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COMMUNICATION BETWEEN MOTHERS
AND THEIR EMERGENT-LANGUAGE CHILDREN:
A LONGITUDINAL STUDY

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**COMMUNICATION BETWEEN MOTHERS
AND THEIR EMERGENT-LANGUAGE CHILDREN:
A LONGITUDINAL STUDY**

JULIE PATRICIA MESSER

**Thesis submitted in partial fulfilment of the
requirements of the London Guildhall University
for the degree of Doctor of Philosophy**

London Guildhall University

**November 1992
(Amended 1993)**

ABSTRACT

This thesis focuses its examination on the communication in the mother-child interaction over a year.

Interactions between eight mothers and their children from child age eight to eighteen months were video-recorded at five week intervals throughout the year of investigation.

The study sought to develop and apply an instrument for a parallel analysis incorporating communicative, 'manual' and metamessage categories. The results revealed a useful descriptive analysis of the communication over the year as well as evaluating the new instrument. It was found that the ratio of total mother to child categories was essentially consistent across time; change was revealed over categories; for certain categories mother use of categories correlated with child use of categories; mothers emerged as either more monologic or more dialogic, differing in terms of their category use. Measures were taken not just of frequencies of categories but also of patterns of conversation. At child age 8 months, the conversations of 75% of dyads were characterised by Mother Bids for Attention and Child Responses. At child age 18 months, the conversations of over 60% of dyads were characterised by Mother Assertions and Requests and Child Assertions. The new Category Analysis Tool was found to be efficient and useful. A discussion of possible amendments and improvements was undertaken.

A main emphasis of this study is that the research was longitudinal, measured both sides of the interaction and using the same measures. It did this at the difficult to access social-functional level and assessed both inter- and intra-observer reliability.

to

Peter
Richard
Broadie

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CHAPTER ONE

*** INTRODUCTION ***

including problem under exploration and aims

This study examines mother-child interaction from a social-functional perspective. A review of the literature on mother-child interaction, particularly studies of their communication, led to the conclusion that the best research design involved a longitudinal study, the analysis of both sides of the interaction and with the same measures, and at the social-functional level. Assessment of both inter- and intra- observer reliability are important in such observational studies where category analysis is used.

Existing category analysis systems are examined critically and this led to the development of a new category system. It is a hierarchically organised, comprehensive category tool which analyses purely functional communicative acts as well as some broader, more socially based acts. The fourth edition of the Category Analysis Tool is implemented here on eight mothers with their emergent-language children over the year from 8 to 18 months.

It is evident that children aged 8 to 18 months are developing in many ways, and acquiring language and communication skills as well as becoming social. This development has long been a focus of research because of the richness of the period and its significance. However, many

behavioural and linguistic studies have fallen short of adequate descriptions of this area, often due to a negligence of the social context. In the last decade there has been an increase in the number of studies using functional or social-functional techniques. This had led to an emphasis on the development of communication and social skills, and it is likely that a combination of the linguistic and functional approaches will be needed for a better understanding of language acquisition.

This study aims to achieve several different sets of objectives.

Firstly, it is a methodological exercise in that it involves the development of a new instrument. This instrument aims to measure multiple channels of interaction using social-functional categories. It is applied here to mother-child (dyadic) interactions but the instrument is designed to assess many types of interaction. This new instrument is assessed for inter- and intra-observer reliability.

The second main aim of this study is to describe the communication of the mother and child. An emphasis is placed on change over time because of the child's development. Also, frequency measures are limited in the descriptive powers and account was taken of the patterns of conversations.

The third aim is to assess the efficiency of the new instrument by examining certain issues. One such issue concerned metamessages. Mothers impute meaning to their

child's potentially communicative behaviour and this can be reflected in the use of expansions. In the light of the child's increasing mastery of communication skills, it is likely that mothers' use of expansions would decrease over time. Also, an examination of indirect speech acts is of interest although it is probable that mothers will use these acts most infrequently to this age child.

Analysing just the number of acts may be of value. It is likely that children's use of acts will increase over time and an examination of how mothers' number of acts relates to this would be useful. This would include an examination of number of acts in terms of ratios of mother acts to child acts. These ratios can be expanded to describe whether the conversation is characterised by a predominance of monologic or dialogic patterning.

An investigation into repetitions, both of self and of other could also be illuminating. Change over time was an expected finding of this study because of the child's age. Various categorical changes were also thought likely to occur, such as the increase of talk about the immediate world, and, where relevant, correlations between mothers' use of certain categories and children's use were undertaken. This was not just applicable to communicative acts but also to more socially based acts such as pointing and exchange.

Finally, an essentially descriptive analysis was undertaken of the patterning of conversation in terms of the categories. A comparison of the interactions at child age 8

months and child age 18 months was undertaken.

The Category Analysis Tool and the findings obtained from its implementation are discussed, as well as any implications for further research.

CHAPTER TWO

*** THE EMERGENT-LANGUAGE CHILD DEVELOPING IN A SOCIAL WORLD *** **theoretical background and key issues**

Research into language acquisition in the first half of this century was basically from a behaviourist perspective. This changed in the 1950s when Chomsky's theories effected an upsurge in new research into early child language. This emphasised syntax and other structural levels of analysis. In the 1970s the social context in which the child develops became a focus of interest. An emphasis on social factors led to the research spotlighting conversational and other metapragmatic skills. Building on this and bringing the actual communication back into the arena with a reference to Speech Act theory approaches allows for the development of a social-functional system of analysis.

Different strategies for analysis

There are many different perspectives within psychology and many different levels of analysis. These can influence research strategies. Some levels are easier to access than others and therefore are less ambiguous for analysis. Other levels are much more difficult to access and are problematic for analysis. This is described using the metaphor of an iceberg, where only a small part of language and communication are readily open to observation, and the rest is obscured, becoming more difficult to examine the further one goes. It can be seen that an inverse relationship

exists between the difficulty of measurement and the communicative significance of the research focus.

The Iceberg Metaphor

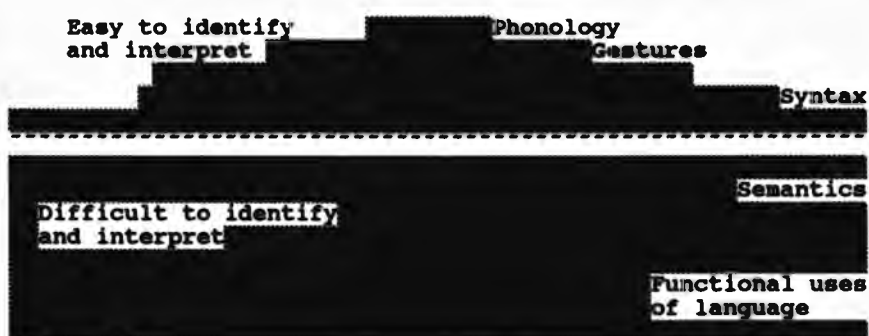



Figure 2.1

One set of levels that can be studied includes phonology, gestures, syntax, semantics and pragmatics. Using the analogy of the iceberg, if we think of phonology as being near the very tip of the iceberg and gesture close by, and syntax just above the water level. Then we can see semantics as being just below the water level and the functional uses of language as being in the depths (see Fig. 2.1). The iceberg metaphor shows the correspondence between what is easy to see and is accessible to measurement, and what is obscured in the murky depths and is problematic for analysis.

"Phonemes and body movements are measured with greater ease and accuracy than denotative and connotative meaning, and these are infinitely easier to identify and interpret than communicative acts" (Messer, 1985, abstract).

Here arises the problem of the terms of language, communication and conversation. Gesture may be considered



part of communication, while phonology, syntax and semantics are more directly facets of language. The pragmatic levels deal with the broader phenomena of communication and conversation. This research investigates below the tip of the iceberg, at the pragmatic level, and thus encounters some methodological difficulties, but analyses the material at a significant level.

The levels of analysis depicted in the iceberg metaphor are echoed in Perfetti's (1979) work on memory. He also recognised that certain levels were more accessible than others, terming them 'transparent' and 'opaque'. It is only at the functional level, the final level, that he introduced mutual knowledge into the framework, acknowledging that non-text or non-discourse knowledge is important.

The levels of meaning can become overwhelming, however. In the simplest way, the researcher can study the individual, but at this level, findings may be distorted or limited. Thus, the researcher can place the individual in the context of his interaction with others. At an even more comprehensive level, the individual can be placed in the broader social, cultural and historical context. To what degree this is actually practicable is debatable. The ideal approach to understanding people in any depth would be "to study them in dynamic, changing situations where time past and time future are recognized as important as well as the present" (Warr, 1977, p.4). Longitudinal studies are a useful design for taking some account of 'time past' but it is difficult to see how far it is possible to take account

of 'time future'. The other important point Warr makes is that people should be studied in 'dynamic, changing situations' and thus, research into the developing child should focus on the child in interactions and not in isolation.

The key issue is to "never analyse a psychological process into units which are below the meaning level of the original phenomenon" (Harre, 1974, p.248, quoting Vygotsky), and with this in mind the functions of communicative acts were analysed in this study.

It is important to emphasise that all levels of analysis are worthy of research and an ideal aim would be to eventually integrate the findings at all levels (and also in an interdisciplinary way).

"As one proceeds down the scale from discourse to word, from larger to smaller units, the analysis of audience-directed aims begins to merge with that of the mechanics of sentence construction" (Harris, 1980, p.101).

All levels of communication are available for study though some are more accessible than others. When focusing on one level, the perspective of the other levels need not be disregarded.

The levels are obviously interrelated and can have meaning for each other. For example, intonation may be regarded as part of the realm of phonology, but it has at least two pragmatic functions. Firstly, it can alert the listener that the illocutionary act is not being performed in the set manner, that the conditions for it have been altered. Secondly, intonation can alert the listener that

some specific rule of conversation has not been fulfilled (Glenn, 1976). Thus it is important to consider this interrelation when performing research. Thus, intonation and other prosody factors such as tone of voice, may modify the message and thus carries additional information, for example, sarcasm.

The many different perspectives in psychology add to the issue of levels of analysis and the suggestion is made that an integration of such levels of analysis is a way forward for an integrated approach within psychology.

Hartup (1979) also supports this call:

"by simultaneous classifications of social relations across different levels of analysis, basic communication processes, their development, and the broader functions of the relationships themselves can be understood better" (p.28).

However, this is not actually occurring in much research although there is adequate technology and methodology available. Better progress could be made in research into child development if, say, linguistic, pragmatic, social and cognitive aspects were combined.

Richards (1974) considered that "social scientists have had a long-standing prejudice against biological views of man" (p.234) and that other areas of research have 'looked down on' social psychology. He suggested that "any complete account of man must be able to come to terms with both his social and his biological natures" (ibid. p.235). Some psychoanalytical theories do produce accounts of man which consider both biological and social factors to some degree, although neo-Freudian approaches emphasise the social and

ignore the biological. Generally, there is much fragmentation and inadequate interaction between the realms of analysis within psychology. The view of the child in this research is very similar to that of Richards (1974) in that the child is seen as developing as a social being in a social setting, but that he is aided by being biologically predisposed to this development.

In recent years the field of research has broadened in several ways. Previously it was language which was the focus of study, but now communication and discourse are the subject for research. Previously, empirical experimentation was the single mode of study, but now there are a greater variety of research techniques employed. Previously, only what was observable could be studied, but now intersubjectivity and intentions and such like are researched. Now, "the only real 'language acquisition device' is the whole child growing up in a social world" (Bates, 1976, introduction).

"During the 1960s, when psycholinguistics became a popular research area, there was a tendency for studies to be more linguistic than psychological" (Bates, 1976, p.3).

Part of the reason for this was that the research seemed scientific, and therefore respectable and desirable. In the last decade there has been some interest in language in use, researchers using natural conversation and not idealised single sentences, an acknowledgement of the many channels of communication, and some acceptance that the listening process is an active one.

Even as recently as 1985 there was still a strong

emphasis on the structural aspects of language, however. Certainly, examinations of caretaker speech researching 'motherese' has tended to focus on the structural levels, mainly phonology, morphology and syntax (Pinker, 1985). Also, MacWhinney and Snow (1985) called for child language data so that all the data could be run through a computer to generate a large database. Much of the research into child language has been on very small sample sizes and single studies, and thus there was a need to amass these findings. It was thought that the computer data bank could then serve as a basis for verification. The computer was able to analyse syntax, phonological issues, MLU, pronoun use and passives. Thus the emphasis was very much on the structural elements of language and simple semantic properties. The idea of the system was that the automation would increase precision, eradicate the need for inter-observer agreement measures and standardise transcription and coding practices. The hope was that intentional aspects of speech and speech act categories would be added to the analysis, but it was not possible for the computer to perform the analysis, only to handle codes that are entered by the researcher. Another important weakness is that it excluded context and non-verbal communication, as well as intonation. This attempt to unify and strengthen the research into child language will remain very limited as no computer system can analyse intentions and other subtleties of language such as indirect speech acts. The computer is not capable of comprehension or uptake.

Phonology, an easy to access level, in language acquisition is regarded as following a set (universal) developmental pattern (e.g. Menyuk, 1971). Examples of language are obtained and described using conventional forms of notation. Some research in this area examines more than phonemes, but considers intonation and other prosodic features. Prosody is considered an important cue for the organisation of speech (Halliday, 1978). The child's protolanguage has the important ingredient of intonation, but appears to be a difficult material to comprehend. Of course, if intonation was unequivocal then there would be little need to have a language.

Much of the work at the structural level in psychology has come from the work of Chomsky (1978). As well as his theory of generative grammar, however, there have been other, simpler, grammatical approaches. All this research is aimed at the sentence, and attempts to describe the sentence in terms of its syntactic constituents. Much of this type of analysis is more properly the realm of linguistics. However, the structural analysis of sentences coming out of generative grammar has been revealing, for example, the concept of surface and deep meanings is a useful one. This whole approach is seen to have limitations: "one can't express the meaning of a sentence merely by parsing it grammatically" (Miller, 1983, p.160). Also, looking at 'motherese' in this way can suggest that it is not the simplified form of communication that it is considered to be (Gleitman & Wanner, 1982).

Other structural approaches involved the description of early child language, such as 'pivot-open' (Bloom, 1975). This referred largely to the position of the (usually two) word utterances. This approach was criticised for being limited in "that it does not account for the meaning of what the child says" (Halliday, 1975, p.224). Bloom's famous example of 'MUMMY SOCK' could be more fully described than pivot-open using a functional analysis. It could be an Assertion ('There's mummy's sock'); a Request ('Mummy, where's my sock?') or a Directive ('Mummy, put my sock on'). Thus, the functional analysis reveals a diversity which simple grammars cannot (Messer, 1992).

To focus on the meaning of language can immediately suggest difficulties, as very few words have a single meaning. Most words, as they pass from context to context, change their meanings, and in many different ways. It is this characteristic, in addition to the numerous combinations of words and the structure of grammar, that allows language to be so open. As well as the many meanings of words, there are other meanings which can be examined: the speaker's intended meaning, the listener's uptake and an external observer's uptake. For every viewpoint, there is a construed meaning, but the important ones are those of the speaker and the listener: they are the meanings which are significant to the interaction. Two points are of interest here. Firstly, the myriad of meanings which the child acquires signifies that acquiring language is not a simple learning exercise. Secondly, it is the interactants whose

meaning is significant to the interaction, and thus the mothers' interpretation of her child's communicative attempts are much more significant than an external person; at least, much more significant to the developing child.

The work on semantics uses categories a great deal, often organised in some form. Support for the arguments of how meanings are organised comes from memory experiments (e.g. Kintsch, 1974). Single word utterances and sentences were the focus of study for semantic theories in the 1970s and language acquisition was related to general cognitive development, which was valuable.

Pragmatics examines various qualities of discourse and so can bring studies on communication into the social world. Even fairly structural aspects of discourse can reveal features of the social dynamics of interactions. An example of this can be found in a study to examine the ratios of mother-communication to child-communication. A large scale longitudinal study was undertaken by Clarke-Stewart and Hevey (1981) on seventy-seven children from one year to two-and-a-half years old. They were observed four times over the one-and-a-half years. The same behaviours were recorded for both mother and child.

The findings showed that in the early sessions the mother was the dominant initiator but this declined as the child grew older. The verbal interaction and responsiveness of the child increased over the one-and-a-half years. The attention and verbal interaction of the mothers increased at first but then decreased. At two-and-a-half years, the

ratio of the communication of the mother and the child was about 1:1. It is suggested that the mothers are stimulating the child's autonomy.

In the last decade there has been a call for an emphasis on natural language and a social-functional approach. There has also been an increasing interest in intersubjectivity and social notions (Potter, 1980). "The 'propositional content' of a sentence is no longer to be identified in vacuo, but has to be assessed against the contextual background of what is being presupposed" (Rommetveit, 1974, p.51). Natural observation and other similar techniques have been introduced to try to gather the richness of actual conversation.

In recent years there has been a call for an Interactionist approach, particularly by researchers into early language. Bruner, speaking on an Open University programme, emphasised that account should be taken of all levels of analysis. When one level of analysis is focused on in research then it is important that the other levels are not forgotten. This is a sensible and important approach, but often not practical, either through lack of expertise or lack of time. Teams of researchers may be a good solution.

Handy (1987) has emphasised the importance of studying human 'activity' in its social context, (including an examination of the effects of structural and cultural influences).

"An undue emphasis upon the individual
results in over-simplistic analyses of the ways
people relate to and perceive their social world"
(ibid. p.162).

In relation to developmental psychology, since the mid-1970s there has been a growing emphasis on the mother-child interaction, rather than the child alone. Piaget's cognitive theories are typical of the isolated individual approach. His theories did not take account of the social factor, although at the end of his life Piaget did admit to a reconsideration in favour of including social factors.

An examination of the literature revealed that there is still an emphasis on structural aspects of language (e.g. MacWhinney and Snow, 1985), possibly in part due to the relative ease of analysis. A lot of the studies reviewed did measure some aspect of both sides of the interaction but most used different measures for mother and child. Some of the studies are summarised in Table 2.1.

In the 1980s, some theorists started using a functional approach to underlie their studies, as it was a comprehensive theory which allowed for the inclusion of social and metapragmatic factors (Wells, 1980; Dore, 1983; McShane, 1980). However, broader social issues also influenced research in the 1980s, as there was evidently an increase in studies on disadvantaged groups: handicapped, retarded, autistic, and chronically ill children and depressed and socially disadvantaged mothers (Holaday, 1987; Bettes, 1988; Zarling et al, 1988; Davis et al, 1988a & b).

TABLE TO SUMMARISE A REVIEW OF MOTHER-CHILD STUDIES

AUTHOR	YEAR	AREA	No. of DYADS	AGE of child	CHILD ONLY	MOTHER ONLY	BOTH DIFF	BOTH SAME	LONG? Y/-	RELIABILITY
Bishop	1951	B	34	3:4 - 5:7 (infants)		*			-	Inter: mean = 0.87
Brody	1956	P	32	mean 4:0		*			-	NONE PERFORMED
Hess	1967	C	163	6, 26, 52wks		*			-	part only: 62 - 96%
Brody	1970	P	122	1:0 - 3:0		*			-	NONE PERFORMED
LaCrosse	1970	S	30/170	0:10- 1:3		*			Y	NONE REPORTED
Nelson	1973	L	18	0:0 - 1:0		*			Y	Inter: 59 - 99%
Ainsworth	1974	L	26	mean 2:0		*			Y	NONE REPORTED
Cherry	1976	L	12	1, 3, 8 mths		*			-	NONE REPORTED
Cohen	1976	L	36	0:8 - 1:11		*			Y	NONE REPORTED
Jones	1977	L	12	4-15 days		*		*	-	NONE REPORTED
Kaye	1977	L	30	9-14 mths		*		*	-	Inter: 0.85, 0.90, 0.92
Murphy	1977	L	24	14/25 mths		*		*	Y	Inter: 83.6% & 81.8%
Schaffer	1977	S	16	0:3 - 1:6		*		*	-	Inter: 0.975, 0.979, 0.992
Snow	1977	L	2	13/14 wks		*			Y	NONE REPORTED
Stern	1977	S	2	2:0 - 7:0		*			-	Inter: 91 - 100%
Brody	1978	P	121	11, 14, 24mth		*			Y	NONE REPORTED
Messer	1978	L	42	9, 14, 20, 24m		*		*	-	Inter: 79.9%, 79.4%, 89.8%
Murphy	1978	L	32	20 weeks		*		*	-	NONE REPORTED
Hall	1979	S	68	0:0 - 0:6		*			-	Inter: 0.77
Kaye	1979	L	50	1:10- 2:10		*			Y	NONE REPORTED
Schachter	1979	L	30	mean 4:3		*			-	Inter: 71.5 - 91%
Shure	1979	C	40	0:8 - 5:1		*			Y	NONE REPORTED
Davis	1980	L	16	21/24 mths		*		*	-	Inter: 0.99, 80%, 95+%
Howe	1980	L	24	12-25 mths		*		*	-	Inter: 87 - 98%
McShane	1980	L	6	1:3 at onset	*			*	Y	NONE REPORTED
Wells (a)	1980	L	33	1:3 / 3:3		*		*	Y	NONE REPORTED
Wells (b)	1980	L	64/64	1:0 - 2:6		*		*	Y	Inter: 0.73 - 0.90
Clarke-St.	1981	S	77					*	Y	

Table 2.1 (continued)

(continued)

TABLE TO SUMMARISE A REVIEW OF MOTHER-CHILD STUDIES

AUTHOR	YEAR	AREA	No. of DYADS	AGE of child	CHILD ONLY	MOTHER ONLY	BOTH DIFF SAME	BOTH LONG? Y/-	RELIABILITY
Hartmann	1981	C	34/34	6:5 - 7:4			*	-	Inter: 73 - 91% & retest
Martin	1981	S	77	18 months			*	-	NONE REPORTED
Trevarthen	1982	S	-	0-100 weeks	*			-	NONE REPORTED
Eyberg	1983	L	22	2:0 - 7:0			*	-	Inter: 0.735 - 0.999
Holden	1983	B	24	2:3 - 2:10			*	-	Inter: 64 - 94%
Morocco	1983	L	1	1:10			*	Y	NONE REPORTED
Raphael-L.	1983	P	61	0:0 - 1:0		*		-	NONE REPORTED
Moseley	1984	L	4/4	Pre-school			*	-	NONE REPORTED
Zinobar	1985	L	2	10-21 mths	*			Y	Inter: mean 92%
Barrett	1986	L	4	0:6 - 2:0			*	Y	NONE REPORTED
Stevenson	1986	L	25	0:4				-	Inter: 72% & 0.84
Breznitz	1987	L	14/18	3:0			*	-	Inter: 99% & 100%
Holaday	1987	S	5	0:4 - 0:6			*	Y	Inter: 0.76 - 0.96
Kropp	1987	S	40	(infants)		*		-	NONE PERFORMED
Bettes	1988	L	36	0:3 - 0:4		*		-	Inter: mean 0.99, 90%+
K. Bloom	1988	L	40	0:3			*	-	Inter: 0.97 - 0.99
Davis (a)	1988	L	30	1:3 - 3:3	*		*	-	Inter: mean 92.3% & 98.5%
Davis (b)	1988	L	16	25.5/15.2m			*	-	Inter: 87.8% - 96.9%
Ratner	1988	L	8	1:6 - 2:0		*		-	NONE REPORTED
Zarling	1988	S	54	0:6		*		-	Intra: 0.865 Inter: 0.87
This Study	1992	L	8	0:8 - 1:6			*	Y	Intra: 0.7859 Inter: 0.7363

AREA: B = behaviourism; C = cognitive; L = linguistic; P = psychoanalytic; S = social.

AGE of child: Year:Month, unless otherwise stated.

Table 2.1

The needs of these broader social studies have required an emphasis on observation (and to some extent interview) rather than primarily experimental methods. Meaningful findings are demanded rather than trivial ones. Also, developments in technology have played a part in that video-recording is now more accessible, allowing for more sophisticated observational studies. Observation was the most common method used in the studies on mother-child interaction reviewed in this thesis.

It was evident from the summary table of 48 studies (over a 40 year period), that many researchers do not report any measures of reliability at all (46%), and those that do favour inter-observer agreement (48%), ignoring the importance of intra-observer reliability. (Only two studies reported intra-observer reliability measures and a single study reported measures of both inter- and intra-observer reliability).

The summary table indicates only a third of the studies were longitudinal, which is probably a reflection of the problems of resources that such a research design brings. However, there should be more longitudinal studies in this area, otherwise the continuities and discontinuities of development will remain obscure. Of the longitudinal studies, 35% reported inter-observer reliability measures and 65% reported no reliability measures at all.

Although there were many 'linguistic' studies selected for review, there were very few who took a functional or social-functional approach. Of the 48 studies, more than

half analysed both sides of the mother-child interaction but used different measures to do. Just six of the studies analysed the mother only and merely four studied the child only. This is unlikely to be representative of the research in this area as a whole as the studies were selected with a bias for measures of both sides of the interaction.

Of the 12 studies which used the same measures for mother and child, six were longitudinal. Four of these concerned language and the other two were social. There appears to be a lack of longitudinal studies which measure both sides of the interaction in the same way and provide adequate assessment of reliability. Further, such studies would be valuable at the social-functional approach.

THE SOCIAL-FUNCTIONAL APPROACH

This is an approach which has grown in popularity in this last decade. It derives from Speech Act theory where utterances are believed to be made intentionally, for a purpose, and that the interactants draw on convention or mutual knowledge or similar to aid their understanding. By describing utterances in terms of their function, their channel of communication becomes irrelevant, which broadens the area to which this theory can be applied. Thus, non-verbal, pre-verbal, sign-language and prosodic features can all be included into studies from this approach. It can then describe utterances in terms of their functions or purposes: statements (Assertions), Requests, Directives, Expressives, Promises, Warning, and so on. Several key theorists have worked in this area.

Dore

Dore (1975) examined early child language, mainly single word utterances and prosodic patterns, using a speech act approach. He did this as a means of dealing with the holophrase controversy, which was tied up with the notion of sentence as central to examining holophrases.

"What has prompted other approaches to posit underlying semantic or syntactic structure in the one word is revealed by a speech act analysis to be the child's pragmatic intention in using a rudimentary referring expression" (Dore, 1975, p.32).

He revised the notion of a speech act and termed it a Primitive Speech Act, with a Rudimentary Referring Expression (usually the word) and a Primitive Force (typically an intonation pattern).

Dore identified nine types of Primitive Speech Act.

Dore's 9 Primitive Speech acts

LABELLING:	the child utters a word and attends to the object or event.
REPEATING:	the child utters a word or prosodic pattern in imitation of an adult utterance but does not address the adult or await a response.
ANSWERING:	the child utters a word in response to an adult utterance.
REQUESTING ACTION:	the child utters a word or a marked prosodic pattern addressed to an adult and awaits a response.
REQUESTING ANSWER:	the child utters a word addressed to an adult and awaits a response.
CALLING:	the child calls an adult.
GREETING:	the child utters a greeting.
PROTESTING:	the child utters a word or marked prosodic pattern while resisting or denying an adult's action.
PRACTISING:	the child utters a word or prosodic pattern that is not addressed to an adult and no apparent aspect of the context is relevant to the utterance

Table 2.2

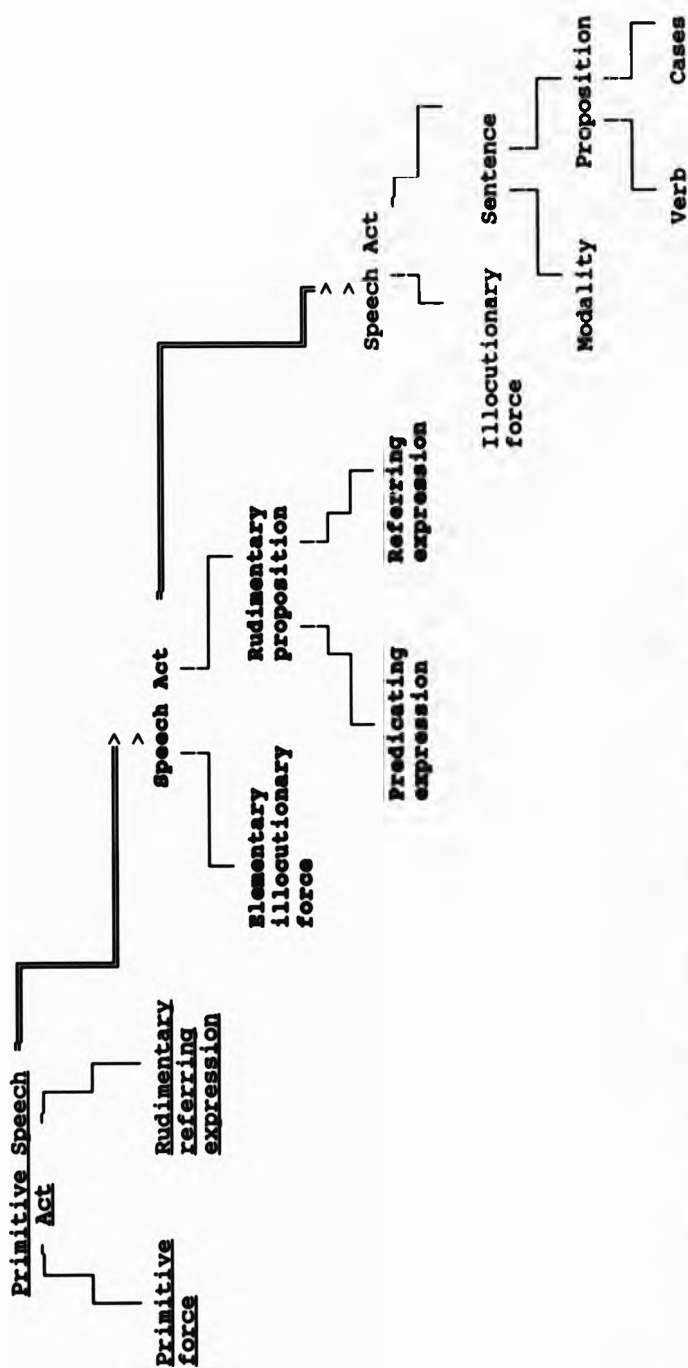


Table 2.3 Development of speech acts (after Dore, 1975).

Dore's Primitive Speech Acts refers to the same phenomenon as Halliday's protolanguage (1975). This system is similar to McShane's later system (1980) which is examined in Chapter Three. Dore evolved this idea to show how the Primitive Speech Act develops into the Speech Act. The PSA is not regarded as an elliptical adult speech act, but as a different entity. For example, the PSA does not contain a predicating expression, and thus is an utterance without a propositional structure.

"Of course the components of PSAs eventually develop into the propositions and illocutionary forces of conventional speech acts, but this occurs only after the child has acquired most of the grammatical structures of his language" (Dore, 1975, p.32).

The development from Primitive Speech Act to (adult) Speech Act is described by Figure 2.3. This transition shows how the child's utterances "begin to become marked syntactically and semantically according to the conventions of the language he is learning" (ibid. p.34/5).

An advantage of Dore's system is that it gives a richer description of child language at the holophrase stage.

"The linguistic intention in our speech act model is a cognitive-pragmatic structure, distinct from the grammatical categories that serve to express it. Such intentions are the functions of utterances, as opposed to their meanings or forms" (ibid. p.36/7).

A disadvantage for Dore's system is that it does not study pre-verbal or non-verbal communication, focusing on verbal utterances, whether words or prosodic patterns. Further, McShane (1980) criticised Dore for not "specifying plausible developmental processes that might account for changes in

the child's system" (p.36). McShane cited several other theorists who integrated language development into a more general concept of cognitive processes, which he saw as being a (mutually?) dependent relationship.

In his later work, Dore (1983) attempted to show how the child learns to behave purposefully, and through this makes his transition into language. The baby shows affect and the mother matches this with similar affect or compliments with different affect. Dore stated that the child learns to observe his own affect by his mother's response and thus it is transformed into intents to express affect. Thus, it appears that Dore's work led to explanations of the development of communication in terms of emotion rather than cognition.

This is an interesting hypothesis and one which requires more research. If it transpires that this interaction of affect is fundamental to language acquisition, then this may have implications for impaired mother-child interactions, such as abusive mothers who are poor at determining emotion in their children (Kropp & Haynes, 1987).

Dore's (1979) approach evolved and he developed a system of (38) Conversational Acts. These acts developed the functional uses of utterances with an emphasis on broader conversational factors. His aim was to develop a system which

"captures both the functions of utterances in conversation and the structures of utterance forms which allow their functions to be recognised by speakers" (ibid. p.340).

It is doubtful whether he achieved this: certainly the functional aspects are covered but it is unclear how the latter aim is fulfilled. Also, the system appears to be rather complex to apply and not easily learnt.

Bruner

Bruner (1975a; 1975b; 1978a; 1978b and Sherwood, 1981) also examined early child language. He used a mix of Speech Act Theory and a general functional approach. He focused on the relationship between early communication and language.

"I shall propose that the child communicates before he has language. These primitive communicative acts are effected by gesture, vocalisation, and the exploitation of context" (Bruner, 1978a, p.65).

Aspects of early communication have been shown to be universal and Bruner considered that an innate element must be accepted.

"What may be innate about language acquisition is not linguistic innateness, but some special features of human action and human attention that permit language to be decoded by the uses to which it is put" (Bruner, 1975b, p.2).

He believed that

"many of the major organising features of syntax, semantics, pragmatics, and even phonology have important precursors and prerequisites in the pre-speech communicative acts of infants" (Bruner, 1975a, p.255).

He described certain aspects of the early interaction and suggested how they might be related to language acquisition (Bruner, 1975a). An example of this is indicating, manifested by the mutual gaze of the infant (from about 4 months old) and the mother. This progresses to deixis which is directly pointing out objects or events.

Bruner has found that intentional gesturing in the child is found within its first year. This develops into vocal marking which involves words and sounds linked to the deixis, which becomes the basis for referring or naming. Early reference is linked to what the child wants. As the child develops, the character of the vocal and gestural marking changes. The child refers more to what is novel or unusual in his world.

"And at the end of this first year there emerges yet another distinct step: the deep hypothesis that how one vocalises affects how another's attention can be altered, that sounds and sound patterns have semanticity" (Bruner, 1978a, p.66).

Of course, this is merely theory, but a fitting one.

Bruner noted the degree to which "adults impute communicative intents to the utterances of infants and children" (1975a, p.265). He terms this glossing. Thus the importance of the mother in the dialogue can be seen as giving the child meaning. She does this by directly imposing intention on the child's behaviour, thereby making early behaviour meaningful for the child. This is one example of a theory still giving emphasis to the mother's contribution and may prove more illuminating than studies on 'motherese' have so far done.

Bruner (1975a) talked of three developmental aspects. The child's early utterances are usually tied to particular routines, situations or contexts. Decontextualisation frees them. Conventionalisation is the means whereby communicative gestures and utterances are gradually changed from being idiosyncratic to being conventional. Language

must be conventional otherwise we could not communicate as there would be no shared meanings. Conventionalisation starts with the mutual recognition of an object/event/person between the mother and child. Economy grows through gestures becoming reduced when it is seen that the meaning can be conveyed with a reduced gesture rather than the total action. For example, a full reaching movement towards a desired object becomes a single finger point.

Bruner linked the functional grammars, categorised by agent, object, instrument, locus, recipient of action, and so on, to the actual action and joint action that the child experiences. These joint actions require signalling (e.g. to communicate that it is 'my' turn) and rules to govern them. For them to function satisfactorily there must also be intersubjectivity. Halliday's (1975) Phase II described the child's development of the ability to participate in dialogue, enhancing the abilities of reciprocity and turn-taking, also. There are similarities here with Bruner's concepts of joint-action and joint-reference. This early non-linguistic reference underlies later verbal reference: "well before language, the idea of the word or label as an instrument of reference becomes firmly fixed" (Bruner, 1975a, p.278). Much of this happens through play:

"There is a crucial point here. It is that play has the effect of drawing the child's attention to communication itself, and to the structure of the acts in which communication is taking place" (Bruner, 1975b, p.12).

Bruner's work focused on the pre-verbal child and thus the emphasis is on pre-linguistic communication and relevant

behaviours. Bruner does not confuse the terms communication and language, but there are instances when others (and even occasionally Bruner himself) make the error of treating his conjectures as fact. This realm of early communication needs more work to clarify just what are the precursors and prerequisites to language, conversational skills and so on. Bruner clarified some of this. An instance he described was early indicating as being a precursor to language, and the continuity is seen in that they both refer. For example, pointing at a toy and naming the toy have a continuity because both "serve the same function of indicating, or at least some aspect of this function" (Bruner, 1975a,).

Bruner (1978) carried out a longitudinal study on six children from three months to about two years, although he focused on only two children. The study involved video recording the mother-child interaction, parental recordings of the child and diary records. He examined joint action and reference. He showed that mothers match their gaze to their infants from four months. The child starts to reach for objects from about five months and by about eight months this reaching changes into an indicating gesture. From about 13 months this indicating becomes a clear pointing behaviour. "I would urge that however associative it may be, such indicating behaviour also serves for generating and testing hypotheses" (Bruner, 1978, p.72). This suggestion about the cognitive processes linked with the pointing behaviour must remain debatable at this time.

Bruner showed that the mother has shared the child's attention to objects by attending to his indicating, and she frequently names the objects, later asking questions about them (such as 'what's that?'). Book reading is considered to be an important source of joint action and reference. Bruner suggested that "the child initially is learning as much about the rules of dialogue as he is about lexical labels" (ibid. p.74). The development from about eighteen months onwards uses the acquired skills as a scaffold for dialogue, with the mother shaping the child's vocalisations (mainly at the phonological level), according to Bruner. He also considered that behavioural exchanges (such as passing objects), early vocal exchanges and games, such as 'round and round the garden' and 'this little pig', are all important in mastering turn taking. "A stunning number of linguistic prerequisites is being mastered. Role shifting is one. Another is turn taking" (ibid. p.78).

Bruner's theories develop this issue of prerequisites and language acquisition, but the relationship is not proved. As controlled studies would not be possible, it would be of interest to find a culture (if possible) which did not use such techniques of exchange and repetitive games and examine the child's language acquisition. If such a culture was found and the children acquired language without difficulty, then Bruner's hypothesis would be disproved. If such a culture was not found, it would still be difficult to establish whether these exchanges are a prerequisite for (successful) language acquisition, conversational skills or

social interaction, or whether such exchange behaviours are merely a precursor and not a prerequisite.

Bruner talked of the mother glossing the child's attempts at communication. This describes the way in which the mother imputes meaning. For example, if a child reaches out its hand and vocalises, the mother may say, 'Do you want your bottle, then?' Thus the mother is seen as important in the dialogue for giving the child meaning. It is presumed by some researchers that the mother has a certain (innate) ability or sensitivity to their child (e.g. Ainsworth et al, 1974). It is also presumed that mothers are consistent in imputing meaning and that this is significant for the child's development. Schieffelin & Ochs (1983), however, report that Kaluli caregivers do not interpret their infants' behaviour (including babbling) as meaningful, they rarely speak directly to them and if they do, they do not leave room for the infant to respond. However, once the child starts to talk, he is given more direct instruction than western children, and 'baby talk' is not used, being considered detrimental to the child's language development. Thus, cultural variations suggest that the mother's role in the child's early communicative development still needs clarification. However, importantly, Bruner (1978b) did emphasise the significance of the mother in the child's early language development and described the mother as providing a 'stabilising scaffold' for the developing child.

Bruner deemed that the work of the Russian psychologist, Vygotsky, was valuable. Vygotsky also

considered social factors to be all important in the child's acquisition of language.

"He pointed out that the social development of the child was a determining factor in the psychological growth of the child" (Luria, 1939, p.53).

He saw language as developing directly from the early social interactions children have with their parents. In fact, he saw language as developing because it facilitates social interaction, and children have a need to interact with other people. "But speech is the central function of social relations and of the cultured behaviour of the personality" (Vygotsky, 1966, p.41).

He suggested pre-verbal children were capable of non-verbal thought, an ability that is reduced in adults. The children's early reaching and grasping behaviours may be considered part of this non-verbal thought. Non-conceptual speech is also a part of the pre-verbal child's communication, evinced as babbling, which fulfil various social functions. One is 'emotional release' which describes the expression of positive and negative affect. A second is 'social reactions', noises made in response to a person's presence or voice. A third function of non-conceptual speech consists of the child's early words which are 'substitutes for objects and desires': these are learnt by conditioning from the talk of significant others.

These two abilities, non-conceptual speech and non-verbal thought, gradually join, leading to the emergence of language. Holophrases typify the child's early forays into language. Many approaches are weak in describing these

single word utterances, but the functional approach can do justice to the richness of the child's emergent language. The child discovers the symbolic function of words and typically asks 'What's that?' over and over. The child's vocabulary increases dramatically, and thought and language begin to merge. According to Vygotsky, until the child is about seven, language serves the internal function of directing thought as well as the prime, external, function of communicating with others. "The sign is always primarily a means of social relation, a means of influencing others, and only then a means of influencing oneself" (Vygotsky, 1966, p.40).

The young child often speaks his thoughts and plans out loud, called egocentric speech, and similar to Piaget's concept. This function of language allows the child to organise and structure situations, and features strongly in the child's cognitive development and everyday problem solving. This is paralleled by Piaget's (1971) concept of monologues: he considered that young children talk in monologues, and often in parallel play situations, where he termed this 'collective monologues'. Thus, the child still has non-verbal thought and preconceptual speech, but also has language which he uses socially, and language which he uses internally. This internal language may be silent, but is more often expressed as a monologue accompanying action by the child. This language may help to organise the child's thought and may result in conceptual or verbal thought. The social context is crucial, and the child's

significant others, normally the mother, are of great importance.

"When the mother comes to the child's aid and realises his movements indicate something, the situation changes fundamentally. Pointing becomes a gesture for others. The child's unsuccessful attempts engenders a reaction not from the object he seeks but from another person" (Vygotsky, 1962, p.56).

Thus, the mother is significant in giving the child's acts meaning.

Vygotsky continues his explanation of the child's language development through childhood and into adolescence, linking it with the child's cognitive development into "higher psychological functions" (Vygotsky, 1978, p.124).

Vygotsky's theories are remarkable because he developed them at a time when Watson and Pavlov were the dominant figures in psychology. "Psychology is indebted to him for his brilliant interpretations of the genesis of psychological functions in the child" (Luria, 1939, p.53). Vygotsky re-introduced the concept of mind at a time when it was unpopular, emphasised the social characteristics of the child's language development, deliberated on the significance of shared assumptions for successful communication, discussed cultural influences, and produced a valuable theory of the development of and the relationship between language and thought. His view of functions was a very broad one:

"The original psychology of the functions of the word is a social function, and, if we want to trace the function of the word in the behaviour of the personality, we must consider its former function in the social behaviour of people" (Vygotsky, 1966, p.41).

Comment on the functional approach

Francis (1979) has indicated that a major weakness in the functional approach is that the researcher has to attribute the function, and she proposes that measures must be taken to ensure the validity and reliability of such 'inferences'. However, she felt that sound theoretical underpinning would allow for a systematic method for the attribution of function. Her idea used Searle's (1975) necessary and sufficient conditions, and rules for speech act analysis, such as the sincerity rule. For example, she stated that

"it would be necessary to document behaviours that indicated that the child expected to be able to influence another person to do what he wished by means of some agreed act" (Francis, 1979, p.206).

A difficulty with this, especially in pre-verbal and non-verbal communication, is to determine the exact intention. For example, if a child reaches out for an object, either he may be trying to reach it for himself, or he may be wanting another person to obtain it for him. Thus, the evidence is not obvious or indisputable.

Francis acknowledged that mutual knowledge plays a part in the communication between individuals and states the problem as that

"what is required is information about the ways the speaker and hearer have come to establish reliable ways of making their intentions and references more or less clear to each other. Such information is in principle obtainable, for relevant behaviours can be observed and tested for" (ibid. p.208/9).

Even though Francis claimed that through various (speech act) rules a systematic method can be found, her suggestions

fall short of the precision she demands. The intentions of the speaker still need to be determined, and it is unclear how the supporting behaviours are selected for their relevance. In fact, she seemed to be proposing an ethnomethodological approach, whereby the responses of the hearer are used in determining the intentions of the speaker. While this can be useful, it is not always unequivocal.

It is clear that a functional approach encounters difficulties because it is analysing at a difficult to access level. It is, however, considered to be a valuable approach for its ability to deal with the multiple channels and social basis of communicative development. Dale (1980) concluded that

"the range of pragmatic functions in the second year of life is measurable and contributes information about language development not tapped by a measure of syntactic development" (p.11)

Harris (1980) referred to the 4th century philosopher, St. Augustine, and his description of language acquisition.

Harris explicated Augustine's account of

"how, at an earlier stage of communicational experimenting, he had endeavoured as a child, with groans and other forms of vocalisation (*gemitibus et vocibus variis*) and by gesture (*variis membrorum motibus*) to express what he wanted, in order that his wishes might be obeyed (*ut voluntati paretur*). Thus it is clear that it was not merely natural instinct for - or spontaneous delight in - vocal expression, but the achievement of practical ends which motivated the child's attempts to communicate" (p.81).

This indicates the purposive nature of communication and thus the value of a functional approach. Learning naming is not adequate on its own as a description of language

acquisition.

"Children do not learn that books exist, that armchairs exist, etc. etc., - they learn to fetch books, sit in armchairs, etc. etc." (Wittgenstein, 1969, para. 476e).

CONTINUITY AND DISCONTINUITY

The issue of continuity and discontinuity highlights a confusion in much research in the area of language development, language acquisition and studies of communication.

Bloom (1983) says that the emphasis on joint activity in current mother-child research is causing researchers to lose sight of the language. Much evidence has been accumulated to show that communication develops gradually through joint activities and joint attention in the social interaction (Bruner, 1975a; 1975b; Richards, 1974). This, however, does not answer the question of how language is learned.

"Learning how to communicate is not explanatory for learning language. To say that language develops when shared activity leads to shared understandings, for example, explains something about how children learn to communicate, but explains nothing about how children learn the words and the structure of language" (Bloom, 1983, p.80).

In trying to explain language acquisition from a continuous view, it is as if the tracks have got crossed. The work on early joint activity leads along a track to explain how to communicate, and while relevant to language acquisition, this issue of acquiring grammar and words is on a different track. Sugarman (1983) explains this confusion by pointing out that both continuity and discontinuity

exist. Children initially communicate by non-verbal means but gradually develop to using predominantly verbal means. The continuity exists in that the pre-verbal child and the verbal child are both communicating but they are using different means to do so, and therein lies the discontinuity. Some researchers confuse this issue either by stating that they have a continuous view of development and then using a methodology that is opposed to this, such as Mean Length of Utterance (MLU); or by confusing the terms of communication and language. This thesis reviews a wide variety of research concerning the mother-child interaction and child communication development, and it is evident that these important issues are often confused.

The child is communicating throughout this year of study (a continuous phenomenon) but is acquiring language (a discontinuous phenomenon). The mother is communicating and, by virtue of being an adult member of the human race, is considered to have acquired language, conversational and social skills (all continuous phenomenon).

If one adopts this stance that pre-linguistic and linguistic behaviour are continuous (in some way) or if one wants to examine any relationship between early communication and later communication, then it is advantageous to use a functional approach because it allows the researcher to study all aspects of communicative behaviour using the same technique. Adopting this stance has implications for mother-child studies where both sides of the interaction are studied. It becomes more sensible to

use the same measures for adult and child because using different measures would require a cut-off point when the child system could no longer be applied and the adult system brought into play. There is no such point to be found in the development of a child and so this could not be rationalised.

INTENTIONALITY

When analysing communication in terms of functions, the issue of intentions becomes relevant. Intentions are rarely stated and even if they were, this does not mean that this was the true intention, nor yet the only intention. Intentions can be conscious or subconscious and single or multiple. Intentions are very difficult to examine because the technique would involve indirect means. Either reported intentions can be assessed or intentions must be imputed. A further difficulty arises with imputed intentions as to whether the speaker really did intend what was imputed. Thus, the issue of intentions is a complex (philosophical) one.

The whole area becomes even more problematic when considered in regard to infant's and children's intentions: can we say that a pre-verbal child has intentions, and if so, when do they develop? Some discussions on intentionality in emergent-language children refer to Grice's (1975) maxims of conversation, such as 'be concise, be relevant'. This seems an unenlightening approach as Grice's maxims are not seen to be pertinent to everyday adult conversations (Kreckel, 1981; Housel, 1984) so are

unlikely to have much value for the developing child.

