

**Developing a communicative mind:
A longitudinal study of the development of
communicative competence in Japanese children
aged from 13 to 24 months**

Hiromi Tsuji

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Abstract

There are cultural variations in how young children learn to communicate with others. The development of Japanese children provides evidence of cultural variations and universal aspects in the way young communicative minds develop.

Children's communicative competence during their second year was investigated in terms of the expression of communicative intents and joint attentional skills during dyadic interaction with caregivers.

Ten children and their mothers interacting in two contexts were observed and video-recorded at monthly intervals. Systematic coding systems identified and coded communicative acts and joint attentional engagements. The analyses were based on the type of communicative acts and their frequencies as well as the total time spent in joint attentional episodes.

With the increasing interpretability of children's speech, their communicative repertoire increased, albeit with individual variability in their developmental courses. The common developmental feature was an increase in the repertoire of linguistic expressions in the main communicative exchanges: directing attention, negotiation and discussion. There was also an expansion of conversational topics to non-present referents. Culturally specific communicative behaviours were found in the use of meta-conversational repertoires, both in children and mothers.

There was a linear trend for increased time spent in joint attentional episodes. Early joint attentional episodes were dominated by routine play and/or gesture use, both of which involved an element of establishing interactional formats within the dyads.

The mothers facilitated the interactions using a wide variety of communicative acts in the discussion domain. They also supported joint attentional engagement. Their interaction with the pre-verbal child showed a significant impact on the child's communicative repertoire in the later stages.

Developmental routes to mastery of communication reflect cultural variations in the way people interact. Despite cultural variations, the fundamental process of language learning is that children's experience of early communicative exchanges leads to their accomplishment of "meeting of minds" (Bruner, 1995)

The work presented in this thesis is my own original work.

The total number of words in the thesis is 74,154.

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Hiromi Tsuji

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Contents

Chapter 1. Introduction	11
Chapter 2. Literature Review	17
2.1 Research into language development.....	17
2.2 Speech to children: linguistic input and language development.....	19
2.2.1 What is Child Directed Speech?	20
2.2.2 What is the role of CDS in language development?	25
2.3 Interaction with children: theories of language development in a developmental context.....	32
2.3.1 Language Acquisition Device (LAD) and Language Acquisition Support System (LASS)	33
2.3.2 Social-cognitive skills of young children.....	41
2.3.3 Socio-pragmatic theories of language development	45
2.4 Cross-linguistic and cross-cultural diversity: beyond universality	58
2.4.1 Cross-linguistic approaches	58
2.4.2 Cross-cultural approaches: ethnographic studies	61
2.4.3 Language experience and language development in Japanese	64
2.5 Communication as a process of language development	70
2.6 Rationale of the study.....	74
2.6.1 The issues summarised.....	74
2.6.2 The development of the expression of communicative intents.....	75
2.6.3 The development of joint attentional skills.....	77
2.7 Research questions	78
Chapter 3. Methodology.....	81
3.1 Child language research: historical background and issues.....	81
3.2 Design and methods of the study.....	86
3.2.1 Longitudinal observations.....	86
3.2.2 Setting and context for observation.....	87
3.2.3 Scales of sampling.....	89
3.2.4 The Child Language Data Exchange System (CHILDES)	90
3.2.5 Data collection and analysis of data.....	90
3.2.6 Defining “communication”, “communicative intent” and “communicative acts”	91
3.2.7 Coding systems for the study of communicative acts.....	93
3.2.8 Defining “joint attention”	102
3.2.9 Coding systems for the study of joint attention	104
3.2.10 Methods for statistical analysis	107
Chapter 4. Pilot Study	109
4.1 Objectives.....	109
4.2 Participants and procedures.....	110
4.2.1 The materials prepared for the interaction	111
4.2.2 Parental interview.....	112

4.2.3 Transcription	112
4.2.4 Coding of communicative acts.....	113
4.3 Consideration of contexts.....	113
4.4 Frequency of communicative acts.....	115
4.4.1 Sample size in relation to the length of observation and the contexts	115
4.5 Communicative acts produced by children of different ages.....	117
4.5.1 Transition in the mode of communicative acts	117
4.5.2 Variation of communicative gestures.....	118
4.5.3 Variations in verbal communicative acts at different levels of measurements	119
4.6 Implications of the pilot study.....	122
 Chapter 5. Outline of the Study.....	 126
5.1 Data collection	126
5.1.1 Recruitment of participants.....	126
5.1.2 Participants.....	126
5.1.3 Observation procedure	127
5.2 Transcription	129
5.3 Analysis of communicative acts.....	129
5.3.1 Coding communicative acts.....	129
5.3.2 Reliability	130
5.3.3 Measurements in analysis of communicative acts	131
5.4 Analysis of joint attention.....	131
5.4.1 Coding children's engagements	131
5.4.2 Reliability	132
5.4.3 Measurements in analysis of joint attention.....	132
 Chapter 6. Development in Expressing Communicative Intentions	 134
6.1 Developmental changes in different modes of communicative acts.....	134
6.2 Communicative intentions expressed by gesture	141
6.2.1 Deictic and depictive types of gesture	141
6.2.2 Illustrations of gesture use	143
6.3 Communicative intentions expressed by speech.....	151
6.3.1 Developmental changes in communicative repertoire	151
6.3.2 Communicative acts relative to the milestones.....	157
6.4 Summary	167
6.5 Discussion	168
 Chapter 7. Mothers' Communicative Acts in their Interaction with Children.....	 180
7.1 Mothers' involvement with communicative interaction	180
7.2 Mothers' repertoires of communicative acts.....	182
7.2.1 Interchanges	183
7.2.2 Speech Acts.....	187
7.3 Changes in mothers' communicative acts.....	188
7.4 Communication styles of individual mothers	191
7.5 The relationships between mothers' communication styles and children's communicative acts.....	199
7.6 Summary	202

7.7 Discussion	203
Chapter 8. Joint Attention and Communication.....	211
8.1 Developmental trajectories of joint attentional engagements	212
8.2 Developmental transition of initiating joint attentional episodes	219
8.3 The relationship between joint attentional engagements and expressing communicative intents	227
8.4 Summary	231
8.5 Discussion	232
Chapter 9. Communication Development.....	238
9.1 Summary of the main findings.....	238
9.2 Communication development-a picture from 10 children	241
9.2.1 Joint attentional ability and developing communicative expression.....	241
9.2.2 The mother's role in communication with the child.....	248
9.3 Summary of the development of communication in 10 children.....	252
Chapter 10. General Discussion and Conclusions	255
10.1 Communicative competence in the expression of intents.....	255
10.2 Joint attention as an underpinning of communication skills.....	262
10.3 The caregivers' role in the socialisation of the communicative mind	268
10.4 Limitations of the study and prospects for future research.....	272
References.....	279
Appendix 1 Coding systems	303
Appendix 2 Transcription formats using CHAT.....	307
Appendix 3 A list of books used in the main study	311
Appendix 4 Developmental trajectories in children's communicative modes.....	312
Appendix 5 Unplanned multiple comparisons.....	314
Appendix 6 Contingency tables for the declarative and imperative use of deictic gestures.....	315
Appendix 7 Number of different types of communicative act produced by the children and the mothers	316
Appendix 8 Mean proportions of the major Interchange types produced by the children and the mothers	321
Appendix 9 Relative frequency of speech acts by children.....	323

Appendix 10 Hierarchical linear models in different types of engagement.....	324
Appendix 11 Summary of the exploratory regression analyses for the mothers’ communicative style and joint attentional episode variables that predict the child’s pragmatic skills	326

List of Tables

Table 4.1	Mean and standard deviation of frequency of communicative acts	115
Table 4.2	Communicative gestures produced with or without speech	118
Table 5.1	Information on participants	127
Table 6.2	Frequency of communicative acts produced in different modes	135
Table 6.3	Descriptive measures of frequency of communicative gestures	142
Table 6.4	Deictic gesture used in different communicative Interchanges	144
Table 6.5	Depictive gesture used in the different communicative Interchanges	147
Table 7.1	Summary of standardised regression coefficients	181
Table 7.2	Comparison of the mothers' communicative acts between "Directive" and "Discussion"	198
Table 7.3	Pearson Product-Moment Correlation coefficients (r) between the mothers' communicative orientation and children's communicative acts for the three measures	200
Table 8.1	Mean and standard deviation for the duration of the engagements	217
Table 8.2	The linear model of growth in children's engagements	218
Table 8.3	Illustration of the mother's initiation of a joint attentional episode	226
Table 8.4	Concurrent correlations between the duration of joint attentional episodes and the variation of communicative acts	229
Table 8.5	Correlations between the duration of joint attentional episodes and the variations of children's communicative acts	230
Table 9.1	Illustration of the child's communicative gestures	245

List of Figures

Figure 4.1	Proportion of communicative acts using different communicative modes	118
Figure 4.2	Variations in the types of verbal communicative acts: children	120
Figure 4.3	Variations in types of verbal communicative acts: mothers	120
Figure 4.4	Variety of Speech Acts used within main Interchanges	121
Figure 6.1	Mean frequency of different communicative modes as a function of age	135
Figure 6.2	Development of different communicative modes in each child	137
Figure 6.3	Cumulative numbers of children that achieved each milestone at each age in months	140
Figure 6.4	Mean numbers of different types of communicative acts	152
Figure 6.5	Relative frequencies of Interchanges by children and mothers	154
Figure 6.6	Relative frequencies of Speech Acts	157
Figure 6.7	Emergence of communicative acts relative the developmental milestones	158
Figure 6.8	Mean and range of different Speech Act types combined with a particular Interchange	161
Figure 6.9	Change in the number of different Speech Act types in the main Interchanges and peripheral Interchanges observed in each child	163
Figure 6.10	The growth in Pragmatic Flexibility relative to the milestones	166
Figure 7.1	Trends of main Interchanges used by mothers	184
Figure 7.2	Trends of conventional Interchanges used by mothers	184
Figure 7.3	Trends of third Interchange group used by mothers	185
Figure 7.4	Trends of Speech Act groups frequently used by mothers	187
Figure 7.5	Trends of different types of communicative acts used by mothers	190
Figure 7.6	The trends in the frequency of the mother's involvement in "Discussion" and "Directive"	192
Figure 7.7	The mother's Pragmatic Flexibility in the domains of "Directives" and "Discussion"	195
Figure 8.1	Developmental trajectories for the total time spent in each engagement	213
Figure 8.2	The mean duration of joint attentional episodes	216
Figure 8.3	The linear model of growth in children's engagements	218
Figure 8.4	Initiation of joint attentional episodes by mother and child	221
Figure 8.5-i)	Proportional duration of joint attentional episodes initiated by mothers	224
Figure 8.5-ii)	The ratio of the two types of episode initiated by the mothers	225
Figure 9.1	Proportion of each type of communicative act used before M2	243

Chapter 1

Introduction

Learning how to communicate is one of the most important developmental achievements of children. Human communication is unique in that it largely involves the use of language. Language is a highly abstract system and its basic structure stems from arbitrary relationships between sound, meaning and forms to signify content. This language system enables humans to make use of its richness and complexity in order to convey messages.

Despite the complex nature of language, a sign of entry into a language system emerges at the end of the first year of a child's life. During the second year, children start to show remarkable competence for engaging in communication using emerging social and cognitive abilities. It is possible that such an early emerging ability plays a crucial part in their grasp of a language system during the early development of communication.

Research on child language development has provided numerous pictures describing the ways in which young children increase their capacity to understand the complex system of language; many of these pictures focus on the semantic and grammatical aspect of language. An increase in children's capacity to express their communicative intents draws on the development of several aspects of such a language system. Communicating through pragmatic means is one of their earliest emerging abilities, which becomes more sophisticated with the subsequent development of grammar. The developing expression of communicative intent may also be one of the key areas that encompass different aspects of language development. Nevertheless, relatively little attention has been given to examining the process in which children increase communicative competence in terms of the wider scope of language

development.

This study investigates the process by which young children begin to use Japanese language as a part of their mastery of communication. Although the very nature of language in respect of human communication may be similar, the ways people use language in different cultures are diverse, and such differences may be subtle. Studying communication development in different cultures and languages could contribute to the recognition of such subtle differences in the process of language learning, which may be unique to one language community, and of universal aspects, which could be attributed to the unique human ability to acquire and use a sophisticated language system. However, nearly all contributions to the literature of communication development to date have been limited to studies that examined children within western cultures. Therefore this study aims to provide a developmental picture of one group of language communities.

There are two main aspects of the development of communicative competence that are investigated in this study. One is the development of communicative acts used as the representation of young children's communicative intents, and the other is the development of joint attentional skills that enable the interlocutors to share an experience regarding an external entity in the social world.

This study also involves an examination of the way in which children develop communicative behaviours in relation to their primary caregivers. The linguistic input and other aspects of the caregivers' communicative behaviours are important as parts of the language environment. The global character of a caregiver's role in the process of language learning can be described by the term "*scaffolding*" (Bruner, 1983b; Wood 1989) in which children's development is fostered through their social experiences with the caregivers. Research into language development in social contexts generally no longer revolves around issues related to the nature-nurture controversy. The main

questions regarding the caregivers' role are what kind of interactional behaviour is of significance for the development of a particular language, as well as to what extent the social and language environment provided by the caregiver makes a significant impact on the child's development. This study presents a descriptive picture of communication development in children, as well as the facilitative roles played by the caregivers in a Japanese-speaking community in Japan. This picture may have significant implications for understanding and promoting communication development.

Overview

Following this introductory chapter, Chapter 2 begins with an extensive literature review on research into child language development, comprising studies on Child Directed Speech (CDS), socio-pragmatic theories of language development including studies in relation to joint attentional skills, and cross-linguistic and cross-cultural studies of language development. The review of the literature on CDS examines its nature and its role in child language development, and discusses issues and implications of the research in this area. The review of socio-pragmatic theories of language development highlights the importance for language learning of early social and cognitive skills of young children. Cross-cultural and cross-linguistic studies are reviewed, to underscore the differences across language communities and to discuss the issues and implications of such studies. The remaining sections are devoted to locating the current study in the area of language development, which places a particular emphasis on communicative aspects, and to stating the main research questions that are addressed throughout this thesis.

Chapter 3 presents a discussion of the methodologies that are related to the current study. Firstly, the methodology of child language research is reviewed, and issues identified in the literature are discussed. Following the review, the design and

methods employed in this study are described, and the rationale of opting for the particular method used as well as the definitions of the main concepts used in this study are discussed.

Chapter 4 reports on the pilot study that preceded the main study. This pilot study aimed to examine certain aspects of the study such as the procedure for observation and the feasibility of the proposed methods for coding communicative acts. Some preliminary data obtained in the pilot study will also be presented for the purpose of discussion. The implications of the pilot study are discussed at the end of this chapter.

Chapter 5 summarises the outline of the main study. This includes information about the participants, the procedure for observations and the methods analysing communicative acts and joint attentional skills. In order to validate the coding process, the inter-rater reliability for the coding is presented for the analysis of both communicative acts and joint attentional skills.

The next three chapters report the results of the analyses with respect to the research questions; these results are followed by a discussion at the end of each chapter.

Chapter 6 presents in three parts the children's developmental progress in the expression of communicative intents. The first section examines developmental changes in the children's use of different communicative modes, gesture, vocalisation and interpretable speech as well as possible combinations of these modes. This examination identifies the nature of developmental progress in the children's communication modes. The nature of the progresses serves as the main developmental milestones used throughout this study. The second section analyses communicative gestures in the light of communicative modes (gesture only, gesture-vocalisation, and gesture-speech) and types of gesture (deictic and depictive), and examines developmental changes in children's use of communicative gestures. The third section

charts the progress in children's use of verbal communicative acts, according to the types and frequencies of communicative acts that children mastered at different ages. Some individual differences are identified in their patterns of development in relation to the developmental milestones.

Chapter 7 examines the mothers' verbal communicative acts in relation to their children's age. The mothers' communicative behaviours that changed in quantitative and qualitative aspects during the children's development are reported at group and individual levels. The first section examines the quantitative involvement of the mothers in communicative interactions with their children. The second and the third sections provide an overall picture of the repertoires of the mothers' communicative acts. The fourth section examines individual mothers' communicative styles; the variability of communicative styles is examined in relation to the child's development of communicative acts in the final section of this chapter.

Chapter 8 reports on the analyses of joint attentional skills. Firstly, developmental trajectories of the time spent in joint attentional episodes are investigated at group and individual levels. The second section analyses the initiation of each joint attentional episode; this section identifies dramatic changes in the way joint attentional episodes are initiated as the child's linguistic and attentional competence increases. The final section examines the relationship between the time spent in joint attentional episodes and the variety in communicative acts by the children at different developmental points in time.

Chapter 9 provides a synoptic picture of communication development, derived from the data on the 10 children. The first section summarises the main findings of the study. The second section presents a synthesis of the previous three chapters, focusing on early joint attentional ability, the development of communicative expression, and the caregivers' role in communication with the child. The final section summarises

important aspects of communicative behaviour with respect to joint attention and expressing communicative intents.

In Chapter 10, the findings of the study are discussed from theoretical, methodological and cultural perspectives. The main discussion comprises three sections. Firstly, theoretical views on the status of early communicative intents and their expressions during the transition from pre-verbal to verbal communication are discussed, with reference to the developmental course in which the children in this study increased their competence in expressing communicative intentions.

Communicative behaviours that emerged as culturally specific aspects of Japanese life are discussed, and validate the meaning of such culturally unique aspects of communicative behaviours in the light of previous studies. The second section discusses the role of joint attentional skills in the course of communication development. The insights derived from the current study will be further discussed in relation to early communicative interactions in different cultures. The third section addresses the interactions provided by the caregiver, illuminating the part of the language environment that goes beyond linguistic input. The thesis concludes with a discussion of the limitations of this study, and of the potential for future development in child language research.

Chapter 2

Literature Review

2.1 Research into language development

One of the key historical debates in the study of language dates back to the 1950s.

Noam Chomsky challenged the behaviourists' idea of language learning, in particular, B.F. Skinner's book "*Verbal Behaviour*" (Skinner, 1957). Skinner proposed that children's language learning takes place through operant conditioning; the sounds made by children are shaped by reinforcement received from their caregiver (Skinner, 1957).

This claim, particularly the role of reinforcement as a crucial event for language learning, was heavily criticised by Chomsky (1959). Chomsky (1965) regarded the nature of linguistic input to children as being less than optimal, because adult speech is often ill-formed, including mistakes, garbles, mispronunciations and ungrammaticalities. Furthermore, the underlying principles of language are so abstract that what the child might hear from the adult is not sufficient for the child to acquire a knowledge of grammar. Therefore, he argued that the child is born with a capacity to acquire language, which is called the "Language Acquisition Device" (LAD). This view thus stands on the nature-nurture spectrum in opposition to the empiricists' idea.

Such pure nativists' accounts were contested quickly by scholars, mainly from the so called middle ground. These middle positions broadly fall into two groups; one of them is represented by the semantic approach. This approach (e.g. Bloom, 1970; Brown, 1973) proposed that children's learning of language depends on their real-world knowledge, which enables them to discover the semantic-syntactic structure of language. Those who took the other approach, such as Bruner (1983a) and Snow and Ferguson (1977), focused on the role of social interaction in language learning, but they did not

view such social contexts for the cause of language learning in the same way as the behaviourists; rather, they proposed that social interaction *supports* (Bruner, 1983b) or *facilitates* (Snow, 1989) language development. Within the social interactionist views, there are, in essence, differences in their focus, which will be discussed in turn below.

Early research that focused on adult speech to children was in part undertaken to refute Chomsky's view. Specifically, Chomsky was criticised for using anecdotal evidence to support his claim. He described adult speech that children heard as a degenerate linguistic input (for a review see Snow, 1977a). Preceding the psychological study of adult speech to children, the linguistic study of adult speech to young children, so called "baby talk", had already noted special characteristics in its prosodic features. The characteristics of such speech commonly include high pitch and exaggerated intonation, and these were described as "simplified register" (Ferguson, 1977).

Psychological research regards adult speech to children as "Motherese" or "Child Directed Speech (CDS)", and shows discrete differences between adult-adult speech and adult-child speech. This line of research further tried to identify the facilitative role of CDS for language development. Initial analyses were concentrated on the grammatical complexity of the speech of the mother and child, in which the child's growth in grammatical complexity was considered as an outcome of the mother's linguistic input. This trend, focusing on the syntactical aspect, appeared to be in part contesting Chomsky's view of language acquisition. Despite some satisfactory results, such as identifying the particular nature of CDS (Snow, 1972; Phillip, 1973) and some relationships between CDS and child language development (Cross, 1977; Chapman, 1981b), the initial approach raised issues regarding the interpretation of some of the findings and their methodology. These issues encouraged further research, to examine a much wider aspect of linguistic interactions.

Bruner viewed Chomsky's work rather differently and criticised it from a different viewpoint. Bruner's challenge was on the point that Chomsky did not provide evidence of *how* young children become able to use a knowledge of the universal rules of language in order to become speakers of a particular language. As Bruner put it (1975a),

...if language grows from its own roots, it suffices to study the beginning of language proper if one wishes to understand the nature of its early acquisition.... Even if it were literally true (as claimed by Chomsky), that the child, mastering a particular language, initially possesses a tacit knowledge of an alleged universal deep structure of language, we would still have to know how he manages to recognise universal deep rules as they manifest themselves in the surface structure of a particular language. (Bruner, 1975a, p. 256)

Bruner emphasised the importance of examining the children's pre-verbal communication system in order to understand *how* a child's innate language acquisition device evolves. Bruner (1983b), drawing on the notions of Speech Act theory (Austin, 1962; Searle, 1969), claimed that pre-linguistic children already know how to communicate by means of gesture and vocalisation. He then tried to explain how communicative functions are developed and conventionalised, and finally how young children acquire sensitivity to the context-appropriate use of language, all of which is related to development in the aspect of pragmatics. In the following sections, different approaches to the study of language development within the social interactionist perspective, as well as Speech Act theory, which plays an important part in the study of modern pragmatics, are discussed in detail.

2.2 Speech to children: linguistic input and language development

The distinctive features of adult speech to children were first reported by the French linguist, Antoine Meillet, who recognised that linguistic research on adults'

modification of speech to young children was a promising area (Meillet, 1921, as cited in Ferguson, 1977). Later, literature on linguistics began to describe more detailed features of “Baby Talk”. This included prosodic characteristics; the Baby Talk lexicon, which was analysed in terms of its structure; the process of simplifying and clarifying; and other features of Baby Talk, such as its expressive function, i.e. affect being attached to the utterance, and its identifying function (Ferguson, 1977). However, few linguistic studies were interested in how such features of adult speech to children affected a child’s language development. Psychological studies then began to explore adults’ speech to children as CDS (Child Directed Speech) in terms of syntactic and semantic aspects, and the role of such speech for children’s language development (Snow, 1986). This section reviews the psychological studies of CDS, and reconsiders the definition of CDS and the relationship between CDS and child language development.

2.2.1 What is Child Directed Speech?

Early studies that tried to understand the nature of CDS looked broadly at three features: prosody, grammatical complexity and redundancy. Very little attention was given to its pragmatic features (Snow, 1977b). Initial analyses of CDS appeared to be very descriptive in nature.

Snow (1972) and Phillips (1973) carried out an experiment to test the specific features identified in CDS relative to age, gender and situation. Phillips found similar characteristics of CDS in adult speech to both boys and girls. Mothers’ CDS appeared to differ even to young children between the ages of 18 and 28 months. Snow also confirmed that mothers of two-year-old children were more sensitive, using simpler language including more redundancy, than mothers of older children; but even mothers

of older children spoke to their children using less complex language than their speech to adults. Snow also compared mothers to non-mothers in their speech to two-year-old children. Mothers were slightly better than non-mothers in predicting what speech was required by their child to enable them to understand. Mothers' speech included a set of utterances that was "relatively consistent, organised, simplified and redundant" (p.561). This indicates that adult speech addressed to children is not always as degenerate as Chomsky assumed. Furthermore, the difficulty of tasks in which the mother and child were engaged did not change the simplified or redundant features of CDS.

These experimental studies appeared to confirm the characteristics of CDS, in that adults do use CDS when they speak to young children. Such speech includes relatively less complex sentences, more repetition and more redundancy than normal speech. As Snow (1972) argued, these modifications when adults speak to young children may play an important role in terms of making speech more interesting, comprehensible and meaningful for young children. It was assumed that such simplified speech helps children to learn language. In particular, it helps them to formulate the rules of grammar in ways that forms consistent and relevant linguistic information. Thus, these early studies inferred the role of CDS as offering language teaching, specifically of syntax. However, there was no evidence from these results to suggest that linguistic input itself was either necessary or sufficient, because no data regarding the child's uptake were obtained. There was also the problem that these studies looked at the features of CDS with children of different ages in a cross-sectional design. Therefore it was not evident that any difference in CDS existed within individual dyads throughout the child's development. Much of the research in this area then moved to observe both mothers' and children's utterances, and investigated the relationship between linguistic input and child language development. A further

issue arising from early studies is that if the nature of CDS derives from its effects on language learning, it could be the case that this teaching aspect of CDS varies as the child's linguistic competence increases-this is called the "Fine-Tuning Hypothesis" (e.g. Cross, 1977).

A broad consensus about the characteristics of CDS appeared to be reached, despite different ways of looking at these features. Newport, Gleitman and Gleitman (1977) agreed that CDS is characteristically short in Mean Length of Utterance (MLU) compared with normal adult speech, and is highly intelligible. However, they viewed CDS as more complicated than normal adult speech because CDS consists of a wider range of sentence types such as questions and imperatives, which are rarely heard in normal adult speech, and contains more inconsistencies. They raised the issue of what is meant by "simple style" of speech, and argued that more specificity in describing the features of CDS, rather than taking a holistic impression of CDS, is necessary. As Newport *et al.* (1977) put it, the findings of other studies which assessed the syntactic simplicity of CDS might derive from a brevity of speech itself. Their arguments further criticised any optimistic view of the relationship between the role of CDS and language development. Demonstrating the differences between CDS and normal adult speech does not confirm that CDS is better for language learners. If CDS plays a role in "teaching" language, then it should become more complex through fine-tuning to a child's growth of linguistic sophistication. This again refers to the controversy regarding the "Fine-Tuning Hypothesis".

Snow (1977b) further investigated CDS to find an answer to this controversy. She followed young children aged from 3 to 21 months and their mothers to observe their interactions. The analysis of the corpus of their utterances found no change between 3 months and 18 months in their MLU, and between 10 months and 14 months in the characteristics of CDS, such as the high frequency of questions, in response to

children's growing linguistic sophistication. These findings suggest that these mothers' speech register was not entirely dependent on the child's linguistic ability. On the contrary, more significant changes in mothers' speech during the same periods of the study were found in what they were talking about. At an early age, mothers' utterances included mainly references to the child's feelings and his/her experiences, whereas at a later age mothers talked about the activities or events in the immediate context in which they were engaged. These changes occurred when the child was aged between 5 and 7 months. As Snow put it, these changes derived from the mother's use of conversation in interacting with children. Such interpretations of the changes in mothers' speech to children explain the natural occurrence of CDS in adults, in that mothers may be trying to communicate with their children and also to find out what is going on in their minds.

Shatz and Gelman (1977) also postulated a similar position, that CDS cannot be explained on the basis of the mere modification of syntactic rules and grammatical simplification. They also argued that CDS is influenced by conversational constraints, which are dependent on the specific communicative demands deriving from a given situation where a communicative interaction takes place. Their evidence came from the observation of four-year-olds talking to younger children; even four-year-olds showed some modifications of their speech to younger children, but these utterances appeared to be syntactically complex, using "that"-clauses or "wh"-words predicates to complement constructions (Shatz & Gelman, 1973). However, the use of such complex syntactic structure in four-year-olds' interaction with younger children appeared consistently to serve the following purposes: modulating their assertions, talking about mental state and initiating topics or activities. Thus Shatz and Gelman argued that a primary function of CDS is to help children discover the world and to help them to map language onto relationships which young children begin to discover.

Further support for this view can be found in a study by Cross (1977). This study, with children aged 19 to 32 months, explored discourse-related features of mothers' speech in relation to children's language as measured by MLU in spontaneous speech and receptive abilities (e.g. comprehension). It was found that maternal speech was more strongly correlated with the child's receptive abilities than with productive abilities. However, there are some issues in this study regarding the use of a simple correlation method in order to examine the changes of maternal speech measures over time. This methodological design cannot take into account the possibility that different adults may be adjusting their speech to their children's growth in competence from different baselines (Snow, 1995). Therefore this study should be interpreted with some caution. In fact, maternal speech adjustment to the child's ability in general does not seem to be as strong as might be expected.

For example, as part of the Bristol Longitudinal Study in the UK, Ellis and Wells (1980) collected naturalistic samples of speech and found evidence of some degree of adjustment in maternal speech to children when the children became able to communicate linguistically. However, the aspect of maternal speech adjustment only accounted for a small portion of the total variance. They therefore concluded that

...in many respects adults continue to talk to children in very much the same way generally lower level of correlations between adult speech variables and child comprehension cast some doubts on the suggestion that adult speech is finely tuned to the child's concurrent level of comprehension. (Ellis & Wells, 1980, p.53)

Overall, the results of many studies are mixed, in particular with respect to the "Fine-Tuning Hypothesis". As Snow, Perham and Nathan (1987) suggest, it may be that the results are crucially dependent on the aspect measured at and the age of the children being studied.

In summary, there seem to be some kind of adjustment in adults' speech to children which distinguishes it from normal adult speech; nevertheless, such adjustments are not always found to indicate that adults' speech is tailored to the child's linguistic ability. Therefore, the nature of CDS seems to be better understood as speech which has significance in seeking perceptual clarity and comprehensibility for young children and is derived from a speaker's communicative intent rather than an intention to teach language. More precise functions of CDS, as Brown (1977) argues, are to facilitate children's understanding and to direct and sustain their attention. In this respect, it is possible to say that mothers and other speakers might be fine-tuning speech to young children in terms of their communicative competence, which may not necessarily involve linguistic skills. If so, studying the conversational interactions between the child and caregiver might be a more promising area of research compared to the mere extraction of linguistic input and uptake in order to examine the "Fine-Tuning Hypothesis" (Sokolov, 1993).

2.2.2 What is the role of CDS in language development?

The findings that CDS differs from adult-adult speech and has specific features did not demonstrate that CDS affects language development. Therefore there was a move towards research designed to explore the relationship between variations of CDS, as representations of the linguistic environment for the child, and the growth of linguistic competence.

Early studies that looked at the relationship between CDS and children's language development focused on syntactic variability. Some studies (e.g. Nelson, Carskaddon & Bonvillian, 1973; Nelson, 1977; Baker & Nelson, 1984; Nelson,

Denninger, Bonvillian, Kaplan & Baker, 1984) adopted the view that there were some positive effects of CDS on the rate of language development. The aspects of CDS that appeared to promote the child's language were related to recasts where mothers provided correct or alternative versions of utterances in response to those of the child. The trend was, in part, driven by the main focus of the debate between nativist and empiricist (Furrow, Nelson & Benedict, 1979). Therefore much of the early research in this area reflects the nature-nurture controversy. More specifically, many studies contested the role of CDS in terms of the "Motherese Hypothesis". This is 'the hypothesis that these special properties of caregiver speech play a causal role in acquisition [of language]' (Gleitman, Newport & Gleitman, 1984, p.45). The most striking dispute is found between Newport, Gleitman and Gleitman (1977) and Furrow, Nelson and Benedict (1979).

Newport *et al.* examined fifteen mother-child dyads at two sessions six months apart. Participants included a wide range of age groups between 12 and 15 months, 18 and 21 months and 24 and 27 months, at various developmental stages from one word to multi-word utterances. Correlations between mothers' utterances, which were coded into precise measures of syntactic and stylistic aspects at the first session, and the measures of child language development over six months were analysed. The researchers found little effect of CDS on the growth of a child's MLU, although mothers varied in their CDS in terms of MLU. On the other hand, an aspect that is specific to the surface structure of language, such as the use of auxiliaries and inflection of noun-phrases in English, appeared to be sensitive to the variation of mothers' style (e.g. mothers' use of yes/no questions). They differentiated these findings in terms of the effect and non-effect of CDS; universal properties of human language, the use of nouns and verbs, did not have an effect on the children's language, whereas language-specific aspects, surface morphological and syntactic elements, did have an

effect. Based on these interpretations, they concluded that CDS does not have an effect on language growth; CDS is predominantly derived from the local need for communication.

However, the assumptions on which their statistical analyses were carried out cast doubt on this conclusion. Because a wide range of age groups were involved in this study, they statistically adjusted the variance in the mother's speech to the child relative to both the child's age and initial linguistic ability at session 1, and then carried out correlation analyses in relation to the child's growth rate. With a small group of just 15 participants, the use of statistical adjustments may lead to a violation of original data, for the following reasons: 1) because one individual's developmental course differs from another's, it is difficult to assume that the effect of CDS is equally distributed among children of a particular age and their linguistic competence; and 2) in general, child language development does not necessarily happen in a linear manner; therefore the effect of the changes in mothers' speech to the child may not be equal during the child's first and second years of life (Furrow *et al.*, 1979). As this study examined children showed a wide range of language development, it is very difficult to infer relationships from statistically adjusted data in such cases.

Furrow *et al.* (1979), in a challenge to Newport *et al.* (1977), proposed some "simple" relationships between mothers' CDS and syntactic development. Furrow *et al.* studied seven children who were all at the one-word stage at 18 months. These children were observed for a second time at 27 months. Measures for mothers' speech to children included several syntactic and semantic aspects. They analysed the relationship between the mother's speech at the child's age of 18 months and the child's speech at the age of 27 months. The mother's use of yes/no questions showed a relationship with the child's development of auxiliaries at the later age. This is congruent with the findings of Newport *et al.* Other measures, which reflect the

increased complexity of speech in terms of syntactic and semantic aspects, appeared to correlate negatively with the child's language development. They suggested from these results that complexities in maternal speech hindered a child's language development. In order for such significant correlations to be attributed to the effect of mothers' speech at 18 months on language development at 27 months, they also analysed the concurrent correlation between the mother's and child's language measures at 27 months. There were no significant relationships between these measures; therefore, they concluded that early maternal speech style to children at 18 months of age did have an effect on language development at 27 months of age.

There are at least two problems in the design and interpretation of the analyses. First of all, they took it for granted that all the children were in the same phase of language development because these children were at the one-word utterance stage. However, as Harris (1992) points out, even amongst those who are at the one-word utterance stage there is a great variation between children's lexical knowledge, from a few words to 100 words. Without taking children's potential differences into account at the initial observation, it is difficult to conclude whether mothers' linguistic input affects the measured outcome of children nine months later. Secondly, their conclusion was derived mainly from negative correlations. In fact, positive relationships were found only on the measures of mothers' total use of yes/no questions and their noun/pronoun ratio; other measures all showed negative correlations with the measures of the child's development. Their conclusion that mothers' choice of simple constructions in linguistic input facilitated language growth is not convincing without showing the positive effects of such a simple linguistic repertoire on the child's language development.

Due to methodological problems, neither study seems to provide a clear picture of the exact effect of CDS on a child's language development. However, a re-analysis

of the same data in Newport *et al.* (1977), without the youngest group of children, using the same method of analysis as carried out by Furrow *et al.* (i.e. two groups of children were analysed separately), found some effects of CDS on children's language development (Gleitman, Newport & Gleitman, 1984). For the younger group, the measures of maternal use of expansion, maternal MLU, number of clauses per utterance and frequency of interjections were correlated with the child's use of auxiliaries. There were also positive correlations between maternal use of declaratives and the child's use of verbs per utterance, and negative correlations between maternal repetition and the child's growth in MLU and use of auxiliaries. For the older group, only the maternal use of yes/no questions was correlated with MLU and use of auxiliaries; this was a similar result to the earlier finding in Furrow, *et al.* (1979). As seen in the re-analysis by Gleitman *et al.* (1984) only younger children, who were in the same age group as the children in Furrow *et al.*'s study, showed some possible effects of CDS, but not the older age group children. As Hoff-Ginsberg and Shatz (1982) argued, it is possible that Furrow *et al.*'s study examined children who were developing a specific feature of language structure, in this case, use of the verb, which turned out to reflect exactly what they were measuring. Snow (1986) also supported this view, with the following explanation. There are differences in the tasks children are facing for language learning at different stages of development. In the early stages, simple semantic and pragmatic functions may be more salient in CDS, because children are developing basic vocabulary, whereas when the child's tasks move on to acquiring morpho-syntactic rules, more complex input may be required. This explanation makes sense of the finding of Gleitman *et al.* (1984) in that only the older children's use of auxiliaries is related to that of mothers.

Given the methodological problems raised earlier, the interpretation of these data does not seem to be easy. Nevertheless, the implication from these studies is that

the positive effect of CDS on child development cannot be explained by any simplistic view. These studies did not consider the role of the child, specifically the extent to which the child might affect his/her mother's speech. Cross and collaborators stressed the relationship between changes in CDS and children's comprehension (Cross 1977; Cross & Morris, 1980). Although the relationship between changes in CDS and children's comprehension was initially seen to have little importance, this relationship could be interpreted as an indication of the possibility that there is an influence of the child on the mother's speech. Gleitman *et al.* (1984) also highlighted a similar view:

While language is learned through experience with the environment, its ultimate character is materially an effect of the learner's own disposition as to how to organise and exploit linguistic stimulation. (Gleitman et al., 1984, p.76)

Thus it is important to understand that research into the effect of CDS on language development should ask how the CDS that the child hears is actually used by the child at particular points of the developmental processes, rather than to what extent CDS facilitates a child's language development (Pine, 1994).

Another important implication from the early studies is that, since consistent positive effects of CDS on the growth of language were found only in auxiliaries but not in other syntactic aspects, the development in the area of syntax may be more complex than it might have initially appeared. In contrast, some support for the facilitative role of CDS appeared in the area of discourse features (Ellis & Wells, 1980).

Ellis and Wells (1980) found that the actual frequency, rather than the proportion, of certain features such as acknowledgement, directives and questions, correlated with the developmental rate of children's linguistic sophistication. They interpreted these correlations in relation to the qualitative aspect of CDS. These features are particularly useful for the adult to direct the child's attention, and to provide the child with valuable feedback at an early stage of language development. The main

point of Ellis and Wells' (1980) argument is that the facilitative environment as a function of CDS is not limited to the extent to which certain types of linguistic input are given to the child. Rather, as Zukow, Reilly and Greenfield (1982) and Harris (1992) point out, such a facilitative environment can be seen in the relationship between the language which the child hears and what is going on in the very context of the mother-child interaction. In order to investigate what kind of relationship exists in facilitative language-learning contexts, one must go beyond the quantitative analysis which uses global measures such as MLU. From qualitative perspectives, it is important to examine how the child's language system is changing in relation to, or is mediated by different aspects in the interaction (Pine, 1994).

In summary, in order to clarify the role of CDS on children's language development, much research has been devoted to identifying the relationship between the measures of syntactic and semantic features of CDS and the rate of children's growth in language in terms of their utterances. However, these correlational studies did not appear to show a clear-cut relationship. As to the causal relationship proposed by the Motherese Hypothesis, the conclusion remained unclear. Nevertheless, early studies contributed to broadening the issues in the study of input and language development.

- 1) The relationship between CDS and child language development is not simple, in at least two ways. Firstly, in terms of developmental aspects, children's language development is in general unlikely to follow a linear trajectory. At different points in children's development, the rate of their growth may differ; therefore, the extent to which the adult adjusts CDS may also differ at different points. Secondly, a global measure such as MLU for either an adult or a child is not sensitive enough to capture the more subtle features. A more fine-grained analysis is necessary to identify exactly which aspect of CDS

facilitates which particular aspect of the child language system, and how this process happens during the period of observation (Pine, 1994).

- 2) The focus in early research on input and language development was identifying changes and individual differences in their linguistic aspects. However, through these studies, it appears necessary to be aware of the role of social interaction in a broader sense that includes not only linguistic input but also a non-linguistic aspect. Therefore CDS is not merely adults' linguistic speech addressed to the child, but embraces all communication with the child. Shifting the focus to the examination of all aspect of CDS, and including non-linguistic contexts where social interaction is taking place, seems to be one of the most promising directions in studying the effect of CDS on language development.

The next section reviews more recent studies, in particular those with the focus on non-linguistic aspects, in order to understand the relationship between CDS, as a part of the context where social interaction takes place, and the child's language development.

2.3 Interaction with children: theories of language development in a developmental context

The preceding section reviewed studies that focused on the linguistic input as a function of CDS (Child Directed Speech) in relation to child language development. These studies appeared to view children's language development in a very narrow sense, in relation to linguistic input and uptake. Language development is a series of changes in children's language systems, which co-occurs with other aspects of child development.

The approach from such a narrow perspective does not give us rich interpretations of the role of language experience in language development. As Ryan (1974), for example, argues:

Recent [1970s] psycholinguistic work has neglected the earliest, presyntactic stages of language development, concentrating exclusively on the details of the child's later mastery of grammar. This approach ... regards language as something to be studied as the object of the child's knowledge, and ignores all the other skills that determine actual language use. (Ryan, 1974, p.185)

The approach that looks at language development from a much broader perspective focuses on the social context of the child. In this sense, the child is playing an active role. Within this perspective, the strong version of a social theory of language development emphasises the role of others' contribution to the child, by which the adult sets up the situation and guides the child's language development (Bloom, 1998). This idea originated in the work of Vygotsky (1962, 1978). However, direct influences on the current line of research on social theories of language development are derived from the work of Bruner (e.g. 1975a; 1983b). This section firstly discusses the theory proposed by Bruner, and then reviews more recent works using a similar framework for studying language development.

2.3.1 Language Acquisition Device (LAD) and Language Acquisition Support System (LASS)

As mentioned in the introduction, Bruner's criticism of Chomsky's theory derived from a rather different perspective from that of most developmental psycholinguists, who tried to contest the view of an innate system for language acquisition by identifying the significant role of adult speech to young children. Bruner (1983b) claimed that an innate language-learning capacity, such as the LAD proposed by Chomsky, could not

function without the aid provided by an adult, which he called the Language Acquisition Support System (LASS). More precisely, he stated:

It [LASS] frames or structures the input of language and interaction to the child's Language Acquisition Device in a manner to "make system function". In a word, it is the interaction between LAD and LASS that makes it possible for the infant to enter the linguistic community- and, at the same time, the culture to which the language gives access. (Bruner, 1983b, p.19)

For Bruner, language development is not merely a matter of gaining linguistic competence; he thinks that such development begins before a child's utterance appears in their first lexico-grammatical speech.

It begins when mother and infant create a predictable format of interaction that can serve as a microcosm for communicating and for constituting a shared reality. The transactions that occur in such formats constitute the "input" from which the child then masters grammar, how to refer and mean, and how to realise his intentions communicatively. (Bruner, 1983b, p.18)

Bruner (1975a) emphasises the importance of pragmatics, whose role is distinctively different from syntax or semantics, in order to understand the transition from pre-linguistic to linguistic communication.

What are the elements of pragmatics? According to Bruner (1983a), pragmatics is defined as "the study of how speech is used to accomplish such social ends as promising, humiliating, deceiving, assuaging, warning, and declaring" (p.31). Bruner argues that the elements of pragmatics "constitute a social reality in their own right in a manner that neither the rules of syntax nor the codes of a lexicon do" (p.32). Therefore, a pragmatic analysis also takes for granted "a reciprocal commitment between speakers sharing a common culture" in the feature of "speaker intent and listener uptake", "regulation of deixis" and "control of presupposition" (p.33).

These features represent the meaning of what Bruner (1983a, 1983b) called *format*, which is 'the instrument of patterned human interaction' (Bruner, 1983a, p.36).

He argues that these formats that are established between the caregiver and the child through their pragmatic interaction in pre-linguistic communication provide the framing context where language is introduced. Such script-like events therefore constitute the LASS, which initially enables the child to grasp a non-linguistic way of expressing communicative intent as a guide for language use, and later to come to realise linguistic means for expressing such intentions. There are, according to Bruner (1983b), four ways in which LASS plays a role in assuring continuity from pre-linguistic to linguistic communication. The first is that familiar and routine formats enable the caregiver to highlight specific features of the world that involve simple grammatical forms and are also salient to the child. The second way is that the adult encourages the child to be aware of the alternative ways of effecting communicative intents by modelling relevant linguistic rules such as lexical and phrasal substitutes for the child's familiar vocalisation and gestures. Thirdly, play formats elicit events that create high demands on language, and offer an ideal opportunity for language use and learning. Finally, established formats between the caregiver and the child also set up the psychological and linguistic processes that enable new formats to be incorporated into established formats.

Early studies by Bruner and his colleagues observed caregiver-child interaction in such familiar situations as book reading (e.g. Ninio & Bruner, 1978) and routine play and games such as "peek-a-boo" and "give and take" (e.g. Bruner & Sherwood, 1976; Ratner & Bruner, 1978). As an example of a game dialogue, Ratner and Bruner (1978), observed how young children's active participation in the "peek-a-boo" game grew. Initially the game was started by the mother and gradually the initiation was handed over to the child. Through this highly ritualised context the child became a more active agent in the game, having learned how to initiate and execute the moves. Bruner (1983b) noted that as the child came to take a more active part in the "give and

take” game, the child learned the idea that the object is supposed to be handed back to the mother, which is an underlying structure of this game. These game skills in managing and interchanging the role that the child has learned also play a large role in his/her relation of their referential act to the mother’s. This relation also becomes essential for other referential activities such as joint book-sharing activities. As an early precursor of the understanding of referential acts, Bruner (1983b) highlights the way of directing people’s attention. This directive act can be observed at an early stage of development, being used to maintain joint attention between the caregiver and the young child. For example, the mother’s use of a particular intonation, with specific stress on “something or somewhere” that the child can attend to, appears to work as a cue for the child to change his/her direction of gaze or responsiveness. Once such ways of directing attention are established between mother and child, they become a repertoire for routinised ways of presenting objects in the interactions between the mother and the child.

As for the emergence of referential behaviours, Ninio and Bruner (1978) examined the process by which the child managed to label an object; they made the longitudinal observations (between 8 and 18 months) of one mother-child dyad during book-sharing activities, which occurred naturally in their free play. Bruner (1983a) and Ninio and Bruner (1978) argued that joint book-sharing dialogue required a more advanced level of communicative skill, in order to share the meaning of what the speaker refers to, than the previous interaction that had taken place in the “peek-a-boo” or exchange game, which involved more concrete objects to share. They found that, even if the child was at a very early age, joint book-sharing activities appeared to be conforming to the turn-taking structures, and these structures were well formed. The child’s smiling, reaching, pointing and babbling vocalisations were consistently interpreted by the mother as communicative expressions, in the form of requests for

lexical labelling. Typical and most frequently observed examples of communicative exchange are:

Mother: Look! (ATTENTIONAL VOCATIVE)
Child: (Touches picture)
M: What are those? (QUERY)
C: (Vocalize and smiles)
M: Yes, they are rabbits. (FEEDBACK AND LABEL)
C: (Vocalize, smile and looks up at mother)
M: (Laughs) Yes, rabbit. (FEEDBACK AND LABEL)
C: (Vocalizes, smiles)
M: Yes (Laughs) (FEEDBACK)

(Ninio & Bruner, 1978, p. 6-7)

Even after the onset of the child's lexical labelling, the mother continued to respond to the child's non-lexical vocalisation by using the "What's that?" query style, which Ninio and Bruner interpret as being a mother's indication to require the child to provide such labelling himself. In this way, a mother encourages the child to substitute a vocalisation instead of a non-vocal gesture, and to use linguistically well-formed words instead of non-lexical vocalisation in subsequent development. Their analysis also suggests that the transition from non-linguistic to linguistic labelling is unlikely to be supported by the imitation of the mother's labelling, or by her correction of a child's inappropriate labelling, which further supports the view that adult speech to the child is unlikely to play a part in language-teaching in the narrow sense, as reviewed earlier. Rather, the child's achievement of labelling, in other words, "reference", is dependent on not only the mastery of skills in linking signs and the representation of the words but also on the child's understanding of the social rules, i.e. the mastery of "discourse and dialogue rules" (1983a, p.88).

A further step for the child in becoming a competent communicative agent is pragmatic achievement, learning "how to do things with words" (Austin, 1962). In order to understand the development of pragmatic aspects, Bruner (1983b) looked at the growth of requesting behaviour in two children. There were three types of requests:

request for an object, invitation to share a role relationship in the context of games and play, and request for supportive action or help in order to achieve a goal. According to Bruner, the antecedents of the development of these requests appear to be found in some developmental changes occurring in the child's need: from a physical to a psychological one. Once the child's signal becomes more socialised, negotiations between the mother's interpretation of what the child wants and the child's effortful manoeuvre to imply a request become essential parts of mastering how to request.

First, the child's request for the object is stimulated by the adult's offer of nearby objects or those currently held by the adult. Consequently the child's reaching behaviour towards the object appears to be a request. The child's direction of gaze towards the object also becomes a sign of a request. The reaching behaviour becomes more ostensive, and such signs of request are accompanied with sounds such as vocalisations. The request formats go through elaboration, in request-like vocalisations. Significant changes in intonation pattern and grammatical and semantic relations are used to replace the initial signals. For requesting an absent object, the child is required to name or point. Because the object is out of sight, the mother is unable to interpret exactly what the child wants. This makes the mother-child exchange more interpersonal. Looking at the mother's face and smiling sometimes replace the request for the object that is found in the standard place. Once the child starts to use nominals, the objects to be requested become diverse.

Bruner also noted two concrete examples of the important features of LASS from these series of observations. The first is a negotiation between mother and child, by which the child tries to convey his/her needs and the mother tries to understand what the child wants. This negotiation elicited a gentle pressure from the mother, trying to get the child to use a more advanced form which the child had already showed in early discourse. The second is that the mother's responses to the child's inappropriate

request also often served as “speech act lessons” (p.101). That is, the mothers teach their children that 1) requests are derived from a genuine need; therefore, one should not ask for things that one can do oneself, 2) requests relate to timetables, and to shortage conditions, 3) requests must demand reasonable effort, 4) requests should be made with respect for the person from whom one requests, and 5) requests must be accountable; therefore one must have a reason to ask. These lessons address how language should be used in culturally appropriate ways that go beyond producing linguistic codes.

Bruner concludes that

...language acquisition appear to be a by-product (and a vehicle) of cultural transmission. Children learn to use a language initially (or its prelinguistic precursors) to get what they want, to play games, In doing so, they find the constraints that prevail in the culture around them embodied in their parents' restrictions and conventions. The engine that drives the enterprise is not language acquisition per se, but the need to get on with the demands of the culture. (Bruner, 1983b, p.103)

It seems that Bruner has a strong conviction that language development is shaped by a mutual effect between language and culture. Bruner (1983a) maintained that the ‘culture must be regarded as a product of language and language as an instrument of culture’ (p. 33). In the same vein, for other types of request, as the child masters not only linguistic but also cultural constraints, they become more competent communicative persons who are able to get things done with language within a particular culture.

The empirical works by Bruner are mainly case studies, which may present limitations in generalisability. In particular, the developmental course that each child takes could be different from another child. However, the rich, in-depth analysis of each case clearly shows the importance of LASS, which is employed in the social interaction between the caregiver and the child to form the early language experience, particularly in the pre-linguistic period. Other limitations of Bruner’s study are that firstly the notion of “format” through which the language is introduced by the caregiver

underestimates other aspects of the language learning setting. That is, routine activities, established as their formats, are not the only opportunities for young children to learn the meaning of words. Language experience through the observation of on-going conversation between other persons, such as overhearing the conversation between elder siblings and the mother, may also facilitate the child's language learning (e.g. Oshima-Takane, 1996; Hanna & Meltzoff, 1993). The third limitation, which cast a doubt on the whole concept of LASS, is that Bruner introduced the idea of LASS in line with a "scaffolding" model of social interaction, in which the adult takes most responsibility to make such a support system function and the child's contribution is secondary. However, some later studies challenged this asymmetric view of adult-child interaction and put forward the view that the children's contribution to social interaction plays a primary part in their language development (e.g. Bloom, 1993, Bloom, Margulis, Tinker & Fujita, 1996). If one takes the view that children have an active role in their social interaction, to what extent and in what way they contribute to constructing their social interaction with the caregiver needs to be addressed precisely. This will be discussed in a later section. Nevertheless, the concept of LASS offered by Bruner appears to be very attractive for those who are going to explore language development in distinctively different cultures. Given that culture provides the motivation for language learning in order to live in that society, the context where the adult uses LASS might differ in different cultures, as might the shape LASS. The approach from a cross-cultural perspective will be discussed in later sections.

Before moving on to more recent empirical works on social theory of language development, the literature that investigated the young children's social development will be reviewed. Many studies, including Bruner's work, examined language development by drawing on the view that children are social at a very early stage of development. It is essential to understand the way in which children become

socialised, in order to examine how children's language develops in relation to their experience in the social context.

2.3.2 Social-cognitive skills of young children

The remarkable social ability of human infants has been well-documented. Young infants selectively attend to human faces (Fantz, 1963), and to particular characteristics of adult speech to young children (e.g. Cooper & Aslin, 1990). They also start to engage in face-to-face interaction with adults from a very early age (Trevarthen, 1979). Their repertoire of signalling and communicating, using different social behaviours, such as crying, smiling and other facial expressions (e.g. Izard, Hembree & Huebner, 1987), and imitation (Meltzoff & Moore, 1983; 1992) also increases. It has been less clear whether these documented abilities have a genuine social origin or are a consequence of familiarization to social stimuli (Messer, 1994). It is possible to argue that these abilities have a significant contribution to developing social interaction between caregivers and young children. For the development of communication, such young children's social behaviours that enable them to form interpersonal relationships are all crucial.

However, it is important to argue that there is a clear distinction in their abilities to relate their mental and emotional processes to other persons between their infancy and subsequent development. For example, Trevarthen (1979) used the term *intersubjectivity* referring to such an interpersonal process. He referred to an interpersonal process by which infants and their caregivers share mental and emotional intimacy through face-to-face interaction as 'primary intersubjectivity'. The subsequent development, whereby infants combine actively and systematically their interests of physical reality in an immediate context, and acts of communication

addressed to their caregivers, is referred to as 'secondary intersubjectivity' (Trevarthen & Hubley, 1978). The main feature of this shift from primary to secondary intersubjectivity is found in infants' behaviours in which s/he seeks to share their experience about external world with the other person. Hobson (2002) describes the process of such a change as:

...the infant is no longer embedded in a one-track, for-me mode of experiencing reality. She is subject to mental pushes and pulls from other people, and as a result of this her attitudes to the world are changed. The meanings of things shift. Something can appear in such-and-such a way, then another person enters the picture and it comes to acquire new meanings. This is fertile ground for the infant to acquire new insight into the nature of mind-her own as well as those of others. (Hobson, 2002, p93)

Therefore one of the important qualitative changes in infants' social behaviours relating to their psychological process at the end of the first year of life is that they show an overt understanding of other people as psychological agents like themselves (Carpenter, Nagell & Tomasello, 1998). Social behaviours observed during early infancy need not be regarded as social-cognitive skills. In this section, the young children's social-cognitive skills that play a particularly significant part in relation to the development of language and communication will be highlighted and reviewed.

At 6 months of age, children appear to be capable of following an adult's gaze, and turning their heads when an object is presented within their visual field (Butterworth & Grover, 1988, 1989). At 18 months, children become capable of locating targets beyond their visual field (Butterworth & Jarrett, 1991). Once children become able to direct their attention to referents, joint attention is also achieved. Adults often follow the gaze of the child; this occurs more than by chance, and the mother naturally makes a comment about the object under their focus of attention (Collis & Schaffer, 1975; Collis, 1977). Such careful timing by the mother allows the child to take the initiative in determining the focus of visual attention; consequently the

mother is commenting on the object in which the child is currently interested (Messer, 1978).

Similar to the child's ability to direct the line of gaze, the child also becomes able to follow a pointing gesture from the age of 9 to 12 months, which leads to further social interaction with the caregiver. This also serves to maintain social interaction effectively, by monitoring the other partner's interest and registering the child's own interest in a particular feature of the surrounding environment (Murphy & Messer, 1977). According to the study by Murphy and Messer, although children's attentional skills were limited to following the points within their visual field at 9 months they became capable of following a greater range of points at 14 months of age. Their study also identified that pointing gestures by mothers were usually accompanied by their verbalising. This observation indicates that, taken together with joint attention, pointing behaviour serves to direct people's attention.

Around 14 months of age, children also begin to produce their own pointing (e.g. Murphy, 1978). Murphy (1978) examined mothers' pointing in relation to their speech during joint book sharing activities with their children between 9 to 24 months, and found that until the age of 14 months, at which the children started to produce their own pointing, mothers' pointing was accompanied by the naming of an object. From the stage where children's pointing appeared, mothers' pointing decreased whereas their questioning increased. She argues that the change in the mother's communicative style happened in relation to the child's social and communicative skills. Furthermore, recent studies on children's pointing have found that children appeared to check whether their mothers were looking at the direction of pointing, and such behaviours were accompanied by vocalisation (Butterworth & Franco, 1990). Therefore such behaviours can be regarded as having a communicative function. Young children's capacities for engaging in joint attention and demonstrating communicative behaviour,

such as pointing, involve not only social exchange but also the object of mutual interest of their partners. Use of these communicative skills enables the child to identify a referent and to understand objects and events that are important in their culture (Messer, 1994). These referential skills also appear to play an important part in the development of symbolic and representational abilities (Hobson, 1993).

Tomasello (1995) argues that joint attention is a social-cognitive skill which appears in children aged 9 months, and this represents an emerging understanding of another person as an intentional agent in that the other person also attends and behaves selectively to the outside object and event, just as the children do. Tomasello and his collaborators further identify the emergence of several other social-cognitive skills. Most children progressed from joint engagement, communicative gestures, attention following, imitative learning to the production of referential language. These results indicate that the emergence of these skills represents the developmental progression of social cognitive skills, and that these skills may serve as a prerequisite for language development. In fact, the time spent in joint attentional engagement showed marked individual differences, and this ability to engage in joint attention correlated with the children's early communicative skills in both the non-linguistic and linguistic domain (Carpenter, Nagell & Tomasello, 1998).

Joint attentional behaviour has also been studied by Adamson and her collaborators as part of communication development (Adamson, 1996; Bakeman & Adamson, 1984). They refer to joint attentional behaviour as coordinated joint attention, indicating the importance of a particular type of behaviour in which the child looks at both the communicative partner and the outside object or event simultaneously. These studies have shown consistent results in that the time spent in joint attentional engagement increased from the end of the first year to the middle of the second year.

These results indicate that joint attention is an important skill that starts to grow at the beginning of the second year, preceding the emergence of linguistic communication.

The importance of joint attentional skills has appeared to be in the early periods of communication development, when young children have developed few linguistic means to convey messages. There has been little research that has followed the development of communication in relation to joint attentional behaviour from the middle to the end of the second year of childhood. Although joint attention is one of the indications of communicative intents at an early stage of development, once children start to use language, joint attention manifests itself in many complex ways, such as in learning and language use (Tomasello, 1995). In respect of joint attentional skills, an underlying ability which makes further experiences possible is the understanding of others' intention. Thus, it is important to look beyond the development of this ability, which will increase in sophistication as experience of learning and language use increases. Recent studies have examined how children's development of social cognition enables them to identify and understand pragmatic cues for learning the meaning of words (e.g. Baldwin, 1991, 1993a, 1993b; Akhtar & Tomasello, 1996; Tomasello, Strosberg & Akhtar, 1996). These studies are reviewed in the following section.

