal phenomena have been, first, the difficulty of isolating variables from within the amorphous mass of nonverbal behaviour, and secondly, finding a method whereby such variables, when distinguished, could be recorded.

Some variables worthy of consideration were mentioned indirectly by Ainsworth (1964), Kagan (1968) and Rabinovitch (1968). Ainsworth considered that while physical contact was important to the human infant, much important interaction between infant and mother involved distance receptors.

> "The baby when apart from his mother, but able to see her keeps his eyes more or less continuously oriented towards her" (p.53).

This face-to-face attraction was reported by Rabinovitch also:

> "If you take a month old infant and present it with the possibility of looking at stripes or looking at a human face, he will first look at the human face..." (p.14).

Kagan (1968) presented four-month-old babies with masks of human faces,

some with eyes painted on them and some without. The babies looked longest at the masks which had the painted eyes. Kagan explained this in terms of the contrast which the eyes provided, but Goffman (1963) cited two distinct features of face-to-face interaction between two human beings:

> "the richness of information flow and the facilitation of feedback" (p.17).

In 1933, Simmel said that

> "The union and interaction of individuals is based upon mutual glances. This is perhaps the most direct and purest reciprocity which exists anywhere" (p.358).

Both Heider (1958) and Tomkins (1963) concurred on the great intimacy involved in the interocular experience. Katz (1963) suggested that empathy may take the form of a parallel activity of the sense organs. It appeared that the majority of research on face-to-face interaction, which included the interocular behaviour, has been conducted with adults, primarily within the psychotherapeutic setting (Davitz, 1964; Reik, 1948; Ruesch, 1955), but also, more recently, during the observations of examiners working with their subjects during psychological experiments (Rosenthal, 1966; Friedman, 1967). Davitz reported that it didn't seem to be the words that were missed when a client's feelings were misunderstood by a trainee psychotherapist, but rather what was missed seemed to be a function of the nonverbal aspects of the client's communication. Reik made the point that "no small power of communication is contained in a glance". Ruesch considered that it was only through nonverbal replies that a nonverbal patient could be influenced.

'Glancing' behaviour seemed to be a suitable variable for inclusion in this study because it was objective, easily tallied and could be manipulated if the experimenter wished to do so. For example, Masling (1959) increased what he called 'psychological distance' by having an accomplice put sunglasses on during an interview, and then observing the reactions of the interviewer. Exline and Winters (in Tomkins and Izard, 1965) directed the glancing behaviour of the experimenter by instructing him to look continually at the subject's eyes. In the latter case a mutual glance was recorded each time the subject looked at the experimenter. As the situation was artificial the generality of the findings was somewhat restricted. However, the recent work of Rosenthal (1966) and Friedman (1967) which studied filmed recordings of experimenters working with their subjects, illuminated another aspect of glancing behaviour:

> "And when we looked we saw that experimenters differed in their verbal and nonverbal behavior, and it looked as if these differences were a function of their learned styles of dyadic interaction and their immediate expectancies" (Friedman, p.34).

Friedman considered a number of nonverbal variables including glances, exchange of glances (mutual glances), body slant and head activity, together with the duration of each interaction. From the evidence provided by Friedman's investigations he suggested that,

> "It is the variable time and exchange of glances... to which we should devote our discussion of the mediation of experimenter effects" (p.50).

Some additional nonverbal measures were employed. (The terms body slant and body inclination were used synonymously throughout this present study.) Friedman had used body slant in his 1967 work, and

Scheflen (1964) used it as an indicator of what occurred during an interview, he said:

> "All English-speaking people (who also move in English) seem to utilize this postural information UNCONSCIOUSLY for orienting themselves in a group. A CONSCIOUS knowledge of these postural functions is of great value in research in human behavior..." (p.316).

Body inclination could be seen as a special case of decreasing the social distance. In his discussion of group dynamics Kurt Lewin (in G. Lewin, 1948, p.20) defined differences in social distance as different degrees of intimacy of the situation which the person is willing to share with the other. The final measure was physical contact, this was included because of the frequency of its occurrence during the second pilot study. It occurred most frequently during the manipulative task, being used by the mother to prevent further action by the child.

The samples, tasks and measures were selected, and it was felt that the caution stated by Ekman (1965) had been overcome:

> "The critical point is that the design be one in which judges must react to many separate slices of nonverbal behavior rather than to a conglomerate mass" (p.426).

In 1964, Ekman had foreseen another major problem and that was to obtain a permanent record of the interaction sequence. Previous attempts had utilized interval notations (Merrill, 1946) where an observer wrote down what he thought was happening at regular intervals. Birdwhistell (1952) carried this method to the extreme when he invented a notational system comprehensive enough to record every twitch. An example of the comprehensiveness of his notational system can be found in Sebeok _et al_. A slight advance on writing down what occurred was to record a description of each action on a tape-recorder synchronized with

another tape-recorder which recorded the speech of the subjects, (Hess and Shipman, 1965). Both of these methods suffered from their inability to provide information which could be used for inter-judge reliability checks. Still photographs taken at regular intervals were used by Kline and Johannsen (1935) and by Ekman (in Tomkins and Izard, 1965) but while these provided some measures of reliability the total sequence was not recorded. Ruesch and Kees (1956) talked about movie photography and considered that "for the study of human behavior it has no equal" (p.11). In his study of body language, Katz (1964) used movie film and commented upon the restrictions it imposed because of the 'two-dimensionality' of the image it provided. He outlined the benefits, such as the increase in reliability which came from the replay facility which allowed the judges to observe a single sequence as often as they wished. Rosenthal (1966) considered sound motion pictures to be the best permanent record of experimenter-subject interaction. The present study utilized the media of television; the videotape recordings had all the advantages of movie film plus the additional benefits of immediate playback if required, and reusability of the tape itself. One disadvantage was the high cost involved in the initial purchase of the videotape.

The knowledge, afforded by the Rosenthal and Friedman investigations, that the experimenter may unintentionally bias the outcome made it clear that some control must be exercised to keep the effects of such contamination constant. For this reason the major instructions of each task were given to the subjects by means of a videotaped film.

The following chapter provides the details of the methods and procedures.

CHAPTER III

METHODOLOGY

DEFINITIONS

For the purposes of this investigation the terms given below were employed, having the following operational definitions.

Unreciprocated Glance -- A single look at the face of the other person, which was not returned by that person.

Mutual Glance -- A glance which was reciprocated, entailing a measurable unit of time with direct eye-to-eye contact. (See Figure 2)

Body Inclination -- Refers to the physical proximity of the heads of the individuals in the dyad. The section on experimental design gives a description of the method used to obtain this measure.

Physical Contact -- The touching of any part of the body by either member of the dyad.

Phonological Unit[1] -- An initial method of segmenting the

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[1]Definition taken from Loban (1963, p.5 and 6), the example was taken from recordings made during the present study.

FIGURE 2

A MUTUAL GLANCE

FIGURE 2

A MUTUAL GLANCE

Phonological Unit (continued) -- subject's speech by intonation patterns. It was dependent upon the pattern of sound without encompassing meaning, and judged by the contours of inflection, stress and pause in the human voice.

EXAMPLE -- "They were singing songs / and running and playing tag // and they were having a great time." #

The # marks the completion of a phonological unit. The # symbolizes a definite pause which is usually preceded by a drop in the force and pitch of the voice. The other symbols represent a silence pause of less finality.

Word Group Communication Unit[2] (WGCU) -- This was a subdivision of the larger phonological unit and identified by the semantic meaning communicated. It was a group of words which could not be further subdivided without the loss of essential meaning.

EXAMPLE -- "They were singing songs / and running and playing tag // * and they were having a great time." # *

---

[2]Definition from Loban (1963, p.6) and example from recordings made during the present study.

Word Group Communication Unit (continued) -- The asterisk marks the end of each communication unit.

Single Word Communication Unit (SWCU) -- Words like "yes", "no" and psuedo-words like "whoa" and "O.K." were included in this section, and were not taken into account when calculations were made to obtain the average number of words per communication unit.

It was necessary to subdivide communication units into "word group" and "single word" sections because the nature of one of the tasks engendered the use of single words. To include these when computing the average number of words per communication unit would have placed artificial restrictions on its validity as a measure.

Language Maze[3] (Maze) -- A tangle of language which did not make semantic sense and which was impossible to classify phonologically or semantically. It may have consisted of words or parts of words which did not constitute a communication unit.

EXAMPLE -- "(And they went)...and they went to the hospital one day / * and they got a little baby." # *

The maze is enclosed in brackets.

---

[3]Definition from Loban (1963, p.8) and example from recordings made during the present study.

Language Measure -- The language measure used was the average number of words per communication unit, which was defined as:-

Average Number of Words Per CU -- The total number of words, minus any language mazes or single word communication units, divided by the number of CU's for any specified session/person.

Nonverbal Measures -- The measures, based on the definitions given above, were as follows:-

Mutual Glance - Total (MGT) -- The total number of times in any specified period when the mother and child maintained eye-to-eye contact.

Duration of MGT -- The time spent maintaining this contact over any specified period.

Mutual Inclination Count -- This was based on the position of the subjects' heads on the Inclination Grid[4]. If both heads were in the central portion of the inclination grid, called the Proximity Zone[5], one tally was recorded.

Intelligence Measure -- The child's intellectual potentialities were appraised through the score obtained upon administration of the Peabody Picture Vocabulary Test[6].

[4,5,6] Described further in the 'Instrument' section of this chapter.

Occupational Class Score -- The father's occupation was scored according to the table of occupational class scores assembled by Blishen (1958).

HYPOTHESES

The general hypothesis tested in this study was that there would be differences between mother-child pairs from widely different social classes in both their verbal and nonverbal communication.

The work of Bernstein (1960, 1962) and Loban (1963) leads one to hypothesize that both parents and children from the higher socio-economic status groups would be superior when their language is analyzed into average number of words per communication unit.

While little is known about the development of nonverbal language, it was hypothesized on the basis of the literature and the ensuing theoretical model (Figure 1), that a concurrent analysis of the nonverbal aspects of the communication between mothers and their pre-school children would show a difference in favour of the lower-class pairs.

The operational hypotheses which follow were derived from the general hypothesis.

VERBAL MEASURE.

1. The mothers from the high SES group will produce a greater average number of words per communication unit in the Etch-a-sketch task[7], than the mothers from the low SES group.

---

[7]Described further in the 'Instrument' section of this chapter.

2. The children from the high SES group will produce a greater average number of words per communication unit in the Etch-a-sketch task, than the children from the low SES group.
3. The mothers from the high SES group will produce a greater average number of words per communication unit in the story-telling task[8], than the mothers from the low SES group.
4. The children from the high SES group will produce a greater average number of words per communication unit in the story-telling task, than the children from the low SES group.

NONVERBAL MEASURES.

MUTUAL GLANCES.

5. The mother-child pairs from the low SES group will show a greater number of mutual glances, than the mother-child pairs from the high SES group, during the Etch-a-sketch task.
6. The mother-child pairs from the low SES group will show a greater number of mutual glances, than the mother-child pairs from the high SES group, during the story-telling task.

PHYSICAL CONTACT.

7. There will be a greater amount of physical contact shown by the low SES pairs than by the high SES pairs during the Etch-a-sketch task.