Bruner's (1975a) term 'glossing' is important as the mother in the dialogue is seen as giving the child meaning. She does this by directly imposing intention on the child's behaviour, thereby making early behaviour meaningful for the child. On the whole, Bruner's work related to younger children than in this study, generally from birth to 8 months. It is not known to what extent mothers impute meaning on the age group from 8 - 18 months. Indeed, it is not clear to what degree mothers impute meaning on their child's communicative attempts prior to this as much of Bruner's work used anecdotal evidence. As yet, it has not been established whether mothers are consistent in imputing meaning or whether the child finds this critical, merely helpful or irrelevant. Some researchers see the development of intention in the infant as being contingent on the imputation of meaning (for example, McShane, 1980) but it is unlikely to be a crucial factor because not all cultures interpret their infants' behaviour and babbling (Schieffelin & Ochs, 1983).

Dore (1983) considered that "intentionality emerges out of the more fundamental motivation toward persons and the objective world" (p.188). He developed his early speech act approach to one which attempted to integrate the social-interactional approach with the affective approaches of Erikson and others. Thus, Dore saw that "while affect is the primary dimension of early communication, it is the cross-personal dialogue of affect

that is most crucial for language emergence" (p.188).

Trevarthen (1979) claimed human infants are intentional because "they are capable of formulating forms of actions" (p.530) which he considered were open to examination. He saw intentionality as developing through different degrees of (inter-) subjectivity. He saw the infant as being at first subjective but capable of expectation. Then able to achieve primary intersubjectivity, where the child shares object manipulation with an other but where the focus is on the shared objects. Finally, the child reaches secondary intersubjectivity about the end of his first year, which means he is capable of "sharing the world of experiences with others" (Trevarthen, 1979, p.561). Ritualised games such as giving are enjoyed at this stage and achieving inter-subjectivity is regarded as indicative of true communication.

Intentionality is a problematic issue but cannot be ignored. It is a significant part of the mother-child interaction, and also plays a significant part in any research, however experimental.

MUTUAL KNOWLEDGE

An important factor in interactions is the degree of shared or mutual knowledge. It is by drawing on this that it becomes unnecessary to constantly refer back to explain every point. Some knowledge is acquired by people in the same interaction and so will have strong links and commonality: this may be revealed by the homodynamic code in communication (Kreckel, 1981). Other knowledge can be

mutual to individuals but acquired in different situations and thus may vary in certain ways: this may be shown through the heterodynamic code in communication.

Mutual knowledge is not easily measured but plays an important part in conversation. "Any communication depends upon shared assumptions and rests upon inherent ambiguities, but the nature of the assumptions and the nature of the ambiguities may vary" (Bernstein, 1973, p.70).

In some recent research,

"the openness of language towards intuitively and experientially established shared knowledge and the embeddedness of the act of speech in social life are central and recurrent themes" in some of recent research (Rommetveit, 1974, p.43).

This issue links with research: the etic (external) and emic (internal) approaches to analysis. The etic viewpoint describes the outsider's perspective and the emic describes the insider's perspective. There are other differences in the two approaches also. In the etic approach, the units of analysis are usually determined in advance by the researcher and may be considered to differ when measurement shows them to be different. In the emic approach, the units of analysis are discovered and not predicted and may be considered to differ when their function within the system differs. Etic organisation is created by the researcher and emic organisation has to be discovered (Kreckel, 1981). Thus, in research the experimenter can be completely outside the event she is studying or share some degree of mutual knowledge. Levels of mutual knowledge are influential for many understandings, so it is important how external or

outside an experimenter is: it may benefit her to talk with the participants.

A difficulty with mutual knowledge for researchers is "its infinity of conditions" (Clark & Carlson, 1982). However, in practice, a certain number of conditions can be adequate to determine mutual knowledge and thus researchers need only establish a certain set of them. In everyday interactions, if individuals had to refer to an infinity of conditions for every utterance, conversations would not be workable. Thus, just as mutual knowledge must be used usefully by interactants, researchers need only establish a working set of conditions, sometimes even a single condition will suffice, if it is the right kind of evidence.

The fundamental difficulty of researching mutual knowledge is that it is often unconscious knowledge and is certainly not explicit. Further, some see this knowledge as being located socially and that it is not only "inner and private, but public and collective" (Harre, 1981, p.212).

An important part of conversation is uptake or comprehension and this can vary with intersubjectivity. Groups of observers are a popular approach within psychology but must stand from an external view point. Those who have shared experience with the interaction or shared meanings with the interactants may vary in uptake from those who are external. This may negate the meaningfulness of using objective, external observers if their uptake is less significant than those who share greater intersubjectivity.

Finally, mutual knowledge is not just significant to

the research process. It is significant for the object of research here, the mother-child interaction. It is likely that they build on a high degree of homodynamic knowledge and this must aid their understandings. It may be useful to try to tap this knowledge to aid the experimenter's understanding. For example, if a child is repeatedly saying (or attempting say) 'fishes' but there are none in evidence, then it may clarify the situation to know that this is the name of a game he and his mother play, and that he is calling for the game to be played.

UPTAKE

Uptake may be defined as "the capacity for understanding" (Onions, 1966). It is of interest because "not everything that is available or transmitted is taken up, and not everything that is taken up is shared" (Kreckel, 1981, p.20). Thus, there is no one-to-one, perfect relation between intended meaning and the comprehension of it. In addition to the methodological difficulties surrounding intentions, the uptake of an utterance is an uncertain event. Further, uptake is "an act of construction rather than perception" (Rivers, 1971, p.125). It is this fact that uptake is internal and constructed, rather than external and given, which makes it difficult to examine, and it is undeniable that one person's uptake may vary to some degree from another person's.

A relevant factor in relation to uptake is mutual or shared knowledge. Uptake may be facilitated by being able to draw on shared knowledge. People who are well known to

each other are likely to draw on this a great deal and the utterances can appear elliptical or incomprehensible to others. It is in part this pool of shared experiences which suggests that mothers should understand their babies and young children better than 'outsiders'. Certainly, if a mother were inconsistent in her uptake of her child's communicative attempts she would make the world a rather confusing place for the child. Bruner (1983b) described the situation as

"from very early on, the mother constantly assigns intentional interpretations to the child's utterances, at first based on her reading of the context, and then gradually on her appreciation of the child's mastery of illocutionary procedures" (p.39/40).

To what extent this pool of shared knowledge also aids the child's understanding is difficult to assess, as is the age at which the child starts to use such knowledge.

"Interactional views of meaning stress the crucial role of inferencing and interpretation in listening comprehension and remind us of the active and creative dimensions of listening" (Richards, 1983, p.222).

If this is taken to be true, then the child is developing some very sophisticated skills.

Uptake is rarely focused on in research.

"Although certain kinds of abstract linguistic models may very well describe sentences, they do not describe tacit knowledge and/or the workings of the mind in processing utterances" (Bates & MacWhinney, 1982, p.187).

Uptake is fundamental to our everyday conversations, and an ability which the child must acquire, and so is an important element of research into communication. All efforts to analyse meaning can only be an interpretation, though clear

attempts are made to ensure the analysis is rigorous. The complexity of intended meanings explicates the complexity of uptake. There is no one-to-one, perfect relation between intended meaning and the comprehension of it. The uptake, or comprehension, of an utterance is an uncertain, yet fundamental, event in communication research.

MESSAGES AND METAMESSAGES

It has been mentioned that factors such as prosodic features can alter the sense of an utterance. Thus, a critical comment can be lightened or even said affectionately according to the tone with which it is said. Thus, there can be an extra element to the basic content of a message.

Indirect Speech acts

Indirect speech acts are a means of saying something other than or in addition to the basic message content. For example, 'Can you bring me the toy?' can act as a request to see if you are able to bring the toy or a request that you bring the toy or both. It is believed that the listener relies on conventional knowledge to comprehend the functioning of this (Grice, 1975; Searle, 1975). The reason for the indirectness is basically politeness, although fear of non-compliance in children may be an alternative reason (McTear, 1985)

PATTERNS OF CONVERSATION

Monologic and Dialogic

Although some theorists think of conversation as co-operative behaviour and describe balanced turn-taking and

agreement of topic (Beattie, 1985) not all conversations are so reciprocal. Some participants may be dominant and have a monologic style in a communication context. In the mother-child interaction, particularly with the pre-linguistic and emergent-language child, a monologic style on the part of the mother may be common. This is largely due to the mother's competence (in conversational skills) and the child's incompetence. As the child becomes more competent the conversation may move along this continuum towards the dialogic.

Monologues are considered to be a significant part of development (Piaget, 1971; Vygotsky, 1966). Piaget had an optimistic view:

"As we pass from early childhood to the adult stage, we shall naturally see the gradual disappearance of the monologue, for it is a primitive and infantile function of language" (ibid. p.17).

Elias et al (1984) reported findings from research into mother-child interaction which

"clearly indicates the presence of within-speaker structuring which may be monologic or dialogic in nature. Attempts to determine between-speakers structuring of a conversational form must take into account such within-speaker patterning" (p.188).

A technique of analysis which would describe the patterning of both within- and between- speakers is thus likely to be informative. It would also register any monologic or dialogic characteristics of the conversation. Further, it would be valuable to describe the patterning qualitatively, that is in categorical terms.

It was thought important because

"a great deal of observational research has focused only on the response rates of various coding categories rather than on the sequential patterning of behaviour over time. This focus on rates clearly ignores the dimension of time and ignores the importance of sequence" (Gottman and Notarius, 1978, p.237).

RITUAL

Ritual may be defined as

"a socially programmed use of time where everybody agrees to do the same thing. It is safe, the outcome is predictable" (Harris, 1973, p.113).

The interaction of the mother-child dyads examined in this research may help to highlight early patterns of ritual which may be precursors or even prerequisites to the ritual of conversation. The predictability of the outcome may be a useful structure to the child in early interactions. Further, it has been suggested that early ritual is important in some way to language acquisition (Messer, 1983).

These interactive acts of exchange are important in language acquisition. Bruner (1975a) considered that "established and reversible role relationships obviously provide a primitive base for later linguistic deixis" (p.84). It has been argued

"that the mastery of procedures for joint action provides the precursor for the child's grasp of initial grammatical forms" (Bruner and Sherwood, 1981, p.36).

These joint actions

"include such familiar formats as activating attention to objects, give-and-take exchange, peekaboo and object appearance-disappearance routines." (ibid. p.37).

Bruner considered that give-and-take games help the

child to acquire conversational turn-taking skills, and that in time the child learns to replace the objects exchanged with words. Ratner and Bruner (1978) described four characteristics of games in mother-child interaction. Firstly, that they have a restricted format. Secondly, that they have a clear repetitive structure. Thirdly, that they contain positions for appropriate vocalisations. And in the fourth place, that such games allow for the mother and child roles to be reversed. Ratner and Bruner concluded, from a study on two children, that "these factors have been observed to operate in a way that leads the child into appropriate dialogue" (p.401).

Allwood (1976) is another researcher who has recognised the importance of ritual. He included ritual in his taxonomy of some of a child's early communication. He gave the game of peek-a-boo as an example of the types of structured and routine games in which a child and adult interact. Allwood suggested that this helped the child to master conventional acts by becoming aware of

"1) ritualised repeated behaviour and 2) through the playful nature of the game a certain degree of arbitrariness (the game is not tied to any specific organic or situational factors)" (p.163).

He focused mainly on greetings, farewells, and other conventional utterances, such as 'how do you do' and 'ouch'

"Saying 'ouch' is a conventional action. It is the conventional way to express pain. It is not a symbol of pain, but can, because of a natural tie with its conventional role in actual communication, function as a sign or signal" (p.164).

An example Allwood gave highlights clearly the conventional

and cultural characteristics of ritual. Ritual behaviours of affection in western culture include kissing, while in certain other cultures, they include nose rubbing. Thus, ritual acts are learnt in the social and cultural context available to the individual.


This context is an important aspect of ritual. It is evident that a child must learn, not only language, but convention, cultural conventions, social mores and such like. Thus, some aspects of the ritual of conversation lie within the individual and some lie with "the social-collective of the human group" (Harre, 1983, p.165).

Eibl-Eibesfeldt (1979) considered that rituals served many functions such as bonding, and he regarded "speech itself as a form of ritual" (p.38). He too saw the value of child games: "repetitive actions like give and take develop into rituals of dyadic communication, long before verbal communication is possible" (p.47).

Thus ritual is a significant topic in relation to communicative development although whether ritual is a precursor or a prerequisite to language or social interaction is not yet clear.

SUMMARY

A review of the literature has been undertaken and several issues and the common research designs drawn out and discussed. The various levels of analysis for mother-child interaction was discussed with a focus on the social-functional approach, examining the work of Dore, Bruner and Vygotsky. In the light of this, issues of intentionality,



mutual knowledge, uptake and metamessages were discussed. The important matter of continuity and discontinuity was addressed, of concern to all developmental studies. Finally, frequency measures of categories or acts are useful but the importance of examining patterns of conversations was discussed.

CHAPTER THREE

*** CATEGORICAL ANALYSIS OF MOTHER-CHILD INTERACTION ***

development of category analysis tool

This chapter firstly examines two studies of child communication using category systems. These were of value because they were fundamental to the development of the present category scheme. After a critical discussion of the studies of Schachter (1979) and McShane (1980), a brief examination of some general issues relating to category systems is undertaken. There follows a statement of the rationale of the category system used in this study, examining the key issues which were taken into account when developing such a coding scheme. The process of development of the Category Analysis Tool is then stated in some detail. There then follows a description of the Category Analysis Tool: the method for its implementation and a description of all categories, with examples. Finally, the Category Analysis Tool is compared with Schachter's system and McShane's scheme.

Many observational studies find that a useful way to measure behaviour is to divide it up into discrete units and label these as categories. Of particular interest for this research were those studies which described behaviour in categories derived from a Speech Act theory base. Two of those studies are briefly described here.

The Speech Act approach of Dore has been discussed in Chapter Two. He took the philosophical theories of Austin (1962) and Searle (1975) and developed them into a theory appropriate for a child with developing language. His work was an example of the Speech Act approach applied in a reasonably pure way to child language development. Below, two broader based studies are briefly described.

Schachter's study (1979)

Description

Schachter (1979) devised a means of analysing both the mother's and the child's language, but different measures were taken for each. Schachter saw the mothers as teachers and advocated instructing mothers in teaching skills. A curriculum was proposed for the caregivers. The underlying approach was derived from Piagetian theories and Speech Act theory. The dyads were observed on two occasions within a month of each other (average about eleven days apart) and as there was no noticeable difference in the two sessions they were combined. The mother and child communication was observed and recorded directly on all occasions and audio-taped on half the occasions. The recorder later scored the communication according to the categories.

on mothers

The FIS-C is a scoring scheme for the responsive and spontaneous communications of the mother. The acronym stands for Interpersonal Functions of Responsive and spontaneous Speech of Caregivers. Responsive speech was defined as "talk that is instigated by the child's verbal or

non-verbal communication to the caregiver" (p.31). Spontaneous talk is speech initiated by the mother and not in response to the child's communication.

The ten adult categories are summarised in Table 3.1.

An analysis of Routine scores was also undertaken by Schachter which included "stock phrases and interjections (such) as 'What?' God bless you; Hi." (p.32). Repetitions (of self and child), questions and justifying explanations were also undertaken. Some of the subscores of the ten categories were considered to be confusing. For example, the subscores of Controls and Teaches were "in order to study stylistic variations" (p.33) and so content categories were mixed with style or metalinguistic categories.

The findings of Schachter's study: the mothers

The study carried out by Schachter was on three groups of mothers: black disadvantaged, white advantaged and black advantaged, as determined by social status. The approximate mean percentage for all mothers over these ten main categories is given first, followed by mean percentage for the black disadvantaged group, and then by the mean percentage for the advantaged groups.

TEN ADULT CATEGORIES (after Schachter, 1979)

[I] Responds to Child Expressive Communication	[II] Responds to Child Desire Communication	[III] Responds to Child Ego-enhancing Communication	[IV] Responds to Child Collaborative Communication	[V] Responds to Child Report
(1) explicates expressive	(1) explicates desire	(1) explicates ego-enhancing communication	(1) engages in collaborative discourse	(1) explicates report
(2) confirms expressive	(2) dis-inhibits desire	(2) ego-boasts excuse for ego blow	(2) engages in collaborative dramatic play	(2) confirms report
(3) accommodates, comforts distress	(3) accommodates, fulfills desire	(3) provides reason for child's failure)	(3) engages in collaborative chanting	(3) accommodates, gives report
(4) seeks further elaboration of expressive	(4) seeks further elaboration of desire	(i.e. gives reason for child's failure)	(4) responds gratefully to collaborative giving	(4) seeks further elaboration of report
			(5) explicates collaborative	(5) corrects report
[VI] Responds to Child Learning Communication	[VII] Controls, Restricts, Commands	[VIII] Teaches, Provides Knowledge	[IX] Reports on Child	[X] Reports on Self, Others, Things
(1) explicates learning	(1) "Do"s	(1) presents knowledge	(1) presents report/specific	(1) report on self
(2) confirms learning	(2) "Don't"s	(2) elicits knowledge	(2) presents report/general	(2) report on others
(3) accommodates, supplies learning	(3) Refusals	(3) elicits imitation of own words	(3) elicits report/specific	(3) report on things
(4) corrects learning		(4) word teaching	(4) elicits report/general	

Table 3.1

Predominantly responsive categories			
Group	Total	Disad.	Advant.
[I]	2.5%	1.5%	3.0%
[II]	8.9%	5.5%	10.6%
[III]	1.3%	0.3%	1.7%
[IV]	3.8%	1.5%	5.0%
[V]	9.7%	6.6%	11.3%
[VI]	9.6%	7.6%	10.6%
Predominantly spontaneous categories			
Group	Total	Disad.	Advant.
[VII]	37.5%	53.4%	29.6%
[VIII]	9.7%	8.6%	9.8%
[IX]	6.1%	5.1%	6.5%
[X]	3.6%	2.5%	4.2%

Table 3.2
Mean percentage over categories for mothers
(from a study by Schachter, 1979)

Advantaged mother tended to talk more than disadvantaged mothers, and more of the speech was responsive for the advantaged mothers than for the disadvantaged mothers.

on children

Ten child categories (after Schachter, 1979)

[I]	Expressive communication
[II]	Desire communication
[III]	Possession rights communication
[IV]	Ego-enhancing communication (essentially boasting)
[V]	Self-referring, self-inducing communication
[VI]	Joining communication
[VII]	Collaborative communication
[VIII]	Reports on self, others, things
[IX]	Learning communication
[X]	Calls when out of sight

Table 3.3

The children in Schachter's study were aged 22 to 34 months. There were equal numbers of boys and girls. The

FIS-P was designed to measure the spontaneous communications of children. Its acronym stands for Functions of Interpersonal Spontaneous Preschool speech. The ten categories are summarised in Table 3.3.

The findings of the Schachter study: the children

The mean percentages for the children, followed by the mean percentage for the black disadvantaged group, followed by the mixed advantaged group, are given below.

Group	Total	Disad.	Advant
[I]	6.0%	5.3%	6.4%
[II]	36.0%	42.9%	32.5%
[III]	0.6%	0.4%	0.8%
[IV]	1.3%	0.4%	1.7%
[V]	0.0%	0.0%	0.0%
[VI]	0.8%	1.5%	0.5%
[VII]	7.2%	6.4%	7.6%
[VIII]	26.9%	20.5%	30.1%
[IX]	15.5%	13.2%	16.6%
[X]	4.6%	7.5%	3.1%

Table 3.4
Mean percentage over categories
for children
(from a study by Schachter, 1979).

The advantaged children spoke more than the disadvantaged children, and all children's communication contained slightly more spontaneous speech than responsive speech. The maternal talk rate and child talk rate was positively correlated, and verbal productivity was related to maternal educational level but not to race.

The reliability of the study

Schachter's system of ten categories for mothers (with elaborations) and ten categories for children was also assessed for reliability. The reliability of the main part

of the Schachter study was performed between the two main observers on eighteen minutes of interaction for a 22 month old girl with a black advantaged mother and eighteen minutes for a 33 month old boy with a white advantaged mother, thus no reliability measures were obtained for black disadvantaged dyads. The interaction was recorded and then scored at a later time. Percentage agreement was calculated for scores based on manual recording and for scores based on manual recording plus audiotaping. The agreement percentages are not given independently, but a mean of the two is reported. There is an implication that manual recording was the more efficient of the two techniques: "manual recording was undertaken because it was possible to obtain reliable results" (ibid. p.28).

The recorder reliability was reported as 91%. The scorer reliability ranged from 71.5% (for Routine scores) to 86.3% for subscores. A percentage agreement of 91% was achieved for subcategories, given that there was agreement on the category.

Discussion of the Schachter study

The ten FIS-C categories accounted for more than 93% of the mothers' talk. Half of the remaining talk was accounted for by routines, and the rest "occurs in categories of inadequate frequency" (p.67) which means that some of the communication is omitted. The maternal non-verbal behaviour had already been omitted, as they were said to account for such a small percentage as to not make any difference. The three most popular adult categories were Responds to Child

Desire Communication, Responds to Child Report and Responds to Child Learning Communication. This reflects the child's communication where nearly 78% is accounted for by the categories Desire Communication, Report and Learning communication.

Schachter's system has assessed both the mothers' and the children's communication but on different categories, and the validity of this must be questioned. Other categories were assessed but were discarded because they did not reach the 1% frequency level, for example, adults did not score at all on Learning communication and was considered reasonable because "caregivers do not ask young children for help on learning" (p.181). However, it is possible to conceive of such a situation. If the child had been with other people away from the mother and had learnt a new game, then the adult may ask the child to teach her the game.

A clear example of the disparity is shown by the fact that the child's question 'What's that?' would be classified as FIS-P [IX] Learning communication, but the mother's question 'What's that?' may be classified as one of several categories, either as responsive subcategories 'explicates' or 'seeks further elaboration' or as spontaneous subcategories 'elicits'.

Another example of mismatch of analysis is 'calls when out of sight'. The child's system has a category for this and the mother's does not,

"because the caregiver's call is viewed as an introduction to her subsequent speech act. Both

her call and her speech act that follows are assigned the same score" (ibid. p.181).

Thus, Schachter is treating the mothers' communication and the children's communication as different entities, and it is uncertain whether such a distinction is valid and theoretically sound, especially when the analysis is based on a functional, speech act approach. (Obviously, there are differences, in grammar for example).

One advantage of the FIS-P and FIS-C is that both measures are linked to express any relation between the two, but this is limited as it focuses on the spontaneous speech of the child and the responsive speech of the adult. Another advantage is that a functional approach is used for the analysis which gives richer findings than many other previous studies.

Schachter's defence of use of different categories for the mothers and toddlers is that child categories were included in the adult assessment but that because only one (Reports on self, others, things) reached the 1% frequency level, the others were omitted. Schachter concludes that "this suggests that mothers and toddlers use speech in very different ways" (ibid. p.36). Alternative functional analyses using the same categories for mother and child may clarify whether this is indeed true and, if so, in what way they differ.

There are two main arguments against the use of different categories for mother and child. One is that if one uses different categories, the differences between the mothers and children will always be emphasised, as it will

be impossible for any group to score similarly. Thus the assumption of different use of communication becomes an integral part of the analysis. Schachter studied children of 22 to 34 months, but the category system is for Preschool children, and thus could be applied to children up to five years old. The assumption of different use would be applied to this group as well, and it is not known if this is valid.

This brings us to the second argument: language development is a continuous process: describing it in discrete stages cannot be justified. Therefore, if one uses different categories for mother and child, one must create a cut-off point when the child category system is no longer applied to the child, but the adult system is applied. Schachter has already created an artificial cut-off point with the FIS-P, which is for preschool children only. While there may well be differences in the way pre-school children, school children, adolescents and adults use language, different assessment systems may not be the best way of dealing with this. A comprehensive and flexible system may be more enlightening.

Two other aspects of the Schachter study cause concern. One is the implication that the FIS-P and FIS-C could be used for (clinical) assessment, and this raises the problem of standardisation. Schachter has not standardised it, and it is difficult to see how this could be satisfactorily achieved. Most studies using category analysis are open to such difficulties of external validation and standardisation because one system is rarely comparable to another.

The other problematic aspect of Schachter's study is the emphasis on the responsive speech of mothers. If a child's utterance is categorised as 'Desire communication', then the subsequent mother utterance is likely to be classified as 'Responds to desire communication' which gives very limited information about the mother's utterance.

However, Schachter was one of the earliest researchers to use a functional approach to the study of child communication, and measures of the mothers' speech was taken which is a common omission, so the study does have valuable strengths.

McShane's study (1980)

Description

McShane (1980) studied six children at different onset ages but from approximately one year old for about twelve months. He assessed their communication functionally, using the parents' speech as an aid but no measure of the adult speech was taken.

The categories used by McShane are summarised in Table 3.5.

McShane's system of five categories, 65 subcategories, plus a Miscellaneous category was assessed for reliability. One 'judge' analysed 100 utterances per child when the child's speech consisted of mostly words. Another 'judge' analysed 100 utterances for four of the six children when the child's communication was mainly 'non-words'. When disagreements occurred between the experimenter and the

CHILD CATEGORIES (McShane, 1980)

[I] REGULATION CATEGORIES	[II] STATEMENT CATEGORIES	[III] EXCHANGE CATEGORIES	[IV] PERSONAL CATEGORIES	[V] CONVERSATION CATEGORIES
(a) <u>Attention:</u> look that name object name person other	(a) <u>Naming:</u> labelling (1) onomatopoeia (2) association (3) interaction (4) other	(a) <u>Giving:</u> person object here/there other	(a) <u>Doing:</u> action location completion impossible other	(a) <u>Imitation:</u> (b) <u>Answer:</u> statement (1) Yes (2) No (3) other (4) regulation (5)
(b) <u>Request:</u> person conventional mood recurrence forbidding object action other	(b) <u>Description:</u> recurrence non-existence attribute action subject-object holophrase comparison possession denial location other	(b) <u>Receiving:</u> mostly 'thank you'	(b) <u>Determination:</u> person recurrence object action conventional mood other	(c) <u>Follow-on:</u> statement (1) No (2) other (3) Yes (4) regulation (5)
(c) <u>Vocative:</u> mainly calling mother to request presence	(c) <u>Information</u>	(c) <u>Refusal:</u> mostly 'no'	(c) <u>Protest</u>	(d) <u>Question:</u> where (1) what (2) Normally/N (3) Tag Y/N (4) Who (6) How (6) Why (6)

[VI] MISCELLANEOUS CATEGORY

on average, 5% of utterances

[Numbers in brackets refer to the rank order of popularity]

Table 3.5

'judges', these 'errors' were discussed and mistakes rectified. The rectifying of mistakes obviously inflated the reliability measures, which ranged from 90 to 98% for the mainly words utterances, and 87 to 92% for the mainly non- words utterances.

The numbers in brackets in the list of categories above refer to the rank order of popularity: thus, labelling is the most common form of naming, while interaction is the least. Labelling actually accounted for more than 88% of the naming utterances.

The findings of McShane's study

These are complex as the differences between the six children are emphasised, and thus the findings are primarily descriptive of six individual patterns. This limits the deductions that can be made.

McShane reported that the number of lexicalised utterances increased over time, and for five of the six children, the number of utterances increased over time. The proportion of lexicalised requests was positively correlated with age, which is a common-sense result for this age group.

The Exchange category is of interest as it suggests a reflection of theorising by Bruner (1975a, 1978b) and Trevarthen (1979, 1982) who considered such ritualised behaviours as significant to the child's development. McShane's category actually focuses only on the words accompanying giving and taking behaviour, and not the ritual behaviour itself, however. It was not used a great deal,

for example only 49 utterances in all were categorised as receiving, 17 of which were 'thank you'.

The Miscellaneous category accounted for 5% of total utterances and included noises and utterances that appeared to have no communicative purpose. However, other utterances that were recorded in this category were because "they were of a degree of sophistication not generally evidenced in the group" (ibid. p.139). This shows that this category system has a ceiling and thus would be of little use for children older than two years, or perhaps be ineffectual with children other than McShane's six. Examples of these sophisticated utterances are: 'Fiona like this elephant', 'he can have a cup of tea' and 'he can have another bath, if he want to'. Being unable to categorise such utterances seems a fundamental weakness for a system analysing child communication.

Discussion of McShane's study

A first difficulty with the system, which McShane readily acknowledged, was that the categories are not mutually exclusive.

"The reason for the lack of specificity of permissible overlap was the desire to determine empirically what overlaps occurred in communicative behaviour." (McShane, 1980, p.73).

This actually seemed to create confusion which lay in the mixture of linguistic and metalinguistic. For example, conventional mood refers to the style of an utterance. It would have clarified the system if the metalinguistic

categories were grouped together, and the other 'content' categories grouped.

McShane asserted that "language development takes place in a context of social interaction between a child and his or her caretakers." (ibid. p.145). He goes on to emphasise the importance of the other in the development of the child's intentional communication, yet he does not give any adequate measure of the mother's language. [He does indicate that 26% of adult utterances were questions.] This is the weakest point in a study that is otherwise exploratory and a rich description of six children's language development over a year.

CATEGORY SYSTEMS: General issues and development

Often observed behaviour appears a continuous stream of movements that are difficult to divide into units. Communication, however, is a behaviour that appears to be composed of natural units and thus segmenting for analysis is less problematic. Once the units have been identified, categories must be determined that satisfy several criteria. Martin and Bateson (1989) suggested some basic points. Firstly, that enough categories are selected to be informative. Secondly, that precise definitions are provided for the categories. Thirdly, that categories should be mutually exclusive and independent of one another. All these points are important when developing a category system but probably the most difficult to achieve is the defining of categories.

"Each category should be clearly, comprehensively and unambiguously defined, using criteria that are easily understood the criteria should unambiguously distinguish it from other categories" (Martin & Bateson, 1989, p.41).

Also, the categories chosen are very important.

"Developing a coding scheme is very much a theoretical act the coding scheme itself represents an hypothesis, even if it is rarely treated as such. After all, it embodies the behaviours and distinctions that the investigator thinks important for exploring the problem in hand. It is, very simply, the lens with which he or she has chosen to view the world" (Bakeman and Gottman, 1987, p.19).

Rationale

The theoretical underpinning of this research is to examine communication below the tip of the iceberg, that is at the functional level. Thus, the aim of the analysis will be to describe communication in terms of its purpose or how it is used. A major advantage of the functional approach is that it can describe non-verbal communication and emergent-language as well as language.

Natural language samples were used because the majority of communication occurs in this non-grammatical and spontaneous way. To retain the natural quality of the language samples, observation of interactions was undertaken. The interactions were all video-recorded and then were systematically observed and coded using a category analysis tool.

Systematic observation is often undertaken using predetermined categories of codes (Bakeman & Gottman, 1987).

This allows the data to be organised based on a theoretical premise. Thus the coding scheme is a crucial part of the research. It needs to be based on sound theory, to be meaningful and to be comprehensive but not unwieldy. "Studies involving clearly stated questions and tightly focused coding schemes seem far more productive" (ibid. p.21). As a coding scheme is typically devised to help answer a specific question, it will be quite specific and have little application outside of this. However, a coding system based on fundamental functional categories could have a wider application than many narrower category systems. It may successfully code communication of many types and not just emergent-language children and their mothers, and in doing so answer different questions.

A final condition for a good coding scheme is that

"it is better to 'split' than to 'lump' codes. Behaviour categories can always be lumped together during data analysis if that seems useful, but behaviours lumped together by the coding scheme cannot be split out later" (Bakeman and Gottman, 1987, p.31).

This relates to levels of analysis where behaviours can be described in fine detail (the molecular level) or in broader, more inclusive terms (the molar level). An effective coding scheme would integrate these levels hierarchically, and allow detailed information to underlie the codes at which the analysis may take place. This can be meaningful for conceptual reasons and/or have value for

statistical reasons when low frequency categories can lead to problems with analysis.

Process of development

Before developing the category system for this study, several studies were examined. They were selected because they examined emergent-language from a functional approach. The development of the Category Analysis Tool grew from two main external sources, the Schachter study (1979) and McShane's study (1980). Also, mother-child interaction was studied, in vivo and in video, as informal observation is considered to be advantageous (Bakeman and Gottman, 1987). It has been reported that this is the most common technique for categorical analysis: "a combination of deductive reasoning and empirical observation" (Hartup, 1979, p.25).

A review of mother-child studies showed that the distinction between social interaction studies and communication studies was unclear, with much over-lapping. Thus, it seemed important not to distinguish between the two, and so the Category Analysis Tool uses broad acts that are mainly communicative but also some that emphasise ritual and are termed 'manual' as the hands are always involved in these acts. If communication develops in company, then the social and interactive aspects of the social interaction should be taken into account in an examination of the development of communication.

In the majority of studies on child (communication) development, only the child is studied. However, the child

does not develop in isolation, indeed often being studied in interactions. For many researchers, the behaviour of the person interacting with the child and their relationship to the child are considered to be merely sources of variance (Cairns & Green, 1979). This is considered to be an inadequate approach. The main strength of the Schachter (1979) study was seen to be that both the child's and the mother's communication was analysed. This was considered to be of great importance as the mother-child interaction is an interrelated situation and to study only the child's communication seems a distortion and a limitation. As Ferrier (1973) said,

"Mother and child are an interactional unit and it is pointless to look at a child's production without giving equal weight to the mother's contribution to the dialogue" (p.19).

The significant amendment that the present study makes to the Schachter study is that the same categories are used for child and mother as the development of communication is seen as a continuous process. It does not seem logical to devise separate categories for adult and child as this would lead to a cut-off point being necessary when the child's communication was no longer analysed by the child's system but by the adult system. Not only is there no apparent cut off point to be found in the child's development, but it would be illogical to suggest distinct systems in a continuous process. A review of the literature did not

reveal any study of child (communicative) development which applied the same categories to both mother and child.

The main strength of the McShane (1980) study was its functional categories. Many studies use functional categories, such as Halliday (1975,1979), Schachter (1979) and Dore (1975). However, McShane's were chosen as a starting point because they were considered to be a fairly comprehensive system.

The CAT was developed from a general consideration of the relevant literature (primarily on the functional approach and speech acts) and from a thorough examination of relevant communication (i.e. mother-child). McShane's categories were taken as a starting point and modified in the first instance to make them mutually exclusive. Tajfel (1986) states that

"a system of categories which has clarity needs to consist of categories which have internal unity and which are, at the same time, clearly distinct from one another" (p.317).

McShane does not satisfy this as his system has categories that are not mutually exclusive, or comprehensive.

Schachter's system does satisfy the former but not the latter. The coding system designed for the present study and detailed below is considered to satisfy the conditions that the categories have internal unity and are clearly distinct from one another: the categories are mutually exclusive and comprehensive.

Separate pieces of paper were taken and on each one a potential title/name of a category was placed with a definition. Then examples of utterances were drawn up (from day to day experiences, from previous work with children and from other studies) and placed on each sheet as applicable. Whenever difficulties arose, the category would be amended, either adjusting the definition or amalgamating or dividing further a category. Developing a coding scheme for an area such as communication means that the subject material is available for observation all the time. Thus, life was lived for a time with all sorts of utterances being responded to as an item to be coded. At any time, an example or an idea for an adjustment would be noted. Some new ideas and examples could be readily assimilated into the coding tool and others would not be so readily accommodated. Ideas for how to make the adjustments often came from the literature, such as including a category for imputed meaning because of its centrality to Bruner's theories (e.g. 1975a). Other points derived from the literature played a part in the early development of the scheme.

Bakeman and Gottman (1987) stated that "it is important to have clear conceptual categories that are essentially at the same level of description" (p.30). McShane (1980) does not satisfy this as he mixes linguistic and meta-linguistic categories. The coding scheme devised here tackles this issue by organizing the categories so that the meta-pragmatic categories are clearly grouped separately from the


pragmatic ones. This emphasises that there are different levels of analysis in the system, unlike McShane who does not distinguish his categories. This was not done in the early versions of the category system and it was a source of confusion. Once it was taken into account in the design of the present coding system difficulties in coding certain types of utterances were eradicated. Thus, the words 'that was silly' may be coded as a negative comment, but the tone may indicate a warm, teasing comment. This dilemma is resolved by recognising both messages, and coding the words as a negative comment, but coding the tone as Light and Playful to describe the metamessage. This insight was gained after the full analysis was completed using an early (pre-metamessage) version of the category tool. Preliminary data analysis from this had been shown to members of a research committee and concern was expressed over the inclusion of imputed meaning and the difficulty of coding such comments as just given in the above example. It was considered an important improvement and all the data were re-analysed with the final version of the category system.

Further, it was considered useful to build in a multi-level coding system at the development stage in preparation for the analysis stage, rather than to try to expand or contract categories after collection. Thus there are four levels in the hierarchical system. Level One (the molecular level) consists of 32 categories which can be condensed to 27 categories (Level Two). Level Three condenses these to

16 categories and, finally, Level Four (the molar level) describes 9 categories. This grouping was part of the design of the coding system and was not a result of arbitrary lumping together after categorization. The hierarchical organization is shown in Table 3.6, after the description of the categories.


The four editions of the CAT were each carefully revised by being tested in practice by more, sometimes by more than one person. The first 'edition' of the Category Analysis Tool was tried out on material similar to the actual data and several amendments were made, mainly to simplify the system and to add new categories or re-define existing ones. A second 'edition' was tried out on similar material with another observer and the discussion arising from this helped to further develop the system. After further feedback (from a research committee), the system was greatly clarified by the introduction of 5 metapragmatic categories. Final grooming led to this, the fourth edition.

The difficulty in devising an analysis tool of this nature is to make it comprehensive and informative while ensuring it is still manageable. Several techniques were employed to assist in the mastery of the category system. One technique was to order the categories hierarchically as such organization can aid memory (Mandler, 1974; Bower, 1970). A letter was chosen to indicate each category and wherever possible one was chosen that would be easily remembered by having a link with the category name. Thus,



the category for 'Imitation' is designated by the letter 'M' (as 'I' was used elsewhere) and so the category is called 'Mimic, Imitation', thus prompting the correct letter. Further, in addition to the detailed booklet, a quick reference card was produced that was colour coded according to the way the system is organised for easy reference (see Insert inside front cover).

Selecting the categories to be included in the category analysis tool was based on other studies, mainly McShane (1980), on observation and was limited by the needs of restricting the size of a coding tool. Statements were an obvious category to include but such a large one that several attempts were made to try to sub-divide it. Firstly an attempt was made to divide them in terms of the functions they perform, in typical speech act terms, such as warning, promise, etc. This was found to be unwieldy and could lead to a list as long as a dictionary. It was finally decided from various items in the literature that the social and contextual aspects of early communication were worthy of emphasis and this was crystallised by Schachter's tenth adult category of reports on self, reports on others and reports on things. The addition firstly of reports on 'us' was added to alleviate any difficulty with such statements being forced into either of the first two sub-categories. Also, dividing these further into positive and negative statements was considered a useful distinction.



Questions are another obvious category and at first were divided into Requests Information and Requests Help, but this was inadequate and other types of request were constantly being added, such as Requests Action, Requests Object. Although another large category, it was decided at this stage to merge all requests together without distinction. Tag questions and Hints and Suggestions were separately categorised with the potential for all being grouped together at a molar level.

Expressives were another obvious and fundamental category. The obvious split was into positive (e.g. smiling, laughing, arm flapping for excitement) and negative (crying, stomping with frustration or anger). However, it proved necessary to include a third expressive category which was not so readily determined as positive or negative, such as frowning for concentration, certain sighs or facial expressions. Expressives can often be non-verbal, either vocal and/or behavioural and therefore be ambiguous.

Repetitions were another significant category, brought to mind because of the discussion in the literature of the role of repetition and imitation in child language development (Schachter, 1979; Reichle et al, 1976). Schachter included an analysis of repetitions and McShane had a sub-category of Imitation. It was felt that it was useful to distinguish between repetitions of self and repetitions of the other.

Directives are another fundamental category used in many studies on communication. It has been shown that mothers can differ in the amount they use directives and that this may have implications for the child (Mahoney, 1988). Praise and criticism are other aspects of a mother's communication that can have implications for the child's development and so were worthy of inclusion.

Refusals and compliance & affirmation are also categories which were fundamental, and are included in McShane's system and echoed in Schachter's. These were grouped together with a particular category which came about from observation of mothers with their young children. This was called 'acknowledgement' for want of a better description. It was a clear and unmistakable response to another's behaviour which was little more than a recognition of it.

Of the other categories that were considered of note were calling a person's name (or vocative) which is coded by McShane (1980) and Schachter (1979). Also, bids for attention are a common category, particularly salient with mother-child interactions. Greetings or salutes, as McShane calls them, are another category which can occur. Greetings were only partially coded by Schachter, as mother routine scores but not at all if uttered by the child. McShane discussed them to a degree but included them only in his Miscellaneous category. Halliday (1975) described language in broad functions, such as Instrumental and Regulatory.

One of these broad functions was that of 'Interactional'. Under this broad category he includes attention getting utterances, greetings and responding to being called. It unclear whether calling is included in this category, probably in part because Halliday is only measuring the child's side of the conversation. In the light of Halliday's grouping, these three sub-categories were grouped together at a molar level. Further investigation may prove necessary to determine whether this grouping is meaningful. Halliday's term 'Interactional' is itself a problematic one as all communicative behaviour is interactional.

Finally, various aspects of ritual and exchange behaviours were discussed in Chapter Two. These behaviours were considered significant to social and communicative interactions. Thus, some of these were coded in the category tool to enable some determination of their role in children's development of communication. The ritualised games that are played with young children, such as peep-bo, were considered to be important and therefore constituted one category. One particular part of ritual and game playing is that of Exchange which was given a category of its own. This describes the giving/offering of objects and the taking of them. This was considered significant because it may be revealing about the development of turn-taking.

Onomatopoeia, a category used by McShane (1980), was included but not in exactly the same sense. He used it to describe onomatopoeic words that are naming an object,

whereas this is coded as a statement about the world in this study. Onomatopoeia is a common part of communication with and by children and so was considered a worthwhile category. Making the sounds of cars, trains and animals is a meaningful and vocal part of play.

As revealed in Chapter Two, pointing or deixis is an important part of early interactions, particularly in Bruner's (1975a) theories where it plays a part in early propositions. Thus, this was considered a useful category to further investigate the role of deixis in language development.

McShane (1980) measured utterances which had a 'conventional mood' which he defined as utterances using "a conventional grammatical means of signalling" certain meanings (p.94). This would not include 'please' on its own but might include, 'Can I have a biscuit, please?' It would also include signalling intention, such as 'I need to go to the toilet'. Schachter (1979) also examined convention in a small way, included in the rather mixed bag of Routine Scores. Thus, a conventional utterance, such as 'God bless you', would be included here, but along with 'you know', 'hi' and 'what?'. This did suggest though that conventional aspects of communication are worthy of examination. Bruner (1975a) discussed the gradual conventionalisation of communication and thus it was considered important for this investigation into the development of language.

These five categories, Ritual/Games, Onomatopoeia, Exchange, Deixis and Polite & Conventional utterances, were grouped together at the molar level. The Exchange category covers clearly defined ritualised 'give and take' situations, some conventionalised, such as shaking hands, some established routines such as one person building up bricks and the other knocking them down. Deixis involves convention as a rough gesture becomes clear pointing.

The Games or Rituals encoded are established routines, mainly originating outside of the dyad, such as nursery rhymes, peep-bo and hiding objects, and so have a conventional aspect as they are culture specific. Such games are seen to play a fundamental part in the development of social exchange and conversation. (See Chapter Two for a discussion of these issues).

The Onomatopoeia category also has a degree of convention about it in that most sounds uttered have become actual words, such as bump, crash and bow-wow. There are also culture differences in these sounds. If the onomatopoeic words were purely imitative of sound, they would be the same in different languages, and they are not. For example, the English 'tick-tock' is 'tic-tac' in French and Polish; the English 'Whoops-a-daisy' is 'Houp-là!' in French; the English 'wallop' is 'patatras' in French and the English 'crash' is 'baraboum' in French, and whereas in English we would say 'woof' or 'bow wow', the French would say 'oua oua' (none of which really sound like a dog!).

The Polite and Conventional Utterances category, by definition, covers the conventional utterances our culture uses. Thus, these five categories have a conventional underpinning, and can be grouped together for sound theoretical reasons.

A Miscellaneous category was included, as McShane (1980) had done, because this allows for any unspecified category to be coded without being pushed into a category which it does not fit. It also allows a measure of the coding scheme's efficiency for if there is a large percentage of utterances coded as miscellaneous then the scheme is inadequate.

The introduction of some meta-message categories has been mentioned. Two of these were Imputed meaning and Indirect Speech acts (as discussed in Chapter Two). Three others were included in this exploratory area: Sarcasm, a light, teasing playful tone, and an emphatic tone. These categories were rated in addition to the above one, if they added to or modified the message in anyway.

Such a Category Analysis Tool was considered important for several reasons. Firstly, as it measures communication at the social-functional level, it allows for examination of communication at a significant and meaningful level. Camaioni (1979) discussed the importance of sociological and linguistic factors to elucidate conversational competence, where examination of "the physical, social and cultural

context" (p.326) of the conversation is pivotal. She also points out

"the limitations of an approach that considers conversation development as isolated, and in a certain way independent, from nonverbal communication on one side and social interaction on the other" (p.326).

This category analysis tool takes account of the physical, social and cultural context of the interactions, and includes the issues of social interaction and all channels of communication. Most importantly, it takes account of the social interaction in that it measures both sides and in the same terms. The data derived from use of such a Category Analysis Tool may reveal useful information concerning a child's social and communicative development, about a mother's skills and role in this development, about any distinction between different children's development and different mothers' skills, and about failures and problems in these.

Technique for implementing the Category Analysis Tool

The analysis is performed directly from the video-recording as non-verbal and prosodic channels were being used in the analysis, as well as the importance of context. An example of the coding procedure is given in the Appendix (page Appendix 1). The video-recording is watched and as soon as a communicative act is observed, the video is paused and the category noted on a single line on the paper, in the colour ink corresponding to whether the act is by the child or the mother. The tape is re-started and then paused when

the next communicative act is observed, and this is noted on the next line. By recording mother and child on subsequent lines in this manner, a record of the acts as they occur over time is achieved.

A review of the literature revealed that most commonly 'utterance' or 'communicative act' are not defined (e.g. Ferrier, 1985;), and this has some sense to it. This is a special case, whereby language is being used to describe itself by language-users and there is a common knowledge, or a common sense, about what constitutes an act or an utterance. McShane (1980) makes some attempt to define an utterance and it should be noted that he only examines utterances and not non-verbal or gestural acts. He points out that an utterance can be but is not always a grammatical sentence and that it can be a phrase segmented by a distinct pause. With children it can be holophrases, two word utterances, early sentences and vocal utterances which are without recognizable words but have a distinct pause at the end. He stated that in determining what constitutes a pause "an intuitive criterion" (p.77) was used. This use of pause as a primary guide is a common technique (e.g. Nelson, 1989). It is unrealistic to specify the minimum length of a pause as this would be cumbersome to measure as well as the fact that natural language does not follow such rules. On occasion, one speaker may just be completing her utterance when the next speaker starts his, and there is not clear

pause. The pause is most useful in segmenting same speaker utterances, but it cannot be definitive.

Further difficulties can arise with the type of act to be coded. Also, not all behaviours are coded as acts: it is necessary that they be determined as communicative. Most behavioural and gestural acts are discrete and therefore unproblematic to segment, such as shrugs and smiles. However, other acts can have uncertain boundaries. For example, a child crying can be quite a lengthy event and it is necessary to define some arbitrary way to segment this. Here, the onset and offset of such behaviour was noted only. Further investigation may be necessary to determine how useful and meaningful this is. The other problematic point in coding is when a child utters two words one after the other, such as 'people' 'train'. From the context it may be possible to determine that the child is communicating that 'the people are in the train' and thus that the two adjacent words are forming one proposition. McShane (1980) achieved good reliability measures between coders and it must be this measure which indicates how efficient the coding scheme is and to highlight any difficulties in segmenting acts and utterances. Absolute definitions of what is an act and each category is impossible and it is through practical implementation with various coders that it can be determined what, if any, difficulties arise. This technique is formalising behaviour which occurs hundreds or thousands of times a day, that of understanding communication.