2.3.3 Socio-pragmatic theories of language development

The work of Bruner has clearly suggested that early formulation of the social basis of language learning is important in bridging the child's pre-linguistic and linguistic communication skills. The adult initially plays a part in supporting such language learning capacity. At the same time, Bruner's in-depth analysis of the child-caregiver dialogue indicates that the focus on measuring the increase in utterances over-shadowed

investigations of the non-linguistic domain of language development, which relies more heavily on facilitation through certain forms of social interaction (Snow, 1989).

Bruner's work, specifically his notion of the development of pragmatics in the course of early social interaction, has influenced more recent research in this area. Robust findings from quantitative studies, employing not only correlational but also experimental designs, support the view that particular features of social interaction play a facilitative role in language development. These features are found in joint attention (Tomasello & Todd, 1983; Tomasello & Farrar, 1986), recasting and feedback (Nelson, 1984, Baker & Nelson, 1984).

However, it is very important to bear in mind that most studies are based on data from adult-child interactions within the western mainstream middle classes, particularly in Anglophone populations. The nature of adult-child interaction in this particular culture reflects the view that children are to be treated as fully-fledged conversational partners even before they are capable of exchanging information with adults. This model of the adult-child conversation presumes that the adult is responsible for structuring the interaction and keeping conversation going (Snow, 1989). It is very likely that in different cultural traditions, the embedded facilitative features of social interaction will differ. This cross-cultural aspect will be considered in a later section. This section reviews in depth the studies that have focused on the effect of socio-pragmatic factors on language development.

Recent studies from a socio-pragmatic perspective focus not only on how the input provided by the adult is embedded in the social context but also on how the child uses information provided through such social contexts as a cue to learn the meaning of words. The most extensively studied aspect is word learning in relation to joint attention by the child and the caregiver. The first correlational study by Tomasello and Todd (1983) and a subsequent experimental study by Tomasello and Farrar (1986)

provided some evidence for the relationship between the quality and quantity of joint attentional interaction and the rate and style of a child's language development.

Tomasello and Todd (1983) followed the language development of six children (between 12 and 13 months of age) and their mothers during interactions in natural play settings at home for six months, with video recording at monthly intervals. In addition, the children's acquisition of vocabulary was examined through maternal diary records. Their findings indicate that the children whose mothers initiated interaction, by directing the child's attention rather than following their child's focus of attention, learned more personal-social words but learned fewer nominal-based words. Furthermore, in mother and child dyads who spent more time on joint interactions, which were maintained by both participants' active manipulation of each other's attention and behaviour, the children appear to show a larger vocabulary six months later. Another interesting finding in this study is that joint interaction styles, categorised by whether the child or mother leads, were not related to the overall competence of the child but to the type of words that the child learned. This finding indicates the importance of employing more fine-grained language measures than the use of a global measure such as vocabulary size. The way a mother and child regulated each other's focus of attention during joint interaction appeared to be a key for children's lexical development.

Tomasello and Farrar (1986) also confirmed their previous findings using further micro-level analysis of the joint attentional process in relation to mothers' reference to objects. Again, within the joint episodes, the mother's references to the object on which the child had already focused were significantly correlated with the child's subsequent vocabulary, whereas the mother's object references to direct the child's attention were negatively correlated. The subsequent training study examined the role of joint attentional processes in the child's word learning; initiating joint

attentional focus in relation to child's word learning was analysed in terms of the mother's "follow in" type as opposed to "directive" type of attention getting move. The findings in this training study provided further evidence that the children learned better when references were made to an object that the child had already focused on, rather than when references were made to direct the child's attentional focus to an object. However, the reason why the children learned better when the adults followed the child's attentional focus remains speculative. Tomasello and Farrar suggest two possible explanations, which are not necessarily mutually exclusive. The first is that if the child's focus of attention on the object is related to the child's interest in that object, the child may attend to and play more with that object; thus the child may be primed to learn its name. When mothers follow the child's focus of attention with an object reference, it is most likely that the child is attending to the object in which the child is interested; such a situation will serve as an optimal condition for word learning. The other explanation is a functional hypothesis suggested by Nelson (1981). The children with more directive mothers may learn social regulative words because these mothers tend to focus on regulation as a primary function of language in order to regulate the children's behaviours and are less interested in object names. On the other hand, mothers who follow their child's focus of attention may focus more on language with respect to cognitive significance, which results in their children learning object labels. As Tomasello and Farrar put it, both these two mechanisms are possibly operative in the real world, but their experimental design could not pin down which mechanism is more plausible. It may be that looking at individual differences in relation to basic cognitive and social processes, for example cognitive style differences or dyadic interaction style differences, will provide some evidence to address the questions of why and how joint attention plays a role in language development. Nevertheless it is at least clear that the

processes of joint attention between the caregiver and the child play an important role in early language development.

A series of observational studies conducted by Harris and her colleagues also confirms a close relationship between maternal speech in relation to object references and the non-verbal context to which the child is attending. As many as 80% of the mother's utterance appeared to refer to the object on which the child was focusing at the age of 16 months (Harris, Jones & Grant, 1983, 1984/5). Harris, Jones, Brookes and Grant (1986) also identified a subtle asynchrony in the interaction between slow language developers and their mother. Mothers of slow developers tended to wait too long and did not comment on the object at the precise time when the child was attending to that object. By the time these mothers uttered, the child's focus of attention had turned to a new activity. Moreover, they identified that these mothers tended to direct the child's focus of attention to a new object by commenting on it. This is exactly the case identified in the study by Tomasello and Farrar as having a negative effect on children's language development.

The studies reviewed so far do not identify who is in charge of such joint attentional focuses, which play an important role in language development. It seems that the adult may appear to have more responsibility at the very early stage of a child's development, according to early studies concerned with social theories of language development such as those of Bruner (e.g. Bruner, 1983b). Barnes, Gutfreund, Satterly and Wells (1983) argue that the mother being directive in the context of joint focus may actually be beneficial at the early stage of children's language development. This argument indicates that the kind of directive interaction provided by the caregiver may provoke either positive or negative effects on language development. Akhter, Dunham and Dunham (1991) studied young children aged 13 months to investigate whether directive interaction has a negative impact on children's language learning.

Their finding supports the study of Tomasello and Todd (1983); the caregivers who followed their child's attentional focus had some positive correlations with later vocabulary development, while the mothers who led their child's attentional focus had negative correlations with the child's subsequent vocabulary size. However, their coding in terms of maternal pragmatic speech (e.g. prescriptive versus descriptive) indicated that the mothers who used a prescriptive lead in directing the child's focus of attention did not show a negative effect on vocabulary development. This result suggests that the facilitative role played by the joint attentional processes is not straightforward.

As mentioned earlier in this section, the children of mothers who failed to maintain the focus of joint attention appeared to develop early vocabulary at a slower rate than the contrasted group of children (Harris *et al.*, 1986). Is such a failure really a mother's responsibility? It may well be the case that what is an optimal condition provided by the mothers in the process of achieving joint attention at a certain stage will differ depending on the child's language ability and other aspects of development. As Bruner and Barnes *et al.* argue, the caregiver's scaffolding may be vital for maintaining joint attention in the early stages of language development. However, subsequently, it is possible to view the child as a more active agent in initiating and maintaining joint attentional processes between the caregiver and the child. If so, what is the child's contribution to achieving joint attention? This will be explored by reviewing more recent studies.

Baldwin (1991) argues that in general caregivers are far from perfect in achieving joint attention with their children; in effect, it appeared from relevant studies (Collis, 1977; Harris *et al.*, 1983) that for only 50 % to 70 % of the time the caregiver labels successfully what the child is attending to. If this is the case, and the caregiver has total responsibility for the 30 % to 50 % of occasions that result in failure to achieve

joint attention then children may learn to map incorrectly or fail to learn the meaning of words. This problem suggests that the young children may be necessary to play a more active role in the search for cues to achieve joint reference. Baldwin's (1991) experimental study provides preliminary evidence to support such possibilities. This study found that children aged 18 and 19 months were able to learn new word labels for novel objects in both conditions: "follow-in" labelling, which already appeared to be an optimal condition for joint reference, and discrepancy labelling when the experimenter looked at and labelled an object which was different from the object to which the child was currently attending. In the discrepancy condition, when the children heard the experimenter's object labelling, they actively consulted the experimenter's line-of-regard and mapped the new label successfully on to the object that the experimenter was focusing on, but not the one to which they had been attending. Although the younger children aged 16 and 17 months were not able to learn the label in the discrepancy condition, they still showed no sign of mapping incorrectly onto the object to which they were attending. This indicates that there is little possibility that incorrect labelling occurs even without the adults' "follow-in" joint reference, and that young children have the ability to search for the cue for the word reference. In order to examine young children's referential understanding thoroughly, Baldwin (1993b) set up a series of experimental studies. In study 1, she looked at the effect of the discrepancy condition in detail, to ascertain whether the previous finding was due to the temporal contiguity between hearing the labels and children's viewing the correct object or to the child's genuine referential understanding. Children aged 19 and 20 months under the discrepancy condition, with a temporal gap of more than 10 seconds between hearing the labels and viewing the objects of the other's focus, not only appeared to avoid incorrect mapping but also managed to label the object that was in the experimenter's focus of attention. This result strengthened the view that children at this age are able

to understand the other's referential acts, and use them as a cue for the interpretation of new objects rather than relying on temporal contiguity. This finding was also confirmed by Akhtar and Tomasello (1996) and Tomasello, Strosberg and Akhtar (1996). Akhtar and Tomasello (1996) used object-finding games as a word learning condition in which an object referent is absent after hearing the word; the object was either missing or placed in an inaccessible place. 24-month-old children appeared to learn object names even under the condition when the referent was absent. In the replication study by Tomasello, Strosberg and Akhtar (1996), even younger children at the age of 18 months were able to learn object names without object references. That is, the children used other referential cues in order to map the label onto the absent object.

Further, Baldwin (1993b), in a subsequent experiment, examined how far children's understanding of a referential cue and their ability to use it to interpret new labels are employed in the non-referential conditions. In these conditions, the experimenter either used carrier phrases, which did not imply referential intent, or labelled the object without looking at the target object. Because the experimenter's referential intention was not clear in these conditions, children did not show any sign of a systematic use of referential cues for identifying word-object mapping, as was found in the previous experiment. Overall, these findings make it possible to conclude that children at this age seem to be tuned in to relatively subtle differences in other people's behaviour and are capable of recognising such significance for interpreting other people's intentions from their utterances.

This is in line with a study of Baldwin, Markman, Bill, Desjardins, Irwin and Tidball (1996) who examined children aged 15 to 20 months. These children were able to map a novel label on to the object which they played with only when they appreciated that the experimenter exhibited signs of referring to that object. Although

the object to be labelled was within the child's zone of attention, if the experimenter's intention to label the object was not clear to the child (i.e. she was labelling without looking at the object), they were not able to establish a mapping between the label and the object. In order for young children to be able to establish word-object mapping, a clear-cut sign of referential intent seems to be necessary. At the same time, the result highlighted the children's ability to differentiate referential acts, from non-referential acts and they were able to interpret another's intent as referential; this also implies that at this age they have some understanding of other people's intentionality, which serves as a central element for the development of the theory of mind (e.g. Wellman, 1993; Baron-Cohen, 1991).

Even more sophisticated intersubjectivity was found in a study with 24 month old children. Akhtar, Carpenter and Tomasello (1996) set up a situation where the children played with 3 un-named objects together with their parents and the experimenters. No object labels were given to any of the three objects. A fourth, un-named target object was not shown to the children, their parents and one of the experimenters in the first study, so that this object was novel to all of them (in the subsequent study, the fourth object was only novel to their parents). After a familiarisation phase with the three nameless objects, the experimenter and parents gave language modelling to the children, referring to the four objects (i.e. three familiarised and one novel object). In the experimental condition, the non-word "gazer" was used to label the object; "Look, I see a gazer! A gazer! I see a gazer in there!" In the control condition, no labelling was made; "Look! Look at that! Look at that in there!" In both conditions, parents said this with an excited tone. In both studies, children who were in the experimental condition mapped a new object label to a novel object at more than chance level. This was not the case for the children in the control group. This indicates that a new label given to the children in the experimental group

was attached to the target object either because young children's attention spontaneously went to a novel object or because they understood why the parents and experimenter labelled objects with an excited tone.

From the findings in the subsequent study, in which the fourth object was only novel to their parents, it is possible to say the latter is the more likely explanation. In order for children to map a new label to the target object, children needed to identify which object was new to the parent and to know that in terms of discourse context, people use new language with an exclamation when they talk about things that are new to them. The second study indicated a possibility that children had used discourse novelty as a cue to mapping a new object label onto a novel object, taking into account the speaker's point of view. As Akhtar *et al.* (1996) noted, at this age children may not possess an explicit level of understanding of others' belief, that is, an "adult-like theory of mind" (p.644). However, these studies suggest that young children know more about the social world than was previously thought and that they use such knowledge to learn language in a social context.

These studies were about children's learning of object labels. As for labels for action words, similarly, a few studies have identified that children of around 2 years of age use the adults' intention to perform that action as a cue to map the action and the relevant label (e.g. Tomasello & Barton, 1994; Tomasello, 1995; Akhtar & Tomasello, 1996). Finally, Tomasello and Akhtar (1995) demonstrated that children at 27 months of age were able to differentiate the kind of reference, such as whether an action or object is being labelled, using a pragmatic cue embedded in the discourse context in which new labels were introduced. Tomasello and Akhtar manipulated the discourse situation leading to the naming event so that in one condition only the target action was a new element, and in the other condition, only the target object was the new element in the context at the time of naming. Children appeared to learn the new word as either

an action word or an object word depending on which element was new in the discourse context. The subsequent study used the same general method, with one different dimension; the children in one condition watched the adult engage in a behaviour that highlighted her desire for the child to perform a target action, whereas in the other condition the child watched the adult's behaviour that highlighted the target word. Again, the results, in line with the results of the earlier study, showed clearly that despite the absence of morphological or syntactic cues for the children, they used pragmatic cues that were available in the context to determine whether an adult intended to signify an object or action. The implications from a series of studies seemed to be not only that the novelty of discourse is important for encouraging the child (e.g. Greenfield, 1982) to learn new language and use it, but also that socio-pragmatic cues, which are based on the child's general knowledge of event and understanding of the other's intention, enable the child to learn words which are across different ontological categories as well as words within the same categories. This finding also casts doubt on the whole object assumption (e.g. Markman, 1992) that children are biased in favour of nouns when they learn new words. At least this study indicates that children learn new words through the way a word is used in a context. Further scrutiny of this assumption is not possible merely from this study, but as will be reviewed in a later section, cross-linguistic studies (e.g. Gopnik & Choi, 1995 for Korean) have demonstrated that noun bias for early word learning is not the case for children who speak Korean. It may be that noun bias arises not from an innate constraint but from cultural and linguistic constraints on what is emphasised in the communicative context.

So far, the review in this section has focused on experimental studies. These experimental studies demonstrate clearly that young children have a remarkable ability to use various cues in their conversational context in order to understand the meaning of new words and to label objects. By their second birthday, children appear to show

sophisticated understanding of another's intentions; such social cognitive development seems to play a crucial part in structuring a rich language experience for the children themselves in order for them to become more sophisticated language users. Lastly, a longitudinal study that illustrates the child's active role from the beginning of word learning is reviewed, and some implications derived from this study are discussed, in contrast to Bruner's scaffolding model of language development.

Lois Bloom and her colleagues (1993, 1996) put forward the intentionality model for explaining language development; this model shares a common idea with the scaffolding model in that children's social and cognitive development plays a part in their language development, but places more emphasis on a child's inner resources rather than the external support or guidance offered by the adult. Bloom, Margulis, Tinker and Fujita (1996) demonstrated this model empirically. When children achieved the two developmental milestones of first words and vocabulary spurt, more conversations were initiated by children rather than their mothers. This pattern increased in amplitude as the children's language developed. Only a third of children's speech occurred in response to mothers' speech. When mothers in this study responded to the child, they tended to acknowledge, repeat and clarify what the child said. Overall, they found children took the initiative in eliciting conversation with their mothers. The view that a child plays an active role in social interaction is important, and this view is plausible in explaining development in general. However, in this study what they overlooked seems to be the non-linguistic aspect of communicative intent. They focused only on what the child said and considered intelligible speech as turns; non-linguistic behaviours such as vocalisation, gesture, actions and emotional expressions, were not counted as turns. Children at the stage of pre-linguistic communication still use various ways of communicating with adults. The adult may pick up such communicative signs and construct dialogues with their

child, which in turn create a rich language experience for the child. Furthermore, although Bloom *et al.* challenged the scaffolding model, Bruner emphasised the scaffolding model, in particular, during the transition from pre-linguistic to linguistic communication. Because this study did not look closely at the very early period of mother-child pre-verbal communication, it is difficult to conclude that a child's ability to initiate conversation explains by itself the whole of language development. Nevertheless, it is possible to argue that the part played by the child in the process of achieving joint attention is very important. Even a naive initiation will provide an opportunity for the adult's follow-up to keep pre-verbal communication going. Therefore, it is possible to say that both models are plausible, and the absence of either the child's or caregiver's contribution may hinder the maintenance of communicative interactions.

In summary, Bruner's work has had a significant influence on current research on adult-child communication as a crucial part of early language development. As discussed earlier, Bruner claims that an innate language-learning capacity, such as the LAD proposed by Chomsky, could not function without the aid provided by an adult as a function of the LASS. However, such a support system does not necessarily happen only through external contributions. As Bruner takes very early joint attention on board in order to illuminate the active role of the child in pre-verbal communication, such a support system seems to be better explained if one incorporates a child's cognitive and social development into the basis of early language development (Tomasello, 1996). The support system does not function without a child's active contribution. Although the approach of the socio-pragmatic theory of language development was derived originally from the view of the social basis of language acquisition (Vygotsky, 1978; for a more recent account, Tomasello, 1992), this does not mean that this line of research overlooked the active role of children in their language

development; rather, it means that socio-pragmatic theory brings a child's cognitive and social aspects of development together and tries to explain how social interaction builds on a child's social-cognitive foundations as the basis for language development.

One of the limitations of this approach to date is that very little research has been systematically carried out in different cultures. As mentioned earlier, the majority of studies have focused on middle-class Western culture as the social context; different cultures may have different styles of facilitative support for children's early language development, and such interaction styles are likely to reflect cultural expectations, and people's beliefs and attitudes on child-rearing practices (Super & Harkness, 1982; 1997). The next section looks at studies of language development in different cultures.

2.4 Cross-linguistic and cross-cultural diversity: beyond universality

In order to understand the whole picture of language development it is necessary to study language development in different contexts in terms of language structure and culture. Studies from cross-linguistic and cross-cultural perspectives are still limited, and little has been explored systematically. Nevertheless these studies claim to provide further insight into universal as well as linguistically and culturally specific aspects of language development.

2.4.1 Cross-linguistic approaches

In an earlier section, it was argued that examining the influence of the language environment on the child's learning by focusing merely on the aspect of linguistic input is not sufficient to understand how language experience facilitates language development. However, there is indisputable evidence that the kind of linguistic input

which the child experiences at a fundamental level impacts on the structure of the language which the child speaks.

*Linguistic input has an obvious impact on the child's acquisition of language-a child who hears Swahili learns Swahili, not French or Polish.
(Goldin-Meadow & Mylander, 1990, p.323)*

This is an obvious and uninteresting aspect of linguistic input; nevertheless, it is important to examine the differences derived from cross-linguistic studies, because this approach enables us to examine the effect of linguistic input at the level of the language system (Snow, 1995). A closer look at how children in different language communities start to speak their languages at the early stage has revealed some idiosyncrasies of particular languages.

Studies of Korean-speaking children appeared to show a difference in their early acquisition of words compared with English-speaking children. This has been observed with respect to structural form in early semantic-syntactic categories of space, time and motion (Choi, 1991; Choi & Bowerman, 1991). Choi and Gopnik (1995) and Gopnik and Choi (1995) also identified cross-linguistic differences in early language learning between Korean and American-English speaking children. Contrary to the claim that there is a universal noun bias in early lexical development (Gentner, 1982), Korean children use as many verbs as nouns in their one-word period. This indicates that English-speaking children show a noun-bias but Korean children do not. Further, Choi (2000) investigated to what extent these different patterns of lexical development relate to a caregiver's input in terms of the structural and pragmatic aspects in two different contexts: joint book sharing and toy play. The results, confirming the previous patterns, showed that Korean mothers provided a balanced input of nouns and verbs, whereas English-speaking mothers used more nouns than verbs. Korean mothers used more verbs than nouns only in the toy play context, whereas

English-speaking mothers used more nouns than verbs in both contexts. Similar trends have been reported in studies of Mandarin Chinese (Tardif, 1996; Tardif, Shatz & Naigels, 1997) and Tzotzil, i.e. the Mayan language, (de Lón, 1997 as cited in Choi, 2000). It seems that, in these language communities, verbs are more cognitively accessible to children than for English speakers, and their perceptual and structural saliency of verbs in the language grammar could contribute to shaping early lexical development (Choi, 2000).

However, given the verb-bias in Korean, Chinese and Tzotzil children's early lexical development, there is an issue to consider: is this observed difference due to the specific language structure of these languages, or due to the different ways in which mothers speak to their children? This issue remains unclear.

Cross-linguistic studies of other language families may offer evidence to suggest that early lexical development is influenced by caregivers' speech styles. Caselli, Bates, Casadio, Fenson, Sanderl and Weir (1995) carried out a comparison between English and Italian children in their early lexical development. Italian, in terms of language structure, has a similarity with Chinese and Korean in that both languages allow ellipsis of nouns as subjects (i.e. pro-drop) in speech; therefore CDS often contains only verbs. Despite this similarity, Italian children appeared to start to use more nouns than verbs during early lexical development. A recent study of Japanese learners also demonstrated similar trends to Italian (Ogura, 1999). Although the Japanese language has a similar structure to Korean, children seem to start to speak nouns first. These results suggest that linguistic structures, which place different emphases on either verbs or nouns, do not necessarily determine what young children are more likely to learn at an early stage of language development. Instead, as Fernald and Morikawa (1993) argue, these differences are more likely to be derived from the relative differences in the emphasis put by caregivers in different cultures on object

naming as opposed to the social routines involved in adult-child interaction. In the study of Korean by Choi (2000), referred to previously, contextual effects on mothers' use of verbs and nouns appeared to be significant. In a joint book-sharing context, Korean-speaking mothers' speech to their child was more noun-oriented, even though they used more verbs in a toy play context. Given these contextual effects on CDS, the common type of adult-child interaction used in their social context does seem to influence the type of words learned during early language development. Thus, it is possible that social practices in a particular culture influence the way of communicating with young children, including the types of words frequently used and how they are used. A cross-linguistic study that examines the impact of linguistic input, comparing the number of different categories of words, may have little validity unless it considers the variability in the way people communicate in different cultures. It is very unlikely that the impact of different language structures on language learning can be examined by separating it from the cultural aspect of how language is used.

Language learning is not divorced from other socio-cultural meanings of growing up. It is not only integral to participation within social life, but is also a major tool for conveying cultural knowledge about social relations. (Burman, 1994, p.133)

2.4.2 Cross-cultural approaches: ethnographic studies

A series of studies conducted by Ochs and Schiefflin investigating language socialisation in non-Western cultures have received particular attention in the argument related to the universal aspects of language development. Although many studies related to language development have been carried out in Western culture, in order to put forward a universal aspect of language experience, one has to examine whether social interaction provides support for the child's language development in different cultures in whatever form it takes. In the picture described by Ochs and Shieffelin

(1984), mother-child interaction in Samoa and Kaluli of Papua New Guinea appeared to be significantly different from what one might have expected to happen, in particular with respect to the perspectives found in westernised culture. Their striking findings are that generally very little speech is directed to very young children in these societies. Even when the child's first word appears, CDS is not normally adapted to the child's level; it is believed to be the child's responsibility to adapt to the adult's level in order to communicate with others.

More specifically, in a study of Western Samoa, Ochs (1983, 1988) reports that young children meet a variety of caregivers and siblings, who are living together and providing most of the immediate care. Mothers tend to instruct older siblings to direct the care for young children; therefore, young Samoan children do not expect mothers to respond directly to their needs. Instead, children are exposed from the very beginning of their life to different people varying in age, and socialise with them. In Samoan communities, adult caretakers and older siblings are keen to socialise these young children. This seems to enable young children to decentre and to take a more mature interlocutors' perspective in the presence of society members. Children are often forced to make an effort to meet these people's levels of communicative need. Whereas face-to-face interaction between mother and child is expected in Western culture to be an optimal situation for early language experience, this type of interaction rarely happens in Samoan society. It seems that children's language learning takes place in the process of socialisation through which children learn to become the person whom society expects. There is also an organisation of status hierarchies, which determines speech adaptation; the adult, as a higher status person, does not adapt speech to the level of children. In this society and a language environment, children's experience may facilitate their understanding of cultural ritual and rules that have more

significance for the learner than language learning that can be measured by vocabulary size at an early age.

In Kaluli, a different style of speech is addressed to young children, and is again influenced by specific cultural beliefs (Schieffelin, 1983, 1990). According to Schieffelin, sound-play is discouraged in this society, because it is seen as animal-like and assumed to be taboo. This comes from their cultural belief that the entry into language marks the boundary between inhabiting the world of animals and spirits and the world of humans. Learning to speak is believed to be a departure from the land of spirits to enter human society. What normally happens in this society is that children are often given a message to pass on or model utterances to be repeated, so that they learn how to say rhetorically and formally sophisticated adult words through their imitation and repetition at a very early age.

The common features for both societies seem to be that children are reared in a diversity of socialisation processes, which place little emphasis on a child-centred way of practice. Nevertheless, this does not signify that children are ignored; this child-rearing practice best fits into the process of becoming a socially accepted member of society. Drawing on these ethnographic studies, Ochs and Shiefflin (1995) postulated a language socialisation approach for explaining language development.

The important generalisation [from these studies] is that although children the world over will ultimately assume the basic communicative roles (speaker, addressee, referent audience), societies differ in the developmental point at which and the situations in which it is appropriate for children to assume particular roles, these differences being linked to their attitudes about children and their communicative competence. (Ochs, 1986, p.8)

Samoan and Kaluli societies prefer children to stay on the sidelines of caregivers and not to occupy a central position. Therefore there appears to be little pressure for children to take an active communicative role. Thus it is not surprising that young children are not considered to be active communicative agents.

Ethnographic studies have provided important insights for studying language development from cross-cultural perspectives. However, a major methodological problem remains in the difficulty of comparing these studies with those studying children learning English (Lieven, 1994). Although Ochs and Schiefflin's studies provide qualitatively rich and in-depth analyses, these are descriptive, and little quantification is involved. This makes cross-culture comparisons difficult, and it is very dangerous to attempt them:

*...how can we be sure that what look like similar behaviours are culturally fulfilling the same functional role in the two different cultures? These factors make it difficult to draw definitive conclusions...
(Lieven, 1994, p.58)*

Because ethnographic studies tend to be carried out by outsiders, inevitably results are often based on what is observable through the outsiders' eyes. It is desirable for an insider to study language development in non-Western society, using systematic and comparative designs in which quantitative and qualitative analyses are possible. Japan is a country whose culture provides a representative picture of a non-western culture with a similar level of socio-economic background to western counterparts. Previous cross-cultural studies have compared Japanese to western cultures. The following review focuses on studies carried out from a cross-cultural perspective, comparing particular age groups or particular aspects of caregiver-child interaction in Japanese culture.

2.4.3 Language experience and language development in Japanese

The ethnographic studies reviewed above indicate that the language environments which the child experiences relate to the organisation and relationships of membership within the society. In respect of the early language experience of children in Japan,

there is significance in the relationship between the children and their caregivers, usually mothers. Such relationships are regarded as a tight unity between the mother and child, where the child's security derives from the mother constantly providing for the child's physical and emotional needs. This relationship contrasts with the way caregivers in the United States provide their children with security serving as a foundation for the exploration of the external environment (Rothbaum, Pott, Azuma, Miyake & Weisz, 2000). Rothbaum *et al.* argue that there are cultural differences in the pathways for the development of children, which differ in their meanings and the dynamics of relationships. The following review of comparative studies between the cultures of Japan and the United States reveals how typical differences in the nature of caregiver-child relationship are manifested in particular aspects of human behaviours in each culture.

Toda, Fogel and Kawai (1990) made a comparative study of pre-verbal communication between Japanese and English speaking dyads. They examined the differences and commonalities of maternal speech between Japanese mothers of 3-month-old children and Caucasian American-English speaking mothers with children of the same age. Maternal speech was analysed in terms of function, syntactic forms and use of baby talk. American mothers' speech was more information-oriented, asking more questions, such as yes/no questions, whereas Japanese mothers' speech was more affect-oriented, using more nonsense, onomatopoeic sounds and a greater frequency of baby talk, and calling their child's name frequently. These findings are in line with previous research (e.g. Fogel, Toda & Kawai, 1988; Shand & Kosawa, 1985) that found these differences consistently in mothers' interaction styles between Japanese and Caucasians in the United State of America. US mothers showed a tendency to respond vocally and to stimulate positive vocalisation in their young children, whereas Japanese mothers responded with less vocalisation but showed more physical contact

with their child. There seem to be some stereotypical interaction styles in Japanese and US mothers, in particular the frequent use of a non-vocalised mode in Japanese as opposed to a vocalisation mode in US mothers. Toda *et al.* (1990) argue that these differences in maternal speech (CDS) between two cultures may also reflect a culturally constructed view of the child and a belief about child-rearing practices in each culture. Interestingly, although they found a contrasting feature of maternal speech to young children in this comparison, a commonality across these different dyad groups appeared to be the aspect of attentional processes, which has been illuminated in the study of English-speaking children's early language development: they found that the duration and frequency of the child's gaze at the mother appeared to be similar. This finding indicates that maternal speech also served the function of getting young children's attention as well as maintaining the child's focus of attention. This commonality suggested that these aspects of maternal speech serve a more fundamental function, which derives from the mother's intention to communicate with the child. Fernald and Morikawa (1993) explain cross-cultural differences in maternal speech on the grounds of different cultural expectations of the child. Fernald and Morikawa also suggest that Japanese mothers use baby talk in their speech to the child for more months of early childhood, compared with American mothers. A reason for Japanese mothers' frequent use of baby talk is considered to be derived from speech conventions in Japanese society. Addressers use a different code of speech, taking into account the relationship between addresser and addressee in terms of their gender, status and situation (Hakuta, 1986). This differentiation in the code of speech is respected in the society; therefore, mothers try to distinguish children from adults in order to teach such culturally valued speech conventions at an early age (Clancy, 1986). Japanese mothers' frequent use of baby talk may also constitute maternal expressions of affection (Fisher, 1970) and may be a way of expressing empathy with young children. In

contrast, American mothers' communicative styles reflect that they are more likely than Japanese mothers to emphasise direct and individual expressions to their child and to encourage their child to become independent at an early age (Toda *et al.*, 1990).

These comparative studies not only found differences in early interaction styles but also in the later interactions between the parents and their child at pre-school age. This evidence for different conversational interactions derived from the study of children's narrative patterns in mother-child dialogues (Minami & McCabe, 1995). Although the details of mothers' interaction changed to suit their children's age, a culturally specific interaction style was still represented in communicative exchanges with five-year-old children. Minami and McCabe identified cross-cultural difference in the style of narrative elicitation. Japanese mothers provided less evaluation but more verbal attention to children than did US mothers. The culturally specific conversation styles, such as providing more verbal attention to their child and fewer evaluative comments, were found in Japanese mother-child pairs who lived in the US (Minami, 2003). Such interaction styles also appeared to be transmitted in the way children conversed with their mothers. Japanese children's utterances per turn were significantly shorter than American children's; Minami and McCabe interpret this brevity of their utterance as indication of seeking conformity from their mother and a somewhat implicit way of expressing themselves. This comparative study illuminated the difference in the degree of frequency as well as the proportion of particular features in parent-child conversations. Such a difference in conversational styles, as well as in the way of expressing one's experience, may be culturally defined and transmitted through social interaction with a caregiver during childhood.

In relation to these stereotypical maternal interaction styles, the comparative studies examining young children's lexical development in Japanese and English indicate some differences in the emergence of their developmental milestones, such as

first words and vocabulary spurts. Needless to say, given wide individual differences in children's language development, these results should be interpreted with caution. However, currently available data strongly indicate such differences (e.g. Ogura, 1999; de Boysson-Bardies and Vihman, 1991; Tamis-Lemonda, Bornstein, Cyphers, Toda and Ogino, 1992). It appears that Japanese children's first words generally appear later than English-speaking children's. In particular, Ogura's (1999) analysis was based on the data, using the Japanese version of the MacArthur Communicative Development Inventory (MCDI), which is comparable to the study of English-speaking children in the US by Caselli *et al.* (1995). Therefore, it is likely to represent the norm of development in Japanese children. Ogura (1999) speculates that such developmental differences can be attributed to the contrasts in the frequency of use of onomatopoeic words and baby talk by Japanese-speaking mothers for a longer period of early childhood as opposed to the frequent object naming by English-speaking mothers. The frequent use of onomatopoeia in Japanese CDS is highlighted in several studies (e.g. Ogino & Kobayashi, 1999). Use of onomatopoeia is also recognised by Werner and Kaplan (1963); the child's use of such words is particularly regarded as one of the early vocal mediums for a child to depict references externally, which develop later into a more conventional representation, i.e. object naming. Although the reason why Japanese mothers tend to use this type of speech with young children is not clear, it is possible that such verbal behaviour could be derived from mothers' empathy with their child, in that onomatopoeia is considered more easily accessible to a young child. In fact, a mother's use of onomatopoeia to depict reference seems to decline as a child grows (Murase, Ogura & Yamashita, 1998). Therefore, this typical language use in Japanese caregivers' speech, which has been identified in previous studies, is confined to young children. Although children who are learning to speak Japanese may start to produce proper naming of an object later than their English-speaking counterparts, this

does not mean that their early expression of intention to communicate is absent. The representation of such intents can be represented in the form of baby talk and gestures. The analyses that focused on categorising types of words which young children use underscores the importance of early communicative expression, which may not necessarily be manifested within a formal linguistic convention. Therefore it is fair to say that the difference in the speed of development that appeared in a cross-cultural comparison is based on one particular aspect of linguistic production amongst many dimensions on which the competence of communication can be measured.

With respect to the onomatopoeic-words, it is important to note that the onomatopoeic-words are not only used frequently in Japanese caregivers' speech but are also commonly used during Japanese adults' informal conversation. The Japanese language has a set of sound-symbolic systems, which are highly cohesive, including distinct phonological, semantic and syntactic characteristics. This sound-symbolic system appeared to be very culture- and language-specific, in that the expressive meaning of such words is very elusive from an outsider's point of view, but these are easily understood and interpreted by the native speaker of the language (Hamano, 1998). However, it is possible that onomatopoeic-word use in Japanese CDS does not always fulfil the same rules governing such a sound-symbolic system as those used in adult-adult conversation. Therefore, the particular word type which appears in the Japanese CDS may fulfil a pragmatic rather than a linguistic function, although early exposure to such word use may help children to realise a particular feature of Japanese in later conversations.

Overall, it is generally recognised that Japanese mothers' interaction styles are less information-oriented and more affect-oriented than those of American mothers. It is possible to say that interaction styles of typical Japanese mothers' reflect the culturally constructed values of child-rearing (Super & Harkness, 1982, 1997). These interaction

styles may play an important part in nurturing children who will be valued in Japanese culture, rather than learning many more words to become a competent speaker of Japanese. Such culturally expected values may appear through the process in which the mother and the child communicate. Currently little has been examined concerning the development of early communication in relation to Japanese mothers' communication styles. The study of early communication should include the examination of the non-verbal aspect of children's communication before and after the child starts to produce language proper, and should address how the mothers' communication styles affect early language development. The comparative studies considered above suggest that there are culturally distinctive features embedded in the caregivers' communicative interaction with their child. Such differences have implications for the description of a universal picture of children's development in language and its sub-domains. It is important to consider that culturally unique aspects of communicative behaviours may also contribute to successful and meaningful language learning processes, beyond fundamental aspects of communication which are essential to all kinds of language. The place for examining such cultural uniqueness will be in the pragmatic use of language, which goes beyond the manipulation of linguistic codes in a particular language system. The final section reviews the studies of language development focusing on communicative competence.

2.5 Communication as a process of language development

Thus far, this chapter has reviewed studies of language development from a social interactionist perspective. These studies examined the way in which children learn grammar and new meanings of words through social interaction, whereby the pragmatic contexts provide useful clues for the child accessing the referent. As Bruner (1975)

emphasises the pragmatic aspect in the development of language, it is important to examine not only the way in which the child capitalises on pragmatic contexts for learning language but also the way in which the child becomes a user of language. Learning to use language in such a way that the child's communicative goal is achieved in a culturally appropriate way provides the child with further knowledge of the pragmatic rules that can be used in interpreting the meaning conveyed through interpersonal communication.

One of the approaches to the study of language use has been built upon the Speech Act theory of Austin (1962) and Searle (1969). These scholars focused on the performative aspect of language in linguistic communication. Searle in particular proposed the notion of the *Speech Act*, stating that "speaking language is performing speech acts such as making statements, giving commands, asking questions, making promises, and so on" (p.16). Searle made a clear distinction between the two structural parts of each speech act, which is performed through uttering words: the proposition conveying conceptual contents of an utterance, and the illocutionary force of an utterance which indicates the speaker's attitude towards the proposition. Searle argued that the analysis of speech acts needs to capture both the intentional aspect of uttering words and the linguistic conventions for expressing such intentions. Dore (1975) put this theory in the perspective of the developmental study of language acquisition by describing the children's speech acts during the pre-verbal and one-word stages. Dore regarded such early expressions of intents as primitive speech acts, and distinguished this stage of communication from those expressed with language proper that incorporates grammatical components for the production of speech acts.

This view contrasts with some other investigators, Bruner (1983b), Bates (1976) and Bates, Camaioni and Volterra (1975), who claimed the continuity of a child's communication system, in particular, the existence of the same communicative

intention during the transition from pre-verbal to verbal communication. More recently, Ninio and Snow (1996) investigated the development of speech acts from the single-word stage onwards, drawing on the continuity view. They consider that the capacity of older children to express their intention in a conventional manner reflects what they have learnt during earlier interaction, both about what meanings might be expressed and how they are expressed. In the discontinuity view, it is very difficult to work out what makes young children realise that a certain intended meaning can be conveyed through a certain manner that involves some form of conventionality before the emergence of grammatical expressions. Indeed, young children aged 12 months are unlikely to have as many different types of communicative intents as adults do, or even as many as children aged 24 months. However, this does not mean that there is no continuity between pre-linguistic and linguistic communication. In addition, there has been a strong claim for continuity based on evidence in the domain of early non-verbal communication (Bates *et al.*, 1975). Bates *et al.* described the emergence of early intentional communicative ability as evident in two categorical gesture-related expressions: *proto-declarative gestures* that involve pointing and showing, which were used to direct the adults' attention as precursors to statements; and *proto-imperative gestures* that were used to seek help or obtain a desired object, as precursors to requests and other directives. They propose the clear continuity of a communication system in which two types of communicative gestures serve as precursors to later speech acts. Bates *et al.* considered these two categories as the most reliable and consistent expressions of intents during pre-verbal communicative attempts. The very limited number of communicative intents expressed by young children indicates either that they may not be able to express many intents, or that it is difficult to identify young children's intentionality in their limited communicative repertoires. However, as Ninio and Snow (1996) argue, it is also possible that although many communicative

intents emerge as consequences of learning language, the acquisition of forms expressing novel intents depends on children's ability to interpret the intents they are not yet able to express. Therefore, it is necessary to consider that some form of continuity acts as a bridge between pre-linguistic and linguistic communication. Such continuity does not manifest itself in the exact form of an expression but at a more fundamental level of understanding how to communicate. For example, it may be the understanding of the ways in which different intents can be expressed in different means, though these expressions may be context-dependent in early stages.

The study of pragmatic development focusing on speech act theory, or language use in a wider sense, has revealed some theoretical issues regarding the continuity of the child's expression of intention in the communication system. However, it is clear that the child has some intents to communicate, regardless of whether these are expressed in a formal conventional manner in a language system or not. Thus, it may be inappropriate to focus just on the aspect of verbal communication, within the terms of speech acts. Expressions of communicative intents could be considered, in a wider sense, as communicative acts. Nevertheless, Speech Act theory provides some foundations for a study of language use, which makes a clear distinction from a study of the linguistic system. The implication of Speech Act theory for the developmental study of language may be that language learning involves not only the acquisition of static knowledge of a linguistic system, but also the ability to use language in relation to the pragmatic knowledge of its usage. The aspect of language use is important for the study of language development from social interactionist perspectives. Social interaction provides children with an opportunity to communicate with adults who are prepared to share the communicative contexts with their child. It is very clear that children whose communicative environment is Japanese acquire the Japanese language. The impact of linguistic input is apparent but it is also likely that

the caregiver provides more than linguistic input in the language that the children are going to learn. It is possible that children learn how to express their intents appropriately through communicative experiences, even in the periods during which their expression is not formally constructed.

2.6 Rationale of the study

2.6.1 The issues summarised

The main issues derived from the literature review are three-fold. The first is that the study of language development has been influenced by ways of viewing language. Since Saussure (1922/1983) made a clear distinction between *la langue* and *la parole*, language had been considered in terms of two separate entities. One is a language system that consists of symbols and rules of combination to make meaning; the other is the acts of speech, in which a rule-governed symbolic system is used in order to communicate with others. In early language development, young children begin to acquire not only knowledge of context-free word meanings and combinations of these symbols but also knowledge of how to use such a linguistic system in functional contexts. Despite the recognition of these two aspects of language, i.e. analytic and functional, early studies of language seemed to be influenced largely by the analytical view of studying language. The dominant view in the study of language development focused on children's understanding of a linguistic system, and little attention was given to studying the development of a child's communicative skills (Snow, Pan, Imbens-Bailey & Herman, 1996). Thus the second issue is a shortage of studies in the pragmatic aspect of language development. This limitation underscores the need for studies in early language development from a communicative perspective. Early

communicative ability embraces non-verbal aspects of communication, as well as primitive ways of communicating with caregivers, which are embedded in the pragmatic contexts of children's lives. The early development of communication, before linguistic competence is consolidated, will provide a picture of how children go through their transition towards more linguistically oriented communication. The third issue is the ability that enables the child to use pragmatic knowledge to understand what the other person means. The socio-pragmatic theories of language development demonstrated that children's understanding of another's intention is at work in the course of word learning. Communicative competence involves not only the ability to express children's communicative intention but also their understanding of other peoples'. Meaningful communication derives from the interplay of these two processes. Before the child achieves a fully-fledged understanding of the other's intention, the caregiver's support may be vital, so that the child's attention is carefully managed and sustained. Therefore, it is important to study this development of communicative competence in relation to the way caregivers interact with their children.

The aspects of communication development explored in the present study are broadly two-fold. The first examines the developmental course of the expression of communicative intents. The second aspect is the investigation of joint attentional skills that enable the child to capitalise on communicative exchanges.

2.6.2 The development of the expression of communicative intents

As has been argued elsewhere (e.g. Bruner, 1975b; Bates, 1976), given that the main motivation for the acquisition of a linguistic system is to achieve their social goals, young children first need to learn how to express their intentions in a context-specific way. Such pragmatic communication seems to be found in children's communicative

gestures that precede the acquisition of the abstract knowledge of linguistic systems. Indeed, the representation that develops through the expression of their communicative intents helps the child “crack the linguistic code” (Bruner, 1975a, p.61). Even further, Halliday (1975) regards learning language as learning how to mean; the linguistic system is essentially a system of meaning with expression as the realisation of these meanings. For him, the investigation of MLU affords very little understanding of language development. Long before a child starts to combine words, i.e. before MLU=1, the child may have acquired a well-developed system of meaning in order to communicate with others.

Moreover, children’s gestures, such as pointing, have received great attention amongst developmental psychologists as precursors of speech development. However, there are many other gestures that children exhibit in order to express their communicative intents, and communicative intents expressed by these gestures have not been well researched in their transition to speech. These early communicative gestures dominate pre-verbal communication, and could possibly play a part for young children in getting a grip on the linguistic code. Therefore, communication is not only established by the linguistic code but also by other forms of the symbolic code, including gestures.

According to McNeill (1992), gestures and speech share a common cognitive representation, although they present meaning in a fundamentally different form. Therefore, speech and gesture are integrated in a single process to form an utterance. If so, communicative gestures are not only the precursors of speech but also of another aspect of communication, which continues to develop throughout childhood and into adulthood. The evidence that gesture and speech function as an integrated system comes from studies with adult speakers. However, in children’s early development, simultaneous integration does not seem to appear from the onset. Rather, it seems that

children initially use communicative gestures independent from their speech, and gradually their gesture and speech are integrated in terms of temporal synchrony and semantic coherence (Butcher & Goldin-Meadow, 2000). According to Butcher and Goldin-Meadow, children's development of the combination of a meaningful word plus gesture appears to set the next stage in the combination of gesture and speech, in which each modality exhibits different but related information (e.g. a transition from a child's pointing at an object while uttering the name of the object to the child's pointing at an object while uttering "give"). Moreover, the onset of such development in children appears to correlate highly with the onset of their two-word combinations. This also implies a relationship between the onset of young children's early communicative gestures, gesture-speech combinations and their realisation of linguistic systems; specifically, of syntax.

2.6.3 The development of joint attentional skills

The studies reviewed earlier suggest that even after the emergence of the first word, children's new word learning seems to be embedded in their social contexts. As children's social cognition develops, they begin to identify other people's intentions at more sophisticated levels. This enables them to understand salient pragmatic cues and to use pragmatic knowledge to facilitate their word learning. The underlying ability to use these processes is rooted in joint attentional skills. There are some strong predictions about how a deficit in this area affects the course of word learning. Frith and Happé (1994) argue that the language impairments of autistic children are due to an impairment in the ability to develop a theory of mind. Those children who had relatively well-preserved language skills performed well on tasks that tapped their understanding of other people's thoughts and vice versa. Baron-Cohen, Baldwin and

Crowson (1997) support this view. They found that autistic children made errors on the associative mapping task requiring inferential capacity whereas age-matched and mentally-handicapped children did not. Given this evidence, the development of joint attentional skill could be vital for language learning and communication as a whole.

2.7 Research questions

The main purpose of this study is to examine the development of communicative competence within the context of Japanese culture. Investigations in the present study concern two aspects of communicative competence in children. One is the expression of communicative intents, and the other is joint attentional skills. The role of caregivers, with reference to their communicative styles, is addressed in relation to the development of children's communicative skills. The research questions relating these two aspects of children's communicative skills in relation to their mothers' interaction styles are summarised below.

- a) The questions related to the investigation of the expression of communicative intents by children are:
 - 1) What kind of developmental trajectory is found in the children's communicative mode, such as gesture, speech and a combination of them, during the transition from pre-linguistic to linguistic communication? What kind of common pattern and individual differences are found in their development?
 - 2) What kinds of communicative gestures are commonly used? Are there any developmental changes in the way such gestures were used during the second year, particularly in relation to the emergence of syntax?
 - 3) What category of verbal communicative acts is used, at which ages? Are there any commonalities and differences in the emergence of verbal-communicative acts?

- b) The questions related to the investigation of mothers' communicative styles and their relationship with the development of communicative skills in children are:
- 4) Whether or not the mothers' involvement, measured by the frequency and the number of different types of communicative acts, changes in quantitative and qualitative aspects as a function of each child's age?
 - 5) In what way, if any, does the mothers' communicative interaction change?
 - 6) Are there any individual differences in the mothers' communicative styles?
 - 7) Is there any relationship between the mother's communication styles and the development of the child's expression of communicative intents? If so, what kind of relationship exists?
- c) The questions in the examination of joint attentional skills are:
- 8) What kind of growth trajectory is found in the children's engagement in the joint attentional episodes?
 - 9) Are there any individual differences in the growth of joint attentional engagements? If so, in what way do they differ?
 - 10) Is there any relationship between the development of joint attentional engagements and the development of the expression of communicative intents?

The set of questions relating to the children's expression of communicative intents, investigates their developmental patterns. Given the variability in the development of language between individual children, it is also possible to identify the variability in the development of communicative acts in different modalities, as well as in the repertoire of communicative acts. The repertoires of communicative acts are examined with respect to both gesture and vocal modalities. The examinations of communicative gestures aim to reveal their role during the integration of different modalities used to express communicative intents. The examinations of verbal communicative acts aim

to show developmental features with respect to the emergence of different communicative repertoires at particular stages. Individual children's developmental profiles enable variability and commonality between the children to be identified.

The set of questions relating to the mothers' communicative styles addresses the impact of the mothers' communicative styles on the children's development of communicative acts. The mothers' communicative acts are examined in terms of quantity of involvement and quality concerning certain types of communicative repertoire. Mothers' communicative styles relative to their use of particular communicative acts are identified, and their individual differences in relation to the development of children's communicative acts are examined.

The set of questions relating to joint attention examines developmental trajectories of joint attentional skills, measured by the total duration spent in joint attentional episodes, in individual children. Individual differences in the growth of joint attentional skills, if any, are examined in relation to the processes by which the child and mother initiate each joint attentional episode. The final question addresses the relationship between the developments in the expression of communicative intents and joint attentional skills.

Chapter 3

Methodology

The preceding chapter discussed the perspective of this study in the field of language development. Given the rich social environment in which most children live, it is essential to study children's development in the context where their social interactions take place. This study, taking a social interactionist perspective, explores children's language development with a specific focus on communicative aspects, i.e. pragmatics. This chapter discusses the methodology of the study, and includes a detailed description of methods used in the phase of data collection and the analyses. The first section reviews research on child language and discusses some issues.

3.1 Child language research: historical background and issues

The historical background in the field of child language research has been dominated by two major research practices: psychology and linguistics. The assumptions derived from these disciplinary traditions (for example, the contest between behaviourism and generativism, which caused tensions in the 1960s) manifested themselves in different theories, which in turn led to different methodologies (Bennet-Kastor, 1988).

Research into child language in the 1960s was dominated by grammatical studies (e.g. Braine, 1963; Brown & Bellugi, 1964; Miller & Ervin, 1964). This line of research was influenced by structural and transformational linguistics. The major assumption was that child language is similar to adult language, thus child language can be studied using the same techniques as those used to study adult language. This had led people studying child language to adopt research methods from linguistics, which places a

particular emphasis on the discovery of grammatical regularity, such as the frequency of word categories and word position in an utterance. The data from language corpora were analysed without reference to the underlying meaning. The nature of such studies was also far from comprehensive, because these investigations focused on the development of the grammatical aspect of child language, and little attention was given to development before the one-word stage. Bloom (1970) recognised the weakness of this linguistically-oriented research, and studied child language focusing more on the non-linguistic contexts, such as situational information and semantic knowledge, in order to describe grammatical development. However, this line of research did not go beyond the theoretical framework that focused on grammatical aspects. For example, the measure of MLU (Mean Length of Utterance), which was introduced by Roger Brown (1973), has been used extensively in child language research. Although this measure is one of the major indices to assess language development, there are limitations to employing it. The measure of MLU that is derived from the computation of the number of morphemes per utterance may be useful if one believes that the development of complexity in a language system can be represented by a simple quantitative measure, and that such a system functions independently of other systems underlying human behaviours. In fact, this measure appears to have little correlation with other pragmatic functions (Dale, 1980) and even with other measures of grammatical development (Klee & Fitzgerald, 1985). The concept of MLU was oriented to the English language and did not appear to apply to other languages such as Hebrew, where increases in length do not indicate an increase in complexity (Dromi & Berman, 1982). Moreover, this measure is not sensitive to younger children's language that has not yet reached the one-word stage; therefore, it is not applicable to a study that investigates very early language development.

The move to a semantic approach, with a further emphasis on a pragmatic orientation, focused on the contextualisation of data, which in turn influenced the means of collecting and archiving data. Non-linguistic information was seen to be as important as linguistic data. Therefore, children's propositions were interpreted by examining not only sequences of utterances but also eye gaze, pauses, intonation and other paralinguistic aspects. This approach necessitated the recording of visual data that enable the coding of non-linguistic information in addition to utterances. The increasing emphasis on extra-linguistic context reflects the view that a description of children's language requires not only linguistic data but also evidence from their cognitive and social development.

The advances of technology, such as the digitised recording of visual data and linking such data with computer systems, have contributed to research in terms of data collection, and the organisation and analysis of collected data. The use of technology enables the researcher to capture contextual information in depth and to analyse the coded information precisely. The CHILDES, i.e. Child Language Data Exchange System, (MacWhinney & Snow, 1985, 1990; MacWhinney, 2000) is one of the systems used for computer analysis. This system has been continuously developing its applicability to various ranges of corpora and different measures, which in turn have increased its flexibility, enabling users to tailor their own analyses depending on their research questions. This computer-based data system not only provides a tool for analysing data, but also contributes to the expansion of the database for further studies. This database allows the researcher to handle more data, expending less effort on collecting data, since transcription and coding of data generally take a long time. However, it is important for the researcher to be aware that sharing data means sharing the problems involved in collecting the data (Wells, 1985).

There are other methodological issues in studying child language. Firstly, in many developmental studies, the number of participants observed longitudinally is very small; often, such cases are single case studies. For a longitudinal design, given the significant amount of time needed for collecting, transcribing and coding data, it is often inevitable that an only small number of participants will be studied. A cross-sectional design, on the other hand, may allow the researcher to study a larger number of participants. A picture related to developmental characteristics may be inferred from data collected from a cross-sectional study. However, given the variability of speed of development and its trajectory in child language, the picture derived from cross-sectional data does not necessarily provide an insight into the nature of development. Thus, the main limitation of a cross-sectional study is that it cannot provide information related to either individuals' developmental trajectories or differences in their developmental patterns. Each type of design for collecting data has some limitations. Therefore, it is important to consider the influence of each design on the interpretation of the results, which are derived from the particular method of collecting data. This study aims to capitalise on the features of individual children's development by employing a longitudinal study, though it is recognised that the results derived from a study with a small number of participants may have limited implications for a wider population.

Secondly, another issue involves the selection of the setting for sampling data, such as an experimental as opposed to a naturalistic setting. The experimental study is powerful when the researcher attempts to answer a specific question in a deductive manner. However, this design cannot provide the whole picture of development. A longitudinal study in naturalistic setting, on the other hand, has its strength in describing developmental changes, though there are many factors that are amalgamated in the

naturalistic context whose effects on the data cannot be estimated. Thus, the extent to which the researcher intends to control contextual variation, while maintaining a naturalistic atmosphere for the participants, is a matter of concern.

Finally, there has been little discussion regarding how many data samples are sufficient for analysing child language since Brown (1973) originally proposed the number of utterances for computing MLU. In the case of observational study, the duration of observation has appeared to vary from 10 minutes to an hour or beyond, but there seems to be no rationale for the lengths of observations. In essence, these uncertainties relate to a methodological question: how many data samples data is are required in order to answer the research questions? and a practical question: how much data can a researcher manage to collect and analyse? The quantity of data required should be considered carefully in relation to both questions.

This study takes account of the issues discussed in this methodological review, and attempts to design appropriate methods to capture the developmental picture of early communicative competence. As stated earlier, the main focus of this study is to examine children's early language development, concentrating on their use of language and gestures in order to communicate with their caregivers. Their contexts of interaction provide vital information for examining children's and mothers' communicative behaviours. This study regards mothers' communicative behaviours used in their interactions, as being equally important as children's social and cognitive development for the examination of children's communicative development. The methods employed in this study therefore aim to elicit mother and child interactions in a quasi-natural setting. The method of longitudinal observations with regular intervals allows for a rich density of data, which subsequently enables the analysis of developmental changes in the children's communicative ability in relation to the

mothers' interaction styles. This observational study also employs an interview method, to supplement the observation of child behaviours. Interviewing caregivers may provide vital information concerning their insights regarding parental beliefs and attitudes towards interaction with their children and child development in general, as well as providing confirmatory information on what is being observed.

3.2 Design and methods of the study

This section describes the main design and methods employed in this study. This study constitutes a series of repeated longitudinal observations of dyadic interactions between Japanese children and their mothers in semi-structured contexts. While describing the design and methods of the present study, related methodological issues will also be discussed. The design of this study includes the consideration of intervals of observations, contexts in which participants were observed and duration of observations that are required to generate a sufficient data sample. The methods include the computation programme used for organising data and coding systems for identifying and categorising communicative behaviours. The definition of the terms used and the criteria for the coding are also discussed.

3.2.1 Longitudinal observations

The main structure of this study comprises longitudinal observations of interactions between children and their caregivers. It is likely that the primary caregiver will be the mother, given the cultural context of Japan. There are many studies categorised under the design of a longitudinal study. A common feature of longitudinal studies is the

measurement of the same entity at more than one point in time (van der Kamp & Bijleveld, 1998). However, longitudinal methodology can vary, from simple initial and final observations to the microgenetic methods advocated by Siegler (Siegler, 1996). This study aims to capture the growth of children's communication skills as they develop, drawing on the notion of microgenetics. The length of the intervals between repeated observations was considered with reference to the likelihood of developmental change and the practicality of managing data collection. Monthly observations were planned to enable sufficient observational data to be collected, so that developmental transitions and possible individual differences could be identified. As a consequence, the number of mother and child dyads was inevitably small, namely 10. In other respects, the longitudinal design which comprises data collection at many points in time rather than only a few occasions provides a more comprehensive picture of the developmental course. The resulting developmental growth curves can be tested statistically and more reliably as the number of observations increases.

3.2.2 Setting and context for observation

The setting where the series of observations was conducted was chosen taking into account the participants' familiarity with the place. Recent studies have addressed the methodological issues over the representativeness of child language samples in relation to the setting and contexts (Bornstein, Painter & Park, 2002; Bornstein, Haynes, Painter & Genevro, 2000). According to their results, levels of familiarity with the setting, such as the home versus the laboratory, did not produce significant differences in terms of the frequency of utterances and MLU. However, familiarity with the interlocutor makes a difference. Children produced more utterances with more variations when

they interacted with a familiar person than with an unfamiliar person. In particular, the mothers regarded interaction without an observer present as the optimal situation for language production, and indeed, children produced more speech in this condition. The current study planned observational sessions to take place in a family centre where mother and toddler groups take place on a weekly basis. This setting was considered to be appropriate, because this place is familiar to the mothers and children and it was possible to maintain the consistency of setting between the dyads. Furthermore, it was possible to avoid the fundamental limitations of observations in a laboratory setting that might have elicited undesired behaviours such as stress in both mother and child. In addition, great attention was given to the consideration of the context in which mother-child dyads were observed. Given the limited period available for observation at one time, what the researcher can sample may be influenced by the context being observed. This variation in context could affect the types of communicative behaviours exhibited during the observation. In order to avoid such undesirable bias to the data, a semi-structured context was designed so that each dyad would experience a similar context. The concern was then that the naturalistic context might be distorted by introducing a semi-structured context. Therefore, during the pilot study, feedback was requested from the mothers regarding any aspect of the setting and the semi-structured context. The mothers' comments about any issues raised during the pilot study were taken into account when designing the procedure for the main study.

It was considered necessary to examine the effect of contextual variation on the data collected. In their analyses of data, Choi (2000) and Zinober and Martlew (1985) have reported on contextual differences. Therefore, this study examined two contrasting types of activity contexts: joint book sharing and toy play. For a book sharing context, in order to avoid a mother merely reading the text, several picture

books with minimal text were prepared. For a toy play context, several types of toy, which are suitable for the age-range of the children, were selected. The most important point for the selection of these toys was that they would be appropriate for interaction and for eliciting symbolic and/or fantasy play. The books and toys selected were used throughout the observational sessions for all the dyads in the study.