---

[8]Described further in the 'Instrument' section of this chapter.

NONVERBAL MEASURES (continued)

INCLINATION COUNT.

8. There will be a greater mutual inclination count from the low SES pairs than from the high SES pairs during the Etch-a-sketch task.

9. There will be a greater mutual inclination count from the low SES pairs than from the high SES pairs during the story-telling task.

THE SAMPLE

In November 1967, the 1966 census data were examined and the total number of four year old children was drawn from two areas[9] of the City of Edmonton, Alberta, Canada, which Kupfer (1967) described as being representative of high and low income families. The final samples of 15 high socio-economic status children and 15 low socio-economic status children were randomly selected[10] from these purposive[11] samples. The samples could be assumed to have been drawn from infinitely large high and low SES populations.

---

[9]See Figure 3.

[10]Using a Table of Random Numbers (Underwood, 1966, pp.642-666).

[11]Selltiz et al, p.520-521 for definition.

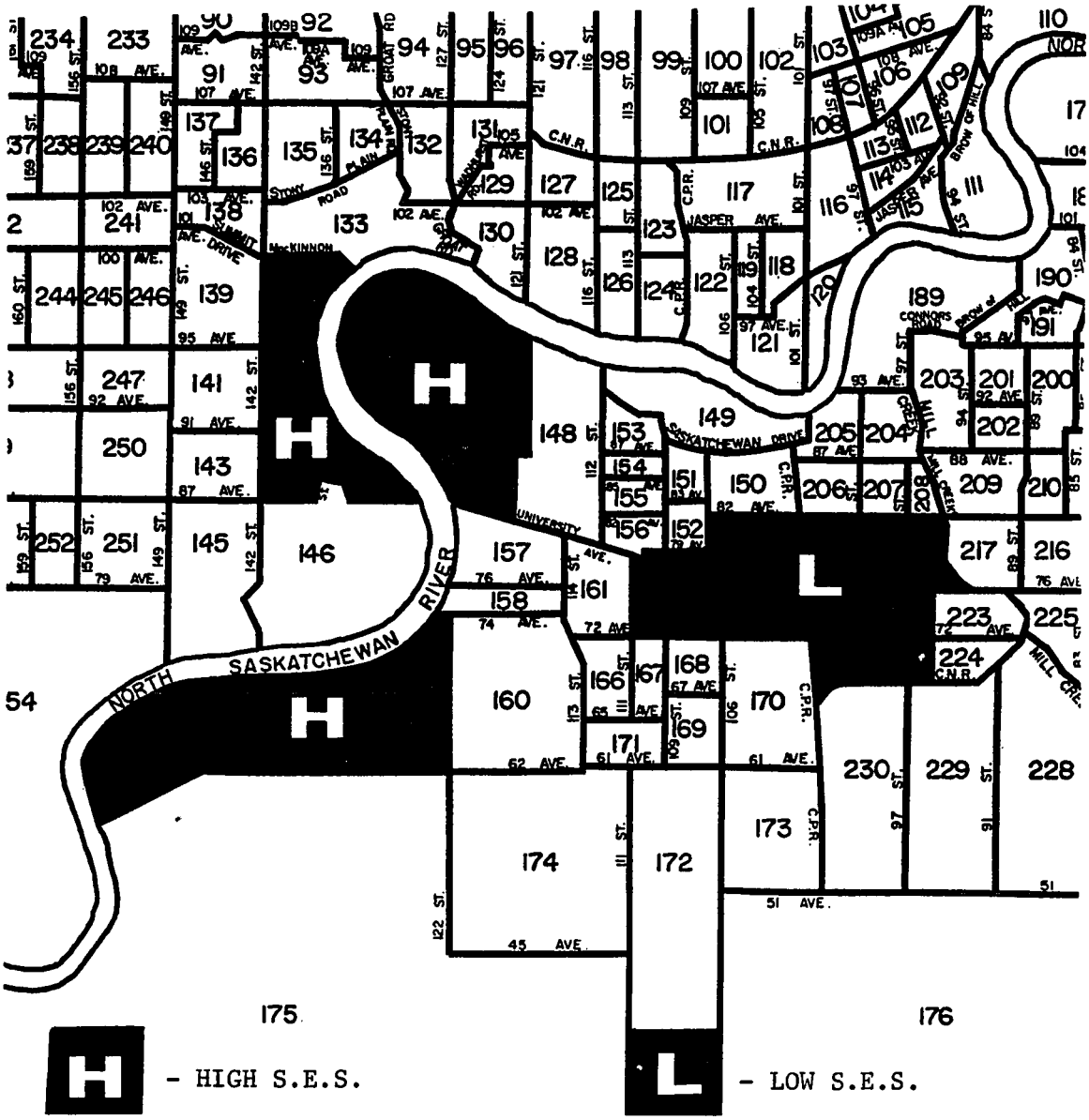

FIGURE 3

A SECTION OF A MAP OF THE CITY OF EDMONTON,
SHOWING THE POLLING DIVISIONS FROM WHICH THE SAMPLES WERE DRAWN
(REPRODUCED WITH THE PERMISSION OF THE CITY OF EDMONTON)

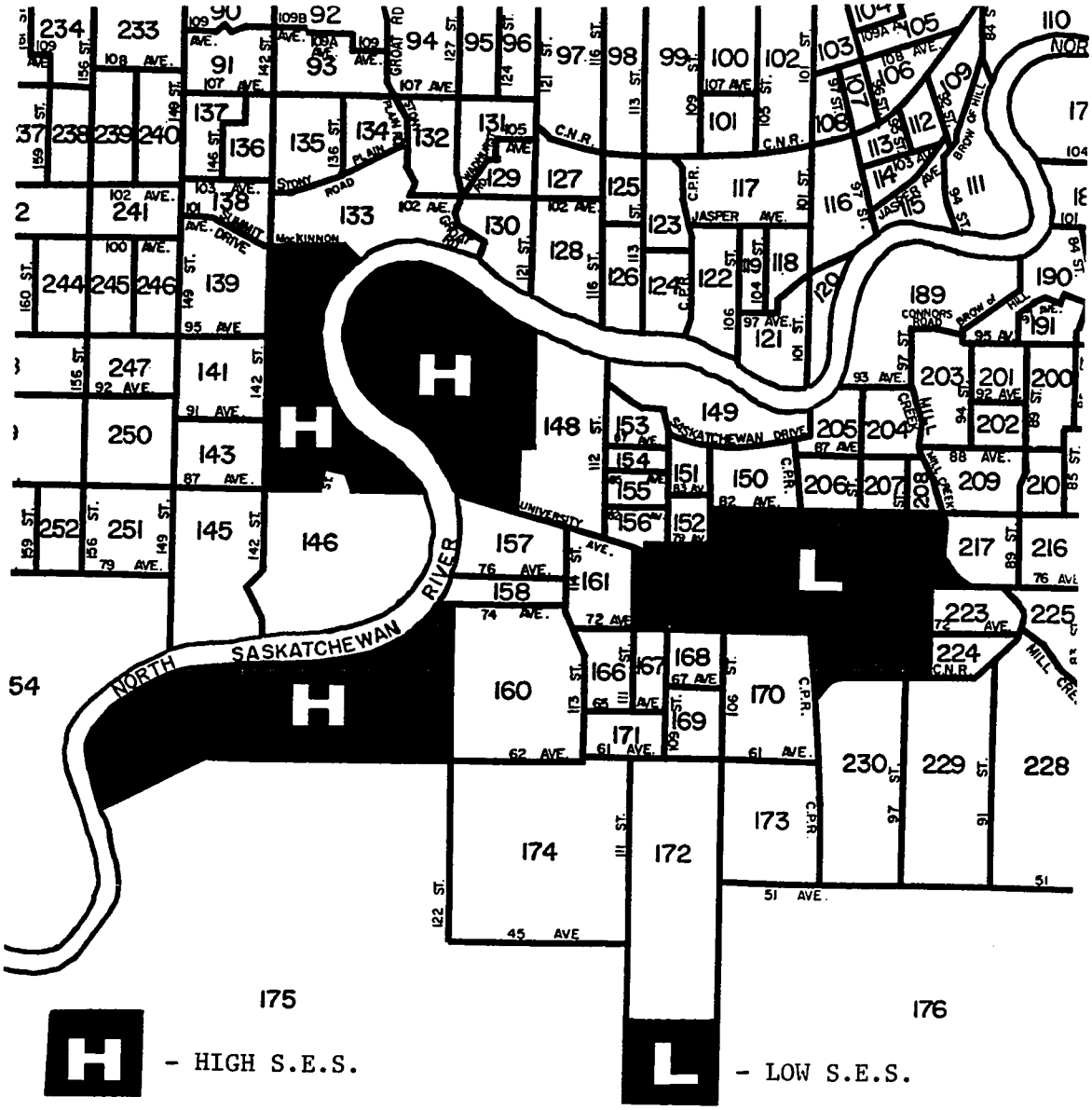

FIGURE 3

A SECTION OF A MAP OF THE CITY OF EDMONTON,
SHOWING THE POLLING DIVISIONS FROM WHICH THE SAMPLES WERE DRAWN
(REPRODUCED WITH THE PERMISSION OF THE CITY OF EDMONTON)

TABLE I

DESCRIPTIVE DATA FOR THE TWO SAMPLES

		HIGH SES	LOW SES
N		15	15
SEX	Male	7	8
	Female	8	7
*AGE	Mean	5-11	5-9
	Range	5-3 to 6-3	5-5 to 6-0
*IQ[12]	Mean	108.2	102.0
	Range	83-121	83-119
**SES[13]	Mean	71.147	45.94
	Range	57 to 82.5	40.8 to 51.2
NUMBER OF SIBLINGS	Mean	3.53	4.73[14]
	Median	3	4
NUMBER OF FIRST-BORN CHILDREN		3	4
NUMBER OF LAST-BORN CHILDREN		5	5
NUMBER OF CHILDREN WHO ATTEND KINDER-GARTEN OR PLAYSCHOOL		15	8
NUMBER OF MOTHERS WITH FULL-TIME EMPLOYMENT		0	0

[12]Peabody Picture Vocabulary Test (Dunn, 1965).

[13]Occupational Class Scale (Blishen, 1958).

[14]One child in the L-SES group had twelve siblings, for this reason the median score is also given.