Transcribing was only performed under certain conditions:

(a) all utterances recorded in the miscellaneous category. If they could not be transcribed, then they were described. This was a very rarely used category.

(b) all counting.

(c) for any categorisation where the scorer felt uncertainty. This was to enable further examination and clarification in the reliability measures where appropriate; to highlight any difficulties with the category analysis tool in case of future revisions.

Simultaneous utterances were still recorded on separate lines but were bracketed together. Thus:

$\left\{ \begin{array}{l} A3 \\ R \end{array} \right.$

A single category was recorded in brackets and this was incomplete instances of category 'K' (Exchange) - see under category for details.

Time was recorded by a straight line across the column with the time written on the same line. The time was noted every half minute, according to the on-screen video clock.

The category [M] records repeated or 'mimicked' utterances. In order to know what was repeated, the object of repetition was marked with an asterisk.

Any occurrence that helped to explain an utterance was briefly noted. For example, a mother saying 'Bless you', may be clarified by noting that the child had sneezed.

Other than this information, all coughs, sneezes and exertion noises were ignored.

The frequency of categories was established for all mothers and all children for all sessions attended. The frequency data for the metamessage categories were noted separately. Patterns of conversation were analysed and this technique is described in Chapter Four.

DESCRIPTION OF CATEGORY ANALYSIS TOOL

There are three groups of categories used in this analysis tool. The main group, consisting of 14 categories, describes the content or message of communication. The second group, consisting of 5 categories, describes the style or metamessage of communication. The last group, consisting of just two categories, describes 'manual' categories that may enhance or underlie communication. In this case, the communication being examined is that of a number of mothers each with their emergent-language child, and so examples and explanations concentrate on such communication, but it is hoped that the system could be applied to adult-adult conversation. The category system is applied without amendment to both participants, whether pre-verbal child or adult.

Content / Message Categories

These fourteen categories are for describing the message or the function of an utterance. Four of the categories are sub-divided. The categories are defined below, and examples given.

ASSERTIONS [A]

Assertions are statements which include action, location, state, intent, completion, possessive, nominal, numbering and description.

EXAMPLES:

ACTION: It crashed!
LOCATION: The car is behind you.
STATE: I'm hungry.
INTENT: I'm going to build a castle.
COMPLETION: I've done it!
POSSESSIVE: It's my teddy.
NOMINAL: It's a train.
NUMBERING: One, two, three. Two biscuits.
DESCRIPTION: It's a big red bus.

There are sub-divisions of the assertion category.

They are:

[A] Any general assertion that is not specified below. This may include an unfinished or indistinct utterance, or an utterance of the child that is difficult to distinguish. A non-word that has consonants as well as vowel sounds, MAY be an assertion (such as 'Gah'), and non-words that are purely intonation patterns MAY be expressives, but this is not an exact rule and context is needed to determine the classification. A consistent use of a non-word to apply to a certain event or object can indicate that it is an assertion. The mothers would also give additional information at times which would clarify this and her response to the child was an added source of information for defining these.

[A-ve] Any general assertion in a negative form that is not specified below. For the pre-verbal child, the intonation pattern may be significant in determining the negative.

[A1] Assertion about the self. All 'I' statements and possessives. This includes commentary on own actions.

Examples: 'That toy is mine.' 'I want to do that.'

'Put the brick in the hole.' (when describing own actions - not when an instruction.)

[A1-ve] Negative assertions about the self.

Examples: 'I don't want to do that.' 'It's not mine.'

[A2] Assertions about an other. Refers to any other person present or absent. Also includes pets but not toys.

Examples: 'You are driving the train.' 'It's your toy.'

[A2-ve] Negative assertions about the other.

Examples: 'It's not your toy.' 'You're not building a very big house.'

[A12] Assertions about 'we'.

Examples: 'We're building a big castle.'

[A12-ve] Negative assertions about 'we.'

'We're not making a very good station.'

[A3] Assertions about the 'world.' Statements not about self or others, mainly about objects.

Examples: 'That's red.' 'It's a big car.'

'One, two, three.' {Mark 'A3' for each number.}

'There it is.' {When designating location.}

The child's protolanguage, or non-word utterances, may be classified as this when context suggests this. For example, when such an utterance is accompanied by pointing at an object, then it may support the classification as A3.

[A3-ve] Negative assertions about the 'world'.

Some statements may be followed by a phrase that turns the utterance into a question. These phrases are called tag questions and are classified in category [T]. The part of the utterance prior to the tag will be classified also.

Example: 'It's a car, is it?' [A3/T]

'You want a drink, do you?' [A2/T]

RESPONSES [V]

Most, if not all, utterances could be classified as responses. This category covers just three types of responses.

[VR] REFUSALS: including 'no', not complying, shaking the head. For example, the mother may ask the child to relinquish a toy and the child may keep tight hold of it. Not complying also encompasses defiance, such as the mother asking the child to come here and the child walking away in the opposite direction, or being asked not to touch an object and then touching it.

[VC] COMPLIANCE & AFFIRMATION: including 'yes', 'O.K.', 'mmm.', compliance, nodding head, 'alright ' when meaning O.K.

[VK] **ACKNOWLEDGEMENT:** such as 'I see', 'mmm'. Looking at attention-getting behaviour, responding to name being called by head turning, eye contact, turning round, coming towards speaker, etc.

EXPRESSIVES [E]

[E] General indication of feeling, including surprise, astonishment. Often 'Oh!' If two examples of an expressive follow each other, they must have a distinctly different intonation pattern to both be coded as 'E', otherwise the second expressive is encoded as a repetition.

[E+ve] Expressing positive affect, including expressing excitement, smiling, laughing. 'I feel happy.'

[E-ve] Expressing negative affect, including frowning, crying, expressing frustration. 'I feel sad.' The child may express negative affect by holding himself rigid, by arm flapping, by throwing an object, by hitting an object or person, as well as by crying. If the child cries for long periods, mark an 'E-' at the onset, and write down where the crying ends or pauses.

ONOMATOPOEIA [O]

Words or sounds that are imitative of actual noises or actions, such as 'bump', 'bang', 'hiss', 'buzz', 'brmmmm', 'pooh!', 'whreeee', blowing a raspberry.

Nonsense noises that are not onomatopoeic are categorised as miscellaneous. The child may call a dog 'bow wow', but this is category 'A3' because it is a nominal, it is not making the noise of the animal.

REQUESTS [R]

Essentially, this covers the questions. It includes those utterances in standard question form and those with an interrogative tone. One exception is detailed in the [H] category where questions starting with 'Shall we..' or 'How about...' are classified as suggestions. The child's non-verbal 'demands' are usually classified as Requests, unless they are emphatic, when they are categorised as Directives.

Includes requests for:

INFORMATION: 'What's that?'
ACTION: 'Will you push the car?'
STATE: 'What's up?'
CLARIFICATION: 'What did you say?'
REPETITION: 'Pardon?'
PERMISSION: 'Can I help you?'
LOCATION: 'Where is the ball?'

A request may be in the form of a child grasping at mother when wanting to be picked up, or extending arms when wanting a toy to be placed in reach.

Some requests will be in the form of an indirect speech act, such as 'Can you get the car for me?'. This is categorised as a request, but more details of this are in the metamessage section.

Some questions, often in the form of a statement with an interrogative tone, may, in addition, have the metamessage of expansions or imputed meanings. For details, see metamessage category [X].

Examples: 'What's this?' 'Do you want this one?'

TAG QUESTIONS [T]

This is a phrase at the end of an utterance which transforms the utterance into a question.

EXAMPLES:

'He's tired, is he?' [A2/T]
'It's a big car, isn't it?' [A3/T]
'We'll build a castle, shall we?' [H/T]

'eh?' after an utterance is not a tag question. The utterances 'Where are you going?' 'eh?' would be coded [R] [R]

HINTS & SUGGESTIONS [H]

Essentially a suggestion. This can be a certain form of polite request, usually starting with 'Shall we...' or 'How about...'. Otherwise, commonly starts with 'Let's'. Tone is important for determining between a suggestion and a directive.

EXAMPLES:

'Let's play trains'	'Let's build a castle'
'Shall we play trains?'	'How about a game of ball?'
'We'll build a castle, shall we?' [H/T]	
'Come and play with these beakers.' (if Interrogative tone, not if Directive tone).	

DIRECTIVES [D]

This is essentially an instruction, often in the form of a command or order, but can be in a milder form. Not a request or suggestion. The child's non-verbal 'demands' are usually categorised as Requests, and are only classified as Directives if they are emphatic.

Includes reprimands, imperatives, forbidding.

EXAMPLES:

'Let go!' 'Stop that.' 'Come here.'
'Put that down.' 'Put the brick in there.'
'In there.' (pointing) 'Give us a kiss.'
Index finger to closed lips and Ssshhh! i.e.
Be quiet. 'Like this.' 'Come on' when
an order, not when encouragement.
'Come and play with these beakers.' (with
Directive tone.)

GAMES/RITUAL [G]

This a broad communicative act that includes utterances and ritual acts.

Remember: some ritualised games do not involve any utterances but may be included in this category.

GAMES includes:

Incy-Wincy spider	Peek-a-boo (Peep-bo)
Pat-a-cake	Nursery Rhymes*
Play chants	Ring-a-ring-a-roses
See-saw	kissing better
blowing kisses	singing and dancing
hiding an object and finding it	
building up/knocking down bricks, beakers,	
'Ready, steady, go.'	clap hands as a game
pushing car or train with another involved	
(i.e. (attempts to) push to the other or for	
the other to go and fetch. NOT moving object	
when the other is not involved.)	
throwing balls etc. when other is involved.	
narration.*	

* segmenting of nursery rhymes and narration - mark 'G' at onset and again after any other utterance.

Example:

Mother: Incy wincy spider climbs up the water spout [G]

Child: (laughs) [E+ve]

Mother: Down came the rain and washed the spider out.
Out comes the sun etc. [G]

SALUTATIONS [S]

This category covers three groups, but they are not coded as sub-divisions.

GREETINGS:

Includes: 'Hello' (and similar, such as 'Hi')
'Goodbye' (and similar, such as 'Ta ta')
'Goodnight' (and similar, such as 'night night')
waving, shaking hands

CALLING A PERSON'S NAME (whether person is present or absent). This is always categorised as [S] and never as a repetition, as name calling is quite common in interactions with young children. A name attached to another utterance is not counted, such as 'Bring the ball to me, David.' which is categorised as [D]

A child's holophrase may consist of a person's name, so the function of the holophrase needs to be determined. For example, one child says 'Laura' and this is because she can be heard next door crying - this would be encoded as 'A2'.

ALL BIDS FOR ATTENTION. BOTH VERBAL and BEHAVIOURAL.

EXAMPLES:

squeaking/rattling toys clapping hands (for attention) 'Look' 'Watch' 'Oi!' 'Hey.'

Mother: 'Look, Daniel./ Daniel. / (bangs toy).' this
encodes as ' [S] / [S] / [S] .'

POLITE & CONVENTIONAL UTTERANCES [P]

EXAMPLES:

'Please' (when not functioning as a request)
'Thank you' 'Ta' etc. (when not functioning
as a request). 'Pardon me.'
'Excuse me.' 'Bless you'
'Oh dear' (NOTE: 'Oh' alone categorised as [E])
'Whoops', 'Ooops', 'Whoops-a-daisy'
'There you go'
'There you are' (when not location)
'Here we are' (when not location)
'Uh-oh' with an 'oh dear, what's up' meaning.

MIMIC, IMITATION, REPETITION [M]

This does not include repetitions of name, repetitions of bids for attention, or those re-worded repetitions that are classified as Expansions. The repetition should be exact or near exact, that is no more than a two word difference. The utterance being repeated is marked with an asterisk.

Example: 'Bring the book here.' [D*] 'Bring it here, David.' [M] . 'What's this?' 'What's that?' are both category 'R' and not repetition.

Child: 'One' points at first camera. 'One' points at second camera. Both categorised as 'A3' because distinctly different objects.

Mother: 'Brick. Brick.' [A3*] [M]

Child: 'Bik.' (M)

For the Full Categories and the Condensed categories the data were revised by taking all the self-repetitions and recoding them as the utterance category of the repeated

utterance. Thus, an [A3* M] would become two instances of [A3]. This created a new group of utterances: repetitions of the other.

COMMENT [C]

There are two sub-divisions of this category.

POSITIVE COMMENT [C+ve]

Includes: praise, appeasement, encouragement, self-congratulation.

EXAMPLES:

applause	'Never mind.'
'Well done.'	'There there.'
'Come on' (unless a directive)	
'Hurray.'	'Goal!'
'All right' (as appeasement).	

NEGATIVE COMMENT [C-ve]

Includes: criticism, censure, discouragement.

EXAMPLES:

'Naughty boy.	a smack
'What have you done?'	(exaggerated tone)
'Silly boy.'	
'You shouldn't do that.'	

MISCELLANEOUS [2]

All utterances not covered by other categories. All utterances in this category should be transcribed or described. This parallels with McShane's Miscellaneous category. In his analysis, this category accounted for on average 5% of utterances, the highest being 9% of a child's total utterances. His miscellaneous category included

salutes (hello, goodbye) and utterances that describe the child's mental states, which are covered by this system's [S] and [A1]/[E] categories, respectively. McShane saw the miscellaneous category as informative, possibly leading to extending his system to include new categories. In addition to this category he scored some children's utterances as 'not possible to categorize'.

Style / Metamessage Categories

There are five categories in this group. They reflect the use of tone or other means to add information to or moderate or alter the meaning of an utterance.

INDIRECT SPEECH ACTS [N]

Briefly, indirect speech acts can be a means of saying something other than or as well as the surface meaning. They are often formulated as a request.

Example: 'Can you get that for me?' [R/N]

Polite and conventional form of request 'will you get ...'. Can also function as 'are you able to get..' or function as both.

Example: 'Nobody loves me.'

Can also function as 'give me some affection.'

EXPANSIONS & IMPUTED MEANINGS [X]

Imputed meaning has already been discussed in Chapter Two when discussing Bruner's work in relation to imputed meaning. He stated that "adults impute communicative intent to the utterances of infants and children" (Bruner, 1975a, p.73). Expansions are not pure repetitions, but may be re-

worded repetitions which draw out the meaning. It is possible that these utterances may be in the interrogative form. Imputed meanings involve a problematic element of judgement because the mother's utterance will only be seen as imputed meaning if it is considered that the child was communicating in an unclear or incomplete manner, and that the mother states her interpretation of the communicative attempt.

Example:

Child: (is banging on the door) vocalises. [R]

Mother: You want to go out? [R/X]

Example:

Child: People. Train. [A3]

Mother: We'll put the people on the train, shall we?

[H/T/X]

LIGHT, PLAYFUL TONE

[L]

A light tone which indicates meaning other than the surface meaning, or moderates it. Often a negative message with a positive tone. Just a playful tone that does not moderate the meaning is not categorised.

Example:

You mustn't do that! (laughing) [D/L]

Silly boy! (laughing) [C-ve/L]

'WIT', IRONY, SARCASM

[W]

Use of a tone which indicates meaning other than surface meaning. Often a positive message with a negative tone.

Example:

That was clever. [C+ve/W] when child has just accidentally knocked over a brick construction of the mother's.

Example:

Thank you. [P/W] when the child has just trodden on the mother's foot.

EMPHATIC TONE

[I]

Use of emphatic, peremptory or authoritative tone. This metamessage category does not alter the content message but reinforces it. It carries information in addition to the content message and may differentiate between an order or command and a request.

Example:

Don't do that! [D/I]

Manual categories

Not all interactive behaviour could be measured and so much was left out, such as physical contact (cuddles, etc.) and very little of eye contact was included. As the material was video-recorded, this could be added to the current system in the future if deemed useful. Just two categories were included in this 'manual' group. They were

termed manual for want of a better description in that hands play a part in both categories. One category, Deixis, functions directly as part of communication. The other category, Exchange, describes behaviour which may possibly underlie conversation in that it develops turn-taking skills, according to Bruner (1975a).

DEIXIS, POINTING, INDICATING

[^]

This can occur alone or as an adjunct to an utterance. It is often clear pointing, but may be less exact, such as a half-hearted sweep of the arm, or extended arm with open hand. Reaching in this way may be a request, so context may be needed to determine the category. The child may sometimes have an object in his hand when he extends his arm, but this may still be indicating, unless he is showing the object to someone. It is important to consider that infants may stretch out their arms as a request for an out-of-reach object. This would be classified as [R].

Moving the beads on the abacus is NOT deixis, but beckoning is.

EXCHANGE [K]

GIVING OR OFFERING: [KG]

When a person successfully gives an object to another person, it is scored [KG]

If a person offers an object but it is not taken, then it is scored in brackets [(KG)]

TAKING OR TRYING TO TAKE: [KT]

When a person successfully takes an object from another person (not from the floor etc.) then it is coded [KT]

If a person tries to take an object from another person but fails to do so, then it is scored in brackets [(KT)].

THE CONDENSED CATEGORIES [LEVEL FOUR]

The encoding of all utterances was performed using all these categories and meta-message categories. Some analysis was performed on this Full Category data, but most analysis was performed on Condensed Category data [Levels Two and Four, mainly]. This was because the analysis became more manageable and there were less zero frequencies, which would present difficulties for some statistical analysis. The reducing of the above Content / Message and 'Manual' Categories into the Condensed Categories is detailed below. The Category System was designed to condense prior to being applied and thus it is not a reduction of data after analysis: it is a hierarchical system determined by theoretical factors. Metamessage categories were not involved in the condensing but were analysed separately.

[1] **ATOT** This is simply all utterances that come under category 'A', that is all assertions.

[2] **VTOT** This is the combination of the three types of response sub-categories: refusals, compliance and acknowledgement.

[3] **ETOT** This is both negative and positive affect.

[4] **REQUEST (REQ)** This includes all questions covered by the full request category, and all suggestions also. Thus, it includes 'R' and 'H' full categories, and Tag questions.

[5] **RITUAL (RIT)** This combines five full categories. The Games / Ritual category, the Onomatopoeia category, the Polite and Conventional Utterances category, and the two Manual categories of Exchange and Deixis. The grouping of these was discussed in the Process of Development section earlier in this chapter. Although it was argued on theoretical grounds, it remains to be seen whether this grouping is satisfactory. An examination of the data obtained may further clarify this, and as this is only a molar level grouping, it is not a fundamental issue.

[6] **S** The Full Category 'S' on its own.

[7] **CTOT** Both positive and negative comment, the 'C+' and 'C-' of the Full Categories.

[8] **D** The Full Category 'D' on its own.

[9] **Repetitions of the Other (REPO).**

The hierarchical organization of the different levels of categories is shown in Table 3.6. A Summary of the condensed categories can be found in Table 3.7.

HIERARCHICAL ORGANIZATION OF CATEGORIES

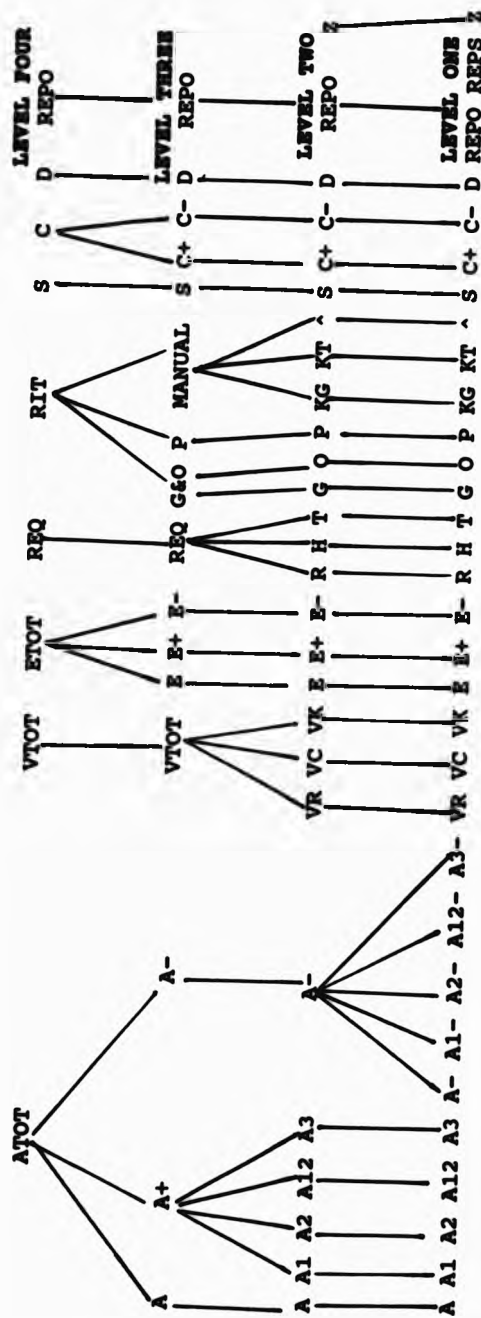


Table 3.4

ASSERTIONS	'RESPONSES'		EXPRESSIVES	REQUESTS
Positive Self Other World	Refusals.	Compliance & Affirmation.	Positive	All Questions and suggestions ignoring Tag Questions.
Negative Self Other World	Acknowledgement.		Negative	
RITUAL	SALUTATIONS	COMMENTS	DIRECTIVES	REPEATS
Games & Ritual.	Greetings.	Positive: praise, appeasement	Instructions, commands, orders, reprimands, imperatives	of self or of other.
Onomatopoeia	Calling someone's name.	Negative: criticism, censure		
Polite & Conventional Utterances.	Bids for attention.			
Exchange.				
Deixis.				

Table 3.7 Summary of the Condensed Categories (Level Four)

Comparison with the studies of McShane & Schachter

The Category Analysis Tool has been devised in part from aspects of McShane's (1980) system and Schachter's (1979) system. Thus, they have some similarities, as indicated in Table 3.8.

The metamessage categories used in this study measure an important channel of communication but one that is rarely studied. The only clear parallel was a measure of Expansions in Schachter's study. Schachter recorded an average of 1.67% of expansions. McShane does indirectly analyse some Indirect Speech Acts by his use of Conventional Mood, but this does not equate with the metamessage category used here.

Table 3.8 has indicated the many similarities between the three studies, for example, this study's category Assertions is similar to some of McShane's Statement and Personal categories. Assertions is also similar to Schachter's FIS-C VIII, IX and X and FIS-P II, III, VIII and X (see Table 3.1). Schachter and McShane have further categorised the broad category of Assertions, while this study did not.

Differences between this category system and the other two were noted. Responses, in this study category [V], concerned the bulk of Schachter's FIS-C, covering categories I-VI, but does not have a category for the children. This study's response category is a specific communication that is Acknowledgement. McShane's category system has parallels of this response category in his Answer category,

McSHANE'S SYSTEM (1980) CHILD ONLY	SCHACHTER'S SYSTEM (1979) MOTHER	CHILD	THIS STUDY'S SYSTEM (1992) TO BOTH MOTHER AND CHILD
Most Statement categories	[IX] [X] [VIII]	[VIII] [II]-[V]	Assertions ATOT
Most Personal categories			
Answer Refusal/ Answer No Answer Yes	[I] to [VI] [VII] (3)		Responses VTOT [PLUS Refusal VR ACKNOWLEDGEMENTS] Agreement VC
		[I] ([VI])	Expressives
Requests/Question Cat.s Tag Yes-No	([VIII])		Requests [PLUS HINTS Tag Questions AND SUGGESTIONS
Exchange categories Onomatopoeia Conventional mood	[IV] (3) [IV] (4) Routine scores	[VII]	Games [PLUS POINTING] Exchange Onomatopoeia Polite & Conventional utterances
Vocative Attention	Routine scores	[X]	Greeting Calling name Bids for attention
(Protest?)	[I] (3), [III]	([IV])	Positive comment Negative comment
	[VII]		Directives
Imitation	Appended data for mothers		Repetitions of self, of other
	Subcategory Explicates		Expansions & Imputed meaning [+4]

Table 3.6 COMPARISON OF THREE CATEGORY SYSTEMS [For details of Schachter Categories see Table 3.4]

and matches the [VR] Refusal and [VC] Compliance with Refusal, Answer No and Answer Yes. Schachter also has a category refusal (FIS-C VII (3)) but only for the mother, which is difficult to justify.

McShane distinguished between Requests and Questions, although of course, his categories were not mutually exclusive and he could allow a question to fit both categories. His system does have a sub-category for Tag questions. This study measured Requests (all forms of question), Suggestions and Tag questions. Schachter does not measure Request in the child but does measure mother questions. Some questions are categorised as FIS-C VIII, and the percentage of questions asked by mothers in terms of their total utterances was assessed: it varied between 19% and 31%.

Games were not specifically categorised by McShane but Schachter does measure this for both mothers (FIS-C IV) and children (FIS-P VII). Pointing is not measured specifically by McShane or Schachter. The Exchange categories in this study were reflected by the Exchange categories of McShane and FIS-C IV (4) by Schachter, a mother category, but not for the children. It seems difficult to explain how only one side of exchange behaviour is measured. Onomatopoeia was a sub-category of McShane but not a type categorised by Schachter, and differed in definition in some degree.

Polite and Conventional utterances were reflected to some degree by McShane's use of Conventional Mood although his use of this is broader than the present study.

Utterances commencing 'I need...' or 'I want...' would not be categorised as Polite or Conventional utterances in this study. Other differences are apparent in that 'Please' is categorised as Request Other by McShane and not conventional mood. Schachter also assesses Routine Scores in addition to the category system used, and this measures such utterances as 'you know', 'what?', 'hi' 'God bless you'. These account for over 3% of the mothers' total talk. 'You know' was not categorised in the present study as it is a conversational filler (or a habit) and rarely carries any communicative purpose. The mothers in the present study did not actually use the phrase anyway. In this study 'what?' would be classified as a request and 'hi' as a salutation. 'God bless you' would be counted as a conventional utterance. Thus, there are major differences between all three studies in this area of communication.

Salutations, in the present study, encompasses three types of communicative acts: greeting, name calling and bids for attention. Greetings are not included as a category in McShane's system although 'salutes' are coded into the miscellaneous category. Greetings are only partially included by Schachter, who denotes 'hi' as a mother routine score. Calling the other's name is a commonly used category: McShane has a distinct category for it (Vocative), Schachter categorises the child's name calling as FIS-P X, but does not categorise the mother name calling. Dore (1975) has shown that Vocative is a common category. Bids for attention were not specifically categorised by

Schachter, but McShane does categorise several types of Attention category, and states that gestures are likely to occur in these communicative acts. Halliday (1975) drew these 'intreactional' categories together.

The Positive and Negative comment of the present study was covered to a degree by Schachter's categories FIS-C I and III and FIS-P IV, so both mother and child are analysed for comment. McShane does not specifically categorise for Comment, but he does have a sub-category Protest, which may be encompassed by Negative Comment, but is more likely to be described as [VR] Refusal.

Directives were not a specific category for McShane and Schachter only classifies the mothers utterances in this way (FIS-C VII), and this is a limited form of Directives (Do's and Don'ts). McShane does categorise Requests and it seems an unjustifiable omission to not distinguish Directives. Schachter classifies communicative acts functionally but particularly in relation to the other and so there are major differences in the category systems.

Repetitions were analysed by all studies. McShane classified them as Imitation and found the amount of Imitation was variable, especially between children. On average, he determined 19% of conversational responses were Imitations, but conversational responses were only one group out of five category groups, so it is not clear what percentage repetitions make of the whole. Also, not all repetitions were designated as such. For example, uttering 'Peep bo' after the other has said it is counted as Follow-


On (Other) not a repetition. The repetitions by the mothers of self and child were assessed in addition to the category system, by Schachter. Over 26% of utterances by the mothers were repetitions: 14.9% of self and 11.5% of the child. Schachter did not assess the child's repetitions.

It is clear that there are a core of categories shared by the three systems, which lends some credibility to them all. A clear difference is that McShane's study only examined the child's communication, Schachter's study examined both sides of the communication but with different measures and this system is applied in the same way to both sides of the interaction.

SUMMARY

The Category Analysis Tool which has been developed and described here is considered to be of mutually exclusive, comprehensive categories, and able to analyse at both molecular and molar levels. A review of the literature revealed the difficulty of distinguishing between communication and social interaction, and this distinction was not made here. Instead, a comprehensive number of communicative acts were incorporated into the instrument with the addition of a few more socially based categories, such as exchange. All the more socially based categories were shown, from reference to other studies, to be linked with communication and its development.

Several metanessage categories were included in the instrument because of the difficulty of coding a communicative act when it has one message but another



metamessage, and thus the clarification was necessary. The Category Analysis Tool was designed to be allow analysis at a number of different levels, using either all the 32 categories or a condensed nine. This was valuable for purposes of analysis and for summarising the data.

CHAPTER FOUR

*** RESEARCH METHODS ***

a discussion, and report of this study's methodology

RESEARCH FRAMEWORK

This research studies communication between mother and child using a social-functional approach, which means viewing language as being used purposefully by human beings in actual interactions. Speech Act Theory is one such approach and seeks to examine the intentional and conventional aspects of utterances. Other studies using the functional approach use broader categories to describe communication.

Much of the research into the area of communication development and mother-child interaction has been either behaviourist or nativist, neither one being satisfactorily productive or elucidating.

"Perhaps in response to this theoretical stalemate, and to many years of the dominance of structural models, psycholinguists have begun to turn to functional theories for frameworks to describe language" (Dore, 1983, p.167).

It is considered by many that the mother plays an important part in the child's language acquisition (Bruner, 1975, 1983; Schachter, 1979, Trevarthen, 1979, 1982). Although this is a significant factor for study it was largely neglected until the last decade. A vast amount of research has been carried out on child language, but only

a small percentage include any measure of the mother's contribution (see Chapter Two).

It was considered that a thorough, functional analysis of the communication in a mother-child interaction through a longitudinal study would be edifying. As Francis (1979) stated,

"Valid descriptions of child language in use are not, however, all that is needed in an account of language acquisition. What is required further is some description of how change in use is affected. Now I think the method of attributing functions of various kinds to aspects of speech acts takes research forward in this respect" (p.209).

This is valuable as far as it goes, but it is only suggesting examination of one side of the coin. It is more sensible and useful to have a parallel examination of the mother's communication as well.

This study aims to examine both sides of the mother-child interaction over a year. A longitudinal approach is used rather than cross-sectional for, although it is more time consuming, it has many advantages. The same individuals are used and thus changes and stages can be more confidently studied and any continuities can be detected. A social-functional approach was used because of its value in determining the broad communicative acts that occur in interactions. Also, it is able to assess communication at several levels and across all channels: non-verbal, verbal, intonational and pre-verbal. Patterns of conversation are taken into account rather than using only frequency measures.

Alternative ways of looking at the research questions

Others may propose alternative ways of looking at the research questions tackled but it is suggested that this would alter the research question.

"Every researcher's theoretical framework influences his/her choice of methodology and methodology determines to a large extent the theoretical questions s/he can answer" (Als et al, 1979, p.33).

If the issues of intersubjectivity and mutual knowledge discussed in Chapter Two are taken into consideration, then it may seem important for the mother to identify and interpret her child's early attempts at communication, because they have shared knowledge on which to build their understanding. However, a pilot study which required the mothers to identify and interpret every communicative attempt by their child showed the mothers found this task very difficult. Despite explanations and numerous examples, they commented on a very small percentage of the child's communicative acts, and then all remarked on at least one occasion that they were guessing at the meaning or that they didn't know.

The logical step from this would seem to be to train the mothers in observational skills and the use of the category tool to give them some structure by which to describe their child's communication. However, several points argue against this. One is that it would be unreasonable to ask mothers to invest the time required to undergo the training and then perform the analysis. A second point is that then the study would be examining a

very unusual group of specially skilled mothers which may have limited meaning. Some studies are carried out by researchers on their own children but this necessarily means a small sample ($n = 1$ usually) and some are criticised for a lack of objectivity.

Finally, a crucial part of this investigation is that both sides of the conversation are examined, so if the mothers perform the analysis, they then would be interpreting their own acts as well as those of the child. It is likely that the process of interpretation would be different in that one would involve some (private?) knowledge of the intentions or motivations of the speaker and the other would not. Thus, although it may seem theoretically sound to have mothers perform the analysis, it is not practical or methodologically sound to do so.

Typically in psychology, the experimenter carries out the research in a structured way to achieve an objective stance. Measures of inter-observer reliability are used to help to guard against an idiosyncratic analysis. However, in most cases (and in this study) the experimenter has interacted with the subjects and the external observer has not. This means that the experimenter and the external observer will vary in degree of intersubjectivity relative to the subjects. A stringent tool of analysis will reduce the effects of this but at the functional level of analysis, where interpretation plays a significant part, then it must be born in mind as a possible, but unavoidable, influencing factor.

It would, of course, be possible to apply other category systems and/or other means of measuring patterns of conversation. The use of any category system would always be open to this point and all that can be said is that the category system chosen can be considered satisfactory if it measures what it purports to measure, does so efficiently and produces results that meaningfully represent the behaviours being analysed. Of the current category system, it could be expanded by a further analysis, examining more metamessages or breaking down the assertions into warnings, descriptives, etc.

Observation techniques are seen to be problematic in terms of objectivity and controlling for intervening variables. However, "the experimental method in psychology is not always well adapted to analysis of complex mental events" (Trevvarthen, 1982, p.86) such as intentions of speakers. Observation studies can be by a present observer, through a one-way mirror, or, more commonly now, by using video-recordings. Kent et al (1979) has suggested that the media has some effect on categorisation of vocalisations.

It has been reported that it is the obtrusive effects of the video-recording that cause difficulties, and that this must be minimised. Renne et al (1983) suggested five routines which would reduce these effects. Attempts were made to take them into consideration in the study. The first, preparation, requires the procedure of the recording sessions to be explained to each mother and their informed consent obtained: this was carried out. Second,

familiarisation requires that the subjects are acquainted with the setting and equipment: this was carried out. Thirdly, adaptation requires that subjects are allowed to get used to the setting before the onset of recording: this was done. The fourth routine, minimisation, requires that the contextual influences are minimised, involving the cameras being out of the way (they were wall-mounted in the corners), that the microphone be unobtrusive (it was fitted in the ceiling), that the operator be out of sight (the recording room was next door and the whole system worked by remote control) and that camera noise was minimised. This latter point was not entirely dealt with as there was certainly some noise from the remote control motors but this was unavoidable. The fifth and last routine, programming strategies requires that the decision of when to commence the actual recording after the subjects have settled down be predetermined (this was done) and that if the whole interaction was recorded then the segment to be used was predetermined.

Research methods are an integral part of the research question and alternative ways of trying to look at the same thing will not always be asking the same question.

Participants:

The eight dyads were recruited from advertisements in local newspapers in East London. A departmental secretary took the name and address of each caller (on separate pieces of paper) of all who responded to the advertisements for a period of ten days after publication. About twenty callers

were interested enough to leave their name and address. The researcher then took the names at random and attempted to make contact until the eight families were selected and agreement had been made. If there was no answer when telephoned the name was put back with the other pieces of paper and so could be selected again. Only two respondents were refused for the study: one because the child was too old and one because it became apparent that the woman had too many family demands to ensure the commitment. The criteria for acceptance were that the child was eight months at onset of study, that only English was spoken in the home and that an agreement of commitment was undertaken. A copy of the agreement and accompanying letters and questionnaire can be found in the Appendix. Two mothers were known to each other (they had met in the maternity ward) and when one was contacted, she mentioned that her friend had also called and that they would like to attend together. This was done (Mothers 5 and 6) and was the only time a name was purposefully pulled out of the list. After the eight had been selected, the other callers were thanked and notified that it would be unlikely that they would be needed for the research. Their names were kept for the first few months of the study and then destroyed.

SUMMARY OF PARTICIPANTS' AGES

	MOTHERS	CHILDREN
MEAN AGE	26 years . 8 months	33.5 WEEKS
RANGE	20 y . 1 m - 35years	30 - 35.5 WEEKS

Table 4.1

The mothers had their travelling expenses paid and were given a very small fee. At the end of the study, each mother was presented with a VHS video-recording of the ten sessions over the year.

The mothers' ages ranged from 20 years 1 month to 35 years, with a mean age of 26 years 8 months (at onset of study). The children's ages ranged from 30 to 35.5 weeks at onset of study with a mean age of 33.5 weeks. There were six boys and two girls (Children Two and Eight). At the onset of study an estimate of social class was made according to the father's occupation (or the mother's occupation for the single parent family). According to the Registrar General's Classification of Occupations, all families were of Social Class III, being a mixture of manual and non-manual.

Dyad Two was a single parent family with just the one child and no family living nearby. All the other seven children had fathers who lived at home and who worked. Children Three and Six both had older siblings: Child Three had a sister of about three years (at onset of study) and Child Six had a brother of two years (at onset of study). Child One had no siblings but played with his cousins nearly everyday. None of the children acquired younger siblings during the duration of the study. Child Four had been born eight weeks prematurely.

Materials:

A developmental laboratory was used, carpeted, curtained and sparsely furnished. Two remote-control video-

cameras were wall-mounted. A microphone was suspended from the ceiling. A recording studio was adjacent to the laboratory and the interaction was recorded simultaneously on VHS and U-matic. The VHS tapes were given to the mothers at the end of the study and all analysis was performed using the U-matic tapes and a studio-quality Sony playback system. It was possible from this room to move the wall-mounted cameras and to choose which of the two views to record.

Toys were supplied at each session, being a mix of previously encountered toys and novel ones, to provide a stable-changing environment. This was structured in this way because a natural environment has elements which are novel and those which are familiar.

Three toys were provided at each session, two known and one novel. The toys used for each session were:

Session [1] Soft ball, Mobile 1, 4 objects*.

Session [2] Mobile 1, 4 objects*, Rocking Hippo.

Session [3] 4 objects*, Rocking Hippo, Beakers.

Session [4] Rocking Hippo, Beakers, Rings on Stacker.

Session [5] Beakers, Rings on Stacker, Car.

Session [6] Rings on Stacker, Car, Shap sorter.


Session [7] Car, Shap sorter, Abacus.

Session [8] Shap sorter, Abacus, Train.

Session [9] Abacus, Train, Bricks.

Session [10] Train, Bricks, Mobile 2.

[*] The four different coloured objects consisted of a cube with a mirror on one side and a triangular indentation; a cone which 'tooted' when blown and which fitted in the cube;



a two-tone ball which rattled and was situated inside a ring: the ball could move inside the ring but could not be removed; and a two part cylinder which squeaked when depressed. These four toys came in one box and were counted as a single toy.

All the toys were purchased from Hamleys in Regent Street after careful research, and the Early Learning Centre was most helpful in the task of acquiring suitable toys for the children's ages over eight months to eighteen months.

The Category System booklet, the Summary Card (see front insert) and paper and pens were used.

Procedure:

For collection of data

Each mother-child dyad was left alone in the developmental laboratory and given time to settle. This was for two minutes only, as in a pilot study it was found that a longer settling time was not advantageous. The mother was asked to play with her child as naturally as possible. The mothers were told that this was a study about child development but that no assessment of the child was going to be made, and that use of the toys was optional. Each mother-child dyad was video-recorded for 10 minutes every 5 weeks for a year, making ten sessions. Other researchers have used 6 week intervals as being optimum to assess change and to keep continuity between sessions (Halliday, 1975; Painter, 1984), while some have used 4 week intervals (McShane, 1980). It was felt that a 5 week interval was

best to ensure encapsulating change and continuity. The full 10 recorded minutes was used for analysis.

Procedure for coding

After the year was over, each video-recorded session was watched through once. Then the session was viewed while the Category System was applied. Although the video equipment was a reasonably sophisticated system, pausing the video at each communicative act was not sufficient as a whole utterance could be lost when restarted and thus the video had to be continually back-tracked during analysis. Each communicative or 'manual' act to be measured was noted on a separate line, in one colour pen for the mother (black) and in a different colour pen for the child (blue). All acts were noted chronologically, the acts of the mother and child together. The analysis was performed directly from the video-recording and transcribing was only performed under certain conditions (see Chapter 3). Frequency counts of the data were made. An example of the coding scheme in practice is shown in the Appendix (page Appendix 1).

Procedure for assessing reliability

Two calculations of reliability were made: percentage agreement and Cohen's kappa, for both inter- and intra-observer measures. For the intra-observer measures, a selection of eight half-sessions were analysed a second time some weeks after the completion of the analysis. The eight dyads were selected in a random order (by selecting the tapes blindly) and then assigned the session for analysis in that order (Sessions 2-9). By chance, no unattended session

was chosen, so no re-selection was necessary. A coin-toss was used to determine whether the first five minutes or the second five minutes of the session was to be re-analysed. The comparison was performed using the full (Level One) categories, and metamessages.

For the inter-observer measures, a different technique for selection was used. The Dyads were taken in numerical order. (Dyads were numbered according to the order in which they attended their first session). A spread of child ages were assigned across the dyads, to ensure inclusion of all dyads and different ages: Dyads 1 & 2, Session 2; Dyads 3,4 & 5, Session 5; Dyads 6 & 7, Session 9; Dyad 8, Session 10. The decision of whether to select the first or second five minutes of each session was also determined by a coin toss until four of one type had occurred, and then the other type was assigned, so that there were equal numbers of first and second halves.

The other observer was another female PhD student who was experienced in observation skills and analysing video-recordings. She was not experienced in analysing child behaviour and communication only adult behaviour and communication, but her skills were considered to be useful. She first played a part at the 3rd edition stage of the category analysis instrument. The instrument was explained to her in detail one afternoon and the experimenter and the observer jointly analysed some video-recorded material which was similar to the actual study material. A summary card of

categories was used as an aid. Discussion over the procedure, the categories and child behaviour took place.

When the instrument was revised into the current 4th edition, a booklet describing it and the procedure was drawn up as well as the summary card. The observer was given a day to examine these items. Then, the procedure was explained to the observer face to face and any questions about procedure or the definitions were answered. Again, a 5 minute recording was jointly analysed and any questions answered. Then this task was repeated for another 5 minute test piece on the same afternoon but it was performed completely separately; that is, the experimenter analysed the test piece alone in the studio and then the observer analysed the test piece alone in the studio. The codings were matched and any disagreements or omissions were discussed.

This separate task was repeated on three more consecutive afternoons, each time with a new five minute segment, and covering different age children. The training started with a recording of a 30 month old child and then moved to a recording of an 18 month old child, then to a 12 month old child and then to an 8 month old child. These test pieces were of three different children. Each time, a simple percentage agreement was calculated to assess progress. On each meeting, lengthy discussions took place, clarifying the instrument and its categories. This one-to-one training lasted more than 20 hours and took place over six days, the last five days being consecutive.

The observer was then given eight prepared tapes of the comparison material. Each tape was labelled with the dyad number and the child's age. The observer was then left entirely alone for a week and in this time she performed the codings. No discussion took place during this time. The codings were then passed to the experimenter who analysed them for reliability. The experimenter's codings were not taken to be the standard by which the observer's codings were measured, and so theoretically the experimenter could make an omission as well as the observer. In fact, this did not occur.

The technique for assessing reliability was not the whole-session method but to some extent followed the exact-agreement method (Repp et al, 1976). In the latter method, set intervals are determined and, typically, the number of responses recorded by each observer in each interval are compared. An agreement in this method was defined "as an interval in which both observers recorded the same number of responses" (Repp et al, 1976, p.109). The percentage agreement calculated by Repp decreased as interval increased (from 5 to 30 second intervals). This method is likely to be drastically effected by length of observation in the same way as frequency of behaviours and complexity of coding effects agreement. Also, this measure does not reveal whether the interval of agreement has one behaviour/event agreed upon or many.

Although this technique is known as the exact-agreement method, it is not a precise comparison of behaviours or

events. It allows for agreement as long as the behaviour/event was coded as present or absent by both observers within the time interval, and it cannot be known if it was actually the same behaviour/event being coded. Thus, an observer may code the presence of a communicative act at the onset of the interval and the other observer may not code this but code a communicative act as present right at the end of the interval and the other observer may not code this. As they have both coded the presence of one communicative act, then by Repp's method, this would count as agreement. This seems inadequate as a technique of exact comparison. However, it is exceedingly difficult to devise a fully exact comparison.

The technique used here was a variation on the exact-agreement method. The five-minute comparison sessions were segmented into 30 second intervals. Then, the best fit of line by line comparison was undertaken. The 30-second boundaries helped to determine the extent to which a group of codings could be fitted. An example is given below to clarify the technique. Agreements are marked with a [+] and disagreements or omissions are marked with a [-].

Observer One	Observer Two	
A3	A3	[+]
A3	A3	[+]
A3		[-]
R	R	[+]
R^	R	[+] [-]
S	S	[+]
G		[-]
R		[-]
A3	A3	[+]
KG	KG	[+]

Thus, the best fit is obtained within the interval and retaining the order of codings for both observers. This is necessary when dealing with omissions. This technique increases the exactness of the comparison over the method used by Repp. To achieve even more exact comparison it would be necessary to either describe each coding sufficiently to ensure that matched codings were the same behaviour or to mark each coding with the precise timing of onset of the behaviour/event. In the light of the difficulty to analyse material and the complexity of the coding instrument, it was felt adequate to assess the reliability with the exactness described above.

Procedure for analysing patterns of conversation

The patterns of conversation were achieved by looking at the sequential patterning of the communicative acts, rather than just the frequencies, in a technique based on Markov chains (see, for example, Gottman & Notarius, 1978). It is not suggested that every utterance is the stimulus for the next utterance, but an examination of the patterns of conversation could be enlightening.

The technique used in this study was to create a grid of 324 cells, each side consisting of eighteen cells. These eighteen represent the nine condensed categories of the mother and the nine condensed categories of the child. A mark was made in a cell to signify that a category on the vertical left side on the grid was followed by a category on the horizontal top side of the grid. Thus, if the mother's category 'ATOT' was followed by a child's category 'atot' a

The patterns of conversation 324-cell grid

MOTHER 9 categories	CHILD 9 categories
1. ATTENTION	1. ATTENTION
2. COMPLIMENT	2. COMPLIMENT
3. CONGRATULATION	3. CONGRATULATION
4. DISAPPROVAL	4. DISAPPROVAL
5. ENCOURAGEMENT	5. ENCOURAGEMENT
6. EXPLANATION	6. EXPLANATION
7. INSTRUCTION	7. INSTRUCTION
8. NEGATIVE REACTION	8. NEGATIVE REACTION
9. POSITIVE REACTION	9. POSITIVE REACTION

[illegible]

An example grid of two categories is used here to clarify this technique.

	ATOT	ETOT	atot	etot
ATOT	/ /	/	A	/ /
ETOT	C	/		/ / /
atot	/ /	B	/	
etot	/	/ /		/ /

Thus, the mother's ATOT was followed by the child's atot (A), which was followed by the mother's ETOT (B), which was followed by the mother's ATOT (C), and so on.

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child, with two exceptions. The category which commenced the conversation will have one extra in its row total than in its column total, and the category which ends the conversation will have one more in its column total than in its row total, unless the initial and concluding categories are the same, when all row and column categories will be equal for categories.

This technique will highlight repeated patterns of conversation, such as whether a question by the mother is followed by an assertion from the child, and whether this is a common pattern in their conversation.

One technique for analysing sequential data is to compute conditional probabilities. This normally only takes into account the influence of the immediately preceding time interval and ignores the fact that an earlier behaviour may have an influence. Further, some calculations are only geared to the influence of Person A's behaviour on Person B and vice versa, but does not take into account the influence of Person A's behaviour on his or her own behaviour. Those calculations which do take this into account become increasingly complex. A major limitation is that behaviour frequencies must be reasonably high, and thus researchers wishing to use this method must condense their categories (and reduce the data). This often necessitates a dramatic loss of information. For example, Martin et al (1981) reduced their 23 categories to 4 to permit the data to be analysed in terms of conditional probabilities. In addition

to the loss of information, there may be difficulties in how meaningful the reduced data/condensed categories are.

Another technique for analysing sequential data formulated as matrices (as in this study) is that of Ethograms. When a matrix of cell frequencies has been obtained, a distance matrix is calculated. [This is often the Euclidean distance squared, or a calculation of Chi Square.] Again, zero and low frequency cells are problematic and cells may be grouped to solve this difficulty. It is usually assumed that a behaviour cannot follow itself and thus the diagonal cells (from right to left) on a transition matrix are empty. Jones and Brain (1985) gave a detailed description of the techniques required.