3.2.3 Scales of sampling

In addition to the consideration of the context, practical issues for observational study include the amount of data which are required for the planned analysis as well as how long the participants are able to engage in the activity. Although little has been reported about the adequate duration of an observation, the two typical means of data collection, the time base and the frequency base of sampling, inherently determine how long the observation should last. In this study, the number of communicative attempts, which is a frequency-based measure, and the duration of joint attentional episodes, which is time based, were the main data for the analyses. It is important to observe a sufficient number of communicative attempts to enable conclusions to be drawn. For communicative attempts, it was likely that when children were younger they would show fewer attempts than when they were older, during the duration of sampling. Therefore the frequency of communicative attempts per minute was examined in the pilot study. The length of the observational session necessary to elicit an adequate sample size for the analyses was estimated using the pilot data.

3.2.4 The Child Language Data Exchange System (CHILDES)

The CHILDES comprises three integrated components: 1) CHAT, a system for discourse notation and coding that offers the editing of transcription and coding for computer analysis, using 2) CLAN programme; and 3) a large database of language transcripts in CHAT formats (MacWhinney, 2000). Transcription in CHAT formats allows the researcher to transcribe utterances as a separate main entry in the system, as well as any contextual information on interactions as separate entries, using up to 26 possible “dependent tiers”. This study utilised the resources of CHILDES for coding and computational analysis of the frequency counts. Therefore all transcripts followed the convention of CHAT formats, assigning the three dependent tiers that include the main coding of communicative acts, comprising linguistic and non-linguistic aspects as well as contextual information, which is vital to the coding of communicative acts. CLAN programme offers computer analysis in a combination with CHAT format transcription. Thus the different numbers of categories in the coding and their corresponding frequencies were calculated drawing on this programme.

3.2.5 Data collection and analysis of data

The main phase of data collection comprised a monthly video recording of mother and child interactions. These recorded tapes served as primary data for the coding of communicative acts expressed by gesture and speech. The prescribed time coder function of the digital camcorder was used during the recording of the observations. The organisation of video-recorded data involves two processes: transcribing, and the coding of video-recordings. The purposes of transcribing were to synthesise video recorded data into a single mode, representing linguistic and non-linguistic aspects of

communication as well as contextual information (Ochs, 1979). This transcription bridges the original recordings and coded data, although the coding was based on the video-recorded data, not the transcriptions. Coding of communicative acts was carried out using the existing coding system, in part modified to serve the purpose of this study. Data were further organised and analysed systematically, using computer programmes developed in CHILDES.

3.2.6 Defining “communication”, “communicative intent” and “communicative acts”

In examining the developmental progress through which children gain competence in expressing their intents, the main problem is to determine what kind of behaviour is regarded as a communicative act and what should be included in the analyses of communicative exchanges. Before moving on to the specific criteria used in this study, the definitions adopted in this study are discussed.

The term “communication” and related concepts, such as communicative intent and communicative acts, are defined drawing on a particular cognitive psychological theory: “Relevance theory” (Sperber & Wilson, 1986/95). This theory makes two basic claims in relation to features of human cognition and communication, both of which are important in the process of interpreting what a speaker means.

1. *Human cognition tends to be geared to the maximisation of relevance.*
2. *Every ostensive stimulus conveys a presumption of its own optimal relevance.*
(Sperber & Wilson, 1995, p. 260)

This theory defines communication as “a process that involves two information-processing devices” (Sperber & Wilson, 1986/95, p.1). Communication is described with respect to what is processed and how it is processed. It involves

producing a certain stimulus so that the communicator's intention to convey some specific assumptions (this is called *informative intention* (p.29)) is recognised by the audience. The intention to inform the audience of the communicator's informative intention refers to *communicative intention*. Therefore, communicative intention is fulfilled once informative intention is recognised by the audience.

According to Sperber and Wilson, there are two ways of achieving communication: the code model and the inferential model. The code model involves the processes of encoding and decoding linguistic messages; and the inferential model involves the processes by which the communicator provides evidence of intention and the audience infers such communicator's intentions. These models differ but can be combined in different ways. In general conversation, the communicator conveys his/her informative intent by acoustic stimuli, or with a combination of other behavioural stimuli; such stimuli then need to be interpreted. The communicator produces ostensive stimuli to attract an audience's attention. If the stimulus is relevant enough for the listener to pay attention, such information will be processed. The audience make inferences spontaneously to interpret communicative input, constructing an assumption about the communicator's meaning which fulfils the presumption of the relevance of what is conveyed by the utterance.

Drawing on such a description, communication is defined in this study as a process involving two information-processing devices in which one influences the other, and which is achieved by acoustic and behavioural stimuli. In this communication, the communicator explicitly produces a stimulus, intending to inform an audience of a particular assumption so that such an intention can be recognised. This intention is regarded as communicative intent. The stimuli that are produced by the communicator intending to provide the audience with relevant information to be interpreted are

regarded as communicative acts. However, a problem arises when one tries to draw a line between acoustic stimuli such as oral speech and mere vocalisation. In this study the distinction between speech and vocalisation was made drawing on the interpretability of its function rather than merely on the formality of the linguistic code. Therefore, forms expressed in a phonologically consistent manner whether or not this was a conventional manner were included if their functions were interpretable. Exclamations, baby talk and onomatopoeic expressions were also included. In the case of communicative gesture, the forms of gestures that are regarded as conventional within the community or the culture, some of which are recognised cross-culturally, were included.

For the interpretation of communicative intents, *Relevance theory* suggests that the communicator produces stimuli that an audience can understand in a given context. Therefore it is possible to regard communicative acts in the form of gesture or linguistic stimuli as the representations of communicative intents, and that the communicator produces certain stimuli because s/he is aware of this as a relevant way of expressing a particular intent that s/he wants to make manifest in a given context.

3.2.7 Coding systems for the study of communicative acts

3.2.7.1 Issues of categorising communicative acts

Early language development is represented as the emergence of a pragmatic system that often appears without language proper. In the last section, the processes in the interpretation of communicators' acts were discussed. Although these processes are a fundamental aspect of understanding communication, identifying the speakers' communicative intention and categorising them appears to be a difficult task,

particularly when these involve the intents of young children (Ninio, Snow, Pan & Rollins, 1994). This section discusses several issues in classifying communicative acts and justifies the use of a particular coding system.

The first issue is that there is no one-to-one mapping between what the speaker utters and what is meant by it. Because most communicative intents are expressed simultaneously at a number of different levels, identifying a speaker's intents needs to be considered at these different levels. For example, Chapman (1981a) points out that there are at least four levels of analysis: the utterance, conversational, discourse and social levels. The classification in the coding system is influenced by the degree to which each aspect of communication is focused. In fact, any review of existing classifications (e.g. Chapman, 1981a; Ninio, Snow, Pan & Rollins, 1994) reveals a great diversity in categories of communicative intents.

Several classifications of children's communicative acts have been developed to describe the development of the pragmatic aspect of children's communicative capability (Greenfield and Smith, 1976; Dore, 1974; 1975; Halliday, 1975; McShane, 1980; Bates, 1976; Bates *et al.*, 1979; Coggins & Carpenter, 1981). Some of them were developed on a purely empirical basis; thus they vary in the criteria for each coding category, and often include both syntactical and conversational features in the analyses of pragmatics. These coding systems also concentrate on the specific developmental periods that were the focus of their specific empirical research questions, and do not embrace a wider range of development (Snow, Pan, Imbens-Baily & Herman, 1996). This makes the synthesis of these findings more difficult when one attempts to draw a complete picture of the development of children across different ages. This leads to the second issue in developing coding systems.

A coding system assessing children's communicative acts at different ages enables the researcher to capture a longer span of developmental changes. However, most coding systems focus on either pre-verbal or verbal communication. Coggins and Carpenter (1981) classify and offer clear definitions of young children's communicative intents encapsulating gesture, vocalisation and early verbal communicative behaviour. This coding inventory appears to be very useful when coding younger children's communicative acts during the transition from preverbal to verbal communication, because coding their communicative behaviours is often more difficult than coding those of older children. However, this coding scheme is not adequate to classify more complex communicative acts, which may be used by older children.

3.2.7.2 *The Inventory of Communicative Acts-Abridged*

A recent development in the classification of children's communicative acts is represented by the Inventory of Communicative Acts-Abridged: INCA-A, (Ninio, Snow, Pan & Rollins, 1994, the full list of the categories is in Appendix 1). This was adapted from a more detailed version that was initially developed by Ninio and Wheeler (1984). This inventory, INCA-A, rests on a strong theoretical basis including Speech Act theory (Austin, 1962; Searle, 1969, 1976) and studies of face-to-face interaction (Goffman, 1961, 1974; Streeck, 1980), which stressed the importance of socially constructed communicative interchanges. This coding system also has several advantages over other coding systems, in that it can be adapted to a wide age range of children and to include their caregivers.

The INCA-A identifies and codes two levels of communicative intent. One type of coding refers to a higher-level organisation of talk (i.e. Interchange), which is

coded for a speaker's overt framing of the immediate social situation. The other type refers to a single utterance level (i.e. illocutionary force), which represents a speaker's intended speech acts. Ninio *et al.* (1994) also make claims for the ecological validity of the system, as they used so-called "account analysis" by which the mothers who participated in the observation provided information for constructing the system. Compared with many of the previous systems, which tended to categorise speech acts unevenly depending on the focus of study, INCA-A covers a similar level of generality across the various speech acts (Ninio *et al.*, 1994). Therefore, it was decided to adopt this coding system as a working basis from which some modifications, such as a finer differentiation for specific categories, could be added in order to analyse them in the light of a particular research question. Furthermore, this coding system has been widely used to examine the development of typical children in different linguistic communities (Snow, Pan, Imbens-Baily & Herman, 1996; Zhou, 2002) as well as that of atypical children (Rollins & Snow, 1998; Yont, Snow & Vernon-Feagans, 2001). These existing studies provide some comparative grounds for the current study.

However, although this coding system adapts to a wider range of children's development and contexts, the number of categories (Interchange level: 21 categories and Speech Act level: 65) to be considered in the actual coding process is greater than in previously used coding systems. A large number of categories may affect coding reliability. In order to maintain consistency of coding, inter-coder reliability needs to be checked thoroughly throughout the main study.

Another problem in adopting this coding system is that, as its main focus is on utterances, it is inappropriate to code pre- or non-verbal children's communicative behaviours, using these categories. As discussed earlier, before the emergence of language proper, young children show a variety of communicative behaviours such as

pointing, extending an object to an adult and reaching for an object. One has to identify what kind of intention is represented by these gestural communicative acts. Therefore, it was necessary to use an alternative method, which could also be incorporated into INCA-A. In addition to adopting INCA-A, it was decided to develop an additional gesture coding system for the purpose of this study.

3.2.7.3 Constructing gesture coding system comparable to INCA-A

Communicative gestures identified in previous studies of the transition from preverbal to verbal communication (e.g. Volterra & Erting, 1990) are summarised below.

- A) Reaching for an object,
- B) Pointing at an object,
- C) Extending or showing an object to the hearer,
- D) Gestures used in social routine and game,
- E) Symbolic gesture accompanied by an object,
- F) Symbolic gesture without accompanying object,
- G) Other gestures that appeared to show communicative intents, such as referring to “yes” or “no”.

These communicative gestures fall into two broad categories that have been used in the literature: *Deictic Gesture* and *Referential Gesture*.¹

In order to code these gestural communicative acts precisely, the gestures that met all the following criteria based on Caselli (1990) were coded:

- 1) Gestures are used with communicative intentions;
- 2) Gestures are conventional;
- 3) Gestures refer to some external object or event.

¹ The term “depictive gesture” is used instead of “referential gesture” in this study.

With regard to the inclusion of gestural communicative acts, there are some particular issues concerning the status of symbolic gestures that involve the use of objects.

The term “symbolic” has been used to describe a certain type of play (i.e. symbolic play) and gesture (i.e. symbolic gesture) in the study of child development. Although this “symbolic” status is often used to indicate a certain quality, absolute criteria do not seem to be operationalised for qualifying a type of gesture or play as “symbolic”. For example, Bates, Benigni, Bretherton, Camaioni and Volterra (1979) believe that children first employ nonverbal symbols to name objects when they are engaged in an indexical act, so-called “gestural naming”, and they only gradually come to name with verbal symbols. Bates *et al.* assume that when a child is doing an indexical act that entails identifying, recognising, or classifying an object, such a culturally appropriate manipulation of an object is conceived as naming (Zukow, 1984). Therefore, they regard such manipulation of the object as symbolic.

However, it is not absolutely certain that the child interprets his/her act in the way Bates *et al.* assumed. There seems to be an issue regarding the criteria for being “symbolic”. Although most researchers studying the emergence of symbolic play make an implicit assumption that children are carrying out acts in relation to the use of cultural tools, children may just mimic the appropriate use of objects without comprehending how those manipulations are linked to a cultural event. These acts may be unintentionally communicative (Zukow, 1984). Ryle’s (1949) distinction between “knowing-how” and “knowing-that” may be important. Children could manipulate cultural tools in a culturally appropriate way without knowing to what the act actually refers.

Acredolo and Goodwyn (1988, 1990) did not include such behaviours as symbolic, since they focus on gestures that operate as symbolic vehicles whose purpose

is to represent a particular referent or class of referent in a communicative context. Likewise, a recent study by Butcher and Goldin-Meadow (2000) also adopted the conservative coding criteria for symbolic gestures used by Acredolo and Goodwyn. Using such criteria may exclude important information that contributes to the understanding of children's communicative development, particularly how children's communicative gestures develop in relation to their understanding of reference. In this study, all gestures that appear to have a communicative impact on the listener as a part of the communication are regarded as communicative gestures, because the coding system for gestures was developed alongside INCA-A which codes the communicative acts in speech. Therefore, an action that appears as the simple manipulation of objects (listed as "category E" above), so called "gesture naming", was excluded from the category of communicative gestures. In summary, the six categories of communicative gestures were included in the gesture coding system (see Appendix 1).

As the focus of this study is the developmental change in children's communicative acts, the coding system should be able to capture changes in gestural communicative acts. Therefore, the system includes a wide variety of communicative gestures including those that are culturally unique. Gestures elicited in social routines are also credited as communicative because, as Bruner (1983b) maintains in his work, early language development is facilitated through interactive and communicative routines, called *formats*. The expression of socially expected communicative behaviour in everyday life and the gestures that are learned in routine games are likely to be communicative acts which emerge early. Likewise, the category of "other gestures" serves to embrace all potential communicative gestures that do not fall into other categories. By introducing this coding system, it was expected that a broad picture of communicative development could be obtained.

3.2.7.4 Coding communicative acts

Verbal communicative acts, which include both vocalisation and speech proper, were coded using the Inventory of Communicative Acts-Abridged (INCA-A) (Ninio *et. al.*, 1994). A full description of the categories is provided in Appendix 1. This system identifies and codes a speaker's communicative intents at two different levels:

Interchange and Speech Act. Interchange is defined as “one or more rounds of talk all of which serve a unitary interactive function” (p.166). Thus the speaker's communicative intention is coded in terms of his/her overt framing of the immediate social situation. The nature of Interchange categories can be divided into broadly five types: ‘negotiation’, ‘discussion’, ‘marking’, ‘performances’ and ‘meta-communication’. Each group of Interchanges was further distinguished on the basis of the state and events on which each speaker operated. For example, ‘discussion’ includes *Discussing the Joint Focus*, *Discussing the Non-Present* as well as *Discussing Speaker's or Hearer's Feelings and Thoughts*. Similarly, ‘negotiation’ includes *Negotiating the Immediate Activity*, *Negotiating Future Activity* etc. The total number of categories was 21, excluding the categories of ‘unintelligible’ and ‘uninterpretable’.

The Speech Act level is used to code specific communicative intents expressed in a speaker's single utterance. For example, in the situation of negotiating an immediate activity, the speaker might suggest to the partner a certain act; then the partner may agree to carry out the suggested act. Within the negotiation, the former utterance functioned as the request for or suggestion of an act, whereas the latter functioned as agreement to the proposed act. Although both utterances fall into the Interchange type of *Negotiating the Immediate Activity* (NIA), each individual utterance serves its unique function, contributing to the NIA. There are 65 categories, excluding the categories of “unintelligible” and “uninterpretable vocalisation”. These 65 Speech

Act types can be grouped into the following 11 broad categories according to their pragmatic forces: directives and responses, speech elicitation and responses, commitments and responses, declarations and responses, marking and responses, statements and responses, questions and responses, performances, evaluation, demands for clarification and text editing.

The combination of the two levels of communicative act types generated the third level, which Snow *et al.* (1996) refer to as *Pragmatic Flexibility*. This measure indicates the variation in language use. In the example above, the request for an act in the situation of *Negotiating the Immediate Activity* is one type of combination, and the agreement to the proposed act in the *Negotiating the Immediate Activity* is another type of combination.

Similarly, the communicative intents expressed by gestures were coded using a supplemental system devised for the coding of gesture. The communicative acts expressed by gestures were coded on the basis of form and functionality; this gesture coding is equivalent to the level of Speech Act. Interchanges where such gestures were used were also coded adopting the INCA-A Interchange categories.

Examples of the coding involving the speech and gesture domains are illustrated below. The symbols used in the CHAT convention are all translated, and their formats are edited for the purpose of this example.

Example -book sharing

Mother: kore (wa) nani [what is this?]
 act: pointing at the picture of a bus
 coding: DHA (directing hearer's attention)= Interchange/QN (ask a product question)= Speech Act
 Child: basu [bus].
 act: looks at the picture of the bus
 coding: DJF (discussing a joint focus)/SA (answer a question by a statement)
 Mother: un basu. [yes, it is a bus]
 coding: DJF (discussing a joint focus)/AP (agree with the proposition expressed by previous speaker)

Example -toy play

Child: ocha suru [(I'm) going to make tea].
 act: holds a teapot
 coding: NIA (negotiating the immediate activity)/SI (state intent to carry out act)
 Mother: un ocha irete [yes, you can make tea].
 coding: NIA (negotiating the immediate activity)/PA (permit hearer to perform act)
 Child: doozo [there you are].
 act: holding out a teacup to the mother
 coding: NIA (negotiating the immediate activity)/TO (marking the transfer of object)
 coding: NIA (negotiating the immediate activity)/EO (giving an object)
 Mother: arigatou [thank you].
 act: holds the cup
 coding: MRK (marking)/ MK (thanking)

3.2.8 Defining “joint attention”

Joint attention can be considered to be attentional engagements in which two or more individuals simultaneously focus on the same external entity. In developmental psychology, young children’s gaze-following behaviour in dyadic interaction is referred to as joint visual attention. Infants, as young as 6 months old, show this gaze-following behaviour in conditioned learning (Butterworth & Jarrett, 1991; Morales, Mundy & Rojas, 1998). As the child develops, such attentional engagement is not limited to gaze-following.

Baldwin (1995) emphasises a particular aspect of joint attention in which the child is aware of sharing attentional focus, and appreciates that such shared focus can enhance communicative exchanges. A young child’s understanding about joint attention may not necessarily be in place at the beginning of gaze-following behaviours. In line with Baldwin (1995), Tomasello (1995) conceptualises joint attention in a narrower sense. Tomasello argues that joint attention does not just mean two people looking at the same thing simultaneously, but that a child can coordinate his or her attention to the external thing and the adult at the same time as the adult coordinates his or her attention to the same thing and the child. In this respect, joint attention is

formed based on a mutual understanding of what they are experiencing in relation to the external world. This coordinated attentional engagement does not seem to happen until a child is approximately 12 months old, as previous studies revealed (Adamson & Bakeman, 1982; Bakeman & Adamson, 1984). Nevertheless, joint attentional interactions between infants younger than 12 months and their caregivers, when the adult follows the infant's line of gaze, are possible, though this does not meet the definition of joint attention in the narrow sense. Such joint attention with the support of the adult also appears to have a link with later language competence (Morales, Mundy & Rojas, 1998; Saxon, 1997).

Conceptualising joint attention in a narrow sense may be important when such skills are regarded as precursors to children's representational theories of mind. That is, joint attention represents the beginning of the understanding of others as intentional agents (Tomasello, 1995). However, for a developmental investigation, it is not necessary to restrict the concept of joint attention narrowly, although it is essential to be aware that this developmental difference is significant.

Bakeman and Adamson (1984) examined the development of infants' joint attentional engagement using six categories of states in mother and infant interaction: "unengaged", "onlooking", "persons", "objects", "passive joint"; and "coordinated joint" (p.1281). In the light of Tomasello (1995) and Baldwin (1995), the last category, "coordinated joint", is regarded as "joint attention". Passive joint attention is an engagement where the child shows little sign of awareness of the adult being involved with the same object or event. Bakeman and Adamson found a significant increase in the state of coordinated joint attentional engagement for infants between the age of 6 months and 18 months, whereas passive joint engagement did not change over time. Tomasello also argues that there are three developmental periods, each manifesting a

different nature of joint attentional interactions; the first 9 months of life, when infants' skills of joint attention have not fully emerged; the period from 9 to 18 months, when young children begin to follow and direct the other's attention and behaviour; and the period from 18 months to 24 months, when children's skills of joint attention are manifested in many complex ways through everyday experience and use of language. These developmental changes are of interest in the current study; therefore, it is important to include all types of attentional engagement.

3.2.9 Coding systems for the study of joint attention

In order to examine developmental changes in joint attention, six categories were used, adapted from Bakeman and Adamson (1984). According to Bakeman and Adamson, this coding system categorises the child's engagements exhaustively into mutually exclusive periods depending on his/her engagement with objects and/or person in the context. The video-recording of the interactions was coded second by second. Engagements that lasted less than 3 seconds were not regarded as indicating a change of attentional state. The categories of attentional engagement are described below.

Attentional engagement states

- 1) *Unengaged*: the child is uninvolved with any specific person, object or activity; the child switches between toys or books without focusing on specific items for an extended period.
- 2) *Onlooking*: the child is looking at the mother's activity, but not taking part in that activity.

- 3) *Objects*: the child is involved in playing with an object only. There is no involvement of the mother.
- 4) *Persons*: the child is engaged with his/her mother in a face-to-face manner, without any involvement with an object or event.
- 5) *Passive joint*: the child and the mother are actively involved with the same object or event, but the child shows little awareness of the mother's involvement.
- 6) *Coordinated joint*: the child is actively involved in the object, and coordinates his or her attention to both the mother and the object or event that the mother is also involved with. This category includes the coordination of attention mediated by a symbolic system such as language and gesture.

The category, coordinated joint, is regarded as joint attentional engagements in this study. This study examines the development of joint attentional skills that are manifested in language use in the communicative exchanges. The interactions, involving the same object or event that continued over an extended period of time, were regarded as a joint attentional episode as long as the child showed an explicit behavioural signal of understanding the mother's involvement.

More specifically, criteria for the joint attentional episode were defined drawing on Tomasello and Farrar (1983). Joint attentional episode includes interactions that meet the following conditions:

- (1) Interaction begins by the initiation of either mother or child,
- (2) The mother and child are engaged in the same activity on which they focused for a minimum of 3 seconds, although either member may look briefly away during an interaction; and
- (3) Either member, particularly the child, indicates that the child is aware of their

interaction by directing overt behaviour towards the mother, or exchanging messages regarding the same object or event of their interest (i.e. intentional interaction rather than merely onlooking).

When the mother looked at what the child was doing while both were focused on the same object, this was not regarded as a joint attentional engagement, because it did not fulfil the condition of an explicit interaction.

There is a clear difference between previous studies and the current study, which may be important in the interpretation of the results. Previous studies may have just measured the duration of each joint attentional engagement. This study measures the duration of joint attentional episodes, which may comprise one or more joint attentional engagements that take place while the dyads are involved in the same object or event. The reason for this difference is that even though one member of the dyad may, for example, briefly look away from the object, their attention is still on the object and the joint attentional episode is continuous. However, previous studies may have considered this as more than one joint attentional engagement. Therefore, the unit of analysis is the joint attentional episode (rather than engagement) in this study.

A consequence of this difference could be that as a child becomes older, the duration of a joint attentional episode increases. This increase could correspond to more joint attentional engagements in the joint attentional episode.

Each joint attentional episode was further categorised in terms of the initiating process. The investigation of how each joint attentional episode was initiated was of interest. Thus, the beginning of each joint attentional episode was coded into one of four types of initiation, described below:

- a) *Mother's supportive*: the coordinated joint attention is initiated by the mother following the child's line of gaze or attending to what the child has already focused.
- b) *Mother's directive*: the coordinated joint attention is initiated by the mother's attempt to direct the child's attention to another object or event on which the mother focuses.
- c) *Child's supportive*: the coordinated joint attention is initiated by the child following the mother's line of gaze or attending to what the mother has already focused.
- d) *Child's directive*: the coordinated joint attention is initiated by the child's attempt to direct the mother's attention to another object or event on which the child focuses.

3.2.10 Methods for statistical analysis

The main purpose of this study was to examine developmental changes in communicative competence, using the measurements of communicative expression and joint attention as dependent variables. The main focus was on observing and describing such changes. The descriptions of developmental changes were based on the frequency and proportion of different types of categories, as well as the time spent on a particular category of engagement.

Statistical analyses were made only where appropriate to test a specific hypothesis derived from the preliminary analysis. In such cases, the nature of developmental data generally seldom fulfils the assumptions of statistical tests in univariate analysis. Thus, multivariate analyses were employed where necessary.

In addition, where appropriate, hierarchical linear modelling (or alternatively, multilevel modelling) was employed to predict developmental trajectories. The merit of employing this method is that it enables the statistical assessment of changes at different levels (Bryk & Raudenbush, 1987). At the first level, changes under investigation were assessed at individual child level as a function of age in months. At the second level, the parameter of individual growth trajectory was varied as a function of differences between the children. Furthermore, because the number of repeated measures for the individual can vary, the data sets that include some missing data can be incorporated into the analysis. In this study, where appropriate, multilevel models were developed and tested using the software *MLwiN* (Rasbash, Browne, Goldstein, Yang, *et al.*, 2000).

Chapter 4

Pilot Study

This chapter presents the pilot study, which was carried out before the main longitudinal study.

4.1 Objectives

The main objectives of the pilot study were to examine the validity of the observational procedure as well as the application of the coding systems. This pilot study was used as an opportunity to develop expertise with the methodology and to identify any further issues in implementing the procedures. Modifications in the main longitudinal study were made based on issues arising from the pilot study. The implications are summarised at the end of this chapter.

Specific points of the investigation documented below are:

1. The way of introducing the two semi-structured contexts of book sharing and toy play: self-select or fixed order.
2. The adequacy of the material used in the contexts of book sharing and toy play to elicit verbal and non-verbal behaviours in the child and the mother.
3. The length of the observation required to elicit an adequate quantity of communicative acts.
4. The feasibility of the application of the coding systems to Japanese-speaking dyads.
5. An outline of the developmental features of children of different ages.

4.2 Participants and procedures

A demographically stable suburban area was chosen for recruiting the participants for the longitudinal study as well as the pilot study. The place where both studies were carried out is in a small town in the Kansai district of Japan². The initial contact for the recruitment of participants was made with the council health authority and a family centre where mother and toddler groups are run weekly. This family centre is run by the council and is open to all residents in this area. Mothers normally take their child to this centre to socialise with other mothers and children. More than 20 mothers and toddlers aged one to four years old participate in the group activities there at any one time. Although there are two qualified early years teachers, who play facilitating roles in this centre, the mothers maintain their caregiving roles during their participation in the group activities. The mothers who participate in the groups at this centre are all full time carers for their children and are normally self-selected to participate in the group activity.

Children who were 10 to 28 months of age and their mothers were recruited at this family centre. Sixteen mother and child dyads participated in this pilot study. Seven of the children were male and nine were female. All of the participants lived locally. They were all native speakers of Japanese.

Each mother-child dyad was contacted individually during their free-play time; each mother was asked to consider her child's state of mind on the day, and the observation was carried out only when the mother and her child were ready to play together. Once a mother and child dyad agreed to participate, they were invited to the smaller playroom where the video camera was set up. They were instructed to play in

² The pilot study was carried out in 2001, 9 months prior to the longitudinal study that started in 2002.

the room as they might do at home. If the child was distracted from playing or not willing to play in the room, they were allowed to terminate the session and leave the room. For recording, a camcorder (Sony digital handycam, DCR-TRV20, for NTSC) was set on a tripod on a table (recording from a height of approx 1.8 m) in the corner of the room. Recording started when a dyad settled in the room, which was usually approximately one minute after they came into the room. The researcher started the recording by using a remote control, so that the dyad was not distracted. Once the recording had started the researcher left the room, so that the dyad could interact without any distractions from the presence of an observer. The length of recording varied, depending on the child's state of mind on the day. All recording sessions were no less than 12 minutes: approximately 6 minutes for book reading and 6 minutes for the toy play session. 13 mother and child dyads out of 16 were available for the second observational session carried out a week later; the second observations were planned to enable these participants to become familiarised with the observational context.

4.2.1 The materials prepared for the interaction

The toys and books were prepared for use in the dyadic interactions during the observation. In detail, these toys and books are listed below.

Toys: (mainly plastic) cups & saucers, spoons, forks, plates, tea pot, miniature fruits & vegetables, bath tub, miniature hair brush, washcloth, soap, toy chair and stuffed animals (e.g. bear and rabbit); watering can, planting pots, shovel, toy car; towel; toy telephone and glove puppet.

Picture books: Miffy, Disney vroom vroom vehicles, Disney baby friends, Zoo, Good

morning Teddy Bear, Peek-a-boo, Vehicles, Baby's picture word book, Boek zonder woorden.

4.2.2 Parental interview

After the observation, each mother was asked how she felt about the fact that their interaction was recorded and how she felt about the context, such as the types of toys and books, and the setting for her child to play. These were followed by more general questions regarding the child's play and language development in everyday life, types of favourite play at home and any particular verbal or non-verbal behaviour related to playful interaction. The feedback given by the mothers was written down in field notes after this short interview.

4.2.3 Transcription

Following the observation, the recorded tapes were reviewed many times. Throughout this review, a brief written description was made about what the mothers and their children did in their interaction, in order to identify any features of the context, which might have influenced their interactions. These records were kept with the field notes.

Recorded videotapes were transcribed in CHAT formats. Transcriptions included each speaker's utterances and any action concurrent with or without an utterance. Salient contextual information was recorded as separate entries in the transcription format. Any words that had a clear meaning or were close to the adult word were transcribed as utterances, otherwise were coded separately using a phonemic format. Utterance boundaries were based on turn, intonation contour and pause. Transcripts were checked for adherence to the transcription conventions using the

automatic checking facility of CHILDES during the transcribing process. More detail on the transcription format is in Appendix 2.

4.2.4 Coding of communicative acts

A separate coding was made for verbal and gestural communicative acts. The communicative acts expressed verbally included interpretable utterances and vocalisations, and were coded using INCA-A (Ninio *et al.*, 1994); communicative gestures were coded using the gesture coding system developed for the purpose of this study. Verbal communicative acts that had uninterpretable functions were coded YYY or YY at Interchange and Speech Act level, respectively. When an utterance was accompanied by a gesture, both INCA-A and the gestural coding systems were applied respectively. The CLAN programme generated lists of the types of communicative acts used by each speaker and their corresponding frequencies.

4.3 Consideration of contexts

In order to examine whether the way in which the semi-structured contexts were introduced to the dyads affected their interaction, it was planned that three dyads experience a context mixing of book sharing and toy play, whereas other dyads experience two discrete contexts. The exact procedures for different introductions of the context to the participants were: for the first three dyads, the books and toys were placed together, from the onset of the observation; and the other thirteen dyads experienced the context for sharing books, followed by the context for toy play in which a box of toys was brought into the room by the researcher. The reverse order was not

examined, because some studies have reported that children did not focus on the book-sharing activity once they had experienced toy play (e.g. Choi, 2000).

The three dyads who were introduced to books and toys together played with the toys but did not engage in the activity of book-sharing. One mother of a 12-month-old child commented that she did not try to read to her child because the child was too young to understand books. The other two dyads continued to play with the toys throughout the observation and showed little interest in the books. On the other hand, ten out of thirteen dyads who experienced the two discrete contexts considerably engaged in a book-sharing activity. This suggested that the two contexts needed to be introduced separately. The ages of the children who showed little interest in the book-sharing were 10 months, 11 months and 21 months old. The mothers of the younger children reported particular difficulty in interacting with their children because the child's understanding of language was limited. Although a few young children did not engage in joint book-sharing, other young children engaged in interactions such as turning pages and playing peek-a-boo with the books. Mothers appeared to find the book-sharing activity less appropriate for young children. Therefore it was necessary to prepare a wider range of activity books that would enable young children to be involved in some book-related activities without their mothers finding it hard to interest them in books at a young age.

As for the toys, the mothers felt that their children recognised most of the toys, and they were similar to the ones that they had in their own homes. Most of the toys available were used by the children and mothers during their interactions, though some of the toys that usually elicit symbolic play seemed to be too sophisticated for the youngest child to use. However, they were considered to be appropriate for children during the second year.

4.4 Frequency of communicative acts

From the 16 mother and child dyads, the following analyses were made on the data of the 10 dyads who completed both the book-sharing activity and the toy play activity.

The other dyads were eliminated from the pilot data analyses because the data did not elicit enough book-sharing behaviour, and this made those data less comparable to the data for the other 10 dyads (age: 11 to 28 months, four boys and six girls).

4.4.1 Sample size in relation to the length of observation and the contexts

In order to determine the optimal length of observation in terms of the quantity of communicative acts, two types of comparisons were carried out on the frequency and number of types of communicative acts: 1) at different lengths of sampling time and 2) in different contexts. Table 4.1 presents the means and standard deviations of the frequency of communicative acts produced by children and mothers.

Table 4.1 Mean and standard deviation of frequency of communicative acts

Sampling condition	Children				Mothers			
	Frequency/min		N of types		Frequency/min		N of types	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
4 minutes	5.68	4.16	9.6	5.7	19.6	5.74	25.1	7.2
8 minutes	5.96	3.98	16.4	10.1	19.7	5.88	38.7	11.7
Book sharing	7.65	4.80	10.4	6.5	21.8	6.30	25.6	6.8
Toy play	4.25	3.87	9.6	7.1	17.4	6.07	23.9	9.2

The frequencies of the communicative acts were compared for the observation of the 4-minute and the 8-minute samples. Wilcoxon Signed Ranks Tests indicate that there were no differences between the duration of the observations: $z=.77$, ns, for children and $z=.20$, ns, for mothers. However, there were significant differences in the

numbers of different types of communicative acts between the two sets of data: $z=2.68$, $p<.01$ for the children's data, $z=2.81$, $p<.01$ for the mothers' data.

When the type-token ratio (number of different types/total frequency of communicative acts) was calculated, it was found that the ratio was dependent on the number of samples. In the mothers' figures, as the sample size increased the type-token ratio decreased. The wide variation according to sample size indicates that these indices do not show any stable quantitative values. The sampling size has an effect on certain measures. Commonly used measures, such as the MLU and lexical diversity measures (Richards, 1987) have used a minimum of 50 to 100 utterances. In the light of this criterion, on average a duration of 10 minutes would be necessary to elicit sufficient communicative acts. In the pilot study, the younger children produced far fewer communicative acts, particularly those expressed verbally, than older children. Younger children produced between 2.5 and 4.0 communicative acts per minute. This suggested that a total of 20 minutes of observation would be necessary.

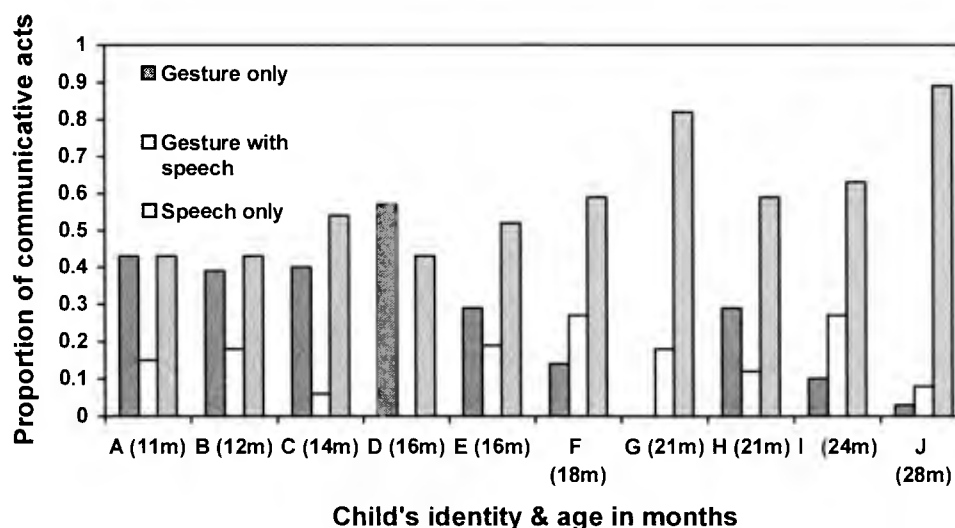
There were significant differences in the frequency of communicative acts between the two contexts for both children and mothers: $z= 2.19$, $p<.05$, $z= 2.40$, $p<.05$ respectively. No differences were found in the numbers of different types of communicative acts: $z=.26$, ns, for the children and $z=.89$, ns, for the mothers. In summary, these pilot analyses suggested that the frequency measures were influenced by the context, whereas the number of different types of communicative acts was influenced by the total duration of the sampling.

4.5 Communicative acts produced by children of different ages

This section describes developmentally different features of child and mother interaction in different age groups based on the data from 8 minutes of recording from each mother and child dyad. Because the length of observation varied across the dyads in the pilot study, 8 minutes of recording was the longest common length of observation across dyads.

4.5.1 Transition in the mode of communicative acts

The transition from pre-verbal to verbal communication was described comparing the proportions of different types of communicative modes: gesture only, gesture with speech and speech including vocalisation only (Figure 4.1). Younger children appeared to use a substantial amount of gesture for expressing their intents, whereas older children came to use more speech for expressing these. Gestures accompanied by speech were found in most of the children, even in the very youngest. Gesture accompanied by speech seems to exist throughout early language development, and communicative speech and gesture combinations may set the stage for the next phase of language development, the emergence of two-word combinations (Butcher & Goldin-Meadows, 2000). If so, a close examination of this type of communicative act will contribute to the understanding of how the communicative and syntactic aspects of young children's development are bridged.

Figure 4.1 Proportion of communicative acts using the different communicative modes

4.5.2 Variation of communicative gestures

The types of communicative gestures and their frequency were examined. Table 4.2 summarises the frequency of communicative gestures in the six categories. Each category of children's communicative gestures was further subdivided into two types: communicative gesture only (GO) and communicative gesture accompanied by speech or vocalisation (GS).

Table 4.2 Communicative gestures produced with (GS) and without speech (GO)

ID	RO		EO		PO		SR		SW		OO	
	GO	GS	GO	GS	GO	GS	GO	GS	GO	GS	GO	GS
A (11m)	1	4	1				10				4	1
B (12m)				1		1		1			3	
C (14m)	3	2			2							1
D (16m)							2				5	
E (16m)	1	1	1	1	4	8			1			
F (18m)		3	1	3		10	1	1			1	1
G (21m)										2		
H (21m)					2	2	1	2		2		
I (24m)				9		1	3					
J (28m)				2		4			1			

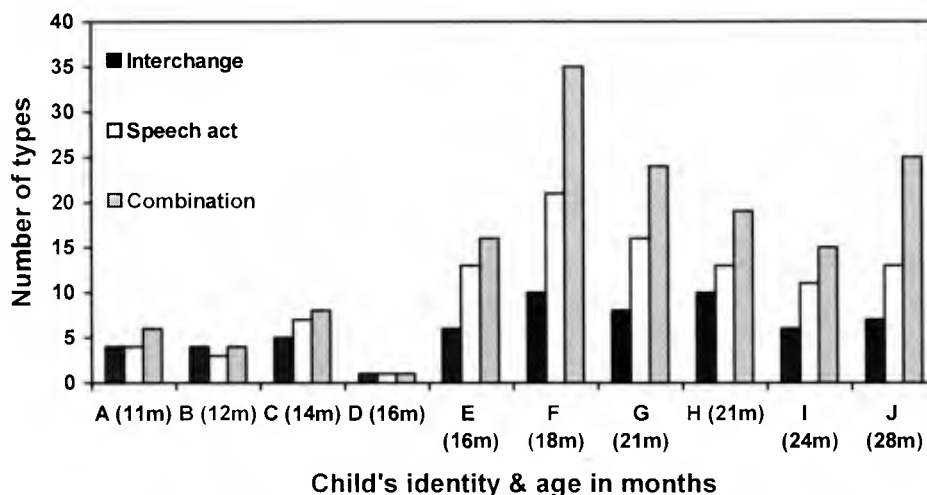
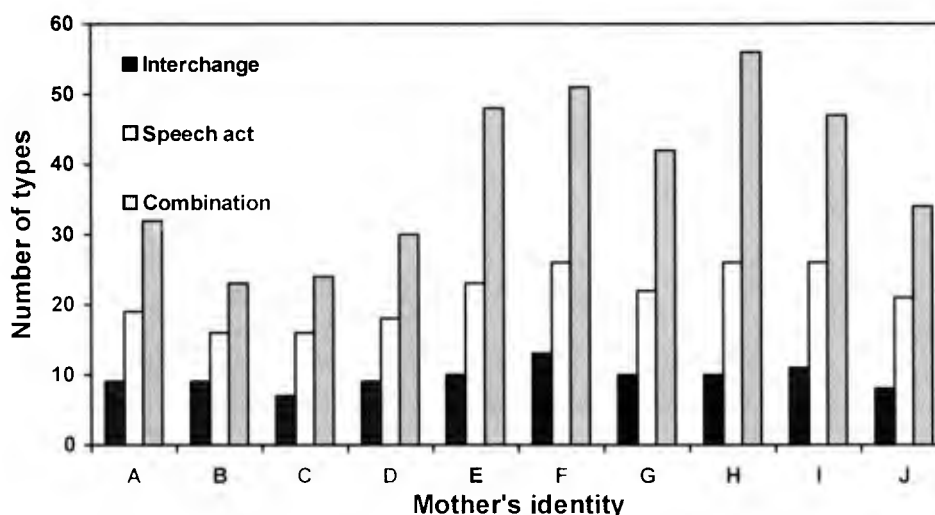
RO: reaching for an object; EO: showing or extending an object to adult; PO: pointing; SR: social routine (incl. routine game); SW: symbolic gesture without object; OO: other communicative gesture such as nodding for "yes".

The type of communicative gesture appeared to vary according to the age of the child. Extending an object (EO) and reaching for an object (RO) were observed even in the youngest children; this is in line with the literature on pre-verbal communication (e.g. Volterra and Erting, 1990). The older children used gestures such as extending to an object in combination with speech. This trend is also found with the pointing gesture. The number of communicative gestures produced in 8 minutes of interaction was relatively small, though there were some indications that it reflected developmental changes.

4.5.3 Variations in verbal communicative acts at different levels of measurements

Variations in the communicative acts expressed by speech were examined according to the different types of communicative acts coded at the levels of Interchange and Speech Act as well as the different combinations of Interchange and Speech Act.

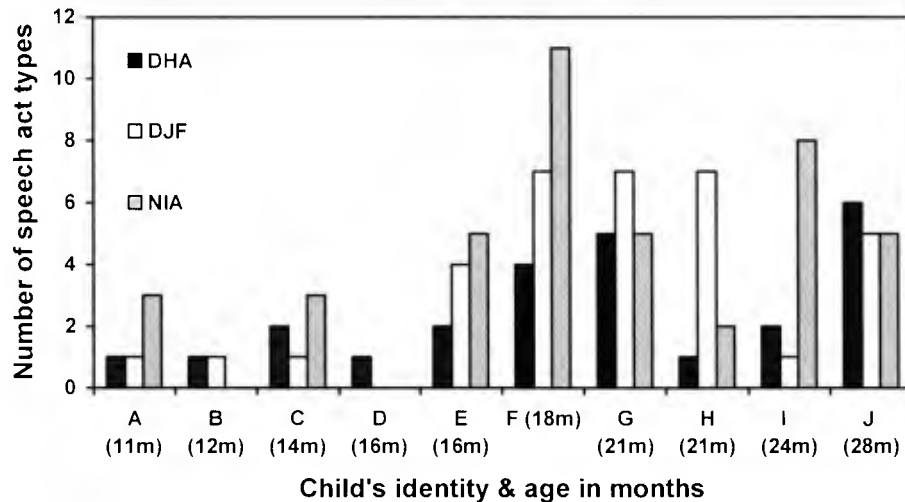
Figure 4.2 and Figure 4.3 present the numbers of different types of verbal communicative act expressed by each individual.

Figure 4.2 Variations in the types of verbal communicative acts: children**Figure 4.3** Variations in types of verbal communicative acts: mothers

The children's data showed age-related differences on the three measures, in particular, Speech Act and Interchange-Speech Act combinations. Figure 4.4 describes the number of different speech act types within the major Interchange categories. Three categories, *Directing Hearer's Attention* (DHA), *Discussing Joint Focus* (DJF) and *Negotiating the Immediate Activity* (NIA) were used by all the children. The older children seemed to exhibit many more different types of speech acts to

express their intentions. Although, younger children's speech acts were dominated by the uninterpretable category, they used communicative gestures within those Interchanges.

Figure 4.4 *Variety of Speech Acts used within main Interchanges*



As for the details of Interchange types in which children engaged, there were some common types of Interchange across the children of different ages. In addition to the major Interchanges such as *Directing Hearer's Attention* (DHA), *Discussing Joint Focus* (DJF) and *Negotiating the Immediate Activity* (NIA), *Performing Verbal Moves in an Activity* (PRO), was used by all the children. This category included interactive game, peek-a-boo. Only older children engaged in the categories of *Discussing the Non-Present* (DNP), *Discussing the Related-to-Present* (DRP) and *Discussing the Fantasy World* (DFW). This result is in line with Snow *et al.* (1996) in that early communicative attempts appeared to occur in limited sets of communicative interchanges, whereas older children became engaged in broader aspects of communicative interchanges. The Interchange, *Performing Verbal Moves in an Activity* occurred in most of the dyads' interaction. This indicates that, as Bruner (1983b) explains, this format appears to be potentially significant for plausible

communicative exchange to occur between mother and child. The older children's engagements in the categories of *Discussing the Non-Present* (DNP), *Discussing the Related-to-Present* (DRP) and *Discussing the Fantasy World* (DFW) may be an indication of children's growing ability to represent past events and relate them to the present.

On the other hand, there was less variation in the number of mothers' Interchange types according to the child's age (see Figure 4.3). A possible variation related to the child's age was found in the mothers' Interchange-Speech Act combinations. Mothers of the older children seemed to use a wider variety of combinations in order to communicate with their child, which led to them showing more communicative acts than the mothers of younger children. Given the limited number of participants, this result may have a chance finding. However, on the theoretical ground, this result is plausible because their interactive contexts become more sophisticated as children develop, which in turn necessitates the use of more elaborate expressions by mothers to facilitate interactions with their children.

4.6 Implications of the pilot study

This pilot study has investigated the conditions for dyadic interaction under two types of semi-structured contexts; the length of observation that generates sufficient communicative acts; and some trends in communicative acts relative to the children's age. For the contextual effects on communicative behaviours, the results suggest that the two types of semi-structured contexts (book-sharing and toy play) appeared to be different in terms of their propensity to elicit communicative acts. The frequency of communicative acts differed significantly between the contexts. This confirmed

previous studies (Choi, 2000; Zinober and Martlew, 1985). The numbers of types of communicative acts appeared to be dependent on the duration of the observation. In order to meet some criteria given in the literature (Brown, 1973; Richards, 1987), the frequency of communicative acts per minute was examined. This led to the decision to use 20 minutes as the duration of the observation for the main study. While the interactions in semi-structured contexts may have constrained the types of behaviours shown, these constraints were considered essential for systematic analyses, particularly comparing verbal and non-verbal behaviour across different points in time as well as across individual dyads. Therefore it is possible to argue that the contexts used in this pilot study provide a perfect balance, compared with naturalistic observations that are entirely idiopathic.

Secondly, for observational procedures, the participants' reaction to the observation is of particular concern. The interviews and review of the video recording did not show any problems in this respect that might have distorted the dyads' natural behaviours. Nevertheless, failing to obtain sufficient book-sharing behaviours from three dyads, despite offering a discrete book sharing context, indicated that further improvements were needed to initiate a mother and child dyad into the book-sharing context. This need also relates to the materials used in the contexts. Specifically, the selection of books needed further consideration, to include activity-related books so that young children could enjoy the book-sharing activity.

Finally, adopting an existing coding system of communicative acts, INCA-A, seemed to depict developmental features in terms of types of communicative acts at social interchange and utterance level. Though this pilot was based on a very small-scale cross-sectional study, the coding system enabled the analysis to capture the age-related features of children's verbal communicative acts. This indicates that this

coding system is sufficiently serving to capture an individual child's development of communicative acts across time. Further, the gestural coding system that was developed for the purpose of this study also appeared to be able to capture very young children's communicative acts before they can be expressed verbally. A combination of these coding systems covered both verbal and non-verbal communicative acts. The results brought about a fuller picture of development in communicative acts in terms of the expression of specific intents and modalities. In the main study, these two aspects of communicative acts were examined closely. It is possible that children's progress in the use of different modalities, gestures, speech and a combination of gestures and speech, provides important information for the development of the expression of communicative intents. Moreover, examinations in the use of different modalities could provide an opportunity to identify relationships between these, particularly one between a gesture-speech combination and an emergence of two-word speech, as indicated in Butcher and Goldin-Meadow (2000). Such results could support developmental continuity of gesture and linguistic aspects of communicative acts.

Children's ability to express communicative intents in relation to their ability to manage the attentional process is of interest. It is likely that joint attentional episodes expand to include a wider range of interactions as competence in expressing communicative intents increases. Although many studies (e.g. Tomasello & Todd, 1983; Tomasello & Farrar, 1986; Harris, 1992) point out the importance of joint attentional processes in the interaction between mother and child, little attention was given to discover how these processes changes as a child develops. Given the child's social cognitive development in terms of understanding the other's intention, their growing ability to understand pragmatic cues enables them be in tune with what the mother initiates. Thus, developmental features within an individual dyad, particularly

how a child changes in terms of managing his or her attentional focus, are examined in relation to the development of communicative acts in the main study.

Chapter 5

Outline of the Study

This chapter contains an outline of the study. This includes the recruitment of participants, the procedure for carrying out the longitudinal observations, and the process of the data analyses for the study of communicative acts and joint attentional engagements.

5.1 Data collection

5.1.1 Recruitment of participants

The family centre used in the pilot study was contacted for the longitudinal study. The initial selection of participants for this study was made from the lists of participants in the mother and toddler groups, on the basis of the approximate target age range of this study and the medical history of the children. Mothers selected from the lists were contacted individually and given a basic outline of the study, including the procedures for longitudinal observations. Mothers' intentions to participate in the study were confirmed in a written form once they had agreed to participate. All mother-child dyads with whom initial contacts were made agreed to participate in the study.

5.1.2 Participants

The participants were 10 mother-child dyads, recruited from the mother and toddler group. Children were at beginning of their second year and no developmental problems had been identified in a series of routine post-natal check-ups. Mothers were all full-time caregivers of the children, and their first language was Japanese. The 10

children (3 girls, 7 boys) were aged between 12 and 15 months at the beginning of the study, and none of them was first born. Background information for the children is summarised in Table 5.1.

Table 5.1 *Information on participant*

Child's ID	Birth order	Sex	Ages observed (age in months)	No. of sessions observed
A	Second born	girl	12.0 to 22.6	11
B	Third born	boy	13.0 to 23.6	12
C	Third born	boy	13.7 to 24.3	11
D	Second born	boy	13.4 to 24.2	12
E	Second born	boy	13.6 to 24.9	11
F	Second born	boy	14.1 to 24.3	11
G	Second born	girl	14.4 to 25.2	12
H	Second born	boy	15.8 to 26.3	11
I	Second born	girl	12.0 to 23.0	12
J	Third born	boy	13.7 to 23.4	11

The slightly older child, H, was included because he had not produced many intelligible words at the time of the initial contact. There was no attrition in this study. However, constraints due to child illness, family holidays and the timing of the initial observations for each dyad affected the total number of observation sessions for each dyad.

5.1.3 Observation procedure

Recording of the interactions took place at the family centre. Each mother-child dyad was invited into the room where picture books were arranged for the book-sharing activity. For the first few sessions, a few minutes for a warm-up period were allowed, so that recoding started only when the dyad had settled into the context. As expected from the pilot study, after a few sessions they all became familiar with the context; therefore, no warm-up period was considered necessary thereafter. Once recording started, the researcher left the room so that the dyad could interact without any distractions from the presence of an observer. After 10 minutes of interaction, a box of

toys was brought into the room and they were instructed to play with these toys for another 10 minutes. Each recording session lasted approximately 20 minutes. However, the length of interaction varied for some sessions, particularly when a child wanted to move to the main playroom having enjoyed playing with the given toys available, or if a child became upset by some accident such as falling over during play.

The picture books used in the book-sharing context contained few words; some were designed to elicit play-like activities, such as placing picture stickers within a context. These books were added to the initial selection used in the pilot study, replacing the books that had not been used by the children in the pilot study. A total of 10 picture books was available to each dyad, so that they could continue to interact in the book-sharing context lasting for 10 minutes. For the toy play context, the same toys as for the pilot study were used because there were no identifiable problems in the selection of toys (for details of the material, see Chapter 4 for toys and Appendix 3 for the list of books).

Some recording sessions had to take place in participants' homes because of maintenance work at the family centre. However, the same books and toys were used in their sessions, and there were no identifiable differences in their behaviours. The video-recording device used in the study was the same as in the pilot study, with a few minor alternations: a conversion lens was attached in order to capture a wider area of the room; the camera was set up at lower point (1.2 metre height) than in the pilot study, to record sound better; and the location of the camera was changed according to the incoming light from the window.

After the recording session, each mother was interviewed for 5 to 10 minutes on her child's recent noticeable changes in everyday interaction with the mother and other family members. This interview was also audio-recorded, so that the parental

reports could be used to assist the interpretations of the child's verbal and non-verbal behaviour as well as in understanding the way the mother interacted with her child at a particular age.

5.2 Transcription

Video tapes were transcribed onto computer files and formatted in accordance with the transcription convention CHAT of CHILDES (MacWhinney, 2000). All utterances and overt actions by each participant and any environmental cues related to their behaviour were transcribed. Utterance boundaries were based on turn, intonation contour and pause. Transcripts were first checked for adherence to the transcription conventions, using the automatic checking facility of CHILDES during the transcribing process. The second check was made when each utterance was coded for the communicative acts. Unintelligible utterances were marked following the transcription convention, but some strings of words in these utterances were transcribed where intelligible.

5.3 Analysis of communicative acts

5.3.1 Coding communicative acts

Verbal communicative acts, which included both vocalisation and speech proper, were coded using the Inventory of Communicative Acts-Abridged (INCA-A) (Ninio *et. al.*, 1994). A full description of the categories is provided in Appendix 1. Similarly, the communicative intents expressed by gestures were coded using a supplemental system devised for the coding of gesture (detail discussion for definition and criteria of

communicative acts are given in Chapter 3 and Appendix 1 for coding systems).

Coding of communicative acts in the form of the speech and gesture domains inherently makes for the differentiation of communicative modes: gesture, speech and a combination of gesture and speech. In the speech domain, where communicative acts were coded on INCA-A, uninterpretable utterances were coded as vocalisation. Thus this study differentiated five types of mode of communicative acts derived from the following mode or combination of modes: 1) speech, including any adult form of language; baby talk (e.g. *bubu*, equivalent to *vroomvroom* in English); and phonetically constant forms whose function is clear in the communication; 2) vocalisation including phonetically constant forms in which their functions are not identifiable; 3) speech-gesture; 4) speech-vocalisation; and 5) gesture only. When the communicative intents were expressed by a combination of different modes, e.g. gesture-speech or gesture-vocalisation, both types of coding outlined above were applied. Unintelligible utterances were eliminated from the analyses.

5.3.2 Reliability

Coding was done by the main researcher for all the collected videotapes. A second coder, who was trained to use the coding system, coded 8 % of the entire sets of videotapes, sampled randomly from the collection for each dyad at two different age ranges: from 12 to 18 months and from 19 to 24 months. Inter-rater reliability was calculated, based on agreements on coding at an utterance-by-utterance basis. The mean percentage of agreements was 84% for the Interchange level and 89% for the Speech Act level.

5.3.3 Measurements in analysis of communicative acts

The measures used in the analyses of communicative acts are summarised below.

The most fundamental level of measurement is the communicative mode: one of the five types of modes described above was used to represent each communicative act.

This measure was used to chart the growth of the children's communicative competence in using different mediums. The measure produced a link between the different stages of linguistic competence: pre-linguistic and linguistic.

The coding of communicative acts expressed by speech as well as vocalisation generated the following measures: types of Interchange, Speech Act, and Pragmatic Flexibility which was derived from the combination of Interchange and Speech Act, and their corresponding frequencies. The number of different types at the levels of Interchange, Speech Act, and Pragmatic Flexibility was used to represent the variety of communicative acts at each level.

The coding of communicative acts expressed by gesture also generated three levels, but slightly different measures: types of Interchange, gesture and a combination of Interchange and gesture, and their corresponding frequencies. Communicative gestures were coded only for the children's data.

The count of the number of different types as well as the frequency of each category was made through computation using the CLAN programme.

5.4 Analysis of joint attention

5.4.1 Coding children's engagements

Children's joint attentional engagements, as well as the other five categories of engagements: passive joint, objects, onlooking, persons, unengaged, were identified

using the coding system adapted from Bakeman & Adamson (1984). Details of the coding criteria are described in Chapter 3. The series of interactions was examined second by second to code behaviour into one of the six categories of engagement. Each joint attentional episode was further examined in the light of its initiation. Initiations fell into four types: mother's supportive, mother's directive, child's supportive and child's directive. The duration of the observations varied slightly around the target duration of 20 minutes for each session. Where necessary, exclusion of the off-camera periods from the total duration created further variations in their duration. Therefore all variables concerned with the time duration were proportionalised according to the total duration of the observation on which coding was based.

5.4.2 Reliability

Coding of the states of engagement was done by the first coder for all the data sets; the second coder coded the randomly selected sample of videotapes from the collection for each dyad, consisting of 10 % of the entire set of videotapes. The agreements for each category were based on each second rather than each episode, because duration was used as the dependent variable. The mean percentage of agreements was 86%.

5.4.3 Measurements in analysis of joint attention

Coding of engagements second by second generated a continuous duration of each engagement type, which refers to an episode. The time spent in each type of engagement was totalled for each session. Thus this coding generated the respective duration of the six types of engagements. In addition, joint attentional episodes were

grouped depending on the type of initiation of the episode. The total duration of each type of joint attentional episode was generated.

Chapter 6

Development in Expressing Communicative Intents

This chapter explores the children's development in expressing their communicative intents. There are two main analyses of communicative acts. The communicative acts during the transition from pre-linguistic to linguistic communication were first examined from the aspect of communication mode. This analysis permitted individual children's profiles to be generated in terms of their use of different communicative modes in relation to their ages. The second analysis aimed to show developmental pictures for the emergence of different types of communicative act in the form of speech as well as gesture. The main questions in this chapter are: 1) What kind of developmental trajectory is found in the children's communicative mode during the transition from pre-linguistic to linguistic communication? What kind of common pattern and individual differences are found in their development? 2) What kinds of communicative gestures are commonly used? Are there any developmental changes in the way such gestures were used during the second year, particularly in relation to the emergence of syntax? 3) What category of verbal communicative acts is used, at which ages? Are there any commonalities and differences in the emergence of verbal-communicative acts?