*Not significantly different at the .05 level (two-tailed)

**Significantly different at the $p < .0001$ level (two-tailed)

Some descriptive data for the two samples are presented in Tables I and II. The groups were initially selected on the basis of a crude purposive sampling of the fathers' incomes, using under $5,000 per year for the low SES and over $10,000 per year as the criteria. A more thorough comparison of the two final samples using the scores from an occupational class scale (Blishen, 1958) showed the two samples to be different, with no overlap between their distributions. There is no difference between the groups when age (t_{obs} = 1.274, df=28, p=0.21) and IQ (t_{obs} = 1.497, df=28, p=0.15) are considered. The fathers' income and number of years of schooling are taken into account in the computation of the Occupational Scale (Blishen, 1958), however, the groups also differed considerably when the average years of schooling was calculated for the mothers. See Table II (t_{obs} = 4.404, df=28, $p<.001$)

TABLE II

EDUCATIONAL ACHIEVEMENT (AND YEARS OF SCHOOLING) FOR THE MOTHERS IN THE TWO SAMPLES

	HIGH SES	LOW SES
2 or more University Degrees	3	
1 University Degree	3	
Attended University (no Degree)	1	1
Grade XII	5	2
Grade XI	2	2
Grade X	1	2
Grade IX		7
Grade VIII		1
N	15	15
Total Years of Schooling	205	151
Average Years of Schooling	13.66	10.06

THE INSTRUMENTS

The Peabody Picture Vocabulary Test (PPVT) provided a simple, quick measure of 'intelligence'[15] which did not require the child to use language and hence did not inflate the scores of those children with superior linguistic ability. The Expanded Manual (Dunn, 1965) reported alternate-form reliability (Pearson Product Moment Correlation) at ages 5 and 6 years as .73 and .67 respectively for raw scores and the standard errors of measurement, for the intelligence quotient, at the same ages as 7.8 and 8.6. Page 32 of the above manual contains the comment that,

> "In the light of evidence to date, coefficients of equivalence and temporal stability appear to be satisfactory for both average children and those who have one of a number of disabilities."

The Etch-a-sketch Toy[16] is marketed commercially by most department stores across Canada. It consisted of a plastic box with a glass top, containing aluminum powder. Two control knobs operated a mechanism inside the box which scraped the powder from the underside of the glass, leaving a fine line. It is possible to draw horizontal and vertical lines by operating each knob independently. To erase, the powder is rearranged by holding the toy upside down and shaking it. Four of the high SES children and three of the low SES children had access to this toy within their own homes.

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[15] In this case, the ability to respond correctly by pointing to one of four pictures exemplifying the auditory stimulus word.

[16] 'Etch-a-sketch' #505 made under license by Kelton Co. Ltd. for Peter Austin Mfg. Co. Ltd., Toronto, Canada.

Children's Apperception Test-Supplement, (Bellak and Bellak, 1957) Four cards (numbers 1-5, 2-5, 3-5 and 6-5) were used from this supplement, not for any diagnostic purposes, but to stimulate speech in mother and child.

Animal Pictures. Verbal output was also stimulated during the practical session by the use of four animal pictures[17] taken from ordinary magazines such as 'Life'.

Interaction Timer and Tally-Counter. This instrument was designed by the author to count and time the duration of each event, i.e. mutual glance. (See Appendix B for circuit diagram.) It consisted of three sets of timers and counters, each wired in parallel and controlled by a separate switch. The timer started as soon as the switch was depressed, when the switch was released the timer stopped and one tally was added to the cumulative score maintained by the counter. A computer-assisted version of an instrument similar to this, called an interaction chronograph, has been used in studies by Phillips et al (1957) and Matarazzo et al (1956). In the former study Phillips was able to demonstrate inter-observer reliability of above .94.

The Inclination Grid. In order to obtain an objective measure of body-lean or body inclination a frame was constructed to fit over the screen of the television set. The screen was sub-divided vertically, the central division was called the 'Proximity Zone'. (See Figure 4).

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[17]Collected originally by R.D. Armstrong, University of Alberta.

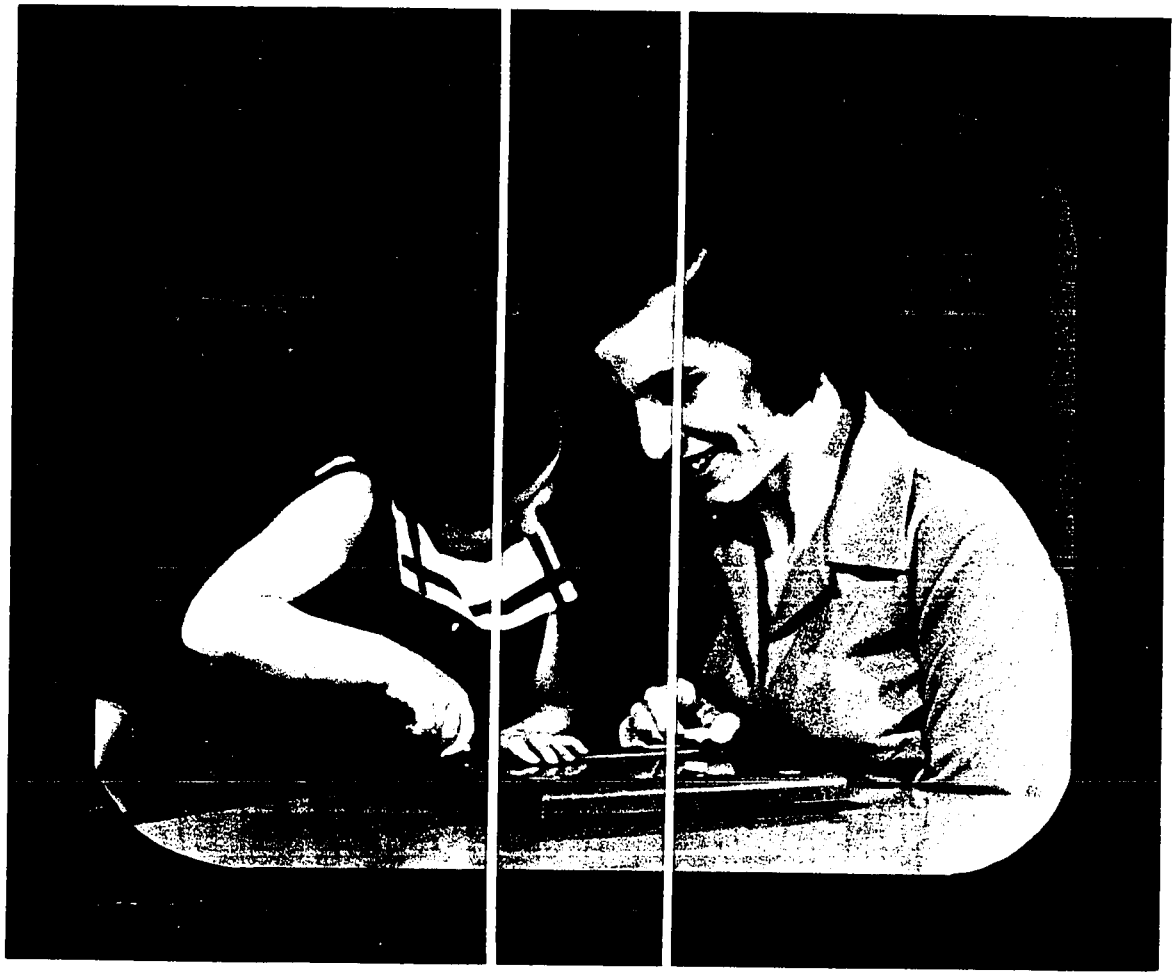


FIGURE 4

THE POSITIONS OF INCLINATION GRID, MOTHER AND CHILD
AS SEEN ON THE TELEVISION SCREEN

FIGURE 4

THE POSITIONS OF INCLINATION GRID, MOTHER AND CHILD
AS SEEN ON THE TELEVISION SCREEN

THE TESTING AREA

The unusual shape of the testing area (See Figure 5) resulted from pilot studies which experimented with camera positions. It was found that the nonverbal behaviours could be seen most easily when the direction of the camera was such that it bisected the angle of the table between the mother and child. The table and television camera were placed in this relationship to one another and the testing area was built around the table. The use of the 50 mm. lens on the camera enabled the experimenter to position the camera in the shadows outside the illuminated testing area. All subjects entered and exited through a door which opened directly into the testing area from an outside corridor.

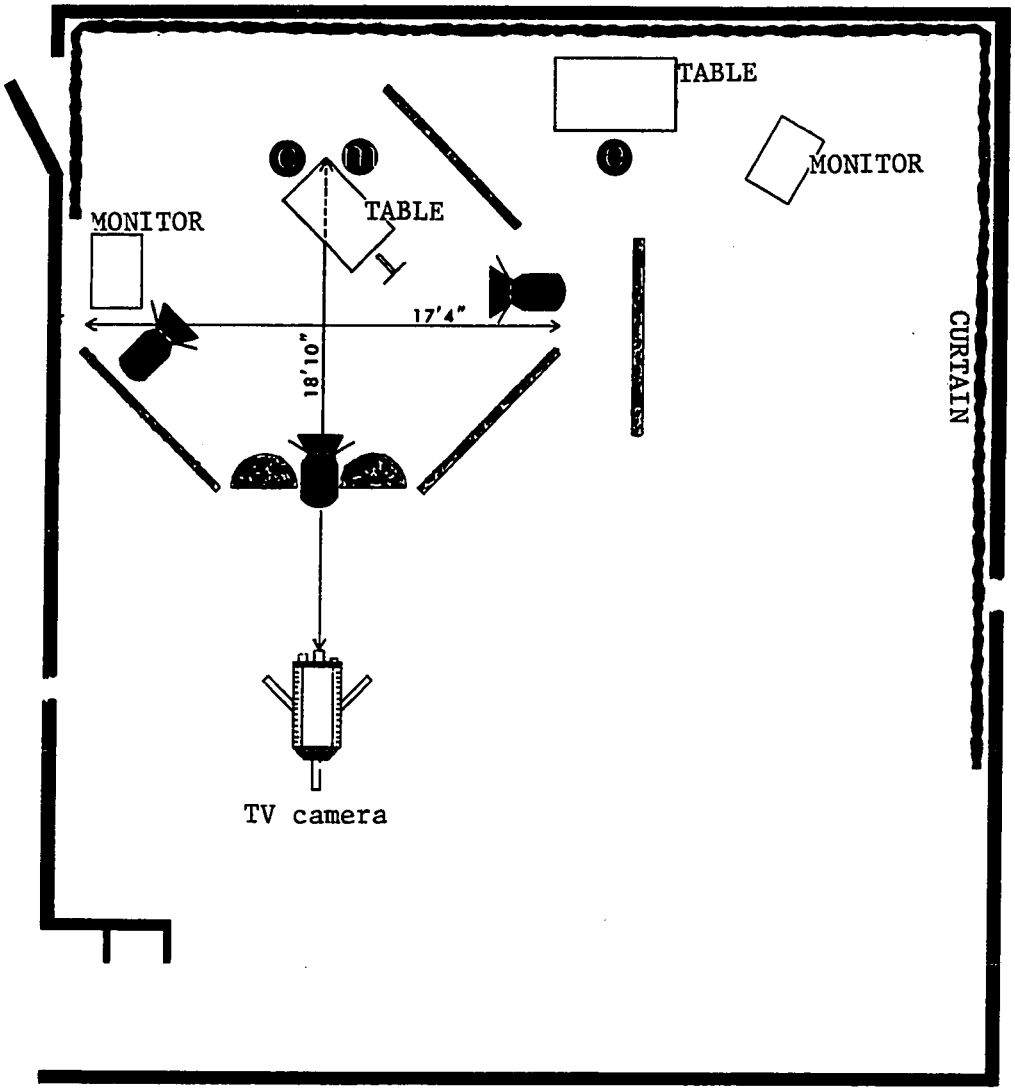
THE TECHNICAL EQUIPMENT

The technical equipment required for the videotape recordings and playback was provided and operated by the staff of the Audio-Visual Media Department of the University of Alberta. The specifications for the equipment were as follows:

Television Camera - General Electric Model #PC.14. Out of the complement of four lenses the 50 mm. was used. The focus was pre-set and the camera left unattended throughout.