When the transition matrix has been computed, then the data is usually subjected to cluster analysis, a technique of classification. This can be depicted as a dendrogram (see, for example, Dawkins, 1976). Some critics of cluster analysis say that it is crude and fallible (Marriott, 1974), and suggest that a graphical representation of the groupings may be sufficiently informative. Another diagrammatic way of depicting an ethogram is a pathway diagram. This shows the degree or frequency and direction of the relationships between variables or categories of behaviour (see, for example, Isaacson & Gispen, 1990; Olivier et al, 1987). This can quite simply reveal the relationships between categories but becomes confusing if there are too many variables.

Although the patterns of conversation were carried out on the condensed categories, this resulted in a matrix of 324 cells. There was no clear logical technique for 'decomposing' the matrix into sub-tables and so cluster analysis or any graphical depiction was not possible for a matrix of this size.

RELIABILITY

"Reliability assesses the extent to which any research design, any part thereof, and any data resulting from them represent variations in real phenomena rather than the extraneous circumstances of measurement, the hidden idiosyncrasies of individual analysts, and surreptitious biases of a procedure" (Krippendorff, 1980, p.129).

The difficulty can arise in finding adequate and accurate methods to assess reliability.

Functions of reliability

What reliability measures are seen to achieve seems to vary from author to author.

Hawkins & Fabry (1979) suggested four functions served by inter-observer reliability measures. (They do not mention intra-observer reliability). These functions are: [1] that the definition of the categories/behaviours is adequate for replication by others; [2] the evaluation of the competence of the observers, especially the training of them and any bias; [3] whether the experimental effects are believable; and [4] whether the level of behaviour measured is believable. It is questionable to what degree measures of inter-observer reliability can achieve all this, but Hawkins and Fabry considered that it was possible through

certain graphical means, developed by Birkimer & Brown (1979).

Krippendorff discussed three aspects of reliability (in relation to content analysis): stability, reproducibility and accuracy. Stability is typically measured by test-retest comparisons, where the same researcher performs the analysis on different occasions. An examination of any disagreements gives a measure of consistency or intra observer reliability. This is considered the weakest measure of reliability and to be inadequate alone (Krippendorff, 1980)

Reproducibility compares the analysis of data by two different and independent researchers (on separate occasions). This type of reliability is also referred to as intersubjective agreement, consensus and inter-observer reliability. It is a stronger test than just intra-observer reliability.

Accuracy is the strongest measure of reliability and involves the analysis of a researcher being compared with a known standard. This measure can show any intra-observer and inter-observer discrepancies as well as any test disagreement from the standard. This last measure of reliability is most useful when training researchers, as it can give a measure of their progress and ability. However, despite its compelling assurance of reliability, it is rarely used in social science research because standards do not exist by which to make the comparison. Thus intra- and inter-observer reliability are the most common techniques

applied, although many pieces of research flout the independence criterion for observers.

Martin and Bateson (1989) described four related factors pertinent to reliability. One of their factors echoes Krippendorff's Reproducibility and Hawkins & Fabry's first function: they called it Consistency and defined it as that a repeated measurement should produce the same result. They also described a factor of Precision which concerns the degree of freedom the measure has from random errors. The third factor is Resolution which refers to the smallest change in the true value which the analysis can detect. The last factor is Sensitivity which refers to whether small changes in the true value are invariably found in the measured value. Thus, a measurement tool should efficiently measure what it purports to measure.

Confounding factors

There are also various factors which are considered to have an influence on the level of reliability achieved. Kent et al (1977) stated three artefacts that could inflate reliability measures. The first of these, the knowledge by observers of when and by whom their reliability is being assessed, will have some effect in this study but was unavoidable. The independent observer was aware that the purpose of her training and rating was to compute reliability measures with the experimenter. She was unaware of the ratings made by the experimenter and the measurement of reliability was not discussed prior to the observations.

The second artefact Kent mentioned is the absence of the experimenter or a monitor to prevent cheating. The experimenter was not present during the independent observer's analysis of the video, but it was not clear how she could have cheated as she did not know what the experimenter's analysis had revealed. This would probably only be relevant if there was a group of observers rating at the same time and therefore able to collude in the absence of the experimenter.

The last artefact Kent referred to is computation of reliability within (versus between) observer groups. There were no groups so this point is not relevant for this study.

Martin and Bateson (1989) described three different factors which could affect reliability measures. One potentially influential factor is that of observer fatigue which may be relevant for long observation sessions, leading to loss of concentration and generally impaired performance due to fatigue. A balance in the length of observation session must be reached: long enough to get a reasonable sample of behaviours, but short enough to avoid fatigue effects. Related difficulties with inter-observer agreement can arise from learning effects, noticing things not previously noticed, refining previous decision and boredom as well as fatigue.

The second factor mentioned by Martin and Bateson is adequacy of definition where the definition of each category must be clear and unambiguous. Studies must be free from

observer drift where definitions and criteria are amended over time, either consciously or not.

Finally, the frequency of occurrence of the behaviour is a significant factor. High frequency can result in the difficulty of recording each instance reliably, while very low frequency behaviours may be missed. Dorsey et al (1986) have shown that frequency of behaviour can adversely effect reliability levels but this can be minimised. One way is to include some statistical compensation for length of training of observers.

Another way is to not use measures of percentage agreement which do not correct for chance agreement, as these measures are influenced by behaviour frequency. Cohen's kappa is a useful measure of reliability as it corrects for chance, and is less susceptible to behaviour frequency, although kappa will generally give slightly lower reliability measures (Bakeman and Gottman, 1987).

The number of codes or categories is an important factor also. If there are only a few codes the difference between percentage agreement and Cohen's kappa may be more dramatic, as the agreement due to chance will be much higher. However, Dorsey et al (1986) have shown that code complexity adversely effects reliability measures whatever the means of assessment.

It has been suggested that percentage agreement and complexity should be multiplied to protect against obtaining low levels of synchronic agreement due to the high complexity of the coding instrument (Kazdin, 1977). Kreckel

(1981) supported this, understandably, for she used a coding instrument of 125 metapragmatic categories. This is a valid comment because the more complex a system of analysis, the more difficult it will be to implement and thus the potential for more disagreement and uncertainty. However, a more complex computation would have to be derived because an inter-observer agreement of 20% multiplied by a complex system of 125 categories (as in Kreckel's study) would give the number 2500. And an inter-observer agreement of 81% multiplied by a complex system of 31 categories would give the number 2511. The two studies are clearly not comparable in terms of reliability levels achieved but Kreckel's suggested formula would make them seem the same. This formula would need to be made more complex to give a meaningful result.

Another factor which may influence reliability measures, in addition to the complexity of the category system, is the level of analysis. The level of analysis plays a part in reliability levels, for if the presence or absence of speech is being determined, then greater reliability will be obtained than if syllabic, morphological, lexical, syntactic or pragmatic analysis is being undertaken (Pye et al, 1985). Thus, if the task is purely one of identification, then reasonable agreement can be achieved, but if the task involves identification and interpretation, then agreement becomes more problematical. Individuals are likely to interpret events differently.

In implementing a category analysis instrument, decisions are being made all the time about whether a behaviour has been observed and then deciding which category describes it. Gardenfors and Sahlin (1988) have shown that decision-making is influenced by the sets of alternatives (code complexity), the states and the outcomes, which are difficult to evaluate. The outcome of applying this Category Analysis Tool is not one of great consequence, although the degree of consequence is different for the external observer and the experimenter.

Kreckel (1981) also examined the form of the material in relation to reliability and found that this influenced reliability measures. [The task was to identify tone units]. She found that the greatest measures of reliability were found with audio-tape only data, then video-recorded material, and the worst measures were obtained from written transcriptions. She suggested that there was too much information to handle simultaneously. It may be argued that in conversation we do handle so many channels of communication simultaneously, but we are not required to report the tone unit boundaries at the same time. When one is participating in a conversation the task is primarily an aural/oral one, whereas the task Kreckel set her observers was an aural/written one. This has relevance for the present research which used video-recorded material. However, it was decided that it was better to lose a degree of reliability rather than lose a wealth of information about non-verbal communication, interaction and context.

Methods of measuring reliability

In addition to the variability of what is considered to be achieved by reliability measures and the factors which influence them, there is also disagreement about the best methods of measurement. There is a massive literature on reliability measures and this must cloud the issue. If the issue were clear, it would be unequivocal which measures were suitable for which experimental situation. However, the issue is not clear and the debate continues, sadly leaving researchers to be open to the influence of "the authors' skill at rational appeal" (Cone, 1979, p.571). Important issues in the discussion of measures of reliability are that it must not overshadow the actual findings, nor should researchers "confuse statistical significance with meaningfulness" (Kratochwill, 1979, p.553) or validity.

It has been shown that agreement percentages may be inflated when the total is examined because random or sequence errors tend to be cancelled out (Kelly, 1977). It is more efficient to compute the reliability point by point, and this was the technique used in this study. All Level Four categories (and metamessage categories) were used and each coded category assessed, not the total frequencies for each 5 minute segment.

The measures of inter- and intra-observer agreement, using the agreement percentage, are considered by some to be inadequate (Bakeman & Gottman, 1987). A more efficient agreement statistic is that of Cohen's kappa, which includes

a correction for chance and a means of establishing whether the result is significant. However, not all analysts are interested in an in-depth analysis of the variance and so on, and merely ask whether "any two observers using the same behaviour code see the same behaviours in the same way at the same time?" (Baer, 1977, p.118). It is clear that there are many different ways of calculating observer agreement and that they produce different percentages (Repp et al, 1976). Thus, the technique used for assessing observer agreement becomes a source of variance itself.

"The author's excellent demonstration of the fact that different means of estimating reliability produce different numbers, may well reflect not the inadequacy of one versus another, but the arbitrariness of all" (Baer, 1977, p.117).

It is extremely rare for inter- and intra-observer agreement to be 100% (or $r = +1.0$) and thus an estimate of the degree of reliability must indicate, at least, that it is above chance. However,

"no magic figure exists, above which all measures are acceptable and below which none are. Acceptability depends on several factors, including the importance of the category and the ease with which it can be measured" (Martin and Bateson, 1989, p.91).

They say that a correlation coefficient should reach at least +0.7 for difficult to measure categories, and considerably more for more straightforward measures. Levels of significance for correlations are not relevant here as they are dependent on sample size as well as degree of association. The size of the correlation is all that matters for reliability measures. This is echoed by Bakeman and Gottman (1987) who prefer only to accept values of

Cohen's kappa over 0.70 (based on their own research experiences). Fleiss (1981) has suggested that kappas of .40 to .60 are fair, of .61 to .75 are good and that kappas over .75 are excellent. It is possible to calculate the level of significance of Cohen's kappa, which strengthens the value of its use. However, there are still critics that this calculation is not stringent enough (see Bakeman and Gottman, 1987, for how to calculate significance and for the criticisms of the technique).

When there is not perfect agreement, there are three types of differences that occur in reliability studies: disagreements, omissions and additions. The last two types are primarily difficulties at the identification level. Observers may identify an event or communicative act, or whatever, which others may not. It is the actual disagreements that have significance for an analysis, and this disparity occurs at the interpretation level. An advantage of computing agreement using Cohen's kappa is that disagreements are clearly revealed.

Inter- and Intra-observer reliability

Inter-observer reliability is common in psychological research, but intra-observer reliability is not. This appears to be a fundamental issue: an experimenter should be seen to be consistent prior to any questions about agreement with others. It was shown in the summary table in Chapter Two that there was a predominance of inter-observer reliability over intra-observer reliability, where any reliability measures were reported. Halliday (1975) studied

his own child's development and has been criticised for not assessing reliability with other analysts, i.e. inter-observer reliability (Francis, 1979). The criticism is not made as to whether Halliday himself shows consistency. This issue of intra-observer reliability seems fundamental to the issue of inter-observer reliability.

Language plays a part in all assessments of reliability: it is difficult to conceive of any research taking place outside the bounds of language. This is significant because

"language orders our perceptions and makes things happen and can be used to construct and create social interaction and diverse social worlds" (Potter and Wetherell, 1987, p.1).

"Language-use is a species of action which constructs a plurality of social worlds and multiple versions of objects in those worlds" (Bowers, 1988, p.185).

Thus, "variability - both within and between individuals - is a commonplace feature of ordinary talk" (ibid.). With this situation as a foundation, the most a researcher can hope for is a reasonable degree of shared understandings, obtained through explicit definitions and examples.

Reliability measures also have important consequences for validity measures, for

"the probability of a valid result cannot exceed the probability with which the result is obtainable in the process of repeated analysis" (Krippendorff, 1980, p.129).

VALIDITY

Some researchers appear to confuse validity with reliability by making a fundamental error of suggesting that good levels of inter-observer reliability would increase

confidence in the validity of any analysis (e.g. Francis, 1979).

"Validity concerns the extent to which a measurement actually measures those features the investigator wishes to measure, and provides information that is relevant to the questions being asked" (Martin & Bateson, 1989, p.87).

Finding a feasible technique is not always easy.

Content validity estimates the validity of a test or form of measurement in terms of its content which should reflect the area or concept it purports to measure. For example, if a test claimed to measure arithmetic skills, but only assessed addition skills, and omitted subtraction, multiplication and division, then it would not be content valid. However, content validity is not an exact measurement for it is often difficult "to specify the full domain of content that is relevant to the particular measurement situation" (Carmines & Zeller, 1979, p.20). This is especially true in most areas of social science. Specificity is the term used to describe the extent to which an instrument measures what it purports to measure (content validity) and nothing else.

Criterion-related validity uses an external measurement to validate the test. For example, the scores obtained on a written test on driving a car would be validated by showing how well these scores predict the performance of the subjects when actually driving a car. Typically, the test scores would be correlated with some measurement of actual performance. The difficulty with criterion-related validity is that many studies in social and developmental psychology

cannot be validated in this way because there are no known criteria against which they can be compared.

Consensual validity relies upon consensus, with the idea that the more people who accord with a proposition, the more likely it is to be valid. This is an uncertain technique for validation but is mentioned here for two reasons. Firstly, some researchers make the error that if they achieve inter-observer reliability, then they have shown their study to be valid. This shows confusion over the issues and it must be made clear that inter-observer agreement does not indicate validity.

Secondly, this approach to validity is susceptible to influences of personal construct systems, frames of reference, etic viewpoint and idiosyncrasies.

To assess the validity of a category analysis system is extremely difficult. Kreckel (1981) ignored the issue entirely, as do many others. In terms of content validity, it may be assessed to a degree by looking at the percentage of target behaviour the instrument measured. If only a small percentage is not classified then the system can at least be considered to be efficient. Carmines & Zeller (1979) noted that content validity "is not so much a specific type of validity as it is a goal to be achieved in order to obtain valid measurements" (p.26). As there are no established procedures for estimating content validity, then it is difficult to make an assertion about it.

In addition to specificity, a key issue when considering validity is accuracy (Martin and Bateson, 1989).

Accuracy is achieved if measurements are free from systematic errors. To some extent this can be assessed by measures of inter-rater reliability - if there are systematic differences between them then this may reveal that the instrument is at fault. [It may also reveal a misunderstanding of codes from one rater or both.] Such reliability measures cannot show that there are no systematic errors if there is good agreement between raters as it is possible that they are both/all making systematic errors.

Krippendorff (1980) indicated that "validation may be said to reduce the risk involved in acting on misleading research findings as if they were true" (p.155). It is the difficulty of obtaining external evidence which makes assessment of validity such a problem for some social science research. One point of view is that "it is often better to measure the right thing imperfectly rather than the wrong thing extremely well" (Martin and Bateson, 1989, p.88). Also, it is important to study behaviour at a meaningful level rather than at a trivial level (Harre, 1974).

Summary of research issues

There are clearly a number of difficulties with analysis at this level. This is in part due to the fact that interpretation plays a part in functional analysis. Issues and techniques of reliability and validity have been discussed and shown to be problematic, although the value of inter-observer agreement is to guard against idiosyncratic

analysis. Observation by an experimenter using stringent and theoretically-based, structured techniques is a common method in some areas of psychology, and the one thought to be best suited to the research questions posed here.

**RESEARCH AIMS AND TECHNIQUES FOR EVALUATING THE CATEGORY
ANALYSIS INSTRUMENT**

The first aim of this study was to develop a new instrument for analysing mother-child communication using social-functional categories. This Category Analysis Tool and its development has been described in Chapter Three.

The second aim of this study is to use the system to describe the communication of the mother and of the child in the same terms over the year of study. There is likely to be a change in the communication over time, reflected in the number of communicative acts occurring and the frequency of different categories, as this is a rich period of development. Such change has been discussed in other research, such as Halliday (1975) and Francis (1979). While fully describing the communication, it is also possible (and necessary) to evaluate this newly developed instrument, which fulfils the third aim of the study.

Theoretical issues and details concerning categories have been discussed in Chapters Two and Three. Many of the findings from the literature are drawn out and summarised here, and form factors against which the new instrument can be evaluated.

Assessment [1] Efficiency

A simple technique for evaluating the efficiency of the Category Analysis Tool was incorporated into the instrument. There was a Miscellaneous category so that no communicative act needed to be forced into an unsuitable category. By examining how many utterances were classified in this way, a measure can be taken of how effective the instrument is at analysing communication. Thus, Assessment [1] will be to examine the proportion of acts classified as Miscellaneous.

Assessment [2] Metamessages

The Category Analysis Tool included a measure of five meta-pragmatic categories, or metamessages. Studies have varied but the earliest age at which children begin to use Indirect speech acts appears to be about five years (Garvey, 1975; McTear, 1985). Mothers are considered to use simpler, moderated speech to infants and children (Snow & Ferguson, 1977; Gleitman & Wanner, 1982) and thus it would be expected that mothers' use of indirect speech acts when communicating with this age group child will be very infrequent. Thus, Assessment [2] will include the effective measurement of Indirect Speech acts and an examination of their low frequency.

Another meta-pragmatic category was that of Expansions. Bruner (1975) stated that mothers impute meaning to their child's potentially communicative behaviour and that this can be reflected in the use of expansions. Thus, Assessment [2] will further include the effective measurement of

Expansions and an examination of their decrease over time as the child becomes more adept at communicating.

Assessment [3] Number of communicative acts

Prior to the detailed category analysis, it is possible and useful to examine the number of acts which occurred at different child ages. Number of acts or utterances over time appear to be described differently in various studies. McShane's (1980) study showed that children's utterances increased over time for a similar age group, so Assessment [3] will include the effective measurement of the number of communicative acts and an investigation of any increase over time. McShane (1980) also showed that the number of utterances by the mother was closely related to the number of child utterances, and so Assessment [3] will further seek to investigate a positive correlation between the number of communicative acts for the mothers and for the children as a group over time.

Assessment [4] Ratios of acts

The work on ratios by Clarke-Stewart & Hevey (1981) showed that the ratio of mother utterances to child utterances decreased over time until, by child age 2.5 years the ratio was almost 1:1. Thus, Assessment [4] will involve an investigation into the change over time of the ratios of mother acts to child acts, with the expectation that it will decrease over the year of study. These last two assessments may help to clarify the relationship between mother and child communication.

Assessment [5] Patterns of acts

Elias et al (1984) have shown that there can be either monologic or dialogic within- and between-speaker patterning. Assessment [5] aimed to determine whether the new instrument could distinguish between dyads showing a predominance of monologic or dialogic patterning, in terms of number of communicative acts.

Assessment [6] Repetitions

An examination of repetitions was part of the category analysis. After the findings of Ellis & Wells (1980), it was decided that Assessment [6] should examine whether mothers' self-repetitions decreased over time. As the children are becoming more adept throughout this period of study and are acquiring language, Assessment [6] sought to determine whether the children's repetitions increased over time. Also in this light, Assessment [6] further sought to determine whether mothers' repetition of the children's communication increased over time, as the children should be expected to increasingly produce repeatable utterances. As an example to illustrate this, it was thought worthwhile to examine whether mothers' repetitions were positively correlated with children's use of Assertions. Assessment [6] sought to examine whether children's repetitions increased over time, as they are becoming more adept and repetitions are thought to be one method of learning (Reichle, 1976; Schachter, 1979). To further examine the relationship of repetitions, it was considered worthwhile to examine whether mothers' repetitions of the child were

positively correlated with the child's repetitions of the mother.

Assessments [7] to [14] Categorical changes

Change over time is evident for the developing child and Ellis and Wells (1980) report that parents fine tune their communication to fit the child's level of development, so change in the mothers' communication is to be expected as well. One of the ways in which this has been reported to have happened is that mothers talk increasingly about the immediate world to their developing child (Snow, 1977; Ellis & Wells, 1980). Ryan (1974) showed that emergent-language children's communication changes "from predominantly expressive or emotional use of words to their factual or descriptive use" (p.196). Thus, Assessment [7] sought to examine the instrument's effectiveness at revealing whether mothers' use of Assertions generally, and about the world [A3] specifically, increased over time. Also, Assessment [7] sought to examine whether the children's use of Assertions increased over time, and whether this was positively correlated with mothers' use of Assertions.

Further, in the light of Ryan's (1974) findings stated above, Assessment [8] sought to examine whether the children's use of Expressives would decrease over time and whether this would be positively correlated with mothers' use of Expressives.

Questions and answers and requests for action are considered to be common speech acts in conversations with children (McTear, 1985), although mothers may show stylistic

variations in frequency of requests (Howe, 1980; 1981), or in use of Directives (Mahoney, 1988). If question and answer routines are common, then the new instrument should determine whether mothers' use of Requests would be positively correlated with children's use of Assertions and that children's use of Requests would be positively correlated with mothers' use of Assertions (Assessment [9]).

Further, McTear (1985) has shown that Requests for action are often followed by Compliance or Non-compliance (Refusal), so it is possible that the instrument would reveal a positive correlation between mothers' use of Requests and children's use of Refusal and Compliance (Assessment [10]).

Several studies have shown either use of Directives as a style of communicating in mothers or use of Requests as a style (see above). If such communicating styles exist, they may influence the children's communicative style. Thus, Assessment [11] sought to examine whether mothers' use of Directives was correlated with children's use of Directives, and whether mothers' use of Requests was correlated with children's use of Requests.

Sylva and Lunt (1982) examined giving and taking in young children, and found that from about 12 months, giving and taking was shared almost equally. The Category Analysis Tool measured both successful giving and offering, and the taking of a proffered object as well as taking from a person. Thus, unequal exchanges can be measured as well as mutual exchanges, and there need not be an automatic

correlation between one person's giving category and the partner's taking category. However, many theorists suggest that mothers and children perform effective exchanges due to the mother's skill and that this is a useful and significant part of turn-taking and conversation (Kaye, 1977 & 1979; Bruner, 1975a; Ratner & Bruner, 1978). Thus, Assessment [12] sought to examine how effectively the instrument reveals the exchange relationship. Specifically, points to be examined are that children's use of taking [KT] will be positively correlated with mothers' use of giving [KG], and that children's use of giving [KG] will be positively correlated with mothers use of taking [KT].

Murphy (1978) and Murphy and Messer (1977) showed that pointing emerges in children at about 9 months, and increases in frequency through to 24 months (as far as they studied). Murphy also showed that mothers moderate their pointing with their child's age. Assessment [13] examines this area, looking at both children's use of pointing and mothers' use of pointing and determining whether it increases over time and whether the mother and child's use will be positively correlated.

Ratner & Bruner (1978) and Bruner & Sherwood (1981) have shown the important role early ritualised games have in language acquisition. Trevarthen (1982) considered that children commenced ritualised games from about the age of 6 months. Game playing is a very social event, so it is likely that the frequency of ritualised games will be positively correlated for mothers and children, and that it

will increase over time (Assessment [14]). It is not automatic that the use of this category will actually be mutual, although the intention will be social, as a mother may be playing her role in peep-bo, or even both roles of peep-bo, without a response from the child who may be absorbed in a toy.

Dale (1980) showed that the range of functions expressed by the child increased steadily between one and two years. In the light of this, the mainly descriptive examination of patterns of conversation in terms of categories is expected to reveal a greater diversity in Session Ten than in Session One. This forms the basis for the final evaluation, Assessment [15].

Chapter Five describes the results, giving a full description of the communication over the year as well as examining the above aims and assessments.

SUMMARY OF RESEARCH AIMS

There are three main aims to this study. The first one has been completed and described (in Chapter Three): that of developing a Category Analysis Tool. The second and third aims involve the implementation of this instrument, and its evaluation. Firstly, the interaction on ten occasions between eight mothers and their children will be described according to the number of communicative acts and in terms of categorical differences. Embedded in this first objective is the second: the evaluation of the new instrument, using 15 techniques of assessment.

CHAPTER FIVE

*** RESULTS ***

INTRODUCTION

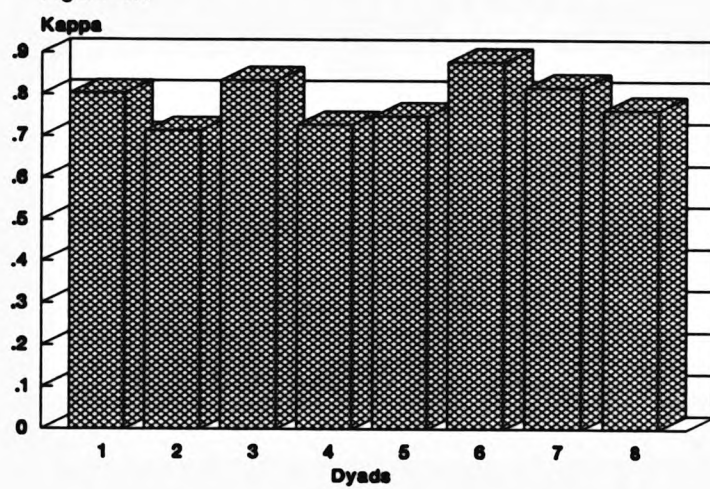
The study had three main aims and the results are given below. Firstly, there was the development of a new instrument of analysis, details of which were given in Chapter Three. As part of this initial development, there was an assessment of reliability, and account was taken of the instrument's validity and efficiency. Secondly, a descriptive analysis was undertaken using a social-functional approach of the interaction of 8 mother-child dyads from child age 8 to 18 months. Integrated into this descriptive analysis was the evaluation of the new instrument, fulfilling the third aim. These findings are summarised at the end of the chapter.

RELIABILITY & VALIDITY

Two measures of reliability were used: the percentage agreement and Cohen's kappa, for both the intra- and inter-observer reliability measures. For the intra-observer agreement, an average kappa of 0.7859 was achieved, the range being from 0.7124 to 0.8794. (See Figure 5.1). This is an excellent level, according to Fleiss (1981). The few instances of lack of agreement were caused by disagreements, omissions and extras, although omissions were the main cause.

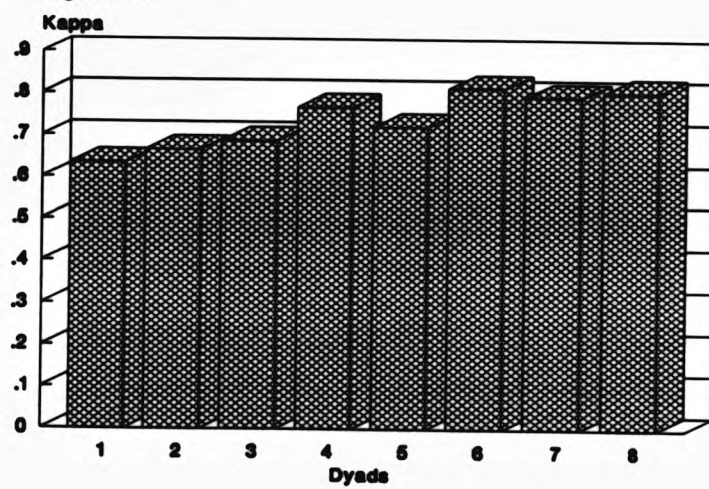
INTRA-OBSERVER AGREEMENT

Figure 5.1



INTER-OBSERVER AGREEMENT

Figure 5.2



For the inter-observer reliability measure an average kappa of 0.7363 was achieved, with a range from 0.6350 to 0.8138. (See Figure 5.2). This is a good level, according to Fleiss (1981). The observer achieved an average of 80.81% agreement with the experimenter's analysis for the mothers' communication, and an average of 70.62% for the children's communication. The level of reliability increased with the child's age.

Omissions accounted for the majority of lack of agreement. The only regular occurrences of omissions were pointing when it accompanied a vocalisation, but not when it occurred alone, and gestural expressives such as arm-flapping to show excitement and foot-stomping to show frustration or anger.

As Cohen's kappa was used, it was possible to examine the disagreements which occurred. The majority of disagreements were single instances which suggested that the coding instrument was satisfactory. The only multiple occurrences of disagreements were D and A3 (4 times), D and A (twice), and VC and VK (twice). The latter disagreement was a temporary (or early?) misunderstanding or error on the part of the external observer. The other disagreements were all concerning child vocal but non-verbal utterances, and indicate how ambiguous emergent-language can be. However, these disagreements were very rare and so it can be concluded that the Category Analysis Tool can be used with confidence.

It was not possible to fully assess validity as no

external criteria could be determined but a partial assessment can be made by a determination of the instrument's efficiency, and of an evaluation of it.

Assessment [1] Efficiency

This system's Miscellaneous category accounted for less than 0.1% of total utterances. Four mothers and seven children had no utterances encoded as Miscellaneous. The other four mothers had an average of 0.0925% (ranging from 0.034% to 0.18%) and the child had 0.094% of the total utterances encoded as Miscellaneous. As this was a 'catch-all' so that no utterance was ignored or forced into a category it did not really fit, these very low percentages suggest that this category system is efficient.

The majority of [2] categories recorded were nonsense words. As there was a minimal number of instances of this category it was ignored in all calculations, but occurrences are recorded in the tables of Full Categories in the Appendix.

Assessment [2] Metamessages

The frequency of the five metamessage categories measured was analysed.

Children's use

The eight children showed some use of Emphatic tone and one child used the Light, Playful Tone on five occasions. (Obviously, Light, Playful tone is a common tone in communication during play, but it was only counted as a metamessage if it modified the meaning of the utterance.) These five instances used by Child Six were grouped together

and all modified the content message 'Directive', resulting in a teasing behaviour.

Children's use of Emphatic tone over session										
Session	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
mean%	0.50	0.63	0.37	0.63	3.14	1.67	2.63	1.29	1.63	1.63

Table 5.1

Children's use of Emphatic tone								
Child:	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Total:	29	4	20	16	1	25	7	3
% of Tot	3.01	0.94	1.98	2.16	0.16	2.30	0.76	0.34

Table 5.2

Child Five hardly used Emphatic tone at all, and Child One, with the highest frequency, only used it for 3% of utterances.

Mothers' use

Of the five metamessage categories, one category, 'Indirect Speech Acts' was used very little. In fact, only Mother One used this: 13.77% of her use of metamessages being Requests expressed indirectly. This accounted for less than 1% of her total utterances. This supported the first part of Assessment [2] that Indirect Speech Acts could be effectively measured and that mothers' use of Indirect Speech Acts to children of this age would be very infrequent.

Table 5.3 shows the 8 mothers' use of four metamessage categories over sessions, expressed as mean percentages. Use of metamessages significantly increased over time (Page's L = 1396, C=10, N=4, p=0.001). Mothers' use of Expansions did not decrease over time, so the second part of

Assessment [2] is not supported (L = 823, C=7, N=8). In fact, the mothers' use of Expansions appears to increase. This may be explained by the children's increase in communicative acts, giving more to expand on, and that Expansions increase before decreasing.

Mothers' use of four metamessage categories over session										
Session	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Emphat.	0	0.13	0.37	0.25	1.43	0.50	0.13	1.14	1.63	0.25
Expans.	1.37	1.50	1.37	2.25	2.29	2.17	2.00	5.00	3.50	6.00
Sarcasm	0	0.13	0	0.13	0.43	0	0.25	0.57	0.50	0.13
Light	1.87	1.37	2.00	4.13	2.43	3.83	1.87	3.57	2.13	2.00

Table 5.3

Table 5.4 shows the use of four metamessage categories for each mother. Data is expressed as a percentage of total utterances. Mothers 5 and 7 used Expansions the most, and Mothers 1 and 2 used Light, Playful tone the most. All usage was very low frequency.

Mothers' use of four metamessage categories								
Mother:	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Emphat.	0.43	0	0.09	0.37	1.15	0	0.06	0.08
Expans.	1.59	0.58	0.58	0.68	2.24	1.34	3.13	0.53
Sarcasm	0.53	0.23	0	0	0.13	0	0	0.03
Light	3.19	2.07	1.44	0.82	0.95	0.49	0.74	0.28

Table 5.4

Table 5.5 (overleaf) shows how the use of metamessages related to category. Emphatic tone was used primarily with Attention Bids and Salutations and also with Directives. Expansions occurred primarily with Assertions or Requests. Sarcasm and Irony occurred mostly with Comments, and Light, Playful tone was used primarily with Comment, although also with Directives.

Metamessage use over Condensed Categories				
Category	Emphatic	Expansions	Sarcasm	Light tone
ATOT	2.33	41.35		5.32
VTOT	6.98	2.40	6.25	15.43
ETOT	2.33			2.13
REQ		49.52	6.25	0.53
RIT	2.33	2.88	31.25	0.53
S	48.84	0.96		
CTOT		0.48	56.25	43.09
D	34.88	1.92		32.98
REPO	2.33	0.48		

(Expressed as % of metamessage total use)

Table 5.5

Metamessage categories did not occur with much frequency but were still informative.

DESCRIPTIVE STATISTICS AND ANALYSIS

There were difficulties arising from missing data. Therefore, in some cases, such as examinations of change over time, only the seven fully attended sessions were used, omitting sessions Five, Six and Eight. Unless otherwise stated means, percentages and proportions are used to compensate for the missing data and to control for frequency. The missing data are from Dyad 2 (Session 5), Dyads 3 and 5 (Session 6) and Dyad 2 (Session 8). Change over time was a key point of the analysis because of the developing child and these were largely accomplished using Page's L trend test on the mean number of utterances for the eight mothers or eight children over the seven completely attended sessions. Tables of the data used for all Page's L tests performed are given in the same order in the Appendix.

TOTAL NUMBER OF ACTS AND RATIOS

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT	NINE	TEN	TOTAL
MOTHER1	84	173	203	184	195	254	233	260	245	242	2073
CHILD1	49	48	91	97	90	73	95	155	91	176	963
RATIO	1.7143	3.6042	2.2308	1.8969	2.1667	3.4795	2.4526	1.6774	2.6923	1.3730	2.1482
MOTHER2	38	35	43	77		170	149		183	173	869
CHILD2	33	32	27	42		81	29		90	52	426
RATIO	1.1515	1.0938	1.5926	1.8333		2.0968	5.1379		2.0333	1.8904	2.0376
MOTHER3	248	203	177	221	261		230	344	235	274	2233
CHILD3	123	89	84	101	123		76	137	180	99	1012
RATIO	2.0169	2.2809	2.1071	2.1881	2.1220		3.2895	2.5109	1.4167	2.7677	2.2065
MOTHER4	325	232	230	317	298	223	291	407	286	318	2927
CHILD4	107	53	74	84	61	65	50	91	96	59	740
RATIO	3.0374	4.3774	3.1081	3.7736	4.8852	3.4308	5.8200	4.4725	2.9792	5.3898	3.9534
MOTHER5	101	118	182	130	166		158	223	185	211	1474
CHILD5	69	50	53	77	73		21	87	101	96	621
RATIO	1.6032	2.3600	3.4340	1.6833	2.2740		7.5238	2.5632	1.8317	2.1979	2.3736
MOTHER6	199	224	213	245	238	212	220	263	232	199	2245
CHILD6	72	100	73	103	131	100	95	138	144	130	1098
RATIO	2.7639	2.2400	2.8400	2.3786	1.8168	2.1200	2.3158	1.9058	1.6111	1.5308	2.0634
MOTHER7	115	116	156	207	160	209	204	215	187	188	1757
CHILD7	78	53	65	73	104	90	104	88	110	118	920
RATIO	1.4744	2.1887	2.4000	2.8356	1.5385	2.3222	1.9615	2.4482	1.7000	1.5932	1.9098
MOTHER8	383	315	357	313	374	354	418	377	344	328	3563
CHILD8	54	85	102	66	81	124	77	79	99	111	878
RATIO	7.0926	3.7059	3.5000	4.7424	4.6173	2.8548	5.4286	4.7722	3.4747	2.9550	4.0581

Table 5.6

ANALYSIS OF NUMBER OF ACTS

Assessment [3] Total number of acts

An examination of the gross number of acts for the mothers for each fully attended session showed that the number of acts increased significantly over time (Page's L = 1015, C=7, N=8, p=0.001). This was also true for the children (Page's L = 1002.5, C=7, N=8, p=0.001), which supported the first part of Assessment [3], that the number of children's utterances would increase over time. (See Table 5.6).

Table to show mean number of acts & mean ratios over sessions

SESSION	CHILD	MOTHER	RATIO
1	72.375	186.625	2.6067
2	63.750	177.000	2.7314
3	71.375	195.125	2.6516
4	80.375	211.750	2.6671
5	94.714	241.714	2.7743
6	88.833	237.000	2.7177
7	68.375	240.375	4.2412
8	110.714	298.429	2.9065
9	113.875	239.625	2.2174
10	110.125	241.625	2.4612

Table 5.7

Having established that the frequency of acts used increased over time, an examination of the mean number of acts for the children and for the mothers over sessions followed (see Table 5.7). This showed a significant relationship between mother and child usage (Spearman Rank, $r = 0.6848$, $n=10$, $p=0.025$, 1-tailed), which supported the second part of Assessment [3] that, as a group, the number of mother acts would be positively correlated with number of child acts, over time.

Table to show mean number of acts & mean ratios over dyads

DYAD	CHILD	MOTHER	RATIO
1	96.50	207.30	2.1482
2	53.25	108.50	2.0376
3	112.44	248.11	2.2065
4	74.00	292.70	3.9954
5	69.00	163.78	2.3736
6	108.80	224.50	2.0634
7	92.00	175.70	1.9098
8	87.80	356.30	4.0581

Table 5.8

This relationship was not clear cut however. An examination of the relationship between the mean number of acts for mother and child for each dyad (see Table 5.8) did not show a significant relationship (Spearman Rank, $r = 0.4286$). This suggested that frequency of acts is not clearly related from mother to child.

However, a further examination of number of acts for each mother and child over sessions showed that three dyads did have a significant relationship (see Table 5.9). Thus, for Dyads 2, 5 and 6 the frequency of the child's acts is positively correlated to the frequency of the mother's acts.

Table to show correlations between number of acts for mother and for child over time

DYAD	Spearman	Sessions	p(1-tailed)
ONE	$r = 0.51$	10	n.s.
TWO	$r = 0.71$	8	$p = 0.05$
THREE	$r = 0.55$	9	n.s.
FOUR	$r = 0.35$	10	n.s.
FIVE	$r = 0.63$	9	$p = 0.05$
SIX	$r = 0.62$	10	$p = 0.05$
SEVEN	$r = 0.31$	10	n.s.
EIGHT	$r = -0.36$	10	n.s.

Table 5.9

Of interest is Dyad Eight's negative correlation.

Assessment [4] Ratios of acts

Figures 5.3 & 5.4 show the fluctuations in the ratios of number of acts for the dyads. It is clear that Dyads 4 and 8 revealed distinctly different ratio levels from the other dyads. A comparison of the mean ratios per session for Dyads 4 and 8 with the mean ratios per session for the other six dyads over the ten sessions showed there to be a significant difference (Wilcoxon $W = 0$, $N = 10$, $p < 0.01$). (See Table 5.10).

**Table to show mean ratios for
Dyads 4&8 and Dyads 1,2,3,5,6,7**

SESSION	DYADS 4 & 8 mean ratio	ALL OTHER DYADS mean ratio
ONE	5.065	1.787
TWO	4.042	2.295
THREE	3.304	2.431
FOUR	4.258	2.137
FIVE	4.751	1.984
SIX	6.286	2.505
SEVEN	5.624	3.780
EIGHT	4.622	2.220
NINE	3.227	1.881
TEN	4.172	1.891

Table 5.10

Although the utterances of both dyad members did increase over time, the ratios did not significantly change over time. It can be seen in Table 5.7 that the mean ratios are very similar over the sessions, although there is a high ratio for Session 8 (mainly due to the interaction pattern of Dyad 5) and a slight decrease in the ratios for Sessions 9 and 10. However, the expected decrease in ratios over time (Assessment [4]) was not supported, (Page's $L = 897$, $C=7$, $N=8$).

Ratios for first 4 dyads

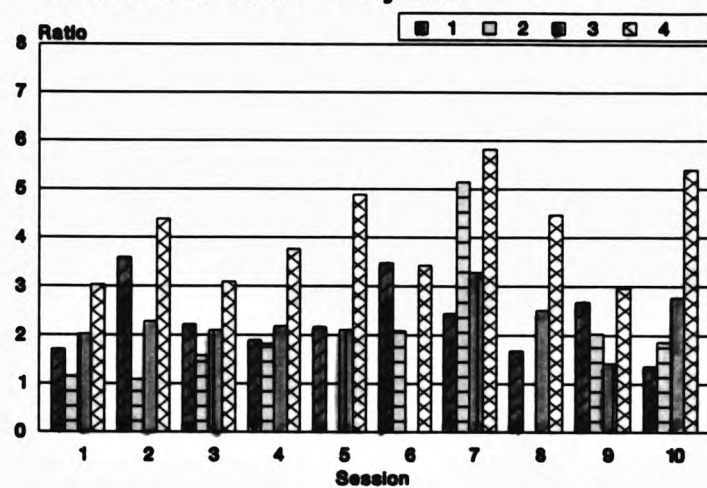


Figure 5.3

Ratios for second 4 dyads

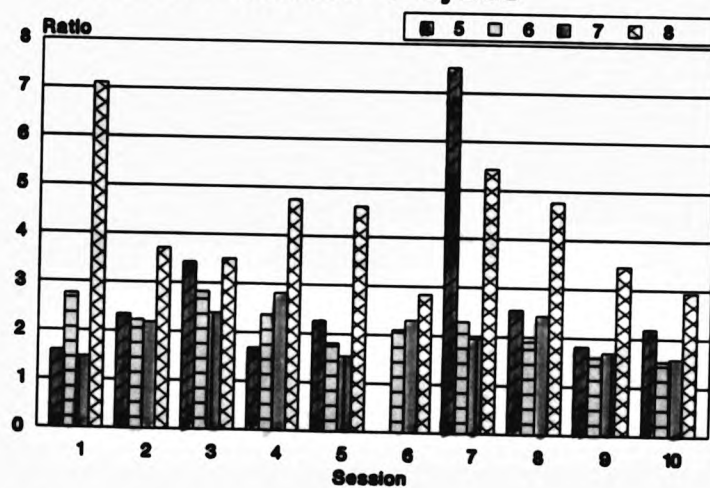


Figure 5.4

Assessment [5] Patterns of acts

The patterns of acts were determined for Sessions 1 and 10 for all dyads. This indicated the proportion of conversation that was mother-act followed by mother-act and child-act followed by child-act, and the proportion of 'dialogic' acts. It was possible to determine the proportion of between-speaker patterning (termed dialogic measures here) and the proportion of within-speaker patterning (termed here monologic measures) (Messer, 1992).

Patterns of acts expressed as percentages

CHILD AGE 8 MONTHS					
DYAD	M - M	C - C	M - C	C - M	Dialogue
ONE	33.83	5.26	30.83	30.08	60.91
TWO	22.86	17.14	30.00	30.00	60.00
THREE	40.45	9.83	25.00	24.72	49.72
FOUR	52.49	2.85	22.33	22.33	44.66
FIVE	25.93	3.09	35.18	35.80	70.98
SIX	48.50	1.88	24.81	24.81	49.62
SEVEN	33.87	17.21	24.19	24.73	48.92
EIGHT	74.83	.23	12.47	12.47	24.94
CHILD AGE 18 MONTHS					
DYAD	M - M	C - C	M - C	C - M	Dialogue
ONE	28.90	6.91	32.22	31.97	64.19
TWO	42.03	10.51	23.73	23.73	47.46
THREE	50.00	4.31	22.99	22.70	45.69
FOUR	70.27	1.35	14.32	14.06	28.38
FIVE	44.93	5.07	25.00	25.00	50.00
SIX	33.22	4.24	31.27	31.27	62.54
SEVEN	33.10	10.34	28.28	28.28	56.56
EIGHT	57.46	1.74	20.40	20.40	40.80
t-test	- 0.634	1.125	0.340	0.381	0.361
sig.	n.s.	n.s.	n.s.	n.s.	n.s.

Table 5.11

The dialogic measures were the sum of the mother utterance to child utterance column and the child utterance to mother

utterance column. There was no significant difference between dialogic and monologic measures for child age 8 months and child age 18 months (see Table 5.11). This suggested that there was a degree of consistency in the patterning and it was not a function of child age.

A ratio was computed from the dialogic and monologic measures. It assessed the dominance of the mother in the interaction in terms of her monologic communication. Her monologic measures were subtracted from the dialogic measures (the sum of mother utterance followed by child utterance and child utterance followed by mother utterance). A negative ratio would indicate that the mother dominated the interaction while a positive one would indicate that the character of the interaction remained dialogic. See Figure 5.5.

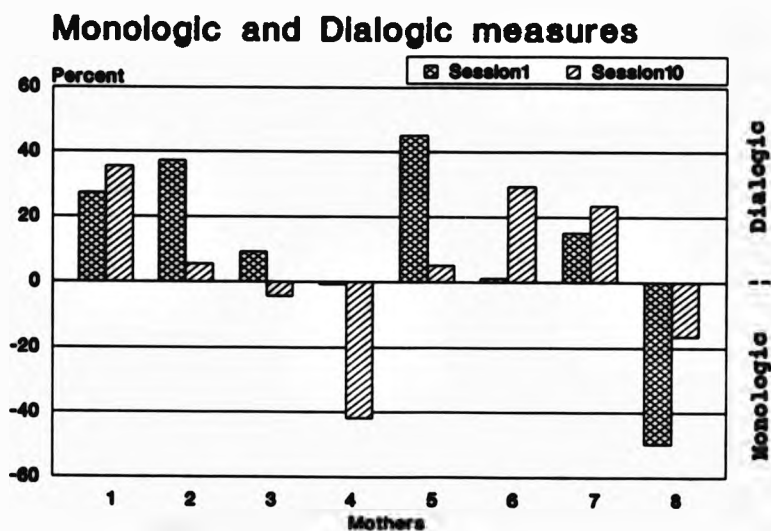


Figure 5.5

It was not deemed meaningful to assess the character of the dyad interaction by adding the two monologic measures and subtracting them from the dialogic measures. This could indicate that a conversation had a primarily dialogic or primarily monologic character but could also reflect that the mother uttered twice followed by two communicative acts from the child: this type of dialogic style would inflate the monologic measure.

Table to show Monologic/Dialogic Ratio: Sessions 1 & 10

SESSION 1	DYAD	SESSION10
27.08	ONE	35.29
37.14	TWO	5.43
9.27	THREE	- 4.31
- 7.83	FOUR	-41.89
45.05	FIVE	5.07
1.12	SIX	29.32
15.05	SEVEN	23.46
-49.89	EIGHT	-16.66

Table 5.12

Table 5.12 summarizes the calculated ratios of the patterns of acts. Dyads Four and Eight revealed a consistent negative ratio for Sessions One and Ten. It appears that this technique can distinguish between dyads with a monologic patterning and dyads with a dialogic patterning, and so fulfils Assessment [5]. The exception is Dyad Three who has a Dialogic measure at Session One and a Monologic One at Session Ten.

Assessment [6] Repetitions

Repetitions were examined and it was possible to determine the total amount of repetitions for each mother

and also how much of the repetitions were of the self and how much of the child. Over this age span, the mothers revealed an average 9.26% self-repetitions and an average of 2.03% repetitions of the child. The comparison of repetitions for Session One and Session Ten suggested that the children were becoming more adept at repetitions and had reached very similar percentages to the mothers, on average (see Table 5.13).