6.1 Developmental changes in different modes of communicative acts

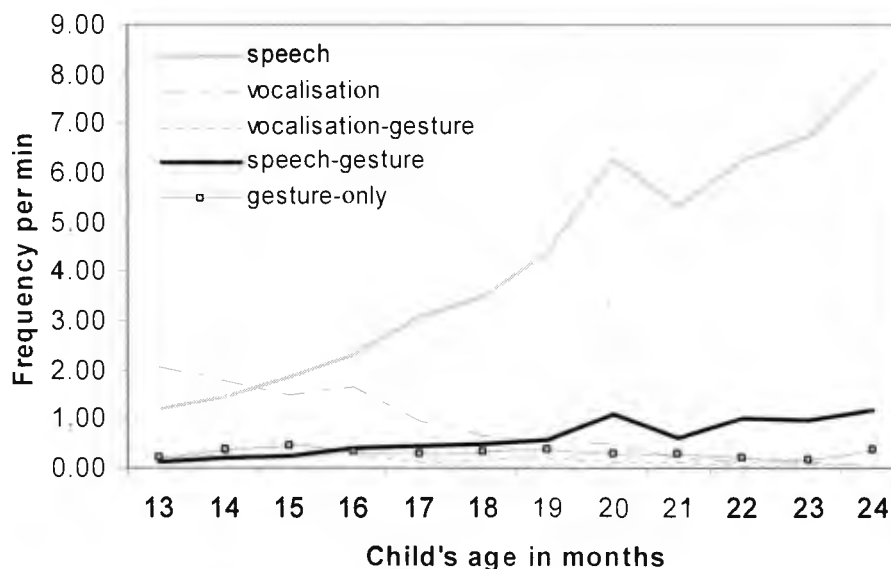
The developmental trends in the mode of children's communicative acts were examined. The communication modes, such as speech and gesture, were further differentiated into the five categories: 'speech', 'vocalisation', 'vocalisation accompanied by gesture',

'speech accompanied by gesture' and 'gesture only'. Table 6.2 summarises the descriptive measures for the different modes of communicative acts. The mean frequency as a function of age is presented in Figure 6.1.

Table 6.2 *Frequency of communicative acts produced in different modes (frequency per min)*

Age months	N	Speech		Vocalisation		Vocalisation-gesture		Speech-gesture		Gesture only	
		M	SD	M	SD	M	SD	M	SD	M	SD
13	6	1.20	0.79	2.06	1.21	0.19	0.13	0.13	0.16	0.22	0.12
14	9	1.45	1.65	1.78	0.97	0.30	0.24	0.21	0.25	0.33	0.23
15	9	1.86	1.21	1.49	1.18	0.21	0.17	0.25	0.26	0.43	0.21
16	9	2.33	2.04	1.66	0.70	0.28	0.22	0.40	0.51	0.33	0.22
17	10	3.09	2.18	0.97	0.52	0.14	0.15	0.45	0.36	0.30	0.28
18	10	3.50	2.99	0.64	0.65	0.16	0.30	0.47	0.29	0.33	0.44
19	9	4.36	2.62	0.53	0.54	0.20	0.39	0.57	0.18	0.37	0.43
20	10	6.30	3.39	0.48	0.36	0.10	0.24	1.09	0.52	0.30	0.25
21	10	5.32	2.17	0.22	0.34	0.11	0.24	0.59	0.32	0.27	0.26
22	10	6.23	2.13	0.13	0.23	0.06	0.11	1.00	0.78	0.22	0.21
23	10	6.72	1.97	0.14	0.41	0.08	0.23	0.96	0.54	0.14	0.18
24	7	8.05	2.54	0.05	0.08	0.03	0.06	1.17	0.56	0.38	0.52

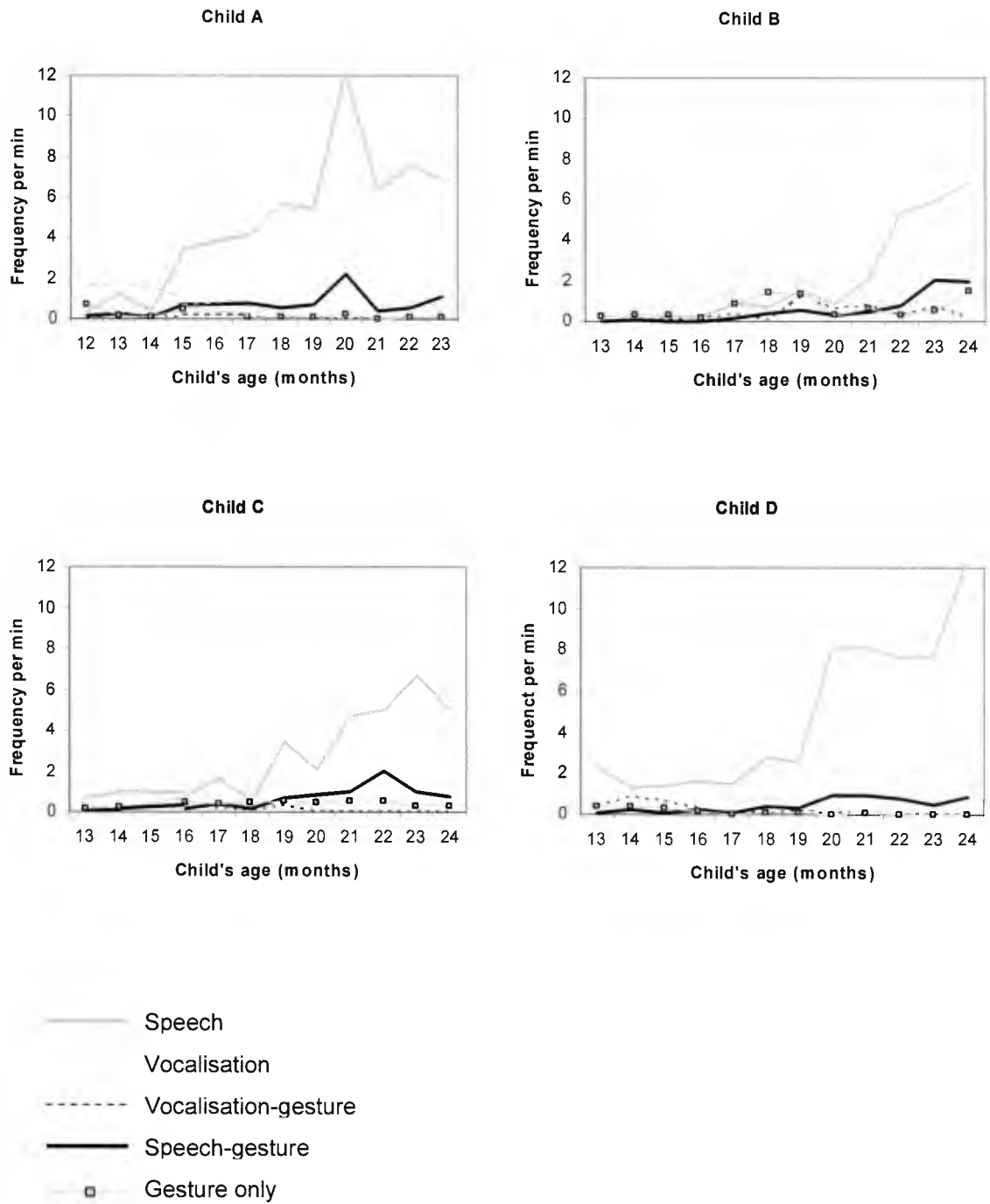
Figure 6.1 *Mean frequency of different communicative modes as a function of age*



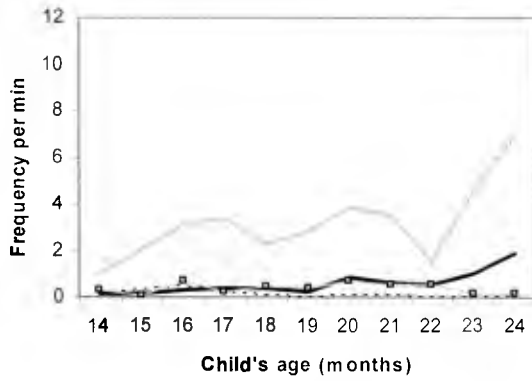
During the first few months of the second year, vocalisation was used most frequently in the children's communicative acts. However, speech soon became dominant among

the five communicative modes and showed a steady increase during the second year. For gestural communicative acts, although the frequency of use was smaller than that of verbal communicative acts, there were some trends; the use of vocalisation-gesture decreased, and that of speech-gesture increased with age. These trends, based on the mean data, provide only limited insights into developmental trends. Individual differences were apparent between the children at each point in time; individual trajectories were further examined, and are presented in Figure 6.2.

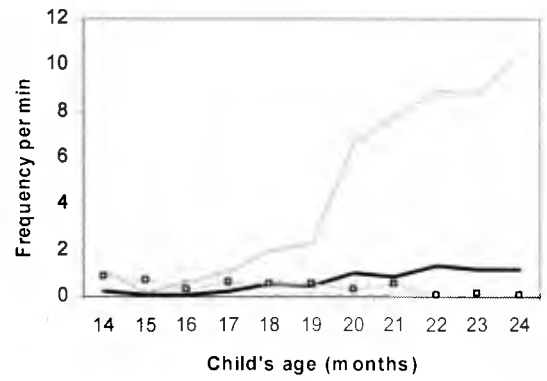
Figure 6.2 Development of different communicative modes in each child



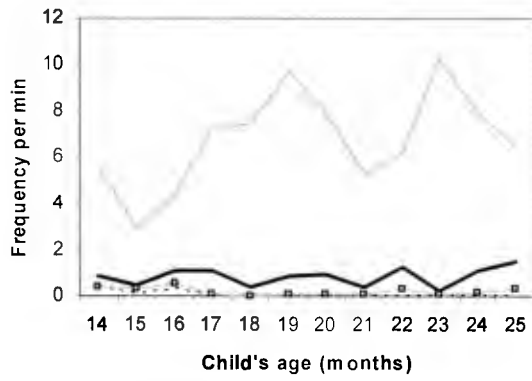
Child E



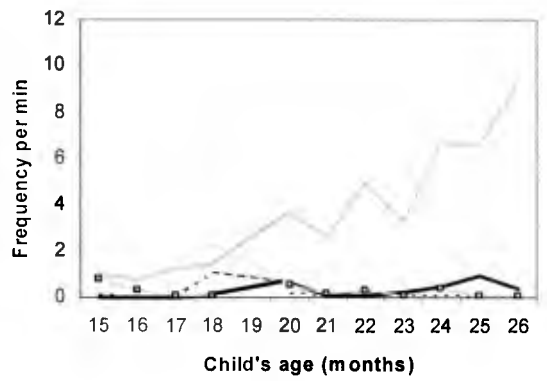
Child F



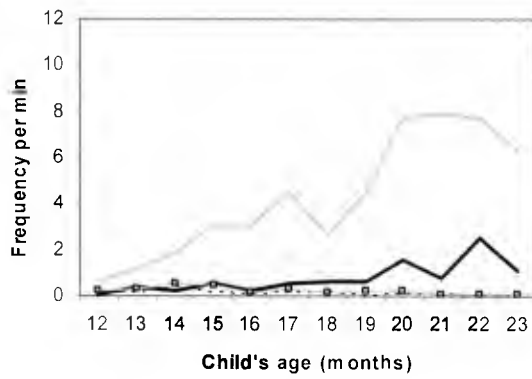
Child G



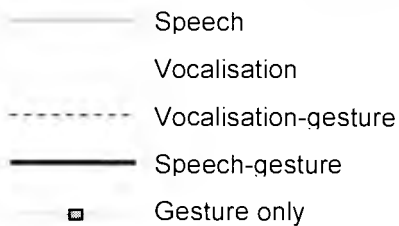
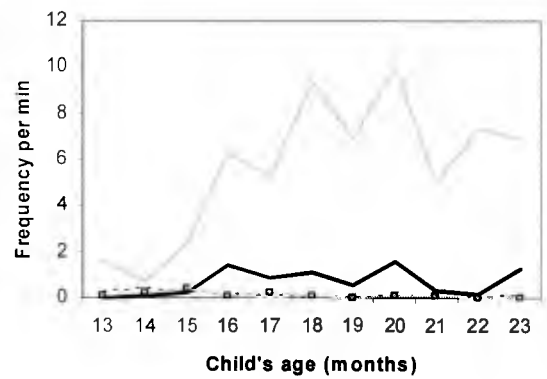
Child H



Child I



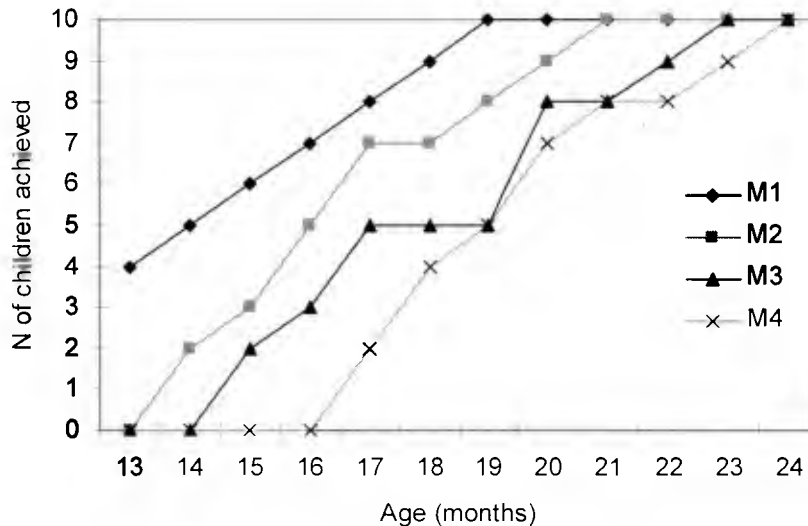
Child J



The trend of a decrease in vocalisation and an increase in speech was observed during the second year in all children, except Child G, who had already demonstrated substantial amounts of communicative acts by speech at 14 months. For Child G, it is only possible to speculate that the transition from vocalisation to speech happened very early in the second year or even earlier. Although the proportional frequency was small, there appeared to be another trend in the combination of speech and gesture, in that it started to increase along with speech once a child's speech dominated the totality of communicative acts.

In order to investigate the transition between these different modes closely, each communicative mode was examined relative to the total number of communicative acts used at each point in time. This proportional data provides a clearer picture of the changes in children's communicative modes than the frequency data. The four milestones, which derived from the proportional changes in different communicative modes, were identified: M1) gesture with vocalization or speech became dominant in the gesture domain; M2) speech dominated all modes of communication; M3) gesture with speech dominated the gesture domain; and M4) the emergence of syntax, which was when two-word utterances were first observed. These four milestones were ascertained for each individual child and the trajectories are presented in Appendix 4. Figure 6.3 presents the summary of children's achievements of the four milestones in terms of the cumulative number of children achieving each milestone.

Figure 6.3 Cumulative numbers of children that achieved each milestone at each age in months



The concordance of order in these four milestones was tested using Kendall's coefficient of concordance. The result shows that there is a significant level of concordance in the order of these milestones: $df=3$, $\chi^2=16.27$, $p<.001$. However, as seen in Figure 6.3, there were individual differences in the speed of achieving each milestone. Amongst the four milestones, M3, where children started to produce more speech-gesture combinations than vocalisation-gesture and gesture only, and M4, where two-word utterances emerged, were closely related. Individuals' data suggest that these two milestones were achieved almost simultaneously, with the longest lag being two months. Spearman's correlation coefficient for ranked data indicates that there is a significant association between the ages of achieving M3 and M4: $r_s=.98$, $p<.0001$. Although some children appeared to be late talkers in terms of achieving M2, indicating the use of language proper, all children produced two-word utterances by the end of their second year.

6.2 Communicative intents expressed by gesture

The use of communicative acts involving gesture, as represented by the modes of 1) gesture only; 2) vocalisation-gesture; and 3) speech-gesture, appeared low in frequency relative to verbal communicative acts. However, there was a developmental trend in each mode; vocalisation-speech diminished and speech-gesture increased once a child's speech became dominant. This section examines closely the gesture-related communicative acts.

6.2.1 Deictic and depictive types of gesture

The categories of gesture, pointing to an object (PO); extending an object for showing or giving (EO); reaching for an object (RO); social ritual and routine (SR); symbolic gesture without objects (SW); and other gestures such as nodding and head shaking (OO), were grouped into two types. The deictic type (PO, EO and RO) includes gestures referring to external objects or events; the semantic content of the referent is only accessible within the context in which the gesture is used. The depictive type (SR, SW, OO) includes gestures that by themselves denote the referent, and their meaning is self-contained.

Two distinct gesture types were examined in relation to the mode of communicative acts. Table 6.3 summarises the descriptive measures of frequency based on the totality of gestures used.

Table 6.3 Descriptive measures of frequency of communicative gestures (frequency per min)

Type	Gesture only		Vocalisation-gesture		Speech-gesture	
	M	SD	M	SD	M	SD
Deictic (total)	0.190	0.039	0.124	0.031	0.528	0.048
PO	0.086	0.090	0.067	0.071	0.323	0.062
EO	0.093	0.043	0.049	0.034	0.186	0.128
RO	0.017	0.006	0.009	0.009	0.019	0.015
Depictive (total)	0.106	0.019	0.018	0.004	0.095	0.017
SR	0.049	0.036	0.003	0.004	0.033	0.025
SW	0.018	0.022	0.003	0.004	0.036	0.032
OO	0.039	0.062	0.013	0.011	0.026	0.053

Among the gesture categories, pointing (PO) appeared to be the most frequently used gesture, followed by the extending of objects (EO). Other types of gesture were not used as much as these two categories. Exploratory analyses indicated that there were two outliers in deictic gesture under the gesture-only and vocalisation-gesture modes. These came from the same individual (child B). However, because the homogeneity assumption was satisfied in the Mauchly's test, analyses of variance of the 10 children's data were tested for the following factors: communicative mode (gesture-only, vocalisation-gesture, speech-gesture) × gesture type (deictic, depictive). There were significant differences in both factors: $F(2,18)=27.27, p<.001$ for communicative mode and $F(1,9)=95.54, p<.001$ for gesture type³. There was a significant interaction between communicative mode and gesture type: $F(2,18)=29.6, p<.001$. Unplanned multiple comparisons using paired sample t-tests revealed that the interaction was due to a significant difference of deictic gesture use in the gesture-only and speech-gesture modes, with the reverse of the outcomes for depictive gestures (see Appendix 5 for all test results). Overall, the children used more deictic gestures than depictive gestures in communication during the second year. Deictic gestures were most frequently used in combination with speech, whereas depictive gestures were used equally with and

³ The same tests were carried out on all 10 children and again on 9 children's data sets excluding Child B who had extreme values; both results showed a significant main effect.

without speech. The results seem to reflect the nature of two distinctive gesture types. The rank order of overall frequency of use in the gesture categories are, from the most frequent, PO, EO, SR, OO, SW and RO.

6.2.2 Illustrations of gesture use

The ways in which these gestures were used as precise communicative acts are illustrated according to the types (see Table 6.4 for deictic gesture and Table 6.5 for depictive gesture). For both types of gesture, a transition from gesture-only mode to a combination of speech-gesture was observed. In each table, the transitions are summarised in terms of Interchange type, where a particular communicative gesture was used.

Table 6.4 *Deictic gesture used in different communicative Interchanges*

(* Target gestures are specified in bold italics)

Gesture category	Interchange	Illustration of the use of gesture only	Illustration of the use of speech-gesture
PO	DJF/ DHA (Discussing Joint Focus)/ (Directing Hearer's Attention)	(1) The child turns a page of a book. M: "ara, ofune" [oh, a boat] looking at a picture in the book. C: points at the picture of a boat. M: "so, ofune ne" [yes, that's a boat]. (Child I: 12;00)	(2) The mother and child look at a picture of a car which a man is driving. C: points at a different picture of a car. M: "sore mo bubu dane" [that is a car too]. C: "bubu"[car] points at the picture of a car M: "so, bubu" [yes, that's a car]. (Child I: 17;00)
		(3) The mother and child are looking at a book. C: points at the book then looks at mother. M: "nani kana?" [what are they] looking at child C: opens the book and looks at mother. M: smiling to child (Child B: 13;00)	(4)-1 The mother and child are talking about a picture and a picture sticker in a book. C: "kore" [this] points at a different picture M: "kore wa e" [this is a picture] (Child B: 18;21)
			(4)-2 The mother and child look at pictures in a book. C: "a wanwan" [oh, doggy]. points at the picture of a cow. M: "kore wa wanwan chigau ne, moomoo" [this isn't a doggy, it's a cow]. C: "moomoo" [cow]. M: "un" [that's right]. (Child B: 22;12)
			(4)-3 C: "kore wa?" [what's this?] points at a picture of a tractor. M: "tractor ya" [a tractor]. (Child B: 23;18)
			(6)-1 The child tries to get a ball and fails. C: "tote" [give]. points at the ball. M: picks up the ball and gives it to the child. (Child F: 20;12)
PO	NIA (Negotiating the Immediate Activity)	(5) The mother and child have finished a book and the mother offers another book. M: "hona kondo kore hai" [let's read this book next] holds up another book and shows it to the child. C: glances at a different book and points at it. M: "kore ka?" [this one?] holding up the book which the child pointed to. (child F: 14;03)	

Continues

Gesture category	Interchange	Illustration of the use of gesture only	Illustration of the use of speech-gesture
PO	NIA (Negotiate the Immediate Activity)		<p>(6)-2 The mother and child talk about playing with picture stickers.</p> <p>M: “kore nani suruno yatta?” [how do you do this?] shows a picture sticker to the child. C: “kotchi” [this]. <i>points</i> at a different picture sticker. M: “ee?” [huum?] C: “kotchi” [this]. <i>points</i> at the picture sticker again. (Child F: 21;12)</p> <hr/> <p>(6)-3 The mother and child engage in playing with picture stickers.</p> <p>C: “shitai” [(I) want to do]. <i>points</i> at the picture while the child is looking at the mother. M: “sore wa torehen” [you can’t peel it off]. (Child D: 21;14)</p>
EO	DJF/DHA (Discussing Joint Focus) /(Directing Hearer’s Attention)	<p>(7) The child holds out an apple in a bowl to the mother. The mother pretends to eat the apple.</p> <p>M: “aa oishii” [it is very nice]. C: pretends to eat a strawberry. C: <i>shows</i> the strawberry, then pretend to eat it again. M: “oishii ne” [it is lovely, isn’t it!]. (Child A:15;06)</p>	<p>(8)-1 The mother and child play tea-party.</p> <p>C: “juice, juice” [juice [/] juice]. approaches M <i>showing</i> cups. C: <i>holds up</i> the pot. M: “oishii no ga hairimashita ka?” [have you made something nice?] C: pretends to pour something into the cup. (Child A: 19;24)</p> <hr/> <p>(8)-2 The mother and child play with miniature fruits.</p> <p>C: “kore wa?” [what is this?] <i>showing</i> an apple. M: “ringo” [an apple]. (Child G: 24;03)</p> <hr/> <p>(8)-3 The mother and child play with picture stickers in a book.</p> <p>C: “a!” [oh!] <i>shows</i> a picture sticker to M. M: “a!” [oh!] looks at the picture. M: “koko petapeta tte shiteitte” [put it here]. (Child B: 18;21)</p>
EO	NIA (Negotiating the Immediate Activity)	<p>(9) The child approaches the mother.</p> <p>C: picks up a teapot then <i>holds it out</i> to M M: “ochacha jaa tte tsugou ka?” [shall we pour tea into a cup?] pretends to pour tea into the cup.</p>	<p>(10)-1 The mother and child play at having a tea-party</p> <p>C: “doozo” [here you are]. <i>holds out</i> the cup to M. M: “jaa to shite” [pour tea into the cup, please]. (Child E: 20;00)</p>

Gesture category	Interchange	Illustration of the use of gesture only	Illustration of the use of speech-gesture
EO	NIA (Negotiate the Immediate Activity)		<p>(10)-2 The child finds a rice bowl and picks it up.</p> <p>C: "gohan" [rice]. <i>holds out</i> a rice-bowl to M. M: "hai" [yeah]. M: "gohan?" [(is this) rice ?] M: "arigatou" [thank you]. (Child E: 20;00)</p> <hr/> <p>(10)-3 The child has finished with a book and picks up a different one.</p> <p>C: "mama miyou?" [mummy, shall we read (this)]? <i>gives</i> a book to the mother. M: "miyou [let's look (this)]. (Child F: 24;12)</p>
RO	NIA (Negotiate the Immediate Activity)	<p>(11) The mother pretends to dig with a trowel and put it down.</p> <p>C: stretches arm to <i>reaches</i> for the trowel. M: "kore?" [this one?] picks up the trowel for the child. (Child H: 15;25)</p>	<p>(12)-1 The mother is pretending to speak on the phone.</p> <p>C: "kashite" [give me]. <i>reaching</i> for a telephone handset which the mother holds. M: "kasu no?" [do you want to use this?] M: "hai" [here you are]. gives the handset to C. (Child G: 17;12)</p> <hr/> <p>(12)-2</p> <p>C: "denwa" [phone]. <i>reaches</i> for mother's phone. M: "hai" [hello]. Pretends to speak on the phone. C: "denwa" [phone]. M: gives the phone to CHI. (Child G: 20;12)</p>

Table 6.5 *Depictive gesture used in the different communicative Interchange*
 (* Target gestures are specified in italics)

Category	Interchange	Illustration of the use of gesture only	Illustration of the use of speech-gesture
SR	DJF (Discussing Joint Focus)	(13) The mother shows a picture of a dog. M: “wanwan, konnichiwa.” [doggy says hello] M: “konnichiwa tte” [hello]: C: <i>bows</i> , looking at the picture of dog. M: “konnichiwa” [hello]. (Child J: 13;21)	(14) The mother and child are looking at pictures of vehicles. C: “hikouki” [aeroplane]. C: “bai-bai” [bye-bye]. <i>waving</i> to a picture of a moving train. M: “hikouki to chigau” [that’s not an aeroplane]. (Child J:19;00)
		(15) The child opens a book. M: “aa hiraita” [oh it opened]. M: “joozu hiraita” [well done]. C: <i>claps</i> his hands. M: “un, joozu, joozu” [yes, you did very well]. (Child C: 14:18)	(16) The mother and child play at having a tea-party. M: “hai, ocha itadakimasu” [well, I’m going to have tea] holds up a teacup. C: “(kan)pai” [cheers]. <i>holds up a teacup</i> to toast M: “kanpai” [cheers]. (Child C: 20;12)
	NIA (Negotiate the Immediate Activity)	(17) The child pretends to pour tea into a cup. C: “hai” [here you are]. holds out a teacup to M. M: “hai arigatou” [oh, thank you]. C: “hai kanpai” [oh, cheers]. <i>holds out a cup</i> to toast. M: “hai kanpai” [oh, cheers]. The mother pretends to drink M: “oishii ne” [it’s wonderful, isn’t it?]. (Child C: 22;21)	
	MRK (Marking an event)	(18) The child is piling up books, and finishes this. C: <i>holds up his fists in triumph</i> . M: “un dekita?” [well, have you succeeded?] M: “hou ka” [right]. (Child D: 14:12)	
SW	DJF (Discussing joint focus)	(19) The mother and child talk about a picture of a boy sleeping. M: “nenne dou surun yatta?” [what do you do when sleeping?] C: shows <i>a gesture of sleeping</i> . M: “nenne” [sleeping]. (Child F: 17;12)	(20) The mother and child are looking at a picture book. M: “shusshu dou surun yatta?” [how do you brush your teeth?] pointing at the picture of toothbrush. C: “shu” [(sound effects of brushing)]. <i>shows a gesture of brushing teeth</i> . M: “shusshu ya na” [yes, brushing]. (Child F: 19:09)

Continues

Category	Interchange	Illustration of the use of gesture only	Illustration of the use of speech-gesture
OO	NIA (Negotiating the Immediate Activity)	(21) The mother shows the child a teddy bear. M: “a, kuma-chan” [look, a teddy bear]. M: “daisuki” [give it a cuddle] . Holds out the bear to C C: looks at the bear and shakes his head . M: “iya?” [no?] puts down the bear. (Child B: 14;24)	(22) The child asks the mother to pick him up, and the mother refuses. C: “mama, mama” [mummy]. C: “dakko, dakko” [pick me up] hold up his hands to M . M: “dakko, akan, dakko akan” [I’m not picking you up]. (Child D; 16:12)
	DJF (Discussing Joint Focus)	(23) The mother sees a man cutting grass with a machine through a window. M: “a kowa shiteharu” [using a scary machine over there]. C: looks outside. M: “naa” [can you see?]. M: “aa, kowa” [scary]. points outside. C: looks at the man cutting grass and nods . (Child B: 17;00)	(24) The mother and child look at a picture book. M: “hore nani?” [what is that?] C: “bubu”. [car]. M: “bubu?” [a car?] C: “un” [yeah]. nods . M: “hoya na” [that’s right]. (Child B:23;18)

Deictic gestures appeared to be dominant in the frequency of use, as reported earlier.

This type of gesture was used mostly in the context of *Discussing Joint Focus* (DJF), *Directing Hearer’s Attention* (DHA), and *Negotiating the Immediate Activity* (NIA).

In the contexts of *Discussing Joint Focus* and *Directing Hearer’s Attention*, pointing gestures were used alone in a declarative way, referring to an object or an event.

When speech was combined with pointing gestures within these Interchange types, speech provided one of three functions: to make a statement on the referent; to request information on a referent; or to direct hearer’s attention (see excerpt (1) ~ (4) in Table 6.4). In the context of *Negotiating the Immediate Activity*, pointing gestures were used in an imperative way. In addition, there were found to be two structural ways in which speech and pointing gestures were combined. One structure was that gesture and speech referred to an object/event such that the two modes provided the same

information on the referent. This structure of combination was also found in the contexts of *Discussing Joint Focus* and *Directing Hearer's Attention*. The other structure was that deictic gestures referred to an object or event, and speech provided different information related to a referent; the two modes play different roles in the single communicative act, in the speech-gesture mode (see excerpt (5) ~ (6) in Table 6.4). As for the extending gesture (EO), similar to the pointing gesture, there were two usages, showing and giving. In the contexts of *Discussing Joint Focus* and *Directing Hearer's Attention*, the children used this gesture to show that they were interested, whereas in the context of *Negotiating the Immediate Activity* the children used it to hold out an object to initiate a new activity or to request the hearer's action. When these gestures were combined with speech in the contexts of *Discussing Joint Focus* and *Directing Hearer's Attention*, speech involved labelling a referent, requesting information on a referent or directing the hearer's attention by using an exclamation or calling the hearer's name (see excerpt (7) and (8) in Table 6.4). When the extending gesture was combined with speech in the context of *Negotiating the Immediate Activity*, speech involved labelling an object with which a child was about to engage; marking the transfer of an object, using a phrase equivalent to "here you are" in Japanese; or requesting the hearer to perform an act (see excerpt (9) and (10) in Table 6.4).

A reaching gesture was only used in the context of *Negotiating the Immediate Activity*. When this gesture was combined with speech, speech served the purpose of labelling the object that a child was reaching for or requesting the hearer to perform an act related to a referent.

In terms of the number of gestures observed, there appeared to be some characteristics in the use of gestures and types of Interchange. As for pointing gestures without speech, substantial numbers of gestures ($36.9\% = 167/453$: PO/total deictic gestures) were used in *Discussing Joint Focus* and *Directing Hearer's Attention*,

whereas very few of the same gesture (8.6%= 39/453) were used in *Negotiating the Immediate Activity*. On the other hand, use of extending an object gestures, showing and giving, were observed more often in *Negotiating the Immediate Activity* (45%=204/453) than in *Discussing Joint Focus* and *Directing Hearer's Attention* (3.3%=15/453). A chi-square test revealed that there was a significant association between the types of gesture and Interchange ($\chi^2=238.8$, $df=1$, $p<.001$). When the pointing gesture was used in combination with speech, again the use of this gesture in *Negotiating the Immediate Activity* was very low (6.5%=81/1244) in the total number of deictic gestures, whereas the extending gesture was used more often in *Negotiating the Immediate Activity* (22.0%=274/1244) than in *Discussing Joint Focus* and *Directing Hearer's Attention* (13.7%=171/1244). A chi-square test revealed that there was a significant association between types of gesture and Interchange ($\chi^2=346.9$, $df=1$, $p<.001$). The direction of this association was the same as in the gesture-only mode (detailed contingency tables are provided in Appendix 6).

As for the depictive gestures, because this type was observed on far fewer occasions than deictic gestures there appeared to be not many excerpts matching the gesture-only and speech-gesture modes. Social retrieval and routine gesture (SR) was observed in the contexts of *Discussing a Joint Focus*, *Negotiating the Immediate Activity*, *Performing Verbal Moves in an Activity* (PRO) and *Marking* (MRK). The gestures of bowing, waving and holding up a glass for a toast, may not be universal, but they have socially determined semantic meanings which are evident without linguistic forms (excerpt (13) ~ (18) in Table 6.5). These gestures appeared to be in the communicative repertoire of the children at younger ages. Symbolic gesture without object (SW) was observed in the context of *Discussing a Joint Focus*. The gesture seemed to be used as a substitute for a linguistic forms (see excerpt (19)). Other gestures (excerpt (21) ~ (24)), mainly nodding and head shaking, were used as

indications of yes or no in the contexts of *Discussing a Joint Focus* or *Negotiating the Immediate Activity*. When these depictive gestures were combined with speech, speech did not seem to provide additional information. Most of the observed depictive gestures provided semantic contents by themselves.

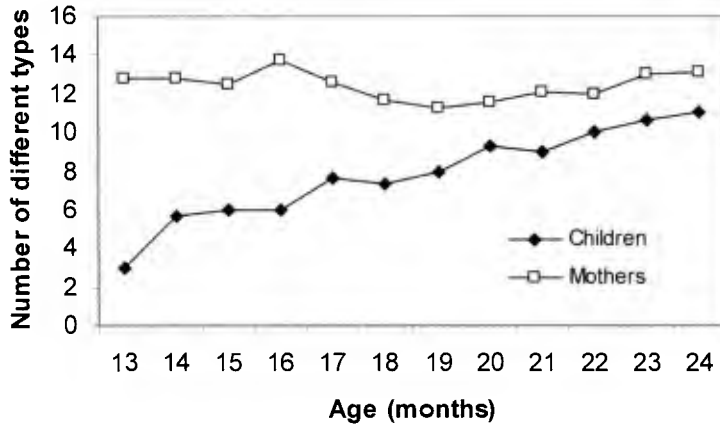
6.3 Communicative intents expressed by speech

This section presents information on how children's communicative intents were expressed as a function of age, in particular focusing on speech. The speech included those of speech occurring together with gesture, as well as phonetically constant forms whose communicative intent was manifest enough for its interpretation on INCA-A. Coding of verbal communicative acts elicited three measures: Interchange; Speech Act, consisting of 21 and 65 categories respectively (see Appendix 1); and a combination of these two levels of coding. For each measure, the number of different types and their corresponding frequencies were used for the analyses.

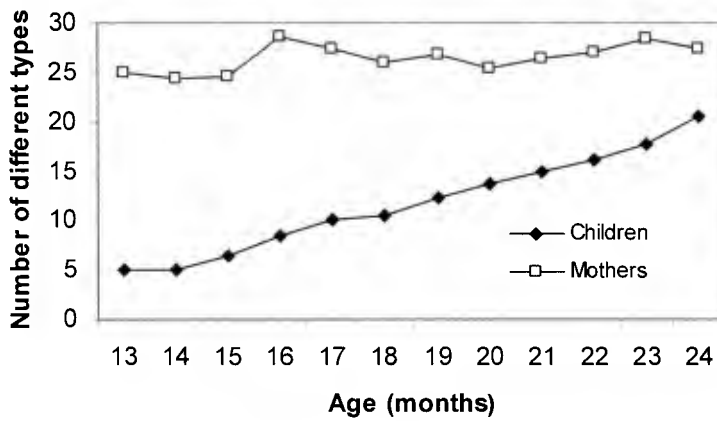
6.3.1 Developmental changes in communicative repertoire

In order to illustrate the changes in the repertoire of children's communicative acts, the number of different types of communicative acts was examined in relation to those of their mothers. The changes in the mean number of different types of communicative acts at Interchange level, Speech Act level and the combination of the two levels are illustrated in Figure 6.4. The details of descriptive statistics and the individual children's and their mothers' trends in the number of different types of communicative acts are provided in Appendix 7.

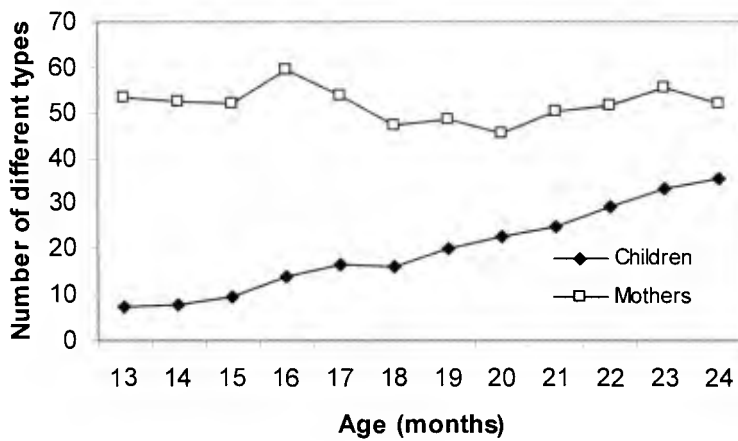
Figure 6.4 Mean numbers of different types of communicative acts
 a) Interchange



b) Speech Act



c) Combination



In the three measures, children increased their communicative repertoires with age, although the increase was smallest for the Interchange measure. On the other hand, no trend to increase or decrease was observed in the mothers' communicative repertoire for any of the measures.

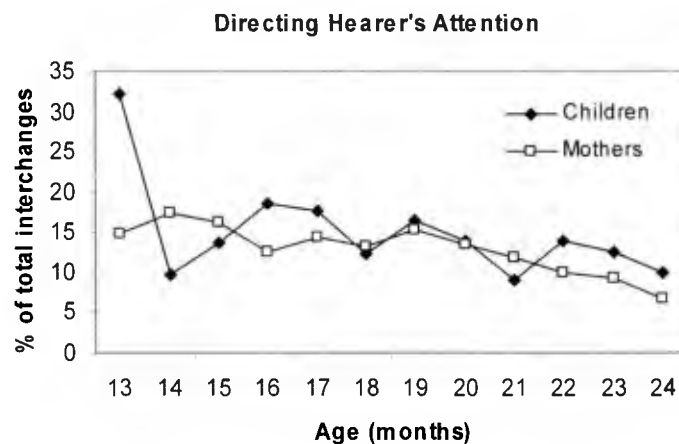
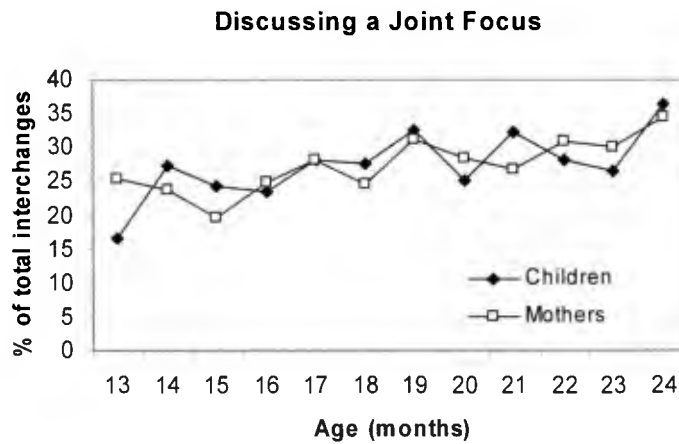
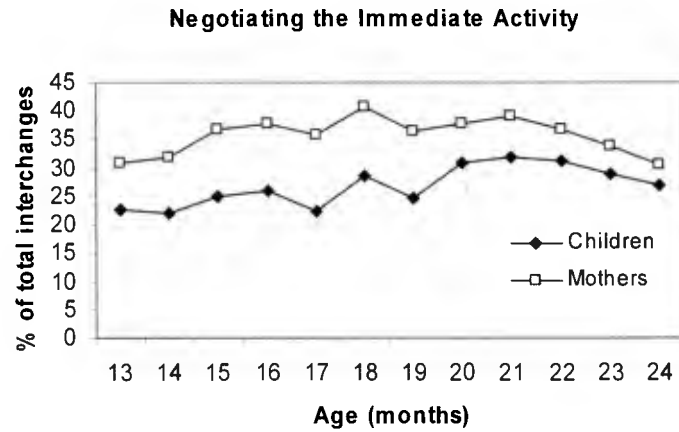
Interchange repertoire

Speech use in the Interchange level was examined in terms of types and their frequencies. The distribution of these Interchange categories was then analysed. Overall, children showed 19 different types of Interchanges out of the possible 21 categories. Eleven different Interchanges, of which seven types appeared frequently, were common for most children. These were, in frequency order, *Negotiating the Immediate Activity* (NIA), *Discussing a Joint Focus* (DJF), *Directing Hearer's Attention* (DHA), *Performing Verbal Move in an Activity* (PRO), *Marking* (MRK), *Showing Attentiveness* (SAT) and *Discussing Speaker's Thoughts and Feelings* (DSS). The other four Interchanges were used less frequently but most children engaged in them at some time points during the observations; these were *Discussing Clarification of Communication* (DCC), *Discussing the Non-Present* (DNP), *Discussing the Related-to-Present* (DRP) and *Discussing a Recent Event* (DRE).

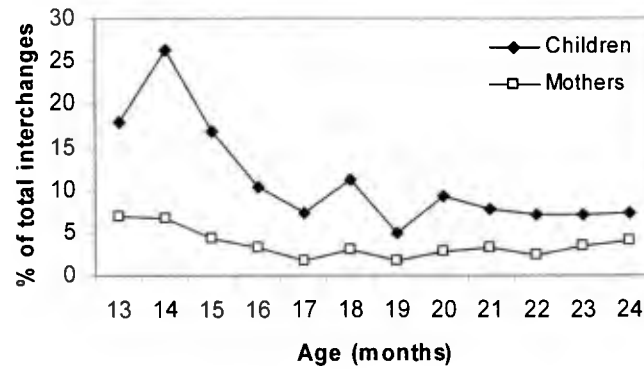
In the mothers' utterances, Interchanges of *Negotiating the Immediate Activity*, *Discussing a Joint Focus* and *Directing Hearer's Attention* were the most frequently used categories, followed by *Marking*, *Showing Attentiveness* and *Performing Verbal Move in an Activity*. These six most frequently used categories were identical to the children's. The next most frequently used category for mothers was *Discussing Hearer's Thoughts and Feelings* (DHS), and for children was *Discussing Speaker's Thoughts and Feelings* (DSS). Relative frequencies of main Interchange uses across

time are illustrated in Figure 6.5. This figure presents the means for the children and their mothers respectively. Descriptive statistics are provided in Appendix 8.

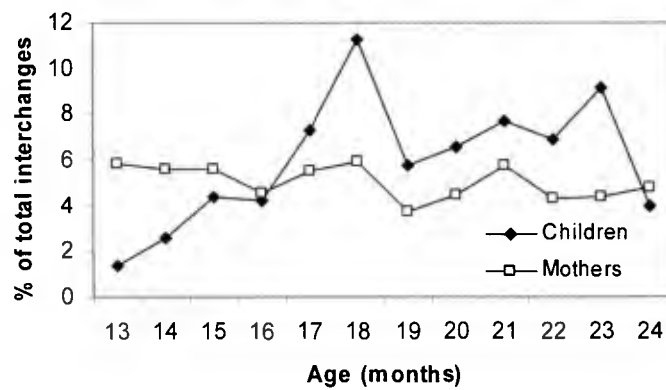
Figure 6.5 *Relative frequencies of Interchanges by children and mothers*



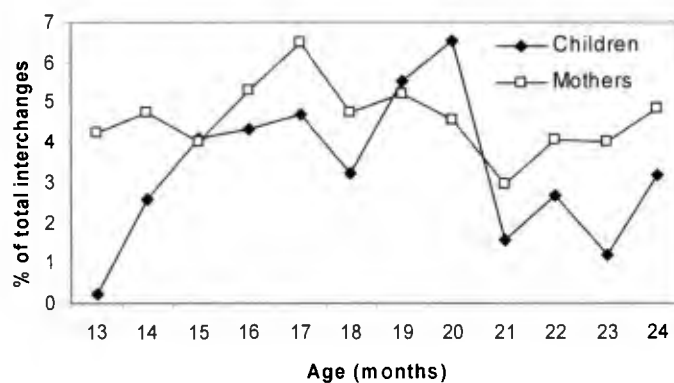
Performing Verbal Moves in Activity



Marking



Showing Attentiveness



A similar pattern was found in both mothers and children for each type of Interchange.

As for *Negotiating the Immediate Activity*, although the mothers' use of this category did not change over time, the children's use of it increased, approaching the frequency

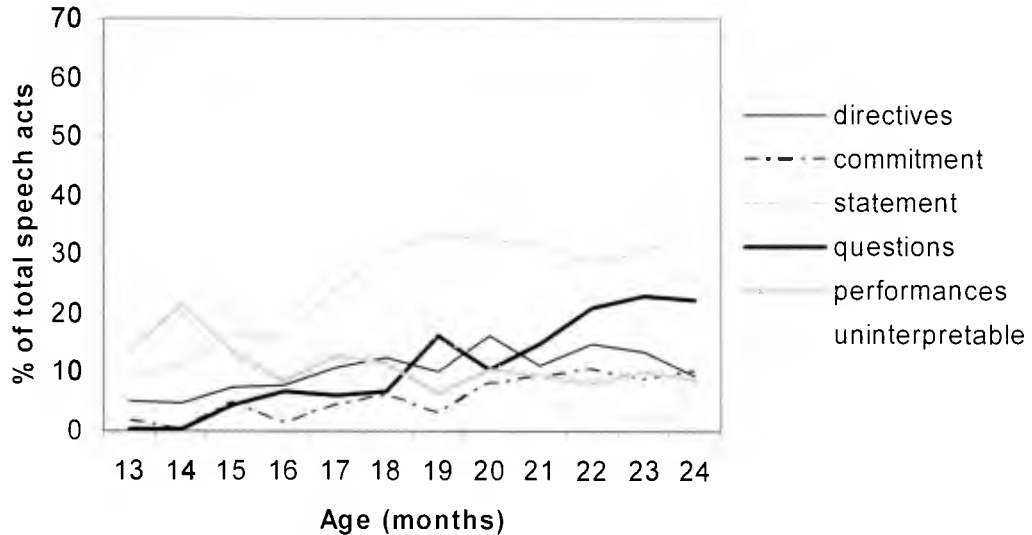
of the mothers. Use of *Discussing a Joint Focus* increased with the child's age in both children and mothers. On the other hand, *Directing Hearer's Attention* and *Performing Verbal Move in an Activity* showed decreasing trends. *Marking* and *Showing Attentiveness* were used constantly over time, showing a peak in the middle of the children's second year, although these two Interchange types had a much lower frequency in relation to the total number of Interchanges.

Speech Act repertoire

Speech acts were analysed in a similar way to the analyses of Interchanges. Overall, children used different Speech Acts, falling into 42 categories out of the possible 65 categories, excluding uninterpretable utterances. Because some categories appeared very infrequently, the Speech Acts that belonged to a similar functional domain were collapsed into one functional group, resulting in 11 functional groups, of which the 7 most frequently used groups were analysed. Substantial increases were found in the groups of 'statements & responses' and 'questions & responses'. In the group of 'directives & responses', the categories of *request for action* (RP) and *agrees or refuses a request* (AD or RD), also increased gradually with age. In the group of 'commitment & responses', the categories of *state a speaker's intention to carry out an act* (SI), *ask for permission to carry out an act* (FP), and responses to these, increased with age. Within the group of 'marking & responses', the children used categories of *mark occurrence of event* (e.g. thank, greet) (MK) and *mark transfer of object to hearer* (TO). In the group of 'speech elicitation & responses', repeating of the mother's previous utterances, *repeat/imitate other's utterance* (RT), remained relatively stable across time. On the other hand, 'performances', which includes *verbal move in a game* (PR), declined slightly. Figure 6.6 presents the trends in which the groups of

speech acts appeared to show developmental changes in their relative frequencies (descriptive statistics are provided in Appendix 9).

Figure 6.6 *Relative frequencies of Speech Acts*



At the younger ages, uninterpretable utterances account for a substantial proportion. Discounting the proportion of uninterpretable, the group of ‘performances’ was the most frequently used speech act at early ages, whereas ‘statement & responses’ and ‘question & responses’ became dominant towards the end of the study.

6.3.2 Communicative acts relative to the milestones

So far, all data have been presented in terms of the mean of the 10 children as function of their ages. However, the children developed competence in different communicative modes at different rates, despite the similarity of the order of these developments (see section 6.2.1). This section presents children’s communicative acts in relation to the milestones that were identified in the previous section.

The categories that appeared to reflect developmental changes at Interchange and Speech Act levels were selected. The cumulative number of children who showed evidence of a particular category of communicative acts at each milestone was

At the Interchange level, the most frequently used Interchanges, *Negotiating the Immediate Activity*, *Discussing a Joint Focus*, *Directing Hearer's Attention* and *Performing Verbal Move in an Activity* were also the categories that all children mastered early. However, the emergence of these categories before M1 was not always accompanied by a clear function identified at the Speech Act level. An exception was *Performing Verbal Move in an Activity*, in which children always produced an interpretable verbal phrase for a game such as peek-a-boo. *Marking* and *Showing Attentiveness*, which provide more conversational functions, appeared to be mastered when children's speech became dominant (M2). Examples of this mastery are the sound effects for banging or the fall of an object using mimetic words⁴, ba/N/ or do/N/, or marking an exertion of effort ("yoisho"). In the category of *Discussing Speaker's Thoughts and Feelings*, children expressed their attitude to an object, using the words "suki" [like] or "aa oishii" [oh lovely] in pretending to finish drinking tea while playing at a tea party game. This category, as well as *Discussing the Non-Present* and *Discussing Hearer's Thoughts and Feelings*, were mastered relatively late. Probes into the discussion of absent referents often came from mothers; particularly when such referents were their family members or relatives, or past events such as visiting a zoo, when looking at pictures of animals. Not all children showed evidence of mastering *Discussing Hearer's Thoughts and Feelings* by the end of this study.

At the Speech Act level, only *perform verbal moves in games* (PR) and *statements* (ST) were categories which all children mastered as early as M1, before children produced a substantial amount of interpretable utterances. On the other hand, most of the late emerging categories were related to the group of 'questions &

⁴ This is a part of sound symbolic system in Japanese (Hamano, 1998). /N/ and /Q/ are the phonemic representations of syllable-final moraic obstruents and nasals

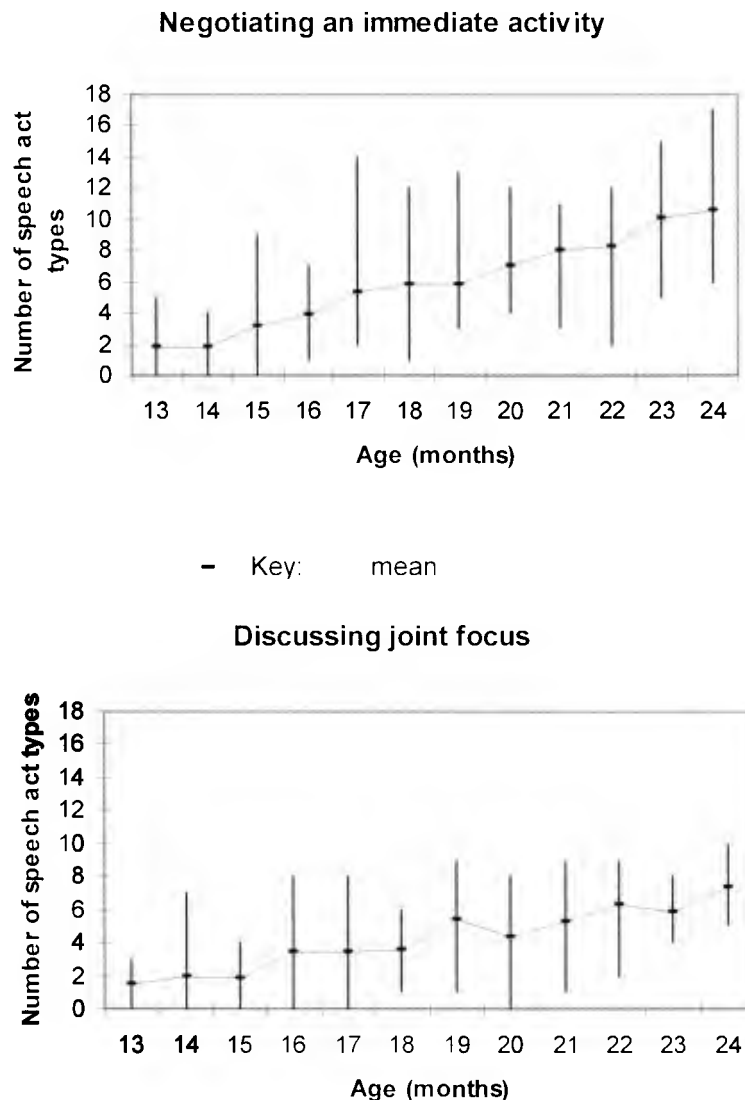
responses', particularly *asking a product question* (QN), such as "kore nani?" [what is this?] and a *yes/no question* (YQ) "hoshii?" [do you want (this)?], rather than answering such questions. Some children, who managed to express questions before M4 where two-word speech emerges, used rising intonations within a single word. In line with questions, expressing agreement with the previous speaker's proposition appeared to be mastered later. These categories require an understanding of the other's proposition in order to use them properly. In the period between when children's speech became dominant (M2) and the emergence of two-word speech (M4), a variety of Speech Acts was mastered; however, these speech act categories arose from self-oriented rather than other-oriented propositions. Overall, among the categories at both Interchange and Speech Act level, there were some developmental characteristics as to when a particular category was mastered. After children passed through the milestone of two-word speech (M4), they also mastered the categories that related to other-oriented propositions.

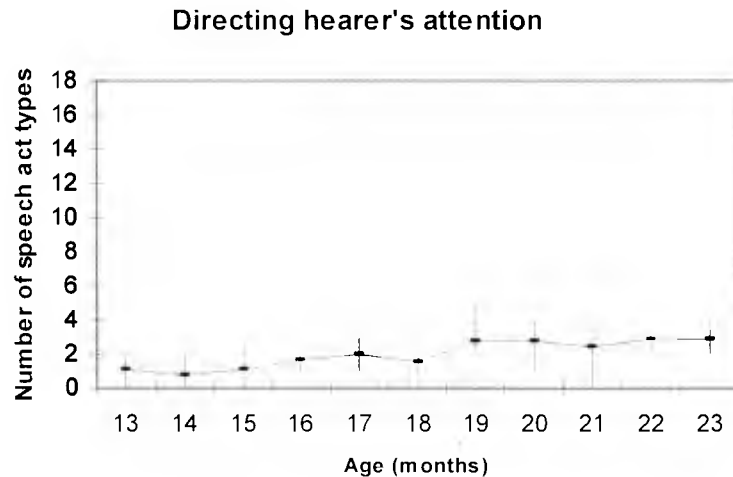
Combination of Interchange and Speech Act

Analyses of communicative acts coded at Interchange and Speech Act level have revealed that there were developmental features in the way that children's intents were expressed. Communicative acts relating to verbal moves in game-like activity emerged early, whereas those relating to discussing absent referents, thoughts and feelings appeared around the time when children started to speak two-word utterances. This section investigates the combinations of these two levels; the investigation was based on the examination of how many different Speech Acts were used in a particular Interchange. Accordingly, the total number of different combinations for the individual child at each point in time was used to indicate pragmatic flexibility, as was used in Snow *et al.* (1996). Firstly, the process whereby children increase their

pragmatic flexibility was examined by focusing on the most frequently used Interchanges, *Negotiating the Immediate Activity*, *Discussing a Joint Focus* and *Directing Hearer's Attention*. The pragmatic development represented by pragmatic flexibility was then explored in relation to the developmental milestones. The combinations that were uninterpretable at Speech Act level were all discounted in the following analyses. The range of the number of types of Speech Act over time is presented for the three Interchange types in Figure 6.8. The mean number of types of Speech Act is indicated on each bar.