Videotape Recording - The recordings were made by an Ampex videotape recorder, Model #VR 1500.

Playback - An Ampex videotape-recorder, Model #VR 660B was used to playback the 2" videotape at a speed of 3.75 inches per second.



C CHILD

M MOTHER

E EXPERIMENTER

MOVEABLE WALLS (8' LONG)

MOVEABLE COLUMNS (2'6" DIAMETER)

CEILING-MOUNTED SPOT-LIGHTS

DIRECTIONAL MICROPHONE

FIGURE 5

THE FLOOR PLAN OF THE TESTING AREA
IN THE TELEVISION STUDIO

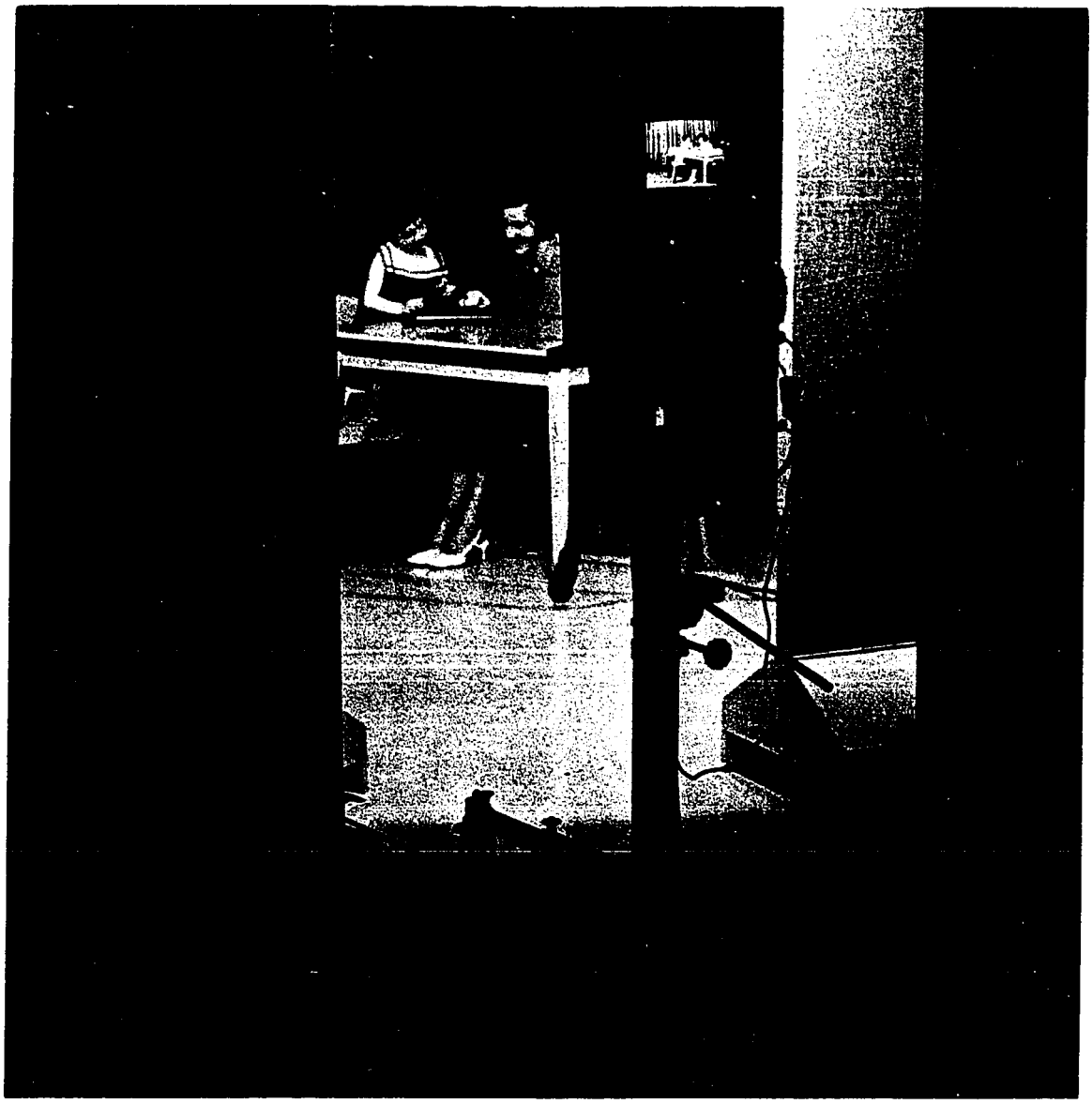


FIGURE 6

VIEW FROM BEHIND THE TELEVISION CAMERA

FIGURE 6

VIEW FROM BEHIND THE TELEVISION CAMERA

Audio Recording - In addition to the videotape recordings, sound tapes were made simultaneously by a Sony tape-recorder Model #TC 105 at a speed of 3.75 inches per second. An Electrovoice microphone, Model #642 was employed throughout the video and audio recordings.

Monitors - Two 23" monitors were located in the studio, and two 17" monitors were used in the control room. The monitor in the testing area was used to screen the instructional films. (See Figure 7.)

Cue-light - This was mounted on the monitor in the testing area. It operated on a 120 volt power supply and was activated from the control room.

PROCEDURE

Early in February 1968, two groups were randomly drawn from the census records of the two areas of the city described earlier. Original letters (see Appendix A) were typed to solicit the parents' support for the research project.

Telephone calls were made during the early part of March seeking confirmation of parental support, and home visits were made during the month of March by the investigator. Two or three children were seen daily. During each home visit the PPVT was administered to each child, to ensure that the means of the IQ scores for the two groups were not significantly different. On completion of the home visits, each mother was asked to bring her child to the Education Building at the University of Alberta, where she was taught to operate the 'Etch-a-

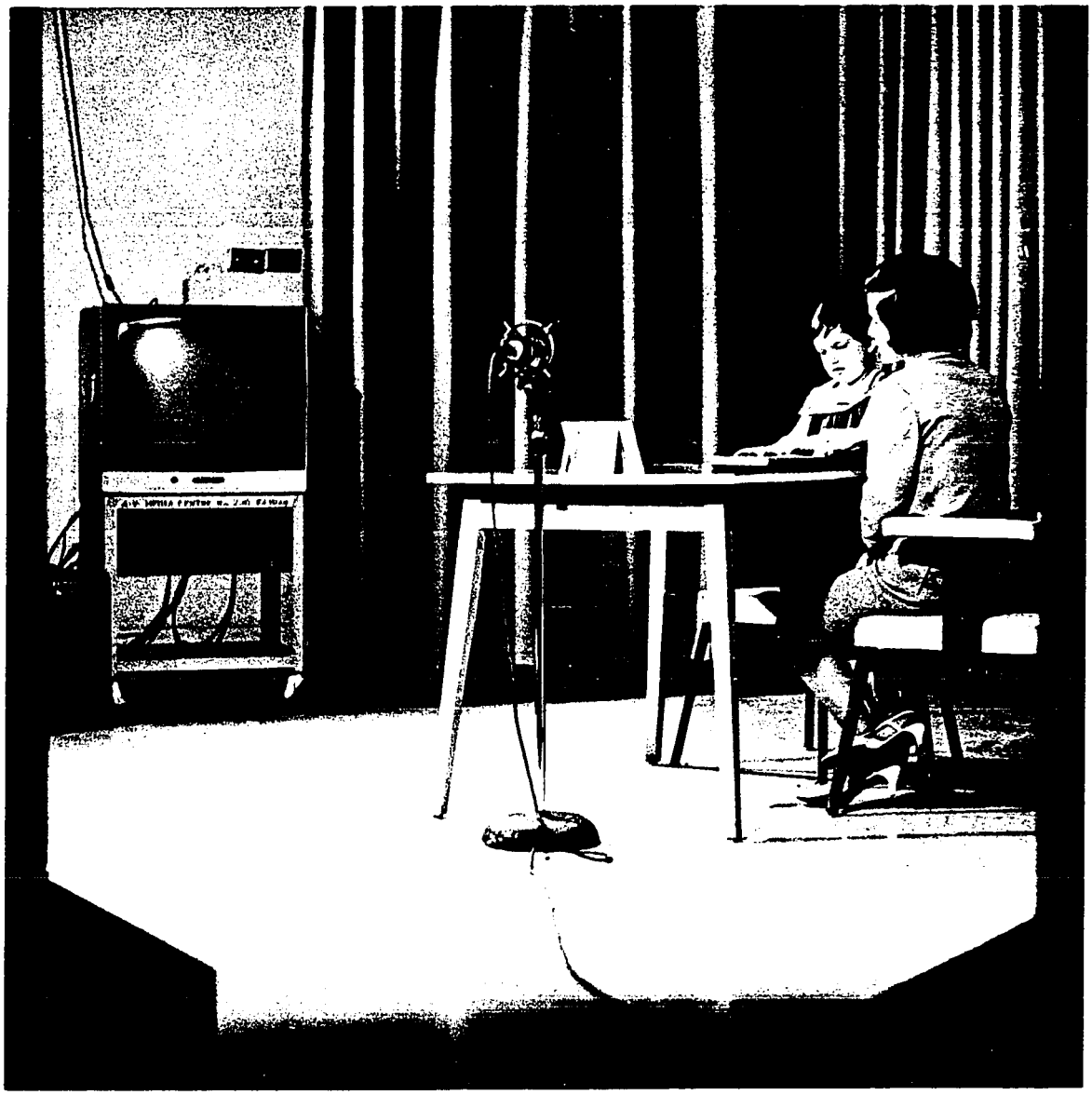


FIGURE 7

PART OF THE TESTING AREA SHOWING THE MONITOR
ON WHICH THE INSTRUCTIONAL FILMS WERE SCREENED

FIGURE 7

PART OF THE TESTING AREA SHOWING THE MONITOR
ON WHICH THE INSTRUCTIONAL FILMS WERE SCREENED

sketch' toy by means of a videotaped instructional film made by the present writer[18]. The child, who had been looked after during this time by the investigator or his assistant, was then introduced into the testing area. The mother had been asked to teach her child how to operate the 'Etch-a-sketch', and she did this without any restrictions upon the method to be used and without any interruptions from the investigator who was watching a monitor outside the testing area. Five minutes were allowed for the mother to teach the child the function of the knobs, etc. After five minutes had elapsed, the investigator entered the testing area and gave the subjects a clean Etch-a-sketch toy and a new design[19], with the verbal instructions that they were to copy the design by using the Etch-a-sketch as directed. The experimenter then left the testing area. The subjects had been instructed to ring a small handbell when they were satisfied with their reproduction of the design. At no time after the teaching period were they allowed to erase their attempts. This procedure was followed for the four designs, with a clean Etch-a-sketch and new design provided by the experimenter each time. The videotape-recordings made during the attempts to copy the four designs provided the raw data which was later analyzed to provide verbal and nonverbal measures for the Etch-a-sketch task. The designs completed by the subjects were not used in this present study. The Etch-a-sketch toy was utilized to provide a

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[18]Appendix C contains the script for the instructional films.