Mean percentage for Repetitions for Sessions 1 & 10					
Session 1	Mother	Child	Session 10	Mother	Child
Rep. Self	9.17	1.29	Rep. Self	9.01	8.19
Rep.Other	1.25	0	Rep.Other	3.16	3.30

Table 5.13

MOTHERS			
Summary of repetitions: all, self, child			
Mother	Total%	of self%	of child%
1	11.25	8.60	2.65
2	3.45	2.99	0.46
3	16.40	14.69	1.71
4	7.89	7.10	0.79
5	15.26	13.09	2.17
6	10.51	7.84	2.67
7	13.33	8.03	5.30
8	12.26	11.73	0.53
mean	11.29	9.26	2.03

Table 5.14

The totals of repetitions of the mothers are shown in Table 5.14 and are expressed as percentages of the total utterances. Part of Assessment [6] sought to examine the mothers' use of self-repetitions but it was found that they did not decrease over time (Page's L =820.5, C=7, N=8). The

mothers' repetitions of the child increased over time (Page's L = 1037.50, C=7, N=8, p=0.001). As an example, however, it was discovered that mothers' repetitions of the child were positively correlated with the children's use of Assertions (Pearson's Product Moment, $r = 0.9046$, $p = 0.0005$). Mothers' repetitions of the child were also positively correlated with the children's repetitions of the mother (Pearson, $r = 0.9323$, $p = 0.0005$). Details of the children's repetitions are shown in Table 5.15.

CHILDREN			
Summary of repetitions: all, self, mother			
Child	Total†	of self†	of mother†
1	3.42	1.55	1.87
2	4.46	4.23	0.23
3	5.73	4.64	1.09
4	2.30	0.68	1.62
5	4.19	2.42	1.77
6	3.68	2.95	0.73
7	8.91	2.55	5.65
8	4.44	2.05	2.39
mean	4.64	2.63	1.92

Table 5.15

Children's use of repetitions did appear to increase over time but could not be computed because over 40% of scores were zero. However, it was evident that over the first five sessions (over the eight children) there was a mean of 1.13 repetitions, and over the second five session there was a mean of 7.30 repetitions, suggesting an increase (see Appendix).

ANALYSIS BY CATEGORY

MOTHERS' COMMUNICATION OVER TIME

The tables showing all data for all eight mothers are shown in the Appendix. Data are shown for the Full Categories adjusted for Self-Repetitions, and for the Condensed categories.

Data were used for the five mothers who had no missing data, that is Mothers 1, 4, 6, 7 and 8 (referred to from now on as the 'complete' mothers). The frequency scores were converted to proportions, each frequency score being divided by its session total. All proportions were then transformed. Proportions between .001 and .999 were transformed using the formula: $x' = 2 \arcsin \sqrt{x}$

Proportions less than .001 were transformed using the formula: $x' = 2 \arcsin \sqrt{x} + [1/(2n)]$

where n = the number of observations on which x is based, i.e. the session total (Winer, 1971). No proportion exceeded .999. The transformations were necessary because there were some zero scores.

The analysis showed that the effect of SESSION was significant (ANOVA, $F = 3.19$, d.f. = 9, 288, $p = 0.006$). CATEGORY accounted for most of the variance (ANOVA, $F = 21.13$, d.f. = 8, 288, $p < 0.001$). The interaction effect of SESSION and CATEGORY was significant, also. (ANOVA, $F = 4.18$, d.f. = 72, 288, $p < 0.001$). Thus, the differences expressed through categories varied significantly, and significantly between sessions.

ALL MOTHERS OVER THE LEVEL 2 CATEGORIES (percentages)

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT	NINE	TEN	mean
A	0.13	0.07	0.13	0.30	---	0.14	0.26	0.14	0.10	0.10	.14
A1	0.87	0.85	1.35	1.59	1.48	2.66	2.81	1.82	3.23	3.98	2.06
A2	3.48	2.26	2.31	1.53	1.00	2.17	1.77	2.15	2.24	2.22	2.11
A12	---	0.35	0.13	0.18	0.18	0.14	0.10	0.29	0.10	0.31	.18
A3	7.84	4.73	8.90	9.68	8.51	10.21	14.66	12.59	14.19	12.98	10.43
A-	0.53	0.42	0.64	0.76	1.07	1.75	0.78	1.14	0.94	1.40	.94
Atot	12.86	8.69	13.45	14.05	12.12	17.06	20.38	18.14	20.81	21.00	15.86
VR	0.47	0.64	0.90	0.47	0.47	1.54	1.25	0.72	1.46	0.88	.88
VC	0.33	0.21	0.64	0.71	0.65	0.91	1.35	0.96	0.94	0.72	.74
VK	0.20	---	---	---	0.06	---	---	---	0.05	0.16	.05
Vtot	1.00	0.85	1.54	1.18	1.18	2.45	2.60	1.68	2.45	1.76	1.67
E	10.18	8.76	8.52	6.14	8.63	7.55	4.58	5.36	8.03	7.40	7.51
E-	0.13	0.14	0.06	0.18	0.12	0.35	---	0.19	0.47	0.26	.19
E+	4.35	3.95	4.80	4.31	3.25	3.92	2.44	2.35	2.76	3.36	3.55
Etot	14.67	12.85	13.39	10.63	12.00	11.82	7.02	7.90	11.27	11.02	11.25
G	2.01	1.98	6.66	13.40	9.69	4.76	3.80	5.03	4.59	3.62	5.55
R	16.61	16.81	17.42	13.87	17.79	16.71	14.87	20.63	16.33	18.05	16.91
H	0.87	0.85	1.73	1.00	1.18	0.98	0.68	0.86	1.15	1.35	1.07
D	9.65	9.39	7.56	13.81	12.53	15.38	19.24	14.79	16.07	18.52	13.69
O	1.74	1.13	1.54	2.01	4.73	2.17	1.77	2.15	2.56	3.05	2.29
S	26.05	31.57	24.22	17.00	13.42	8.81	9.26	9.62	8.56	5.74	15.43
P	2.14	1.77	2.05	2.13	2.60	1.89	1.46	2.97	2.35	1.97	2.13
RepO	1.27	1.20	0.77	0.53	0.83	1.47	2.76	2.73	3.08	3.16	1.78
C+	2.81	6.57	2.24	3.25	4.91	4.83	4.94	4.21	3.23	5.38	4.24
C-	0.33	0.49	0.06	0.83	1.00	1.96	0.68	0.53	1.36	0.98	.82
T	1.74	0.85	1.09	1.00	0.35	0.98	0.94	1.10	1.51	0.88	1.04
KG	3.95	2.68	1.92	1.36	1.54	1.61	1.14	0.96	1.30	0.52	1.70
KT	1.34	1.06	1.79	1.42	1.42	1.33	1.25	1.44	0.89	0.62	1.26
^	0.94	0.99	2.43	2.54	2.66	5.80	7.23	5.22	2.45	2.28	3.25
Z	---	0.28	0.13	---	0.06	---	---	0.05	0.05	0.10	.07

Table 5.16

Table 5.16 shows the percentages for the eight mothers over the Level 2 Categories.

The analysis of variance results indicated that category use varied over sessions, so it was worth establishing whether this was a systematic variation, with use decreasing or increasing over time. Tables of the data used in the Page's L trend tests are to be found in the Appendix.

Analysis of Mothers' communication over time				
Category Description	Cat Code	Change over time?	Page's L	α
StatementsWorld	A3	INCREASE	1019.5	0.001
All Assertions	ATOT	INCREASE	1022.0	0.001
'Responses'	VTOT	INCREASE	978.0	0.01
Expressives	ETOT	***	933.0	n.s.
Request, etc	REQ	***	908.0	n.s.
Games	G	***	909.0	n.s.
Onomatopoeia	O	INCREASE	1004.0	0.001
Politeness	P	***	921.5	n.s.
Giving	KG	Decrease	1040.0	0.001
Taking	KT	***	840.5	n.s.
Pointing	^	INCREASE	988.0	0.01
Attention Bids	S	Decrease	1084.0	0.001
+ve comment	C+	INCREASE	951.0	0.05
-ve comment	C-	\$	\$	\$
Directives	D	INCREASE	1013.0	0.001
Repeat Other	REPO	INCREASE	1037.5	0.001

*** = no change over time

\$ = too many zeros to compute Page's L

Table 5.17

Thus, nine categories significantly increased over time and only one, Bids for Attention, significantly decreased over time (Table 5.17). The findings of Snow (1977) and Ellis and Wells (1980), that mothers speak increasingly about the world to their developing child is supported here by the significant increase in use of the categories [ATOT] and [A3] (Assessment [7]).

CHILDREN'S COMMUNICATION OVER TIME

The tables showing the data for the Full Categories adjusted for Self-Repetitions are shown in the Appendix, as well as the tables showing the condensed data.

The condensed data for the five 'complete' children were transformed in the same way as the mothers' data had been. A fully crossed analysis of variance was then carried out using the Minitab programme. The effect of SESSION was significant ($F = 2.23$, d.f. = 9, 288, $p = 0.043$). CATEGORY accounted for most of the variance ($F = 27.46$, d.f. = 8, 288, $p < 0.001$). The interaction of SESSION and CATEGORY was also significant ($F = 4.70$, d.f. = 72, 288, $p < 0.001$).

Table 5.18 shows the percentages for all eight children over the Level Two categories over the ten sessions.

ALL CHILDREN OVER THE LEVEL 2 CATEGORIES (percentages)

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT	NINE	TEN	mean
A	3.11	4.12	5.01	6.84	6.33	4.88	10.63	8.39	7.57	5.79	6.27
A1	0.35	---	---	---	---	0.38	---	0.65	0.55	0.23	.22
A2	1.04	0.20	---	0.16	---	0.38	---	0.26	0.77	0.34	.31
A12	---	---	---	---	---	---	---	---	---	---	---
A3	2.76	4.31	2.10	6.07	7.24	15.01	14.41	17.29	28.54	27.13	12.49
A-	---	---	---	---	0.15	0.19	---	---	---	---	.03
Atot	7.25	8.63	7.17	13.06	13.73	20.83	25.04	26.58	37.43	33.48	19.32
VR	0.52	0.39	0.35	1.40	1.06	0.19	1.72	0.90	1.32	1.70	.95
VC	---	0.20	0.17	0.31	0.45	0.75	3.26	3.23	2.85	2.04	1.33
VK	34.02	42.94	34.44	21.46	17.35	9.01	11.32	6.06	3.95	3.06	18.36
Vtot	34.54	43.53	34.97	23.17	18.85	9.94	16.30	10.19	8.12	6.81	20.64
E	16.23	13.53	12.59	13.53	12.97	10.13	10.63	10.19	10.21	10.56	12.06
E-	7.43	7.84	4.37	4.82	6.94	3.94	3.77	5.94	4.61	2.61	5.23
E+	15.03	11.76	17.83	14.93	12.97	10.69	9.26	12.56	6.92	11.46	12.35
Etot	38.69	33.14	34.79	33.28	32.88	24.77	23.67	28.77	21.73	24.63	29.63
G	1.38	1.57	11.19	13.53	11.76	9.57	6.35	6.32	7.79	4.88	7.43
R	3.97	2.35	2.10	2.02	1.51	4.69	2.23	1.81	1.21	3.97	2.59
H	---	---	---	---	---	0.19	---	---	---	0.34	.05
D	1.38	---	0.35	---	1.81	0.94	0.69	0.90	0.66	4.20	1.09
O	0.17	---	0.17	0.93	1.51	2.06	2.06	1.03	1.87	1.70	1.15
S	---	0.78	0.35	1.56	0.75	3.00	0.17	1.16	0.55	1.14	.95
P	---	---	---	---	---	---	0.17	0.77	1.21	0.34	.25
RepO	---	---	0.17	0.62	0.30	---	3.09	3.35	4.83	4.43	1.68
C+	---	---	---	---	0.30	0.75	1.37	1.68	0.44	0.45	.50
C-	---	---	---	0.16	---	---	---	---	0.33	0.11	.06
T	---	---	---	---	---	---	---	---	---	---	---
KG	0.17	---	1.22	1.87	2.87	1.88	2.23	2.45	1.98	1.36	1.60
KT	12.44	9.61	5.42	5.91	4.52	5.82	3.09	2.97	2.20	1.25	5.32
^	---	0.20	2.10	3.89	9.20	15.57	13.55	12.00	9.66	10.90	7.71
Z	---	0.20	---	---	---	---	---	---	---	---	.02

Table 5.18

Children: Change in category use over time				
Category Description	Cat Code	Change over time?	Page's L	α
StatementsWorld	A3	INCREASE	1066.5	0.001
All Assertions	ATOT	INCREASE	1046.5	0.001
'Responses'	VTOT	Decrease	1066.0	0.001
Expressives	ETOT	Decrease	957.5	0.05
Request, etc	REQ	***	935.0	n.s.
Games	G	INCREASE	967.0	0.05
Onomatopoeia	O	\$	\$	\$
Politeness	P	\$	\$	\$
Giving	KG	\$	\$	\$
Taking	KT	Decrease	1063.5	0.001
Pointing	^	INCREASE	1006.0	0.001
Attention Bids	S	\$	\$	\$
+ve comment	C+	\$	\$	\$
-ve comment	C-	\$	\$	\$
Directives	D	\$	\$	\$
Repetitions ALL	REP	\$	\$	\$

*** = no change over time

\$ = too many zeros to compute Page's L

Table 5.19

Although there were a number of low frequency cells in the children's data, it was possible to determine, as shown in Table 5.19, that four categories significantly increased and three categories decreased over time. This supports the findings of Ryan (1974) in that the children did indeed increase their use of Assertions (Assessment [7]) and they also significantly decreased their use of Expressives (Assessment [8]). Further to Assessment [8], the children's use of Expressives did correlate significantly with the mothers' use of Expressives, (Pearson, $r=0.6178$, $p=0.05$, 1-tailed), suggesting this expression of emotion may be a social event. The final part of Assessment [7] was supported with the finding that mothers' use of Assertions was positively correlated to the children's use of Assertions (Pearson, $r = 0.9066$, $p=0.0005$, 1-tailed).

**EXAMINATION OF MOTHERS' DISCOURSE AND
CHILDREN'S COMMUNICATION**

The dyads were compared, using the mean percentages of utterances under the condensed categories. These are shown in tables 5.21 and 5.22.

Using the mean percentage data summarised in Table 5.20, it was established that there was no significant difference between mothers and children over these categories (W=22, N=9).

ALL DYADS: MEAN PERCENTAGE		
CATEGORY	MOTHER	CHILD
ATOT	15.85	19.32
VTOT	1.67	20.64
ETOT	11.25	29.63
REQU	19.02	2.64
RIT'L	16.25	23.49
S	15.43	.95
CTOT	5.06	.56
D	13.69	1.09
REPOTH	1.78	1.68

Table 5.20

It is evident that just six Level Four categories account for over 90% of the mothers' communication. Thus, Requests, Ritual, Assertions, Salutations, Directives and Expressives account for 91.49% of acts. For the children, only four Condensed Categories account for more than 90% of their communication. Expressives, Ritual, Responses and Assertions account for 93.08% of their acts. This reveals that the mothers are more diverse in their communication than their emergent-language children.

ALL MOTHERS OVER THE LEVEL FOUR CATEGORIES

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	TOTAL
Atot	12.86	8.69	13.45	14.05	12.12	17.06	20.38	18.14	20.81	21.00	158.64
Vtot	1.00	0.85	1.54	1.18	1.18	2.45	2.60	1.68	2.45	1.76	16.69
Etot	14.67	12.85	13.39	10.63	12.00	11.82	7.02	7.90	11.27	11.02	112.54
REQ	19.22	18.51	20.24	15.87	19.32	18.67	16.49	22.59	18.99	20.28	190.18
RIT	12.12	9.61	16.39	22.86	22.64	17.56	16.65	17.77	14.14	12.06	161.80
S	26.05	31.57	24.22	17.00	13.42	8.81	9.26	9.62	8.56	5.74	154.25
Ctot	3.14	7.06	2.30	4.08	5.91	6.79	5.62	4.74	4.59	6.36	50.59
D	9.65	9.39	7.56	13.81	12.53	15.38	19.24	14.79	16.07	18.52	136.94
RepO	1.27	1.20	0.77	0.53	0.83	1.47	2.76	2.73	3.08	3.16	17.80

Table 5.21

ALL CHILDREN OVER THE LEVEL FOUR CATEGORIES

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	TOTAL
Atot	7.25	8.63	7.17	13.06	13.73	20.83	25.04	26.58	37.43	33.48	193.18
Vtot	34.54	43.53	34.97	23.17	18.85	9.94	16.30	10.19	8.12	6.81	206.42
Etot	38.69	33.14	34.79	33.28	32.88	24.77	23.67	28.77	21.73	24.63	296.34
REQ	3.97	2.35	2.10	2.02	1.51	4.88	2.23	1.81	1.21	4.31	26.39
RIT	14.16	11.38	20.10	26.13	29.86	34.90	27.45	25.54	24.71	20.43	234.66
S	---	0.78	0.35	1.56	0.75	3.00	0.17	1.16	0.55	1.14	9.46
Ctot	---	---	---	0.16	0.30	0.75	1.37	1.68	0.77	0.56	5.59
D	1.38	---	0.35	---	1.81	0.94	0.69	0.90	0.66	4.20	10.93
RepO	---	---	0.17	0.62	0.30	---	3.09	3.35	4.83	4.43	16.79

C
E
I
L
D
R
E
M

Table 5.22

Mothers and children were not compared by analysis of variance because it was considered that they were neither related or unrelated groups, in the statistical sense. The children are obviously a separate group from the mothers, but the conversational data obtained from a child is the other side of the conversational data obtained from the mother, and thus is related.

CHANGE OVER TIME		
	MOTHER	CHILD
INCREASED USE OVER TIME	Statements World Assertions Pointing Responses Directives +ve Comment Onomatopoeia Repeats Other	Statements World Assertions Pointing Games
DECREASED USE OVER TIME	Attention Bids	Responses Expressives Taking

Table 5.23

Table 5.23 summarises the categories which changed over time for the children and for the mothers. Directives increased over time for the mothers but was a category with too many zeros scores to be analysed over time for the children. For Assessment [11], a correlation of mothers' use of Directives and children's use of Directives was carried out and was found to be not significant (Pearson, $r = 0.4253$). Mothers' use of Requests was also not significantly correlated with the children's use of Requests (Pearson, $r = -0.0036$) (Assessment [11]).

Further, for Assessment [9], mothers' use of Requests was correlated with children's use of Assertions but was not significant ($r = 0.1835$), and neither was the correlation between children's use of Requests with mothers' use of Assertions ($r = 0.0710$). Also, for Assessment [10], mothers' use of Requests was correlated with children's use of Refusals but was not significant ($r = -0.2505$) and with children's use of Compliance ($r = 0.2421$), a non-significant result. It is evident that there are no simple patterns here and that the types of Requests need to be broken down.

The importance of exchange rituals has been indicated (see Chapter Two) and formed the focus of Assessment [12]. Children's use of taking was significantly correlated with mothers' use of giving (Pearson, $r = 0.9590$, $p=0.0005$, 1-tailed). However, mothers' use of taking was not significantly correlated with children's use of giving ($r = 0.1566$). Thus the mothers are likely to take objects from the child even though they are not proffered, although the child will wait for an object to be offered him before taking.

For Assessment [13] pointing was examined, and was found to significantly increase over time for both mothers and children (see Tables 5.17 and 5.19 respectively). Further, pointing for each side of the dyad was positively correlated (Pearson, $r = 0.8188$, $p=0.005$, 1-tailed).

Assessment [14] involved an investigation of Games which were found to increase significantly over time for the children (see Table 5.19) but there was no significant

change over time for the mothers (Table 5.17). However, the use of Games was significantly correlated for the mothers and children (Pearson, $r = 0.8867$, $p=0.0005$, 1-tailed). This suggests that there is parallel and/or joint play occurring more often than solitary play.

PATTERNS OF CONVERSATION

The patterns of conversation were derived for Session One and Session Ten for all eight dyads, showing the proportion of conversation that was mother-utterance followed by mother-utterance, child-utterance followed by child-utterance, mother-utterance followed by child-utterance and child-utterance followed by mother-utterance (Messer, 1992). This was performed in terms of categories, and the full matrices for all dyads are shown in the Appendix.

The matrices have 324 cells which makes analysis complex, and there were a number of blank cells as well, as indicated in Table 5.24. There are fewer blank cells in Session Ten, where nearly two-thirds of the cells have occurred but at less than the 1% level.

Number of cells under different frequency levels

Session [1]	Frequency	Session [10]
2	> 4%	1
2	>3% <4%	3
6	>2% <3%	2
19	>1% <2%	21
136	< 1%	201
159	NONE	96
324		324

Table 5.24

There were 165 cells with occurrences of act patterns for Session One, and 228 cells for Session Ten, suggesting a greater diversity in the conversation with the older child as of interest for Assessment [15].

Table 5.25 shows the mean percentages for all eight dyads for Session One. Cell frequencies of more than 1% are shown in bold print. Table 5.26 shows the cell frequencies for Session Ten. CAPITALS refer to mother utterances and lower case refer to child utterances.

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	2.58	.20	.89	1.19	.50	1.34	.20	.64		.40		1.34	.05	.20				
V	.25	.05	.05	.05		.05	.10			.05		.05	.05	.05				
E	2.13	.15	1.83	1.58	.94	1.63	.20	.45		.10	.20	1.29	.15	.15			.05	
REQ	.94	.05	.84	4.31	1.19	2.97	.10	.79		.15	.20	1.09	.15	.05				.05
RIT	.50		.54	.59	.64	1.19		.35		.30	.35	1.24	.05	2.38				
S	.64		.54	1.09	.69	3.91	.20	.59		.05	9.01	1.68	.10	.45			.15	
C	.15		.30	.30	.10	.35	.50	.35			.05	.25						
D	.25		.74	.30	.69	1.49	.40	2.28			.05	.59	.05	.25				
REP	.05			.10	.10	.15	.10	.05	.05	.05		.25						
a	.20	.15	.10	.20	.10	.25		.05	.15	.35		.54						
v	.50		1.63	.79	1.29	3.07	.30	.54		.10		.94	.40	.30				
e	1.04	.05	2.53	1.63	.79	1.88	.15	.54	.64	.40		.99	.10	.20				
req	.05		.25	.05	.30	.10		.05				.20		.10			.05	
rit	.35	.10	.50	.64	.84	.64	.10	.30	.05	.10		.45	.05				.05	
s																		
c																		
d			.05			.05		.05				.05		.05				
rep				.05														

Table 5.25 Mean percentages for all dyads : Session ONE [CAPS = MOTHER, lower case = child]

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	3.31	.08	1.16	1.39	1.35	.60	.56	1.28		1.99	.08	1.92	.15	.60	.04		.08	.64
V	.41			.11			.23	.30	.40	.15			.04				.04	
E	1.69		.49	1.24	.34	.53	.19	1.35	.80	.60		.98	.04	.26		.04	.11	.08
REQ	1.39	.08	.64	2.93	.90	.38	.41	1.09		3.34	.90	1.09	.26	.38	.04		.08	.15
RIT	1.20	.04	.60	.34	1.20	.34	.19	.41	.04	.56	.04	.94	.15	.71		.04	.19	.23
S	.34		.19	.26	.38	.68		.83		.19	.94	.26	.04	.04				
C	.60	.08	.26	.38	.04		.26	1.43		.45		.38	.08	.26	.04	.08	.19	.11
D	.98	.19	.83	.86	.68	.75	1.39	4.17	.04	.98	.15	1.20	.23	.53	.11		.15	.19
REP	.23	.04	.04	.38	.11	.15	.04	.19	.08	.45	.04	.38	.08	.08			.04	.04
a	2.03	.49	.79	3.27	.30	.19	.30	.90	.98	1.24		.04	.08	.38	.04			
v	.41	.04	.08	.53	.34	.15	.04	.26	.04	.11		.04		.11				
e	1.28	.08	1.69	1.16	.53	.34	.30	.60	.64	.38		.64	.08	.15	.08		.15	.04
req	.15	.08	.08	.49	.19		.04	.04	.04	.11		.04	.15	.04				
rit	.41	.04	.83	.30	.60	.04	.23	.26	.19	.34		.23	.08			.08		
s			.04	.08		.04	.08	.08	.04						.04			
c	.04			.04			.11											
d	.15	.04	.11	.23			.23	.15		.04		.11					.34	
rep	.53	.08	.19	.11	.11		.04	.11	.15	.08				.04			.04	

Table 5.26 Mean percentages for all dyads : Session TEN [CAPS = MOTHER, lower case = child]

The cells with a frequency greater than 1% are tabled below (Table 5.27) and show the total percentage these cells account for. Again, CAPITALS refer to mother utterances and lower case refer to child utterances.

PATTERNS OF CONVERSATION: ALL DYADS (PERCENTAGES)				
SESSION ONE			SESSION TEN	
PERCENT	CATEGORIES	Frequency	PERCENT	CATEGORIES
9.01 4.31	S / v REQ / REQ	> 4%	4.17	D / D
3.91 3.07	S / S v / S	>3% <4%	3.34 3.31 3.27	REQ / a A / A a / REQ
2.97 2.58 2.53 2.38 2.28 2.13	REQ / S A / A e / E RIT / rit D / D E / A	>2% <3%	2.03	a / A
1.88 1.83 1.68 1.63 1.63 1.63 1.58 1.49 1.34 1.34 1.29 1.29 1.24 1.19 1.19 1.19 1.09 1.09 1.04	e / S E / E S / e v / E e / REQ E / S E / E D / D A / S A / e v / RIT E / e RIT / e A / REQ REQ / RIT RIT / S S / REQ REQ / e e / A	>1%	1.99 1.92 1.69 1.69 1.43 1.39 1.39 1.39 1.35 1.35 1.28 1.28 1.24 1.24 1.20 1.20 1.20 1.16 1.16 1.09 1.09	A / a A / e E / A e / E C / D REQ / A A / REQ D / C A / RIT E / D e / A A / D E / REQ a / a RIT / A RIT / RIT D / e A / E e / REQ REQ / D REQ / e
61.81	TOTAL		44.85	TOTAL

Table 5.27

There is a greater percentage covered by the 29 cells of greater than 1% frequency for Session One than for the 27 cells for Session Ten. Tables summarizing the ten highest frequency cells for each dyad for both sessions are shown in the Appendix (and see Messer, 1992). Table 5.28 shows the total percentages these top ten cells accounted for.

Percentage totals: top ten cells		
Session 1	DYAD	Session 10
54.90	ONE	33.25
58.58	TWO	22.94
33.43	THREE	33.04
38.24	FOUR	36.46
64.82	FIVE	37.15
51.13	SIX	47.57
39.79	SEVEN	34.49
45.40	EIGHT	30.59
48.29	mean	34.44

Table 5.28

There was a significant difference between the percentage totals for Session One and Session Ten. (Wilcoxon, $W = 0$, $N = 8$, $p = 0.01$). For Session One, the ten highest frequency cells accounted for almost half of the conversation but for Session Ten they accounted for only a third, showing, as expressed in Assessment [15], that the conversation had become more diverse.

Table 5.27 indicates that mothers' Bids for Attention and child Acknowledgements are common in conversation when the child is 8 months old. When the child is 18 months old, however, this common pattern has disappeared and mothers' use of Directives becomes a dominant pattern, as well as mothers' Requests and Assertions, and children's use of

Assertions.

These patterns of conversation for the more Dialogic dyads (1, 2, 3, 5, 6, & 7) and the more Monologic dyads (4 & 8) are shown in the Appendix. [Tables A57 and A58 show the patterns (as mean percentages) for Session One for the Monologic dyads and the Dialogic dyads, respectively, and Tables A59 and A60 show the percentages for Session Ten.]

As a brief examination of these two apparent styles, Table 5.29 below summarises the cells with a frequency greater than 2% for Session One, comparing the Dialogic dyads with the Monologic ones.

COMPARISON OF DIALOGIC WITH MONOLOGIC DYADS				
DIALOGIC		SESS. ONE	MONOLOGIC	
PERCENT	CATEGORIES	Frequency	PERCENT	CATEGORIES
10.32	S / v	> 4%	7.21	S / v
4.43	S / S		6.50	REQ / REQ
4.01	v / S			
3.07	e / S	>3% <4%	3.55	A / A
			3.55	E / E
			3.55	REQ / S
			3.19	S / S
			3.19	D / D
2.90	e / E	>2% <3%	2.72	E / A
2.73	REQ / REQ		2.60	v / E
2.56	REQ / S		2.48	E / REQ
2.47	S / e		2.25	D / S
2.47	RIT / rit		2.25	RIT / rit
2.22	e / REQ		2.01	e / E
			2.01	E / S
37.18	TOTAL		47.06	TOTAL

Table 5.29

For the Dialogic dyads the common pattern of Mother Bids for Attention and Child Acknowledgements (and Expressives) is dominant. This is less dominant with the Monologic dyads

where Mother Bids for Attention with Child Acknowledgements are the most common patterns, but supported by Mother Requests, Assertions and Expressives.

Table 5.309 below summarises the cells with greater than 2% frequency for Session Ten, comparing the Monologic and Dialogic dyads.

COMPARISON OF DIALOGIC WITH MONOLOGIC DYADS				
DIALOGIC		SESS. TEN	MONOLOGIC	
PERCENT	CATEGORIES	Frequency	PERCENT	CATEGORIES
4.18	REQ / a	> 4%	6.87	D / D
3.86	a / REQ	>3% <4%	3.76	REQ / REQ
3.18	A / A		3.63	A / A
3.07	D / D		3.24	C / D
			3.11	D / C
2.59	REQ / REQ	>2% <3%	2.33	A / RIT
2.38	A / a		2.07	S / v
2.33	a / A			
2.28	A / a			
23.87	TOTAL		25.01	TOTAL

Table 5.30

For Session Ten, the Dialogic dyads reveal a dominant patterns of Mother Request and Child Assertion, while the Monologic dyads have predominantly Mother Directives and Requests.

The patterns of conversation have described the conversation for mother-child interactions at different child ages. While difficult to analyse, it has revealed change in functional use over time and possibly differences in stylistic use.

SUMMARY OF FINDINGS

Generally, the Category Analysis Tool achieved an effective description of the mother-child communication over the year, and was shown to have been used reliably. The mother-child ratios of total utterances were reasonably constant within dyads over the year, although there were noticeable differences in ratio size between dyads. Of the techniques for the instrument's evaluation, only one was not able to be determined due to too many zero scores: that of the increase over time of children's repetitions.

Eighteen of the separate Assessment techniques were supported in the findings of this study, showing it to be reasonably effective. These were: the low occurrence of acts categorised as Miscellaneous showed the instrument to be efficient; indirect speech acts were used infrequently by the mothers; the number of children's communicative acts increased over time; as a group, the number of mother communicative acts were positively correlated to the number of child communicative acts over time; it was possible to distinguish between conversations of a primarily monologic nature and those of a primarily dialogic nature; the mothers' repetitions of the children's utterances increased over time; the mothers' repetitions of the child were positively correlated with the children's repetitions of the mother; mothers' use of Assertions (and [A3]) increased over time; as did children's use of Assertions; and mothers' use of Assertions was positively correlated to children's use; mothers' use of Expressives was positively correlated with

children's use of Expressives; mothers' use of giving / offering was positively correlated with children's use of taking; children's use of pointing increased over time; as did mothers' use; children's use of pointing was positively correlated with mothers' use; children's use of Games increased over time; mothers' use of Games was positively correlated with children's use of Games; and, finally, more diverse patterns of conversation were found in Session Ten than in Session One.

Eleven techniques were not supported by the findings. These were: expansions did not decrease over time; the ratio of mother communicative acts to child communicative acts did not decrease over the year; mothers did not decrease in their self-repetitions; children's expressives did not decrease over time; mothers' use of Requests did not positively correlate with children's use of Assertions, Requests, Compliance [VC] or Refusal [VR]; children's use of Requests did not positively correlate with mothers' use of Assertions; mothers' use of Directives did not positively correlate with children's use of Directives; children's use of giving / offering did not positively correlate with mothers' use of taking; and mothers' use of Games did not increase over time.

The analysis in terms of categories, revealing the functions of communicative acts, disclosed that mothers showed differential use over time. Their use of Assertions (including [A3]), Responses, Onomatopoeia, Politeness, Pointing, Positive comment, Directives, and Repetitions of

the child all increased over the year. Only their use of Bids for Attentions significantly decreased over time. One category, Negative comment, had too few occurrences to compute any change.

Children's use of categories also showed differences over time. Their use of Assertions (including [A3]), Games and Pointing increased over time, and their use of Responses decreased significantly over time. For Onomatopoeia, Politeness, Giving, Bids for Attention, Positive comment, Negative comment, Directives and Repetitions of the mother there were too many zero scores to compute change over time.

Mothers' communication was more diverse than the children's, using 6 condensed categories to account for more than 90% of their communication over the year while children used only 4 condensed categories to account for more than 90%.

The analysis of the patterns of conversation revealed that some mothers were more monologic than others and that there may be differences in category use between them. The data was too complex for a precise comparison.

The categorical analysis of these patterns revealed that the conversations for 75% of dyads at child age eight months were characterised by Mother Bids for Attention and Child Response. At child age eighteen months, over 60% of dyads' conversations were characterised by Mother Assertions and Requests and Child Assertions. Thus, the analysis revealed the changes occurring in the mother-child communicative interaction over the year of study.

CHAPTER SIX

*** DISCUSSION ***

INTRODUCTION

In this chapter the findings of the study will be discussed and summarised. The various assessments used to evaluate the new instrument will be discussed and any recommendations for improvements to the Category Analysis Tool will be made. A general discussion of the issues arising will be undertaken, examining any practical implications arising from the new instrument and its implementation, as well as suggested opportunities for future research.

Reliability and validity

The reliability obtained, both diachronic and synchronic, was acceptable. When assessing functional categories, the intention of the speaker has to be determined to perform the encoding. Schachter (1979) considered that 70 - 80% reliability is acceptable when measuring motives which are notoriously difficult to measure. It is reasonable to propound that motives and intentions generate similar problems as they are both internal factors, and largely have to be imputed. Similarly, levels of kappa of 0.70 are considered to be satisfactory (Bakeman and Gottman, 1987; Fleiss, 1981). Thus, the levels of inter- and intra-observer reliability achieved in this study were more than satisfactory and give

confidence to the use of the Category Analysis Tool and the findings.

The main source of lack of agreement was not disagreement over codings but one observer noting communicative acts that were not noted by the other observer. This has been noted in other studies as a "major problem" (Brinker & Goldbart, 1981, p.34) who showed that 60% of their observers' disagreements came from "events which one observer had recorded but which the other observer had not recorded" (p.34). Thus, it may well be a general difficulty for complex observational studies and not a reflection of the skills of this experimenter and external observer.

The levels of reliability achieved were lower for the children's communication than for the adults'. This could in part be lack of experience with emergent-language children, as neither observer is a mother although the researcher has had contact with young children in various studies. Another important factor is that the child is unskilled in communicating and the acts are more ambiguous than adult natural language. Ryan (1974) has indicated that there are four main sources of difficulty for adults trying to understand young children's language. Firstly, the child often makes noises that have no speech-like characteristics. Secondly, the child's noises are not recognisably part of the adult vocabulary. Thirdly, when the child does utter an adult word, the meaning of the utterance may still be unclear. In the fourth place, the child uses an adult word

unconventionally. This may be due to extension (applying a word more broadly than in adult usage) or to restriction (applying a word in a more limited way than in adult usage).

The main 'clues' for interpreting early child language, according to Ryan, are that adult interactants interpret the child's intonation in a systematic way; the accompaniments of the utterance, such as pointing, searching, playing, refusing; and the circumstances or context of the utterance, including the presence/absence of particular objects/people and any preceding event/speech. This last comment can be extended to include succeeding event/speech, which can function as a clue for interpretation. Such factors can be useful in aiding the difficult task of consistently identifying and interpreting communicative acts in emergent-language, and indeed are commonly used in research (Schachter, 1979; Newson, 1977).

The disparity between observer and experimenter has been largely explained without detriment to the Category system. There are a few mundane considerations to make which may shed more light on to the disparity. For example, the levels of motivation cannot be said to be the same for observer and experimenter.

There is one final consideration in the explanation of disparity between observer and experimenter. Although both were external to the interaction, they could not be said to be equal in relation to the dyads. If we take heterodynamic and homodynamic knowledge as a continuum, then although both analysts are clearly on the heterodynamic side, the

experimenter must be closer to the centre because she interacted with the mother, the child, and with them both together at regular intervals over a year. Clearly, heterodynamic and homodynamic knowledge is unquantifiable, but it can be seen as a matter of degree, and that the observer differs in relation to the experimenter. The significance of this is that the experimenter had shared experiences with the dyads, giving her knowledge that was unavailable to the observer. In addition to this, the external observer expressed some difficulty with the East London accent, which the experimenter was familiar with.

A comment should be made about the high levels of reliability obtained for this study, where the level of measurement was difficult and the communication often enigmatic, being largely from an emergent-language child. In this study, a great deal of time was spent in the development of the instrument and in the training of the other observer. In practical terms, this amount of time became of limited value and the large amount of time taken to raise the reliability from about the 60% level to nearer the 80% level is considered by some to be a waste of time (Nunnally, 1967; Brinker & Goldbart, 1981).

Also, in addition to this 'waste' of time and energy, it is obvious that not all training for users of such an instrument could be performed one-to-one by the developer of the instrument. Thus, a comprehensive manual would need to be produced and it may be the case that this might influence other users' level of reliability. Of course, two new users

may take the time and energy to achieve an inter-observer reliability of around 80% and it would be a mark of the instrument's effectiveness if this similarly agreed with, say, the developers' observations. The developers' findings using the instrument should not act as a standard by which all other users should be judged. The instrument and an instruction manual should eventually be able to produce reliable and consistent results by any user.

Nearly fifty-percent of the mother-child studies cited in Chapter Two did not report or perform any form of reliability measures (see Table 2.1). Nearly 90% of those who did perform some reliability measure assessed diachronic reliability only. Only two studies assessed only synchronic reliability, and only one study performed both types of reliability measures. The present study performed both types of reliability measure and achieved satisfactory levels on both.

Personal construct theory puts forward the view that "persons differ from each other in their construction of events" (Button, 1985, p.6). A person's system of constructs may influence the way they construe an event and the way they interpret their experiences. Similarly, the individual frame of reference "will affect and control the ways in which people involve themselves with and experience that situation" (Reber, 1985, p.286). In fact, Button (1985) reports research which suggests that individual differences account for a higher proportion of variance than the actual events.

Reliability is an important issue. The majority of reliability measures used assess between observer reliability and not within, and this emphasis is not seen as satisfactory. An estimate of whether a single observer can manage to be consistent seems fundamental to estimates of whether groups can agree.

Assessment [1] Efficiency

The category analysis tool can be said to be efficient because a 'catch-all' category was included so that no act had to be forced into a category. As less than 0.1% of the utterances were categorised as this miscellaneous category, it can be said to be an efficient tool.

Assessment [2] Metamessages

On the whole, the metamessage categories used in the present study are only rarely used by the mothers and children. Only one child used Light Playful tone in a teasing play with his mother. All eight children used Emphatic tone but all at low rates. This is a very natural tone to use which is probably why it was shown by all children and at all ages. It probably draws more on emotion and does not require the cognitive sophistication of the other metamessage categories.

Mothers used all five metamessage categories, although only Mother One used Indirect Speech acts. It was born out that the mothers' used Indirect Speech acts to their very young children most infrequently, and emergent-language children, unsurprisingly, do not use Indirect Speech acts at all. Mother One used questions like, 'Can you get the

car?', 'Can you get it for me?' which were not asking if the child was able to perform these actions but asking the child to do so. The child sometimes complied. The meaning of the utterances was strongly supported by gesture, pointing at the car and then beckoning to the mother.

Part two of Assessment [2], based on the literature (e.g. Bruner, 1975), had predicted that mothers' use of Expansions would decrease over time. This in fact was not the case, and the data suggested just the opposite, that Expansions were increasing. It was thought that this may be explained by the increase at this time of the children's communicative acts, as they become more competent, and thus supply more material to be expanded. This is supported by the fact that most Expansions were produced by Mother Seven whose child was the most advanced in verbal communication.

Although the literature suggested that imputed meaning and expansions had commonalities, it may be necessary to distinguish them and not to combine them. Further investigation is needed. A clarification may be obtained by examining what child categories are expanded and whether they take the form of non-verbal, pre-verbal, or verbal communication.

Schachter (1979) assessed Expansions by the mother and recorded an average of 1.67% of Expansions. This study reported an average of 1.33% of Expansions and imputed meanings, and thus similar proportions were found in both studies. Both reflect how little this is used, and so the significance for Bruner's theories must be questioned. A

study examining the expansions and imputed meanings by mothers for infants, say from birth to eight months, could be enlightening. If the proportion of speech devoted to this is still so low, then the importance of this in Bruner's theories must be reduced. It has been suggested, by Bruner (1975) and others, that the mother imputing meaning on the child's communicative acts draws the child into social interaction and so is an important issue, but one that has been largely neglected by research.

It was noticed that the emergent-language child quite clearly communicates his own intentions and if the mother's imputed meaning or expansion is incorrect, the child will indicate this. Children Seven and Six showed this particularly clearly, both becoming very frustrated when the mother misunderstood the child, which strengthens the view that the emergent-language child does have intentions. On both the occasions mentioned above, the interactions broke down. Thus, failed understandings are crucial to the interaction for they lead to its breakdown.

Use of a Light, Playful tone was the most common metamessage for Mothers Two and Three, although mothers One and Four used it quite a lot. This category was used mainly to modify negative utterances. The children seemed unaffected by these negative utterances and often laughed but whether they are understanding the message/metamessage, or whether they are responding to the playful tone or the mother's positive expressions is unclear.

Emphatic tone was the most common metamessage category for Mothers Five and Four. This commonly accompanied directives such as 'Don't' or bids for attention such as 'Oi'. There may be individual differences among mothers in their use of Emphatic tone, but the frequency was too low in this rather small group to determine.

Sarcasm or irony was the most common metamessage category for Mothers One and Two, and some mothers did not use this at all to the child. When used, it accompanied such utterances as [P] 'Thank you' when the child had just trod on the mother's toe, and [C+] 'That was clever' when the child had unintentionally knocked down something the mother had built. The sarcasm or irony negated the positive message, but it is difficult to assess what the child comprehends by this. There seemed to be little response to the few sarcastic comments which occurred.

Metamessages, like those considered here, carry an alternative or additional message to the surface meaning. They are a common part of adult communication and their part in this communication and in mother-child communication is an interesting new area. Only Indirect Speech acts have really been researched (e.g. McTear, 1985), and these are examined with older children.

DESCRIPTIVE STATISTICS AND ANALYSES

Assessment [3] Total number of acts

It was apparent that examining measures of mother-child communication in terms of number of communicative acts over the period child age eight to eighteen months was of

value (although it did not reveal the full picture of development and changes that were occurring). Children's communicative acts increased over this longitudinal study, as predicted and this supported McShane's (1980) findings. Their mothers' communicative acts also increased over this time. This confirms that the selected age span for study is a fertile and significant period for study.

Assessment [4] Ratios of acts

Assessment [4] sought to examine the ratios of number of mother utterances to child utterances, and to examine any decrease over time. There was not a significant decrease over the ten sessions but there was a decrease in the last two sessions which may reveal that the decrease is not steady over time but remains constant for a time and dips later. It may be interesting to examine this further with an older group, but it would be necessary to use a longitudinal design. This is because change over time is best measured by such a design, as cross-sectional design is vulnerable to individual and cohort differences.

From child age eight months to eighteen months the mean ratios were from 2.6 to 2.5 (with ranges 1.2 to 7.1 and 1.3 to 5.4, respectively). Looking at the ratios of the mothers after removing the data of dyads four and eight, i.e. the two 'monologic' mothers (according to the patterns of conversation analysis), it can be seen that the ratios are most consistent. For child age eight to eighteen months, the mean ratios were from 1.8 to 1.9 (with ranges from 1.2 to 2.8 and 1.3 to 2.8 respectively). Thus, the data in the

present study does not show a gradual change towards becoming equal partners. However, there is a suggestion that the developing child is not the only significant factor here, as there may be stylistic differences as well.

Clarke-Stewart and Hevey (1981) reported the ratio of mother-child verbal interaction decreased from 2.5 to 1:1 with child age one year to two-and-a-half years old. However, there was a great deal of variation within this group of seventy-seven. For example, mothers spoke to their children between 1% and 97% of the 10-second periods they were together. However, the complex findings of Clarke-Stewart and Hevey's (1981) study suggested that the ratios may remain consistent from child age one to two years and then the ratios would rapidly move towards unity. Thus, the consistency of ratios found in this present study are reasonable. However, comparison is difficult because this study differed from theirs on two crucial points: it was the frequency of acts and not the percentage of time spent which was measured, and a broad number of social-functional acts were measured, not just verbal interaction.

Schachter (1979) took Clarke-Stewart's (1973) idea and found that the total frequency of mother speech acts and child communication were highly correlated. This was supported in this study also when the group data was examined over time but for each dyad there seemed to be some variation as to how well the number of acts correlated.

Both Clarke-Stewart and Hevey's study (1981) and Schachter's study (1979) have suggested a pattern whereby

the mother matches her own interactive behaviour with the child until the child is two years old, increasing her behaviour as the child becomes able to increase his. Then, after age two the mother decreases her interactive behaviours to encourage the child's autonomy, and perhaps the child is also asserting his own behaviour as his abilities develop. Certainly, the first part at least of this pattern seemed to be supported by the findings here. However, the category system itself and stylistic differences may influence this, indicating it is not necessarily a clear cut issue. As the patterning of conversation was examined in this study as well as frequency of acts, the stylistic difference was revealed.

Assessment [5] Patterns of acts

Assessment [5] examined the monologic and dialogic patterning of conversations in respect of the number of utterances. It successfully distinguished between those dyads whose pattern of interaction is characterised as Monologic and those whose were more Dialogic. This patterning may have relevance for theories emphasising turn-taking as an important aspect of the development of conversational skills. Elias et al (1984) stated that within and between speaker patterning could reveal a monologic or dialogic nature to the discourse. It was shown that techniques devised here were able to quantify this and to show them clearly in graphical form. This distinction appeared to be fairly constant over time but varied between

dyads and it may be useful to examine it further in future studies with adequate numbers for comparison.

Assessments of Self- and Other Repetitions

The mothers' use of Self-Repetitions appeared to remain fairly constant over the year of study, while the children's use of Self-Repetitions increased over the time to reach a similar rate as the adults at 18 months. The Repetitions of other increased over time for both mothers and children, although there were computational difficulties. It was not surprising that the two monologic mothers (Four and Eight) repeated their child so little and themselves so much: this fits clearly with the monologic-dialogic picture.

Schachter (1979) noted the mean percentage of repetitions for the mothers of children aged approximately 2 to 3 years. The means for repetitions were adjusted for the child's MLU as it has been shown that self and other repetitions (as well as expansions) decrease as child MLU increases. The total mean percentage for self repetitions was 14.93% and the total mean percentage for repetitions of the child was 11.47%. However, Schachter used a broader definition of repetition than this study. The total mean percentage of exact self-repetitions was 7.05% and the total mean percentage of exact repetitions of the child was 2.7%, which show similar proportions to the results of this study. Schachter (1979) revealed that both types of repetition vary with the level of maternal education: Self-repetitions are lower with higher levels of education and Repetitions of child are higher with higher levels of education. Further

study is needed to clarify this and the role these types of repetitions play in the child's acquisition. However, the similarity in percentages with Schachter's study add to the confidence in this study's findings.

ANALYSIS BY CATEGORY

Mothers' use of category over time

The analysis of variance had shown that most of the variance was accounted for by category and that the interaction of session and category was also significant. This suggested that any differences found over time may be explained by changes in use of categories. Some researchers report on significant differences between subjects (e.g. Zinobar and Martlew, 1985) but one would expect individuals to differ and so this is not useful information. If one can distinguish meaningful and useful differences during research, then this is valuable, but just reporting differences between individuals is saying little more than that they are individuals.

Mothers' use of Statements, Statements about the world, 'Responses', Onomatopoeia, Pointing, Positive comment, Directives and Repetitions of the Child all increased over time. Giving and Attention Bids decreased over time. This suggested that mothers stimulate their child in a minimal way at first but as the child gets older, the mother moves more and more into a full conversation, with all of its diversity.

McShane (1980) indicated that 26% of adult utterances to children of between 1 and 2 years were Questions. Snow

(1977) put this figure much higher - around 50%. Schachter (1979), whose sample of children were older (about 28 months) found an average of 19% of utterances were Questions (rising up to 31% for some of the mothers). In this study a mean of 19% of questions was also found, ranging from 16% to 22%. Thus, these findings echo those of McShane (1980) and Schachter (1979) which adds to their credibility.