Figure 6.8 Mean and range of Speech Act types combined with a particular Interchange



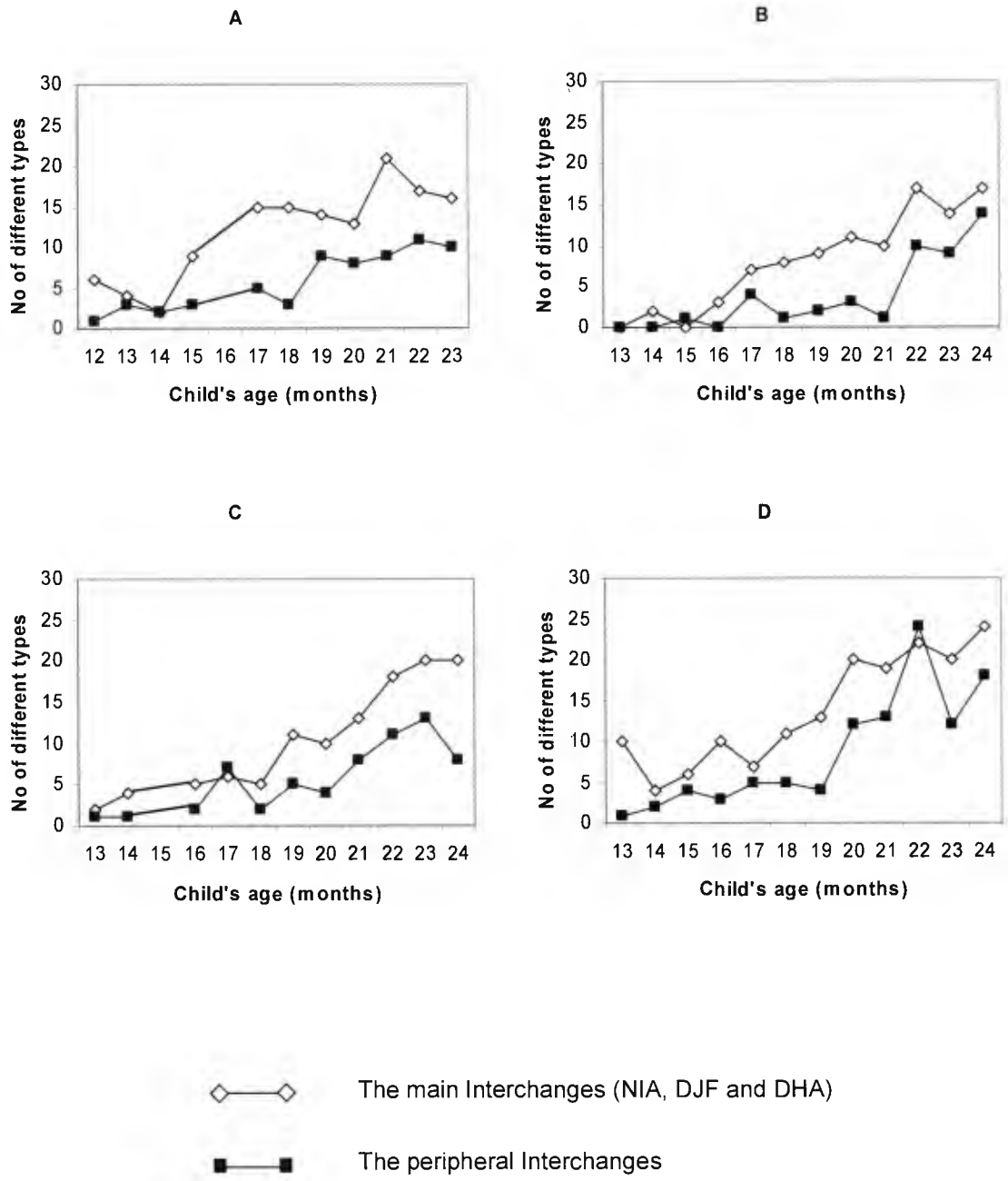


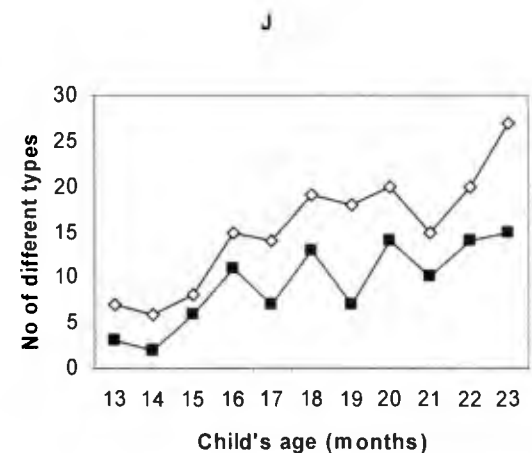
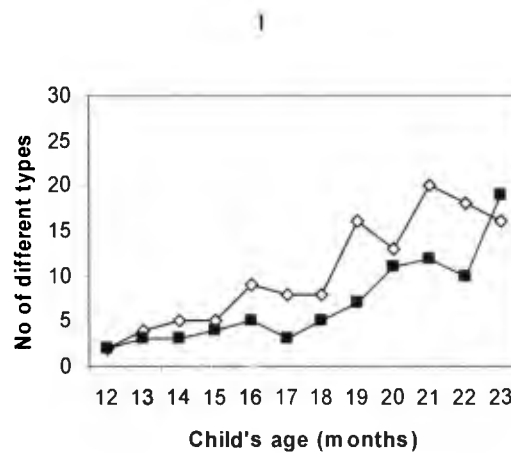
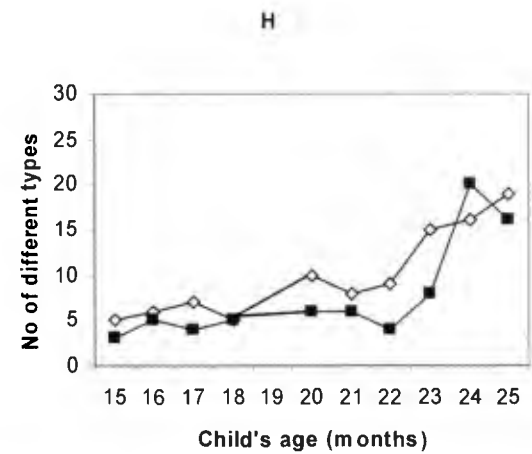
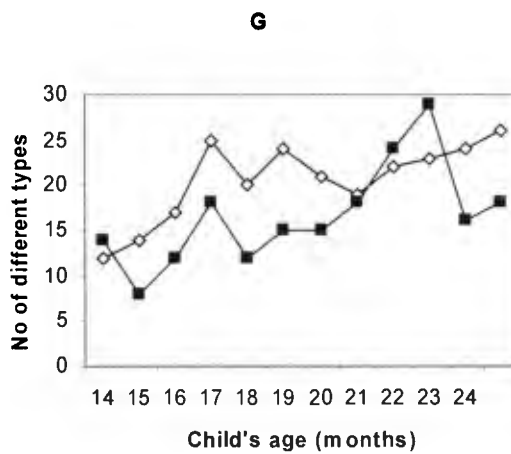
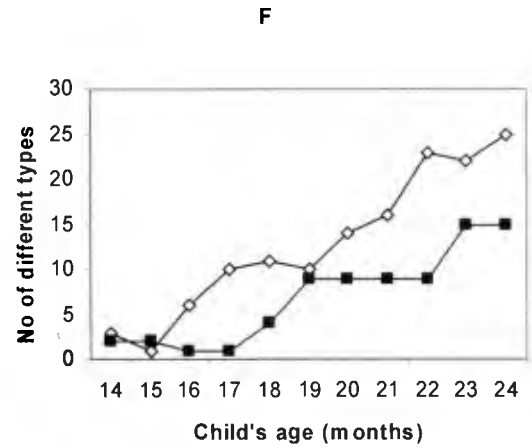
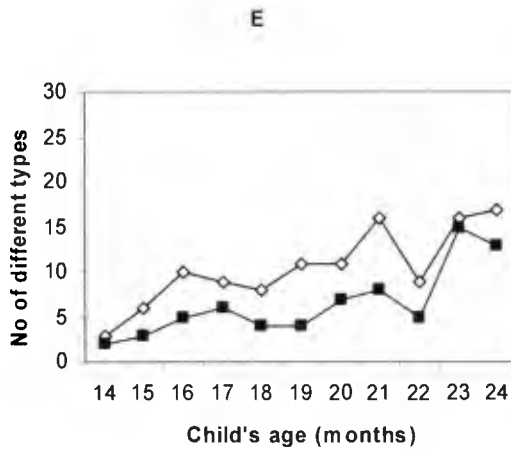
An increasing number of different Speech Act types appeared to be used in *Negotiating the Immediate Activity* and *Discussing a Joint Focus*, whereas there were relatively few variations within *Directing Hearer's Attention*. The reason for little variation within *Directing Hearer's Attention* is likely to concern the function of this Interchange itself. Getting the mother's attention in the interactive context inside a playroom can be achieved with only a couple of Speech Acts. There was also a much higher range in *Negotiating the Immediate Activity* and *Discussing a Joint Focus* than in *Directing Hearer's Attention*, indicating that much of the difference in pragmatic flexibility could be influenced by these two main Interchanges. Individual trends in the same analyses also showed that *Negotiating the Immediate Activity* and *Discussing a Joint Focus* dominated the total number of different combinations, accounting for more than 50%, across the developments.

Separate examinations were carried out to compare the number of Speech Act types within the three main Interchanges, *Negotiating the Immediate Activity* (NIA), *Discussing a Joint Focus* (DJF) and *Directing Hearer's Attention* (DHA), with that of peripheral Interchanges. Peripheral Interchanges included all the other categories which appeared less frequently than the main Interchanges and emerged at different

times. Individual child trajectories in the number of speech act types are presented in Figure 6.9.

Figure 6.9 Change in the number of different Speech Act types in the main Interchanges and peripheral Interchanges observed in each child

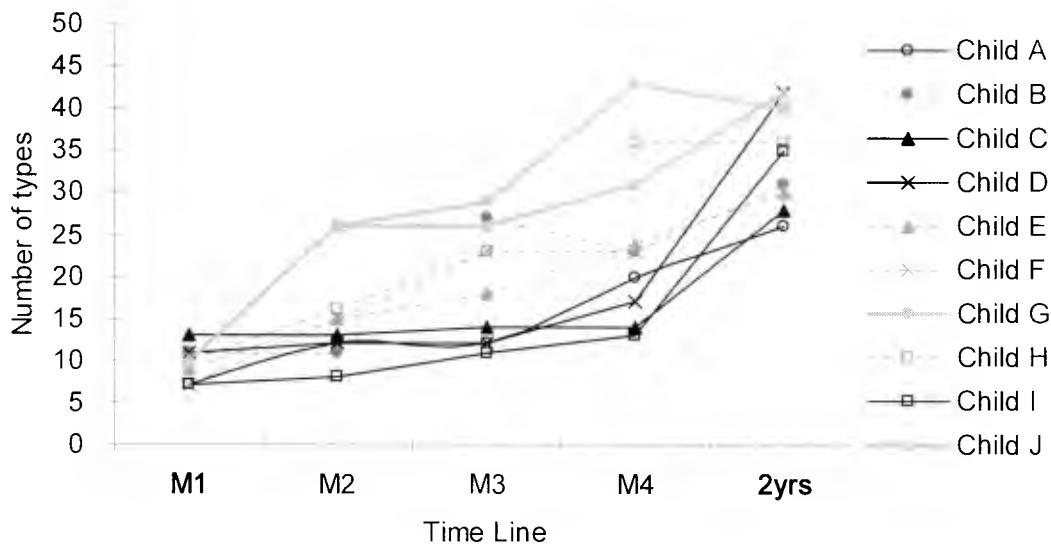




◇ — ◇ The main Interchanges (NIA, DJF and DHA)
 ■ — ■ The peripheral Interchanges

The number of Speech Act types increased with age both in the main category group and in the peripheral group. Some children started to make different combinations within the main Interchanges quite early (see Child G). The common trends in the children appeared to show that there was a sharp increase in the main categories prior to an increase in the peripheral categories, except for Child J who showed both increases relatively early. At later ages, the number of different combinations of speech acts with peripheral Interchanges even outnumbered the main Interchanges in some children. The later increase in peripheral Interchanges reflected the children's growing ability to engage in discussing absent referents and other people's feelings and thoughts, or in a case of some children, in negotiating future activities. These Interchanges involved the groups of Speech Acts classified as 'questions & responses' and 'statements & responses'.

In order to summarise the increase in the children's pragmatic flexibility, the total number of different combinations was examined in relation to the milestones at which different communicative modes became dominant. Figure 6.10 presents the pragmatic development represented by the number of different Interchange-Speech Act combinations as a function of the four milestones.

Figure 6.10 *The growth in Pragmatic Flexibility relative to milestones*

At M1, where children started to produce a greater proportion of speech or vocalisation with gesture than of gesture by itself, there were only small differences across the children. This was partly because the measure of pragmatic flexibility discounted the combinations of Interchange-Speech Act which were not interpretable at the Speech Act level. Nevertheless, there appeared to be only small individual differences in the number of expression of their communicative intents before M2, when children's speech became dominant. Once children's speech became dominant, there were much greater individual differences; particularly, two children, G and J, outperformed the rest in terms of the number of different combinations. These children appeared to show a precocious pragmatic ability long before the emergence of a major linguistic milestone, two-word speech. As for M3 and M4, most children achieved these milestones simultaneously. At these milestones, there appeared to be a further variability between the children who did not show a wider pragmatic flexibility at early ages. One group of children did not show much increase even at M4, whereas the other group of children showed a steady increase. However, all children showed a wide variety of repertoires in their communicative acts by the age of two, and individual differences became much

less than at previous stages. As far as the second year's development is concerned, there appeared to be different patterns of pragmatic developments relative to the competence in the use of different communicative modes.

6.4 Summary

There was a common sequence for the developmental change in the children's use of communication modes. Early signs of speech-gesture integration, represented by the point at which gesture accompanied by vocalisation or speech became dominant in the gesture domain (M1), were followed by the second point, at which interpretable speech became dominant (M2). The third transitional point was found in the clear integration of speech and gesture, where speech-gesture combination became dominant in the gesture domain (M3). This milestone was observed simultaneously with the subsequent milestone, the emergence of two-word speech (M4). Variation across the children was found in the speed of achieving each transition point but not in their order.

The two types of communicative gestures, deictic and depictive gesture, were manifested in the children's communicative acts. The integration of speech was prevalent in the use of the deictic type of gestures, providing an ample amount of illustrative evidence for the children's communicative gestures.

For the verbal communicative acts, on the whole, there were increases in the total number of different types of communicative acts. These increases also reflected the developmental progression in the way a particular type of Interchange and Speech Act emerged despite the subtle individual variability in the time of emergence. The repertoire of communicative acts expanded from the main Interchanges, *Directing Hearer's Attention*, *Negotiating the Immediate Activity* and *Discussing a Joint Focus*, which were embedded in the immediate interactive context, to Interchanges involving

talk of the past and future. The culturally specific aspect of interchange, functioning as facilitating conversations, appeared in the middle of the second year. At the Speech Act level, once interpretable speech increased, the children gradually progressed to express specific communicative acts functioning not only to direct the mothers to do things but also to question them about their mutual interests. The children showed different patterns of increase in the number of types of communicative acts relative to the progressive changes in their communicative modes.

6.5 Discussion

The ways in which children increased their ability to express communicative intents were examined in the two aspects: 1) developmental trajectories in the use of different modes of communication, that is, vocalisation, speech and gesture; and 2) the function of each communicative act whereby his/her communicative intent was informed to an interlocutor.

During the second year, children's communicative intents were expressed using gesture, vocalisation, speech and combinations of these modes in different domains. In the gesture domain, children initially expressed their intents using gesture only; with an increasing proportion of communicative attempts, children's gesture was accompanied by vocalisation or speech (more often with vocalisation rather than with speech proper). In the linguistic domain, all children, except Child J, started off producing more vocalisation than speech; once speech started to dominate over vocalisation in relative frequency, the frequency of speech continued to show an increase for the rest of the second year. Around the time of the emergence of syntax, these two domains seemed to be well synchronised; an increasing proportion of the

gesture-speech combination indicates that these two modes could function as a formal set of systems.

These transitions were found in all children except Child G. Child G had already started to combine gesture and speech and her speech dominated vocalisations at the onset of the study; therefore, the data on the early phases of development were not available. The order of the transitions at which each point was referred to as a milestone showed a significant concordance. However, an examination of the trajectories revealed that the age of achieving each milestone varied among the children. This finding is in line with a general view of language development in typical children; there are great individual differences in the rate of word production as well as in the emergence of syntax. This study extended an existing picture of development in the linguistic domain to the gesture and linguistic co-domain. The picture drawn from the children leads to a few suggestions. For typical children, developmental changes in the sophistication of these communicative modes may happen in an orderly manner; the pattern of development may differ only as a function of the duration between each transition period.

For the developmental picture of communicative modes during the second year, it is possible to say that as linguistic competence increases with age, gesture as another communicative mode also develops in the way these two domains are coordinated. The relationship between gesture and speech has been indicated by a few studies (Butcher & Goldin-Meadow, 2000; Morford & Goldin-Meadow, 1992). Butcher and Goldin-Meadow observed developmental sequences showing that children initially produce communicative gestures independent of speech and, subsequently, start to combine gesture with speech in a synchronised manner. Early gestures were often combined with meaningless speech (i.e. vocalisation) or sometimes with proper speech, but they were not well synchronised. The sequences identified in the current study

strongly support such observations. In particular, the transition between gesture-speech combination and two-word speech was observed during a short period, children moving quickly from M3 to M4. Indeed, the achievement of these milestones happened simultaneously in some children. This indicates that there is a close relationship between an increasing use of gesture combined with speech and the emergence of two-word speech. This relationship, with a high and reliable correlation, has also been confirmed in a previous study (Goldin-Meadow & Butcher, 2003).

Expressions of children's communicative intents using these communicative modes were analysed in two ways, one with respect to the gesture domain, including a combination of gesture with speech, and the other for the linguistic domain. As for the gestural communicative acts, the children appeared to use more deictic-type gestures such as pointing, giving and showing, as opposed to depictive-type gestures that referred to the semantic contents of a referent. Within the deictic type, pointing was the most frequently used gesture, followed by giving and showing gestures. This result was based on the sum of gesture production throughout the children's second year, and not derived from a specific point in time. Nevertheless, the results indicated a similar trend to that found in a study with Italian-speaking children aged 16 months to 20 months (Iverson, Capirci & Caselli, 1994). These children also used significantly more deictic than depictive gestures (Iverson *et al.* refer to these as representational gestures), with particular preference for pointing, around this period.

A similar finding that a significantly larger number of deictic than depictive gestures was used in early communication, suggests that deictic gestures play an important part in a young child's communication system. There may be two possible reasons. One is that deictic gestures, such as pointing, are considered to be an indication of early emerging communicative intents which occur together with the child's coordination of attention between the referent and the communicative partner

(Butterworth & Franco, 1990). This coordination was also the case in this study, and such behaviours impacted on the way the mother interacted with their child in that the mothers provided comments on the referents or appropriate acts. The second reason is that deictic gestures have their potential in more sophisticated forms of communication whereby speech is integrated with the existing communicative mode. The current results also illustrated that the same type of gestures were accompanied by speech at later ages.

In the present study, the difference between deictic and depictive gesture use was found not only in their frequencies but also in how children used these gestures in relation to their speech. The deictic gesture was more likely to be used in a combination with speech, which probably reflected the increased number of speech-gesture modes from M3 onwards, whereas depictive gesture did not show any difference in the number of uses with or without speech. The functionality of the two types of gesture is apparent, as each label indicates. However, the result regarding how each gesture was used with speech bears an interesting interpretation. The deictic gestures, which may be used independently by young children in their early communication, need to be combined with speech in order to accomplish its function fully and effectively. On the other hand, the depictive gesture carries semantic content by itself; therefore, it is less likely to demand extra information derived from the other mode in order to accomplish its function. Furthermore, the deictic and depictive distinction can be viewed as analogous to a feature of the linguistic system. A deictic gesture, like a deictic word, possesses arbitrariness in denoting a referent and can be understood only within the conversational context, whereas a depictive gesture has already assigned a meaning chosen arbitrarily. The depictive gesture already has the mapping that is akin to the linguistic system. For the depictive gesture, there is no further necessity to assign its meaning, though there may be a possible supplementary

part. The deictic gesture, on the other hand, can refer to anything to which it is possible to point to. It seems likely that gesture, particularly the deictic type, has been playing a part in the integration of speech, as argued earlier in this section.

The excerpts presenting the illustration of each type of gesture support this view. For the deictic gesture, there appeared to be many examples that illustrate the transition from independent gesture to a combination with speech; with children's increasing age, they all achieved the use of speech-gesture combinations. However, this is not the case for depictive gestures. There were far fewer examples identified from each child, and when the children added speech to depictive gestures, speech provided only supplementary information, which did not change or increase the value of the meaning derived from the gesture by itself. In addition, in the deictic gestures, there were two types of structures combining gesture and speech: one structure in which two modes refer to the same information, and the other in which the two modes refer to different information working complementarily. Goldin-Meadow and her colleagues argue, making these two structural differences explicit, that once children start to combine speech and gesture so that they complement each other, children also start to use two-word speech (Morford & Goldin-Meadow, 1992; Butcher & Goldin-Meadow, 2000; Goldin-Meadow & Butcher, 2003). Two different structures were also identified in the current study, as presented in the illustrations in Table 6.4. The sequential development in the two structures was not examined in detail, because the main purpose of the analyses related to the expression of communicative acts rather than speech-gesture integration. Nevertheless, this confirmatory finding on the existence of two structural combinations and the spontaneous achievement of two-word speech indicates that the deictic gesture plays an important part in the transition to two-word speech.

In this study, these communicative gestures were coded not only for their form but also for their function in terms of social interchange, by adapting the INCA-A coding system. Among deictic gestures, a particular gesture was used significantly more often in certain Interchanges. Pointing gestures were used in *Discussing a Joint Focus* and *Directing Hearer's Attention*, which indicates that these gestures denote referents in a declarative way. On the other hand, extending gestures, giving and showing, were used more often in *Negotiating the Immediate Activity*, indicating that they were used in an imperative way. The depictive gesture was often used in *Marking* as well as *Discussing a Joint Focus* and *Negotiating the Immediate Activity*. These Interchanges appeared to be the most frequently used of the children's repertoire. Therefore, these gestures could also be regarded as the main features in the communicative exchanges, in addition to speech.

As for the communicative intents expressed by speech, there are developmental features as to when a particular type of communicative act begins to emerge. In the light of existing studies using the same line of coding systems, INCA-A as well as the original coding taxonomy of communicative acts used by Ninio and Wheeler (1984), the current results from Japanese-speaking children share common characteristics with those from non-Japanese children in the development of the expression of communicative intents.

Firstly, children engaged in the Interchange of *Negotiating the Immediate Activity*, *Discussing a Joint Focus* and *Directing Hearer's Attention* at very early ages, although few speech acts with interpretable functions were identified within these categories. The Interchange of *Performing Verbal Move in an Activity* was used by children at very early ages, with a relatively interpretable function at speech act level. The appearance of more interpretable speech acts within *Performing Verbal Move in an Activity* could be due to the nature of this Interchange, which embraces sets of

predetermined verbal phrases in game-like activities. Such verbal phrases uttered in routine activities, which Bruner (1983b) refers to as “format”, are found to be mastered early. Bruner argues that this format plays a part in cracking the linguistic code. In other words, this format enables a child to enter a linguistic system. Within these early emerging Interchanges, *Directing Hearer’s Attention* and *Performing Verbal Move in an Activity* gradually decreased with children’s age. These trends were similar to those found in previous studies (Ninio & Wheeler, 1984; Snow *et al.*, 1996). The proportional decrease in these two categories and, in turn, the increase in *Negotiating the Immediate Activity* and *Discussing a Joint Focus* makes reasonable sense within an increasing communicative ability; children became more frequently involved in negotiation and discussion, rather than just attention-directing acts and routines.

In addition, there appeared to be new categories indicating their increasing communicative repertoire. Particularly, the late emerging categories were related to an unobservable referent, such as discussing a future or past event, or other people’s feelings and thoughts. The emergence of these categories indicates that children’s communication may no longer be limited to the “here and now” context but expanded to more complex and less concrete topics, which reflects sophistication in children’s communicative capability. Given the interactive contexts of the present study, observation of these categories referring to the non-present may not have been expected. Nevertheless, all children engaged in most of these categories, which indicates that the children started to show an interest and ability to become involved in discussions related to the non-present.

A slightly different picture emerged from Japanese children’s communicative acts in the second group of Interchanges, which emerged strongly in the middle of the second year. In addition to *Marking*, which appeared in a similar pattern to the children studied by Ninio *et al.*, *Showing Attentiveness* was a noticeable category in

Japanese children's communicative repertoire. Typical contexts where children used this Interchange were: when a child and his/her mother were involved in different activities, the child indicated an attention shift from their own activity to the mother's by using an utterance such as "un?" [hmm?]; or when a child responded to the mother's declarative statement by signalling that s/he was listening to her, rather than providing an agreement. This category, despite its relatively low frequency, indicates an aspect of conversational behaviour in Japanese culture. In mothers' data this conversational behaviour was also found; they used this category more often than children did. In face-to-face conversation in Japanese culture, it is very common to show verbal or non-verbal signals (such as nodding with or without speech) indicating one's awareness of the main speaker. This is a facilitating process to make conversation flow smoothly rather than any particularly affirmative or negative response to the main speaker. In other words, such behaviours have a meta-conversation regulative function (Kita, 1997). Even children at this age seem to start learning the expression of such meta-conversational functions to some extent. Such meta-conversational aspects found in this study could be considered to be linked to those found in previous studies. These found the frequent use of devices for getting and showing attention in five-year-old Japanese children (Minami & McCabe, 1995). These children's verbal behaviours for getting and showing attention in their narrative production were indeed very sophisticated in the way that they used a particular sentence particle. A recent study (Kajikawa, Amano & Kondo, 2004) reported that when Japanese children started to form the sentence particle, "ne" to get the caregiver's attention, during the two-word period, the pattern of mother and child conversation became more like Japanese adult conversations, using meta-conversational functions. This indicates that this particular sentence particle, related to the maintenance of conversation, emerges much earlier than the pre-school age. However, this study focused on the examination of the overlap

between a particular linguistic form, “ne”, for getting hearer’s attention and the caregiver’s showing attentiveness by using a phrase, such as “un”[uh-huh], based on acoustic data. This limited focus may have prevented them from identifying more subtle communicative behaviors. Nevertheless, the current finding on the emergence of early meta-conversational functions is in line with these studies. An implication from the current study, in particular, is that regardless of linguistic forms to express such intents, Japanese speakers, even at early ages, have a tendency to show such conversational behaviours.

At Speech Act level, although a substantial proportion of early utterances were uninterpretable for their functionality, the utterances used for performing verbal moves in game-like activities were clearly expressed even at the younger ages. Within such routine play, where particular expressions are expected, there is little variation in speech use. This routine could make young children more familiar with such interactions; consequently they master this particular expression earlier than other sorts of speech acts that have a larger potential for diversification. Other groups of categories increased proportionally with age. In particular, ‘Question & responses’ increased dramatically across time. In this group of categories, answering questions emerged earlier than asking them. As for asking questions, less than half of the children started to use this speech act prior to two-word speech, but not as early as M2 when children increased interpretable speech to dominate all communicative modes. In order to express questions in Japanese, the simplest form is a single word with rising intonation for “yes/no” and product questions; therefore, syntactic devices in a linguistic form are not necessary (see Clancy, 1985 for the study of Japanese acquisition). In fact, children’s questions were often made by a single utterance. In such cases, children need to denote a referent using a deictic gesture, pointing or showing, in conjunction with speech, using either a form for asking for information, such as “what?”, or a certain

verb or noun with rising intonation. A similar phenomenon is observed in other languages such as English (Klima & Bellugi, 1966) and French (Clark, 1985). On the other hand, a rising intonation is not an option for children learning Finnish. Children learning Finnish are not reported to use “yes/no” questions as early as for other languages (Foster, 1990). These studies indicate that there are possible linguistic constraints that restrict the pragmatic use of such expressions, but it is unlikely that syntax development is a prerequisite for the expression of questioning. Therefore it is possible to speculate that questioning is a relatively late emerging repertoire because children may have not developed a conceptual understanding of the act of asking for information about things, rather than because of the lack of syntax in children’s linguistic repertoire.

The summary of the emergence of different communicative acts expressed in relation to the transition in communicative modes further suggests the following. The early emerging repertoire (i.e. before M2) of communicative acts at Interchange and Speech Act levels relates closely to the children’s immediate contexts; moreover, the motives to communicate at this period are derived from their self-interest in doing things. These repertoires are limited to the very basics that are essential to the interaction. The next emerging communicative acts add more conversational aspects, such as acknowledging an immediate speaker, to the basic repertoires. These communicative acts function to make conversation happen and sustain communicative exchanges. The later-emerging communicative acts seem to reflect children’s increasing understanding of world across different times and space; children also start to make inquiries about things regarding their extended world.

Children’s increasing communication repertoire was also found in a combinational measure, Pragmatic Flexibility. The examination of how each child developed flexibility indicated that there may be more than one pattern of development.

A relatively constant development in Pragmatic Flexibility as a function of different communicative modes was shown by four children. However, the rest of the children did not follow this trend. There seemed to be two other patterns; one which was shown in children who showed precocious pragmatic ability in terms of the number of types, and one where children had shown very little variation in the increase in Pragmatic Flexibility as late as M4. Given the small number of children's patterns, it would be inappropriate to try to generalise from these data. Nevertheless, such variations could be attributed to children's cognitive styles, as was first proposed by Nelson (1973) in respect of word learning; different learning styles, such as "referential type" and "expressive type", may relate to the current findings. The group of children who appeared to be pragmatically precocious may have been those who were more interested in interacting with people in a variety of communicative exchange, and in learning the way of expressing their intents through conversing. On the other hand, the group of children who showed little increase during the second year may have been opting to engage repetitively in similar contexts where the materials of a child's particular interest were involved; such contexts may not necessarily elicit a variety of conversational exchanges.

However, these are not dichotomous categories, because there seems to be a group of children who have shown a steady pragmatic development relative to the milestones. The two contrasting groups could be at the opposite ends of a continuum. A possible explanatory variable for these variations may be the characteristics of the immediate communicative partner's interactive communication style. In this study, the partner was the mother. Therefore, the mothers' interactive communication needs to be examined. This analysis will be reported in the following chapter. According to previous studies (Fogel *et al.*, 1988; Fernald & Morikawa, 1993; Minami, 2003) from a comparative perspective, there appeared to be certain differences in the way in which

Japanese mothers interact with their children in infancy as well as during the preschool period. In general, Japanese mothers seem to show more empathy to their child's verbal and non-verbal behaviours, and less evaluative behaviours than other mothers. Given the cross-cultural differences in ways of interaction, there may be a unique case where the Japanese mother may make further contributions to the way in which their children develop to use the Japanese language. As far as the current results indicated by the children's data are concerned, it is possible to say that the extent to which a child has a certain attitude to and preference for people or things may have influenced the way they learn to express their intents.

Chapter 7

Mothers' Communicative Acts in their Interaction with Children

The previous chapter, based on the analyses of communicative acts produced by speech and gesture, charted children's growing ability to express their communicative intents. This chapter, using similar analyses, explores the ways in which the mothers interacted with their children. The questions are: 1) Whether or not the mothers' involvement, measured by the frequency and the number of different types of communicative acts, changes in quantitative and qualitative aspects as a function of each child's age? 2) In what way, if any, does the mothers' communicative interaction change? 3) Are there any individual differences in the mothers' communicative styles? and 4) Is there any relationship between the mother's communication styles and the development of the child's expression of communicative intents? If so, what kind of relationship exists?

7.1 Mothers' involvement with communicative interaction

The first question was examined using the following quantitative measures: 1) frequency of communicative acts (per minute); 2) number of types of Interchange; 3) number of types of Speech Act; and 4) number of types of Interchange-Speech Act combinations. The tables of descriptive statistics are provided in Appendix 7. The examination of scatter plots indicated that there were different directional trends in each mother's measure as a function of the child's age. This means that the interpretation of patterns needs to be treated with caution. Testing for changes in quantitative measures of the mothers' communicative acts over time by using averages does not always provide the best picture of trends for small samples of data. Although the child's

age-effect on the mothers' measure was tested with multivariate analysis of variance, the main focus in this analysis was on the individual mothers' trends. The trend for each of the mother's communicative acts was tested with a regression analysis. The changes over time in mothers' communicative acts were first tested with multivariate analysis of variance for the frequency of communicative acts, the number of types of Interchange, Speech Act, and the combinations of Interchange and Speech Act respectively. The data from the mothers, corresponding to children's ages between 14 months and 23 months⁵, were used. There were no significant age effects on the mothers' communicative acts: communicative frequency per minute: $F(9,1)=6.794$, ns; number of types of Interchange: $F(9,1)=28.65$, ns; number of types of Speech Act: $F(9,1)=1.02$, ns; and number of types of Interchange-Speech Act combinations: $F(9,1)=6.79$, ns. The age effects on individual mothers' measures were examined using a separate regression analysis. Table 7.1 summarises the results of the regression analyses.

Table 7.1 Summary of standardised regression coefficients (direction of change)

Mothers ID	Frequency/min	N of types of Interchanges	N of types of Speech acts	N of Types of combinations
A	ns	ns	.877*** (+)	ns
B	.778** (+)	ns	ns	ns
C	ns	ns	ns	ns
D	ns	ns	.736** (+)	ns
E	.728* (-)	ns	ns	ns
F	ns	ns	.632* (+)	ns
G	.793** (-)	ns	.803** (-)	.637* (-)
H	ns	ns	ns	ns
I	ns	ns	.751** (+)	.608* (+)
J	ns	.609* (-)	ns	ns

* $p < .05$, ** $p < .01$, *** $p < .001$

Only two mothers did not show significant age-related changes in any measure. They were Mother C and Mother H. In many cases, the trend was for change to increase

⁵ This age range was chosen from the available data between 13 to 24 months because most children fell into this age range, and this enables data analyses based on the collected data rather than an estimated value. However, four missing values identified during this age range were replaced by estimated values using the EM (Expectation Maximisation) method (van der Kloot, 1998).

with child's age. However, most measures relating to Mother G decreased. In the analysis of individual children, Child G appeared to show remarkably advanced pragmatic skills at an early age (see Chapter 6). The decreases in these measures may be due to the more advanced level of this child's language ability. In the same line of study, Pan, Imbens-Bailey, Winner and Snow (1996) found that all measures of the mothers' communicative acts increased significantly from the child's age of 14 months to 20 months, whereas the same measures declined significantly from the child's age of 20 months to 32 months. Age-related changes in the measures of Mother G fit into the latter trend, indicating that this mother's communicative behaviours were akin to those of mothers of older children. Overall, the results above indicate that there were some changes in mothers' measure with children's age; but the direction of change may have been related to the child's level of language at the time of measurement.

7.2 Mothers' repertoires of communicative acts

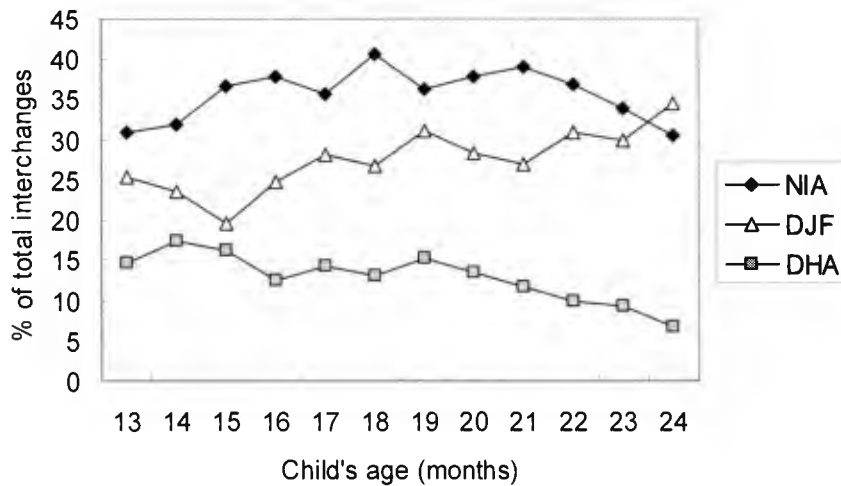
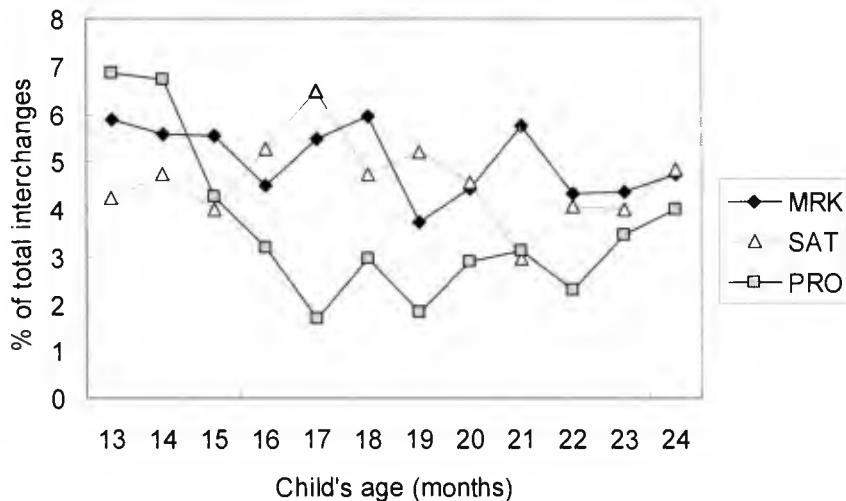
The previous section examined age-related changes in the mothers' communicative acts, based purely on the number of frequency of use and types. Pragmatic measures represented by a numerical frequency count cannot uncover any changes in the more qualitative aspects, such as what types of communicative acts the mothers used at a particular point during the course of their child's development. Moreover, there might have been a change in the composition of different types of communicative acts despite the absence of change in the numerical count of overall frequency and types. In other words, the mothers may use different kinds of talk as well as different functions of speech acts, depending on the developmental stage of their child, which may not have been reflected directly in the numerical measures. In order to capture the characteristics of these changes, examinations of the mothers' communicative repertoire

at three levels of measures, that is, Interchange, Speech Act and Pragmatic Flexibility (derived from the combinations of Interchange and Speech Act), were carried out.

These analyses were based on relative frequency of each type of communicative act which the mothers used at each point in time.

7.2.1 Interchanges

In the previous chapter, mothers' communicative acts at the Interchange level have been described briefly in relation to those of their children. Overall, the mothers engaged in all categories of Interchange (21 categories, excluding unintelligible and uninterpretable). The six Interchange types most frequently used by the mothers were the same as the children's (see Figure 6.5 in Chapter 6). These were, in frequency order, *Negotiating the Immediate Activity* (NIA), *Discussing a Joint Focus* (DJF), *Directing Hearer's Attention* (DHA), *Marking* (MRK), *Showing Attentiveness* (SAT) and *Performing Verbal Move in an Activity* (PRO). Similar to the data for the children, the first three categories dominated nearly 70% of their communicative acts at all points in time, and therefore constitute the main Interchanges. The next three categories were all involved in conventional aspects of communication. The trends of the main and the conventional Interchange groups, which were based on the means, are presented in Figure 7.1 and Figure 7.2.

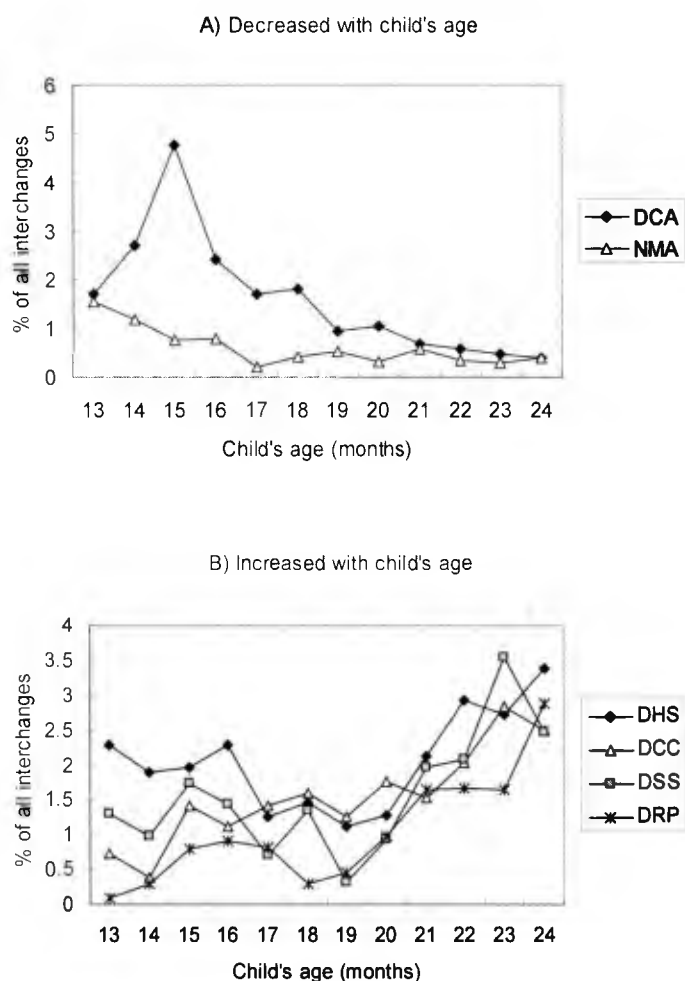
Figure 7.1 Trends of main Interchanges used by mothers (mean)**Figure 7.2** Trends of conventional Interchanges used by mothers (mean)

Within the main three categories, *Negotiating the Immediate Activity* (NIA), *Discussing a Joint Focus* (DJF) and *Directing Hearer's Attention* (DHA), DJF increased with the child's age, whereas DHA decreased. For the conventional Interchange group, the trends for *Marking* (MRK) and *Showing Attentiveness* (SAT) were similar, showing relatively small changes throughout the study. However, it is noteworthy that SAT increased moderately around the time at which most children started to express communicative acts clearly (this refers to a sharp decline in uninterpretable speech acts,

shown in Figure 6.6 in Chapter 6).

The rest of the categories only accounted for a small proportion of the mothers' communicative acts. Only categories that were observed in more than 1% of the total number of Interchanges in at least two sessions were then examined. These were, in proportional frequency order, *Discussing Hearer's Thoughts and Feelings* (DHS), *Discussing Clarification of Communication* (DCC), *Discussing Speaker's Thoughts and Feelings* (DSS), *Discussing Clarification of Non-verbal Acts* (DCA), *Discussing the Related-to-Present* (DRP), *Discussing the Non-Present* (DNP) and *Negotiating Mutual Attentiveness* (NMA). The trends for these categories in the third group fall into two types: the proportional frequency of use either decreased with the child's age or increased with the child's age. Figure 7.3 presents these trends separately.

Figure 7.3 Trends of third Interchange group used by mothers (mean)



The mothers used *Discussing Clarification of Non-verbal Acts* (DCA) and *Negotiating Mutual Attentiveness* (NMA) proportionally less as their children grew older. The trend for DCA is likely to reflect the children's communicative behaviour, in that they used non-verbal communicative acts proportionally less and started to use communicative acts that are either verbal or combinational mode. This change is supported by the trend of an increase in *Discussing Clarification of Communication* (DCC). The decrease in NMA is again likely to relate to a children's active involvement in the interaction and their growing attentional skills, which will be explored further in the following chapter. In the first few months, most mothers used NMA; in the subsequent months, the average use of this category dropped below 1%. As the children grew older, an increasing number of mothers stopped using these two categories.

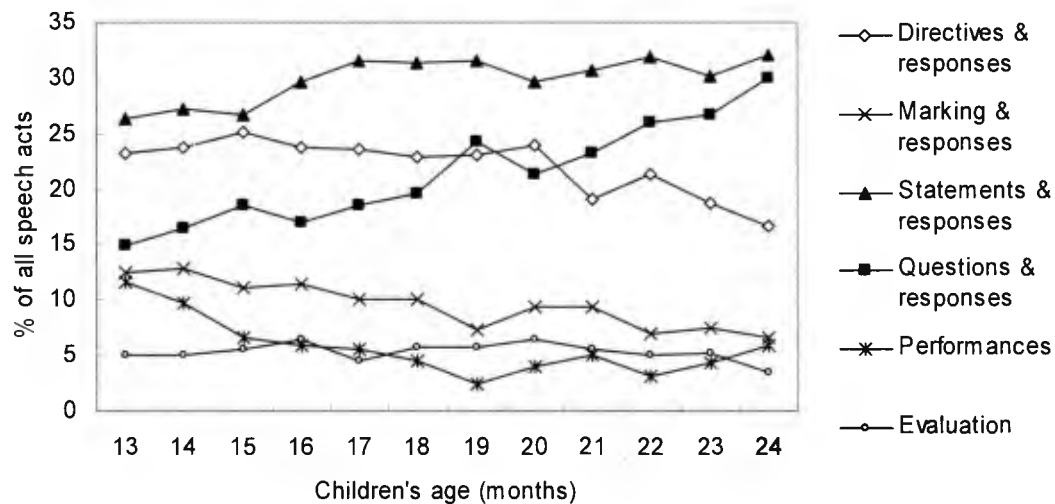
Despite the small proportions, the four Interchange categories, *Discussing Hearer's Thoughts and Feelings* (DHS), *Discussing Clarification of Communication* (DCC), *Discussing Speaker's Thoughts and Feelings* (DSS) and *Discussing the Related-to-Present* (DRP) showed increasing trends. These trends, except DCC, were not simply linear: following an initial decrease there was an increasingly rapid rise. The relatively frequent use of DHS and DSS in the early stages reflected the ways mothers interacted with their child. The mother often consulted her child's thinking and states of mind by talking to her child. For example, the mother used expressions such as "kore suki?" [Do you like this?] or "aa omoshiroi!" [what fun!]. Because the children had not developed a large enough repertoire to express their intents clearly at younger ages, the mothers tended to talk to the child in this way. On the other hand, the later increase in these categories derived from a two-way conversation with her child. The mothers were even asked a question such as "coffee suki?" [do you like coffee?]. This indicates that the child's communicative competence had developed

sufficiently to be able to request information from the communicative partner.

7.2.2 Speech Acts

Mothers used different types of speech acts that fall into 54 categories out of a total of 65, excluding uninterpretable and unintelligible utterances. Firstly, 65 categories were collapsed into 11 functional groups, each of them embracing similar sets of speech act functionality. The functional groups which accounted for at least 5% of all speech acts at one or more observations, and which were also used by more than 90% of mothers during all observations, are presented in Figure 7.4.

Figure 7.4 Trends of Speech Act groups frequently used by mothers (mean)



'Statements & responses' and 'Question & responses' were the groups of categories of which the mother's proportional use increased as the child got older. In particular, 'Questions & responses' increased dramatically. This trend was derived from two possible changes in dyadic communication. One possibility is that mothers increased the proportional use of responses as the children started to ask questions. The other is that the mother tended to ask questions more frequently than they had been doing when

their child was younger. This group was further analysed separately into questions and responses. Both questions and responses increased with the child's age, but questions accounted for more than 92 % of the 'Questions & responses' group. Thus the increase in this group derived from the mothers' questioning their children.

On the other hand, the proportional use of 'Directives & responses', 'Marking' and 'Performances' decreased. The group 'Directives & responses' was dominated by three categories of Speech Acts: *request action (RP)*, *suggest action in a form of asking about hearer's intentions (RQ)* and *call attention to hearer by name or exclamations (CL)*. These categories were used in most observations by all mothers, and showed decreasing trends as the children grew older. The group of speech act categories that fall into 'Evaluation' did not change in proportional use over time. On average, the mothers seemed to provide the children with positive and negative evaluations of their behaviours throughout the second year, although the proportion of this group's use is relatively small compared with other groups of speech acts.

Although no results are presented for the categories that were used in very small proportions (less than 5% of all speech acts), some trends are noteworthy. 'Demand for clarification' and 'Text editing', which were used to clarify or correct the child's verbal behaviour, did not appear in the mothers' repertoires while their children were younger. However, the proportion of these categories increased consistently between 20 months and 24 months of the child's age. This resulted from the fact that more than half of the mothers started to use this category or increased their proportional use of this category during the last few months.

7.3 Changes in mothers' communicative acts

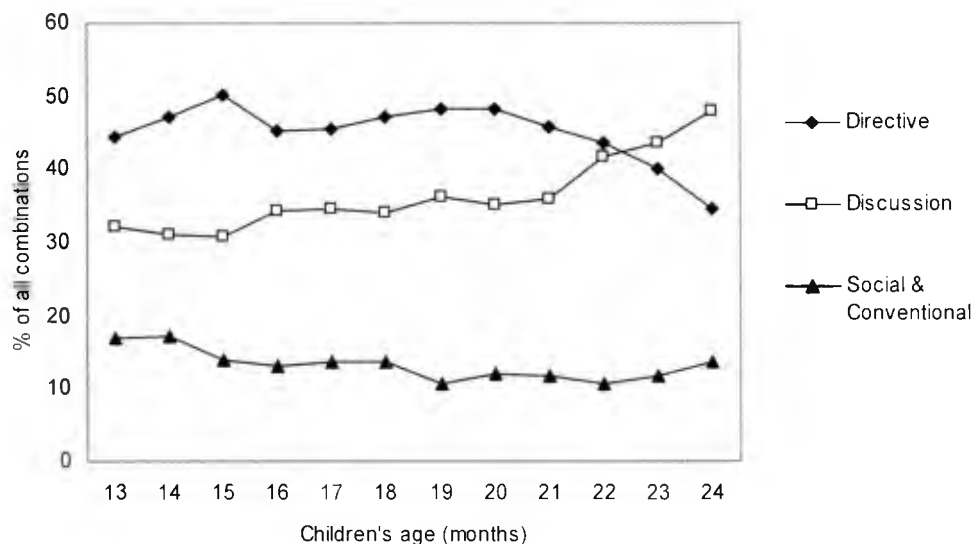
The analyses of the mothers' communicative acts at both Interchange and Speech Act

levels have indicated that there are possible changes in some categories. Both measures at Interchange and Speech Act levels captured similar characteristics of the mothers' verbal behaviours that changed with child's age. The main developmental features identified from these developmental trends are that those communicative acts which have a more directive nature such as *Negotiating the Immediate Activity* and *Directing Hearer's Attention* at Interchange level and the group of directives at Speech Act level, showed declining trends, whereas *Discussing a Joint Focus* at Interchange level and 'Statements & responses' and 'Questions & responses' at Speech Act level increased. However, these categories at two different levels do not always have the same boundary. Therefore, in order to obtain a more precise picture of changes in different types of functional communicative acts, it is important to focus on the combination of the two levels of coding. Particularly, the Interchange of *Negotiating the Immediate Activity* appeared to be combined with many different Speech Act categories that have distinctive functions. The combinations that were related to *Negotiating the Immediate Activity* were therefore differentiated on the basis of the directive or non-directive nature of communicative acts. Non-directive communicative acts were those where the speech acts of 'Statements & responses', 'Commitment & responses', 'Marking' and 'Performances' were combined with the Interchange of *Negotiating the Immediate Activity*.

The main purpose of the following analyses was to examine the overall trend of changes in the mothers' communicative acts. Three different types of communicative acts that have a distinctive nature were constructed: 'Directive' type, 'Discussion' type and 'Social & conventional' type. The 'Directive' type embraces all combinations within the Interchange of *Directing Hearer's Attention* and *Negotiating Mutual Attentiveness*, and any combinations within the Interchange of *Negotiating the Immediate Activity* excluding non-directive communicative acts. The 'Discussion'

type includes all combinations within the Interchanges of: *Discussing a Joint Focus*, *Discussing the Non-Present*, *Discussing the Related-to-Present*, *Discussing Speaker's Thoughts and Feelings*, *Discussing Hearer's Thoughts and Feelings*, *Discussing Clarification of Communication*, *Discussing Clarification of Non-verbal Acts* and *Discussing a Recent Event*. The 'Social & conventional' type includes all combinations within the Interchange of *Marking*, *Performing Verbal Move in an Activity* and *Showing Attentiveness*. The rest of the Interchange-Speech Act combinations that do not have clear boundaries were omitted, so that the three types of communicative acts clearly reflect their functionality. The trend of each communicative act type, which was derived from the mean, is presented in Figure 7.5.

Figure 7.5 Trends of different types of communicative acts used by mothers (mean)



Overall, the 'Directive' type of communicative acts appeared to be most frequently used by the mothers at most points of time. However, the proportional use of the 'Discussion' type of communicative acts gradually increased, and this type was used more frequently than the 'Directive' type toward the end of the child's second year. On the other hand, the 'Social & conventional' type showed a slight decrease in the

middle of the child's second year, but remained relatively stable thereafter. This indicates that there was a change in the way that the mothers used their communicative acts. The mothers' communicative acts changed in the domains of 'Directive' and 'Discussion'. 'Discussion' started to dominate the communicative acts, accounting for nearly 50 % by the end of the second year.

7.4 Communication styles of individual mothers

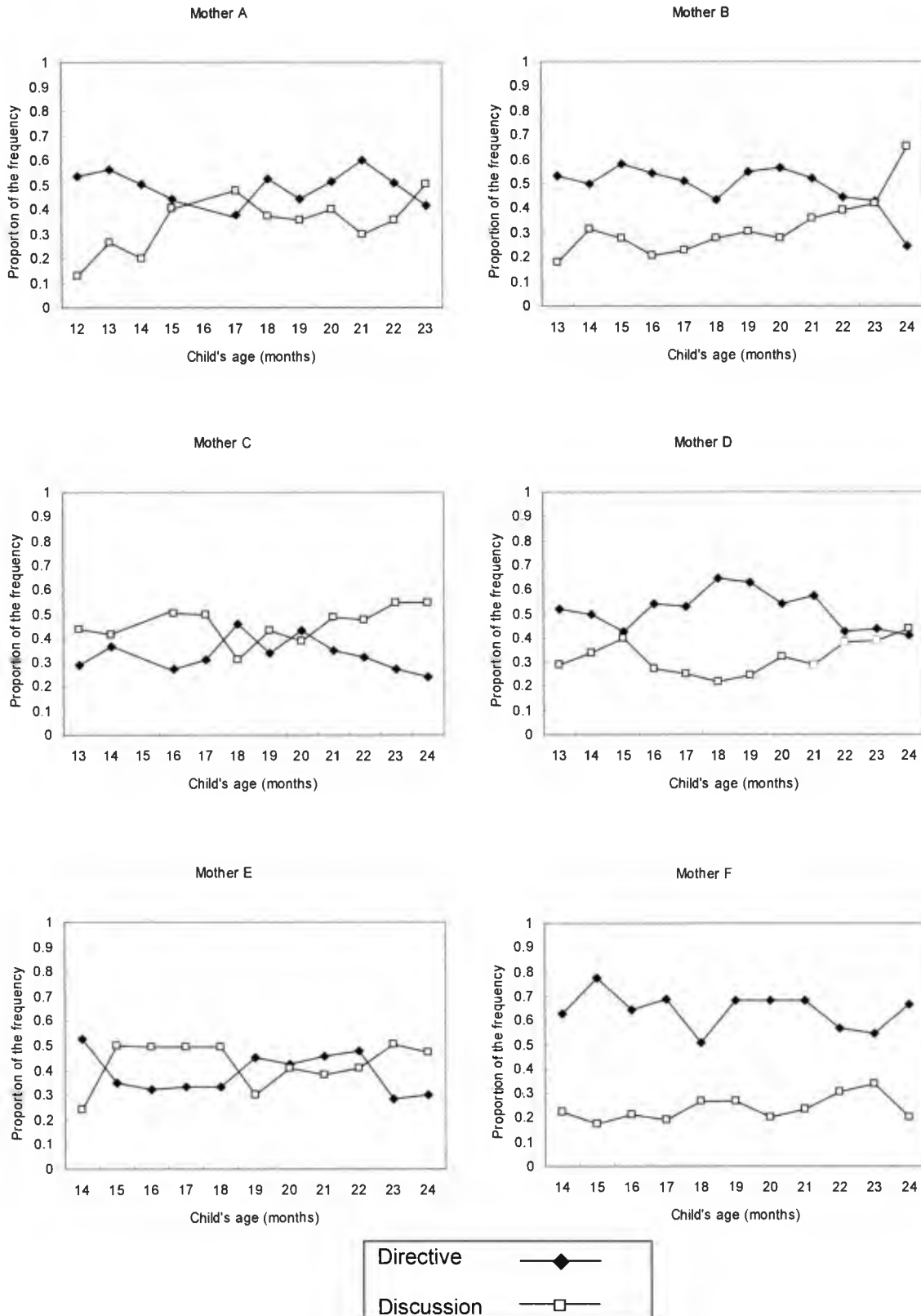
The analyses of the mothers' communicative repertoire have been presented at a group level. This section explores the communication styles of individual mothers. The group level analysis indicated that there were changes in both the domains of 'directive' and 'discussion' as the children grew older, whereas the domain of 'Social & convention' was relatively stable over time. Therefore of particular interest in relation to the individual mothers' communication styles was the extent to which each mother used communicative acts in the domains of 'Discussion' compared to 'Directive'.

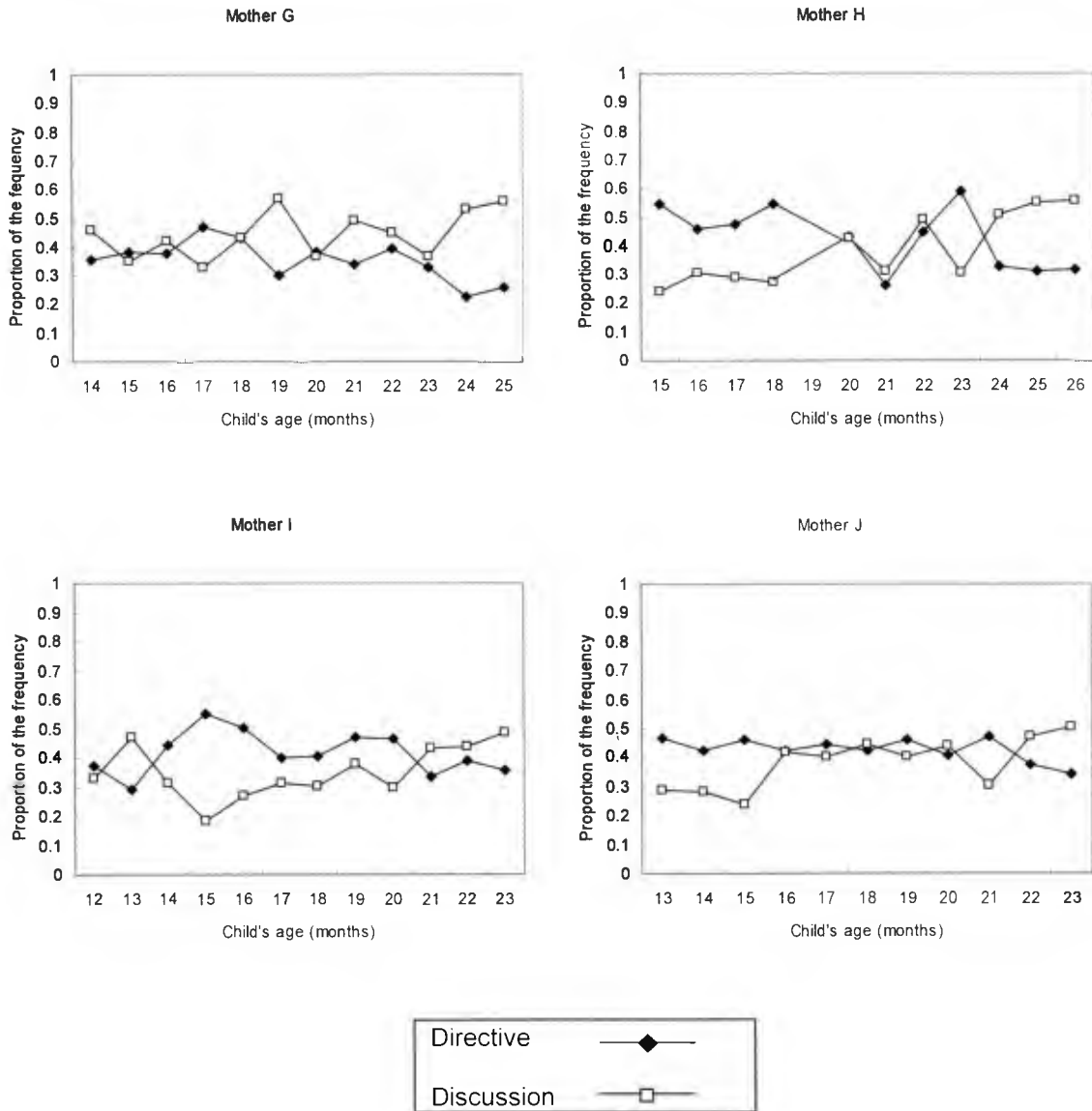
Two analyses were carried out to examine the communicative styles of the individual mothers: 1) changes in the trends of using communicative acts in the two domains over time; and 2) the mother's communicative orientation between the two domains. The first analysis investigated the trend of communicative acts in terms of frequency and variation in the domains of 'Discussion' and 'Directive'. The second analysis investigated the individual mothers' overall tendency to use communicative acts between these domains.

For the first analysis, the trends of the individual mothers' communicative acts were examined for both types of data: frequency of communicative acts in each of the domains of 'Discussion' and 'Directive'; and variation of communicative acts in each of these domains. First of all, the trends of the frequency of involvements in each of the

domains for the individual mothers are shown in Figure 7.6.