[19]Appendix D contains a copy of the four designs used for the Etch-a-sketch task. The designs were provided by Dr. Virginia Shipman, personal communication, December 1967.

situation in which the verbal and nonverbal measures could be taken.

During the story-telling task the mother and the child watched an instructional film[20] made by the present writer. After having told two stories each in the practice session, the stories prompted by the C.A.T. Supplement cards were recorded. The two stories by the mother and the two stories by the child were analyzed to provide verbal and nonverbal measures for the story-telling task. During each task, the cue-light in the testing area informed the subjects when to start; it also served a double purpose in ensuring that the technical equipment was functioning properly before the cue was given.

The tasks were alternated, so that half of each group commenced with the Etch-a-sketch task and the rest of each group commenced with the story-telling task. The sessions were held during the morning to partially control any variability which may have occurred due to fatigue.

STATISTICAL ANALYSIS

Reliability Checks.

Inter-rater reliabilities were computed for the verbal and nonverbal measures using Spearman's Coefficient of Rank Correlation (Ferguson, 1959). The obtained reliabilities ranged from .82 to .95 for the verbal measures and from .80 to .95 for the nonverbal measures.

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[20]Script for this instructional film in Appendix C.

Analyses.

Comparisons between the two socio-economic groups were made on the basis of dependent variables from both the Etch-a-sketch and story-telling tasks. Individual t tests on each pair of means for each verbal and nonverbal measure were calculated. An alpha level of .05 was adopted. The works of Norton (in Lindquist 1953) and Glass (1966) were determining factors in the choice of parametric over nonparametric tests in this study. It seemed feasible from their results that the assumptions underlying the t tests could be violated provided that the number of subjects in each group was equal. However, for the interest of future researchers in the area of nonverbal behaviour, parallel analyses were carried out using Welch's t prime approximations for unequal variances (Ferguson, 1959), and Mann-Whitney U tests. The results of these analyses were compared with the results of the parametric analyses and are presented in Appendix E. All computations were carried out by the IBM 360/67 computor at the University of Alberta.

CHAPTER IV

RESULTS AND DISCUSSION

RESULTS

The data yielded by the procedures outlined in the previous chapter, were examined to see whether they supported the theoretical model. The model represented a situation where a positive relationship existed between the verbal and nonverbal elements of the communication between mothers and their preschool children.

Prior to testing the hypotheses an initial concern was whether it would be necessary to employ some form of time-sampling technique to control extraneous influences. For example, whether a greater number of mutual glances had occurred as a result of longer interaction time alone. The means of the cumulative times of each group on both tasks were submitted to t tests which showed the groups to be similar in terms of the length of time taken to tell the stories or complete the designs, (Table III).

TABLE III

MEANS AND STANDARD DEVIATIONS FOR DURATION OF TASKS[1] CLASSIFIED BY SES LEVELS

TASK	LOW SES		HIGH SES	
	$\bar{X}$	SD	$\bar{X}$	SD
Story-telling	4.63	1.60	4.93	1.95
Etch-a-sketch	7.59	3.29	6.98	2.26

[1]Time in minutes

The t observed (df=28) was not significant at the .05 level in either case. For these reasons time samples were not taken, and therefore, the data which follow were based upon the total time spent working on each task.

Testing the Hypotheses.

Hypothesis 1: The mothers from the high SES group produce a greater average number of words per communication unit (CU) in the Etch-a-sketch task than the mothers from the low SES group. See Table IV.

TABLE IV

MEANS, STANDARD DEVIATIONS AND SAMPLE SIZE FOR MOTHERS' AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT, ON THE ETCH-A-SKETCH TASK CLASSIFIED BY SES LEVELS

	LOW SES	HIGH SES
Means	4.81	5.90
Standard Deviations	0.82	1.23
N	15	15

The data support Hypothesis 1. The t observed (-2.747) was significant at the .005 level for a one-tailed test.

Hypothesis 2: The children from the high SES group produce a greater average number of words per CU in the Etch-a-sketch task than the children from the low SES group. Table V shows the data which failed to support Hypothesis 2. The t observed (-0.698) was not significant at the .05 level for a one-tailed test.

There was no difference between the high and the low SES children on this verbal measure during the Etch-a-sketch task.

TABLE V

MEANS, STANDARD DEVIATIONS AND SAMPLE SIZE
FOR CHILDREN'S AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT,
ON THE ETCH-A-SKETCH TASK
CLASSIFIED BY SES LEVELS

	LOW SES	HIGH SES
Means	7.12	8.19
Standard Deviations	0.74	1.52
N	15	15

Hypothesis 3: The mothers from the high SES group produce a greater average number of words per CU in the story-telling task than those from the low SES group. The result of the t test on the means presented in Table VI supported this hypothesis. The t observed (-3.101) was significant at the .002 level for a one-tailed test.

TABLE VI

MEANS, STANDARD DEVIATIONS AND SAMPLE SIZE
FOR MOTHERS' AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT,
ON THE STORY-TELLING TASK
CLASSIFIED BY SES LEVELS

	LOW SES	HIGH SES
Means	7.12	8.19
Standard Deviations	0.93	0.89
N	15	15

Hypothesis 4: The children from the high SES group produce a greater average number of words per CU in the story-telling task than the children from the low SES group. This hypothesis was not supported by the data (Table VII). The t observed (-0.767) was not significant at the .05 level for a one-tailed test.

TABLE VII

MEANS, STANDARD DEVIATIONS AND SAMPLE SIZE FOR CHILDREN'S AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT, ON THE STORY-TELLING TASK CLASSIFIED BY SES LEVELS

	LOW SES	HIGH SES
Means	6.06	6.39
Standard Deviations	1.12	1.16
N	15	15

Hypothesis 5: The mother-child pairs from the low SES group show a greater number of mutual glances than the mother-child pairs from the high SES group, during the Etch-a-sketch task. The t test between the two independent means for the high and low SES pairs did not show the groups to be different at the .05 level, for a one-tailed test. The t observed was -1.522.

Hypothesis 6: The mother-child pairs from the low SES group show a greater number of mutual glances, than the mother-child pairs from the high SES group, during the story-telling task. Table IX shows the data. The t observed was -2.778 and significant at the 0.004 level for a one-tailed test. However, having

stated a directional alternate hypothesis in favour of the low SES group, the statistical decision rule was that the null hypothesis could only be rejected if the observed t was greater than +1.70. As the t observed was negative the null hypothesis could not be rejected.

TABLE VIII

MEANS, STANDARD DEVIATIONS AND SAMPLE SIZE FOR MUTUAL GLANCES ON THE ETCH-A-SKETCH TASK CLASSIFIED BY SES LEVELS

	LOW SES	HIGH SES
Means	0.20	0.67
Standard Deviations	0.40	1.07
N	15	15

TABLE IX

MEANS, STANDARD DEVIATIONS AND SAMPLE SIZE FOR MUTUAL GLANCES ON THE STORY-TELLING TASK CLASSIFIED BY SES LEVELS

	LOW SES	HIGH SES
Means	6.87	16.00
Standard Deviations	4.94	11.27
N	15	15

Hypothesis 7: A greater amount of physical contact is shown by the low SES pairs than by the high SES pairs during the Etch-a-sketch

task. The data in Table X support this hypothesis. The observed t was 1.766 and significant at the 0.04 level for a one-tailed test.

TABLE X

MEANS, STANDARD DEVIATIONS AND SAMPLE SIZE FOR PHYSICAL CONTACT SCORES ON THE ETCH-A-SKETCH TASK CLASSIFIED BY SES LEVELS

	LOW SES	HIGH SES
Means	6.40	1.87
Standard Deviations	9.27	2.50
N	15	15

Hypotheses 8 and 9 were concerned with physical closeness of mother and child during the two tasks.

Hypothesis 8: The low SES pairs show a greater mutual inclination count, during the Etch-a-sketch task, than the high SES pairs. The data shown in Table XI did not support this hypothesis. The t observed (-1.185) was not significant at the .05 level for a one-tailed test.

Hypothesis 9: The data presented in Table XII did not support the hypothesis that the low SES pairs show greater mutual inclination count during the story-telling task. There was no difference between the groups, the t observed (1.234) was not significant at the .05 level for a one-tailed test.

TABLE XI

MEANS, STANDARD DEVIATIONS AND SAMPLE SIZE
FOR MUTUAL INCLINATION COUNT ON THE ETCH-A-SKETCH TASK
CLASSIFIED BY SES LEVELS

	LOW SES	HIGH SES
Means	2.67	5.60
Standard Deviations	4.45	8.12
N	15	15

TABLE XII

MEANS, STANDARD DEVIATIONS AND SAMPLE SIZE
FOR MUTUAL INCLINATION COUNT ON THE STORY-TELLING TASK
CLASSIFIED BY SES LEVELS

	LOW SES	HIGH SES
Means	1.13	0.20
Standard Deviations	2.73	0.75
N	15	15

DISCUSSION

Most of the results do not support the theoretical model outlined in Chapter I. One of the assumptions underlying the model was a superiority in language usage in the high SES mothers and children when they were compared to the low SES subjects. In the samples taken for the present study the expected superiority was demonstrated by the high SES mothers but not shown by their children. In terms of the average

number of words per communication unit the children were not significantly different. It was suspected that this outcome may have been influenced by the eight children in the low SES group who attended kindergarten (see Table I, Chapter III). A Mann-Whitney U test was used to compare the low SES children who did and who did not attend kindergarten. There was no significant difference between the two groups on average number of words per communication unit. Thus, the suspicion was found groundless. Another possible source of variation seemed to be the education of the mothers as measured by the number of years of schooling (see Table II, Chapter III). Table XIII was obtained by dividing the mothers' years of schooling into three categories, under nine years, ten to fourteen years and over fifteen years.

TABLE XIII

MOTHERS' YEARS OF SCHOOLING
CLASSIFIED INTO HIGH, MEDIUM AND LOW CATEGORIES

MOTHERS' YEARS OF SCHOOLING	HIGH SES MOTHERS (N=15)	LOW SES MOTHERS (N=15)
HIGH 15 years or more	A 6	B 0
MEDIUM 10 years to 14 years	C 9	D 7
LOW 9 years or less	E 0	F 8

Subsequent Mann-Whitney U tests between cells A and F, and between C and D showed no difference between the children's average number of words per communication unit in cells C and D for either task, and no difference in average words per CU on the story-telling task from children in cells A and F. There was a difference between the

verbal measures of the children in cells A and F on the Etch-a-sketch task. There appeared to be no obvious reason for the similarities between the two groups based on the verbal measure used.

The theoretical model was founded on an assumption that where a large amount of verbal maturity or complexity existed a small amount of the nonverbal aspects of communication would be exhibited. The results of testing hypotheses 1 and 3 showed the mothers from contrasting SES groups to be different on the verbal measure: the high SES mothers being superior. Therefore, according to the model, the nonverbal behaviour of the high SES mothers should have been significantly lower. The results related to hypotheses 5, 8 and 9 showed that this was not so; the groups did not differ on mutual glancing behaviour during the Etch-a-sketch task, or on the mutual inclination score in either the Etch-a-sketch or story-telling task. The only data which supported the model were derived from testing hypothesis 7, the high SES pairs showed significantly lower physical contact scores. The result related to hypothesis 6, (mutual glances during the story-telling task), proved to be directly contrary to the direction derived from the model, with the high SES pairs showing significantly more mutual glancing behaviour than their low SES peers. This result suggested that the model should be one in which there is a positive relationship between verbal and nonverbal communication (see Figure 8); viz, those people who employ a high level of verbal communication also employ the non-verbal channels to a greater extent.