Children's use of category over time

The ANOVA performed on the children's data indicated that the effects of Session, Category and the interaction of the two were significant. The error variance was much higher for the children than for the mothers but similar F-ratios were obtained because the children's sums of squares for categories was noticeably higher. This suggested that the children vary between themselves to a greater degree than their mothers, which is not surprising. Rates of development have been shown to vary tremendously. All the data used in the analysis of variance had been expressed as proportions and then transformed so as to adjust the data for nil scores present, which occurred with some frequency with the children. As the data were moderated in this way, the use of the ANOVA can be justified and the results accepted with confidence.

For the children, Category accounted for most of the variance which was the same for the mothers. As the data for the ANOVA was expressed as proportions, any increase in actual number of utterances was controlled for, so the results indicate that there are changes occurring under

category that cannot be accounted for by sheer numbers. As with the mothers, some of the usage of categories increased over time and some decreased.

Children's use of Statements, Statements about the World, Games and Pointing significantly increased over the year of study. However, not all categories could be analysed as there were a number of zero frequencies in the early sessions. The children's increased use of Assertions and Statements about the World were both positively correlated with the mothers' use. This suggested a shared interest in the world, and supported Assessment [7].

The categories 'Responses' and Taking decreased over this time, which matched the decrease of mothers' use of Bids for Attention and Giving. Expressives decreased significantly for the children. This suggests that the children are developing in competence from producing ambiguous responses to unequivocal communicative acts, and in turn the mothers are producing more specific stimuli.

Giving was a category that was expected to show an increase over time for the children, but there were too many zeros to calculate change. Looking at the mean percentages for this category over each session there was some suggestion of an increase, but also a suggestion of individual differences. It has been stated that children take before they can give because the former is in response to an internal desire (subjectivity), not a coordination of a desire with that of another person's (intersubjectivity) (Poster, 1990). The trend of this data support this but was

not able to be proved statistically. Obviously, this is one of the infrequent categories.

In a longitudinal study of one child, Sylva and Lunt (1982) showed that at five months old the child gave objects to the mother less than 10% of the time, but took objects quite a lot. When a year old, the giving role was shared almost equally between the child and the mother. They suggest that the child is at first a passive partner in the exchange and later an equal partner, and relate this to learning to take conversational turns. Thus, exchange is an important category and one considered to be significant in communication. However, it was not evident here that there was any increase in these behaviours, as would be expected. Further, (Assessment [12]) mothers' use of Giving was positively correlated with children's use of Taking. However, mothers' use of Taking was not positively correlated with children's use of Giving: mothers will take from a child without an object being offered. If exchange is supposed to be a significant factor in terms of turn-taking and conversational skills, then mothers do not seem to behave in a way that supports this.

Much of the child's early communication cannot be understood as actual words. Some early utterances appear to be little more than an intonation pattern, which contains the expressive quality of language. Thus, some early utterances were classified as expressives and there was an apparent trend in reduction of [E] over time for the children, so this may suggest a change from purely intonated

utterances towards protowords and words (Assessment [81]). As the children's use of Expressives was positively correlated with the mothers' use, this category may be linked with social and contextual factors, rather than purely developmental.

Gleason (1980) showed that saying hello and goodbye (in various forms) was quite popular with children, and suggested this was because when the child greets or says farewell to someone, that person nearly always reciprocates, which is reinforcing. In fact, children of three and upwards often make a game of it, saying hello or goodbye many times (usually until the adult tires of it). It was not evident here that this was a popular category, but it is a very context-bound phenomenon.

EXAMINATION OF MOTHERS' DISCOURSE AND CHILDREN'S COMMUNICATION

Not surprisingly, mothers and children differed over use of the categories. The most noticeable differences were that children used Responses much more than the mothers, and the mothers used Requests, Directives and Salutations much more than children. The children used Ritual a little more than their mothers, and this can largely be accounted for by pointing. The mothers used language more diversely than the children. Over 90% of the five complete children's communication was accounted for by just four categories: Assertions, Responses, Expressives and Ritual. For the five complete mothers, six categories account for over 90% of

their communication: Assertions, Expressives, Requests, Ritual, Salutations and Directives.

Assessment [10] was not supported: the mothers' use of Requests did not correlate with the children's use of Refusal [VR] and Compliance [VC]. However, the literature suggests that this may only be true of Requests for Action, so that the different types of Request should be separated out and the relationship examined again. Mothers were shown to commonly use Requests but these did not positively correlate with children's use of Assertions (Assessment [9]). There were also no significant correlations with children's use of Requests and mothers' Assertions. It was thought that a breakdown of Requests into Requests for Information, Requests for Action, and so on would clarify this picture.

Further, (Assessment [11]) mothers' use of Directives with children's use of Directives was not significantly correlated so there appears, at least at this stage, to be no imitation of a Directive style. One of the difficulties with correlational studies is that there may be a delay between exposure and acquisition and thus the relationship may not be tapped by doing such correlations (Foster, 1990). It may be of value to correlate the mothers' data at Session One with the children's data from later sessions, to investigate other possible relationships between the communication.

Children's use of Pointing did increase over time and this did correlate significantly with their mothers' use of

Pointing (Assessment [13]). This supported Bruner's (1975a) view that deixis increases at this child age. It is possible to go back to the video tapes and measure whether this further supported Bruner's view that deixis develops into vocal marking. Further, it could be examined whether the emphasis changed from a focus on what the child wanted to what was novel or unusual in his world (such as the wall-mounted cameras, which were commonly pointed at and commented on).

Games increased over time for the children but not for mothers: there was no significant correlation for this category between them (Assessment [14]). It was observed that mothers were fairly consistent in game play - in fact, they play the games, such as Peep-bo and building up and knocking down bricks, before the children can participate, often playing both sides of the game. This was an important category for study because other theorists, such as Ratner and Bruner (1978), have suggested that such games are a significant forerunner of dialogue as well as introducing the child to conventional acts (Allwood, 1976). It may be worthwhile to examine further this category in relation to the child's developing communicative skills in general. It has certainly proved to be a frequent and significant category for the instrument.

PATTERNS OF CONVERSATION

The simple patterns of conversation revealed some useful characteristics. Generally speaking an utterance

from the mother was more likely to be followed by an utterance from her, too, but this varied in degree.

In Session One the mother-mother pattern had high proportions for Dyad Four (over 50%) and for Dyad Eight (nearly 75%). These were termed the monologic mothers, although it must be stressed that monologism and dialogism are relative and it has not yet been confirmed that these are specific types of mother. Dyads Seven and Two had the highest child-child communication (both over 17%), the others having a mean proportion of less than 4% (ranging from less than 0.5% to 10%). Five of the eight dyads had Mother [S] and Child [v] as the most popular conversation pair in Session One.

In Session Ten, the dyads retained their monologic or dialogic emphasis, so this appeared not to be a consequence of age, but rather a stylistic issue. Dyad Three was an exception to this, having a predominantly Dialogic characteristic in Session One and a predominantly Monologic one in Session Ten.

There were too few dyads for any differences in the dyads to be analysed precisely. Further studies are required to examine whether these differences are consistent for Dyads, and whether this consistency remains over a wider age range, and what effects, if any, this may have on the child's language development.

For Session Ten, the ten most common conversation pairs accounted for a smaller percentage of the whole conversation than those for Session One, indicating that when the child

was eighteen months old the dialogue was more diverse. This was true for all eight dyads (Assessment [15]).

All eight mothers commonly used Requests in Session Ten and so it was evident that this had become even more popular than before. All eight mothers commonly used Expressives in Session Ten also. Only two mothers often used Category [S] in Session Ten: Mother Two and Mother Four. Child Four also commonly used Responses, and indeed this was his lone contribution to the top ten conversation pairs, all the other nineteen categories being mother utterances.

In Session Ten only three dyads had top ten ranks that were child/child pairs. Dyad Seven had over 5% of the conversation accounted for by a top ten child/child pairing of Assertion/Assertion and Dyad Two had nearly 2% of the conversation accounted for by the same pairing. Dyad Five had a top ten child/child pair of Expressive/Expressive, and reflected his responses to a game of chase the mother had with him during the session.

It can be seen that Children Seven and Two had followed their own utterances by their own more than the other children at both age 8 months and age 18 months. There could be two explanations for this: either the mother is very unresponsive and the child is reduced to repeating utterances or monologuing, or the child may be advanced in communicative skills and be producing combined utterances. Further investigation is needed, but the dialogic patterning may give some indication that the former is not the case. There are apparent differences in that Dyad Two has just

three dialogic pairs in the top ten cells while Dyad Seven has six dialogic pairs in the top ten cells.

Other findings also give clues to the fact that these two children may be communicating differently: Child Two produced nearly twice as many self-repetitions as Child Seven, while Child Seven produced nearly 25 times as many repetitions of the mother as Child Two.

This analysis of patterns of conversation has clearly shown the categorical changes that have taken place over time, in both the mothers' and children's communication. Mothers changed their communication from name calling and making bids for attention to their eight month old children, to asking questions, making requests and assertions to their eighteen month old children. The children changed from indistinct acknowledgements and expressives at eight months old, to assertions and the beginnings of a broader repertoire at eighteen months old.

The differences between the monologic and dialogic mothers may have implication for the children's communication. Those that tended to be more monologic than dialogic may reduce the opportunities for the child to communicate and it would be interesting to examine the long-term effects of this. Mahoney (1988), in a study on mentally retarded children, also determined that mothers' style of communication varied, and that the mothers' communication significantly influenced the children's communication. More longitudinal studies are required with adequate numbers for research.

There have been a number of findings derived from this study, but as yet they must be considered tentatively until the Category Analysis Instrument has been more fully tested.

THE CATEGORY ANALYSIS TOOL

The Category Analysis Tool devised by this study has proved to be useful. It has allowed a comprehensive study of the mother-child interaction at a meaningful level. It is logical in that the same group of categories are applied to both dyad members, because if one sees the development of communication and language acquisition as a continuous process, then one cannot reasonably apply one set of categories to one and a different one to the other. Although the category system was designed to analyse both mother and child for theoretical considerations, this has another advantage. The system can become more comprehensive because there is only one system for the researcher to learn.

Using a category system of analysis requires decision-making. Anyone using the technique needs to decide to which category an act belongs. Thus, it is important when designing a category system to not only describe clearly the categories, but also to give information about the criteria used in coming to that decision. Some attempt was made to do this in this system, both in the text and in the booklet. Some points were clarified because they were anticipated to be problematic, and others were clarified due to feedback from another researcher using the system. Also, the response to an utterance may be helpful in interpretation,

although it is not suggested that a response always determines an utterance correctly.

Any such system of analysis has to be a compromise. Creating a tool that would be fully informative would make it unwieldy, but too simple a system gives inadequate information. This system is seen as a good compromise in that it is richly informative but manageable also. The latter was achieved by labelling the categories as an aid to memory and organizing it hierarchically. This latter point needs clarification. The hierarchical organization grouped certain categories together, on theoretical and logical grounds. This is not adequate on its own and the integrity of the instrument will be strengthened if such grouping is reinforced by Factor Analysing actual data from the full categories.

The Factor Analysis must be used cautiously and sensibly, though. For example, grouping different types of Assertions together is unlikely to prove theoretically or logically problematic, but it is not automatic that they will produce a single factor when analysed. Other more problematic groupings may be clarified by the use of Factor Analysis, however. Thus, Ritual, which groups Onomatopoeia, Games, Exchange, Pointing and Polite & Conventional Utterances together may not group under Factor Analysis. It may reveal an underlying (conventional?) link or it may reveal significantly different categories, which perhaps links with different pathways of development. There are obvious different pathways involved: for example, pointing

develops from a natural and instinctive reaching behaviour, whereas Politeness utterances are often directly taught by adults.

Another questionable group may turn out to be the different types of utterances included in the Category 'Salutations'. The linking of Bids for attention, Greetings and Calling a person's name may prove problematic. Factor Analysis may reveal that these differences are significant or reveal other groupings. If other groupings are revealed, they must be checked against theoretical and logical reasoning so that no nonsensical groupings are made.

As the development of such an instrument has to be a compromise, it has its shortcomings. One of these is that the category Assertion encompasses a broad range of statements. However, it would be possible to go back to the video-tapes and further analyse the assertions. Also, it would be of interest to further analyse the Requests, another well-used category by the mothers, into requests for information, requests for action, requests for repetition, rhetorical questions and so on. Indeed, the first system designed did incorporate such things, but they were omitted because of the need to keep the analysis tool manageable.

A difficulty that arose with the study was the categorisation of single consecutive words by the child. For example, Child Seven said, 'People. Train.' This was far more than two nominals but required the context to determine its exact meaning. It had the potential to mean, 'Put the people in the train' (Directive), 'The people are

in the train' (Assertion: expressing location) or 'I'm putting the people in the train' (Assertion: Self-commentary). Gesture, intonation and context usually made clear the meaning but it is a potential source of difficulty: some observers may code this as two instances of category [A3].

Another difficult communicative act to categorise was the non-verbal request by children. It was sometimes difficult to distinguish between a request and a directive, but the presence of emphatic tone suggested a directive, and otherwise it was taken to be a request. The task in this study was to determine the communicative intent of a rather incompetent communicator, the emergent language child, and so it was often formidable.

The booklet that was designed to help an external observer in addition to training will need to be thoroughly revised to achieve a comprehensive 'stand-alone' document to enable others to successfully implement the instrument. This is looking to the future as there is likely to be some revision of the instrument required as well as further testing of it before a useful tool of analysis is achieved. Clear criteria for interpreting communicative acts consistently when using the instrument must be achieved, including clarifying further what constitutes a communicative act. This first step of its development is a very positive one, however, showing that it can effectively distinguish many important aspects of communication.

Another issue in the development of the instrument is some means of validating or standardizing it. To some extent, this has been attempted here, in that the fifteen complex assessments sought to replicate findings from others studies. Nineteen part-assessments were supported and ten were not, and this needs to be examined further to establish whether there is some flaw in the instrument, whether this group was different or whether the original findings are suspect. It is not clear whether such a tool could be standardized, but further use of it with different groups (according to age, language ability/disorder, and such like) and examination of whether it can be shown to relate to other measures may strengthen the usefulness and dependability of the instrument.

Some important aspects of the instrument come from its design and techniques for its implementation. It appears to be original in examining both sides of the communication with the same measures, a factor that has been shown to be important on theoretical grounds. Also, it does this at a meaningful and profound level, using social-functional categories. As part of the technique of its implementation, the value of considering patterns of communicative acts as well as frequencies is significant and reveals aspects of the communication that would not have been revealed otherwise. Few studies go beyond frequency measures.

DISCUSSION OF RESEARCH METHODS

An aspect of this study that may be seen as a shortcoming was that only eight dyads were used in the

research. However, the analysis has been in depth so while the advantages of greater numbers are recognised, this comprehensive, longitudinal study of eight dyads should be accepted as reasonable for a single researcher. From a review of the literature (see Table 2.1) about 20 longitudinal studies were examined. These tended to fall into two groups. Some are single subject or very small sample studies by single researchers. Those with larger samples are generally performed by teams of researchers and are often part of larger studies, such as Project Headstart at Harvard (LaCrosse et al, 1970), the Columbus Project in Chicago (Kaye, 1979) or the Bristol Longitudinal Study in England (Wells, 1980).

Also, it has been suggested that the social class of the parents may have an influence on communication (Davis & Oliver, 1980) and the sample used here were all of RG class III, being both manual and non-manual. There may be clear differences in frequency of communication, patterns of communication and use of categories when compared with a professional sample (RG classes I & II) and also with an unskilled sample (RG classes IV & V).

The analysis in this study was applied to video-recorded data. Transcripts were not used for several reasons, mainly that the data were not suitable for it and that transcripts have been shown to be problematical anyway (Pye et al, 1988). Interpretation of the communicative acts is aided by reference to the context, and transcripts provide a very limited context, unless interminable

descriptions are undertaken. Transcripts can be advantageous in that it can increase levels of reliability (Brinker & Goldbart, 1981) but the making of transcripts imposes some interpretation on the data before analysis that may derive from the transcriber rather than the speaker, and thus have important drawbacks. Broad 'manual' acts were included in this study, such as Exchange, and direct reference to the video-recording is the most efficient way of analysing such behaviours. Further, intonation, pitch, speed, stress, and rhythm are an informative channel, particularly highlighted in this study by the examination of some metamessages, and this communicative channel is lost in transcription.

Use of video

The use of videotapes may have had some influence on the findings. Kent et al (1979) showed that the media have some effect. They compared behavioural categorisation techniques using three media: in vivo, mirror and video. They found no difference for the three conditions for eight of the nine categories, but a noticeable difference for vocalisations. In the in vivo condition, many more vocalisations were reported. Reliability measures showed similar percentage agreements for all categories for all media. For the vocalisation category, however, the agreement percentage was higher than for the other two conditions. Kent et al (1979) suggested no adequate explanation for this, although they seemed to feel that the

media presents some difficulty, other than actual sound quality.

It appeared in this study that the use of the video-recorder had an adverse effect in that a whole vocalisation could be lost when the tape was paused and re-started. In the study by Kent, their observers were not allowed to stop and start the tape, and it was believed that there was no loss in sound. Yet, it appeared that there was a clear loss in uptake or reporting of vocalisations in media other than in vivo. If this is consistent and not selective then the relationships between and within dyads are unaffected. Further, steps were taken to minimise the effect of the video-recording situation in this study.

It was also an advantage of this study that it was video-recorded because it is possible to return to the data again and again. More information can be derived from the video-recordings which would enrich the comprehensive findings. Different types of categories could be applied in addition to the data gathered. A breakdown of the children's communication in terms of non-verbal communication, verbal, protowords and babbling could be informative both in terms of development and individual differences. The complexity of both the mother's and the child's utterances could be assessed, but a system more sensitive than MLU is needed because children's holophrases are much richer than this system allows.

All levels of language could be assessed from the video-recordings: phonological, syntactic, semantic as well

as the functional level already assessed. This study has been informative about the categorical changes over time in communication but it has not yet been able to shed any light on how language is acquired. Of course, it did not aim to tackle such an issue, but more longitudinal studies of this type, and studying both the mother and the child, with video-recordings allowing multi-level and multidisciplinary analysis may take us closer to finding the answer to a most fascinating question, or at least a way to seek the answer.

"Studies based on naturalistic observation are liable to be very expensive and time consuming and to provide data which are open to more than one interpretation" (Baddeley, 1981, p.262).

There is certainly a possibility that observations made could be open to other interpretations, or that other category systems could have been used. However, the analysis was embedded in theory, stringently applied with reasonable levels of inter- and intra-observer reliability and produced meaningful findings. Thus, the findings can be shown to be of value and not to be idiosyncratic. "We may hesitate to accept any statement, even the simplest observation statement" but "we may point out that every statement involves interpretation in the light of theories, and that it is therefore uncertain" (Popper, 1980, p.33). Thus all research involves interpretation at various stages and it is in the rigour of the method that meaningful findings can be achieved.

Continuity and Discontinuity

One reason for using the same categories for mother and child is that if the development is seen as

continuous, it makes sense to use the same categories. Otherwise, at some time one would have to say where the cut off point for one set of categories was and where the next set of categories came into play. This would divide development and would not sit happily with the continuous view. Much research fails to take this issue into account. For some, the issue is not clear, and the research focuses on only one member of the dyad. For those studies that do examine both sides of the communicative dyad, no other study was found that used the same measures for both dyad members. This either constitutes a serious methodological flaw or the researcher must support the discontinuous view, and this must be fully explained.

Dunn (1977) has suggested that researching continuities in mother-child interaction is problematic because the significance of the details changes. She suggested that this could lead to only being able to use global categories, which would be unsatisfactory. However, it has been demonstrated in this research that it is possible to examine the changing interaction in a meaningful and specific way. The Category Analysis Tool can be applied to the interaction from the moment the baby is born and throughout its life.

This study has enabled an examination of the continuous communicative interaction between mother and child, which changed in character over time. This could be enhanced by a return to the video-recorded material and an analysis of any discontinuity in the channel of communication, for the child was certainly evolving from totally non-verbal communication

to a mix of verbal and non-verbal communication. For it must be emphasised that

"the properties of conversation itself (together with all the child's experience) cannot explain the abstract structure of the language the child acquires" (Dore, 1979, p.339)

It is apparent that continuity and discontinuity are important issues but complex and often difficult to analyse.

"Increasingly, interest lies in tracking the continuities and discontinuities across time in the family triad of mother, father, and infant. Implicit in this developmental orientation is a recognition that all members of the interactive network are changing over time" (Parke, 1979, p.553).

The child at eight to eighteen months is not competent in language production or comprehension. It is believed that others moderate their speech to the child to simplify the task of uptake for the child. This moderated speech, often referred to as 'motherese', is characterised by many factors, usually described at the levels of phonology, morphology and syntax. They include: the use of fewer number of sentences, shorter and syntactically simpler sentences, exaggerated stress and intonation, higher pitch, a greater number of explicit requests for attention, simplified intention or idea, reference to immediate context, deictic speech, limited vocabulary, repetitive speech, and such like (Snow & Ferguson, 1977; Ochs & Schieffelin, 1979; Pinker, 1985; Gleitman & Wanner, 1982).

This has not remained uncontested, however. Firstly, Pinker (1985) asked the crucial question: do these documented simplicities of caretaker speech help the child's acquisition of language? They may not all be significant,

and some may make little difference, with the possibility that some may hinder. Secondly, Gleitman & Wanner (1982) contested that motherese is syntactically simplified by pointing out the large number of incomplete sentences, usually noun phrases; the interjections; and, notably, the high proportion of imperatives and questions which are more complex in terms of transformational grammars, than simple, canonical sentences. The latter, these simple, active, declarative sentences, increase as the child grows older, not commencing at a high proportion and decreasing as might be expected as the child becomes more proficient. They also indicate that successful correlational studies of maternal speech and the child's linguistic stage are rare and so support Pinker's view that the suggested special features of maternal language have not been shown to be effective in child language acquisition. It may be revealing to examine in what way adult-to-child speech is simplified (if it is) at a pragmatic level because this may provide some clue to the child's comprehension processes. This study has revealed changes in the mothers' communication over time and so, with further examination, this issue may be clarified.

Studies of mother-child (and less often father-child) interaction are often aimed at what is observable. But there is a lot more to consider:

"in responding to an infant's signal's an adult must interpret them, decide what they mean and what, if anything, is to be done about them" (Richards, 1974, p.238).

Thus, it is the parent's uptake and how they construe the child, the situation and the communication that has significance.

"From birth onwards, adults are involved in a process of interpreting an infant's behaviour. It is through these interpretations, the actions of adults towards him, that an infant is able to perceive the consequences of his activities" (ibid. p.236).

Minimally, adults must interpret consistently for otherwise the child cannot learn that he can behave intentionally. Thus, uptake is a crucial part of the interaction, and it is one that is often neglected. The child has to acquire all sorts of conversation skills and if he receives erratic responses to his communicative attempts, then he may not be able to develop adequate skills.

Uptake is constructive and complex: individuals need to be able to comprehend covert and overt messages, for example, in indirect speech acts, and this is a skill children need to be able to acquire. In actual interactions, uptake can occur in situations when

"speakers are, at least in part, evasive, deceitful, irrelevant and opaque; as well as those in which they are informative, truthful, relevant and clear" (Bridges et al, 1981, p.118).

This research has attempted to deal with communication at the difficult level of functional meaning and, thus, interpretation, despite the methodological problems involved.

A word about fathers

In this study the emphasis has been on mothers, and this can be justified by the fact that, on the whole,

mothers are the prime caretakers of children, spending an average of 9 hours per day compared to the father's 3.2 hours per day (Parke, 1979). However, fathers still have an important role. In the present day when divorce and separation are becoming increasingly common, the issue of fathering has become a more important issue. As there are increasing numbers of families where the fathers have limited access to the children, it becomes important to understand the role fathers play in their child's development so that the consequences of the absence of a father may be minimised or compensated for.

Generally, it has been assumed that fathers are only important to the child (apart from the conception) later in development, perhaps from about six months old, but there is increasing evidence to show that fathers can play an important role from birth onwards, especially if present at the birth (Parke, 1979, 1981). It is important to consider the view that just because men do not caretake does not mean that they cannot.

It is apparent that fathers differ qualitatively from mothers in parent-child interactions (Parke, 1979, 1981). It is this difference which makes them important to the child's development. Fathers play with their child more than mothers, and caretake less. Further, the style of play is different between parents (ibid.). It is suggested that mothers interact and stimulate verbally much more than fathers, and so a similar analysis to this study but with fathers could be most informative.

It is important to consider fathers in relation to the child's development, but

"to understand fully the nature of parent-infant relationships, it is necessary to recognise the interdependence among the roles and functions of all family members. It is being increasingly recognised that families are best viewed as social systems" (Parke & Tinsley, 1987, p.580).

There is no reason why the Category Analysis Tool should not be applied to a three-way interaction, and would reveal any differences in category use. The Patterns of Conversation analysis would be much more complex, however, requiring three dimensional matrices.

**CONTRIBUTION OF THIS RESEARCH TO THE DISCIPLINE
and suggestions for future work**

It has been argued that as the mother and the child are an interactional unit, it is not sensible to look at the child's emergent language in isolation, without giving weight to the mother's contribution to the 'conversation'. It has been argued further that unless a theory is adequately presented, it appears unreasonable to measure adult communication differently from child communication as this would require a cut-off point and the development of communication does not appear to be discontinuous. This study examined both the mother's and the child's communicative acts which is rarely done. What makes the study probably unique is that it was a longitudinal study and the same measures were used for mother and child. Future studies which adopt either a one-sided measure of communication (either mother or child) or use different measures for the two sides of the interaction must in future

argue adequately why such a technique would be used. It has been shown here that it is logically and theoretically valid to measure both sides with the same measures, and that it is possible to do so at even profound levels such as the social-functional level.

Further, this study has revealed the need to examine patterns of categories or acts, not just frequencies. The findings showed that the interaction between mothers and their eight month old children is dominated by mother Bids for Attention and child Acknowledgements, and that at eighteen months is dominated by mother Assertions, Requests and Directives and child Assertions and Expressives. This was clarified by an examination of the patterns of acts and not immediately evident from the frequency data.

In addition, the data here suggest that there are stylistic differences between dyads, characterised by a monologic or dialogic nature. This was only apparent from an analysis of the patterns of communication and not from the frequency data. This argues that future studies should attend to patterns of acts as well as the frequency. One technique for this has been revealed here, based on the method of Markov chains.

Inter-observer reliability is reasonably common in psychological research, but intra-observer reliability is not. More specifically, "the question of the reliability of data in studies of child language has rarely been addressed" (Brinker & Goldbart, 1981, p.27). Intra-observer reliability appears to be a fundamental issue: an

experimenter should be seen to be consistent prior to any questions about agreement with others. This study analysed how consistently the experimenter applied the Category Analysis Tool, and achieved very good levels of agreement. This was in addition to the more traditional, though often neglected, assessment of inter-observer reliability. Further, the study used Cohen's kappa to analyse the reliability and thus took account of chance agreements which is particularly significant for behaviours of varying frequency (Dorsey et al, 1986). Acceptable levels of reliability were achieved here even though the analysis was at a difficult to access level. Future studies on child language should always ensure measures of intra-observer and inter-observer reliability are taken, and that they are performed with an efficient measure not merely percentage agreements.

The findings of the current study need to be taken cautiously and conclusions made tentatively. This is because the instrument is new and needs to be further tested before being completely certain of its validity, and also because this is a relatively small sample. However, there are some suggestive outcomes. This study has achieved support for and effective measurement of the views that early communication is characterised by mother's bids for attention (and that the child responds to these) and that at a later stage, the interaction is dominated by Questions, talk about the world, and, to some extent, by Directives.

The stylistic differences of the mothers that was discovered was innovative and with greater numbers it is hoped that the significance for the child's development may be examined. The findings are suggestive that mothers who show a monologic style are likely to use Directives more and this may support similar findings by Mahoney (1988) and Davis et al (1988a) who described the directive style of mothers of mentally retarded children. However, neither of these authors could clarify whether the mothers, who appeared to be acting "both responsively and potentially beneficially" (Davis et al, 1988a, p.151), were actually optimally suited to maximising the child's development. Further clarification is necessary and the Category Analysis Tool may aid this, especially if linked with insight into techniques underlying the child's language acquisition.

None of the children in this study were mentally retarded and yet the monologic, directive style was found to occur. This reveals that this aspect needs further investigation. Future studies could address the issue brought to light here of a monologic or dialogic characteristic of communication. If two groups of adequate numbers could be obtained where the mothers showed that on more than one occasion her communication was dominated by one or the other, then further analysis could investigate any differences in the children's communication. With a longitudinal study, any implications for the child's development could be addressed.

The findings of this study further support the view that the effects of prematurity may have a persistent effect, although this area of complex variables is not clear (Davis et al, 1988b). Child Four, in this study, was 8 weeks premature and was the only child to show a continuation of the early communication patterns (Mother Bids for Attention and Child Acknowledgement) at 18 months (see Patterns of Conversation cells Table A56 and/or Messer, 1992). There is thus a need to determine whether this was just a characteristic of this dyad's communication, or whether this is indicative of typical delay in premature children. The Category Analysis Tool allows for much more subtle measures than some other studies of language delay in that it reveals more than the amount of and syntax of the communication occurring but that it is categorically different, and thus, qualitatively different. In addition, it may indicate a sensitivity on the part of the mother to keeping her communication at this appropriate level for her premature child and that she is naturally responding to the child's abilities.

It could further clarify issues of other types of language-delayed children and their mothers' communication to them, for it is not yet clear how best the mother should adapt her speech to her delayed child. For example, it has been shown that some mothers of language-delayed children speak much less to their child (Davis et al, 1988b) but it is not clear whether this is a sensitive and beneficial response of the mother, whether it is in response to the

child but is detrimental to the child's development or whether it is contributing to, even causing, the language-delay. Davis et al (1988b) suggested that the mother's attitude towards and the way she construes her child may be significant, and that this should be examined in addition to measures of communication.

This supplement may involve an assessment of how the mothers construe their children, and how they construe themselves as mothers and how this changes over time. Davis (1979) examined mothers' construing of herself, of an ideal mother and of her child but found uncertain results, despite pilot studies suggesting distinct relationships between the mother's construing and her maternal behaviour. One reason for this could be that the children used in the study were between 9 and 15 months old (this was not a longitudinal study) and it is apparent from the present study that the mother changes her communication to her child between the child's age of eight and eighteen months. It is reasonable to hypothesise that her constructs of her child also change over this time, and thus, the mixed ages in Davis's study of 20 children may have masked any relationship to be found.


Davis et al (1988b) also discussed the factor of single-parenthood on language development and language-delay, and in some degree this was supported in this study in that the one single mother (Mother Two) did speak much less often to her child, who also spoke very little, but that both sides of the communication increased after periods staying with other family members. It may be as Davis et al

have stated, that this is linked with mood and personal problems, but it may also be linked simply with levels of stimulation for the mother, and thus, in turn, for the child. At age 18 months, Dyad Two were revealing the same pattern of acts as the other six dyads, that of Mother Requests, Assertions and Directives and Child Assertions, and so no language delay was obvious, and it may have been that the two periods of family stimulation were adequate intervention to prevent any delay in this case.

Brinker & Goldbart (1981) have indicated the need for longitudinal data

"comparing the interpretability of young children's vocal behaviour by people differing in their intersubjectivity relative to the child" (p.39).

This study fulfilled part of this call by using an etic approach with analysis by the experimenter. However, the experimenter had regular interaction with the mothers and children and thus differed from the typically-used external observers in intersubjectivity relative to the mothers and children. It may indeed be worthwhile to use different people to analyse the child's communication longitudinally, but it is difficult to conceive of ways to overcome the practical problems which would arise. It may be possible after data collection to train a few mothers to use the instrument and to check that there is not great disparity between their rating and the experimenter's coding. This would still involve a great investment of time and energy from the mother.



Conti-Ramsden (1985) suggested that "whatever the characteristics of mothers' dialogues with their children, motherese does not change over time" (p.65). She based this on the work of Gleitman who stated that there were no changes in the mothers' language from child age one to three years. The findings of this study challenge this proposition by revealing categorical changes in the language of all eight mothers from child eight to eighteen months. Thus, there has been a valuable contribution made by this study in creating a means sensitive enough to measure changes in the mothers' language to her child.

One means of expanding the current study would be to augment some of the categories. The category Request could be divided into Requests for Information, Requests for Action, Requests requiring Yes/No answers and so on, or even into the different channels, such as Gestural requests, vocal/verbal requests and so on. The different channels of communication could be added to the study across all acts and it is expected that this would reveal the child's development from gestural acts and early vocal acts through to verbal acts. Assertions was a large category, and this also could be subdivided, either as location, action, commentary, and so on, or as further speech act categories of warning, promise, and so on. As this study was video-recorded, all the analysis could be supplemented by such further analyses. It may be possible to further supplement the findings by examining other levels, such as phonological

and syntactical, and investigating any relationship between the various levels.

Baron-Cohen (1986) discussed autism with respect to pragmatics. Autism is the tendency to be absorbed in oneself and its defining characteristic is "chronic, severe impairment in social relations" (p.2). Baron-Cohen suggested that this failure in social interaction is linked with the lack of ability in pragmatic skills. He refers to this as a 'theory of mind', signifying the need to attribute mental states, intentions and knowledge to others. As Baron-Cohen makes clear, four year old normal children and Down's Syndrome children are capable of this intersubjectivity but autistic people are not, causing a breakdown in their attempts at communicative interaction. Baron-Cohen (1986) maintained

"that autistic children use speech intentionally (to request, demand, etc) but do not use it with any awareness of their listener's intentions, beliefs (or other mental states). for autistic children, language function is instrumental and sometimes self-regulatory, but it not communicative" (p.6/7).

He supported this declaration that the language is instrumental and not communicative with an example of the type of functions the autistic child uses. The child will request objects and activities but not information and never comments interactively, such as sharing an idea. This suggests that the child has reached a level of Primary Intersubjectivity (Trevvarthen, 1982) but does not reach the level of Secondary Intersubjectivity. An examination of autistic children's communication using the Category

Analysis Tool created in this study could be informative for both researchers into normal child communication development, and for researchers and clinicians working with autism. As Baron-Cohen (1986) expressed it, "autistic children may constitute an 'experiment-of-nature' by which to understand the cognitive prerequisites of 'normal' social and language development" (p.14).

The Category Analysis Tool devised here is ideal for examining gestural as well as spoken languages. Thus, studies on deaf children and deaf parents (and all the combinations with hearing children and hearing parents) could be usefully carried out. Some deaf children are encouraged to lip read, especially when they have hearing parents (Goldin-Meadow & Mylander, 1984). Others are taught a sign language or finger spelling. Some are taught to verbalise as well. Often, a mixture of two, three or all four of these systems are used by deaf people. Analysis of communication development and communicative interactions between deaf (and hearing) individuals could be effectively carried out using the Category Analysis Tool because it could be applied to all channels of communication.

Such a study could have benefit for the developing child. For example, it has been established that a hearing child of deaf parents is likely not to acquire verbal language (Moskowitz, 1978). This study revealed that the child was exposed to spoken language through the television and learnt to sign with his parents. This emphasised the importance of interaction in language development and not

just exposure to the spoken word. This child was hearing and so should develop spoken language but obviously intervention was necessary to achieve this. A detailed study of the development of communication where at least one person is deaf would enhance any intervention programme.

Combining the results of this study and of the study by Clarke-Stewart and Hevey (1981) it is evident that mother-child communication has a fairly consistent ratio from the child age 8 to 24 months. From child age 24 to 30 months this mother-child communication ratio changes dramatically from about 2:5 to almost unity. This suggests that child age 24 to 30 months is a rich period for study.

It would also be of interest to examine the ratio of mother/older-child and various family members to determine the patterns that exist in other communicative situations. In structured situations there may be a naturally dominant member which will bias the ratio, as in interviews or teaching situations. In families it is not known what the ratio in communication is, or whether any hierarchical status or personality traits may influence the ratio. It could lead to a simple measure of social skills, for it is considered to be poor social skills to 'hold the floor' too much, and this could easily be determined by ratio measures. Also, the patterns of conversation analysis performed in this study can be applied to any conversation, and would also be a good measure of whether someone tended to monologue, rather than enter into dialogue. This may also be linked with categorical differences such as a

predominance of directives or more (social?) categories such as Requests.

Some of the simple measures undertaken in this study, such as number of communicative acts, may be of use. As it was clear that all the children communicated more over the year of study (although there were individual differences in the actual amount), it may be useful to examine this with other groups. Frequency of speaking, and any changes over time, may be linked with the child's abilities but not necessarily optimally, in that mothers may over-stimulate their children (Davis & Oliver, 1980), especially significant if the child is mentally retarded and thus likely to have different abilities in processing information, for example.

Father-child interaction could be analysed using the Category Analysis Tool and the Patterns of Conversation analysis. This would enable any differences in father-child and mother-child communication to be highlighted. There have been some attempts to determine this but they are usually in terms of word frequency (for example, Ratner, 1988). A comprehensive analysis in terms of the functions and patterns of conversation could be enlightening and appears to be a sadly neglected area. This may have significance for families where the father is absent for some reason, such as working away, or only has minimal contact with the child. Longitudinal studies require a lot of resources and it is understandable that in a culture where the mother is still most commonly the primary

caretaker, that the studies focus on her. Also, fathers can be less willing to participate and/or less relaxed during interactions, which makes it difficult to tap the nature of the real interaction (Dunn, personal communication).

Broader implications for future research

A development arising from the needs of this study is that teams of researchers should be used rather than a single researcher. This would allow larger numbers of subjects to be used, a variety of perspectives and disciplines to be covered, and possibly a diminution of the effects of personal bias. The British Psychological Society supports this:

"the Society should consider whether some of its organisational arrangements militate against the cross-fertilisation of ideas within the psychological sciences, both between branches of the discipline and between its pure and applied aspects. (and) should consider whether there are constraints on Society membership which inhibit the full participation of colleagues from other disciplines" (BPS, 1988, p.5).

It is further considered by many that dialogues between researchers are an important factor in research. "Often it is from talk that new ideas come" (Wolpert and Richards, 1988, p.5).

Westland (1978) discussed the difficulties facing psychology, showing that the fragmented nature of the discipline and the isolation of different approaches (along with other factors) are leading psychology into crisis. "A great deal of the problem facing psychology is precisely that there is no agreed conceptual basis" (p.134). Research performed in teams could help to reduce the fragmented

nature of psychology by integrating the work of a multidisciplinary team, as well as increasing the number of subjects that could be studied by the group rather than an individual.

Psychology appears to hold hard to the paradigm of Newtonian physics, where all is potentially predictable if one can only discover the governing laws. Yet much of physics has moved past this view, now dealing with uncertainty and chaos, and even subjectivity. Physicists are now happy to deal with probabilities rather than certainties, having realised that sometimes "knowing the laws doesn't enable them to predict the future" (Berry, in Wolpert and Richards, 1988, p.44). It must be recognised that:

"in the long run the predictive power criterion must fail. Whatever we now think we know, we are likely to be overtaken by events. I do not believe that human psychology is a stable and fixed piece of mental machinery" (Harre, 1983, p.170).

This research has not established laws which may predict the development of communication in children. It has described the development of communication in a detailed way and, as a consequence, suggested many productive areas for further research. It will be necessary to revise and further validate the new instrument as well as using it with a variety of different samples before accepting any predictive qualities that may be derived from the findings of the Category Analysis instrument.

An important factor for research is its usefulness in being applied to solve practical problems. A mixture of

basic and applied research can supply a grounding of knowledge that can help in the implementation of policy and, say, child care (Hetherington & Parke, 1986). Thus, developing exact laws may not be necessary: thorough, well-grounded research can be useful in helping to solve problems and improve practices.

This research has selected the communication of mothers and of children aged eight to eighteen months. The reason for this was because this was a fertile period in language development, and that language development itself is fascinating. It was considered worthwhile, significant and revealing to examine the emergence of a phenomenon which is of central importance to all humans. The level of analysis was selected to be able to reflect these qualities. Further analysis is possible from the collected data, such as examining any relationship between the mother's communication to her child age eight months, and the child's communication at later ages. If mothers are truly sensitive to their children, then this relationship may be subtle and not detectable at the time, as the mother may need to extend her child as well as match his development level.

It is important to work at the more difficult to access levels as well, and attempt to analyse phenomena such as intentions, despite the difficulties. Psychology as a discipline can only benefit from using qualitative and descriptive methods to enhance results obtained through strict experimentation.

"It should not be assumed that qualitative methods are insightful, and quantitative ones merely

mechanical methods for checking hypotheses. The relationship is a circular one; each provides new insights on which the other can feed" (Pool, 1959, p.192).

This research has examined communication at a difficult to access level (as portrayed in the Iceberg metaphor, Figure 2.1), and has dealt with intentions and interpretations, not purely observable phenomena. It is believed that the findings were insightful, and can generate more investigations.

CONCLUSION

The social-functional analysis performed in this study with the specifically designed Category Analysis Tool proved to be an enlightening one for this longitudinal study. Some changes were revealed over time in the sheer number of acts, particularly salient when looked at in terms of patterns of conversation. This suggested that there may be a difference in communicative style with some conversations having a more monologic nature than others.

Analysis by category was most informative, although the findings must as yet be taken tentatively. It revealed that there are changes over the year of study in the use of social-functional categories for both the mother and the emergent-language child. For both, the range of acts became more diverse in this time period. For most dyads, the interaction when the child was eight-months old was characterised by Mother Bids for Attention and Child Acknowledgements and Expressives. When the child was eighteen-months old, there was a wider range of functions and the interaction was characterised by Mother Assertions,

Requests and Directives and by Child Assertions and Expressives.

The Category Analysis Tool has proved itself to be a useful and sensitive instrument. Further revisions and testing of the instrument will be necessary before it can put into practice and be applied in comparative studies or for further enlightenment by extending the longitudinal study to a greater child age. The obvious areas for further clarification of the instrument are to check on the three sub-categories of the category, Salutations; to check on the condensed category, Ritual, to examine whether it is meaningful to group the five categories together; to separate the category, Request into the different types of request, such as Requests for Information, Requests for Action and so on, and also possibly to split Requests into verbal and behavioural ones; and, finally, to determine any overlap or any difference between Expansions and Imputed meaning.

Meaning is not an external, given phenomenon but is an internal, constructed one, and its comprehension, or uptake, is fundamental to our everyday conversations. It is an ability which the child must acquire and an important one. Thus, all efforts to analyse meaning can only be an interpretation, though a clear attempt is made to ensure the analysis is rigorous. This problematic level of analysis has not deterred from a comprehensive analysis which has moved from simple frequency measures to more descriptive but meaningful patterns of conversation analysis.

Suggestions have been made for some of the practical implications (and implications for practice) and opportunities for future research that have evolved from the developed Category Analysis Tool and its initial implementation. It is clear that there is much fruitful work that could be performed with this new instrument, and the techniques of examining patterns of communication as well as frequencies of acts.

There have been several methodological points that have come out of this study. Firstly, that it is possible to measure communication at this difficult to access level. Also, that measures of intra-observer and inter-observer reliability are most important in these studies. Further, the assessment of it should not be merely percentage agreement but some measure such as Cohen's kappa which takes account of chance agreements and thus is helpful when the observed behaviours are of varying frequencies. Other methodological points are that both sides of an interaction should be measured and the communication measured by the same categories, unless this can be logically and theoretically justified. Further, multi-disciplinary and multi-level analysis is important if the lines of continuity and discontinuity are to be clarified in this area of developing social, communicative and language skills.

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APPENDIX

Tables A1 to A8	Mothers over Level One Categories
Tables A9 to A16	Mothers over Level Four Categories
Tables A17 to A24	Children over Level One Categories
Tables A25 to A32	Children over Level Four Categories
Tables A33 to A40	Patterns of Conversation: Session One
Tables A41 to A48	Patterns of Conversation: Session Ten
Tables A49 to A56	Top ten cells for dyads, Sessions 1&10
Table A57	Monologic dyads [%] Session One
Table A58	Dialogic dyads [%] Session One
Table A59	Monologic dyads [%] Session Ten
Table A60	Dialogic dyads [%] Session Ten
Appendix 50	List of Page's L trend test
Appendix 51 - 69	Tables for Page's L trend test
Appendix 70	Form for mother
Appendix 71	Confirmation letter and form
Appendix 72	Clarifying letter

Example of coding scheme in practice

Mother	Child
A3 A3 A3* M D D/I E D E+ O* M A3 S	R A3 A3/x/T A2 C+ C+ C+ KG KT G
0.30	2.00
Vx E O E R E R* A M A	(child sneezes) P (Bless you!) R R A3 R H A3* M
1.00	2.30
A/x R A3 A3 E E A3* M A3/T P* M	P A3 A3 ↑ M C+ (fire engine siren outside) A3 R A3 Vc A3
1.30	3.00
R A3 R R R	D/I VR D D R R KG {KT P (Ta!)