Figure 7.6 The trends in the frequency of the mother's involvement in "Discussion" and "Directive"



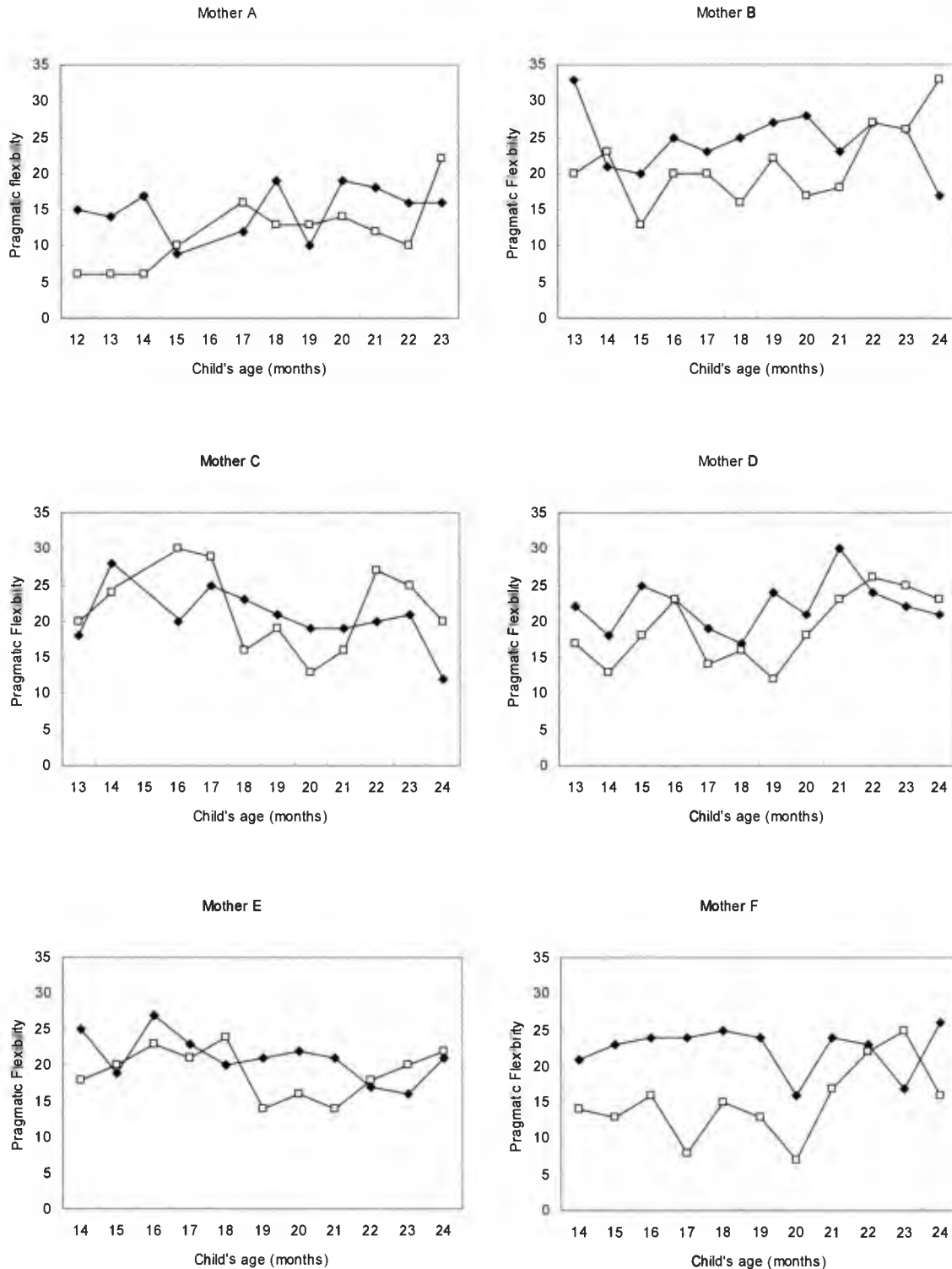


Most mothers increased their involvement in the 'Discussion' domain as their child became older. This increase was shown as a greater proportion of communicative acts in 'Discussion' than in 'Directive' during the final observations. The differences across the mothers were found at the point in time at which each mother's communicative acts were dominated by discussion. Only mother F appeared to use more communicative acts in 'Directive' rather than 'Discussion', showing large differences in the proportions between these two domains over time. However, this mother also showed an increasing proportion of communicative acts in 'Discussion' as

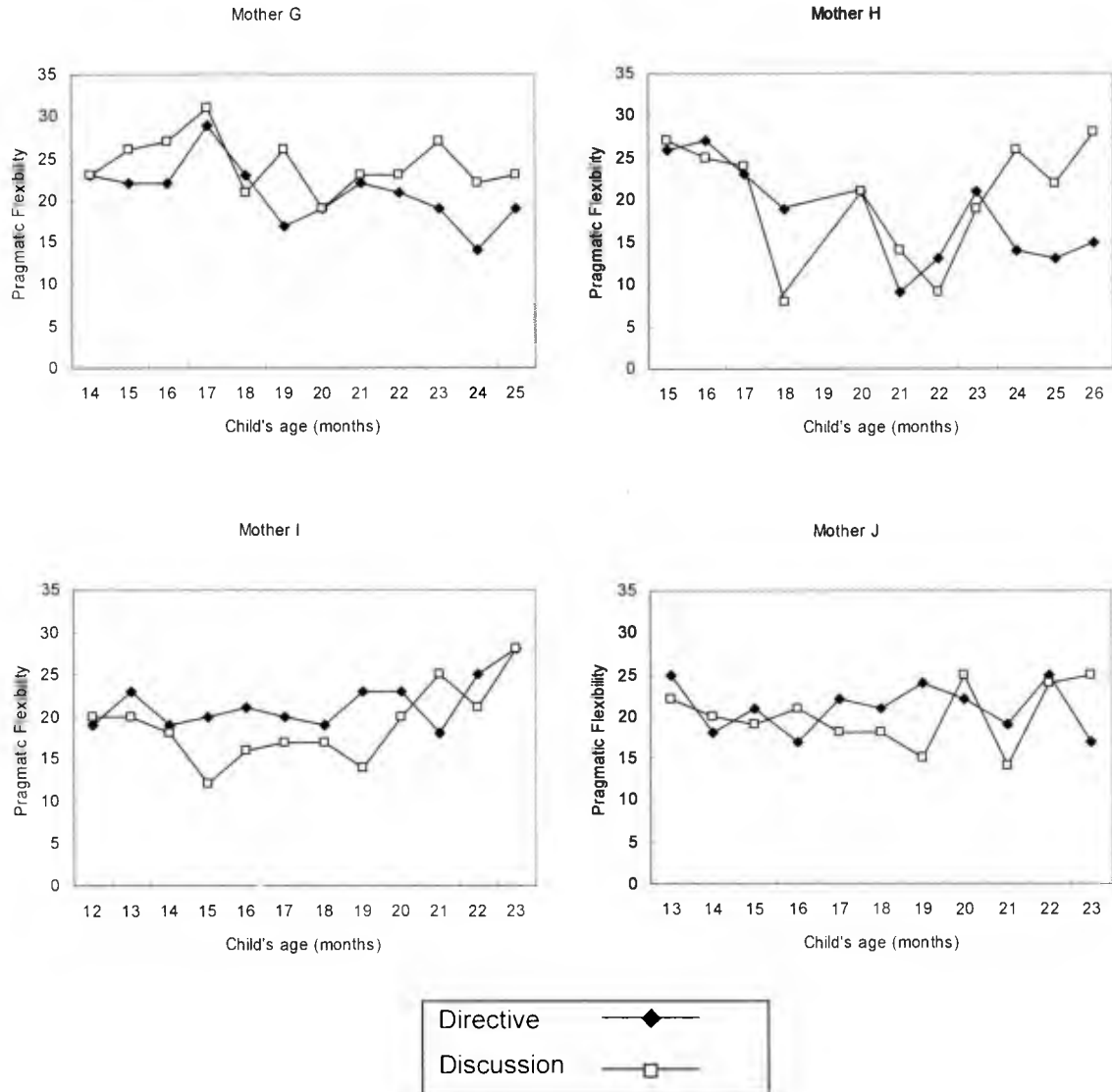
her child became older, and the proportion of communicative acts in 'Directive' decreased accordingly. On the other hand, two mothers, C and G, appeared to use communicative acts more in 'Discussion' than in 'Directives' during most observations. Overall, there was a common trend that the mothers tended to show a shift in the domains of communicative acts from 'Directive' to 'Discussion' over time.

Secondly, variations of communicative acts in each of the domains were compared on an individual basis, and their trends were examined. Given the increasing frequency of communicative acts in the 'Discussion' domain over time, it should be possible to identify more variation in 'Discussion' as the child became older. The trends in the number of different types of combination (i.e. Pragmatic Flexibility) within each domain are charted in Figure 7.7.

Figure 7.7 The mother's Pragmatic Flexibility in the domains of "Directives" and "Discussion"



Directive —◆—
 Discussion —□—



The number of different types of combinations that individual mothers used in each domain seemed to reflect the characteristics of their frequency of involvement.

Overall, there was a significant correlation between this frequency and the variation of communicative acts in the ratios of 'Discussion' to 'Directive': $r(113) = .68, p < .001$.

When the mother used more 'Discussion' than 'Directive', they also showed more variation in the 'Discussion' domain. The patterns in the variation of communicative acts also showed some individual differences in their interaction styles. The clearest difference was found between the patterns of mothers F and G. Mother F showed

much less variation in 'Discussion' than in 'Directive'. However, this mother started to increase the variation in 'Discussion' as her child got older. On the other hand, mother G showed a more balanced variation in her use of communicative acts in each domain, maintaining a slightly greater variation in the domain of 'Discussion' than in 'Directive'. Mother G started to show less variation in 'Directive' as her child grew older. Mothers B, D and I appeared to have a similar pattern to that shown by mother F, though the difference in the variations between the two domains was not large. The patterns of mother C and E were possibly atypical when compared with the others. They used more variation in communicative acts in both domains when their child's language was limited; once the child's interpretable communicative acts increased, the variation of their communicative acts reduced, particularly in the domain of 'Discussion', with subsequent increases towards the end of the child's second year. Despite the individual differences, there was a common characteristic in the trends of most of the mothers. They showed more variations in the domain of 'Discussion' than in 'Directive' during the final observations.

Taken together, the mothers' communicative acts changed over time in terms of the frequency of involvement and the variation within the two domains. The trends of both measures indicated that the mothers' communicative acts in 'Discussion' started to dominate those in 'Directive' towards the end of the second year, despite individual differences in the extent to which the mother's communicative acts in 'Discussion' dominated those in 'Directive'.

The second analysis was carried out to identify individual mothers' communication styles in a more comprehensive way. The difference between the communicative acts in the two domains throughout all observations was tested for each mother. The Wilcoxon signed ranks tests were used to test the differences in both frequency of involvement and pragmatic flexibility between the two domains. The

results are summarised in Table 7.2.

Table 7.2 Comparison of the mothers' communicative acts between 'Directive' and 'Discussion'

Mother (N of observations)	Frequency of involvement		Pragmatic Flexibility	
	Z (p-values)	direction	Z (p-values)	direction
A (11)	2.10 (p<.05)	Directive>Discussion	1.83 (ns)	
B (12)	2.12 (p<.05)	Directive>Discussion	1.69 (ns)	
C (11)	2.31 (p<.05)	Directive<Discussion	.73 (ns)	
D (12)	2.98 (p<.01)	Directive>Discussion	2.19 (p<.05)	Directive>Discussion
E (11)	1.07 (ns)		1.34 (ns)	
F (11)	2.93 (p<.01)	Directive>Discussion	2.54 (p<.05)	Directive>Discussion
G (12)	2.05 (p<.05)	Directive<Discussion	2.51 (p<.05)	Directive<Discussion
H (11)	1.48 (ns)		.98 (ns)	
I (12)	1.16 (ns)		1.99 (p<.05)	Directive>Discussion
J (11)	1.25 (ns)		.73 (ns)	

The results above indicate that three mothers, D, F and G, showed significant differences between 'Directive' and 'Discussion', in their use of communicative acts. The differences were found not only in the quantity of involvement but also in the variation of communicative acts. Other mothers A, B and C showed significant differences in the frequency of involvement but not in the variation, though the differences in the variation for mothers A and B were approaching a significant level (p<.05). Mother I showed more variations in 'Directive' despite no significant difference between the frequencies of involvements in the two domains. To summarise, there were different types of communicative behaviour among the mothers: those (A, B, D, F and I) whose communicative acts were more 'Directive'-oriented in quantity and/or quality; those (C and G) whose communicative acts were more 'Discussion'-oriented; and those (E, H and J) who showed more balanced communicative acts.

7.5 The relationships between mothers' communication styles and children's communicative acts

This section addresses the final question in this chapter, the relationship between the mothers' communicative styles and the development of their children's communicative acts. The mothers' communicative acts showed little variability with child's age; particularly, quantitative changes failed to reach a significance level in the statistical analysis. Nevertheless, there were found to be some qualitative changes in the mother's communicative repertoires over time. There were also individual differences, based on their communicative orientations between the two domains, in the mothers' communicative styles. The main inquiry concerns the implications of these communicative styles in relation to the child's development of communicative acts.

For children's data, the numbers of different types of communicative acts that corresponded to each child's developmental milestones (M1 to M4) were used. These four points in time were chosen because they appeared to represent each child's developmental course, as well as to reflect different patterns of development (See Chapter 6). For mothers' communicative styles, the ratios of 'Discussion' to 'Directive' for the frequency and the variations of communicative acts were used. Again, the ratios of the four points in time corresponding to the child's developmental milestones were used.

The relationships between the mothers' communicative styles and the children's communicative acts were examined using concurrent and cross-lagged correlational analyses at the four developmental points in time. The scatter plots indicated that there were some linear correlations between the two variables at the four developmental points. Therefore these relationships were tested with Pearson Product-Moment correlations. The results are summarised in Table 7.3. Because the

mothers' communicative styles that were based on the frequency ratio did not correlate with any of the children's data, only the relationships between the mothers' communicative styles, as shown by the variation ratio, and the children's communicative acts are cited below.

Table 7.3 *Pearson Product-Moment Correlation coefficients (r) between the mothers' communicative orientation and children's communicative acts for the three measures*

Children's communicative acts (N of different types)	Mothers' communicative orientation in the variation of communicative acts ('Discussion'/'Directive')			
	M1	M2	M3	M4
M1				
Interchange	.867**	ns	ns	ns
Speech Act	ns	ns	ns	ns
Pragmatic Flexibility	ns	ns	ns	ns
M2				
Interchange	ns	ns	ns	ns
Speech Act	.598 ¹	ns	.728*	ns
Pragmatic Flexibility	ns	ns	ns	ns
M3				
Interchange	ns	ns	.637*	ns
Speech Act	.741*	ns	.678*	.597 ³
Pragmatic Flexibility	.683*	ns	.709*	.675*
M4				
Interchange	.746*	ns	.709*	ns
Speech Act	.593 ²	ns	.860**	.746*
Pragmatic Flexibility	ns	ns	.708*	.553 ⁴

* $p < .05$, ** $p < .01$, ¹: $p > .089$, ²: $p > .092$, ³: $p > .068$, ⁴: $p > .097$ (2-tailed)

There were some positive correlations between the mothers' communicative styles and the variations of the children's communicative acts. The mothers' communicative style at M1 not only correlated significantly with the children's Interchange at M1 but also correlated significantly with the children's Speech Act and Pragmatic Flexibility at M3 and with Interchange at M4. The same measures for the mothers also correlated positively with children's Speech Act at M2 and M4, approaching a significant level. The correlation between the mother's communicative styles and the child's pragmatic skills at M1 indicates that the mothers who used a wide variety of communicative acts in 'Discussion' relative to 'Directive' when children's linguistic ability was limited

tended to have a child who engaged in a variety of Interchanges at a young age. This correlation also means that the mother and the child shared the same context related to the 'Discussion' domain, even at early ages. The mothers' communicative style at the early stage of child's development also had significant correlations with the child's communicative acts at later milestones. In addition, the mothers' communicative styles at M3 also appeared to show consistent correlations with the children's communicative acts at M3 and M4.

However, the mothers' communicative style at M2 did not show any correlation with the child's communicative acts at all. This means that the variation of the mothers' communicative acts used at the milestone (M2) when the child's interpretable speech became dominant was not related to the variation of the child's communicative acts at any of the stages. There are two possible reasons why there were no correlations regarding the mothers' communicative styles at M2. One reason could be that this milestone is less pivotal than the other three, as it was not derived from more than one communicative mode. The variation of the mothers' communicative acts at this particular developmental stage may not have been sensitive enough to be able to show the relationships with the development of a child's communicative acts. This interpretation also relates to the second possible reason, which is that the only significant correlations in the mothers' communicative styles occurred between M3 and M4. This result indicates that the individual difference in mothers' communicative styles was not consistent during the child's second year, particularly at the early milestones. As investigated in the previous section, the trends in the variation of mothers' communicative acts in the 'Discussion' domain in relation to the 'Directive' domain differed with regard to the point at which each mother made a shift towards the 'Discussion' domain. This difference probably affected the inconsistency in the mothers' communicative styles over time, which could be related to

the underlying reason for failing to identify these particular relationships.

Moreover, the mothers' communicative styles at both M1 and later milestones (M3 and M4) showed significant correlations with the children's pragmatic skills at later milestones, although there were no significant associations within the mothers' communicative styles at the early and later milestones. These findings suggest the following possibility: the mothers' communicative styles at M1 could have a predictive relationship with the children's subsequent pragmatic skills; and the relationships between the mother and the child at later milestones could also be derived from a different type of variance. It is possible to speculate that the significant correlations at the later milestones were derived from a process by which the children's pragmatic skills at M3, which had developed with their increasing linguistic skills, influenced the ways in which the mothers interacted with their child.

Overall, the results above show some indications concerning the relationship between mothers' communicative styles and their children's communicative acts. The development of children's communicative acts appeared to be more sensitive to the variation of the mothers' communicative acts rather than the frequency of involvement used in the discussion domain. The mothers' communicative styles during their interaction with pre-linguistic children have a relationship with the development of children's ability to express their communicative intents.

7.6 Summary

There were no significant changes in the overall frequency and the number of types of mothers' communicative acts over time. There were trends in the changing proportions of particular types of communicative acts. At the Interchange level, the categories that involved directing the hearer's behaviours decreased, and the categories

that involved discussion increased. At the Speech Act level, the function of the 'directives & responses' group decreased and that of the 'statements & responses' and 'question & responses' groups increased over time. At the combination level, the three domains of communicative acts, 'discussion', 'directive' and 'social & conventional', showed clear trends. 'Discussion' increased and 'directive' decreased over time. The 'social & conventional' domain, though there was a slight decrease towards the middle of the child's second year, remained relatively stable over time. There were individual differences in the trend regarding when the mother's communicative act shifted towards 'discussion' and how far the mother was oriented to either 'discussion' or 'directive' overall. The variation in the mother's communicative acts that were used in 'discussion' as opposed to 'directive' in their interaction showed some concurrent and cross-lagged correlations with the variation in the child's communicative acts.

7.7 Discussion

This chapter has examined the mothers' communicative acts that were used during the interaction with their child. These acts were analysed from quantitative and qualitative perspectives, using both, for frequency counts of the communicative acts, to address the following questions: 1) whether or not the mothers changed their communicative behaviours as their children got older; 2) in what way, if any, the mothers changed their communicative interaction; and 3) whether there were any individual differences between the mothers' communicative styles; and 4) what kind of relationship existed between the mothers' communicative styles and the children's development in expressing their communicative intents.

The mothers' communicative acts did not show significant changes in relation to a child's age in terms of frequency of involvement and the number of different types.

This is a somewhat intriguing result compared with the result of the pilot study, in particular with respect to the measure of communicative acts at the combination level. It was expected that a wide variation of combinations would be observed, because the mothers' use of communicative acts would have become more sophisticated according to the child's progress. This result suggests that the finding from the pilot study may have been derived by chance, because not many older children were observed in it. In the present study, the failure to identify age-related change was possibly related to individual differences in the direction of changes. Although not all individual mothers appeared to show significant age-related change in their measures, some mothers' measures increased, whereas other mothers' measures decreased as their child got older. In the case of Mother G, whose child had developed an advanced level of language for her age, there was a significant decrease in all measures. The trend in this case is consistent with a previous study (Pan, *et al.*, 1996) that identified a significant decrease in the same measures for children aged from 20 to 32 months. This consistency indicates the possibility that a significant level of decrease could also have been observed in other mothers' communicative behaviour if the observations were made a little later than the current study. Nevertheless, these quantitative measures only tapped the very surface level of the mothers' communicative behaviour. Thus it is difficult to conclude whether or not the mothers, on the whole, changed the ways in which they communicated with their child as the child developed.

The analyses of qualitative aspects, that is, the trends in the different types of Interchange, Speech Act and combinations of these, revealed a more comprehensive picture of age-related changes in the mothers' communicative behaviours. At the Interchange level, the mother shared the same common types of communicative acts with their children. The main group of Interchanges, *Negotiating the Immediate Activity, Discussing a Joint Focus*; and *Directing Hearer's Attention*, as well as the

second group that are more socially and conventionally oriented, such as *Marking*, *Showing Attentiveness* and *Performing Verbal Move in an Activity* were used by all mother-child dyads frequently throughout the series of observations. The coding at Interchange level was designed to capture the immediate social context in which a speaker's intention is expressed. Therefore it is understandable that the mother and the child appeared to share the same types of Interchange that are frequently used. This sharing is a good indication that they were conversing, rather than expressing their intents in a one-directional way.

The types of Interchange that decreased with the child's age were *Negotiating the Immediate Activity* and *Directing Hearer's Attention* from the main group and *Discussing Clarification of Non-verbal Acts* and *Negotiating Mutual Attentiveness* from the groups of less frequent Interchanges. These Interchanges involved, in some ways, directing the children's behaviours to focus and sustain their attention in the on-going activities, as well as the mothers' intention to understand their child's limited expressive intents. It is likely that these categories of Interchange decreased with the child's age because the child's language became more expressive and the child's attentional skills developed in such a way that they could engage in the same topic of conversation for longer. On the other hand, several types of Interchanges that involve discussion increased. This trend was well synchronised with what was found in the children. Again, it is possible that the increasing proportion of children's involvement in these Interchanges for discussion had an impact on the mothers' increasing involvements in the same Interchanges. This does not necessarily mean that the children were more in charge of all social interchanges at later ages; it is more likely that the children's growing ability to attend to a wider range of communicative interactions, which the mothers may have initiated in the first instance, allowed the mothers to pursue further discussion on the topic of their mutual interests.

Similar results were found at the level of Speech Act. The speech acts that functioned as 'directives & responses' decreased whereas 'questions & responses' and 'statement & responses' increased with the child's age. These trends further support the arguments above. The shift in the mothers' actual language use indicates a qualitative change in their communicative interactions. The mothers' interaction with the older children involved communication embracing a more declarative nature rather than the simple management and facilitation of communicative exchanges. The mothers questioned more at a later age because their child was capable of answering them; and the mothers' response to the questions started to emerge because their child started to ask the mother questions. Moreover, it is likely that success in such a flow of communicative interaction mediates the next process, in which further expansion of the topic under discussion will be made.

The communicative acts examined at the combination of Interchange and Speech Act level further revealed much clearer trends in the mothers' involvement in the communicative interaction within the three distinctive domains. The trends of 'directive' and 'discussion' yielded a very similar picture to that found in the analyses of Interchange and Speech Act. These trends suggest a clear shift, initially, 'directive' dominated the mothers' communicative acts; and then 'discussion' took over to dominate their communication. Interestingly, the communicative acts that have the nature of 'social & conventional' aspects in the conversation remained constant throughout the second year. Distinctive characteristics of Japanese conversation, such as showing frequent and spontaneous indication of attentiveness to the hearer and marking to show their sentiments towards the previous speaker's propositional statements, were also found in the intimate parent-child conversations. This may also be a unique feature, which facilitates the interaction with young children in Japanese culture. Adults generally include this conversational behaviour in their response to a

young child's vocalisation or speech, to encourage on-going conversation. This way of interaction may reflect their attitude towards communicating with children, in that they value children's learning to express their intention through socialisation rather than providing corrections of linguistic form, unless linguistic errors are fatal in the process of socialisation. In fact, at a very early age, very little correction of the children's erroneous speech, particularly in the naming of objects, was observed. This kind of communicative behaviour by the mothers appeared only during the last few months of their child's second year. However, from the child's early age, the mothers prompted their child to say phrases of greeting and apology, which in Japan are vital for maintaining social relationships with others.

Overall, the mothers' communicative behaviours changed over time. Their involvements in discussion increased and those in directive decreased. These changes were found not only in the frequency of involvement, but also in the variation of the mothers' communicative acts. During the final observational sessions, most mothers used a wider variation of communicative acts in the discussion domain compared with the directive domain. This indicates that during the second year when the child's linguistic ability started to advance rapidly, leading to improved mutual communication, the mothers' communicative behaviour also changed to support such mutual conversation.

Following the overall trend of changes in the mothers' communicative style, the differences in the way in which individual mothers used communicative acts for 'discussion' as opposed to 'directive' was examined. There were significant differences in some mothers' quality and quantity, which were represented by the variation and frequency, of communicative involvements in the two domains. These indicated that some mothers showed a clear tendency to favour one domain over the other. For the mothers who did not show statistically significant differences in the two

domains, it is difficult to identify whether these mothers' communications were literally balanced in those domains, or whether the tests simply failed to identify any significant differences. Nevertheless, it is possible to say that during the limited period of this study, there were individual differences in the way that some mothers deployed a particular communicative style consistently.

The relationship between the differences in the mothers' communicative orientation and their child's communicative competence has revealed some implications of such differences in the mothers' communication styles. What made individual mothers' interaction styles different in facilitating their child's language development, specifically in the arena of pragmatics, appeared to be the quality of involvement. The mothers who engaged in more discussion using a large variation of communicative acts tended to have children who developed a wider variation of ways for expressing their communicative intentions later in the study. Because this result was based on the correlation, the results do not determine the direct causality of these relationships. However, the associations between the mothers' early communicative interaction and the measures of children's pragmatic skills at later ages suggest that the ways in which the mothers interacted with their children were likely to have some impact on the children's development of pragmatic skills. On the other hand, there is another possible relationship between the mothers' communicative styles and the children's pragmatic skills at later ages. Since there was no consistency in the variability of mothers' communicative styles between the interactions with the child at the early and the later milestones, it is possible that some mothers came to use communicative acts with more variation in the discussion when the child became capable of holding the communication linguistically.

In the present study of Japanese mothers and their children, the interaction in which various types of discussion were involved appeared to be one of the key elements

for children's pragmatic development. The variation in the domain of discussion also has important implications for the development of joint attention as well as cognitive development in general. Although the mothers' role in scaffolding communication by initiating and maintaining conversational topics is important, the child's growing ability to attend such conversation could not be overlooked. Children's ability to attend to more complex and abstract topics beyond the 'here and now' context has just started to emerge during the second year of life, as charted in the previous chapter. This ability is supported by the children's conceptual understanding of things in the world, as well as possession of language skills to express their intents. In addition, the child needs to have a sound understanding of the partner's intentional behaviour in relation to their focus on an event or object, which enables the child to judge what the other person really means.

In terms of the nature of Child Directed Speech (CDS), the present study suggests that, with respect to pragmatics, mothers' speech to young children is fine-tuned to the child's level of language. Although the current results were based on Japanese-speaking dyads, the current finding expands on previous studies that used similar methodologies (Pan *et.al.*, 1996; Zhou, 2002). These studies all found some types of adults' fine-tuning of speech to their children, though how they did this in each culture appeared to be quite different. The findings on Chinese-speaking mothers are of particular interest. Zhou (2002) found that these mothers used very few communicative acts of *Marking*, which functions to bring conversations alive and make them more interesting, compared with English-speaking mothers (Pan, *et.al.*, 1996). Conversation reflects the cultural practice in a particular culture, and the way people talk varies from one culture to another. The overt feature of CDS may be common to many cultures, as reviewed earlier, but it will differ in the way in which the adults in a particular culture interact with their child, which is likely to reflect the beliefs of the

caregivers in the culture. From these findings, it is possible to summarise the pragmatic aspect of CDS as follows: caregivers modify their language use to tune into the child's level of development; how and which particular aspects are fine-tuned are culturally specific.

Chapter 8

Joint Attention and Communication

This chapter describes the children's involvement in joint attentional episodes.

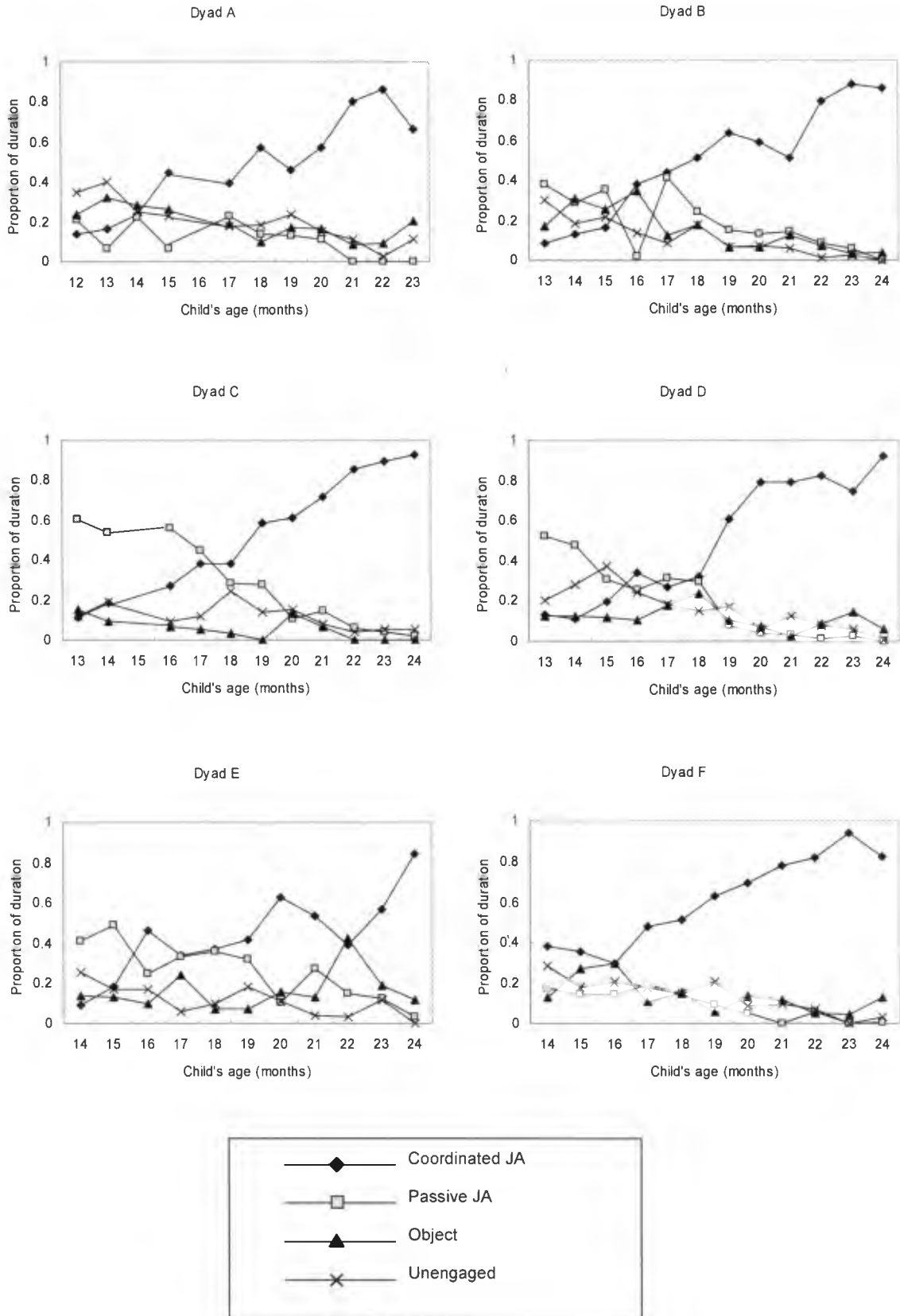
Communicative exchanges that are mediated by joint attentional behaviour are of interest in this chapter. The growing communicative competence of the children was illustrated in terms of the expression of their intents in Chapter 6. The examination of children's joint attentional skill is designed to provide another dimension of their picture of communication development. The extent to which the children are capable of engaging in joint attentional episodes at different ages will reflect the developmental changes in the structure of communicative interactions.

The children in the present study had begun to show joint attentional behaviour at the beginning of the study. Their joint attentional engagements that met the coding criteria outlined in Chapter 3 were identified, and the corresponding duration of these engagements was measured. The developmental trajectories were drawn based on the total time duration of joint attentional episodes each month. The trajectories were then examined in the two analytical frames of an analysis of each child and a comparison between children. The specific research questions were: 1) What kind of growth trajectory is found in the children's engagement in the joint attentional episodes? 2) Are there any individual differences in the growth of joint attentional engagements? If so, in what way do they differ? 3) Is there any relationship between the development of joint attentional engagements and the development of the expression of communicative intents?

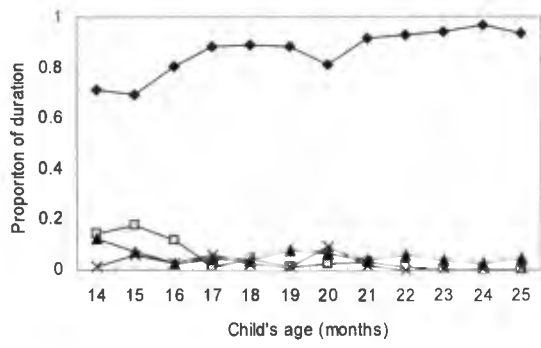
8.1 Developmental trajectories of joint attentional engagements

The children's interactions with their mothers were classified on the basis of six types of engagements: coordinated joint (mediated by joint attentional behaviour); passive joint; objects; onlooking; persons; and unengaged (see Chapter 3 for the details of the criteria). The main focus of the analysis was the development of the joint attentional engagements, which were classified under the category of 'coordinated joint'. All children showed 'coordinated joint' engagement at least once during the initial sessions. The developmental changes of the joint attentional engagements were presented in conjunction with three other types of engagement ('passive joint', 'object' and 'unengaged'). Each of these four categories accounted for at least 10% of the total duration at more than two sessions for each child. The other two categories, 'onlooking' and 'persons', only accounted for very small proportions of the total duration. Figure 8.1 presents the trajectories of the raw data for the four categories of engagements for each dyad.

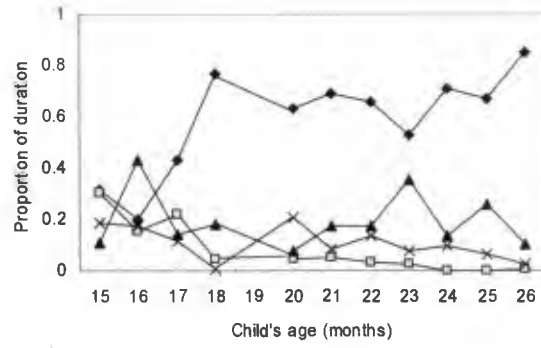
Figure 8.1 Developmental trajectories for the total time spent in each engagement



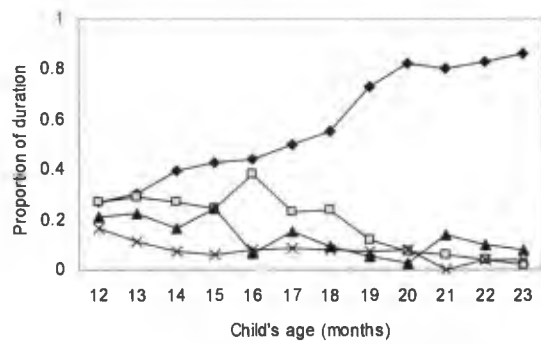
Dyad G



Dyad H



Dyad I



Dyad J

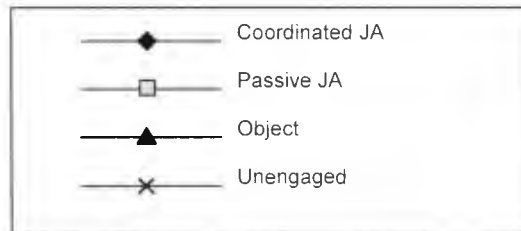
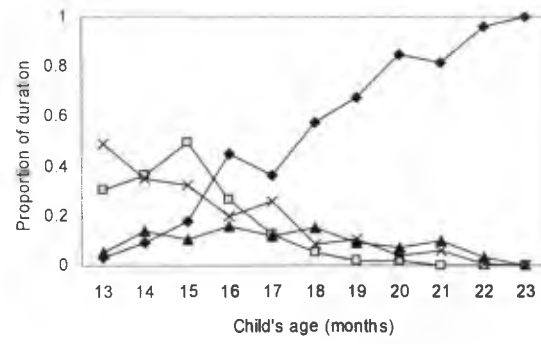
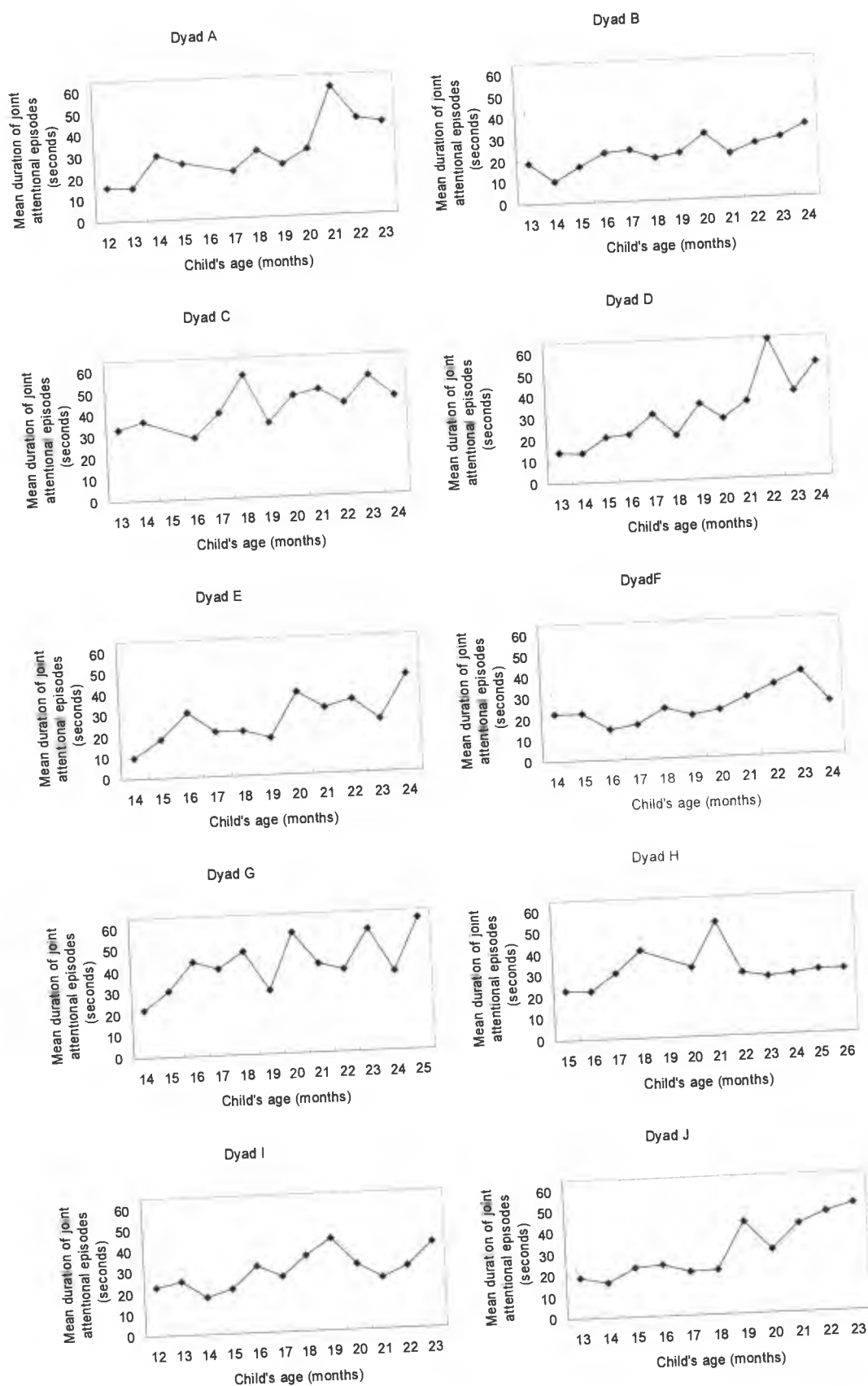


Figure 8.1 shows that there was a steady increase in the proportion of joint attention for all children during the second year, except child G. This child was already showing a substantial amount of such attention, accounting for more than 50%, from the first session. The examination of the trajectories also suggests that the dyads differed with respect to their rates of increase and the initial states of joint attentional engagements. Because the observations started at slightly different ages, a direct comparison between the dyads is more difficult. In the initial observation, some children (A, B, C, D, E and J) engaged in joint attentional episodes for less than 15 % of the total duration, whereas other children (F, G, H and I) engaged in the joint attentional episodes for longer periods. However, it is noteworthy that regardless of the initial states of their joint attentional competence, all children showed a similar level of competence between 17 and 19 months of age. All children reached the point where they were involved in joint attentional episodes for more than 50% of the total duration. Before the joint attentional engagements became dominant, the interactions mainly involved the other three types of engagements. These types of engagement decreased towards the end of the second year in all children. However, there appeared to be individual differences in which types of engagement were predominant in the early sessions, as well as over the point in time at which each type of engagement showed a substantial decrease. The mean duration of the joint attentional episodes was also calculated at each observational point in time for each child, and is presented in Figure 8.2. As the total duration of joint attentional episodes increased, the mean duration of the joint attentional episodes also increased for all children. This indicates that, on average, the children engaged in longer joint attentional episodes as they grew older.

Figure 8.2 The mean duration of joint attentional episodes



The growth curves shown in the preliminary analyses above for the children's engagements were examined, using hierarchical linear modelling. This specific method of analysis provides the trajectory of the growth curve at both the group and individual levels, and indicates how individual trajectories differ from the group means. The growth models were predicted using the following categories as response variables: 1) joint attentional engagements; 2) passive joint attentional engagements; 3) object engagements; and 4) unengaged. The explanatory variable, the children's ages, was centred around the location of 12 months, when most children started to show a sign of joint attentional behaviour (Bakeman & Adamson, 1984). The descriptive statistics for the duration of the four categories of engagements are summarised in Table 8.1.

Table 8.1 Mean and standard deviation for the duration of the engagements (%)

Age (months)	N	Joint attention		Passive joint		Object		Unengaged	
		M	SD	M	SD	M	SD	M	SD
13	6	13.5	3.7	36.0	7.9	17.3	3.8	27.0	6.3
14	9	25.9	6.9	32.3	4.5	16.7	2.5	20.9	3.6
15	9	32.4	5.7	28.9	4.9	17.6	2.7	20.0	3.5
16	9	36.0	6.8	24.0	5.3	18.0	4.8	14.9	2.3
17	10	42.6	5.4	25.2	4.1	13.5	1.9	13.3	2.1
18	10	52.1	6.0	18.4	3.7	12.3	2.1	12.1	2.4
19	9	51.7	5.8	13.3	3.5	7.6	1.5	13.3	2.5
20	10	64.8	3.9	7.2	1.3	9.7	1.5	10.4	1.6
21	10	73.6	3.4	7.2	2.8	9.9	1.5	6.7	1.2
22	10	75.5	4.8	4.4	1.5	10.8	3.9	4.3	1.4
23	10	76.5	5.9	3.0	1.3	10.9	3.6	4.9	1.4
24	7	81.4	5.5	0.9	0.5	7.4	2.1	2.6	1.3

From the univariate statistics and scatter plots, it was hypothesised that there were linear trends for most categories. As expected, the growth curve of each engagement fits a linear model. Figure 8.3 presents a predicted growth curve for all children. The predicted linear curves of each individual child for each type of engagement are presented in Appendix 10. The mean initial state at 12 months (β_0) and growth rate per month (β_1) as well as their variances are summarised in Table 8.2.

Figure 8.3 The linear model of growth in children's engagements

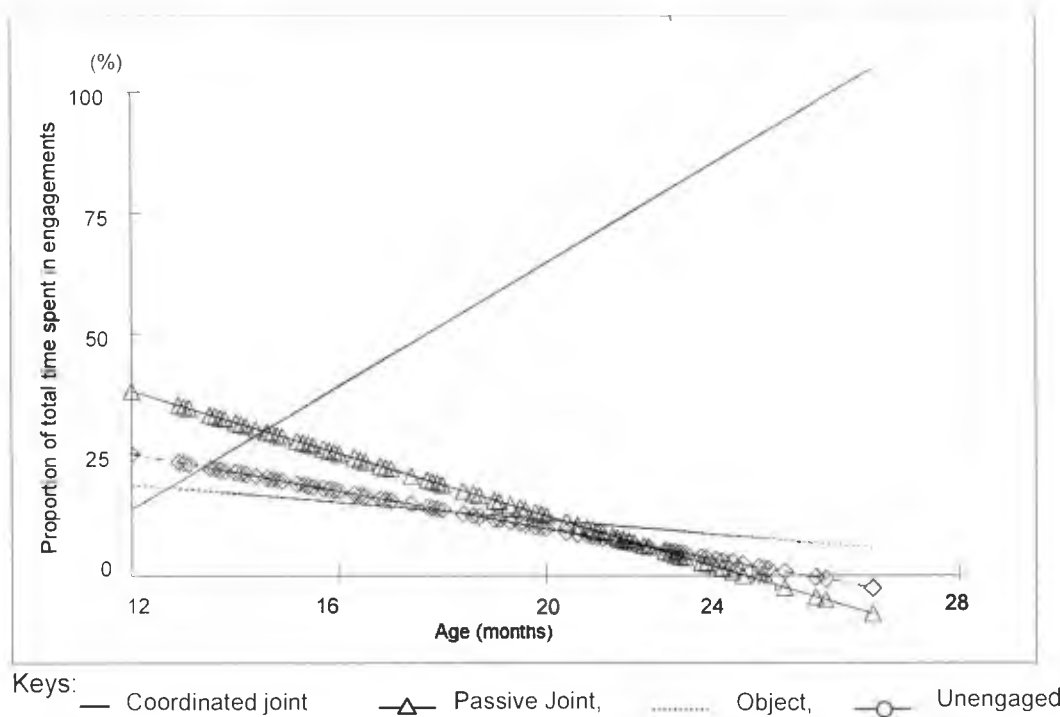


Table 8.2 The linear model of growth in children's engagements

Response variable (%)	Fixed effect			Random effect			
	Coefficient	se	t Ratio	Variance components	se	χ^2	
Joint attention	β_0	13.63	6.83	-	432.16	208.03	4.29*
	β_1	6.36	0.69	9.22***	4.19	2.13	3.86*
Passive joint	β_0	38.01	5.14	-	241.49	117.97	4.19*
	β_1	-3.22	0.45	7.16***	1.70	0.92	3.38
Object	β_0	18.76	2.27	-	30.81	23.15	1.77
	β_1	-0.91	0.28	3.25**	0.43	0.35	1.48
Unengaged	β_0	25.11	3.64	-	122.04	59.16	4.26*
	β_1	-1.93	0.38	5.08**	1.23	0.63	3.86*

* $p < .05$, ** $p < .01$, *** $p < .001$

For the joint attentional engagements, the mean proportional duration at 12 months was 13.63% and the mean growth rate was 6.36%. Individual children's initial states and growth rates varied around the mean proportion. The passive joint attentional

engagements accounted for nearly 40 % of the duration at 12 months of age; this decreased at the rate of 3% per month. The initial duration of engagements for the individual children varied, but the rates did not show significant variations. For object engagements, there were no significant individual variations. The mean proportion of time in the initial engagements was 19 %, and the rate of decrease was nearly 1 % per month. Initially, the children showed no engagement for nearly 25 % of the time. The total time during which the children showed no engagement decreased by nearly 2% per month. There were significant variations in the initial duration of unengaged periods and the rate of decrease.

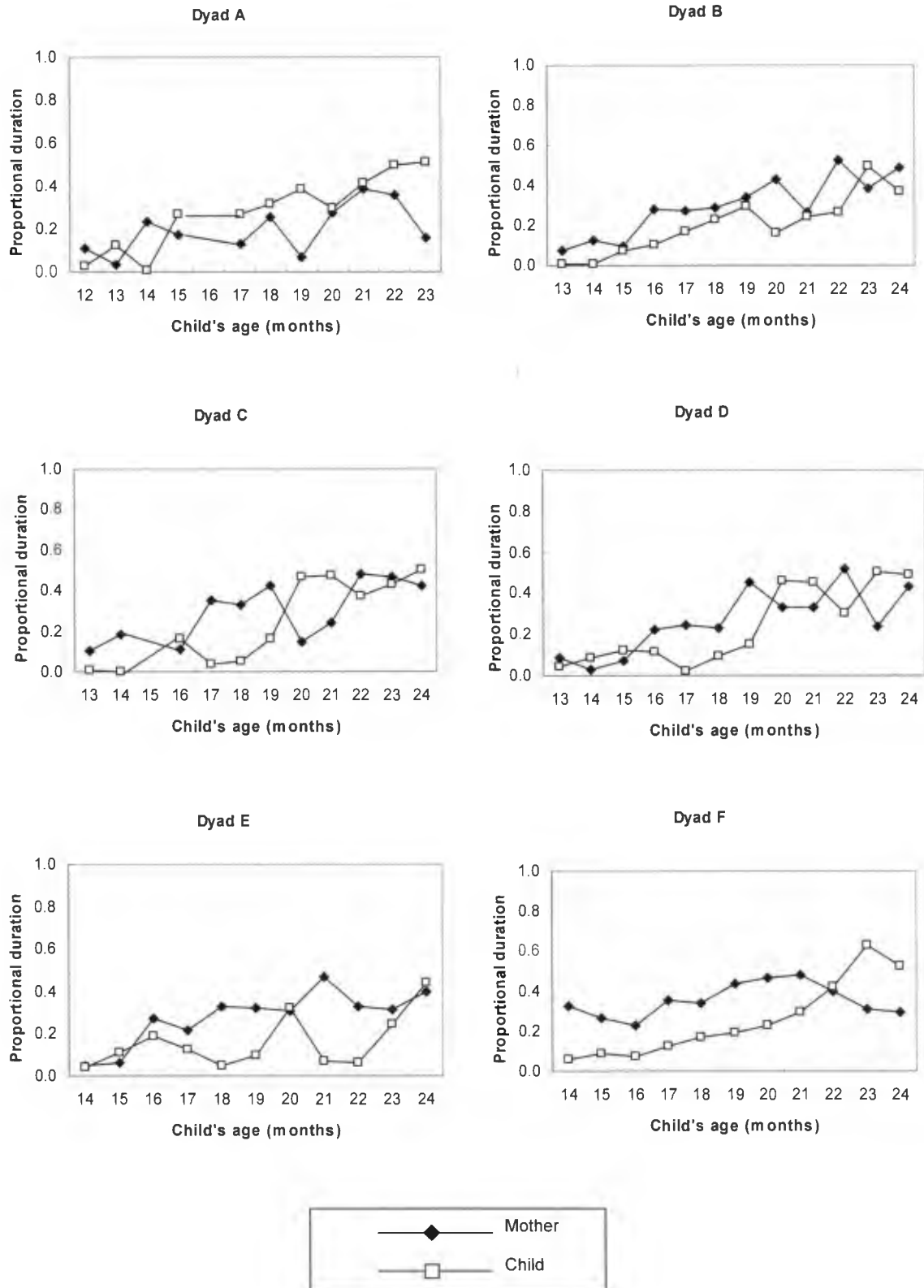
The trends across the different types of engagements showed that initially the children's involvements were dominated by the three types of engagements which indicate no signs of coordination of attention between the object and the mother. The passive joint type, in particular, appeared to be the prevalent type of engagement at the initial stages. The rate of decrease was also the greatest among these three types. On the other hand, object engagements showed very little decrease. This type of engagement remained, even in the later sessions, whereas passive joint engagement had almost disappeared by the end of the second year.

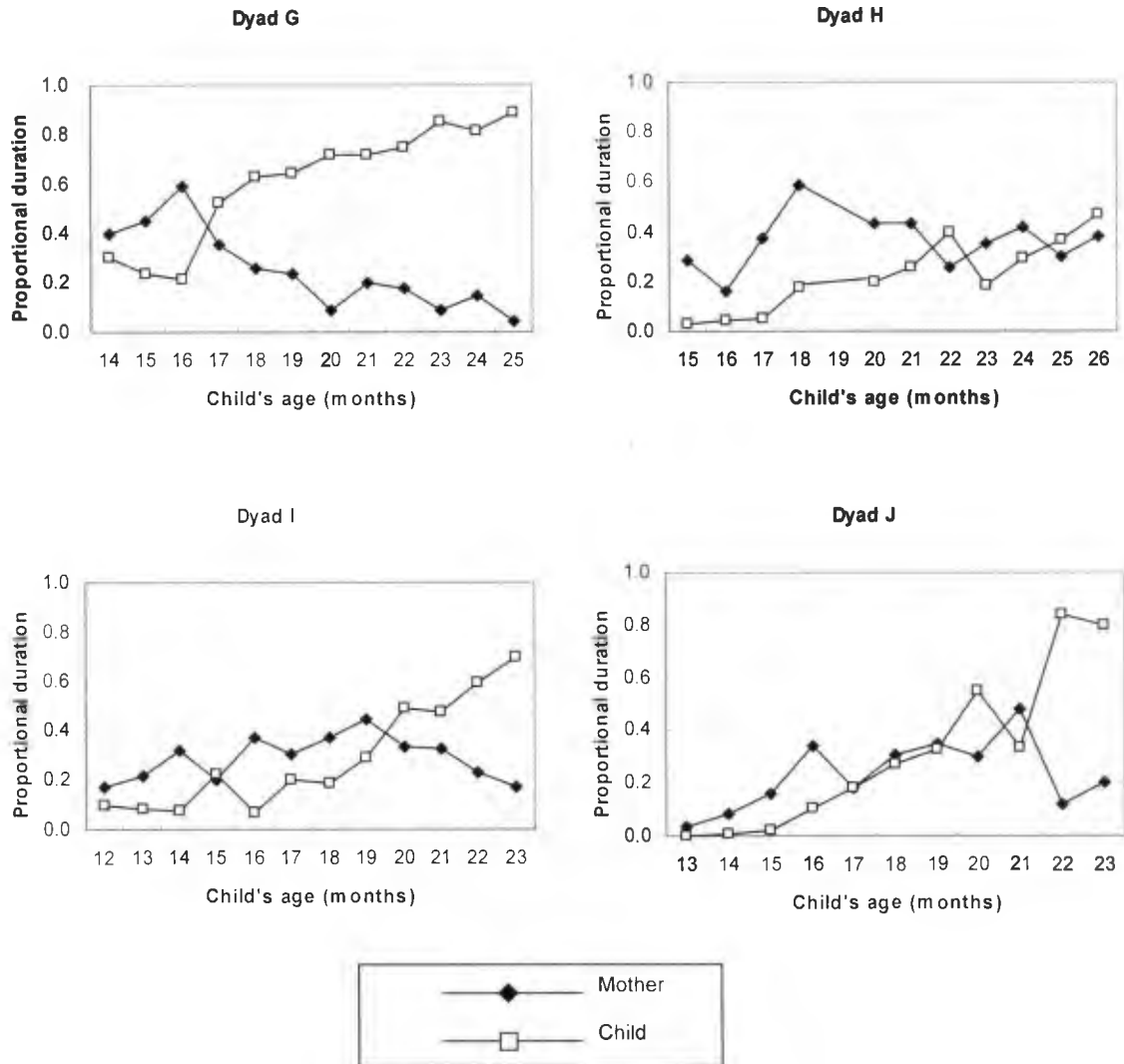
8.2 Developmental transition of initiating joint attentional episodes

The joint attentional episodes were further examined in terms of the initiation of each episode. This examination was designed to provide more details on the development of joint attentional engagements. As children increase their repertoire for expressing their intents, they are likely to become more competent in leading joint attentional

episodes by making their intents clearer. Indeed, such signs of competence in their expression of communicative intents were found and discussed in Chapter 6. For example, most children showed a particular Speech Act, *state one's intent to carry out act* (SI) by the middle of the second year. The children also expressed their intention of refusal, *refused to carry out act requested by other* (RD), at a similar stage of development. Thus it is possible to hypothesise that as the total duration of the joint attentional engagements increases the proportion of the joint attentional episodes that are initiated by children also increases. These episodes were grouped on the basis of who initiated the episode. The total duration of the joint attentional episodes initiated by the mother and the child respectively were calculated for each session, and trends for their proportional duration are presented in Figure 8.4.

Figure 8.4 Initiation of joint attentional episodes by mother and child





As expected, the total duration of the episodes that were initiated by the child increased with the child's age; this trend was found in all dyads. The pattern of increase appeared to be different among the children with respect to the point where the duration of episodes initiated by the child exceeded those initiated by the mother. Child G, again, showed a sharp increase at an early age, whereas other children showed a more steady increase during the second year. In contrast, the total duration of the episodes initiated by the mothers showed a more complex picture. Initially, there were increases in most mothers. However, the increase was maintained throughout the second year only for mothers B, C, D and E. At the end of the second year, the total

duration of episodes initiated by the child became nearly equal to that of the mother. Other mothers showed decreases once their child appeared to take a more leading role in initiating their episodes. For overall trends of the dyads, there are some indications that joint attentional episodes initiated by the child began to dominate from the middle to the end of the second year. More details were examined with reference to the types of initiation. Two further categorisations for the joint attentional episodes were made: (a) directing the other's attention to something in their own focus in order to initiate a joint attentional episode; and (b) following voluntarily into the other's focus of attention without having been directly influenced by the partner, a move that subsequently supported a joint attentional episode. The proportions of joint attentional episodes began by the two types of initiation were charted using two formats as shown in Figure 8.5. One format (Figure 8.5-i) describes the proportion of time spent in the target episodes relative to the total observation duration. The other format (Figure 8.5-ii) charts the trend of the ratios between the time spent in the episodes with the mother's supportive initiation and those with her directive initiation. As for the child's initiations, most initiations derived from a directive manner. Not many episodes were initiated by child following the mother's focus of attention. Therefore this analysis was limited to the mother's initiation.