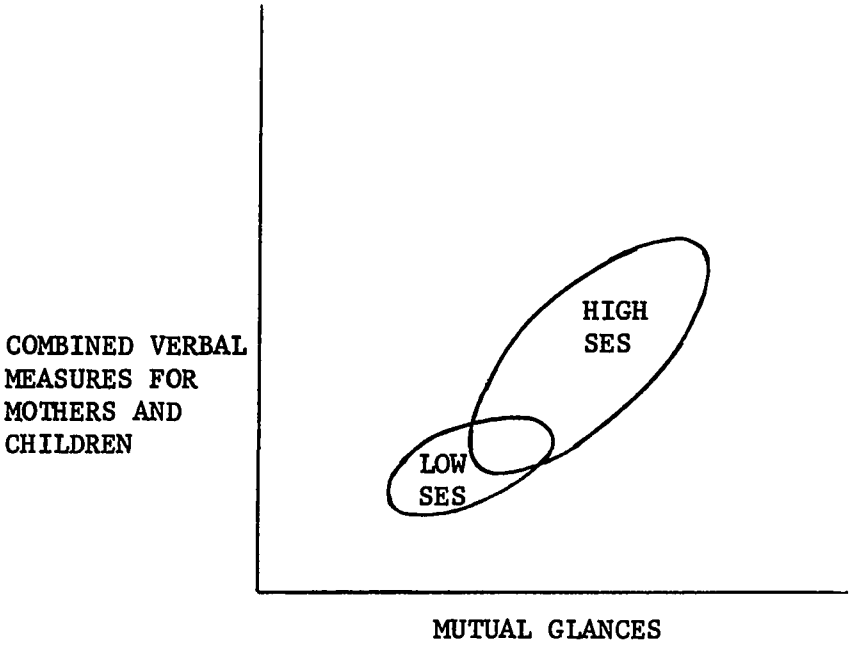

FIGURE 8

REVISED MODEL OF THE RELATIONSHIP OF VERBAL TO NONVERBAL ASPECTS OF COMMUNICATION

Some cohesion in the data obtained in this study can perhaps be attained through a suggestion of Whewell (in Stebbings, 1930).

> "The conception by which facts are bound together, are suggested by the sagacity of the discoverers. This sagacity cannot be taught. It commonly succeeds by guessing; and this success seems to consist in framing several tentative hypotheses and selecting the right one" (p.491).

In looking at the video tapes of the interaction sequences it became obvious that a great deal of differential activity was taking place which could be described as 'unreciprocated' glancing behaviour, that is, glances from either the mother or the child which were not returned, or responded to, by the other member of the dyad. A side

investigation was made in which the unreciprocated glances of mother and child during the Etch-a-sketch and story-telling tasks were tallied and subjected to t tests, with the results presented in Table XIV.

TABLE XIV

UNRECIPROCATED GLANCES DURING
THE ETCH-A-SKETCH AND STORY-TELLING TASKS

TASK	UNRECIPROCATED GLANCES	LOW SES MEAN	HIGH SES MEAN	df	t	PROBABILITY (two-tailed)
Etch-a-sketch	Child to mother	14.07	4.87	28	2.341	0.026
Etch-a-sketch	Mother to child	6.93	6.60	28	0.116	0.908
Story-telling	Child to mother	11.27	6.87	28	1.498	0.145
Story-telling	Mother to child	17.20	25.87	28	-1.952	0.061

The results of Table XIV suggested that the low SES children looked at their mothers more frequently than the high SES children during the Etch-a-sketch task, and that the high SES mothers looked at their children more often than the low SES mothers during the story-telling task. However, if these results are considered in conjunction with the previous information on mutual glances, which indicated that the high SES pairs exchange more mutual glances, it becomes clear that the role of the high SES mothers was more "attentive". For example, during the Etch-a-sketch task the low SES children looked more frequently at their mothers without their mothers responding, than the high SES children. On the other hand, the high SES children had fewer unreciprocated glances because some of these were converted into mutual

glances through the reception and response of the mothers. During the story-telling task the high SES pairs shared significantly more mutual glances, but also the high SES mothers showed more unreciprocated glances than her counterpart in the low SES group. Not only did they respond when looked at by their children but also showed a readiness to respond on many more occasions. If this behaviour could be classed as "help-giving", the present findings fall in line with those of Bing (1963) which were that high verbal mothers were more active in all phases of help-giving behaviour. While she was not discussing inter-ocular experiences, certain similarities may be observed between the overt and conscious helping behaviour discussed by Bing and the covert and possibly unconscious helping behaviour illuminated in the present study. In discussing the "shaping" of a child's speech sounds Jensen (in De Cecco, 1967) considered that this was affected by the differential reinforcing behaviour of the parent which, he believed, was probably carried on more persistently in middle class homes. Jensen included gesture and facial expressions as parts of this differential reinforcement. One may wonder why this 'readiness-to-respond' behaviour which the high SES mother exhibited in the story-telling task was not present to the same degree in the Etch-a-sketch task. It seemed important to examine the nature of the tasks themselves especially with reference to the comments of Ekman (in Tomkins and Izard, 1965), Exline et al (1965) and Tomkins (1963).

> "Knowledge of the situation within which the nonverbal behavior is emitted can greatly expand the interpretations of nonverbal behavior...." (Ekman, p.439).

Exline and Tomkins discussed the taboos on visual exchanges. Tomkins, for example, suggested that the emotional involvement implicit in a mutual glance will, under certain circumstances, inhibit the desire to become involved and hence affect the incidence of mutual glances. Exline proposed that avoiding the glance of another person was motivated by a desire to conceal one's affect from him. He later diluted this proposition to the statement:

> "Individuals whose composure is threatened by the nature of their interaction with another, may perhaps unconsciously signal a desire to maintain psychological distance" (p.208).

A similar type of comment was made by Exline and Winters (in Tomkins and Izard, 1965),

> "Implicit in our argument is the assumption that if one person feels good or comfortable about relating to another he will engage in mutual glances to a greater extent than if he feels bad or uncomfortable with another" (p.322).

These comments were written about people meeting for the first time or early in their acquaintanceship and so may not be directly relevant to the discussion of the mother-child relationship. But as eye-to-eye contact has received little consideration by child development researchers (Robson, 1967), results from associated research suggested alternative orientations which may prove fruitful in answering, for example, questions about the different unreciprocated glancing behaviour from the mothers during the stories, and yet account for the similarity of the unreciprocated glancing behaviour during the Etch-a-sketch task. In terms of the 'composure' and 'comfort' mentioned in the previous quotations, it seemed feasible to consider the Etch-a-sketch situation

equally novel and frustrating to each mother, independent of SES, whereas, in the verbal environment created by the story-telling tasks the high SES mother may have been more 'comfortable'. The child also is used to engaging in verbal games (see Table XV), and so the high SES dyad may be more congruent with one another, as suggested by the following comment of Robson (1967),

> "When one sees 'eye-to-eye' with another person, exclusive communication, 'resonance', and accord of a fundamental sort are implied" (p.16).

TABLE XV

FREQUENCY OF READING TO CHILDREN BY THE HIGH AND LOW SES PARENTS*

NUMBER OF NIGHTS PER WEEK CHILD IS READ TO	LOW SES GROUP (%)	HIGH SES GROUP (%)
6 - 7	26.7	33.3
4 - 5	6.7	26.7
2 - 3	20.0	33.3
0 - 1	46.6	6.7

*From data gathered during the home visit.

The extract from the correlation matrix (Table XVI) points to some interesting relationships. Only correlations with associated probabilities of .05 or better are included, those correlations marked with an asterisk (*) have associated probabilities of .01 or better.

TABLE XVI

CORRELATION MATRIX SHOWING CORRELATIONS
WITH ASSOCIATED PROBABILITIES OF .05 OR BETTER

VARIABLES[1]	1	2	3	4	5	6	7	8	9	10	11	12
1	-		.49*		.49*	.45	.40	-.43	.54*	-.45	.43	
2		-		.38						-.36	-.36	
3			-		.38		.40				.39	
4				-			.56*					
5					-						.74*	
6						-			.66*			
7							-					
8								-				.60*
9									-			
10										-		
11											-	
12												-

* $p < .01$

1. Mothers' average number of words per CU in story-telling task.
2. Mothers' average number of words per CU in Etch-a-sketch task.
3. Childs' average number of words per CU in story-telling task.
4. Childs' average number of words per CU in Etch-a-sketch task.
5. Mutual glance total (story-telling task)
6. Mothers' years of schooling.
7. Childs' IQ (PPVT).
8. Physical contact (Etch-a-sketch task).
9. SES.
10. Unreciprocated glance child to mother (Etch-a-sketch task).
11. Unreciprocated glance mother to child (Story-telling task).
12. Single word CU from mother (Etch-a-sketch task).

Several of the reported correlations would seem to support the revised theoretical model, for example, the correlations between the verbal measure for the mothers and children during the story-telling task and mutual glances. The correlation between mutual glances observed during the story-telling task and the unreciprocated glances from mother to child during the same task would support the previous discussion of "attentive behaviour". There was a negative correlation between the mothers' verbal measure and physical contact suggesting differences in behavioural control. Support for this suggestion may be seen in the correlation between physical contact and the single-word communication unit. The latter were usually imperatives, and this would in turn support the findings of Sears, Macoby and Lewin (1957) that the more educated mothers tended to use more reasoning as a behavioural control than their lower SES peers.

The results of the present study have been presented with reference to an original and a revised model of the relationship of some of the verbal and nonverbal aspects of communication. The implications of this study for further research, child-rearing and teaching are outlined in the next chapter.

CHAPTER V

IMPLICATIONS

The implications of this study are discussed in relation to three areas, future research in developmental psychology, suggestions for possible application in child-rearing practices and finally the application of some of the findings to teaching.

Developmental Psychology.

Flavell (1968) recently suggested that studies of gestural communication would repay close scrutiny, and also that studies of preschoolers' immature communicative forms would be valuable. In some ways the present study has commenced this investigation through the identification of a subtle but reliable measure of nonverbal communication and through the proposition of a tentative theoretical model which relates the verbal to the nonverbal aspects of communication. The model presented in this study implied an experimental approach which viewed communication as a 'package', and suggested that it may be fruitless to study the verbal and nonverbal channels of this process independently.

It has been shown that some mother-child pairs have differed in the amount of mutual glances in which they participated. Robson (1967) cited evidence which supported a notion that babies may be classified in terms of 'sensory modality preference', in the sense that they are soothed through or explore with one modality predominantly. It would seem important to explore modality preference in infants and trace the

subsequent interocular behaviour through a longitudinal study. Greenman (1963) pointed to the importance of such a study when he implied a relationship between the lack of visual communication and subsequent abnormal conditions. Robson used the words 'face-tie' to describe the behaviour called mutual glances in the present study, and he said:

> "...if the face-tie is not established, or if its quality fosters disruption and distress, the infant will experience varying degrees of interference in forming his earliest -- and probably future -- human relationships" (p.22).