Mother One over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]	TOTAL										
A	0	0	0	0	0	0	0	1	0	0	1
A1.	6	1	5	5	8	6	1	1	1	2	36
A2.	1	1	3	3	1	7	1	11	4	8	40
A12.	0	0	0	0	0	1	1	2	1	1	6
A3.	2	6	27	8	6	13	14	22	17	48	163
A-	0	0	0	0	0	0	0	0	0	0	0
A1-	0	0	0	0	1	0	1	0	0	0	2
A2-	0	0	1	2	1	0	0	0	0	1	5
A12-	0	0	0	0	0	1	0	0	1	0	2
A3-	1	0	0	1	0	4	3	1	0	7	17
ATOT	10	8	36	19	17	32	21	38	24	67	272
VR	0	6	7	4	0	8	1	7	12	3	48
VC	0	0	0	3	1	1	4	4	2	2	17
VK	0	0	0	0	0	0	0	0	0	1	1
VTOT	0	6	7	7	1	9	5	11	14	6	66
E	4	7	12	6	17	8	18	13	13	22	120
E-	0	0	0	1	0	1	0	4	7	0	13
E+	4	11	14	12	12	10	9	9	7	5	93
ETOT	8	18	26	19	29	19	27	26	27	27	226
G	3	10	11	9	12	1	12	8	1	4	71
R	7	28	14	17	20	38	52	44	58	49	327
H	0	2	2	4	0	2	4	2	1	0	17
D	8	15	10	38	32	39	11	21	30	19	223
O	0	0	6	8	6	9	4	4	1	5	43
S	38	50	62	33	40	32	25	24	38	6	348
P	2	6	6	4	6	3	5	9	5	13	59
REPO	0	4	0	1	1	5	7	12	10	15	55
C+	0	17	8	6	20	24	20	36	16	17	164
C-	0	5	0	5	4	6	6	3	8	1	38
Z	0	0	0	0	0	0	0	0	0	2	2
T	0	0	0	1	0	1	2	5	1	2	12
KG	4	0	4	5	4	5	11	2	5	4	44
KT	2	1	6	3	1	0	8	5	1	4	31
-	2	3	5	5	2	29	13	9	5	1	74
TOTAL	84	173	203	184	195	254	233	260	245	242	2073

Table A1

Mother Two over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]	TOTAL
A	0 0 0 0 1 0 0 0 1
A1.	0 1 0 0 1 1 0 4 7
A2.	2 0 0 1 2 0 4 6 15
A12.	0 0 0 0 0 0 1 0 1
A3.	1 1 4 13 23 49 70 16 177
A-	0 0 0 0 0 0 0 0 0
A1-	0 0 0 0 0 0 1 0 1
A2-	0 0 1 0 2 0 1 1 5
A12-	0 0 0 0 0 0 1 0 1
A3-	0 0 0 0 2 1 1 0 4
ATOT	3 2 5 14 31 51 79 27 212
VR	0 0 0 1 9 6 2 2 20
VC	0 0 0 0 1 2 3 4 10
VK	0 0 0 0 0 0 0 0 0
VTOT	0 0 0 1 10 8 5 6 30
E	5 1 1 2 5 0 10 10 34
E-	0 0 0 0 4 0 0 2 6
E+	2 3 5 2 9 3 0 16 40
ETOT	7 4 6 4 18 3 10 28 80
G	3 4 7 12 7 2 6 12 53
R	4 4 5 6 9 9 24 30 91
H	0 0 1 0 0 1 1 0 3
D	2 2 2 11 34 26 13 31 121
O	0 0 1 0 1 6 7 6 21
S	14 18 11 16 14 14 8 18 113
P	0 0 1 2 6 7 10 3 29
REPO	0 0 0 0 1 1 1 1 4
C+	0 0 0 0 9 3 1 3 16
C-	0 0 0 3 7 3 3 3 19
Z	0 0 0 0 0 0 0 0 0
T	0 0 0 0 0 0 4 1 5
KG	4 1 3 4 8 1 1 1 23
KT	1 0 1 1 10 6 6 2 27
^	0 0 0 3 5 8 4 1 21
TOTAL	38 35 43 77 170 149 183 173 868

Table A2

Mother Three over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]--[10]	TOTAL									
A	1	0	0	4	0	2	0	0	1	8
A1.	0	1	2	4	2	2	8	6	6	31
A2.	16	4	6	4	1	5	0	9	8	53
A12.	0	3	0	0	1	0	0	0	0	4
A3.	28	11	8	19	36	27	38	29	23	219
A-	0	0	0	0	0	0	0	0	0	0
A1-	0	0	0	0	0	0	0	0	0	0
A2-	2	5	2	3	4	0	4	0	0	20
A12-	0	0	0	0	0	0	0	0	0	0
A3-	0	0	2	0	0	0	1	1	2	6
ATOT	47	24	20	34	44	36	51	45	40	341
VR	1	1	2	1	3	3	4	0	5	20
VC	4	1	0	1	0	0	1	2	0	9
VK	0	0	0	0	0	0	0	0	0	0
VTOT	5	2	2	2	3	3	5	2	5	29
E	21	9	8	6	33	5	18	38	15	153
E-	0	0	0	0	0	0	0	0	0	0
E+	17	9	17	7	6	3	3	4	5	71
ETOT	38	18	25	13	39	8	21	42	20	224
G	4	3	11	8	31	8	27	27	10	129
R	35	21	33	26	53	23	64	42	30	327
H	5	1	1	0	2	1	1	2	4	17
D	30	41	22	68	31	72	71	42	93	470
O	8	0	3	8	18	5	12	7	2	63
S	38	54	31	41	17	39	29	5	14	268
P	8	2	1	3	4	5	12	9	6	50
REPO	4	0	8	2	2	4	4	6	8	38
C+	4	22	10	5	8	6	8	7	14	84
C-	0	1	0	2	1	2	2	0	3	11
Z	0	4	2	0	0	0	1	0	0	7
T	5	2	0	1	1	1	3	6	2	21
KG	3	3	3	3	4	2	6	3	2	29
KT	6	4	1	1	1	0	6	4	3	26
^	8	1	4	4	2	35	19	6	18	97
TOTAL	248	203	177	221	261	250	344	255	274	2233

Table A3

Mother Four over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]	TOTAL
A	1 0 1 0 0 0 2 1 0 1 6
A1.	5 2 3 5 4 4 23 10 18 8 82
A2.	10 5 4 7 2 6 9 9 6 7 65
A12.	0 0 1 0 1 0 0 2 0 1 5
A3.	12 6 3 10 9 17 17 56 24 19 173
A-	0 0 0 0 0 0 0 0 0 0 0
A1-	0 0 0 0 0 0 0 0 1 0 1
A2-	0 0 0 0 1 0 1 1 3 2 8
A12-	0 0 0 0 0 0 0 0 0 0 0
A3-	0 0 0 3 3 0 0 4 0 0 10
ATOT	28 13 12 25 20 27 52 83 52 38 350
VR	4 1 0 1 2 1 2 3 6 4 24
VC	0 0 0 0 2 0 3 4 1 0 10
VK	0 0 0 0 0 0 0 0 0 0 0
VTOT	4 1 0 1 4 1 5 7 7 4 34
E	19 9 18 20 30 32 17 18 21 28 212
E-	1 0 0 2 1 0 0 0 0 0 4
E+	19 2 12 12 10 13 9 5 8 3 93
ETOT	39 11 30 34 41 45 26 23 29 31 309
G	4 1 16 54 22 27 12 20 9 11 176
R	60 38 47 51 47 36 39 59 30 41 448
H	1 3 3 5 4 6 3 3 1 6 35
D	42 28 25 60 58 23 82 85 76 94 573
O	4 0 3 0 0 0 2 4 8 5 26
S	89 65 65 52 60 30 30 58 25 24 498
P	5 9 7 3 7 5 2 11 6 3 58
REPO	0 1 0 0 0 2 5 3 5 7 23
C+	10 43 4 21 24 9 13 20 11 41 196
C-	2 0 0 2 9 2 1 3 12 2 33
Z	0 0 0 0 0 0 0 0 1 0 1
T	5 3 4 2 0 1 3 3 3 1 25
KG	25 11 7 5 0 2 3 2 7 3 65
KT	7 4 5 2 2 4 2 6 1 2 35
^	0 1 2 0 0 3 11 17 3 5 42
TOTAL	325 232 230 317 298 223 291 407 286 318 2927

Table A4

Mother Five over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]TOTAL										
A	0	0	0	0	0		0	0	0	0
A1.	0	4	7	0	4		3	3	23	49
A2.	0	4	3	0	0		0	3	4	3
A12.	0	2	1	0	1		0	1	0	3
A3.	6	2	22	2	2		29	13	15	9
A-	0	0	0	0	0		0	0	0	0
A1-	0	0	0	0	0		0	0	1	0
A2-	0	1	0	0	0		0	0	0	2
A12-	0	0	0	0	3		0	0	0	1
A3-	0	0	0	0	1		2	0	0	1
ATOT	6	13	33	2	11		34	20	43	68
VR	0	0	0	0	1		5	0	2	2
VC	0	0	4	0	0		1	4	0	1
VK	0	0	0	0	0		0	0	0	0
VTOT	0	0	4	0	1		6	4	2	3
E	1	2	20	4	2		3	14	12	19
E-	0	0	0	0	0		0	0	0	0
E+	2	2	0	7	2		0	3	3	11
ETOT	3	4	20	11	4		3	17	15	30
G	6	4	16	63	40		5	9	7	6
R	17	17	42	8	17		19	58	23	27
H	0	0	12	0	3		0	5	0	2
D	1	3	6	2	15		23	12	28	27
O	2	2	1	0	9		3	2	7	16
S	53	65	28	40	43		19	48	37	19
P	0	1	4	3	13		1	16	9	3
REPO	1	1	1	1	3		1	16	2	6
C+	0	3	1	0	1		13	1	0	0
C-	0	1	0	0	0		0	3	0	1
Z	0	0	0	0	0		0	0	0	0
T	1	0	2	0	2		0	2	0	0
KG	10	2	0	0	1		0	0	1	0
KT	1	2	3	0	3		1	7	4	0
-	0	0	9	0	0		30	3	7	3
TOTAL	101	118	182	130	166		158	223	185	211

Table A5

Mother Six over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]TOTAL											
A	0	0	0	0	0	0	0	0	0	0	0
A1.	0	0	1	11	1	4	13	12	3	5	50
A2.	7	8	4	7	5	4	6	3	5	3	52
A12.	0	0	0	0	0	0	1	0	0	1	2
A3.	1	7	11	5	21	8	5	10	12	15	95
A-	0	0	0	0	0	0	0	0	0	0	0
A1-	0	0	0	0	1	0	0	2	0	3	6
A2-	0	0	0	0	0	0	3	0	5	3	11
A12-	0	0	0	0	0	1	1	0	0	0	2
A3-	0	0	0	0	1	1	1	1	0	2	6
ATOT	8	15	16	23	29	18	30	28	25	32	224
VR	2	1	5	1	2	8	2	0	4	0	25
VC	0	0	0	2	1	2	0	0	5	0	10
VK	1	0	0	0	0	0	0	0	0	0	1
VTOT	3	1	5	3	3	10	2	0	9	0	36
E	11	40	18	25	18	14	14	16	17	17	190
E-	0	0	0	0	0	0	0	0	1	1	2
E+	4	14	8	21	8	18	12	17	18	6	126
ETOT	15	54	26	46	26	32	26	33	36	24	318
G	7	2	10	27	24	10	17	24	12	7	140
R	30	34	33	33	48	30	56	104	77	89	534
H	1	0	0	0	1	2	1	0	1	0	6
D	19	9	12	18	28	42	44	42	23	19	256
O	0	0	0	4	7	0	1	4	5	3	24
S	79	79	74	54	16	17	23	6	12	6	366
P	12	4	6	6	9	4	0	4	3	0	48
REPO	13	11	3	0	1	4	2	4	15	7	60
C+	9	3	6	16	10	13	7	4	5	2	75
C-	0	0	1	2	3	2	1	0	2	7	18
Z	0	0	0	0	0	0	0	0	0	0	0
T	2	4	3	2	2	0	4	0	2	1	20
KG	1	6	5	2	13	6	1	1	0	0	35
KT	0	2	8	7	12	5	1	2	0	1	38
-	0	0	5	2	6	17	4	7	5	1	47
TOTAL	199	224	213	245	238	212	220	263	232	199	2245

Table A6

Mother Seven over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]	TOTAL
A	0 0 1 1 0 0 1 0 1 0 4
A1.	2 3 2 2 6 3 7 2 4 1 32
A2.	4 0 6 1 4 5 11 4 4 4 43
A12.	0 0 0 3 0 0 0 0 0 0 3
A3.	20 16 23 53 23 30 31 53 32 50 331
A-	0 0 0 0 0 0 0 0 0 0 0
A1-	0 0 0 0 0 0 0 1 0 0 1
A2-	0 0 1 2 0 0 1 0 0 0 4
A12-	0 0 0 0 0 0 0 0 0 0 0
A3-	1 0 3 2 0 3 0 5 2 1 17
ATOT	27 19 36 64 33 41 51 65 43 56 435
VR	0 0 0 0 0 0 2 0 0 1 3
VC	1 2 6 6 7 9 11 4 3 6 55
VK	2 0 0 0 1 0 0 0 1 2 6
VTOT	3 2 6 6 8 9 13 4 4 9 64
E	15 14 7 15 16 19 6 9 17 11 129
E-	0 0 0 0 0 0 0 0 0 0 0
E+	8 12 9 8 9 8 9 5 8 6 82
ETOT	23 26 16 23 25 27 15 14 25 17 211
G	0 2 14 25 7 6 2 5 2 4 67
R	20 20 34 30 23 28 40 50 38 34 317
H	1 3 2 5 6 5 2 4 10 12 50
D	3 14 18 9 8 17 16 15 19 15 134
O	1 0 0 2 19 12 1 8 3 3 49
S	22 28 16 13 14 8 9 4 4 5 123
P	0 0 1 3 0 4 2 5 1 3 19
REPO	1 0 0 4 5 11 32 18 14 8 93
C+	4 1 5 2 1 12 8 8 13 10 64
C-	0 0 0 0 0 12 0 0 0 2 14
Z	0 0 0 0 1 0 0 0 0 0 1
T	5 1 2 8 1 7 7 1 10 7 49
KG	4 0 2 2 3 1 1 0 0 0 13
KT	0 0 0 3 0 0 0 0 0 0 3
-	1 0 4 8 6 9 5 14 1 3 51
TOTAL	115 116 156 207 160 209 204 215 187 188 1757

Table A7

Mother Eight over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]--[10]	TOTAL
A	0 1 0 0 0 1 0 1 1 0 4
A1.	0 0 1 0 0 11 4 2 7 2 27
A2.	12 10 10 3 4 5 2 15 7 4 72
A12.	0 0 0 0 0 0 0 1 0 0 1
A3.	47 18 41 54 47 58 110 71 73 71 590
A-	0 0 0 0 0 0 0 0 0 0 0
A1-	0 0 0 0 0 0 0 0 0 0 0
A2-	4 0 0 0 0 6 0 3 0 0 13
A12-	0 0 0 0 0 0 0 0 0 0 1
A3-	0 0 0 0 0 2 1 1 0 0 4
ATOT	63 29 52 57 51 83 117 94 88 78 712
VR	0 0 0 0 0 2 3 1 2 0 8
VC	0 0 0 0 0 2 5 3 2 1 13
VK	0 0 0 0 0 0 0 0 0 0 0
VTOT	0 0 0 0 0 4 8 4 4 1 21
E	76 42 49 26 30 30 25 24 26 21 349
E-	1 2 1 0 1 0 0 0 1 2 8
E+	9 3 10 4 8 4 2 7 5 13 65
ETOT	86 47 60 30 39 34 27 31 32 36 422
G	3 2 19 29 28 10 15 12 24 16 158
R	75 76 64 64 93 72 48 52 21 49 614
H	5 3 6 3 4 0 1 3 6 2 33
D	39 21 23 28 40 63 96 62 77 60 509
O	11 14 10 12 21 8 12 11 11 19 129
S	56 88 91 39 37 19 19 32 35 19 435
P	5 3 6 12 5 9 6 5 2 7 60
REPO	0 0 0 1 2 0 1 0 6 9 19
C+	15 4 1 5 19 8 25 11 9 17 114
C-	3 0 0 0 0 0 0 0 1 0 4
Z	0 0 0 0 0 0 0 0 0 0 0
T	8 2 6 3 0 1 1 9 3 3 36
KG	8 15 6 2 1 6 3 9 8 0 58
KT	3 2 4 7 5 4 6 2 1 0 34
-	3 9 9 21 29 33 33 40 16 12 205
TOTAL	383 315 357 313 374 354 418 377 344 328 3563

Table A8

Mother One over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	-[10]	TOTAL
ATOT	10	8	36	19	17	32	21	38	24	67	272
VTOT	0	6	7	7	1	9	5	11	14	6	66
ETOT	8	18	26	19	29	19	27	26	27	27	226
REQUEST	7	30	16	22	20	41	58	51	60	51	356
RITUAL	13	20	38	34	31	47	53	37	18	31	322
S	38	50	62	33	40	32	25	24	38	6	348
CTOT	0	22	8	11	24	30	26	39	24	18	202
D	8	15	10	38	32	39	11	22	30	19	224
REPO	0	4	0	1	1	5	7	12	10	15	55
TOTAL	84	173	203	184	195	254	233	260	245	240	2071

Table A9

Mother Two over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	-[10]	TOTAL
ATOT	3	2	5	14		31	51		79	27	212
VTOT	0	0	0	1		10	8		5	6	30
ETOT	7	4	6	4		18	3		10	28	80
REQUEST	4	4	6	6		9	10		29	31	99
RITUAL	8	5	13	22		37	30		34	25	174
S	14	18	11	16		14	14		8	18	113
CTOT	0	0	0	3		16	6		4	6	35
D	2	2	2	11		34	26		13	31	121
REPO	0	0	0	0		1	1		1	1	4
TOTAL	38	35	43	77		170	149		183	173	868

Table A10

Mother Three over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	47	24	20	34	44		36	51	45	40	341
VTOT	5	2	2	2	3		3	5	2	5	29
ETOT	38	18	25	13	39		8	21	42	20	224
REQUEST	45	24	34	27	56		25	68	50	36	365
RITUAL	37	13	23	27	60		55	84	56	41	396
S	38	54	31	41	17		39	29	5	14	268
CTOT	4	23	10	7	9		8	10	7	17	95
D	30	41	22	68	31		72	71	42	93	470
REPO	4	0	8	2	2		4	4	6	8	38
TOTAL	248	199	175	221	261		250	343	255	274	2226

Table A11

Mother Four over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	28	13	12	25	20	27	52	83	52	38	350
VTOT	4	1	0	1	4	1	5	7	7	4	34
ETOT	39	11	30	34	41	45	26	23	29	31	309
REQUEST	66	44	54	58	51	43	45	65	34	48	508
RITUAL	45	26	40	64	31	41	32	60	34	29	402
S	89	65	65	52	60	30	30	58	25	24	498
CTOT	12	43	4	23	33	11	14	23	23	43	229
D	42	28	25	60	58	23	82	85	76	94	573
REPO	0	1	0	0	0	2	5	3	5	7	23
TOTAL	325	232	230	317	298	223	291	407	285	318	2926

Table A12

Mother Five over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	6	13	33	2	11		34	20	43	68	230
VTOT	0	0	4	0	1		6	4	2	3	20
ETOT	3	4	20	11	4		3	17	15	30	107
REQUEST	18	17	56	8	22		19	65	23	29	257
RITUAL	19	11	33	66	66		40	37	35	28	335
S	53	65	28	40	43		19	48	37	19	352
CTOT	0	4	1	0	1		13	4	0	1	24
D	1	3	6	2	15		23	12	28	27	117
REPO	1	1	1	1	3		1	16	2	6	32
TOTAL	101	118	182	130	166		158	223	185	211	1474

Table A13

Mother Six over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	8	15	16	23	29	18	30	28	25	32	224
VTOT	3	1	5	3	3	10	2	0	9	0	36
ETOT	15	54	26	46	26	32	26	33	36	24	318
REQUEST	33	38	36	35	51	32	61	104	80	90	560
RITUAL	20	14	34	48	71	42	24	42	25	12	332
S	79	79	74	54	16	17	23	6	12	6	366
CTOT	9	3	7	18	13	15	8	4	7	9	93
D	19	9	12	18	28	42	44	42	23	19	256
REPO	13	11	3	0	1	4	2	4	15	7	60
TOTAL	199	224	213	245	238	212	220	263	232	199	2245

Table A14

Mother Seven over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	27	19	36	64	33	41	51	65	43	56	435
VTOT	3	2	6	6	8	9	13	4	4	9	64
ETOT	23	26	16	23	25	27	15	14	25	17	211
REQUEST	26	24	38	43	30	40	49	55	58	53	416
RITUAL	6	2	21	43	35	32	11	32	7	13	202
S	22	28	16	13	14	8	9	4	4	5	123
CTOT	4	1	5	2	1	24	8	8	13	12	78
D	3	14	18	9	8	17	16	15	19	15	134
REPO	1	0	0	4	5	11	32	18	14	8	93
TOTAL	115	116	156	207	159	209	204	215	187	188	1756

Table A15

Mother Eight over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	63	29	52	57	51	83	117	94	88	78	712
VTOT	0	0	0	0	0	4	8	4	4	1	21
ETOT	86	47	60	30	39	34	27	31	32	36	422
REQUEST	88	81	76	70	97	73	50	64	30	54	683
RITUAL	33	45	54	83	89	70	75	79	62	54	644
S	56	88	91	39	37	19	19	32	35	19	435
CTOT	18	4	1	5	19	8	25	11	10	17	118
D	39	21	23	28	40	63	96	62	77	60	509
REPO	0	0	0	1	2	0	1	0	6	9	19
TOTAL	383	315	357	313	374	354	418	377	344	328	3563

Table A16

Child One over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]TOTAL											
A	0	1	4	5	2	4	6	14	10	10	56
A1.	1	0	0	0	0	0	0	1	1	1	4
A2.	0	0	0	0	0	0	0	0	0	0	0
A12.	0	0	0	0	0	0	0	0	0	0	0
A3.	0	0	1	1	4	2	8	28	27	64	135
A-	0	0	0	0	0	0	0	0	0	0	0
A1-	0	0	0	0	0	0	0	0	0	0	0
A2-	0	0	0	0	0	0	0	0	0	0	0
A12-	0	0	0	0	0	0	0	0	0	0	0
A3-	0	0	0	0	0	0	0	0	0	0	0
ATOT	1	1	5	6	6	6	14	43	38	75	195
VR	0	0	0	2	1	0	0	1	1	0	5
VC	0	0	0	0	0	0	0	1	0	1	2
VK	27	26	37	20	12	10	6	7	7	2	154
VTOT	27	26	37	22	13	10	6	9	8	3	161
E	7	4	4	16	20	12	10	20	5	28	126
E-	2	0	1	3	2	2	0	4	5	1	20
E+	1	5	20	12	3	12	15	16	10	10	104
ETOT	10	9	25	31	25	26	25	40	20	39	250
G	3	4	5	13	13	0	19	5	0	1	63
R	0	0	1	1	1	8	4	3	1	5	24
H	0	0	0	0	0	0	0	0	0	0	0
D	3	0	2	0	3	4	2	3	1	6	24
O	0	0	1	4	6	0	0	3	1	8	23
S	0	0	1	4	4	2	0	1	0	1	13
P	0	0	0	0	0	0	0	0	0	0	0
REPO	0	0	0	1	0	0	0	4	6	7	18
C+	0	0	0	0	0	2	4	13	2	2	23
C-	0	0	0	1	0	0	0	0	3	0	4
Z	0	0	0	0	0	0	0	0	0	0	0
T	0	0	0	0	0	0	0	0	0	0	0
KG	0	0	3	1	1	0	8	4	1	4	22
KT	5	8	9	6	6	4	10	4	4	3	59
-	0	0	2	7	12	11	3	23	6	22	86
TOTAL	49	48	91	97	90	73	95	155	91	176	965

Table A17

Child Two over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]TOTAL											
A	1	1	0	0		3	4		4	4	17
A1.	0	0	0	0		2	0		0	0	2
A2.	0	0	0	0		0	0		0	0	0
A12.	0	0	0	0		0	0		0	0	0
A3.	0	0	0	0		9	3		50	23	85
A-	0	0	0	0		0	0		0	0	0
A1-	0	0	0	0		0	0		0	0	0
A2-	0	0	0	0		0	0		0	0	0
A12-	0	0	0	0		0	0		0	0	0
A3-	0	0	0	0		0	0		0	0	0
ATOT	1	1	0	0		14	7		54	27	104
VR	0	0	0	0		0	0		0	0	0
VC	0	0	0	1		0	0		0	0	1
VK	13	16	13	13		7	10		4	4	80
VTOT	13	16	13	14		7	10		4	4	81
E	4	5	2	4		3	2		3	8	31
E-	1	0	0	2		11	2		0	3	19
E+	3	4	7	8		14	1		0	6	43
ETOT	8	9	9	14		28	5		3	17	93
G	3	3	3	7		15	0		3	13	47
R	0	0	0	0		0	0		1	4	5
H	0	0	0	0		0	0		0	0	0
D	0	0	0	0		0	0		1	16	17
O	2	0	0	0		1	1		0	0	4
S	0	0	0	0		1	0		0	0	1
P	0	0	0	0		0	0		0	0	0
REPO	0	0	0	0		0	1		0	0	1
C+	0	0	0	0		0	0		0	1	1
C-	0	0	0	0		0	0		0	1	1
Z	0	0	0	0		0	0		0	0	0
T	0	0	0	0		0	0		0	0	0
KG	0	0	0	0		0	2		7	1	10
KT	6	3	2	4		11	1		1	2	30
~	0	0	0	3		4	2		16	6	31
TOTAL	33	32	27	42		81	29		90	92	426

Table A18

Child Three over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]	TOTAL									
A	7	0	5	3	2	22	14	20	12	85
A1.	0	0	0	0	0	0	2	0	0	2
A2.	6	0	0	0	0	0	0	0	0	6
A12.	0	0	0	0	0	0	0	0	0	0
A3.	1	0	1	1	1	3	5	42	9	63
A-	0	0	0	0	0	0	0	0	0	0
A1-	0	0	0	0	0	0	0	0	0	0
A2-	0	0	0	0	0	0	0	0	0	0
A12-	0	0	0	0	0	0	0	0	0	0
A3-	0	0	0	0	1	0	0	0	0	1
ATOT	14	0	6	4	4	25	21	62	21	157
VR	0	1	0	0	0	1	2	0	0	4
VC	0	0	0	0	0	0	1	2	0	3
VK	15	31	10	13	13	13	4	2	4	105
VTOT	15	32	10	13	13	14	7	4	4	112
E	21	22	24	22	16	3	11	22	21	162
E-	15	11	2	22	39	14	22	11	5	141
E+	35	20	28	18	36	4	28	22	19	210
ETOT	71	53	54	62	91	21	61	55	45	513
G	0	0	8	10	6	0	18	23	5	70
R	12	0	1	0	2	3	4	5	4	31
H	0	0	0	0	0	0	0	0	0	0
D	3	0	0	0	0	1	0	2	0	6
O	0	0	0	2	0	0	0	0	0	2
S	0	2	0	2	0	0	0	0	3	7
P	0	0	0	0	0	1	1	5	0	7
REPO	0	0	0	3	0	0	0	5	3	11
C+	0	0	0	0	1	0	0	0	1	2
C-	0	0	0	0	0	0	0	0	0	0
Z	0	0	0	0	0	0	0	0	0	0
T	0	0	0	0	0	0	0	0	0	0
KG	0	0	0	0	0	0	8	5	6	19
KT	8	2	4	5	6	1	8	2	2	38
-	0	0	1	0	0	10	9	12	5	37
TOTAL	123	89	84	101	123	76	137	180	99	1012

Table A19

Child Four over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]	TOTAL										
A	0	0	0	4	1	0	16	7	23	9	60
A1.	0	0	0	0	0	0	0	0	0	0	0
A2.	0	0	0	0	0	0	0	0	0	0	0
A12.	0	0	0	0	0	0	0	0	0	0	0
A3.	0	1	0	0	1	1	1	1	0	9	14
A-	0	0	0	0	0	0	0	0	0	0	0
A1-	0	0	0	0	0	0	0	0	0	0	0
A2-	0	0	0	0	0	0	0	0	0	0	0
A12-	0	0	0	0	0	0	0	0	0	0	0
A3-	0	0	0	0	0	0	0	0	0	0	0
ATOT	0	1	0	4	2	1	17	8	23	18	74
VR	3	1	1	4	5	0	2	1	1	0	18
VC	0	0	0	0	0	0	0	0	0	0	0
VK	44	13	35	10	12	4	6	10	4	11	149
VTOT	47	14	36	14	17	4	8	11	5	11	167
E	1	3	7	11	10	16	12	31	21	11	123
E-	17	21	18	4	0	7	2	15	16	1	101
E+	11	2	7	5	17	14	6	6	10	4	82
ETOT	29	26	32	20	27	37	20	52	47	16	306
G	0	0	2	22	14	14	1	6	4	4	67
R	8	3	0	5	0	1	0	0	0	1	18
H	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0
O	0	0	0	0	1	0	1	2	8	3	15
S	0	0	0	0	0	1	0	0	0	1	2
P	0	0	0	0	0	0	0	0	0	0	0
REPO	0	0	0	0	0	0	2	5	3	2	12
C+	0	0	0	0	0	0	0	0	0	0	0
C-	0	0	0	0	0	0	0	0	0	0	0
Z	0	0	0	0	0	0	0	0	0	0	0
T	0	0	0	0	0	0	0	0	0	0	0
KG	0	0	0	1	0	3	0	3	0	0	7
KT	23	9	4	18	0	4	1	3	6	2	70
-	0	0	0	0	0	0	0	1	0	1	2
TOTAL	107	53	74	84	61	65	50	91	96	59	740

Table A20

Child Five over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]--[10]TOTAL											
A	4	11	5	11	11		0	8	6	6	62
A1.	0	0	0	0	0		0	2	0	0	2
A2.	0	1	0	1	0		0	2	0	0	4
A12.	0	0	0	0	0		0	0	0	0	0
A3.	1	3	0	5	2		1	32	40	12	96
A-	0	0	0	0	0		0	0	0	0	0
A1-	0	0	0	0	0		0	0	0	0	0
A2-	0	0	0	0	0		0	0	0	0	0
A12-	0	0	0	0	0		0	0	0	0	0
A3-	0	0	0	0	0		0	0	0	0	0
ATOT	5	15	5	17	13		1	44	46	18	164
VR	0	0	0	0	0		0	2	1	1	4
VC	0	0	0	0	0		0	1	0	0	1
VK	38	25	11	29	35		6	1	3	0	148
VTOT	38	25	11	29	35		6	4	4	1	153
E	4	6	15	14	10		5	10	26	4	94
E-	1	0	0	0	1		0	1	2	1	6
E+	4	0	7	9	1		0	1	3	43	68
ETOT	9	6	22	23	12		5	12	31	48	168
G	1	0	13	6	5		5	0	5	5	40
R	2	0	2	0	4		2	1	0	7	18
H	0	0	0	0	0		0	0	0	0	0
D	0	0	0	0	0		0	0	0	0	0
O	1	0	0	0	0		0	0	0	0	1
S	0	0	0	0	0		0	4	0	0	4
P	0	0	0	0	0		0	0	1	0	1
REPO	0	0	0	0	0		0	1	6	4	11
C+	0	0	0	0	0		0	0	0	0	0
C-	0	0	0	0	0		0	0	0	0	0
Z	0	0	0	0	0		0	0	0	0	0
T	0	0	0	0	0		0	0	0	0	0
KG	0	0	0	0	3		0	0	5	0	8
KT	7	4	0	0	1		0	0	1	2	15
~	0	0	0	0	0		2	21	2	11	36
TOTAL	63	50	53	77	73		21	87	101	96	621

Table A21

Child Six over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]TOTAL											
A	1	5	10	2	7	9	5	10	1	5	55
A1.	0	0	0	0	0	0	0	0	3	1	4
A2.	0	0	0	0	0	2	0	0	1	0	3
A12.	0	0	0	0	0	0	0	0	0	0	0
A3.	0	14	4	10	15	8	8	10	36	42	147
A-	0	0	0	0	0	0	0	0	0	0	0
A1-	0	0	0	0	0	1	0	0	0	0	1
A2-	0	0	0	0	0	0	0	0	0	0	0
A12-	0	0	0	0	0	0	0	0	0	0	0
A3-	0	0	0	0	0	0	0	0	0	0	0
ATOT	1	19	14	12	22	20	13	20	41	48	210
VR	0	0	1	3	1	1	3	1	7	3	20
VC	0	0	0	0	1	4	18	22	20	15	80
VK	23	39	21	19	12	8	10	15	0	0	147
VTOT	23	39	22	22	14	13	31	38	27	18	247
E	29	20	10	5	8	6	7	1	5	2	93
E-	0	3	0	0	3	0	0	2	6	9	23
E+	16	8	17	34	18	14	24	45	13	8	197
ETOT	45	31	27	39	29	20	31	48	24	19	313
G	1	0	4	12	23	11	7	17	7	2	84
R	0	3	4	4	0	6	0	0	2	2	21
H	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	7	0	0	0	2	15	24
O	0	0	0	0	0	0	0	0	1	0	1
S	0	1	0	2	0	12	0	3	3	2	23
P	0	0	0	0	0	0	0	0	0	0	0
REPO	0	0	1	0	0	0	0	3	3	1	8
C+	0	0	0	0	1	0	2	0	0	0	3
C-	0	0	0	0	0	0	0	0	0	0	0
Z	0	1	0	0	0	0	0	0	0	0	1
T	0	0	0	0	0	0	0	0	0	0	0
KG	0	0	1	4	10	4	0	2	0	0	21
KT	2	6	2	2	13	7	2	0	0	0	34
-	0	0	0	6	12	7	9	7	34	23	98
TOTAL	72	100	75	103	131	100	95	138	144	130	1088

Table A22

Child Seven over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]TOTAL											
A	5	3	5	18	8	4	6	8	3	2	62
A1.	0	0	0	0	0	0	0	0	1	0	1
A2.	0	0	0	0	0	0	0	0	6	2	8
A12.	0	0	0	0	0	0	0	0	0	0	0
A3.	14	4	6	22	25	27	49	38	46	55	286
A-	0	0	0	0	0	0	0	0	0	0	0
A1-	0	0	0	0	0	0	0	0	0	0	0
A2-	0	0	0	0	0	0	0	0	0	0	0
A12-	0	0	0	0	0	0	0	0	0	0	0
A3-	0	0	0	0	0	0	0	0	0	0	0
ATOT	19	7	11	40	33	31	55	46	56	59	357
VR	0	0	0	0	0	0	2	0	0	1	3
VC	0	1	1	1	2	0	1	0	4	2	12
VK	14	14	9	1	5	6	1	2	0	1	53
VTOT	14	15	10	2	7	6	4	2	4	4	68
E	23	2	0	2	9	9	17	4	6	9	81
E-	0	0	0	0	1	0	0	1	0	2	4
E+	15	20	12	9	8	2	4	0	4	0	74
ETOT	38	22	12	11	18	11	21	5	10	11	159
G	0	0	19	5	6	9	1	1	9	5	55
R	1	3	1	3	3	1	1	6	2	12	33
H	0	0	0	0	0	0	0	0	0	3	3
D	0	0	0	0	2	0	0	4	0	0	6
O	0	0	0	0	3	10	10	3	1	3	30
S	0	1	1	2	0	0	0	0	1	0	5
P	0	0	0	0	0	0	0	5	5	3	13
REPO	0	0	0	0	2	0	15	10	12	13	52
C+	0	0	0	0	0	2	2	0	0	0	4
C-	0	0	0	0	0	0	0	0	0	0	0
Z	0	0	0	0	0	0	0	0	0	0	0
T	0	0	0	0	0	0	0	0	0	0	0
KG	0	0	0	2	0	0	0	0	0	1	3
KT	6	5	3	0	3	1	0	0	0	0	18
-	0	0	9	8	27	19	31	6	10	4	114
TOTAL	78	53	66	73	104	90	140	88	110	118	920

Table A23

Child Eight over Level One Categories

SESS.--[1]--[2]--[3]--[4]--[5]--[6]--[7]--[8]--[9]-[10]	TOTAL										
A	0	0	0	0	11	6	3	4	2	3	29
A1.	1	0	0	0	0	0	0	0	0	0	1
A2.	0	0	0	0	0	0	0	0	0	1	1
A12.	0	0	0	0	0	0	0	0	0	0	0
A3.	0	0	0	0	0	33	11	20	19	25	108
A-	0	0	0	0	0	0	0	0	0	0	0
A1-	0	0	0	0	0	0	0	0	0	0	0
A2-	0	0	0	0	0	0	0	0	0	0	0
A12-	0	0	0	0	0	0	0	0	0	0	0
A3-	0	0	0	0	0	0	0	0	0	0	0
ATOT	1	0	0	0	11	39	14	24	21	29	139
VR	0	0	0	0	0	0	2	0	2	10	14
VC	0	0	0	0	0	0	0	0	0	0	0
VK	23	55	61	33	26	13	14	8	16	5	254
VTOT	23	55	61	33	26	13	16	8	18	15	268
E	5	7	10	13	13	8	6	2	5	10	79
E-	7	5	4	0	0	1	4	1	2	1	25
E+	2	1	4	1	3	1	0	2	1	11	26
ETOT	14	13	18	14	16	10	10	5	8	22	130
G	0	1	10	12	11	2	4	2	20	8	70
R	0	3	3	0	0	9	3	0	0	0	18
H	0	0	0	0	0	1	0	0	0	0	1
D	0	0	0	0	0	1	1	0	0	0	2
O	0	0	0	0	0	0	0	0	6	1	7
S	0	0	0	0	1	0	1	1	1	3	7
P	0	0	0	0	0	0	0	0	0	0	0
REPO	0	0	0	0	0	0	0	3	9	9	21
C+	0	0	0	0	0	0	0	0	2	0	2
C-	0	0	0	0	0	0	0	0	0	0	0
Z	0	0	0	0	0	0	0	0	0	0	0
T	0	0	0	0	0	0	0	0	0	0	0
KG	1	0	3	4	5	3	3	2	0	0	21
KT	15	12	7	2	1	4	3	8	6	0	58
-	0	1	0	1	10	42	22	26	8	24	134
TOTAL	54	85	102	66	81	124	77	79	99	111	878

Table A24

Child One over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	-[10]	TOTAL
ATOT	1	1	5	6	6	6	14	43	38	75	195
VTOT	27	26	37	22	13	10	6	9	8	3	161
ETOT	10	9	25	31	25	26	25	40	20	39	250
REQUEST	0	0	1	1	1	8	4	3	1	5	24
RITUAL	8	12	20	31	38	15	40	39	12	38	253
S	0	0	1	4	4	2	0	1	0	1	13
CTOT	0	0	0	1	0	2	4	13	5	2	27
D	3	0	2	0	3	4	2	3	1	6	24
REPO	0	0	0	1	0	0	0	4	6	7	18
TOTAL	49	48	91	97	90	73	95	155	91	176	965

Table A25

Child Two over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	-[10]	TOTAL
ATOT	1	1	0	0		14	7		54	27	104
VTOT	13	16	13	14		7	10		4	4	81
ETOT	8	9	9	14		28	5		3	17	93
REQUEST	0	0	0	0		0	0		1	4	5
RITUAL	11	6	5	14		31	6		27	22	122
S	0	0	0	0		1	0		0	0	1
CTOT	0	0	0	0		0	0		0	2	2
D	0	0	0	0		0	0		1	16	17
REPO	0	0	0	0		0	1		0	0	1
TOTAL	33	32	27	42		81	29		90	92	426

Table A26

Child Three over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	14	0	6	4	4		25	21	62	21	157
VTOT	15	32	10	13	13		14	7	4	4	112
ETOT	71	53	54	62	91		21	61	55	45	513
REQUEST	12	0	1	0	2		3	4	5	4	31
RITUAL	8	2	13	17	12		12	44	47	18	173
S	0	2	0	2	0		0	0	0	3	7
CTOT	0	0	0	0	1		0	0	0	1	2
D	3	0	0	0	0		1	0	2	0	6
REPO	0	0	0	3	0		0	0	5	3	11
TOTAL	123	89	84	101	123		76	137	180	99	1012

Table A27

Child Four over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	0	1	0	4	2	1	17	8	23	18	74
VTOT	47	14	36	14	17	4	8	11	5	11	167
ETOT	29	26	32	20	27	37	20	52	47	16	306
REQUEST	8	3	0	5	0	1	0	0	0	1	18
RITUAL	23	9	6	41	15	21	3	15	18	10	161
S	0	0	0	0	0	1	0	0	0	1	2
CTOT	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0
REPO	0	0	0	0	0	0	2	5	3	2	12
TOTAL	107	53	74	84	61	65	50	91	96	59	740

Table A28

Child Five over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	5	15	5	18	13		1	44	46	18	165
VTOT	38	25	11	29	35		6	4	4	1	153
ETOT	9	6	22	23	12		5	12	31	48	168
REQUEST	2	0	2	0	4		2	1	0	7	18
RITUAL	9	4	13	7	9		7	21	14	18	102
S	0	0	0	0	0		0	4	0	0	4
CTOT	0	0	0	0	0		0	0	0	0	0
D	0	0	0	0	0		0	0	0	0	0
REPO	0	0	0	0	0		0	1	6	4	11
TOTAL	63	50	53	77	73		21	87	101	96	621

Table A29

Child Six over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	1	19	14	12	22	20	13	20	41	48	210
VTOT	23	39	22	22	14	13	31	38	27	18	247
ETOT	45	31	27	39	29	20	31	48	24	19	313
REQUEST	0	3	4	4	0	6	0	0	2	2	21
RITUAL	3	6	7	24	58	29	18	26	42	25	238
S	0	1	0	2	0	12	0	3	3	2	23
CTOT	0	0	0	0	1	0	2	0	0	0	3
D	0	0	0	0	7	0	0	0	2	15	24
REPO	0	0	1	0	0	0	0	3	3	1	8
TOTAL	72	99	75	103	131	100	95	138	144	130	1087

Table A30

Child Seven over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	19	7	11	40	33	31	55	46	56	59	357
VTOT	14	15	10	2	7	6	4	2	4	4	68
ETOT	38	22	12	11	18	11	21	5	10	11	159
REQUEST	1	3	1	3	3	1	1	6	2	15	36
RITUAL	6	5	31	15	39	39	42	15	25	16	233
S	0	1	1	2	0	0	0	0	1	0	5
CTOT	0	0	0	0	0	2	2	0	0	0	4
D	0	0	0	0	2	0	0	4	0	0	6
REPO	0	0	0	0	2	0	15	10	12	13	52
TOTAL	78	53	66	73	104	90	140	88	110	118	920

Table A31

Child Eight over Level Four Categories

Session	--[1]	--[2]	--[3]	--[4]	--[5]	--[6]	--[7]	--[8]	--[9]	--[10]	TOTAL
ATOT	1	0	0	0	11	39	14	24	21	29	139
VTOT	23	55	61	33	26	13	16	8	18	15	268
ETOT	14	13	18	14	16	10	10	5	8	22	130
REQUEST	0	3	3	0	0	10	3	0	0	0	19
RITUAL	16	14	20	19	27	51	32	38	40	33	290
S	0	0	0	0	1	0	1	1	1	3	7
CTOT	0	0	0	0	0	0	0	0	2	0	2
D	0	0	0	0	0	1	1	0	0	0	2
REPO	0	0	0	0	0	0	0	3	9	9	21
TOTAL	54	85	102	66	81	124	77	79	99	111	878

Table A32

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	4		1	1	1	2		1										
V																		
E	2				2	4						2						
REQ	1			1		3					2							
RIT	1					2				1				7				
S			1	2	2	5		1			25	1					2	
C																		
D	1		1		1	3		2				1						
REP																		
a						1												
v	1		5	2	3	10		1				5						
e			1	1		5		2										
req																		
rit			1			2		1									1	
s						3												
c																		
d						1								1				
rep																		

Table A33 Dyad ONE Session ONE PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A			1			1												
V																		
E	3		1	1	1	1												
REQ			1			1		1		1								
RIT						2								6				
S						1					13							
C																		
D			1											1				
REP																		
a												1						
v			1	1	4	2						2		3				
e			1	1	1	2		1				1		1				
req																		
rit			1	1	2	3						4						
s																		
c																		
d																		
rep																		

Table A34 Dyad TWO Session ONE PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	10	3	3	4	4			3		4		16	1					
V	4													1				
E	8	1	3	6	4	2		3				9					1	
REQ	3	1	3	10	4	6		1		1	1	6	3					1
RIT	4		2	1	2	4		1				11		3				
S				1	1	8		4			14	8	1				1	
C						1	1	1				1						
D	1		3	3	6	2	1	9				4		1				
REP						1		1		1								
a	1		1		2	1			3	4		2						
v	1		1	2	1	4						2	4					
e	13		17	10	3	8	2	5		4		4	2	2				
req	1		3		1	1						4		1			1	
rit	2			1				1				3	1					
s																		
c																		
d			1					1										
rep				1								1						

Table A35 Dyad THREE Session ONE PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	9		1	6	1	7		2				2						
V				1			2						1					
E	4	1	1	7	5	10	1	2			1	3	3					
REQ	5		1	17	11	17		3			1	6						
RIT	2		3	2	1	5		5			5	2	1	17				
S	3		3	10	8	13	2	4			39	4	1	1				
C	1		1	1		4	3				1	1						
D			1	3	3	14		15				3	1	1				
REP																		
a																		
v	1		11	3	6	13	3	4				3	1	2				
e	1	1	11	4	5	2		1				2		1				
req			2	1	3			1						1				
rit	2	2	2	6	1	3	1	4				2						
s																		
c																		
d																		
rep																		

Table A36 Dyad FOUR Session ONE PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	1					4						1						
V																		
E					1	1						1						
REQ				6	2	5						4						
RIT					3	3				2	2	1		8				
S	3				2	9				1	36			1				
C																		
D						1												
REP				1														
a	1			2		1						1						
v			1	4	6	23		1		1			2					
e	1		2	3		3												
req					1	1												
rit				1	4	2			1	1								
s																		
c																		
d																		
rep																		

Table A37 Dyad FIVE Session ONE PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	2	1		2	1		1	1										
V	1	1				1												
E	1	1	1	3	1	3		1			1	3						
REQ			1	10	2	11	2	2				2						
RIT			1	2	4	4				1		6		2				
S	1		4	4		27	2	2			21	17						
C				3		1		2				3						
D	1		3			2		8				4		1				
REP				1	2	2	2		1			5						
a						1												
v			2	1	4	7	2	2				4						
e	2		3	4	5	17		1	12			1						
req																		
rit				1	1	1												
s																		
c																		
d																		
rep																		

Table A3e Dyad six Session ONE PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	5		3	4	1	5	1			4		4						
V			1							1		1						
E	6		2	1		5				2	2	5						
REQ	5		2	5	1	4				1		2						
RIT										1		1		3				
S			1		1	2					12	3		3				
C			1	2				1										
D						3												
REP	1																	
a	2	3	1	1		1		1		3		7						
v	4		1	1		1	1	1		1		3	1					
e	2		10	7		1	1		1	4		12						
req					1													
rit	2		1		1		1			1								
s																		
c																		
d																		
rep																		

Table A39 Dyad SEVEN Session ONE PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	21		9	7	2	8	2	6				4		4				
V																		
E	19		29	14	5	7	3	3				3		3				
REQ	5		9	38	4	13		9				2		1				
RIT	3		5	7	3	4		1		1		4		2				
S	6		2	5		14		1			22	1		4				
C	2		4		2	1	6	3										
D	2		6		4	5	7	12			1			1				
REP																		
a				1														
v	3		11	2	2	2		2						1				
e	2		6	3	2			1										
req																		
rit	1		5	3	6	1												
s																		
c																		
d																		
rep																		

Table A40 Dyad Eight Session One Patterns of Conversation

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	14		4	4	5		2	3		17	1	11		1			1	5
V	2						1	1		1			1					
E	8			2	1	1	1	1		6		4		3			1	
REQ	3		3	8	3		3	1		15	1	7	1	2				
RIT	2			2	9	1				6		4	1	5		1	1	1
S	1		1		2						1							
C	2			3			1	2		5		2	1	1		1		
D	1	1	1	2	1		2	4		4		2					1	
REP			1	1	1	1				5		5					1	
a	25	4	5	13	2	1	1	6	4	8			1	4				
v	2			1														
e	4	1	5	4	1	1	5		10	3		2			1			1
req				2	2					1								
rit			6	1	5				1	1		2						
s						1												
c							2											
d	1			3				1		1								
rep	3		2							1							1	

Table A41 Dyad ONE Session TEN PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	6	1	3	1	3			2		6		1	1	2			1	
V	2						1	1	1								1	
E	2		4	4	2			6		4		2		1		1	2	
REQ	4		2	3	4		1	3		3		4		4			1	
RIT	1		2	2	2	2		1		1		3	2	4			3	
S	1			2	1	7		3			4							
C			1				1	1		1		1		1				
D	4		5	1	2	6		6		2			1	1			3	
REP				1														
a	1	3		7	1	2	1	5		5				2				
v				1	2					1								
e	2		3	3	2					1		3		2			1	
req			1		2									1				
rit	1	1	5	4	1	1				3		1				1		
s																		
c	1						1											
d	2	1	2	1			1	3				2					4	
rep																		

Table A42 Dyad TWO Session TEN PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	8		1	5	2	2	5	10		1		4		2				
V	2							3										
E	6		1	2	1	1		4		1		3						1
REQ	3			9	3	2		7		3		5		1				1
RIT	6	1	2		2			1	1	2		4		3				
S				1		1		5			4	3						
C			2				2	7		2		2				1		1
D	5	2	1	4	2	4	6	35	1	6		18	2	6	2			
REP	1			2				3				2						
a	1		1	6	2	1	2	3	2	2					1			
v	1				1			1						1				
e	5	1	6	2	5	3	1	9	3	3		4	1	1				
req	1	1	1	1														
rit			5			3		1	3	1			1					
s								2	1									
c				1														
d																		
rep	1			1				1										

Table A43 Dyad THREE Session TEN PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	7		2	7	4	5	5	5		1		1		1				
V							2	2										
E	4		2	8	1	2	1	8		2		3						
REQ	7		4	15	3	2	2	8		3		3		1				
RIT	5		2	2	4	2	2	4				1		3				
S					1	4		8			11							
C	7	2	3	1	1		3	18		1		4		1				2
D	6	2	9	5	6	5	18	32		5		3	1	1	1			
REP						1	1			3				1				
a	1		2	6			2	4	1	1				1				
v	1		1	1	3	3		1				1						
e			5	3			1	2	3	1								
req								1										
rit			1		1		4	1	2									
s							1											
c																		
d																		
rep							1			1								

Table A44 Dyad FOUR Session TEN PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	17		6	7	3	2		3		5		20	1	2				2
V	1			1				1										
E	4		2	2	1	4		6		1		8		2				
REQ	6	1	3	5	4	3		1		4		1	1					
RIT	5		2	1	6	3		1				3	1	2				2
S	1		1	1	4	3		2		2		3	1	1				
C	1																	
D	3		1	2	1		1	8		2	1	4	1	2				
REP				3						2								
a	4			3	1	1		1	5			1	1	1				
V		1																
e	18		13	1	2	3		3				7		1				
req	1	1		2						1		1	1					
rit	4		1	1	3			1		1								
s																		
c																		
d																		
rep	2		1		1													

Table A45 Dyad FIVE Session TEN PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	9		4	3	1	2	1			4	1	6	1					
V																		
E	3		2	8		1	1	5		1		2						
REQ	2		1	19	5	1		3		38	14	5		1	1		1	
RIT			1	1						2	1	4		1			1	
S			1	3				2										
C	1		1	1				1									5	
D	4		2	3	1	1	2	2		1	1			1				1
REP				1	1				2	1	1			1				
a	4		8	28				2	5	1								
v	2		1	8	2	1		4										
e	3		2	8	1								1		1		3	
req				2														
rit	2			1								1						
s				2														
c																		
d	1		1	2			5					1					5	
rep					1													