Figure 8.5-i) Proportional duration of the joint attentional episodes initiated by mothers (direct vs. support)

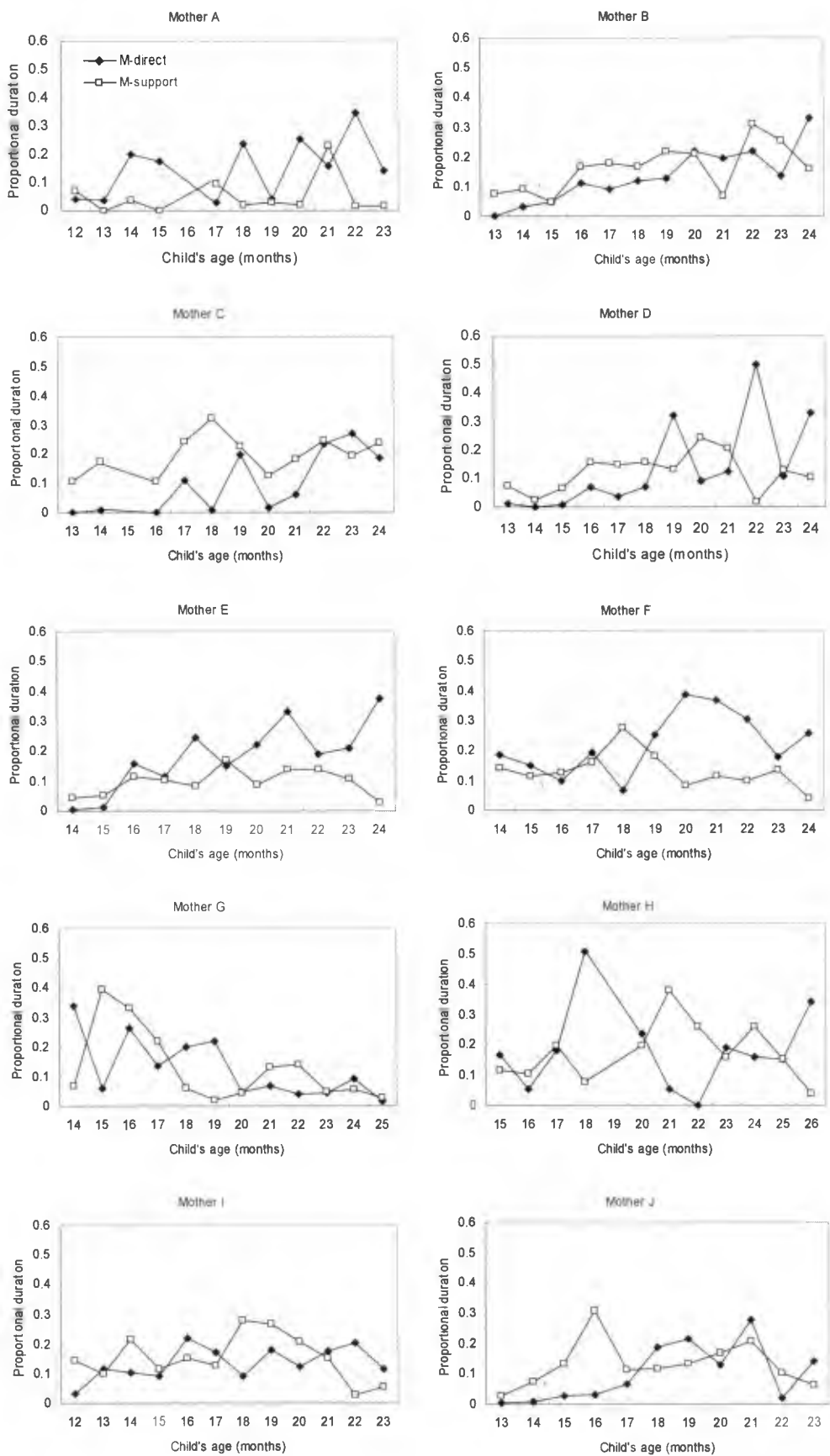


Figure 8.5-ii) The ratio of the two types of episode initiated by the mothers

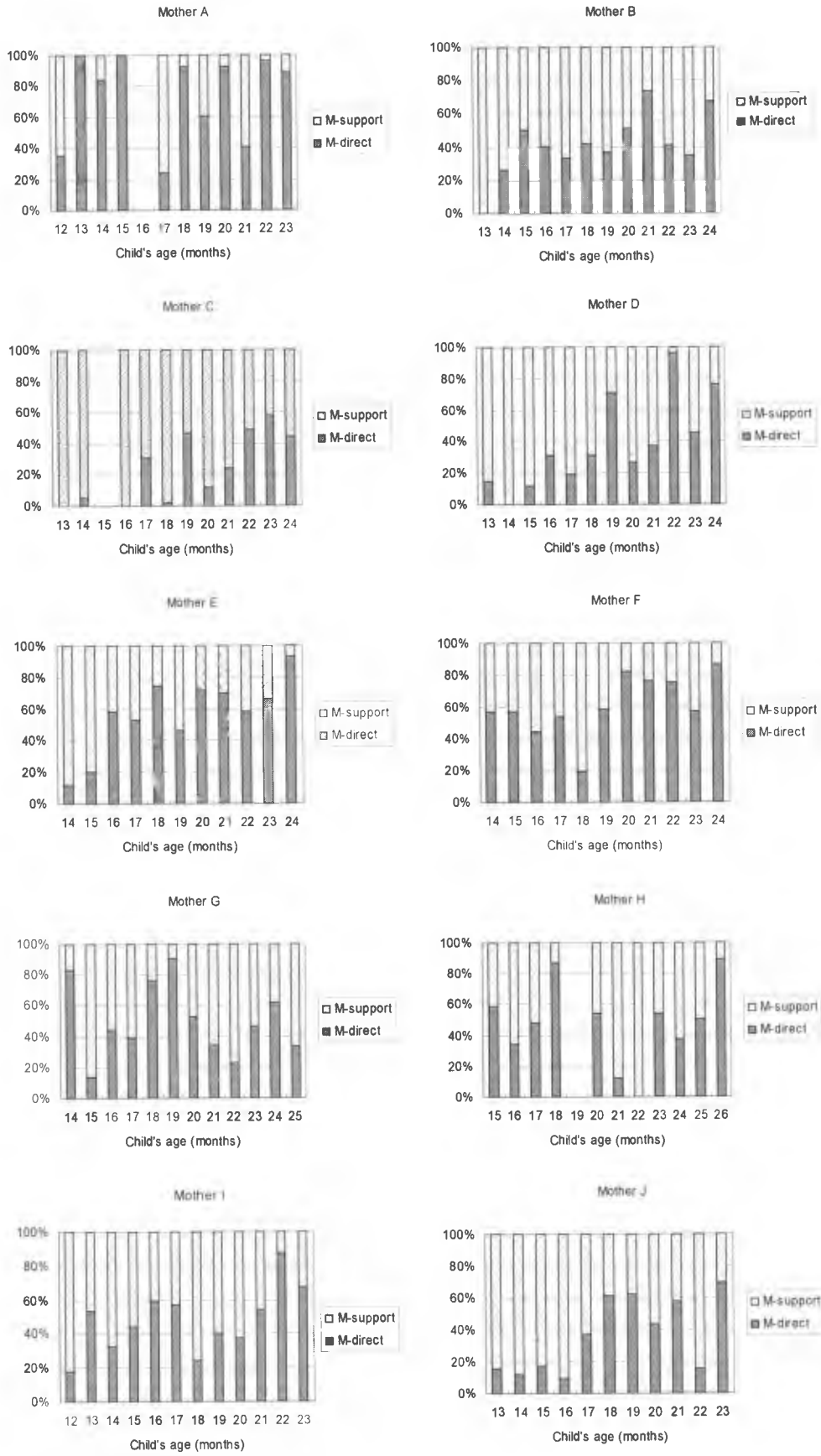


Figure 8.5-i indicates that in early sessions the mother's successful joint attentional episodes that had begun by supportive initiation were longer for most mothers, whereas in the later sessions the opposite trend was observed. Figure 8.5-ii revealed much clearer trends over time for most mothers. When their child was younger, most mothers used a supportive type of initiation and formed joint attentional episodes successfully. Dyad G did not appear to correspond to this age-related trend; in fact, during the early stages, mother G actually showed the trend of moving from supportive to directive initiation until the joint episodes initiated by child became increasingly longer. Thus it is possible that when the child's attentional skills are very limited the directive way of initiation may be less likely to succeed. As the children grew older, their initiations succeeded by using a directive type, rather than a supportive type. This means that the child recognised the mother's communicative intents expressed by a directive act, and attended to the new state of affairs initiated by the mother. An illustration of the two types of initiation is presented in Table 8.3.

Table 8.3 *Illustration of the mother's initiation of joint attentional episodes*

Supportive initiation	Directive initiation
Child C (Nao) at 14 months <i>Child is playing with a plastic planting pot. Mother comments on the act.</i>	Child C (Nao) at 24 months <i>Child moves to the window side.</i>
Child: 0 [no speech]. <i>holds up a pot to hide his face.</i> Mother: <i>Nao-chan no ohana ga...</i> <i>[Nao-chan's nose is...]</i> Child: <i>baa.[boo]</i> <i>shows his face.</i>	Mother: <i>A Nao-chan sazanka no ohana ga saiteru, hora akao ohana ga.</i> <i>[look, Nao, the flowers are over there, look the red flowers, there]</i> <i>Pointing at the flowers they can see from the window.</i> Child: <i>oo! [oh!]</i> <i>looks at the flower then looks back the mother</i> Mother: <i>nee.[oh yes]</i> Mother: <i>takusan saita ne.[there are so many flowers]</i> Child: <i>kirei ne.[they are beautiful]</i> Mother: <i>kirei ne.[they are, indeed]</i> Mother: <i>kirei ne Nao-chan ohana ga.[yes, they are beautiful, Nao]</i>

The example of the supportive initiation shows how mother followed into the child's focus of activity, then commented as if she anticipated some response from the child. The child then responded in the way the mother anticipated. The structure of this communicative exchange was an extension of the "peek-a-boo" scenario. This was easy for the child to respond to, not only with attentional focus but also with a verbal expression. On the other hand, later in the year the same child responded to the mother's directive acts to indicate the flowers that she noticed outside window. The attentional object of the mother was nowhere near the child's attention. It would be difficult for the child to guess what kind of object the mother was referring to. These two examples indicate the difference in the child's attentional competence. These different levels of competence will, in turn, reflect the particular type of initiation that works successfully to form joint attentional engagements.

To summarise the analysis of episode initiation, as the child's communicative competence increased both the child's and the mother's attempts to direct the partner's involvement to joint attentional episodes became more successful.

8.3 The relationship between joint attentional engagements and expressing communicative intents

The preceding examinations revealed a developmental picture of joint attentional engagements during the second year. The total duration of joint attentional episodes increased as the child became older. The total duration of the episodes initiated by the child became longer than those of the mother in the later sessions. There were also individual differences for the patterns of increase in the total duration of the joint attentional episodes. The next investigation focuses on whether or not the differences

in the growth of joint attentional episodes have any association with the child's pragmatic skills. The relationships were examined in two ways, using Pearson product-moment correlations. The first examination was to test concurrent correlations between the joint attentional episodes and the variation of communicative acts at each age (monthly intervals). The second examination was to test cross-lagged correlations at the four developmental milestones (M1: gesture with vocalization or speech became dominant in the gesture domain; M2: speech dominated all modes of communication; M3: gesture with speech became dominant in the gesture domain; and M4: emergence of two-word utterances). These four milestones were identified through the examination of individual children's trajectories for the different types of communicative mode (see Chapter 6). Although each child reached the same milestone at different ages, the order of achievements of the four milestones was identical across all children. This means that the order of milestones 1 to 4 reflects the chronological order, despite the individual differences in the length of months between the milestones. Therefore the correlations of the two variables at these milestones are unlikely to be influenced by the developmental speed of the children.

For the first analysis, the concurrent correlations were examined for the child's ages from 14 months to 23 months, for which most children's data were available for the correlation tests. The summary of these test results is presented in Table 8.4.

Table 8.4 Concurrent correlations between the duration of joint attentional episodes and the variation of communicative acts

Pragmatic measures	Concurrent correlations at each age									
	14	15	16	17	18	19	20	21	22	23
Interchange	.912**	.506	.684*	.565*	.570*	.512	.563*	.818**	.845**	.497
Speech Act	.756*	.575	.407	.723**	.507	.501	.771**	.808**	.615*	.519
Pragmatic Flexibility	.375	.63*	.765**	.657*	.511	.671*	.866***	.768**	.735**	.642*

*: $p < .05$, **: $p < .01$, ***: $p < .001$ (1-tailed)

The results revealed that there were significant correlations at most ages. This finding indicates that there is a positive link between the duration of joint attentional episodes and the variation of communicative acts that the children used during the second year. These high and significant correlations were due to the individual differences based on the chronological age at each point in time. However, as investigated in the previous chapters, when the communicative modes were examined, there were wide differences in the age at which children achieved each milestone. These milestones reflect the competence of producing communicative acts at a fundamental level, regardless of chronological ages. Therefore it was anticipated that this would reveal a more precise picture of the relationship between joint attentional skill and the development of communicative acts.

The correlations between the duration of joint attentional episodes and the variations of children's communicative acts were then examined for the four milestones. Table 8.5 summarises the results of the tests.

Table 8.5 Correlations between the duration of joint attentional engagements and the variations of children's communicative acts

Children's communicative acts (N of different types)	The duration of joint attentional episodes			
	M1	M2	M3	M4
M1				
Interchange	ns	ns	ns	ns
Speech Act	ns	ns	ns	ns
Pragmatic Flexibility	ns	ns	ns	ns
M2				
Interchange	ns	ns	ns	ns
Speech Act	ns	.696*	ns	ns
Pragmatic Flexibility	ns	ns	ns	ns
M3				
Interchange	.752*	.645*	ns	.657*
Speech Act	.667*	.822**	ns	ns
Pragmatic Flexibility	.700*	.837**	ns	ns
M4				
Interchange	ns	.617*	ns	ns
Speech Act	ns	.643*	ns	ns
Pragmatic Flexibility	ns	.769*	ns	ns

*: $p < .05$, **: $p < .01$ (1-tailed)

The results show that the duration of joint attentional episodes at M1 and M2 had significant correlations with the variation of the children's communicative acts at M3. There was also an indication that the total duration of joint attentional engagements at M2 correlated with the variation of communicative acts at M4 as well as M3. The duration of joint attentional episodes at both M3 and M4 did not correlate significantly with the variation of communicative acts either in the concurrent or the subsequent measures. However, the scatter plots indicating positive trends suggest that these results were, to some extent, due to the small sample sizes.

Taken together, the results summarised above suggest that the ability to engage in joint attentional episodes at early stages has a relationship with the acquisition of a variety of communicative acts expressed by speech. During the early developmental stages, although the children began to move away from pre-linguistic communication dominated by vocalisations as well as single gestures to convey some communicative

intent, both their linguistic and their attentional abilities were still limited. The children's ability to engage in joint attentional episodes with the support of the mother around this transition period seems to be vital for later pragmatic development.

8.4 Summary

There was a linear increase in the time spent in joint attentional engagements. Individual children differed in the rate of increase in the proportional time for joint attentional engagements, as well as in their predicted initial states at 12 months of age. The time spent in both 'passive joint' engagements and 'unengaged' decreased with the child's age. The time spent in 'objects' engagements also decreased but there was little variation between the initial states and the rate of decrease across the children. As the total time spent in the joint attentional episodes increased, the total duration of the episodes that were initiated by the child increased. The mother's initiation style also changed, from the supportive type to the directive type, as the child's attentional skills progressed. The time at which the child's initiations became dominant varied across the children, and the change in the mother's initiation type, from supportive to directive, happened according to the child's competence in attention coordination. The joint attentional competence, measured by the total time spent in the episodes, was highly correlated with the children's pragmatic skills measured by the variation of communicative acts throughout the second year. A predictive relationship was found only between joint attentional competence during transition to the linguistic communication, particularly at milestone 2, and later pragmatic skills.

8.5 Discussion

This chapter examined the growth of children's communication skills in terms of the time spent in joint attentional engagements. In contrast to Chapter 6, where descriptive analyses were made on the children's ability to express communicative intents, the current analyses focused on the temporal aspect of communicative exchanges. In order to establish and maintain a flow of communication, it is essential to coordinate one's attention between the entity of the current focus and the communicative partner. Regardless of the frequency and the variation of communicative expression, without this fundamental ability it would be very hard to achieve communication proper. Although many studies have addressed the relationship between joint attentional skills and later language development, little has been reported about how these skills develop during the second year.

The present study first examined the developmental trajectories of the children engaging in joint attentional episodes, as well as the other three types of engagements that did not involve the coordination of attention. There were linear increases in the children's joint attentional engagements. There was also variability in their initial states at 12 months, as well as in the growth rates across the children. As the total duration of the children's joint attentional engagements increased, other types of engagements decreased. There were linear trends for these decreases. In particular, passive joint engagements decreased by a greater degree than the other types. This is the type of engagement where mother and child are involved in the same activity with little coordination of attention by the child. Within this type of engagement, there is no degree of certainty that the children understood that they were sharing something in common with their mothers. Furthermore, because the mother was already engaging in the activity, it would be possible for the child to coordinate his/her attention between

the ongoing activity and the mother if the child's sufficient attentional skills are in place. An age-related decrease in passive joint engagements indicates that this type of engagement could later turn into the joint attentional engagements with the child's subsequent progress in joint attentional skills.

In relation to previous studies (Carpenter, *et al.*, 1998; Bakeman & Adamson, 1984) that examined children's engagement in joint attentional episodes between the first year and the middle of the second year of development, some commonalities and differences are noteworthy. The finding of an increasing trend for coordinated joint attentional engagement was similar to the result observed by Bakeman and Adamson though they did not find any decrease in passive joint engagement for children up to 18 months of age. However, Carpenter *et al.* reported that the proportion of time spent in joint attention was smaller than those found in both the current study and by Bakeman and Adamson when the comparisons were made for the equivalent age ranges. Because of the difference in the children's age ranges studied, the total trend appeared to be slightly different across these studies. Nevertheless, it might well be the case that there were differences in the way the mother and child interacted in the context observed. For example, types of toys used for play would have influenced the length of a joint engagement. The current study included a joint book-sharing context, as well as toys that were likely to induce symbolic play activity. These features would have led Japanese dyads' engagement to become more durable.

This study also further examined the process of forming joint attentional engagements. There were clear trends towards the directive and supportive types of initiation by the mothers as the child aged. Early joint attentional engagements were derived from the mothers' supportive type of initiation, where the mother followed into the child's focus of attention. The child then realised that the mother's attention was

focused on the same item. Thus it is possible that before the child's attentional skills were fully developed the mother's supportive initiative could play an important role in communicative exchanges. This possibility also corresponds with the account provided earlier, that passive joint engagements became joint attentional engagement later because the children were able to understand that the mothers were engaged with the same object as the children.

The current results also support a previous study (Tomasello & Farrar, 1986) that found a significant part played by the mothers' follow-in type of joint attentional episode. As Harris (1992) points out, asynchrony in the timing of referential acts by the mothers when the child's attentional focus was on a particular object may be one of the reasons why some of the children she observed were slower developers of language.

Towards the end of the second year, the duration of joint attention initiated by the child increased. There was also variability in the point at which the child started to direct the joint attentional episodes. It is also possible that the increase in time spent in joint attentional episodes was due not only to the growth of attentional skills but also to linguistic advancements in clarity, and in the variation of expressions in conveying their intents, as well as comprehension of the expression by the mother. The communicative exchanges, such as questions and answers between the child and his/her mother, could keep their attention focused on the object or the event of their interest. Tomasello (1999) proposes an overall developmental picture in relation to this. Initially at around one year of age, the child is able to understand the adult's communicative intention in highly repetitive and predictable joint attentional scenes in which the adult follows into the child's attentional focus. When the child becomes more skilful at understanding the adult's communicative intention in a variety of attentional scenes, such skills enable the child to establish joint attention in more active

ways by identifying the adult's attentional focus in a more complex and wider variety of socio-communicative contexts. Therefore highly structured formats with a sensitive adult's role become less crucial to the joint attentional process. In the light of this explanation, it is reasonable to interpret that the increase in the duration of joint attentional episodes derived from: the mother's directive initiation that succeeded in forming a joint attentional episode because the child could understand the mother's intention; and the child's increasing ability to initiate joint attentional engagements with more sophisticated manipulation of linguistic code and/or combination of language and gesture.

The high and constant correlations between the total duration of joint attentional episodes and the variation of pragmatic expressions from 14 months onwards suggest that both are interrelated and working towards making communicative exchanges more fruitful. Due to the variability of the children's age at the onset of observation, the same test for the very beginning of the second year was not available. However, it may have been difficult to examine the relationship at this age because the children's communicative repertoire did not exhibit variability at M1 and therefore a correlation test using this measure at the M1 stage may not have been valid. However, this does not mean that there is no relationship between early joint attention and expressive pragmatic skills. There may be no concurrent relationship between joint attention and early language development in general. However, many studies suggest that early joint attention has a relationship with later language (e.g. Tomasello & Todd, 1983; Tomasello & Farrar, 1986; Akhtar, Dunham & Dunham, 1991). Recent studies report that even before a child began to show consistent and spontaneous coordination of attention, young children were able to focus on a brief episode with the caregiver's supportive pattern of interaction (Saxon, Frick & Colombo, 1997). In addition, the

frequency of the joint attentional episodes predicted the learning of first words (Silven, 2001) and later vocabulary production (Saxon, 1997). To date, the main focus of inquiry into joint attention has been on its early effects on later language development.

The current results provide further evidence on the predictive relationship between joint attention at the very beginning of the linguistic communication period and the range of variation of later language use. Specifically, the present cross-lagged correlations used the developmental points where individual differences in the speed of development were discounted. In normal longitudinal studies that involve only a few time points, chronological age is often used as the time scale, and measurements under study are taken on the basis of this scale. However, assessing relationships between measurements based on chronological age is subject to individual differences in the rate of development. Given the individual difference during early stages of development, relationships drawn solely from age-related measurements may not be useful. For example, it is highly likely that those children who appeared to have a head start when measured at an early age are likely to be ahead of other the children in later development too. The current results do not have such problems because all measurements were related to developmental points (or milestones) that represented a particular developmental characteristic of the children, regardless of their ages.

Joint attention at the early developmental milestones, more specifically in the transition period from pre-linguistic to linguistic communication, showed a predictive relationship with the child's language use at later stages. It is also interesting to note that there were some predictive relationships between the mother's communicative styles and the development of the child's language use, as explored in Chapter 7. The degree to which the mothers' communicative acts were orientated towards 'discussion' rather than 'directive' domains had significant predictive and concurrent relationships

with the child's pragmatic measures in 12 out of 48 cases (see Chapter 7). However, these mothers' communicative styles at M2 had no relationship with the child's pragmatic measures at any of the four milestones. It is possible to say that regardless of the mothers' communicative orientation at M2, joint attention at this particular developmental point was related to the variation of later pragmatic expressions. This result indicates that even during the second year, before the linguistic medium becomes dominant, joint attention plays an important part in learning how to express communicative intents in a variety of ways. Once sufficient joint attentional skills and linguistic medium are in place, what dyads are communicating, in other words, the quality of communication, seems to be related to the variation of expressions that the children have learnt.

Chapter 9

Communication Development

This chapter summarises the results reported in the previous three chapters. The main objective of the study was to investigate the developmental picture of the children's communication skills from two aspects: the expression of communicative intents and engagement in joint attentional episodes. These investigations were carried out with 10 children and their mothers. The longitudinal study took place during each child's second year, and data were gathered at monthly intervals. Chapter 6 described the growth trajectory of the children's communication mode as well as the variations in communicative acts at group and individual levels. Chapter 7 described changes in the mothers' communicative acts in relation to their child's age, and examined the relationship between mothers' communicative styles and the children's development of expressive pragmatic skills. Chapter 8 examined the development of communication skills from the aspect of joint attentional engagements, with a particular focus on the coordination of attention between an object and the communicative partner. This chapter aims to provide a synoptic picture of communication development during the second year, based on the main findings of the investigations in chapters 6, 7 and 8. The first section summarises the main findings in each chapter; a more synthesised developmental picture across the chapters is provided in the following sections.

9.1 Summary of the main findings

The main findings from the data on 10 Japanese-speaking children and their mothers during the children's second year can be summarised as follows:

1. During the second year, the children progressed to using different communicative modes, including combinations in both the gesture and speech domains. Four developmental milestones that reflected the difference in the proportion of the child's communicative modes in these domains were identified (M1: gesture accompanied by vocalisation or speech became dominant in the gesture domain; M2: interpretable speech became dominant; M3: gesture-speech combination became dominant in the gesture domain; M4: emergence of two-word speech). All children showed a very similar order of development, despite the differences in their speed of achieving each milestone.
2. Within the two broad types of communicative gestures, the use of deictic gesture reflected the transition from pre-linguistic to linguistic communication, specifically in the way gesture was integrated into the speech domain. The other type of communicative gesture, depictive gestures, was used in a more arbitrary manner, showing less consistency in the co-occurrence with speech.
3. The children's repertoire in verbal communicative acts measured at the levels of Interchange, Speech Act and Pragmatic Flexibility increased with age. In the early stages, the children had a very limited repertoire that was used in their immediate context as well as for their own needs; as their linguistic competence increased (moving on to the later milestones M3 and M4), the use of communicative acts expanded to relate to non-present objects or events as well as to the interests of others. The individual children's developmental patterns varied in the range of communicative acts, although individual differences were minimal at the beginning and the end of the second year.
4. The mothers changed their use of particular types of communicative acts in relation to their child's progress in language development, but there were no

- significant statistical changes in the absolute frequency and in the number of various types of communicative acts.
5. On average, the proportion of the mothers' communicative acts involving discussion increased, whereas those involving directives decreased over time. Communicative acts that involve the social and conventional domain also decreased, but only minimally and only at the early stages of the child's development.
 6. All mothers showed a trend to increase the frequency and variation of communicative acts in the discussion domain towards the end of the child's second year, though there was variability in the extent to which individual mothers were oriented to the discussion domain.
 7. There were some concurrent correlations between the variation in the mother's communicative acts in the discussion domain and the variation in the child's communicative acts throughout developmental milestones, except the point where the child's interpretable speech first became dominant (M2). The variation in the mother's communicative acts in the discussion domain during the child's pre-linguistic period also correlated with the variation in the child's communicative acts at later milestones.
 8. Across the observations for each dyad, the total time spent in joint attentional engagements increased linearly with the child's age, whereas the time spent in passive joint engagement, object engagement and in an unengaged state decreased linearly.
 9. There was variability across the children for the initial state (predicted value at 12 months) of competence in joint attentional engagement as well as in the rate of increase. There was also variability in the times at which the total duration

of the joint attentional episodes initiated by child became longer than that of those initiated by the mother.

10. There were concurrent correlations between the time spent in joint attentional engagement and the variation in the child's communicative acts throughout the second year. The time spent in joint attentional engagement during the transition to linguistic communication, particularly when the children's interpretable speech started to become dominant, correlated with the variation in the child's communicative acts at later milestones.

9.2 Communication development-a picture from 10 children

This section presents a synoptic picture of communication development, derived from the data on the 10 children and their mothers. In order to complete the picture, the connections in three areas: 1) the development of the child's communicative expression; 2) the mothers' communication style; and 3) the development of joint attention are further examined and their implications are discussed.

9.2.1 Joint attentional ability and developing communicative expression

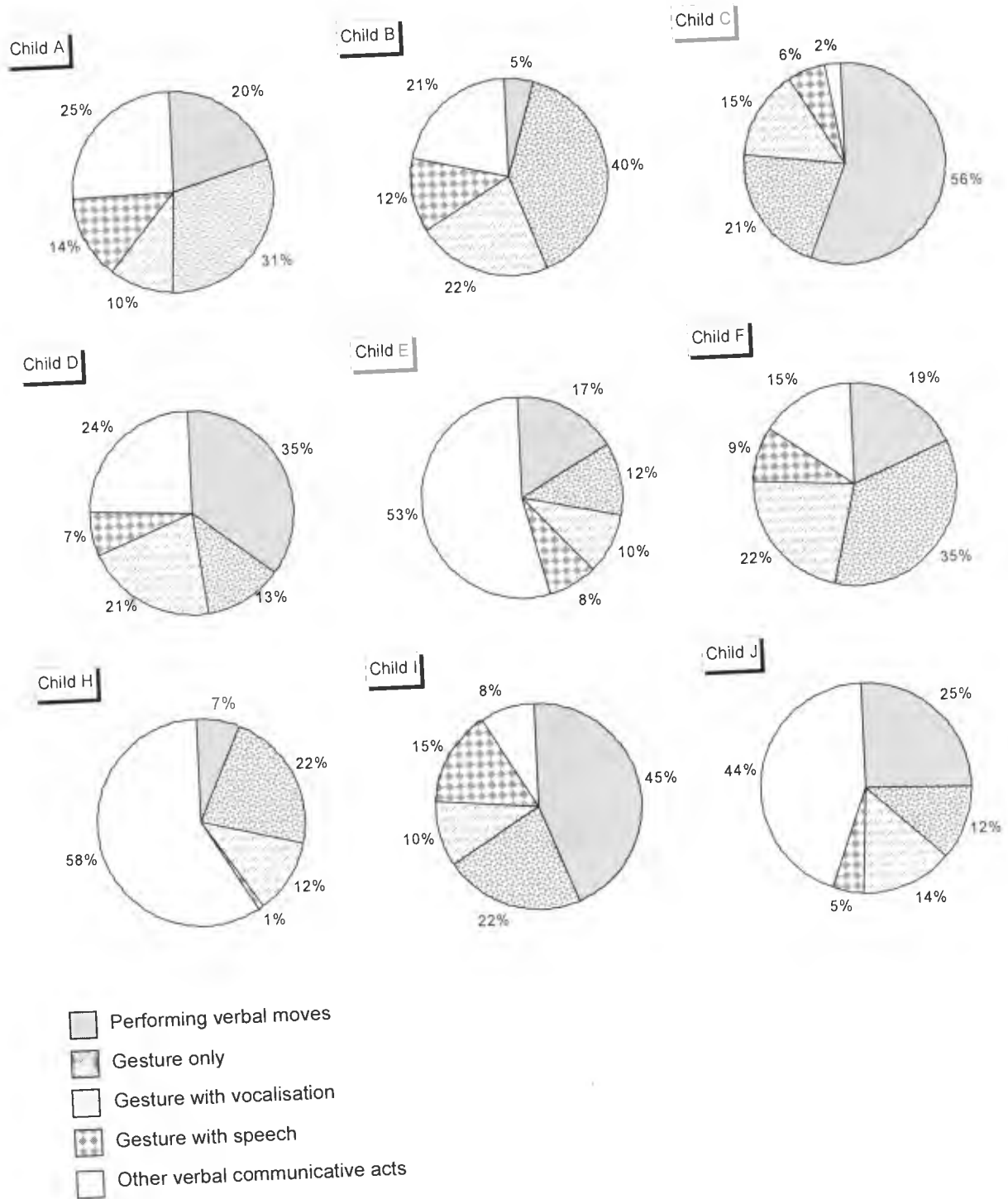
The relationship between the children's joint attentional engagements and the variation in communicative acts has been presented in Chapter 8. The results suggest that joint attentional competence, measured by the total duration of the joint attentional episodes before the child's linguistic competence began to bloom, i.e. in this study at M1 and M2, has some connection with the development of communicative expression at later milestones. All children at the beginning of the study appeared to show at least joint attentional engagements, once even in the absence of clear verbal communicative acts.

This finding suggests that investigations of communicative exchanges during joint attentional episodes before verbal communication became dominant seem to be a key to understanding the precursor of language. Inspection of the data revealed that all children showed evidence of engagement in *Performing Verbal Move in an Activity* (PRO) as well as *Directing Hearer's Attention* (DHA), *Negotiating the Immediate Activity* (NIA) and *Discussing a Joint Focus* (DJF) before M2. Similarly, the utterance performing verbal moves in an activity was one of the first speech acts mastered by all children (see Figure 6.7 in Chapter 6). Interchanges, as well as Speech Acts, that were related to the category of *Performing Verbal Move in an Activity* also accounted for a large proportion of the early repertoire (Figure 6.5 for Interchange and Figure 6.6 for Speech Act). In addition, communicative gestures expressed without proper speech were likely to be working as their potential communication mode for conveying the meaning that the children intended to share with their mothers.

In order to clarify this interpretation, each individual child's early repertoire of communicative acts before M2 was examined. Before M2, where interpretable speech started to become dominant in the total communicative attempts, more than 50% of the child's communicative acts were uninterpretable. Only the communicative acts including speech and gesture that were interpretable were considered for this analysis. Child G was not included in this part of the analysis, because this child was already at the stage between M2 and M3 at the beginning of the study. Figure 9.1 presents the proportions of each type of early communicative act. These include the combination between Interchange of *Performing Verbal Move in an Activity* (PRO) and any Speech Act categories that the child made clearly in the early stages. For the gesture domain, all categories of communicative gestures that showed a clear function represented by their forms of gestures were included. These are deictic gestures, such as pointing,

giving/showing and reaching; and depicting gestures, such as social and ritual gesture, symbolic gesture and other body language, e.g. nodding and shaking the head.

Figure 9.1 Proportion of each type of communicative act used before M2



The children's interpretable early communicative acts were located in the domains of gesture and routine play in most cases. Three children E, H and J, emitted a relatively frequent amount of verbal communicative acts other than *Performing Verbal Move in an Activity*; these children tended to produce a particular type of speech act repeatedly. These three children produced frequent speech acts in *statement (ST)* and *repeat the others' utterance (RT)*, within the Interchange of *Discussing a Joint Focus (DJF)*. The single-word statements comprised the repetitive use of a particular word by the individual child, "buu-buu"[car], "wanwan"[dog], and "uma-uma"[food], respectively. These words are regarded as baby talk in Japanese culture. Thus, it is fair to say that most children's communicative acts that were interpretable at early stages were embedded in routine play and in conventional forms of gestures.

The main variability was found in the proportion of communicative acts in 'performance' related exchanges and in the use of gestures without any linguistic modes. A common verbal move in an activity was in "peek-a-boo" play; all children emitted an interpretable speech act in uttering a phrase during this play. The common communicative gestures included pointing at a picture in a book and showing an object as well as social and ritual gestures, such as greeting the protagonist in the book by bowing, and clapping hands to praise their own success. These communicative acts were followed by the child looking at the mother. This indicates the child's anticipation of sharing the same interest with their mothers. Indeed, these communicative acts were followed by the mother's communicative act corresponding to the child's communicative acts, so that successful joint attentional episodes were achieved. Particularly, the use of social and ritual gestures appeared to be an effective means of conveying communicative intents. The communicative exchanges through the medium of these gestures were also similar to the exchanges found during the

Interchange of *Performing Verbal Move in an Activity*, maintaining simple and repetitive interactions. Examples of these exchanges are presented in Table 9.1.

Table 9.1 Illustrations of the children's communicative gestures

<p>Example 1: Child F (Jo, boy) at 14 months The mother and child are looking at the book "Greeting".</p> <p>Mother: <i>Jo-kun, kore wa? [Jo, how about this one?]</i> <i>points at a protagonist</i> Child: 0 [no speech]. <i>bows to the protagonist</i> Mother: <i>konnichiwa [hello]</i>. Child: 0. <i>looks Mother then bows to the protagonist</i> Mother: <i>hai konnichiwa [hello]</i>. Mother: <i>Jo-kun hora [Jo, look]</i>. <i>points at a different protagonist</i> Child: 0. <i>bows to the protagonist</i> Mother: <i>konnichiwa, konnichiwa [hello, hello]</i>.</p>	<p>Example 2: Child D (Ryo, boy) at 13 months The child picks up a book and opens it.</p> <p>Mother: <i>mama ni choodai [give it to mummy, please]</i>. Mother: <i>doozo shite [give it to me, please]</i>. Child: 0. <i>closes the book</i> Mother: <i>doozo wa [do you want to give it to me?]</i> Child: 0. <i>holds out the book to the mother</i> Mother: <i>arigatou [thank you]</i>. Mother: <i>arigatou [thank you]</i>. <i>bows to the child</i> Child: <i>yy [vocalisation]</i>. <i>bows to the mother</i> Child: 0. <i>picks up another book and holds it out to the mother</i> Mother: <i>arigatou [thank you]</i>.</p>
<p>Example 3 Child I (Yuri, girl) at 14 months The child and mother are laying the pieces of a picture sticker in the story book.</p> <p>Child: <i>yy</i>. <i>takes a piece of a sticker from the mother then put it in the picture.</i> Mother: <i>joozu ya na [very good]</i>. Mother: <i>hareta, hareta [you've done it]</i>. Mother: <i>joozu [well done]</i>. Child: 0. <i>claps her hands and look at the mother.</i></p> <p>*The child repeats the same sequence of exchanges again.</p>	<p>Example 4 Child B (Jun, boy) at 16 months The child picks up a stuffed bear.</p> <p>Mother: <i>mama doozo shite [give it to mummy]</i>. Mother: <i>doozo wa [can you give it to me?]</i> Child: 0. <i>holds out the bear to the mother.</i> Mother: <i>arigatou [thank you]</i>. Mother: <i>taka doozo shiyou ka [shall I give it to you?]</i> Mother: <i>choodai wa [say give]</i>. Child: 0. <i>holds out empty hands</i> towards Mother. Mother: <i>doozo [there you are]</i>. <i>holds out</i> the bear to the child.</p>

It is also interesting to observe that the children came to use verbal expressions equivalent to these gestures later in their development. The examples cited above were not one-off interactions. Similar interactive contexts appeared frequently within and across the observations at different points in time. For example, Child F started to utter verbal greetings in similar interactive formats at 20 months, and Children D and B expressed appropriate verbal utterances to mark the transfer of objects at 19 months and 18 months respectively. Child I expressed verbal praise at the age of 21 months, though very few children used this speech act during the second year.

To summarise, the early communicative exchanges were embedded in the contexts where there was a format with which each participant became familiar by experiencing it repeatedly. The amount of such exchanges during early interactions seemed to help them to engage in joint attentional episodes. Because both the child and the mother knew the kind of message that one is supposed to convey in a given format, any communicative acts, even in an incomplete form, expressed inside the format could influence the hearer. The children's gestures could be regarded as one of the clearest expressions of their intents before the linguistic mode started to develop. It is likely that successful joint engagements emerged around the communicative exchanges where both interlocutors could understand what the communicative partner meant. On the other hand, it is also likely that when ambiguity existed between the interlocutors without clear contexts, it would be hard to maintain and share what was meant. This would particularly be the case where the child's communicative act was devoid of any linguistic expression that might have clarified such ambiguity.

So far, the current study has shown a result that supports the connection between the ability to engage in joint attentional episodes and subsequent pragmatic skills. The detailed analysis above also indicates the source of the interaction that led to successful joint attentional engagements. The crucial question is what makes this

connection possible. In other words, what do children learn through the early joint attentional engagements? Although the current study could not address this question directly, it is possible to infer, from the current findings, that what children can learn through the social communicative exchanges is how to engage with people using conventional and symbolic means. Existing literature in a social-pragmatic perspective suggests that social communicative achievements with these communicative repertoires in which young children have a degree of control constitute the mechanism whereby they “bootstrap” their way into a system of language proper (Snow, 1999). It is therefore possible that early joint attentional engagements provide children with the experience of tuning into the other’s mind and making communication work, thereby conveying their pragmatic intentions. Such pragmatic precursors to language develop upon the basis of intersubjectivity - the understanding that others’ minds are like one’s own (Tomasello, 1995). This understanding was evident from the coordination of attention in children’s communicative behaviour observed in this study. Once the children’s coordination of attention emerges, they also start to learn how to influence others, as well as comprehending what the other person means; they use this emerging ability to understand the mind of others. It is also possible that experiencing social and pragmatic communication enables them to map the linguistic code onto the referent using their pragmatic knowledge, and that eventually this is how they become capable of using linguistic expressions like the children in the examples (see Table 9.1).

The ability to engage in joint attentional episodes during the early part of the second year appeared to be one of the indices for language development in general. There has been strong evidence suggesting that joint attentional ability plays a key part not only in the development of vocabulary but also in that of grammar (Tomasello & Todd, 1983; Tomasello & Kurger, 1992; Rollins & Snow, 1998). The current study suggests that joint attention also holds a key to the development of the expression of

their intents. This ability is therefore not tailored only to promoting a specific aspect of language development, but is a vital underpinning for communication development in general. This ability enables young children to experience communicative exchanges and subsequently guides them to move on to a highly conventional system of language.

9.2.2 The mother's role in communication with the child

The caregiver's role in children's language learning has been debated intensively since the 1960s when the modern study of child language development began. The characteristic of the mothers' speech to the child (CDS) and its correlation with their child's language have been examined in the aspects of syntax, word types and pragmatics, including conversation styles. What was learnt from the inconclusive results of the early studies is that CDS is much more complex than was initially thought. It may also be that CDS is only one of the available tools in a mother's interaction with the child. There are other areas where the child's language development is mediated by how mothers interact with their children. Joint attention is one of the areas in which the mother appears to play a part in facilitating language development (Tomasello & Todd, 1983; Akhtar, Dunham & Dunham, 1991). Particularly when the child's attentional skills are fragile, the mother's maintenance of the child's attention during the interaction is crucial.

This study found some characteristics of the mothers' communicative behaviours in their actual language use and joint attentional engagements, which appeared to be related to the variation in the child's communicative acts. The communicative acts that the mothers used most frequently during the interactions were broadly three types: 'discussion', 'directive' and 'social & conventional'. On average,

the proportion of the mothers' use of communicative acts increased in the discussion domain and decreased in the directive domain. The trend of communicative acts in the social & conventional domain remained relatively stable, but appeared higher in relative frequency when the children were younger. This corresponded to the trend in the children's behaviour, in that a high proportion of engagements in conventional exchanges appeared before their linguistic competence started to grow (see Figure 7.7, Chapter 7). The variability across mothers was found when individual mothers' trends were compared between the discussion domain and the directives domain. The variation in the mothers' communicative acts in the discussion domain in the early interactions appeared to show significant correlations with the variation in the child's communicative acts at both early and later milestones.

Successful joint attentional episodes in the early stages tended to be initiated by the mothers supportively following their child's attention. This initiation type decreased as the time spent in child-initiated joint attentional episodes increased. Although the main analyses in Chapter 8 focused on the engagement of the child, the early joint attentional episodes would not be possible on such a scale if the mothers' supportive initiation was absent. The ability to coordinate children's attention between the focus of attention and the communicative partner that starts to emerge at the beginning of the second year seems to be a primary precursor to communication development. However, it is also the partner's function that enables this precursor to be effective in the communicative exchange. Therefore, the important characteristics of the mother's interactions with the child involve two aspects: language use in discussion and support during joint attentional engagements.

In order to clarify the nature of the relationship between the two aspects in relation to the child, the correlations found in each chapter are summarised below, and the implications of the interrelationship are discussed. As for the duration of joint

attention, consistent correlations were found between the early stages of joint attention (M1 and M2) and the child's communicative acts at later stages (M3 and M4). For the mothers' communicative styles, not only at the early stage (M1) but also at the later stages (M3 and M4), there were significant correlations with the child's communicative acts at later milestones. However, there were no significant correlations between the mothers' communicative styles at the early and the later milestones. This indicates a likelihood that the mothers' communicative styles at later milestones were influenced by the child's progress rather than vice versa (see Chapter 7).

Taken together, these results suggest that the mothers' behaviours during joint attention at stages M1 and M2 and their communicative styles at M1 have predictive relationships with the child's expressive pragmatic skills at M3 and M4. The next intriguing question is: did these two characteristics of the mothers' interaction have the same influence on the children's pragmatic skills? The exploratory analyses revealed that time spent in joint attentional episodes and the mothers' communicative styles were not correlated significantly for all milestones. This indicates that the mothers' role in terms of supporting joint attentional episodes and using certain communicative styles during the early milestones, could either both make a unique contribution, or could make combined contribution to the development of the child's communicative acts. Multiple regression analyses would be an ideal method to test this hypothesis. Statistically, however, regression analysis should only be conducted when a minimum of 10 participants' data per variable are available. This clearly is not the case in this study. Yet the absence of significant relationships between the two aspects seems to indicate a possibility that each aspect could make a unique contribution to the child's outcome. Therefore, exploratory regression analyses were tried for the purpose of confirming a possibility of the relationship being found in the current study only. The regression analysis is therefore not regarded as an investigation of a more general

potential relationship. Exploratory regression analyses between a predictor variable from each aspect (the mothers' communicative styles and joint attentional episodes during early interaction i.e. at M1 and M2) and the child's pragmatic skills at later stages (M3 and M4) were carried out. Several significant regression equations were found for the relations; in these equations the two variables were related to the child's pragmatic skills at M3 as well as M4. A summary of the regression analyses is provided in Appendix 11. The exploratory regression analyses suggest that the mothers' communicative styles at M1 and the duration of joint attention at M2 had a predictive relationship with the children's pragmatic development at M3 and M4. It is also important to note that the results indicate the unique contribution of the duration of joint attentional episodes, as well as of the mothers' communicative styles, to the child's pragmatics skills at later milestones. This means that each variable represents a different quality in the mothers' interaction, and that both aspects are important contributors, helping children to develop their communicative competence.

To summarise, during the development of the second year of the 10 children, both the extent to which the mother and the child engaged in joint attentional episodes and the variation in the mother's language use with a particular orientation to discussion at the early stages, influenced the development of the child's communicative expression.

The quality of the mother's interaction found in this study supports previous studies which have suggested that early joint attention with the support of an adult has a predictive relationship with the development of a child's language. This indicates that the mothers' interaction, other than linguistic features in their input of CDS, also plays an important part in facilitating language development. At the same time, the variation of communicative expressions that the mother uses in discussion influences the extent of variation in the child's speech. The variation in language use may also be linked to

the *quality of input*, where children are exposed to specific words in contexts that support their meanings (Weizman & Snow, 2001). Weizman and Snow found that the frequency of rare words used in conversation with five-year-olds and the amount and usefulness of conversational support in the context where such rare words were used predicted the child's vocabulary two years later. They argue that the meaningful contexts that can support word learning are those in which both meaningful and varied word use tends to occur. In the current study the mothers' communication related to the discussion domain also involved talk about referents in the present and past, and in the imaginary world. This domain has the scope to expand the topic for further discussion, which provides the dyad with more opportunity to engage in extended discourse. It is possible that the mothers' communicative styles during the children's pre-linguistic periods may continue to influence the variation of communicative expression in the children's later talk, if the mothers' communicative styles continue to be oriented to discussion.

9.3 Summary of the development of communication in 10 children

Thus far, two sections providing a synoptic picture of communication development have addressed, first, the young children's communicative experience during the pre-linguistic period that provided a working foundation for language learning, and secondly, the mothers' role in interaction with their children. As far as this study is concerned, an important connection between the child and the mother seems to lie in the pre-linguistic communication periods, when the child has not yet developed sufficient linguistic means to communicate. The children were only able to use very limited

communicative acts, utilising gestures alone or gesture-vocalisation combinations, or they showed attentional coordination without any communication mode. As for the mother's role, interpreting the child's acts and maximising the opportunity for such communicative exchanges to maintain shared interests have an important implication for the child's understanding of how communication works. For the child's part, the communication channel, in any form which is found in the behaviour of sharing attention with the mother at the earliest stage (Carpenter, Nagell & Tomasello, 1998), needs to be open. This is vital because mutual communication under the definition of a joint attentional episode could not be achieved otherwise. There was an age-related decrease in passive joint engagement, where the mother attended to the child's focus of interest without the child's coordination of attention. This decreasing trend was possibly related to the child's improved ability in attentional skills, which enabled them to become aware of the mother's involvement and form joint attentional engagements. This developmental change also supports the idea that the child holds one of the keys to opening a communication channel.

Once the foundation for pragmatic communication was constructed, the child seemed to learn how to show attentiveness to the partner, acquiring cultural-specific features in the communication. In addition, the child's interest in things beyond the "here and now" context stretched the area where the mother and the child could share and communicate. This was represented by the increase in the child's repertoire in discussion-related Interchanges. By the time when the child started to make a substantial amount of gesture-speech combinations (i.e. M3), the variation in the child's verbal communicative acts increased, and the variability across the children became wider. This linguistic competence in communication seemed to influence the way some mothers interacted with their child. It is possible that the child's ability to engage in question and answer exchanges enabled the mothers to move to more

discussion-related communication, rather than using a directive manner of communication.

Overall, the process of communication development in the 10 children can be described as fitting a “transactional model”, where the mother initially plays a facilitative role to accommodate the child’s emerging joint attentional skill and expression of communicative intents. With increasing competence in the linguistic mode of communication, the children also make developmental progress in the ability to express their communicative intents with a wider variation, which in turn influences further development in the way the mother and child communicate. At the end of their second year, most children showed evidence of conversing about their own feelings and thoughts as well as those of others. This is genuine evidence that the children understand that other people also have feelings and thoughts like their own. Communication development during the second year is a stage when the children begin to cultivate their communicative minds through interaction with other members of society.

Chapter 10

General Discussion and Conclusions

This final chapter discusses the theoretical and methodological implications of the findings derived from the investigations reported in earlier chapters. The discussion refers to the theories of pragmatic development in relation to the three domains: communicative competence in the expression of intents; joint attention; and the role of the adult in the interaction with a child. This chapter concludes with a discussion of the limitations of the study, and its potential for promoting future development in child language research.

10.1 Communicative competence in the expression of intents

The reasons why this study examined children's pragmatic development is that children's pragmatic use of any conventionalised communicative modes convey their communicative intents during the transition between the pre-linguistic and linguistic periods. There have been many studies illuminating continuity in the transition to speech (Bates, 1976; Bates, Camaioni & Volterra, 1975; Bruner, 1983a; Carpenter, Mastergorge & Coggins, 1983; Halliday, 1975; Ninio & Bruner, 1978; Adamson, 1996; Ninio & Snow, 1996; Goldin-Meadow, 1998; Blake, 2000). These views regard young children's communicative intents expressed by gestures or vocalisation as the same intents as are expressed by the linguistic mode. More specifically, Goldin-Meadow (1998; 2003) explains that gesture and speech form a single system, though these symbolic modes are not synchronised together at the very beginning of children's communicative acts. However, not all researchers agree with the way young children's communicative behaviours have been described. There are some

contesting views suggesting that these two forms of communication involve completely different systems, although these theories agree with the existence of communicative intents in young children's communication (e.g. Dore, 1975; Barret, 1986).

This study regards the development of communication as a single system that evolves before children start to use language proper. Their way of representing communicative intents may differ between the periods of pre-linguistic and linguistic communication, but the underlying motives that produce the acts derive from the same ground, where one wants to inform the communicative partner of something. The earliest form in the expression of such communicative intents has been observed in the child's behaviour of coordination of attention between an object or an event and the communicative partner before the child has started to use a language properly.

Tomasello (1995; 1999) argues that joint attention is a skill of social cognition that enables one person to manipulate the attention of the other. Similarly, he also regards language as one of the most powerful social-cognitive skills that has the same function as others but works in a different way. The results of the present study suggest a relationship between joint attentional skills before the children's linguistic stages and variations in pragmatic expression in the later stages. This relationship supports the view that there is continuity between the pre-linguistic and linguistic periods, and indicates that the joint attentional skills share something in common with the development of the linguistic expression of intents during later stages. It is possible that this common variance reflects the extent to which the dyad experienced shared communication, which succeeded with the use of conventionalised communicative modes regardless of the forms used to convey their communicative intents.

Moreover, the longitudinal observation of the changes in the children's communicative acts revealed the way in which different modes of communication were integrated into a communicative act that expressed their intents more precisely.

Differences between the two types of communicative gestures, deictic and depictive gesture, were found not only in the frequency of use but also in the way these were integrated into speech. The significant increase in the integration of deictic gestures with speech over time indicates that this type of gesture became a part of the communicative acts in which speech and gesture support one another. Qualitative evidence also supports this trend. Within a dyad, it was possible to observe similar communicative exchanges in which a communicative gesture was initially used alone, and in subsequent communicative exchanges at a later age, the same gesture was used in combination with speech. Also, this trend was commonly observed with reference to deictic gestures.

The short time between the emergence of two-word speech (M4) and the previous stage where the substantial use of gesture-speech combination appeared (M3) provides another line of evidence suggesting that communicative gesture and speech form a single system that serves for communication. All children showed evidence of this transition from the stage when the use of gesture-speech combination became dominant, which preceded the use of two-word speech. In addition, these two were passed almost simultaneously. Gesturing is not a unique communicative behaviour that is limited to pre-linguistic communication. Studies of gestures in the adult (McNeill, 1992) reveal not only that adults gesture while they talk but also that the use of gesture types corresponds to the characteristics of a type of speech; for example, iconic gestures are used for depicting an object or event; and these two modalities show a certain manner of temporal synchronisation. Therefore it is possible to suggest that what has been found in the developmental study of gesture and speech integration (e.g. Goldin-Meadow, 1998) and in the present study is the very beginning of such an integrated system that initially emerges in the gesture domain during the pre-linguistic period.

The speakers of different languages experience different linguistic structures; this also affects the way that they gesture in adulthood (Goldin-Meadow, 2003). In the same vein, it is possible to predict some cross-cultural differences in the way people speak. This study found some evidence supporting such a hypothesis in the way the mothers speak to their children, and this culturally specific nature of speech was learnt by the children during the middle of their second year. In addition to the main Interchanges of *Negotiating the Immediate Activity*, *Directing Hearer's Attention* and *Discussing a Joint Focus*, the Interchanges relating to a meta-conversational aspect, such as *Marking* and *Showing Attentiveness* appeared frequently in the children's communicative repertoires. Involvement in these Interchange types did not require the speaker to have a specific grammar or semantic meaning to convey. People in a culture just use this type of conversational communicative behaviour. However, it is necessary to have some degree of pragmatic understanding of when it is appropriate to use such behaviours. This knowledge or sense of language use can be learned through social and communicative interaction with others in the same society, who hold the same cultural values and conventional use of language.

This particular communicative behaviour might be one of the representations of child-rearing practice in Japanese culture, as many researchers have emphasised the concept of interdependence, "*amae*", after observing the interaction between Japanese mothers and their child (Rothbaum, Pott, Azuma, Miyake & Weisz, 2000; Behrens, Wakabayashi & Fernald, 2001). However, the observations of a particular conversational style which have been represented in this study could be regarded as examples of the way Japanese conversation within a benign relationship is held in general, rather than of the special mother-child conversation style. The coding system which has been used clearly differentiates the Interchange, *Negotiating Mutual Attentiveness* (NMA), which may relate to the concept of interdependence, from

conversational functions, *Marking* and *Showing Attentiveness*. From the pragmatic point of view, these are categorically different social interchanges, although the mother may use the same linguistic code for expressing each intent. Furthermore, this type of conversational behaviour can be observed in a form such as nodding to show attentiveness to the talker, which also conveys the meaning “yes”. A previous study (Minami & McCabe, 1995) also found such a typical communication style in Japanese children’s production of narrative through interactions with their mothers. Thus, these conversational behaviours can be considered to be shown persistently by Japanese speakers. It is possible to argue that the characteristics of the mother and child interaction reflect cultural values, and in Japan empathy (*omoiyari*) with others is emphasised (Lebra, 1994). It is also possible that the mothers, as primary agents of Japanese culture, guide their children to enter this particular type of communicative exchanges.

In addition to the culturally specific characteristics observed in Japanese conversation, the common aspect in communicative interaction across different cultures is that people engage in talk for negotiating, directing and discussing. In this study, three types of Interchanges classified in the coding system, *Negotiating the Immediate Activity*, *Directing Hearer’s Attention* and *Discussing a Joint Focus*, appeared to be the main group of Interchanges, in that they accounted for a high proportional frequency in speech used by the mothers as well as their children. A similar trend has been observed in the data for English-speaking as well as Mandarin-speaking dyads (Snow *et al.*, 1996; Zhou, 2002). Moreover, this study found that the main development in the children’s pragmatic flexibility derived from the increase in the combination of different types of Speech Act in those Interchanges. This result has important implications for the development of communication in young children. These three main types of talk can be regarded as the key areas within which caregivers can work with young children

to develop communicative skills. At the same time, the situations that involve these types of talk are readily available to most people on most occasions. This means that there are plenty of opportunities for learning communicative skills, if one has a communicative mind concerned to engage with the other.

The finding that variations in the mother's communicative acts in the 'discussion' domain during her child's pre-linguistic stages had an influence on the child's pragmatic skills at later stages suggests that talk, relating to discussion, is particularly important among the three domains. The domain of discussion was constituted from several Interchange types that involved the topics relating to the past and future as well as the present. Towards the end of the second year, most children showed evidence of engaging in discussion that involved various topics, including the non-present. The children's ability to engage the topics which related to the non-present during the one-word stage indicates that some such communicative exchanges are possible even though the ability to use linguistic codes in a systematic way is not necessarily in place. It is possible to consider that the children's ability to communicate concerning things that are beyond the immediate context is the result of cognitive development in general. For example, according to Piaget's stage theory (Piaget, 1936/1952), the later part of the second year is the period for the completion of the sensori-motor stage, whereby children are able to make mental representations of reality. These representations require the ability to make a mental image of an absent object, person or event, and this brings with it the ability to engage in make-believe play, such as pretending to do something familiar. For example, in the present study, the children's involvement in pretended acts such as playing at having a tea party became well-structured and sequenced during the later part of the second year. This was reflected in the increase in the time spent in joint attentional episodes. Although these children had already engaged in some kind of pretences at the beginning of the study,

they were only able to pretend to drink tea from a teacup or pour tea into one, which demonstrates an appropriate use of cultural tools rather than related to the mental representation of having a tea party. Thus, it is reasonable to assume that the ability to engage in conversations referring absent referents requires children's cognitive development in general, and such abilities relate closely with the process in which the children's communicative acts develop.

This more fine-grained developmental picture was captured because this study used a coding system that allowed two levels of coding, i.e. Interchange and Speech Act, for each communicative act. As discussed in Chapter 3, there are many levels of categorisation of communicative acts (Chapman, 1981a). Needless to say, two levels of coding are not exhaustive enough to capture every aspect of a speaker's utterance. However, given that the purpose of many developmental studies is to capture changes in children's development, it is possible to say that this coding system was able to capture one of the important aspects of early pragmatic skills in pre-linguistic and linguistic communication. Because each level of coding, Interchange and Speech Act, captured different aspects of every utterance, a developmental picture of the children could be drawn from the two different dimensions of changes, as well as their combination, referred to as "Pragmatic Flexibility". Pragmatic Flexibility can be considered as the most practical measure that reflects the development of both levels.

Unlike the coding systems used in many previous studies, this coding system was constructed on the theoretical basis of speech acts and social interaction. Coding communicative acts, using this system with such a strong theoretical justification makes the interpretation of the results more meaningful, particularly when the studies are compared with those undertaken in different contexts. This study has also shown the applicability of the coding system to the study of Japanese-speaking children as well as their caregivers. One of the main considerations in the development of this coding

system, INCA-A, was to enable its systematic coding to capture the pragmatic skills of children during a wide range of development (Ninio *et al.*, 1994). Thus far, the study of pragmatic development using the same system has been expanded to speakers of English, Mandarin-Chinese and Hebrew. This study extended it to speakers of Japanese.

10.2 Joint attention as an underpinning of communication skills

Bruner's view of early language acquisition emphasises the aspect of communication (Bruner, 1975a; Bruner, 1983a). Bruner argues that the prerequisite for the child to "crack the linguistic code" (1975a, p. 61) is the representation of communicative requirements that is established through interactions between the child and the caregiver during pre-linguistic communication. More specifically, the notion of *formats* in which the child and the caregiver capitalise on their established routine interactions as a way towards the conventionalisation of communicative acts, provides influential insights for further studies of joint attention. The results of the present study have two implications for the socio-pragmatic theory of language development. The first is specifically with respect to Bruner's theory. The second concerns the role of joint attention in various aspects of language development.

The main argument proposed by Bruner himself was illuminated through the rich illustrations derived from longitudinal observations of two children (Bruner, 1983b). The present study found many examples that meet the concept of *formats* in pre-verbal communication between the mother and their child. These *formats* were represented in the form of routine play, as well as in communicative exchanges mediated by

conventional gestures. They were common to the children, despite the difference in the types of format and the modes of communication which they preferred to use, and accounted for the relatively high frequency of communicative acts during the pre-verbal periods. Although the concept of *format* as proposed by Bruner is well-known, and the claim for the importance of formats during early communication is plausible, his initial argument was based on a case study, which often raises the question of the generalisability of a claim. The current results, which were based on the quantification of the communicative behaviours of 10 children, strongly support Bruner's claim, and confirm that mother and child interactions in a non-western culture also involve formats, some of which are similar to those identified in western culture.

Joint attentional behaviours by pre-linguistic children have also been encapsulated in the work of Bruner. Studies which found that individual differences in joint attentional behaviours impacted on subsequent language development (e.g. Tomasello & Todd, 1983) advanced the further investigation of joint attention as a specific area associated with language development. The results from the present study also support the predictive relationship between joint attentional engagements during pre-linguistic periods and the subsequent linguistic repertoire used to express communicative intents.

As pointed out by Carpenter, Nagell and Tomasello (1998), there is an important difference between Bruner's notion of *formats* and the working concept of joint attentional behaviours in their study of joint attention. What Carpenter *et al.* claim is that not only joint attentional engagement in a routine interaction but also those engagements which are achieved spontaneously as a more generic type of interaction are important. In the present study, the operationalisation of joint attentional engagements was made in such a way that each joint attentional episode encapsulated the continuing engagements in which the child had shown the behaviour of coordinating

his/her attention during at least one point of their interactions. There was no differentiation between what were regarded as *formats* and the more generic joint attentional engagements in the analysis. Nevertheless, the investigation of the pre-linguistic repertoire before M2 suggests that the repertoire was a mixture of explicit communicative acts, expressed in the routine formats, with non-routine engagements. This mixture varied across the dyads. However, some of the examples of pre-linguistic joint attentional engagement presented in the previous chapter illustrated that these engagements were similar in nature to *formats* in that they included repetitive sequences of interaction and repeatedly appeared in the course of development. Because this longitudinal study used the same toys and books throughout all observational sessions, each dyad could have developed some of the formats during the early interactions, or these may have been their *formats* that had been established at home, which they then adapted in the contexts where the observations were made. The ability to construct new *formats*, as well as extending what the dyad gained elsewhere into the observational contexts in the present study could be regarded as one of the joint attentional skills. Both are derived from the common capacity for joint attention, which is based on the child's intersubjectivity, that is, the understanding that the mother shares the same experience as the child.