As the observation has been made that the nature of the task may inhibit mutual glances, some form of naturalistic observation would be preferable. This may be possible with the smaller battery operated video-tape recorders which could be placed around the home and preset to run for a given number of minutes during the meal-time, for example.

Child Rearing Practices.

There has been a great deal of reported research on the importance of the time spent by the mother with her child, and this in turn has been offered as a reason why children from smaller families are more mature verbally (e.g. Davis, 1937; Milner, 1951; Nisbet, 1953). More recent research (Watson, 1965) has observed the orientation of the mother's face in relation to the infant and has reported that most care-taking behaviours occur at a 45^{o} orientation relative to that of the child while social interaction occurs vis-a-vis at a 0^{o} orientation. This would suggest that it may not be duration of interaction which is crucial but the face-to-face activity which takes place. An awareness

of the importance of the early establishment of 'face-ties' may lead mothers to respond to the visual searchings of their infants.

The present study has observed social class differences in non-verbal communicative behaviour, and implicitly assumed that these occurred as a result of differential child-rearing practices, however a future step may be in the direction of an examination of the affective components of the mother's personality structure. Schachtel (1959) discussed the "emotional absence" of the mother,

> "It seems to me simpler and more likely if we assume that anxiety, tension, dislike on the part of the mother constitute a situation of separation between mother and child. True, the separation is not a physical but an emotional one. The mother can be turned fully towards the infant only if she has an attitude of tender care... Hence, in anxiety and tension the mother no longer is fully there... The infant probably experiences the global discomfort of separation from the mother and the resulting separation anxiety when one or other of these emotions interferes with her full presence, i.e. with her being turned fully towards the child" (p.51).

If Schachtel meant the phrase "turned fully towards" to be taken literally, and as the mutual glance and the unreciprocated glance epitomize such a position, one can see the possibility of examining the relationship of glancing behaviour to anxiety, tension and other components of the affective domain. This examination may illuminate some reasons for the propensity of certain mothers to be more attentive or aware of the actions of others.

Teaching.

In terms of the present study there was little difference in the verbal maturity of children from different SES groups. This relates

to output only, so as far as performance in Grade 1 is concerned one should see little difference. However the verbal behaviour of the mothers was different and hence one group was exposed to longer, more complex sentences and one might conjecture would be more likely to comprehend the correspondingly mature speech of the teacher. Brown and Bellugi (1964) talked about the restraint placed upon the child by his inability to program lengthy utterances. It is suggested that the high SES child has the facility to do this as far as reception is concerned. Not only does the high SES child have this advantage but he is attuned to the reception and transmission of the nonverbal components of a message. He is more 'comfortable' in the verbal environment of the school and so would tend to exhibit more 'readiness-to-respond' behaviour, i.e. glances possible of conversion by the teacher to mutual glances. Brown and Bellugi suggested that the middle class child learns by feedback from his parents, who reduce or expand the child's expression to incorporate the correct grammatical elements. The present study suggested that the "feedback" mentioned by Brown and Bellugi may not be a single-channel affair, but may also include a concomitant nonverbal channel. Teacher training should include an orientation to the nonverbal channel as a means of influencing behaviour and the educational climate of the classroom. The work of Exline and Winters (in Tomkins and Izard, 1965) has demonstrated that there is a greater affective involvement between individuals who participate in mutual glances. It may be necessary to add another dimension to the study of classroom interaction, that of visual behaviour. The work of Friedman (1967) and Rosenthal (1966) could be applied to the

observation of teachers' visual activity in the classroom situation, and the role they play in the outcomes of their differential expectations based on social class information.

Within the context of cultural deprivation it would seem from the results of this study that an impoverished environment could be described, not only as one which is deficient in verbal stimulation but also, as one which is deficient in nonverbal exchanges, and hence more restricted in the range and variety of communication.

Finally, the discussion of Merleau-Ponty (1945) on the experience of a conversation described implicitly the nonverbal rapport which existed during the mutual glance, and serves to summarize the present writer's position.

> "A double being comes about, and neither is the other one for me a simple behavior in my transcendental field, nor am I that for him, we are, one for the other, collaborators in a perfect reciprocity, our perspectives glide one into the other, we coexist within the same world" (p.407).

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APPENDIX A

FACULTY OF EDUCATION
DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

UNIVERSITY OF ALBERTA
QUAECUMQUE VERA

EDMONTON, ALBERTA
CANADA

February 26, 1968.

Dear

A team of researchers at the University of Alberta is currently engaged in a study of the language development in young children. It is felt by many psychologists that the study of the way children learn to speak and understand language not only gives us the answer to many later school problems, but also assists us to guide the development of curriculum in the schools.

Your name has been selected randomly from the census figures of people with children about to start school, and it is hoped that you will be willing to assist in this study as we believe one of your children will be entering his/her first year of school next year.

I shall be contacting you in the near future to make mutual arrangements should you be willing to participate, but would like to take this opportunity to explain the project to you, so that when I phone, you will know whether or not you care to participate.

There will be two sessions, the total time involved approximately two hours. During the first session I would appreciate being given the opportunity to visit you in order to have your child perform a few tasks in familiar surroundings. During the second session we are asking the mother to bring her child to the Education Building on the University Campus where she will lead the child through a couple of simple tasks. A recording will be made at this time so that we can study your child's speech. The experience of our research team, so far, has been that it is an interesting and enjoyable time for both mother and child.

Should you have any further questions, please feel free to call me at 432-4372 during the day or 434-9487 during the evening.

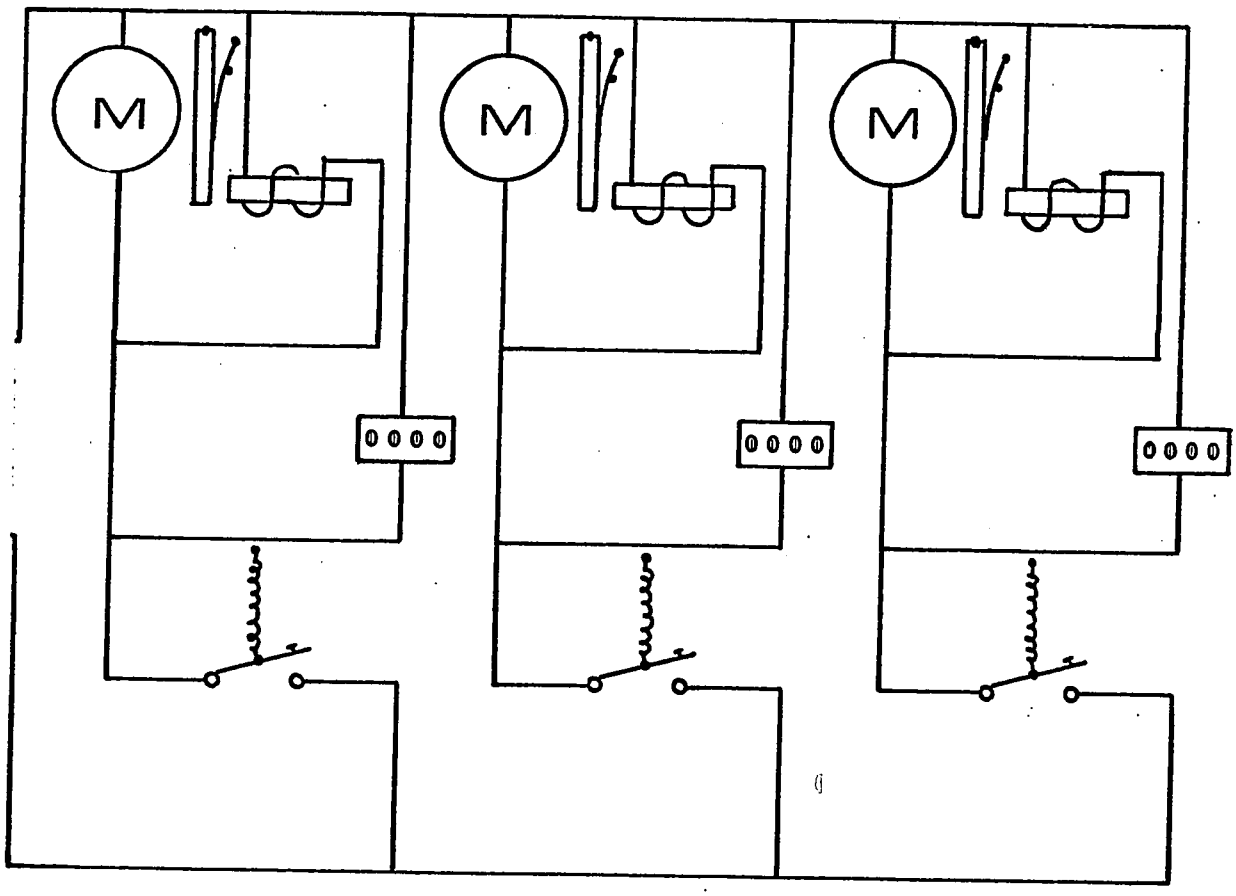
Yours sincerely,

Terry Hore
W.J. Gage Research Fellow.

TH/arp

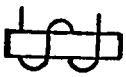
APPENDIX B

INTERACTION TIMER & COUNTER

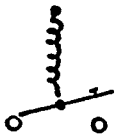


CLOCK MOTOR

COUNTER



SOLENOID



SWITCH (NORMALLY OPEN)

BRAKE

APPENDIX C

ETCH-A-SKETCH INSTRUCTIONS TO MOTHER ONLY

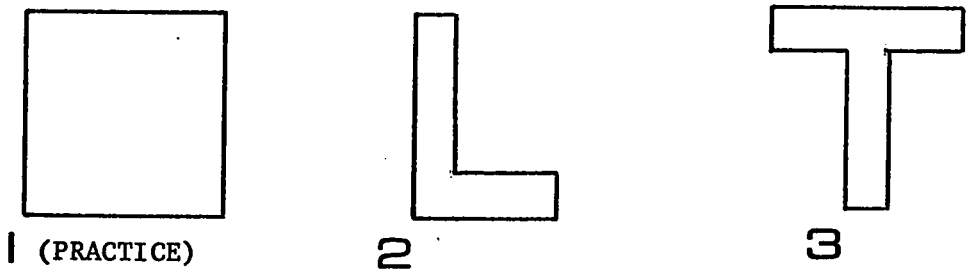
VIDEO	AUDIO
Camera 1 - Full face shot of experimenter (E) sitting at a table.	(Smiles) This task is one where you are going to teach your child how to operate the "Etch-a-sketch" toy,
Camera 2 - To toy - toy inclined to simulate an overhead appearance.	which you have in front of you.
Point to left hand knob, turn knob clockwise then anti-clockwise.	If you turn the left hand knob, a line will appear across the screen. The knob can be turned in either direction to make the line to to the right or to the left.
Point to right hand knob, turn knob clockwise and anti-clockwise.	The same thing happens when you turn the right hand knob, except that now the line goes up and down the screen.
Camera 1 - To E as before.	Watch while I show you how to get rid of the lines you have at present. Turn the toy over and
Camera 2 - To toy.	shake it. (Demonstrate) The only problem now is that we are not sure where the line will begin, so to help you, whenever I give you a
Point to circle in bottom left-hand corner of screen.	clean toy, the line-maker will always be in this circle.
Point to knob "mother".	You will notice that I have labelled one knob "mother" and the
Point to knob "child".	other one "child". So mother you
Point to knob "mother".	may only touch this one, and the
Point to knob "child".	child may only touch this one.
Camera 1 - To E.	When I bring your child in I want you to teach him how to use the toy by trying to copy exactly the
Camera 2 - To card "Practice".	design which is on the card marked "Practice" in front of you.
Camera 2 - On toy.	During the practice you may erase the lines as many times as you wish.
Camera 1 - To E.	Once your child comes in you have five minutes to teach him how to operate the toy.
	If you have any questions, ask me when I bring the child in. Until then you have a few minutes for practice with the design on your
Fade.	own.