Table M6 Dyad SIX Session TEN PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	6	1	4	7	4	1		4		10		3	1	6				6
V	3			2			1			3								
E	8			1	1		2		1	1		1	1	1				
REQ	4		1	5		1	2	4		16	4	1	5					3
RIT	5		2	1								1		1				
S	2				1	1				1								
C	3			3				2		3			1					
D				1	1		2	3		2		1	1					3
REP	3	1			1	1				1	2	2	2					1
a	9	5	3	16	1		2		4	16				2				
v	1								1	2								
e	1		4	2		1	1		1	1								
req	2			6	1		1		1	1			3					
rit	3		1	1			1		1	1		2	1					
s																		
c																		
d																		
rep	3	2	2	1				1	3					1				

Table A47 Dyad SEVEN Session TEN PATTERNS OF CONVERSATION

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	21		7	3	14	4	2	7		9		5		2	1			4
V	1						1											
E	10		2	6	2	5		6	1			3						1
REQ	8	1	3	14	2	1	3	2		7	5	3		1				
RIT	8		5		9	1	3	4		4		5						3
S	4		2		1	2		2		2	5	1						
C	2			2				7				1		4	1			
D	3		3	5	4	4	6	21		4	2	4		3				1
REP	2			2		1		2				1						
a	9	1	2	8	1			3	5									
v	4			3	1		1	1						2				
e	1		7	8	3	1		2		1		1						
req																		
rit	1		3		3			2	1	2								
s			1				1								1			
c																		
d																		
rep	5					2		1	1									

Table M48 Dyad EIGHT Session TEN PATTERNS OF CONVERSATION

TOP TEN CELLS: EACH DYAD FOR SESSION ONE AND TEN

DYAD ONE SESSION ONE			DYAD ONE SESSION TEN	
PERCENT	CATEGORIES	RANK	PERCENT	CATEGORIES
18.80	S / v	1	6.39	a / A
7.52	v / S	2	4.35	A / a
5.26	RIT / rit	3	3.84	REQ / a
3.76	S / S	4	3.58	A / A
3.76	e / S	5	3.32	a / REQ
3.76	v / E	6	2.81	A / e
3.76	v / e	7	2.56	e / REPO
3.01	A / A	8	2.30	RIT / RIT
3.01	E / S	9	2.05	E / A
2.26	rit / S	10	2.05	REQ / REQ
54.90	TOTAL		33.25	TOTAL
		11	2.05	a / a

Table A49

DYAD TWO SESSION ONE			DYAD TWO SESSION TEN	
PERCENT	CATEGORIES	RANK	PERCENT	CATEGORIES
18.57	S / v	1	2.72	S / S
8.57	RIT / rit	2	2.72	a / REQ
5.71	v / RIT	3	2.33	A / A
5.71	rit / e	4	2.33	A / a
4.29	E / A	5	2.33	E / D
4.29	v / rit	6	2.33	D / S
2.86	RIT / S	7	2.33	D / D
2.86	v / S	8	1.95	D / E
2.86	e / S	9	1.95	a / D
2.86	rit / RIT	10	1.95	a / a
58.58	TOTAL		22.94	TOTAL
2.86	v / e	11	1.95	rit / E

Table A50

DYAD THREE SESSION ONE			DYAD THREE SESSION TEN	
PERCENT	CATEGORIES	RANK	PERCENT	CATEGORIES
4.78	● / E	1	10.06	D / D
4.49	A / E	2	5.17	D / ●
3.93	S / ▼	3	2.87	A / D
3.65	● / A	4	2.59	REQ / REQ
3.09	RIT / ●	5	2.59	● / D
2.81	A / A	6	2.30	A / A
2.81	REQ / REQ	7	2.01	REQ / D
2.81	● / REQ	8	2.01	C / D
2.53	D / D	9	1.72	E / A
2.53	E / ●	10	1.72	RIT / A
33.43	TOTAL		33.04	TOTAL
		11	1.72	D / C
		12	1.72	● / REQ
		13	1.72	● / E
		14	1.72	D / ●
		15	1.72	D / rit

Table A51

DYAD FOUR SESSION ONE			DYAD FOUR SESSION TEN	
PERCENT	CATEGORIES	RANK	PERCENT	CATEGORIES
9.26	S / ▼	1	8.65	D / D
4.04	REQ / REQ	2	4.86	C / D
4.04	REQ / S	3	4.86	D / C
3.56	D / D	4	4.05	REQ / REQ
3.33	D / S	5	2.97	S / ▼
3.09	S / S	6	2.43	D / E
3.09	▼ / S	7	2.16	E / REQ
2.61	REQ / RIT	8	2.16	E / D
2.61	▼ / E	9	2.16	REQ / D
2.61	● / E	10	2.16	S / D
38.24	TOTAL		36.46	TOTAL

Table A52

DYAD FIVE SESSION ONE			DYAD FIVE SESSION TEN	
PERCENT	CATEGORIES	RANK	PERCENT	CATEGORIES
22.22	S / ▼	1	6.76	A / ●
14.20	▼ / S	2	6.08	● / A
5.56	S / S	3	5.74	A / A
4.94	RIT / rit	4	4.39	● / E
3.70	REQ / REQ	5	2.70	E / ●
3.70	▼ / RIT	6	2.70	D / D
3.09	REQ / S	7	2.36	A / REQ
2.47	A / S	8	2.36	● / ●
2.47	▼ / REQ	9	2.03	A / E
2.47	rit / RIT	10	2.03	E / D
64.82	TOTAL		37.15	TOTAL
2.47	REQ / ●	11	2.03	REQ / A
		12	2.03	RIT / RIT

Table A53

DYAD SIX SESSION ONE			DYAD SIX SESSION TEN	
PERCENT	CATEGORIES	RANK	PERCENT	CATEGORIES
10.15	S / S	1	12.38	REQ / a
7.89	S / ▼	2	9.12	a / REQ
6.39	S / ●	3	6.19	REQ / REQ
6.39	● / S	4	4.56	REQ / ▼
4.51	● / REPO	5	2.93	A / A
4.14	REQ / S	6	2.61	E / REQ
3.76	REQ / REQ	7	2.61	a / E
3.01	D / D	8	2.61	▼ / REQ
2.63	▼ / S	9	2.61	● / REQ
2.26	RIT / ●	10	1.95	A / ●
51.13	TOTAL		47.57	TOTAL

Table A54

DYAD SEVEN SESSION ONE			DYAD SEVEN SESSION TEN	
PERCENT	CATEGORIES	RANK	PERCENT	CATEGORIES
6.45	S / v	1	5.52	REQ / a
6.45	• / •	2	5.52	a / REQ
5.38	• / E	3	5.52	a / a
3.76	a / •	4	3.45	A / a
3.76	• / REQ	5	3.10	a / A
3.23	E / A	6	2.76	E / A
2.69	A / A	7	2.41	A / REQ
2.69	REQ / A	8	2.07	A / A
2.69	REQ / REQ	9	2.07	A / rit
2.69	A / S	10	2.07	A / repo
39.79	TOTAL		34.49	TOTAL
2.69	E / S	11	2.07	req / REQ
2.69	E / •	12		

Table A55

DYAD EIGHT SESSION ONE			DYAD EIGHT SESSION TEN	
PERCENT	CATEGORIES	RANK	PERCENT	CATEGORIES
8.94	REQ / REQ	1	5.22	A / A
6.82	E / E	2	5.22	D / D
5.18	S / v	3	3.48	A / RIT
4.94	A / A	4	3.48	REQ / REQ
4.47	E / A	5	2.49	E / A
3.29	E / REQ	6	2.24	A / a
3.29	S / S	7	2.24	RIT / RIT
3.06	REQ / S	8	2.24	a / A
2.82	D / D	9	1.99	REQ / A
2.59	v / E	10	1.99	RIT / A
45.40	TOTAL		30.59	TOTAL
		11	1.99	a / REQ
		12	1.99	• / REQ

Table A56

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	3.55		1.18	1.54	.35	1.77	.24	.95				.71		.47				
V				.12			.24						.12					
E	2.72	.12	3.55	2.48	1.18	2.01	.47	.59			.12	.71	.35	.35				
REQ	1.18		1.18	6.50	1.77	3.55		1.42			.12	.95		.12				
RIT	.59		.95	1.06	.47	1.06		.71		.12	.59	.71	.12	2.25				
S	1.06		.59	1.77	.95	3.19	.24	.59			7.21	.59	.12	.59				
C	.35		.59	.12	.24	.59	1.06	.35			.12	.12						
D	.24		.83	.35	.83	2.25	.83	3.19			.12	.35	.12	.24				
REP																		
a				.12														
v	.47		2.60	.59	.95	1.77	.35	.71				.35	.12	.35				
e	.35	.12	2.01	.83	.83	.24		.24				.24		.12				
req			.24	.12	.35			.12						.12				
rit	.35	.24	.83	1.06	.83	.47	.12	.47				.24						
s																		
c																		
d																		
rep																		

Table 257 Mean Percentages for Monologic dyads : Session ONE

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	1.88	.34	.68	.94	.60	1.02	.17	.43		.68		1.79	.09					
V	.43	.09	.09			.09				.09		.09		.09				
E	1.71	.17	.60	.94	.77	1.36		.34		.17	.26	1.71					.09	
REQ	.77	.09	.60	2.73	.77	2.56	.17	.34		.26	.26	1.19	.26					.09
RIT	.43		.26	.26	.77	1.28		.09		.43	.17	1.62		2.47				
S	.34		.51	.60	.51	4.43	.17	.60		.09	10.32	2.47	.09	.34			.26	
C			.09	.43		.17	.09	.34				.34						
D	.26		.68	.26	.77	.94	.09	1.62				.77		.26				
REP	.09			.17	.17	.26	.17	.09	.09	.09		.43						
a	.34	.26	.17	.26	.17	.43		.09	.26	.60		.94						
v	.51		.94	.94	1.53	4.01	.26	.43		.17		1.36	.60	.26				
e	1.53		2.90	2.22	.77	3.07	.26	.77	1.11	.68		1.53	.17	.26				
req	.09		.26		.26	.17						.34		.09			.09	
rit	.34		.26	.34	.85	.77	.09	.17	.09	.17		.60	.09				.09	
s																		
c																		
d			.09			.09		.09				.09		.09				
rep				.09														

Table A58 Mean percentages for Dialogic dyads : Session ONE

	A	V	E	REQ	RIT	S	C	D	REP	a	V	e	req	rit	s	c	d	rep
A	3.63		1.17	1.30	2.33	1.17	.91	1.55		1.30		.78		.39	.13			.52
V	.13						.39	.26										
E	1.81		.52	1.81	.39	.91	.13	1.81	.13	.26		.78						.13
REQ	1.94	.13	.91	3.76	.65	.39	.65	1.30		1.30	.65	.78		.26				
RIT	1.68		.91	.26	1.68	.39	.65	1.04		.52		.78		.39				.39
S	.52		.26		.26	.78		1.30		.26	2.07	.13						
C	1.17	.26	.39	.39	.13		.39	3.24		.13		.65		.65	.13			.26
D	1.17	.26	1.55	1.30	1.30	1.17	3.11	6.87		1.17	.26	.91	.13	.52	.13			.13
REP	.26			.26		.26	.13	.26		.39		.13		.13				
a	1.30	.13	.52	1.81	.13		.26	.91	.78	.13				.13				
v	.65		.13	.52	.52	.39	.13	.26				.13		.26				
e	.13		1.55	1.42	.39	.13	.13	.52	.39	.26		.13						
req								.13										
rit	.13		.95		.52		.52	.39	.39	.26								
s			.13				.26								.13			
c																		
d																		
rep	.65				.26		.13	.13	.13	.13								

Table A59 Mean percentages for Monologic dyads : Session TEN

	A	V	E	REQ	RIT	S	C	D	REP	a	v	e	req	rit	s	c	d	rep
A	3.18	.11	1.16	1.43	.95	.37	.42	1.16		2.28	.11	2.38	.21	.69			.11	.69
V	.53			.16			.16	.32	.05	.21			.05			.05		
E	1.64		.48	1.01	.32	.37	.21	1.16	.05	.74		1.06	.05	.37		.05	.16	.05
REQ	1.16	.05	.53	2.59	1.01	.37	.32	1.01		4.18	1.01	1.22	.37	.42	.05		.11	.21
RIT	1.01	.05	.48	.37	1.01	.32		.16	.05	.58	.05	1.01	.21	.85		.05	.26	.16
S	.26		.16	.37	.42	.64		.64		.16	.48	.32	.05	.05				
C	.37		.21	.37			.21	.69		.58		.26	.11	.11		.11	.26	.05
D	.90	.16	.53	.69	.42	.58	.69	3.07	.05	.90	.11	1.32	.26	.53	.11		.21	.21
REP	.21	.05	.05	.42	.16	.11		.16	.11	.48	.05	.48	.11	.05		.05	.05	.05
a	2.33	.64	.90	3.86	.37	.26	.32	.90	1.06	1.69		.05	.11	.48	.05			
v	.32	.05	.05	.53	.26	.05		.26	.05	.16				.05				
e	1.75	.11	1.75	1.06	.58	.42	.37	.64	.74	.42		.85	.11	.21	.11		.21	.05
req	.21	.11	.11	.69	.26		.05		.05	.16		.05	.21	.05				
rit	.53	.05	.95	.42	.64	.05	.11	.21	.11	.37		.32	.11			.05		
s				.11		.05		.11	.05									
c	.05			.05			.16											
d	.21	.05	.16	.32			.32	.21		.05		.16					.48	
rep	.48	.11	.26	.16	.05			.11	.16	.05				.05			.05	

Table A60 Mean percentages for Dialogic dyads : Session TEN

List of Page's L Trend Tests
and the direction of trend examined.

- [1] Mothers use of expansions: decrease over time?
- [2] Mother number of acts: increase over time?
Children number of acts: increase over time?
- [3] Ratios of acts: decrease over time?
Mothers' self repetitions: decrease over time?
- [4] Mothers' repetitions of the child: increase over time?
Children's repetitions (all): increase over time?
- [5] Mothers' A3: increase over time?
Children's A3: increase over time?
- [6] Mothers' Atot: increase over time?
Children's Atot: increase over time?
- [7] Mothers' V: increase over time?
Children's V: decrease over time?
- [8] Mothers' Etot: increase over time?
Children's Etot: increase over time?
- [9] Mothers' Req: increase over time?
Children's Req: increase over time?
- [10] Mothers' G: increase over time?
Children's G: increase over time?
- [11] Mothers' O: increase over time?
Children's O: increase over time?
- [12] Mothers' P: increase over time?
Children's P: increase over time?
- [13] Mothers' KG: decrease over time?
Children's KG: increase over time?
- [14] Mothers' KT: increase over time?
Children's KT: decrease over time?
- [15] Mothers' ^: increase over time?
Children's ^: increase over time?
- [16] Mothers' S: decrease over time?
Children's S: increase over time?
- [17] Mothers' C+: increase over time?
Children's C+: increase over time?
- [18] Mothers' C-: increase over time?
Children's C-: increase over time?
- [19] Mothers' D: increase over time?
Children's D: increase over time?

PAGE'S L
SESSIONS 1,2,3,4,7,9,10
C = 7, N = 8

MOTHERS' USE OF EXPANSIONS: decrease over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	0	1.45	0	4.35	9.42
TWO	0	0	0	0	0	8.00	8.00
THREE	6.38	6.38	0	2.13	0	4.25	4.25
FOUR	3.64	1.82	0	1.82	9.09	3.64	0
FIVE	9.09	7.57	6.06	7.57	1.51	6.06	1.51
SIX	0	4.88	0	7.32	9.76	7.32	21.95
SEVEN	0	1.45	10.14	8.69	2.90	11.59	17.39
EIGHT	0	0	0	0	12.12	3.03	27.27

PAGE'S L = 823.00, C=7, N=8, NOT SIG.

MOTHERS' NUMBER OF ACTS (actual frequencies): increase

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	84	173	203	184	233	245	242
TWO	38	35	43	77	149	183	173
THREE	248	203	177	221	250	255	274
FOUR	325	232	230	317	291	286	318
FIVE	101	118	182	130	158	185	211
SIX	199	224	213	245	220	232	199
SEVEN	115	116	156	207	204	187	188
EIGHT	383	315	357	313	418	344	328

PAGE'S L = 1015.00, C=7, N=8, p=0.001

CHILDREN'S NUMBER OF ACTS (actual frequencies): increase

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	49	48	91	97	95	91	176
TWO	33	32	27	42	29	90	92
THREE	123	89	84	101	76	180	99
FOUR	107	53	74	84	50	96	59
FIVE	63	50	53	77	21	101	96
SIX	72	100	75	103	95	144	130
SEVEN	78	53	65	73	104	110	118
EIGHT	54	85	102	66	77	99	111

PAGE'S L = 1002.50, C=7, N=8, p=0.001

RATIOS OF NUMBER OF ACTS: decrease

	-----SESSIONS-----						
DYAD	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	1.714	3.604	2.231	1.897	2.453	2.692	1.375
TWO	1.151	1.094	1.593	1.833	5.138	2.033	1.880
THREE	2.016	2.281	2.107	2.188	3.289	1.417	2.768
FOUR	3.037	4.377	3.108	3.774	5.820	2.979	5.390
FIVE	1.603	2.360	3.434	1.688	7.523	1.832	2.198
SIX	2.764	2.240	2.840	2.379	2.316	1.611	1.531
SEVEN	1.474	2.189	2.400	2.836	1.961	1.700	1.593
EIGHT	7.093	3.706	3.500	4.742	5.429	3.475	2.955

PAGE'S L = 897.00, C=7, N=8. NOT SIG.

MOTHERS' SELF-REPETITIONS [%]: decrease over time

	-----SESSIONS-----						
Mother	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0.43	0.92	0.53	1.30	1.25	1.21	0.58
TWO	0	0	0	0.58	0.69	0.46	0.81
THREE	1.30	1.03	1.21	1.75	1.66	1.30	2.19
FOUR	0.75	0.37	0.41	1.40	0.75	0.51	0.68
FIVE	0.54	0.61	2.10	0.54	1.70	2.17	2.78
SIX	1.02	0.40	0.53	0.80	0.85	1.11	0.67
SEVEN	0.28	0.28	1.19	1.14	0.91	0.74	0.40
EIGHT	2.13	1.04	0.65	0.90	1.21	0.59	0.76

PAGE'S L = 820.50, C=7, N=8.

MOTHERS' REPETITIONS OF THE CHILD [%]: increase

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0.19	0	0.05	0.34	0.48	0.72
TWO	0	0	0	0	0.11	0.11	0.11
THREE	0.18	0	0.36	0.09	0.18	0.27	0.36
FOUR	0	0.03	0	0	0.17	0.17	0.24
FIVE	0.07	0.07	0.07	0.07	0.07	0.13	0.41
SIX	0.58	0.49	0.13	0	0.09	0.67	0.31
SEVEN	0.06	0	0	0.23	1.82	0.80	0.45
EIGHT	0	0	0	0.03	0.03	0.17	0.25

PAGE'S L = 1037.50, C=7, N=8, p=0.001

CHILDREN'S REPETITIONS (ALL) [%]: increase

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	0	0.62	0	0.83	1.14
TWO	0	0	0	0	0.23	0.94	2.58
THREE	0.79	0.20	0.20	0.30	0.59	2.67	0.59
FOUR	0	0	0	0	0.27	0.54	0.81
FIVE	0	0	0	0	0	2.41	0.97
SIX	0	0.18	0.09	0.18	0	1.19	1.38
SEVEN	0.33	0	0	0	2.06	0	3.69
EIGHT	0	0.34	0	0	0	1.03	1.37

PAGE'S L = TOO MANY ZEROS TO COMPUTE

MOTHERS' ASSERTIONS: [A3] [%]: increase over time

	SESSIONS						
Mother	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	2.38	3.47	13.30	4.35	6.01	6.94	19.83
TWO	2.63	2.86	9.30	16.88	32.89	38.25	9.25
THREE	11.29	5.42	4.52	8.60	10.80	11.37	8.39
FOUR	3.69	2.59	1.30	3.15	5.84	8.39	5.97
FIVE	5.94	1.69	12.09	1.54	18.35	8.11	4.27
SIX	0.50	3.13	5.16	2.04	2.27	5.17	7.54
SEVEN	17.39	13.79	14.74	25.62	15.20	17.11	26.59
EIGHT	12.27	5.71	11.48	17.25	26.32	21.22	21.65

PAGE'S L = 1019.50, C=7, N=8, p=0.001

CHILDREN'S ASSERTIONS: [A3] [%]: increase over time

	SESSIONS						
Child	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	1.10	1.03	8.42	29.67	36.36
TWO	0	0	0	0	10.34	55.56	25.00
THREE	0.81	0	1.19	0.99	3.95	23.33	9.09
FOUR	0	1.89	0	0	2.00	0	15.25
FIVE	1.59	6.00	0	6.49	4.79	39.60	12.50
SIX	0	14.00	5.33	9.71	8.42	25.00	32.31
SEVEN	17.95	7.55	9.09	30.14	35.00	41.82	46.61
EIGHT	0	0	0	0	14.29	19.19	22.52

PAGE'S L = 1066.50, C=7, N=8, p=0.001

MOTHERS' ASSERTIONS: [ATOT] [%]: increase over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	11.90	4.62	17.73	10.33	9.01	9.80	27.69
TWO	7.89	5.71	11.63	18.18	34.23	43.17	15.61
THREE	18.95	11.82	11.30	15.38	14.40	17.65	14.60
FOUR	8.62	5.60	5.22	7.89	17.87	18.18	11.95
FIVE	5.94	11.02	18.13	1.54	21.52	23.24	32.23
SIX	4.02	6.70	7.51	9.39	13.64	10.77	16.08
SEVEN	23.48	16.78	23.08	30.92	25.00	22.99	29.79
EIGHT	16.45	9.21	14.57	18.21	27.99	25.58	23.78

PAGE'S L = 1022.00, C=7, N=8, p=0.001

CHILDREN'S ASSERTIONS: [ATOT] [%]: increase over time

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	2.04	2.08	5.49	6.19	14.74	41.76	42.61
TWO	3.03	3.13	0	0	24.14	60.00	29.35
THREE	11.38	0	7.14	3.96	32.89	34.44	21.21
FOUR	0	1.89	0	4.76	34.00	23.96	30.51
FIVE	7.94	30.00	9.43	23.38	4.76	45.54	18.75
SIX	1.39	19.00	18.67	11.65	13.68	28.47	36.92
SEVEN	24.36	13.21	16.67	54.79	39.29	50.91	50.00
EIGHT	1.85	0	0	0	18.18	21.21	26.13

PAGE'S L = 1046.50, C=7, N=8, p=0.001

MOTHERS' RESPONSES: [VTOT] [%]: increase over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	3.47	3.45	3.80	2.15	5.71	2.48
TWO	0	0	0	1.30	5.37	2.73	3.47
THREE	2.02	0.99	1.13	0.90	1.20	0.78	1.82
FOUR	1.23	0.43	0	0.32	1.72	2.45	1.26
FIVE	0	0	2.20	0	3.80	1.08	1.42
SIX	1.51	0.45	2.35	1.22	0.91	3.88	0
SEVEN	2.61	1.72	3.85	2.90	6.37	2.14	4.79
EIGHT	0	0	0	0	1.91	1.16	0.30

PAGE'S L = 978.00, C=7, N=8. NOT SIG.

CHILDREN'S RESPONSES: [VTOT] [%]: decrease over time

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	55.10	54.17	40.66	22.68	6.32	8.79	1.70
TWO	39.39	50.00	48.15	33.33	34.48	4.44	4.35
THREE	12.20	35.96	11.90	12.87	18.42	2.22	4.04
FOUR	43.93	26.42	48.65	16.67	16.00	5.21	18.64
FIVE	60.32	50.00	20.75	37.66	28.57	3.96	1.04
SIX	31.94	39.00	29.33	21.36	32.63	18.75	13.85
SEVEN	17.95	28.30	15.15	2.74	2.86	3.64	3.39
EIGHT	42.59	64.71	59.80	50.00	20.78	18.18	13.51

PAGE'S L = 1066.00, C=7, N=8, p=0.001

MOTHERS' EXPRESSIVES: [ETOT] [%]: decrease over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	9.52	10.40	12.81	10.33	11.59	11.02	11.16
TWO	18.42	11.43	13.95	5.19	2.01	5.46	16.18
THREE	15.32	8.87	14.12	5.88	3.20	16.47	7.30
FOUR	12.00	4.74	13.04	10.73	8.93	10.14	9.75
FIVE	2.97	3.39	10.99	8.46	1.90	8.11	14.22
SIX	7.54	24.11	12.21	18.77	11.82	15.52	12.06
SEVEN	20.00	22.41	10.26	11.11	7.35	13.37	9.04
EIGHT	22.45	14.92	16.81	9.58	6.46	9.30	10.98

PAGE'S L = 933.00, C=7, N=8. NOT SIG.

CHILDREN'S EXPRESSIVES: [ETOT] [%]: decrease over time

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	20.41	18.75	27.47	31.96	26.32	21.98	22.16
TWO	24.24	28.13	33.33	33.33	17.24	3.33	18.48
THREE	57.72	59.55	64.29	61.39	27.63	30.56	45.45
FOUR	27.10	49.06	43.24	23.81	40.00	48.96	27.12
FIVE	14.29	12.00	41.51	29.87	23.81	30.69	50.00
SIX	62.50	31.00	36.00	37.86	32.63	16.67	14.62
SEVEN	48.72	41.51	18.18	15.07	15.00	9.09	9.32
EIGHT	25.93	15.29	17.65	21.21	12.99	8.08	19.82

PAGE'S L = 957.50, C=7, N=8, p=0.05.

MOTHERS' REQUESTS: [REQ] [%]: increase over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	8.33	17.34	7.89	11.95	24.90	24.49	21.08
TWO	10.53	11.43	13.96	7.79	6.71	15.85	17.92
THREE	18.15	11.82	19.20	12.21	10.00	19.60	13.14
FOUR	20.31	18.96	23.47	18.30	15.46	11.89	15.09
FIVE	17.82	14.41	30.77	6.15	12.03	12.43	13.75
SIX	16.58	16.97	16.90	14.29	27.72	34.48	45.22
SEVEN	22.61	20.69	24.35	20.76	24.02	31.02	28.19
EIGHT	22.98	25.71	21.29	22.37	11.96	8.71	16.46

PAGE'S L = 908.00, C=7, N=8. NOT SIG.

CHILDREN'S REQUESTS: [REQ] [%]: increase over time

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	1.10	1.03	4.21	1.10	2.84
TWO	0	0	0	0	0	1.11	4.35
THREE	9.76	0	1.19	0	3.95	2.78	4.04
FOUR	7.48	5.66	0	5.95	0	0	1.69
FIVE	3.17	0	3.77	0	9.52	0	7.29
SIX	0	3.00	5.33	3.88	0	1.39	1.54
SEVEN	1.28	5.66	1.52	4.11	0.71	1.82	12.71
EIGHT	0	3.53	2.94	0	3.90	0	0

PAGE'S L = 935.00, C=7, N=8. NOT SIG.

MOTHERS' GAMES: [G] [%]: increase over time

	SESSIONS						
Mother	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	3.57	5.78	5.42	4.89	5.15	0.41	1.65
TWO	7.89	11.43	16.28	15.58	1.34	3.28	6.94
THREE	1.61	1.48	6.21	3.62	3.20	10.59	3.65
FOUR	1.23	0.43	6.96	17.03	4.12	3.15	3.46
FIVE	5.94	3.39	8.79	48.46	3.16	3.78	2.84
SIX	3.52	0.89	4.69	11.02	7.73	5.17	3.52
SEVEN	0	1.72	8.97	12.08	0.98	1.07	2.13
EIGHT	0.78	0.63	5.32	9.27	3.59	6.98	4.88

PAGE'S L = 909.00, C=7, N=8. NOT SIG.

CHILDREN'S GAMES: [G] [%]: increase over time

	SESSIONS						
Child	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	6.12	8.33	5.49	13.40	20.00	0	0.57
TWO	9.09	9.38	11.11	16.67	0	3.33	14.13
THREE	0	0	9.52	9.90	0	12.78	5.05
FOUR	0	0	2.70	26.19	2.00	4.17	6.78
FIVE	1.59	0	24.53	7.79	23.81	4.95	5.21
SIX	1.39	0	5.33	11.65	7.37	4.86	1.54
SEVEN	0	0	28.79	6.85	0.71	8.18	4.24
EIGHT	0	1.18	9.80	18.18	5.19	20.20	7.21

PAGE'S L = 967.00, C=7, N=8, p=0.05.

MOTHERS' ONOMATOPOEIA: [0] [%]: increase over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	2.96	4.35	1.72	0.41	2.07
TWO	0	0	2.33	0	4.03	3.83	3.47
THREE	3.23	0	1.69	3.62	2.00	2.75	0.73
FOUR	1.23	0	1.30	0	0.69	2.80	1.57
FIVE	1.98	1.69	0.55	0	1.90	3.78	7.58
SIX	0	0	0	1.63	0.45	2.15	1.51
SEVEN	0.87	0	0	0.97	0.49	1.60	1.59
EIGHT	2.87	4.44	2.80	3.83	2.87	3.20	5.79

PAGE'S L = 1004.00, C=7, N=8, p=0.001.

CHILDREN'S ONOMATOPOEIA: [0] [%]: increase over time

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	1.10	4.12	0	1.10	4.55
TWO	6.06	0	0	0	3.45	0	0
THREE	0	0	0	1.98	0	0	0
FOUR	0	0	0	0	2.00	8.33	5.08
FIVE	1.59	0	0	0	0	0	0
SIX	0	0	0	0	7.14	0.91	2.54
SEVEN	0	0	0	0	0	6.06	0.90
EIGHT	12.27	5.71	11.48	17.25	26.32	21.22	21.65

PAGE'S L = TOO MANY ZEROS TO COMPUTE

MOTHERS' POLITE & CONVENTIONAL UTTERANCES: [P] [‡]
increase over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	2.38	3.47	2.96	2.17	2.15	2.04	5.37
TWO	0	0	2.33	0	4.70	5.46	1.73
THREE	3.23	0.99	0.56	1.36	2.00	3.53	2.19
FOUR	1.54	3.88	3.04	0.95	0.69	2.10	0.94
FIVE	0	0.85	2.20	2.31	0.63	4.86	1.42
SIX	6.03	1.79	2.82	2.45	0	1.29	0
SEVEN	0	0	0.64	1.45	0.98	0.53	1.59
EIGHT	1.31	0.95	1.68	3.83	1.44	0.58	2.13

PAGE'S L = 921.50, C=7, N=8. NOT SIG.

CHILDREN'S POLITE & CONVENTIONAL UTTERANCES: [P] [‡]
increase over time

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	0	0	0	0	0
TWO	0	0	0	0	0	0	0
THREE	0	0	0	0	1.32	2.78	0
FOUR	0	0	0	0	0	0	0
FIVE	0	0	0	0	0	0.99	0
SIX	0	0	0	0	0	0	0
SEVEN	0	0	0	0	0	4.55	2.54
EIGHT	0	0	0	0	0	0	0

PAGE'S L = TOO MANY ZEROS TO COMPUTE

MOTHERS' GIVING: [KG] [%]: decrease over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	4.76	0	1.97	2.72	4.72	2.04	1.65
TWO	10.53	2.86	6.98	5.19	0.67	0.55	0.58
THREE	1.21	1.48	1.69	1.36	0.80	1.18	0.73
FOUR	7.69	4.74	3.04	1.58	1.03	2.45	0.94
FIVE	9.90	1.69	0	0	0	0.54	0
SIX	0.50	2.68	2.35	0.82	0.45	0	0
SEVEN	3.48	0	1.28	0.97	0.49	0	0
EIGHT	2.09	4.76	1.68	0.64	0.72	2.33	0

PAGE'S L = 1040.00, C=7, N=8, p = 0.001.

CHILDREN'S GIVING: [KG] [%]: increase over time

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	3.30	1.03	8.42	1.10	2.27
TWO	0	0	0	0	6.90	7.78	1.09
THREE	0	0	0	0	0	2.78	6.06
FOUR	0	0	0	1.19	0	0	0
FIVE	0	0	0	0	0	4.95	0
SIX	0	0	1.33	3.88	0	0	0
SEVEN	0	0	0	2.74	0	0	0.85
EIGHT	1.85	0	2.94	6.06	3.90	0	0

PAGE'S L = TOO MANY ZEROS TO COMPUTE

MOTHERS' TAKING: [KT] [%]: increase over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	2.38	0.58	2.96	1.63	3.43	0.41	1.65
TWO	2.63	0	2.33	1.30	4.03	3.28	1.16
THREE	2.42	1.97	0.56	0.45	0	1.57	1.09
FOUR	2.15	1.72	2.17	0.63	0.69	0.35	0.63
FIVE	0.99	1.69	1.65	0	0.63	2.16	0
SIX	0	0.89	3.75	2.86	0.45	0	0.50
SEVEN	0	0	0	1.45	0	0	0
EIGHT	0.78	0.63	1.12	2.24	1.44	0.29	0

PAGE'S L = 840.50, C=7, N=8. NOT SIG.

CHILDREN'S TAKING: [KT] [%]: decrease over time

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	10.20	16.67	9.89	6.19	10.53	4.40	1.70
TWO	18.18	9.38	7.41	9.52	3.45	1.11	2.17
THREE	6.50	2.25	4.49	4.95	1.32	1.11	2.02
FOUR	21.50	16.98	5.41	21.43	2.00	6.25	3.39
FIVE	11.11	8.00	0	1.30	0	0.99	2.08
SIX	2.78	6.00	2.67	1.94	2.11	0	0
SEVEN	7.69	9.43	4.55	0	0	0	0
EIGHT	27.78	14.12	6.86	3.03	3.90	6.06	0

PAGE'S L = 1063.50, C=7, N=8, p = 0.001.

MOTHERS' POINTING: [^] [%]: increase over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	2.38	1.74	2.46	2.72	5.58	2.04	0.41
TWO	0	0	0	3.90	5.37	2.19	0.58
THREE	3.23	0.49	2.26	1.81	14.00	2.35	6.57
FOUR	0	0.43	0.87	0	3.78	1.05	1.57
FIVE	0	0	4.95	0	18.99	3.78	1.42
SIX	0	0	2.35	0.82	1.82	2.15	0.50
SEVEN	0.87	0	2.56	3.86	2.45	0.53	1.59
EIGHT	0.78	2.86	2.52	6.71	7.89	4.65	3.66

PAGE'S L = 988.00, C=7, N=8, p=0.01

CHILDREN'S POINTING: [^] [%]: increase over time

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	2.20	7.22	3.16	6.59	12.50
TWO	0	0	0	7.14	6.90	17.78	6.52
THREE	0	0	1.19	0	13.16	6.67	5.05
FOUR	0	0	0	0	0	0	1.69
FIVE	0	0	0	0	9.52	1.98	11.46
SIX	0	0	0	5.83	9.47	23.61	17.69
SEVEN	0	0	13.64	10.96	22.14	9.09	3.39
EIGHT	0	1.18	0	1.52	28.57	8.08	21.62

PAGE'S L = 1006.00, C=7, N=8, p=0.001.

MOTHERS' SALUTATIONS: [S] [%]: decrease over time

Mother	--SESSIONS--						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	45.24	28.90	30.54	17.93	10.73	15.51	2.48
TWO	36.84	51.43	25.58	20.78	9.40	4.37	10.40
THREE	15.32	26.60	17.51	18.55	15.60	1.96	5.11
FOUR	27.38	28.02	28.26	16.40	10.31	8.74	7.55
FIVE	52.47	55.08	15.38	30.77	12.03	20.00	9.00
SIX	39.70	35.27	34.74	22.04	10.45	5.17	3.01
SEVEN	19.13	24.14	10.26	6.28	4.41	2.14	2.66
EIGHT	14.62	27.94	25.49	12.46	4.55	10.17	5.79

PAGE'S L = 1084.00, C=7, N=8, p=0.001

CHILDREN'S SALUTATIONS: [S] [%]: increase over time

Child	--SESSIONS--						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	1.10	4.12	0	0	0.57
TWO	0	0	0	0	0	0	0
THREE	0	2.25	0	1.98	0	0	3.03
FOUR	0	0	0	0	0	0	1.69
FIVE	0	0	0	0	0	0	0
SIX	0	1.00	0	1.94	0	2.08	1.54
SEVEN	0	1.89	1.52	2.74	0	0.91	0
EIGHT	0	0	0	0	1.30	1.01	2.70

PAGE'S L = TOO MANY ZEROS TO COMPUTE

MOTHERS' POSITIVE COMMENT: [C+] [%]: increase over time

	--SESSIONS--						
Mother	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	9.83	3.94	3.26	8.58	6.53	7.02
TWO	0	0	0	0	2.01	0.55	1.73
THREE	1.61	10.84	5.65	2.26	2.40	2.75	5.11
FOUR	3.08	18.53	1.74	6.62	4.47	3.85	12.89
FIVE	0	2.54	0.55	0	8.23	0	0
SIX	4.52	1.34	2.82	6.53	3.18	2.15	1.01
SEVEN	3.48	0.86	3.21	0.97	3.92	6.95	5.32
EIGHT	3.92	1.27	0.28	1.60	5.98	2.62	5.18

PAGE'S L = 951.00, C=7, N=8, p=0.05

CHILDREN'S POSITIVE COMMENT: [C+] [%]: increase over time

	--SESSIONS--						
Child	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	0	0	4.21	2.20	1.14
TWO	0	0	0	0	0	0	1.09
THREE	0	0	0	0	0	0	1.01
FOUR	0	0	0	0	0	0	0
FIVE	0	0	0	0	0	0	0
SIX	0	0	0	0	2.11	0	0
SEVEN	0	0	0	0	1.43	0	0
EIGHT	0	0	0	0	0	2.02	0

PAGE'S L = TOO MANY ZEROS TO COMPUTE

MOTHERS' NEGATIVE COMMENT: [C-] [%]: increase over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	2.89	0	2.72	2.58	3.27	0.41
TWO	0	0	0	3.90	2.01	1.64	1.73
THREE	0	0.49	0	0.90	0.80	0	1.09
FOUR	0.62	0	0	0.63	0.34	4.19	0.63
FIVE	0	0.85	0	0	0	0	0.47
SIX	0	0	0.47	0.82	0.45	0.86	3.52
SEVEN	0	0	0	0	0	0	1.06
EIGHT	0.78	0	0	0	0	0.29	0

PAGE'S L = TOO MANY ZEROS TO COMPUTE

CHILDREN'S NEGATIVE COMMENT: [C-] [%]: increase over time

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	0	0	0	1.03	0	3.30	0
TWO	0	0	0	0	0	0	1.09
THREE	0	0	0	0	0	0	0
FOUR	0	0	0	0	0	0	0
FIVE	0	0	0	0	0	0	0
SIX	0	0	0	0	0	0	0
SEVEN	0	0	0	0	0	0	0
EIGHT	0	0	0	0	0	0	0

PAGE'S L = TOO MANY ZEROS TO COMPUTE

MOTHERS' DIRECTIVES: [D] [%]: increase over time

Mother	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	9.52	8.67	4.93	20.65	4.72	12.24	7.85
TWO	5.26	5.71	4.65	14.29	17.45	7.10	17.92
THREE	12.10	20.20	12.43	30.77	28.80	16.47	33.94
FOUR	12.92	12.07	10.87	18.93	28.18	26.57	29.56
FIVE	0.99	2.54	3.30	1.54	14.56	15.13	12.80
SIX	9.55	4.02	5.63	7.35	20.00	9.91	9.55
SEVEN	2.61	12.07	11.54	4.35	7.84	10.16	7.98
EIGHT	10.18	6.67	6.44	8.95	22.97	22.38	18.29

PAGE'S L = 1013.00, C=7, N=8, p=0.001

CHILDREN'S DIRECTIVES: [D] [%]: increase over time

Child	SESSIONS						
	[1]	[2]	[3]	[4]	[7]	[9]	[10]
ONE	6.12	0	2.20	0	2.11	1.10	3.41
TWO	0	0	0	0	0	1.11	17.39
THREE	2.44	0	0	0	1.32	1.11	0
FOUR	0	0	0	0	0	0	0
FIVE	0	0	0	0	0	0	0
SIX	0	0	0	0	0	1.39	11.54
SEVEN	0	0	0	0	0	0	0
EIGHT	0	0	0	0	1.30	0	0

PAGE'S L = TOO MANY ZEROS TO COMPUTE

BABY AND MOTHER RESEARCH.

JULIE MESSER
CITY OF LONDON POLYTECHNIC

To help in the understanding of your baby's background please answer the following questions, and bring the completed paper to your next session. All details will be treated in total confidence. If there are any questions you cannot answer or prefer not to answer, please leave blank.

NAME:

ADDRESS:

PHONE :

YOUR DATE OF BIRTH:

BABY'S NAME:

BABY'S DATE OF BIRTH:

ANY OTHER CHILDREN - NAMES AND DATES OF BIRTH:

DETAILS OF ANYONE ELSE LIVING IN YOUR HOUSEHOLD AND THEIR RELATION TO YOU (eg. FATHER, MOTHER, HUSBAND)

IF YOU WORK, WHAT HOURS DO YOU WORK AND WHO LOOKS AFTER THE BABY WHILE YOU ARE AT WORK:

ANY OTHER INFORMATION YOU THINK MIGHT BE OF INTEREST:

THANK YOU.

CITY OF
LONDON
POLYTECHNIC

L C Currie BA CEng MIPrDE ABPS
Dean

T Walsh MA
Deputy Head of Psychology Department

Sir John Cass School of
Life and Environmental
Sciences

Old Castle Street
London E1 7NT

Telephone 01-283 1030

Dear

Mother and Baby Research Project

This is to clarify the conditions connected with this research project. The first session attended you will be paid the fee of £2.50 plus your travelling expenses. Thereafter you are required to come for a further 9 sessions, at an interval of 5 weeks. At each session you will receive your travelling expenses and the fee will be paid every third visit in arrears. On completion of the research, you will receive a video of your child.

I look forward to seeing you and baby at these sessions and thank you for your commitment.

Yours sincerely

Julie Messer

Please tear off this section and return it to me, signed, at the second session.

I am willing to attend all sessions.

(signature) _____

Julie Messer
City of London Polytechnic.

Mother and Baby Research Project.

Dear

Here is a resume of the activities involved during the sessions:

The mother and baby are to be video-taped for a ten-minute period of play/conversation. Toys will be supplied for interest. There are no tests of intelligence or performance of any kind involved - we just want to see you naturally at play with your baby.

Another mother and baby will attend the same session as you, but will be video-recorded separately. We require each mother to review the video and tell us in some detail about her child's attempts at communication. For example, 'John wants me to pick him up' or 'John likes that'. During this playback period, your child will be looked after in a neighbouring room by the mother attending the same session. Your baby will always be close to you. While the other mother reviews her video, we would like you to look after her baby with yours, as she does for you. We hope you may find this of interest, to see another baby of the same age as yours and to talk with a mother like yourself.

We estimate that the total session will take approximately one and a half hours.

Yours sincerely,

ASSERTIONS	RESPONSES	EXPRESSIVES	REQUESTS	GAMES / RITUAL	HINTS / SUGGESTIONS
A	V	E	R	G	H
Statements about self, other and the world. Incl. action, location, completion, nominal, state, intent, possessive, numbering. Assertions: Self[A1] I'm going to play cars. I like that. That toy is mine. [A1-]: That's not mine. I don't want to do that. Assertions: Other[A2]	Refusals [VR] including No, not complying, refusal. Compliance and Affirmation. [VC] including Yes. O.K. Mmm, nodding head. Acknowledgement. [VK] such as I see., looks at attention-getting behaviour, looking at person who is calling name. NOTE: all behaviours are responses, so only these select few are included in this response category.	[E] such as astonishment, surprise. Often an Oh/ Positive affect. [E+] includes smiles, laughs, shows excitement, sometimes by arm flapping. Negative affect. [E-] cries, frowns, shows frustration.	Essentially, this covers QUESTIONS. Requests for state, action, repetition, clarification, permission, object What's that?, Will you bring me the car?, What's up? Pardon?, Can I help you? Which is the red one? Grasping or reaching may form a request. Interrogative tone is important in determining a question. See also TAG QUESTIONS. See also HINTS/SUGGESTIONS.	Includes: Peep-bo (Peek-a-boo), Incy Wincy Spider, Pat-a-cake, King-a-roses, Nursery Rhymes, Clap hands (as a game). Blowing kisses, Kissing better, hiding an object and finding it, building up bricks etc. and knocking them down. Ready, Steady, Go/ includes narration. pushing cars etc. TO AN OTHER. throwing balls etc. TO AN OTHER. singing & dancing.	Not so much a request more a suggestion. Shall we play trains? How about playing trains? We'll build a castle shall we? Let's play trains. DIRECTIVES
About any other person, present or absent, incl. pets but NOT toys. You're tired. [A2-] Daddy isn't here. That's not yours. Assertions: World[A3] It's red. It's a big car. One, two, three. There it is. [A3-] It's not blue. Assertions: Me/Us [A12] and [A12-] Unspecified:[A] [A-]	NOTE: all behaviours are responses, so only these select few are included in this response category.	ONONATOPIA O Sounds that mimic actual noises, and other onomatopoeic words. Brrrrrr. Pooh. Brrr. Blowing a raspberry. Bump. Bang. Crash. Thump. Buzz. Wheeee.	Grasping or reaching may form a request. Interrogative tone is important in determining a question. See also TAG QUESTIONS. See also HINTS/SUGGESTIONS.	Mainly instructions, often in the form of a command or order but may be in milder form. Includes reprimands and imperatives. Put the brick in the hole. Bring me the car. Let go! Stop that! Give us a kiss.	

SALUTATIONS, GREETINGS, etc. BIDS FOR ATTENTION.	MIMIC, IMITATION, REPETITION.	TAG QUESTIONS	INDIRECT SPEECH ACTS	EMPHATIC TONE	DEIXIS, INDICATING, POINTING.
S	M	T	N	I	↑
Greetings: Hello. Goodbye. Goodnight. Hi. Calling a person's name (always [S]). [S]. never [N]) All bids for attention, incl. squeaking toys, whistling, etc. Look. Watch.	Exact or very near exact repetition or mimic of a previous utterance. Bringing the car. [Dx] Bringing it. Tim. [N] x mark utterance being repeated.	Phrase at the end of an utterance forming a question. He's tired. Is he? [A2/T] It's a big car. Isn't it? [A3/T]	A means of saying something other than or as well as the surface meaning. Can you bring the car? [R/N] EXPANSIONS & IMPUTED MEANING.	Emphatic, authoritative, peremptory tone. Stop that! [D/I] "WIT", IRONY, SARCASM. W Tone indicating meaning other than surface meaning. Often +ve message with a -ve tone.	Usually clear pointing, or indicating with outstretched arm. Can occur alone or as an adjunct to an utterance. EXCHANGE K
POLITE AND CONVENTIONAL UTTERANCES P	COMMENT C	MISCELLANEOUS Z	Re-worded repetitions of a previous utterance that draws out or imposes meaning. Child: bangs door and vocalizes. [D/I] Mother: You want to go out, do you? [A2/T/X]	LIGHT, PLAYFUL TONE L A light tone which indicates meaning other than surface meaning. Often a +ve message with a -ve tone. Silly boy. (laughing). [C-/L]	GIVING or OFFERING. [KG] A person offers or gives a toy to an other. Taking or trying to take. [KT] taking an object from another person not from the floor, etc.
Polite and conventional utterances. Please. Ta. Thank you. Pardon me. Excuse me. Oh dear. Whoops-a-daisy. Whoops. Whoops. There you go.	Positive [C+] Praise, appeasement, encouragement, selfcongratulation. applause. Well Done. Clever boy. Excuse me. Negative [C-] Criticism, censure. a smack. Naughty! Silly boy!	All utterances not covered by other categories. All utterances in this category are transcribed or described.			



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AND THEIR EMERGENT-LANGUAGE CHILDREN:
A LONGITUDINAL STUDY**

TITLE

AUTHOR **JULIE PATRICIA MESSER**

DEGREE

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