INSTRUCTIONS FOR STORY-TELLING TO MOTHER AND CHILD

VIDEO	AUDIO
Camera 1 - Full face of experimenter (E) sitting at a table. Camera 2 - To monitor and light a) flash light.	(Smiles) What we are going to do is to make up some stories about some pictures. Mother, as soon as the light flashes, as you can see now
Camera 1 - To E. Camera 2 - To picture.	you may open envelope number 1, inside you will find a picture, and you are to make up a story about it, when you have finished
Camera 1 - To E.	the story about that picture you can give your child envelope number 2 and ask him to make up a story about that picture. Remember do not open envelope number 1 until the light flashes. These two pictures are for practice. Try to teach your child to commence his story by saying "Once upon a time...", and if you or your child get stuck for how to continue the story, some
Camera 2 - To envelope, showing printed clues.	of the clues printed on the front of each envelope may help you.
Camera 1 - To E.	Mother, are you ready to start with card number 1? Remember you may open the envelope as soon as the light flashes.
Fade.	

APPENDIX D

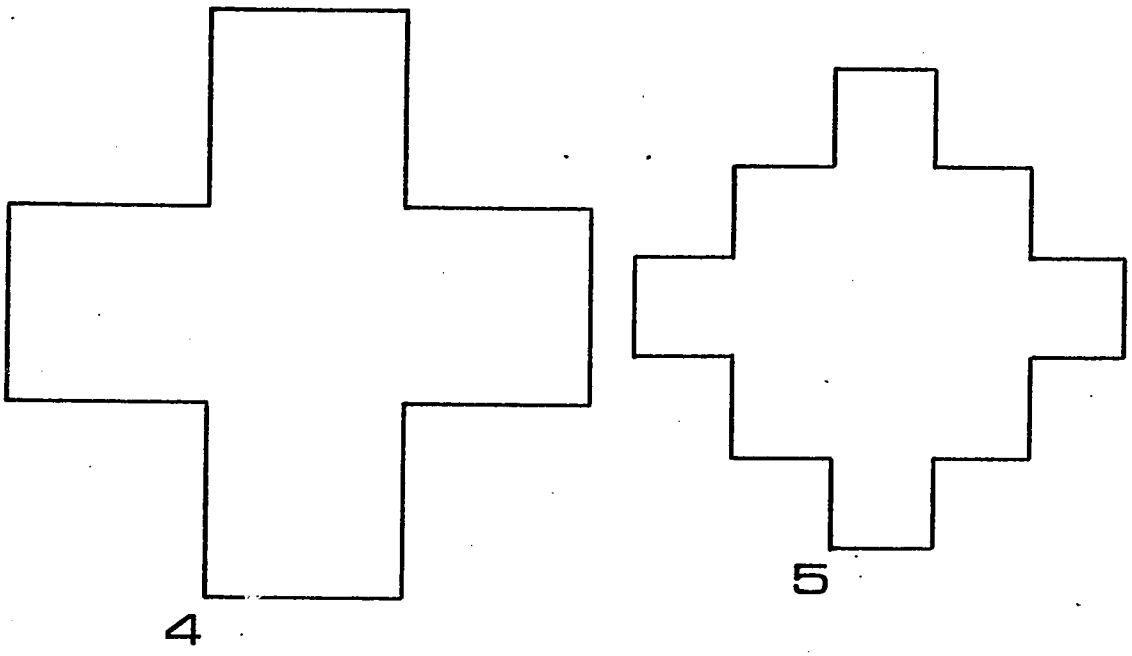
DESIGN MODELS FOR ETCH-A-SCETCH TASK



1 (PRACTICE)

2

3



4

5

APPENDIX E

COMPARISON OF PARALLEL ANALYSES OF THE DATA
USING PARAMETRIC, ADJUSTED PARAMETRIC AND NONPARAMETRIC TESTS
(df=28, ONE-TAILED TESTS ONLY)

HYPOTHESIS	MEASURE	t TEST		WELCH'S t PRIME APPROXIMATION		MANN-WHITNEY U TEST	
		t	p	t	p	U	p
1	Mothers' average number of words per communication unit (Etch-a-sketch)	-2.747	.005	2.84	.004	50.5	<.05
2	Children's average number of words per communication unit (Etch-a-sketch)	-0.698	.24	0.72	.23	71.5	<.05*
3	Mothers' average number of words per communication unit (Story-telling)	-3.101	.002	3.21	.001	45.0	<.05
4	Children's average number of words per communication unit (Story-telling)	-0.767	.22	0.79	.21	86.0	>.05
5	Mutual glances (Etch-a-sketch)	-1.522	.06	1.58	.06	93.0	>.05
6	Mutual glances (Story-telling)	-2.778	.004	2.88	.004	57.0	<.05
7	Physical contact	1.766	.04	1.83	.04	70.5	<.05
8	Mutual inclination count (Etch-a-sketch)	-1.185	.12	1.23	.11	89.5	>.05
9	Mutual inclination count (Story-telling)	1.234	.11	1.28	.10	97.0	>.05

* Disagreement

APPENDIX F

STORY-TELLING TASK: RAW VERBAL DATA, CLASSIFIED BY MEASURES AND SUBJECTS

DYAD[1]	TOTAL WORDS[2]		TOTAL WGCU'S		TOTAL SWCU'S	
	MOTHER	CHILD	MOTHER	CHILD	MOTHER	CHILD
1	229	69	28	9	4	2
2	459	209	59	34	6	3
3	509	155	73	25	5	6
4	177	107	28	20	2	0
5	268	176	43	29	0	8
6	161	47	23	10	1	2
7	380	292	58	50	4	4
8	506	223	73	47	12	6
9	810	176	106	29	4	12
10	685	310	95	50	16	8
11	170	180	21	21	1	0
12	349	222	38	31	0	0
13	182	102	28	19	0	5
14	355	81	68	15	10	9
15	489	141	70	29	5	14
16	339	141	46	19	2	2
17	229	100	31	16	1	0
18	938	309	111	52	4	10
19	195	91	28	19	2	1
20	568	156	67	26	3	5
21	193	86	23	13	1	1
22	373	146	57	23	7	2
23	431	534	49	72	3	0
24	471	100	56	23	5	5
25	551	564	68	69	3	7
26	517	267	53	38	3	2
27	415	205	47	31	8	5
28	448	611	48	74	2	3
29	881	202	96	33	7	10
30	755	112	107	25	23	7

[1]Dyads 1 - 15 inclusive -- Low SES

[2]Excluding Mazes and SWCU'S

ETCH-A-SKETCH TASK: RAW VERBAL DATA,
CLASSIFIED BY MEASURES AND SUBJECTS

DYAD[1]	TOTAL WORDS[2]		TOTAL WGCU'S		TOTAL SWCU'S	
	MOTHER	CHILD	MOTHER	CHILD	MOTHER	CHILD
1	242	22	60	5	22	5
2	1202	165	204	33	42	21
3	839	20	150	6	17	14
4	301	33	72	12	74	7
5	303	17	80	4	30	9
6	407	118	118	38	29	7
7	782	323	156	68	29	9
8	375	73	90	21	29	19
9	672	34	133	9	22	5
10	511	18	106	6	35	8
11	537	41	101	10	14	1
12	679	25	124	9	42	4
13	320	44	68	11	30	1
14	693	138	170	57	108	9
15	996	26	153	7	20	10
16	370	119	55	28	13	19
17	598	85	93	17	13	9
18	644	88	123	16	32	16
19	554	59	64	14	7	2
20	1273	75	172	18	11	8
21	471	2	96	1	0	0
22	495	0	113	0	37	0
23	363	17	56	3	10	0
24	554	10	99	2	33	20
25	1724	184	292	44	60	25
26	667	63	146	13	32	5
27	1415	239	575	120	76	52
28	635	23	125	7	59	11
29	773	41	149	12	38	6
30	738	118	138	30	45	17

[1]Dyads 1 - 15 inclusive -- Low SES

[2]Excluding Mazes and SWCU'S

STORY-TELLING TASK: RAW NONVERBAL DATA,
CLASSIFIED BY MEASURES AND SUBJECTS

DYAD[1]	MUTUAL GLANCES	MUTUAL INCLINATION COUNT	UNRECIPROCATED GLANCES	
	MOTHER & CHILD	MOTHER & CHILD	CHILD	MOTHER
1	8	9	13	22
2	12	0	11	11
3	9	0	8	33
4	7	0	4	10
5	1	0	6	23
6	5	0	11	11
7	12	0	13	11
8	3	7	11	24
9	9	1	14	24
10	20	0	21	24
11	2	0	2	14
12	7	0	41	12
13	2	0	5	6
14	3	0	2	19
15	3	0	7	14
16	9	0	1	16
17	2	0	8	6
18	20	0	26	17
19	9	0	2	9
20	1	0	4	13
21	4	0	7	18
22	16	0	10	16
23	30	3	7	58
24	13	0	5	28
25	37	0	2	47
26	20	0	7	27
27	9	0	8	25
28	31	0	6	51
29	31	0	8	33
30	8	0	2	24

[1]Dyads 1 - 15 inclusive -- Low SES

ETCH-A-SKETCH TASK: RAW NONVERBAL DATA,
CLASSIFIED BY MEASURES AND SUBJECTS

	MUTUAL GLANCES	MUTUAL INCLINATION COUNT	PHYSICAL CONTACT	UNRECIPROCATED GLANCES	
DYAD[1]	MOTHER & CHILD	MOTHER & CHILD	MOTHER & CHILD	CHILD	MOTHER
1	0	5	0	4	2
2	1	16	11	3	7
3	0	0	13	8	29
4	0	0	6	0	3
5	0	0	5	20	9
6	0	0	4	29	4
7	0	9	6	9	4
8	1	0	2	8	18
9	0	6	4	17	0
10	0	1	6	21	3
11	1	0	0	4	3
12	0	2	1	16	1
13	0	0	0	7	2
14	0	0	38	58	15
15	0	1	0	7	4
16	0	4	0	2	5
17	0	0	0	3	0
18	2	0	1	16	0
19	0	1	2	9	7
20	0	2	3	0	3
21	3	0	0	3	10
22	0	0	0	6	6
23	0	0	3	2	5
24	0	7	0	1	5
25	0	2	7	4	9
26	0	10	0	1	0
27	1	23	0	8	30
28	0	0	8	11	2
29	1	26	3	3	1
30	3	9	1	4	16

[1]Dyads 1 - 15 inclusive -- Low SES