This study also examined the growth of joint attention in terms of the time spent in joint attentional episodes during the child's second year. The increasing time for which the children engaged in joint attentional episodes indicates the growth of their communicative skill, including their repertoire of verbal expression, which developed upon the basis of joint attentional engagement during pre-linguistic periods. This developing communicative skill was not limited to the same level of communicative behaviour as was represented by coordination of attention at an earlier age, but embraced important aspects that facilitated communicative exchanges. These aspects

include a more sophisticated level of intersubjectivity that goes beyond the understanding that another person is looking at and experiencing the same entity. As Bruner (1995, p.6) puts it, this is the beginning of a “meeting of minds”, which is achieved not only by shared attention but also by shared context and shared presupposition. An extended joint attentional episode is likely to be buffered by the shared contexts and cultural knowledge that enable the interlocutors to infer what is an expected scenario during the interaction. For example, pretending to have a tea party was one of the scripts shared by many of the dyads in the present study. Initially, the child engaged in the exchange only by holding out a teacup for the mother. This minimal script expanded to more elaborated patterns of joint attentional engagements, such as inviting the toy bear to have tea and marking ritual behaviours with a verbal utterance for toasting with their drink.

Child G, who appeared to have developed advanced skills in communicating with her mother, showed evidence of an even more sophisticated way of sharing an experience. The scenario involved pretending to feed and care for a baby bear. The child held the baby bear and pretended to give it milk. Then she uttered “(the bear is) drinking milk”. The mother said, “Is she drinking milk?” and continued, “Pooh Bear says that he wants some milk too” while the mother held the Pooh Bear. The child responded, “No, not yet”. The mother asked, “Not yet?” The child responded “After (the bear) finishes drinking” as she continued to feed the bear, and finished by patting the bear. “Has the bear finished drinking now?” the mother asked. The child held the Pooh Bear and started feeding it in the similar way as she had fed the previous bear. The child’s behaviour during the interaction indicates that this child had knowledge of a certain script to follow in a given situation. The child had a clear conception of the process of feeding a bear. The mother did not speak much to the child, but it was appropriate for her to be quiet while the child was feeding the baby bear. More

importantly, even during an extended period of engagement, the child still had the mother's initial communicative intent in mind and carried out the mother's request to feed Pooh Bear. Some contexts do not necessarily involve a huge flow of linguistic messages, as in this example, but there is still something meaningful shared between the interlocutors.

In the toy play contexts, the extended joint attentional episodes often involved symbolic play, as described above. According to a comparative study (Tamis-Lemonda, Bornstein, Cyphers, Toda & Ogino, 1992), Japanese dyads were involved in an advanced level of symbolic play, such as other-directed pretence, when children were aged as early as 13 months, which was much earlier than their US counterparts. This study describes the cross-cultural difference of dyadic interactions in relation to play. The activity and the objects themselves were the topic for dyadic communication in the US dyads, whereas Japanese dyads used symbolic play that served to mediate the dyadic communication. Therefore, it is possible that the extended joint attentional episodes observed in the present study have benefited from the involvements in such rich symbolic play. Although the results discussed in the present study could not address any comparative implication, it is possible to speculate about subtle differences in the role of joint attention, and in what is meant by joint attention at a more fundamental level. This study used the same definition of joint attentional behaviour as previous studies in that the child is required to show a clear behaviour in coordinating his/her attentional focus between an object/event and a communicative partner, and found similar results, particularly in relation to subsequent language development as have been found in English-speaking western culture in most cases. However, in some cultures, interaction with young children may not involve visually shared attention. They may be expected to master a more sophisticated level of joint attention, such as taking others' perspective in language learning. In cultures

in which young children are expected to speak in such a way that they adjust to the adult level of communication, and where more direct linguistic instruction is given (Ochs & Schefflin, 1983), the child may need to observe carefully what the adult says. Such an effort would need to be derived spontaneously from the child. It is likely that there is a very meaningful context, at the specific occasion in which each utterance is produced, which can be shared by the child and the adult. In fact, Schefflin (1985) reports that although very little talk is addressed to the children in Kaluli, there are many opportunities for young children to hear adults talking. It may be that children pick up communicative information from the pragmatics of the context and the communication routines happening around them, rather than being involved directly (Lieven, 1994).

In summary, it is possible to consider that there is a sphere of joint attention that involves multifaceted levels. Joint visual attention may be one of the early behavioural signs indicating that there is an understanding of the mind of others. Children will develop this knowledge to achieve a more sophisticated understanding of the mind of others, and to interpret what the other person really means. However, the ways in which they achieve the shared context and presuppositions, what Bruner calls a more sophisticated level of joint attention, could be different. For example, the form of interactions in which a young child desires to share an experience with others could vary in different cultures, or in societies using different languages. Nevertheless, the intentions behind such behaviours, regardless of their forms, are to communicate with others, and these communicative intentions further motivate the development of communicative means to share, discuss and negotiate the experience of the world in a more sophisticated way.

10.3 The caregivers' role in the socialisation of the communicative mind

This study examined children's communicative competence during social interactions during which the children gain in experience with their mothers. Children's communicative competence relating to communicative acts and joint attentional skills were the main focuses of this investigation. Thus the mothers' role in the interaction with their children was examined in relation to these two aspects: mothers' communicative acts in conversing with their child and the mothers' involvement in joint attentional episodes. Particular characteristics of these aspects of the mothers' interactional style appeared to facilitate the development of the children's communicative competence. The implications of the results, with respect to the caregivers' interaction styles, are two-fold. The first implication concerns aspects of the interaction styles in relation to the child's development of communicative competence. The second concerns cultural diversity in the caregiver's interaction style.

As for the first implication, the aspects that appeared to have an influence on the child's development were the supportive initiation of joint attentional episodes and the variation of language use in discussion rather than directive talk. The exploratory analysis suggests that each of these aspects makes a unique contribution to the development of the child's pragmatic expressions. This finding was based on a small number of children and therefore this result remains tentative. However, it is important and useful to take it seriously when considering the possible meanings of the relationships found in this study. Although the results indicated that each of these aspects makes a unique contribution the development of children's pragmatic expressions, at a fundamental level, both aspects stem from mutual engagements

between interlocutors. As discussed previously (see Chapter 8), from the methodological point of view, it was also possible to examine the different dimensions working simultaneously in the communicative exchanges between the mothers and the children. One dimension is at the pragmatic level of language, which reflects the richness of communicative exchanges. Another dimension is the temporal aspect, which particularly reflected the time spent on shared experience in a particular communicative context that may have been achieved with or without a linguistic mode of communication. These two dimensional aspects work to bring about facilitative interactions, and suggest that the caregiver does more than just providing linguistic inputs which may already have a rich facilitative nature. These facilitative interactions may be in the timing of an appropriate communicative act, depending on what the child is focused on at a certain time, so that the same interest can be shared easily and a shared engagement is maintained. The total duration for which a dyad engaged in joint attentional episodes reflects the extent of conversational engagements as well as the sophistication of the conversation that was supported by actual joint attentional behaviour, expressions of communicative intents and script knowledge.

Studies of early interactions with hearing-impaired children illuminated the diversity of child-directed behaviour. The hearing mothers of children with hearing impairment had more physical contacts than with hearing children; the mother used the kinaesthetic channel more for gaining and maintaining the child's attention (Meadow, Erting, Bridges-Cline & Prezioso, 1985). Similarly, when communicating through sign language, the mothers of hearing-impaired children used a range of strategies to gain the child's attention. The successful strategies were to sign within the child's focus (Harris, Clibbens, Chasin & Tibbitts, 1989) and to wait for the optimal timing for signing until the child showed attention to the mother (Mills & Coerts, 1990). These studies of atypical language development suggest not only that maintenance of the

child's attention is crucial because the modality of communication is limited in those individuals but also that there is a common precursor of communication development in both the hearing and the hearing-impaired population in the area of joint attention. As studies of typical language development found (e.g. Tomasello & Farrar, 1986; Akhtar *et al.*, 1991), while the child's attentional skill is fragile, the caregiver's support in following the child's attentional focus at the very moment that linguistic input is made facilitates the child's language learning. The caregiver's role, in particular for young children, should be to facilitate the interaction so as to capitalise on the opportunity for communicative exchanges.

However, Carpenter *et al.* (1998) emphasise that as the children's attentional skills develop, they are able to determine the precise referent even when provided with novel linguistic information, whereby the children monitor the adults' attentional focuses. This may not be achieved so easily in the course of atypical language development, such as when a child is hearing-impaired, because the limited modality in the conversation may hinder a maximisation of the information in the context. Nevertheless, the evidence from the study (Harris *et al.*, 1989; Mills & Coerts, 1990) exploring the discourse strategies of deaf children of hearing parents suggests that these children develop strategies utilising the spatial and temporal dimensions in order to make their communicative intents manifest and to maintain the on-going conversation.

The second implication relates to cultural diversity in the caregiver's interaction style. The evidence from the present study suggests that there is variability in mothers' communicative styles within the same culture. As discussed earlier, with support from previous cross-cultural studies, it is also possible to infer that there are differences in the way in which the mothers in each culture maximise the opportunities of interacting with their young child. Some of the differences may be comparable, and indeed these are areas which have been investigated in the existing literature. Within

the literature of Child Directed Speech, Richards and Gallaway (1994) summarise these areas as follows: “managing attention”, promoting positive affect”, “improving intelligibility”, “facilitating segmentation”, “providing feedback”, providing correct models”, “reducing processing load”, “encouraging conversational participation” and “explicit teaching of social routines”. As Richards and Gallaway (1994) argue, the facilitative role of the caregiver importantly affects how these aspects mesh with the structure of discourse as well as with the child’s current state of language development. The way in which the caregiver interacts with the child is multidimensional, and therefore is not described by counting each incidence of the caregivers’ activities listed by Richards and Gallaway. It is difficult to operationalise these multifunctional aspects of interactions between the caregiver and the child. Therefore a certain maternal communicative style that appeared to facilitate a child’s language development in the present study is only one of many such facilitative styles.

There may also be huge differences across cultures regarding which areas are more important and the way in which any particular process is presented to the child. As there are differences in the structure of the languages that people use, there are also differences how people converse with each other across the cultures. However, it is arguable that the two aspects investigated in the present study are not culturally specific but are the essential aspects for communication. A specific characteristic in the use of communicative acts by Japanese mothers and children, such as the way in which they show attentiveness to the hearer, could be regarded as a reflection of cultural beliefs. At the same time, this characteristic functions to maintain conversation between the interlocutors, which could promote engagement in joint attentional episodes as well as maintaining ongoing discussion. It is possible that an ultimate goal of the caregiver’s interaction is facilitating a communicative context in which the young children can experience the basics of communicative exchange through which language use in a

particular culture is learnt.

10.4 Limitations of the study and prospects for future research

The broad objectives of this study were to describe the development of communication skills in the children's expression of intents and joint attention. Each of these aspects of communicative skills was also investigated in relation to their mothers' communicative behaviours. In order to describe the developmental course for each aspect of communication, individual children's communicative behaviours were observed at monthly intervals during their second year. However, in order to obtain sufficient longitudinal data, the number of dyads was limited. This limits the generalisability of the findings. However, the aim of this study was to provide, through repeated observations of mother and child interactions, further insight into the development of communication. This study gave priority to the density of observational sessions rather than to the number of different individuals being observed. Given the design and methods employed in this study, its limitations are discussed below.

Firstly, there are limitations with respect to the nature of the longitudinal study. There have been many longitudinal studies in child language research, but only a small proportion of these have examined the course of development. This study, as one of this small proportion, makes a contribution to the literature by addressing some characteristics derived from the developmental picture of children learning to use Japanese. Within the studies that have aimed to track the course of developmental changes, it has been possible to carry out repeated observations as often as at two-week

intervals (e.g. Camaioni, Aureli, Bellagamba & Fogel, 2003). A particular statistical technique, known as hierarchical linear modelling, takes advantage of many waves of repeated data and enables an estimate of the growth model to be made from these data. In this respect, the scale of intervals, used in the present study, may have not been sufficient to draw precise models of developmental growth. This study applied this hierarchical linear modelling to the analysis of joint attentional development. The model that emerged from the present study suggests that there was a steady increase in the time spent in joint attentional episodes over the course of the observations, with individual variations in the rates of the increase and the initial states at the beginning of the second year. However, there is no support for defining the categorical nature of the growth curves, such as linearity as opposed to curve-linearity.

For the development of communicative acts, the raw data indicate much wider individual differences in their trajectories than those for the duration of joint attentional episodes. This is due to large individual differences in achieving each developmental milestone relating to the sophistication in children's use of different communicative modes. Therefore, no developmental growth modelling based on the statistical analysis was carried out. Instead, these milestones were used as comparable points in time for the subsequent examination rather than points based on chronological ages. In developmental studies, most measurable aspects increase in measures of quantity or sophistication as time elapses and as a consequence of human development. In early language development, this is the case with the well-known phenomenon of wide individual differences. Using these developmental milestones as anchor points could be a better way of investigating language related growth, rather than using chronological ages. However, the milestones were derived from the analysis of the observational data found in this study. Application of these milestones is conditional on the data under investigation. In this study, these milestones showed highly

significant concordance in their developmental order. Moreover, their nature and order were supported by other empirical studies (Butcher and Goldin-Meadow, 2000; Goldin-Meadow and Butcher, 2003) and a related theory that proposed that speech and gesture are integrated in a single system to form an utterance (McNeill 1992).

Drawing on the empirical and theoretical research on the process of gesture and speech integration, it was possible to carry out the further analysis of the relationship between the developments of the two aspects of communicative skills in relation to these milestones. Thus it is important to note that the application of these milestones should be considered with the initial examination of data at hand before implementing further examination using these milestones. The milestones themselves do not necessarily serve to describe development in isolation from the present data.

The problems of making longitudinal study with repeated measures also need to be addressed. In this study, each dyad was observed in the semi-structured contexts of book-sharing and toy play. Because they were able to use books and toys freely in each context during interaction, the amount of involvement with each item was not controlled. The dyads had established some formats during the series of observations. This particular type of semi-structured context enabled the dyads to have interactions in their own style. It is possible that there is a hidden bias in the data, arising from individual preferences. On the other hand, because the observations were made in a semi-structured context at the family centre rather than in the home environment, the observations may have missed the much richer communicative repertoires of the children that could have been observed in the particular home environments. It is possible to infer that the differences observed between the individual dyads would have been much wider in the home environments because the difference in the home environments themselves could impact on the extent to which and how the mothers and children interacted. It is nonetheless possible to suggest that the observed differences

reflected the variability of the interactions in their home environments to some extent.

There is a further issue relating to the coding system for pragmatic development. The existing coding system, INCA-A was used, with an extension of the gesture coding developed for the purpose of this study. The application of INCA-A was successful, and enabled this study to examine the children's pragmatic development during the pre-linguistic phase as well as the early phase of linguistic communication. The advantage of this coding system was that because it was devised in accordance with theoretical grounds and previous empirical investigations have used it, comparison of the data generated by this study with previous studies was possible. Moreover, as children grow, the sophistication of pragmatic expressions also increases. This could be reflected in the measure of Pragmatic Flexibility which derived from the combination of the coding at Interchange and Speech Act levels.

However, it is possible that some aspects of pragmatic skills are not adequately reflected in the quantity measures of the current coding system. For example, in the case of Japanese, there are many different ways to express the same intents. In fact, the variation of pragmatics in Japanese communication resides in the degree of indirectness as well as politeness. Some researchers have focused on how these aspects of pragmatics are learned during socialisation through the caregiver's use of language (Clancy, 1986; Kobayashi, 2001) as well as embodiment (Burdelski, 2003). Although the young children who were observed did not produce pragmatic variation in this respect, it is true that the mothers' use of language sometimes involved indirect expressions.

In Japanese culture the interrelationship between the interlocutors affects language use distinctively. In fact, study of indirectness (e.g. Clancy, 1986; Burdelski, 2003) often observed dyadic conversation in the presence of a third person. This presence will affect the selection of language use in the light of interpersonal

relationships, and such selections of language use may be different from those used in more intimate mother and child interactions. The observation in this study aimed to examine the latter type of interaction; therefore, it was unlikely to detect indirect expressions in their language use. Nevertheless, Japanese-speaking children learn how to use language with subtle differences, and this is an important area to be examined systematically as well as qualitatively. More specific aspects of development could be examined using conversation analysis (CA), which enables a much more fine-grained level of description so that the process of development in such aspects may be revealed.

Finally, the aspects of the present study which could be further extended in future research are discussed. Overall, the concern of this study was to describe communicative competence during the second year. The findings from the study have some implications for the caregiver's communicative styles, as well as for the joint attentional engagements that facilitate the child's pragmatic skills. The study identified positive aspects that might be important for the development of communication, but no focus was made on the aspects related to failure in communicative exchanges. The kind of particular communicative behaviours or the sequential pattern of those behaviours which might be responsible for communication failure could be identified from the data collected for this study. If some common patterns of failure emerged from the data of individual dyads, this might have important implications when considering how to promote early communication. The knowledge derived from such data could inform practice in mother and toddler groups like the one where this study was carried out. An investigation of unsuccessful communication is relevant to developing a further theory because the aspects of early interaction that correlate negatively with pragmatic development are just as important as positive correlations. A comprehensive argument for the role of the caregiver should be based on evidence brought together from both positive and negative side of the relationship.

There is also the possibility of a follow-up study of these children. In a future investigation, one of the main interests would be the examination in the growth of further Pragmatic Flexibility in relation to the development of grammar. Ninio and Snow (1996) claim that there is a dramatic increase in syntactic and morphological complexity from the third year of life onwards, though the communicative repertoire remains relatively stable on INCA-A. Of course, the apparent increase of communicative repertoires is dependent on how such a repertoire is measured. In respect of INCA-A, it is possible to expect more grammar-related complexity in pragmatic expressions rather than an increase in the number of categorical types of communicative acts from the third year of a child's life. Because the children in the current study already showed evidence of using major categories of Interchange and Speech Act at least once at the age of two, they are unlikely to show a further huge increase in the number of different types of communicative acts. Using the current coding system as a way of measuring further increases of communicative expressions may be limited. However, it is possible to describe a more complex increase in the sophistication of pragmatic expressions, by using a scale such as the number of grammatical points scored within the particular Interchange as well as Speech Act levels. The present study did not examine the development of grammar in a fine-grained way, but only the emergence of two-word speech. It is true that the children's morphological development began to increase dramatically in the measure of MLU only after they started to demonstrate a frequent number of two-word utterances. Therefore investigations of pragmatic development in relation to the development of grammar will be more fruitful with children in the third year onwards. In order to do this, it may be important to consider using a more sensitive measure of grammatical development than MLU. The MLU is not concerned with the types of morpheme that reflect developmental progress. For example, polite forms in Japanese involve extra

morphemes. It may be difficult to know whether or not the increase of MLU derives from the use of these particular morphemes in children's speech.

Another line of research would require increasing the database of children's dyadic conversations during the second year of life. Additional data sets comparable to those used in this study would provide further confirmatory evidence of its results. Alternatively, analyses based on a larger data set may identify further developmental patterns, such as in the way pragmatic flexibility is increased during the second year. Nevertheless, a greater number of repeated observations with a substantial number of children is hard to come by. It may be more important for a large scale study to identify a particular aspect of development for investigation. This aspect would determine the specific analysis that needs to be carried out, which in turn would reduce the burden of data analysis rather than replicating the same process of analyses used in this study.

Overall, this study has fulfilled its purpose of describing the developmental changes in communicative engagements during the pre-linguistic and early linguistic periods, in relation to both the expression of communicative intents and joint attention. The results of this study provide a foundation for future studies that could be built on its results. Further studies focusing on more specific aspects will benefit from the descriptive picture of communication development which can be derived from the present study. This thesis conveys the important message that children are developing their communicative minds even before their linguistic communication skills become fully-fledged. It is hoped that this study will make a substantial contribution to the literature of child language research.

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Appendix 1: Coding systems

INCA-A: Inventory of Communicative Acts (Ninio *et al.*, 1994, bold added) and Coding system for Communicative Gestures (developed for the purpose of this study)

CATEGORIES OF INTERCHANGE

CODE	CATEGORY	FUNCTION	
1	NCS	NEGOTIATE CO-PRESENCE AND SEPARATION	To manage the transition between co-presence and separation.
2	NMA	NEGOTIATE MUTUAL ATTENTION AND PROXIMITY	To establish mutual attentiveness and proximity or withdrawal.
3	SAT	SHOWING ATTENTIVENESS	To demonstrate that speaker is paying attention to hearer.
4	DHA	DIRECTING HEARER'S ATTENTION	To achieve joint focus of attention by directing hearer's attention to object, person and events in the environment.
5	DJF	DISCUSSING A JOINT FOCUS OF ATTENTION	To hold a conversation about something in the environment that both participants are attending to. Eg. Objects, persons, ongoing actions of hearer and speaker, ongoing events.
6	DRP	DISCUSSING THE RELATED-TO PRESENT	To discuss non-observable attributes of objects or persons present in the environment or discuss past or future events related to those referents.
7	DRE	DISCUSSING A RECENT EVENT	To hold a conversation about immediately past actions and events.
8	DNP	DISCUSSING THE NON-PRESENT	To hold a conversation about topics which are not observable in the environment. Eg. Past future and future events and actions, distant objects and persons, abstract matters. (Excluding conversation about hearer's inner states).
9	DFW	DISCUSSING FANTASY WORLD	To hold a conversation within fantasy play.
10	DHF	DISCUSSING HEARER'S THOUGHTS AND FEELINGS	To hold a conversation about hearer's non-observable thoughts and feelings.
11	DSS	DISCUSSING SPEAKER'S THOUGHTS AND FEELINGS	To hold a conversation about speaker's non-observable thoughts and feelings.
12	PSS	NEGOTIATING POSSESSION OF OBJECTS	To determine or discuss who is the possessor of an objects.
13	NIA	NEGOTIATING THE IMMEDIATE ACTIVITY	To negotiate the initiation, continuation, ending and stopping of activities and acts; to direct hearer's and speaker's acts; to allocate roles, moves, and turns in joint activities; to evaluate speaker's and hearer's acts as correct or incorrect; or as desirable or undesirable.
14	NFA	NEGOTIATING ACTIVITY IN THE FUTURE	To negotiate actions and activities in the far future.
15	PRO	PERFORMING VERBAL MOVES IN AN ACTIVITY	To perform moves in a game or other activity by uttering the appropriate verbal forms.
16	MRK	MARKING	To express socially expected sentiments on specific occasions such as thanking, apologising, or mark some events.
17	CMO	COMFORTING	To comfort hearer, to express sympathy for misfortune.
18	DCC	DISCUSSING CLARIFICATION OF VERBAL COMMUNICATION	To discuss clarification of hearer's ambiguous verbal communication or a confirmation of speaker understands of it.
19	DCA	DISCUSSING CLARIFICATION	To discuss clarification of hearer's non verbal

		OF ACTION	communicative acts.
20	TXT	READ WRITTEN TEXT	To read or recite written text aloud.
21	NIN	NON-INTERACTIVE SPEECH	Speaker engages in private speech or produces utterances which are clearly not addresses to present hearer.
22	OOO	UNINTELLIGIBLE UTTERANCE	Unknown function.
22	YYY	UNINTERRUPTIBLE UTTERANCE	Unknown function.

CATEGORIES OF ILLOCUTIONARY FORCE' (speech acts)

Identifying the intent of the utterance from the speaker's point of view

	CODE	CATEGORIES
Directives and responses		
1	RP	Request/propose/suggest action for hearer, or for hearer and speaker.
2	RQ	Yes/no question about hearer's wishes and intentions which functions as a suggestion
3	DR	Dare or challenge hearer to perform action
4	WD	Warn of danger
5	CL	Call attention to hearer by name or by substitute exclamations
6	SS	Signal to start performing an act, eg. To run or roll a ball. Pace performance of acts by hearer.
7	AD	Agree to carry out act requested or proposed by other.
8	AL	Agree to do for the last time
9	RD	Refuse to carry out act requested or proposed by other.
10	CS	Counter-suggestion; an indirect refusal.
11	GI	Give in; accept other's insistence or refusal
12	AC	Answer calls; show attentiveness to communications
13	GR	Give reason; justify a request for action, refusal or prohibition.
Speech elicitations and responses		
14	EI	Elicit imitation of word or sentence by modelling or by explicit command
15	EC	Elicit completion of word or sentence
16	EX	Elicit completion of rote-learned text
17	RT	Repeat/imitate other's utterance (EITHER FULL OR PARTIAL)
18	SC	Complete statement or other utterance in compliance with request eliciting completion
19	CX	Complete text if so demanded
20	EA	Elicit onomatopoeic or animal sounds
Commitments and responses		
21	SI	State intent to carry out act by speaker; description of one's own ongoing activity
22	FP	Ask for permission to carry out act
23	PD	Promise
24	TD	Threaten to do
25	PA	Permit hearer to perform act
26	PF	Prohibit/ forbid /protest hearer's performance of an act.

Declaration and responses		
27	DC	Create a new state of affairs by declaration
28	DP	Declare make-believe reality
29	YD	Agree to a declaration
30	ND	Disagree with a declaration
Marking and responses		
31	MK	Mark occurrence of events (thank, greet, apologize, congratulate, mark ending of action, etc)
32	TO	Mark transfer of object to hearer
33	CM	Commiserate, express sympathy for hearer's distress
34	EM	Exclaim in distress, pain
35	EN	Express positive emotion
36	ES	Express surprise
37	XA	Exhibit attentiveness to hearer
Statements and responses		
38	ST	State or make a declarative statement
39	AP	Agree with proposition expressed by previous speaker
40	DW	Disagree with proposition expressed by previous speaker
41	WS	Express a wish
42	CN	Count
Questions and responses		
43	QN	Ask a product-question (wh question)
44	YQ	Ask a yes/no question
45	TQ	Ask a limited-alternative yes/no question
46	EQ	Eliciting a question (eg. Hmm?)
47	AQ	Aggravated question, expression of disapproval by restating a question
48	SA	Answer a wh-question by a statement
49	AA	Answer in the affirmative to a yes/no question
50	AN	Answer in the negative to yes/no question
51	QA	Answer a question with a wh-question
52	YA	Answer a question with a yes/no question
53	TA	Answer a limited-alternative question
54	NA	Intentionally non-satisfying answer to question
55	RA	Refuse to answer
Performances		
56	PR	Perform verbal move in game
57	TX	Read or recite written text aloud
Evaluations		
58	PM	Praise for motor acts, i.e. for non verbal behaviour
59	ET	Exclaim in surprise or enthusiasm for hearer's performance.

60	CR	Criticise or point out error in nonverbal act
61	AB	Approve of appropriate behaviour. Express positive evaluation of hearer's or speaker's acts
62	DS	Disapprove, scold, and protest disruptive behaviour. Express negative evaluation of hearer's or speaker's behaviour as inappropriate.
63	ED	Exclaim in disapproval
Demands for clarification		
64	RR	Request to repeat utterance
Test editing		
65	CT	Correct, provide correct verbal form in place of erroneous one.
Vocalisations		
66	YY	Utter a word like utterance without clear function
67	OO	Un intelligible vocalisation

GESTURAL COMMUNICATIVE ACTS: developed for the purpose of this study

1	PO	Manual pointing with index finger to denote objects
2	EO	Extending or showing an object to adult
3	RO	Reaching for an object
4	SR	Social ritual and gesture in a game
5	SW	Symbolic gesture without object
6	OO	Other communicative gesture

Appendix 2: Transcription formats using CHAT

1. Obligatory headers

- @Begin
- @Participants: CHI Child , MOT Mother
- @ID: jpn.pil.childID. age=cIDversion
- @End

2. Other headers

- @Dependent: eng, spa, act, gpx (p25, CHAT)
- @Date:
- @Age of XXX:
- @Situation: book reading or toy plus particular note for the situation.
- @Time Start:
- %time: Indicates time

3. Dependent Tier

- %spa: verbal communicative act code (Ninio *et al.*, 1994)
- %act: action
- %gpx: gesture code (developed for this study)
- %exp: provides explanations where necessary.
- %pho: sound transcript for unintelligible utterance yy or yyy by young children.

4. Combination of verbal and gestural communicative acts

In order to differentiate sole verbal, verbal and gestural and sole gestural communicative acts in the phase of data analysis, systematic tagging system was developed for each case.

- Verbal communicative act: [follow the INCA-A]
e.g. %spa: \$DHA:QN

When meaningful vocalisation accompanies or utterance transcribed in phonemic formats

e.g. %spa: \$DHA:SA:V

- Verbal and gestural communicative acts
e.g. %spa: \$NIA:RP
%gpx: \$NIA:MP:V or S
(When vocalisation accompanies: V; and when speech accompanies: S)
- Gestural communicative acts
e.g. %gpx: \$NIA:MP:V or S
(When vocalisation accompanies: V; and when speech accompanies: S)

5. An example of the transcript with CHAT format

```

@Begin
@Participants: CHI Ma Child, MOT Mother
@ID: jpn.macc.g1.0102=CHI
@Sex of CHI: female
@Birth of CHI: 11-Nov-2000
@Age of CHI: 1;02.12
@Filename: g1.cha
@Date: 23-JAN-2002
@Dependent: spa, act, gpx
@Situation: bookreading
@Time Start: 10:42:30

*MOT: dore ga ii?
%spa: $NIA:QN
*MOT: dore ga ii yaro?
%spa: $NIA:QN
*MOT: dore ga ii yaro?
%act: looks at books.
%spa: $NIA:QN
*CHI: 0.
%act: open the book "norimono".
*MOT: inainaibaa ga aru.
%act: picks up the book "inainaibaa".
%spa: $DHA:ST
*CHI: baa.
%act: looks at the book MOT hold.
%spa: $PRO:PR
*MOT: baa.
%act: imitates CHI.
%spa: $DJF:RT
*MOT: kangaruu no aka-chan ga.
%spa: $NIA:RP
*CHI: 0.
%act: touches the page MOT and CHI look at.
*CHI: baa.
%act: looks at MOT's face.
%spa: $PRO:PR
*MOT: inainaibaa ya tte.
%act: gesture of peekaboo.
%spa: $PRO:PR
%gpx: $PRO:SR:S
*MOT: kangaruu no aka-chan ga.
%spa: $DJF:ST
*CHI: (ji)dousha.
%act: looks at the book CHI holds.
%spa: $DHA:ST
*MOT: un.
%act: looks at the book CHI holds.
%spa: $SAT:AC
*CHI: sha.

```

%act: looks at MOT.
 %spa: \$DHA:ST
 *MOT: un?
 %spa: \$DCC:EQ
 *CHI: doozo.
 %act: holds up the book and gives it to MOT.
 %spa: \$NIA:TO
 %gpx: \$NIA:EO:S
 *MOT: doozo.
 %spa: \$SAT:RT
 *MOT: arigatou.
 %act: receives the book from CHI.
 %spa: \$MRK:MK
 *MOT: Ma-chan mite.
 %act: opens the book and shows a picture to CHI.
 %spa: \$DHA:RP
 *MOT: densha.
 %spa: \$DHA:ST
 *CHI: densha.
 %act: points at a picture of train and looks at MOT.
 %spa: \$DJF:RT
 %gpx: \$DJF:IP:S
 *MOT: un densha.
 %spa: \$DJF:AP
 *MOT: densha.
 %spa: \$DJF:ST
 *CHI: densha.
 %act: trys to turn a page of the book CHI holds.
 %spa: \$DJF:RT
 *MOT: un densha.
 %spa: \$DJF:AP

@Situation: play with toys
 @Time Start: 10:54:00
 *CHI: 0.
 %act: holds up a bear.
 *MOT: aa kuma-chan kawaii na.
 %spa: \$DJF:ST
 *MOT: aa kore nan da?
 %act: picks up a toy telephone.
 %spa: \$DHA:QN
 *CHI: nani?
 %act: puts the bear down and reaches the telephone.
 %spa: \$DJF:QN
 *MOT: nani kore?
 %act: show CHI the telephone.
 %spa: \$DJF:QN
 *CHI: yy.
 %pho: /uwa/.
 %act: puts a handset on her ear.

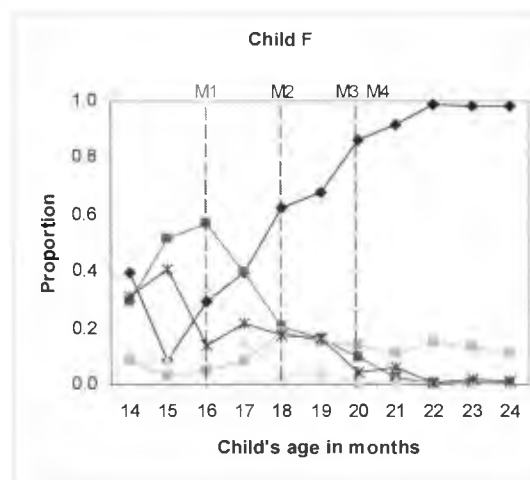
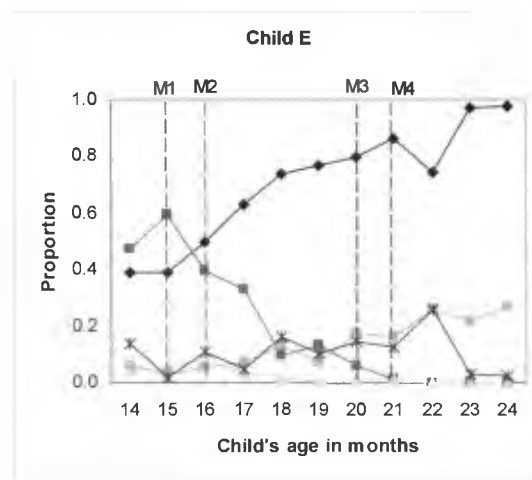
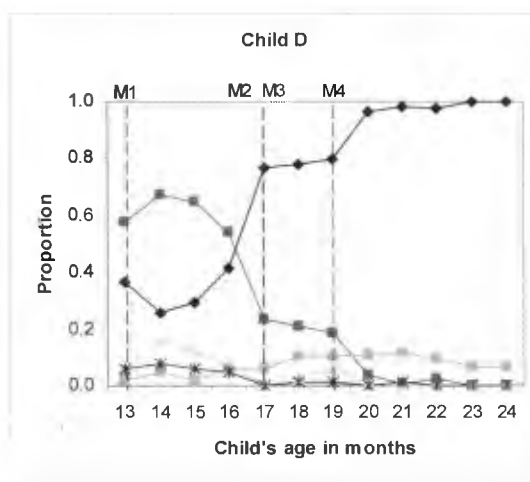
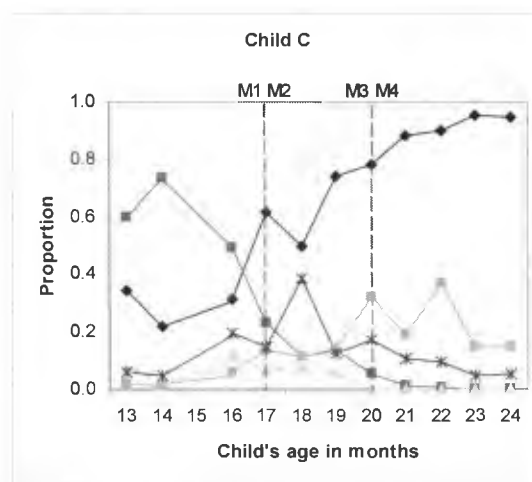
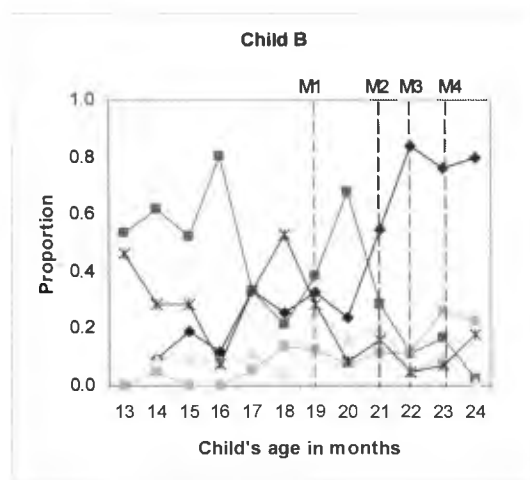
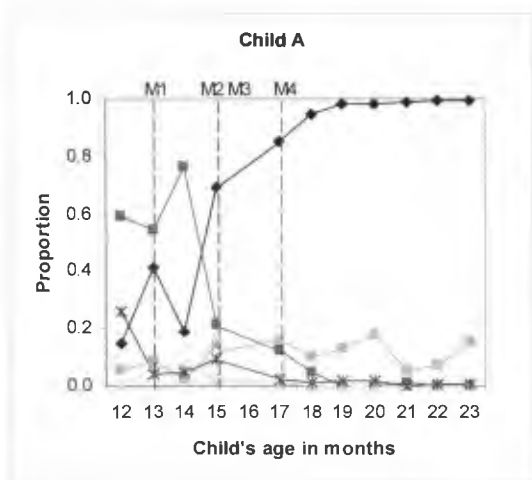
%spa: \$PRO:YY
 *MOT: papa tte.
 %spa: \$NIA:RP
 *MOT: moshimoshi.
 %spa: \$NIA:RP
 *CHI: 0.
 %act: looks at the telephone.
 *MOT: waa ippai dete kita yo Ma-chan.
 %spa: \$DHA:ST
 *MOT: pooh-chan ya Ma-chan.
 %spa: \$DHA:ST
 *CHI: pooh-chan.
 %act: looks at the pooh.
 %spa: \$SAT:ST
 *MOT: pooh-chan.
 %spa: \$DHA:ST
 *MOT: pooh-chan.
 %act: move the puppet Pooh.
 %spa: \$DHA:ST
 *MOT: Ma-chan.
 %spa: \$DHA:CL
 *MOT: boku ni denwa shite yo tte.
 %spa: \$NIA:RP
 *CHI: yy.
 %pho: /aa/.
 %act: holds a hand set and pretend to speak on the
 phone.
 %spa: \$PRO:YY
 *MOT: papa?
 %spa: \$PRO:YQ
 *MOT: papa nani shite iru no tte.
 %spa: \$NIA:RP
 *MOT: hora oishi-soona gohan da yo.
 %act: turn her body to a plate and fruits.
 %spa: \$DHA:ST
 *CHI: yy.
 %pho: /waapa/.
 %act: looks at the plate and fruits.
 %spa: \$YYY:YY
 *MOT: oishi-soo.
 %spa: \$DHA:WS
 *CHI: sou.
 %act: reaches her arm to get a teacup.
 %spa: \$DJF:RT
 *MOT: oishi-soo.
 %spa: \$DJF:CT
 .
 .

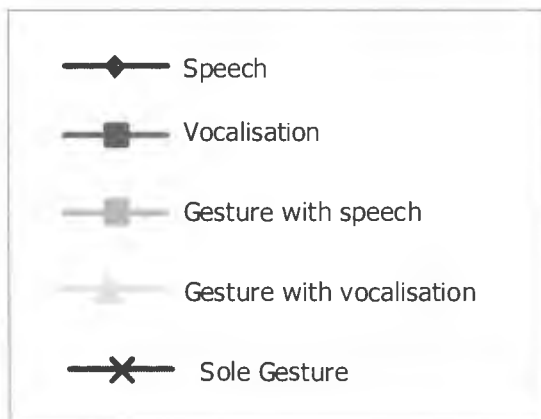
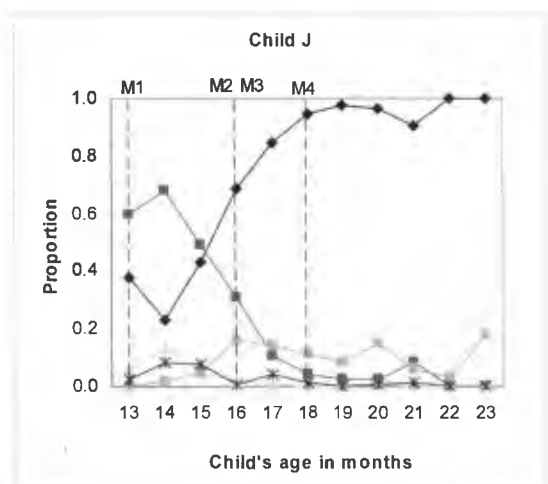
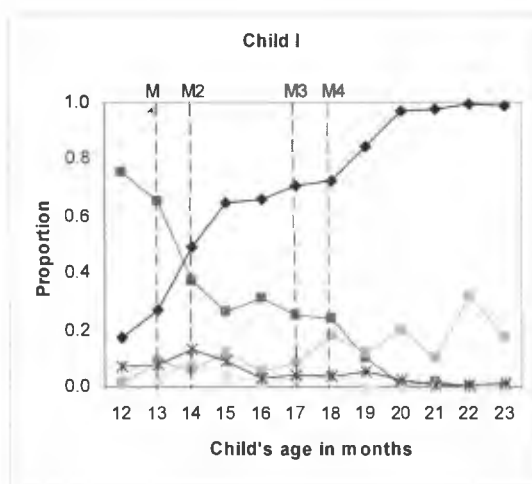
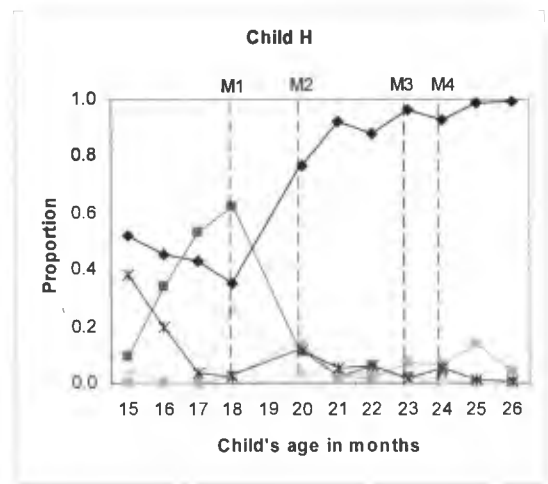
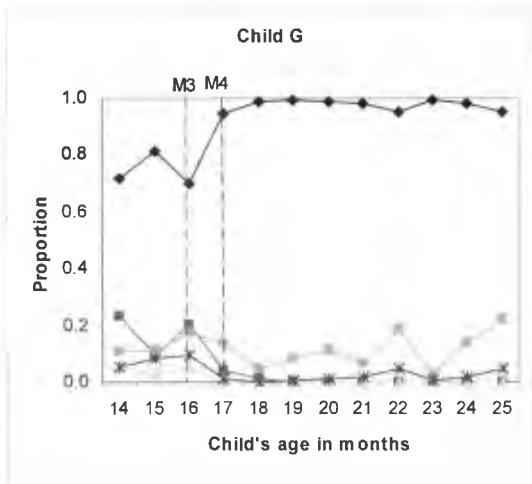
@End

Appendix 3: A list of books used in the main study

- Inaiinai-baa [peek-a-boo]; Yoko Imoto (1997), Kodansha ISBN: 4062546914
- Norimono, Disney's picture book series; (1997) Kodansha, ISBN: 4062546914
- Baby picture word book; Patrick Mcnamara (2000) Ladybird Books, ISBN: 0721429718
- Yaa mina-san; Taro Gomi (1990), Kaiseisha; ISBN: 4031321201
- Goaisatsu; Yuichi Kimura (1989), Kaiseisha, ISBN: 4031310102 ;
- Disney picture book from age 0, series 3 vol 5, Disney vroom vroom vehicles ディズニーベビーのりものブーブー; (1987), Kodansha ,ISBN: 4069979433
- Disney picture book from age 0; series 3 vol 6, Disney baby friends ディズニーベビーかわいいおともだち; (1987) Kodansha, ISBN: 4069979433
- Bruna picture book from age 0, Miffy vol.1; Dick Bruna (1984), Kodansha, ISBN: 4069956611
- Mickey to asobo (activity with Mickey's stickers) (1998); Kodansha, ISBN: 4062090414
- Jinonai ehon, vol 2(original title: Boek zonder woorden); Dick Bruna (1985), Fukuinkan, ISBN: 4834005380 ;

Appendix 4: Developmental trajectories in children's communicative modes





Appendix 5: Unplanned multiple comparisons

(paired t-tests using the Bonferroni method) with 10 children

	G-O deictic	GO depictive	V-S deictic	V-S depictive	S-G deictic	S-G depictive
G-O deictic						
GO depictive	.022					
V-S deictic	n.s.	.512				
V-S depictive	.044	n.s.	.009			
S-G deictic	.002**	.001**	n.s.	.0001**		
S-G depictive	.001**	.0001**	0.001**	.0001**		
	.055	.604	.452	.001**	.0001**	
	n.s.	n.s.	n.s.			

df=1,9 ** when p<.003

(paired t-tests using the Bonferroni method excluding child B)

	G-O deictic	GO depictive	V-S deictic	V-S depictive	S-G deictic	S-G depictive
G-O deictic						
GO depictive	.028					
V-S deictic	n.s.	.989				
V-S depictive	.082	n.s.	.001**			
S-G deictic	.0001**	.002**	.0001**	.0001**		
S-G depictive	.0001**	.0001**	.0001**	.0001**		
	.054	.855	.874	.001**	.0001**	
	n.s.	n.s.	n.s.			

df=1,8 ** when p<.003

Appendix 6: Contingency tables for the declarative and imperative use of deictic gestures

Imperative vs. imperative use of Gesture-only (PO and EO, excluding RO)

GESTURE-ONLY: USE * GESTURE Cross tabulation

		GESTURE-ONLY		Total
		EO	PO	
USE declarative	Count	15	167	182
	Expected	93.8	88.2	182.0
imperative	Count	204	39	243
	Expected	125.2	117.8	243.0
Total	Count	219	206	425
	Expected	219.0	206.0	425.0

Total deictic gesture under GESTURE-ONLY mode: $453 = 425(\text{EO} + \text{PO}) + 32(\text{RO})$

SPEECH-GESTURE: USE * GESTURE Cross tabulation

		SPEECH-GESTURE		Total
		EO	PO	
USE declative	Count	171	673	844
	Expected	313.2	530.8	844.0
imperative	Count	274	81	355
	Expected	131.8	223.2	355.0
Total	Count	445	754	1199
	Expected	445.0	754.0	1199.0

Total deictic gesture under SPEECH-GESTURE mode:
 $1244 = 1199(\text{EO} + \text{PO}) + 45(\text{RO})$

Appendix 7: Number of different types of communicative act produced by the children and the mothers

Number of different types of Interchanges

Age (months)	N	Children		Mothers	
		M	SD	M	SD
13	6	4.3	1.9	12.8	2.3
14	9	6.1	1.8	12.7	2.6
15	9	6.6	1.1	12.3	1.9
16	9	6.7	1.5	13.7	1.8
17	10	7.3	1.9	12.5	2.3
18	10	6.9	1.7	11.7	1.9
19	9	7.7	1.7	11.2	2.2
20	10	8.3	2.2	11.5	2.3
21	10	8.9	1.9	12.1	1.5
22	10	9.5	2.3	12.0	2.9
23	10	9.8	1.9	13.0	1.9
24	7	11	1.5	13.1	1.7

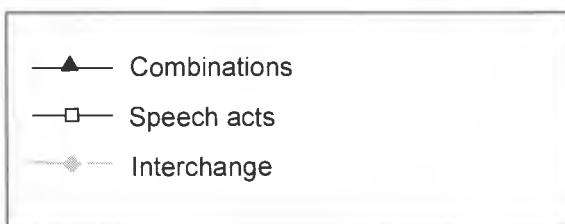
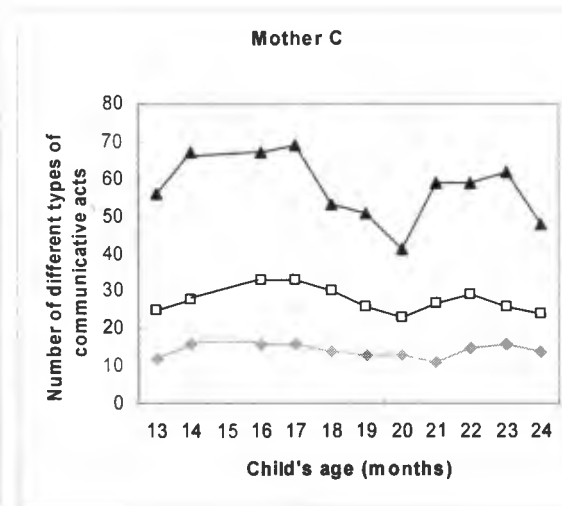
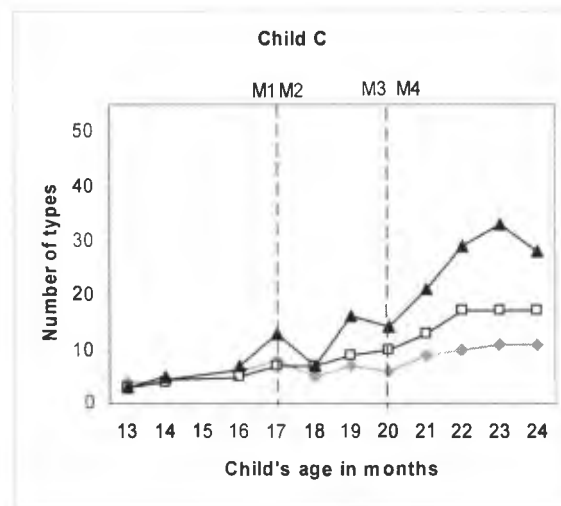
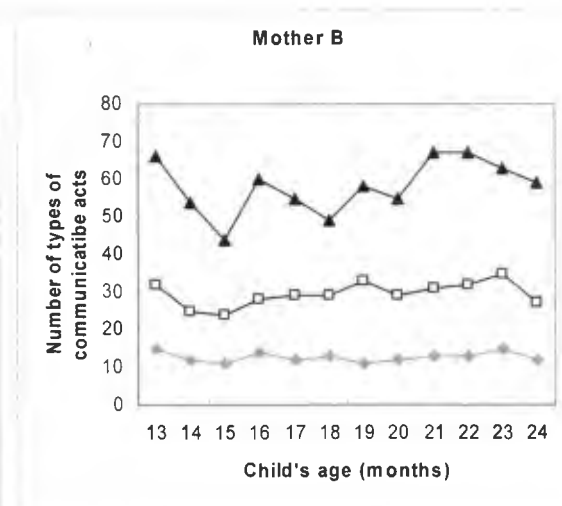
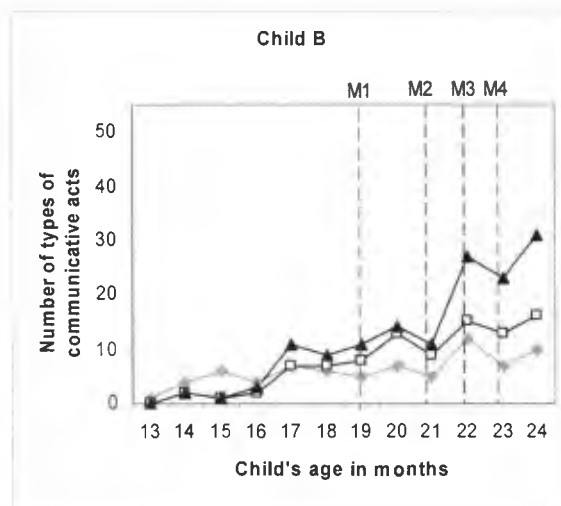
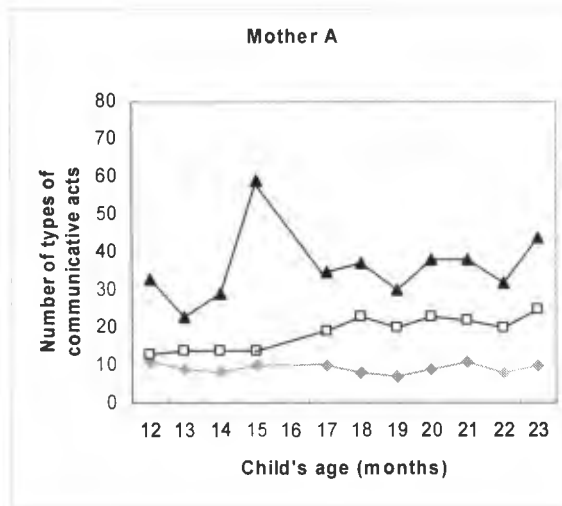
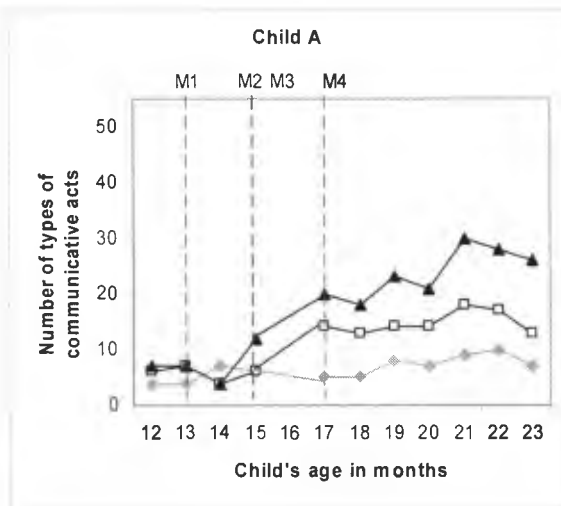
Number of different types of Speech Act

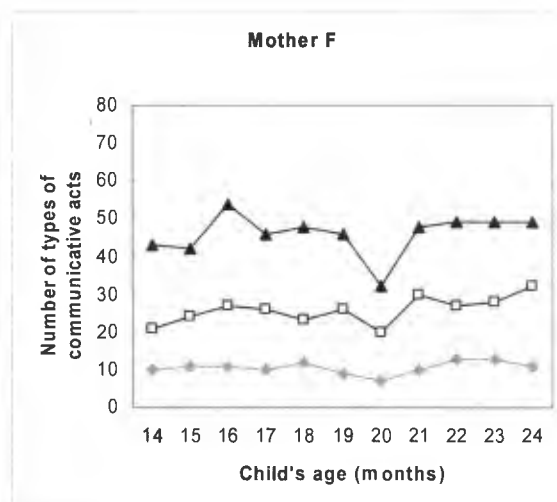
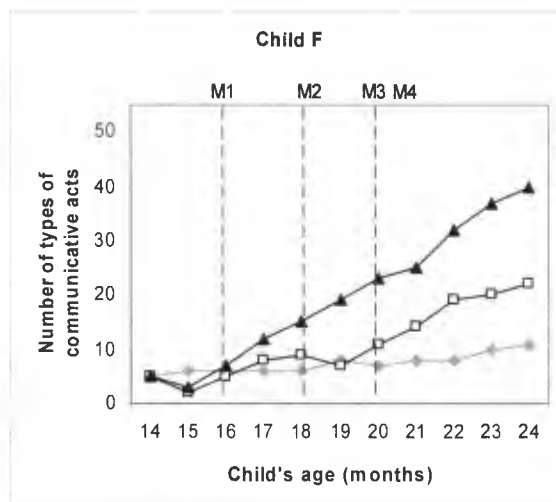
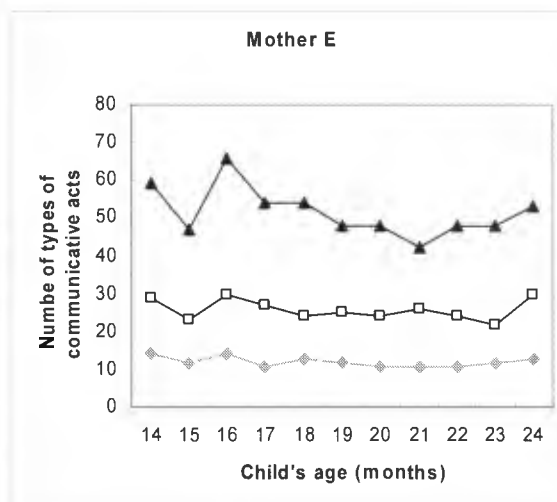
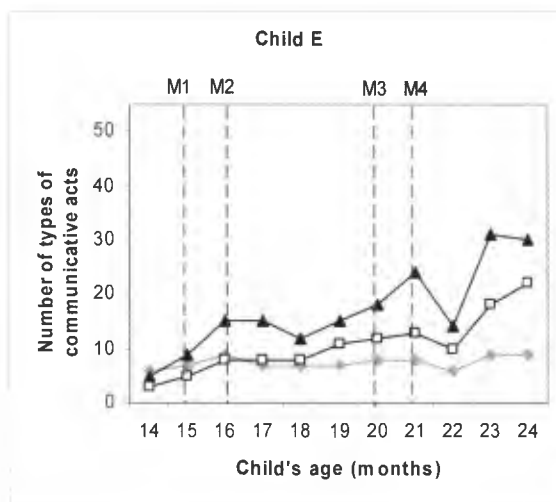
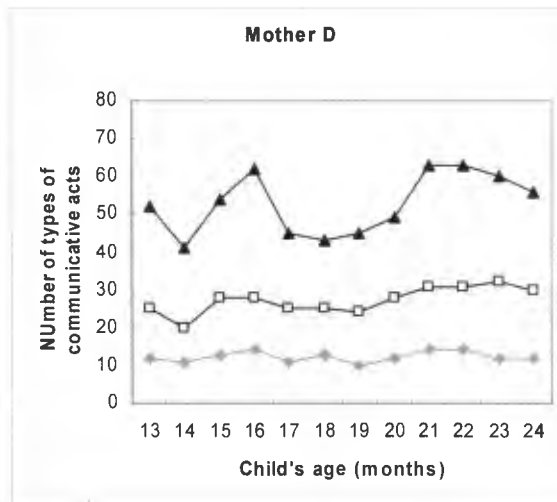
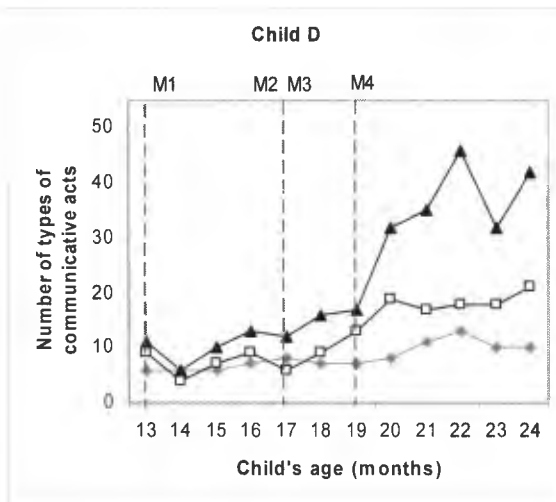
Age (months)	N	Children		Mothers	
		M	SD	M	SD
13	6	5.0	3.2	18.7	6.0
14	9	5.1	3.8	24.3	5.6
15	9	6.4	3.9	24.6	5.1
16	9	8.6	4.6	28.6	3.7
17	10	10.1	5.0	27.3	4.5
18	10	10.5	4.4	25.9	2.8
19	9	12.3	4.1	26.8	4.0
20	10	13.7	3.7	25.4	3.1
21	10	14.9	3.8	26.4	4.1
22	10	16.1	3.8	27.0	5.2
23	10	17.7	3.4	28.4	4.2
24	7	20.6	3.4	27.3	3.4

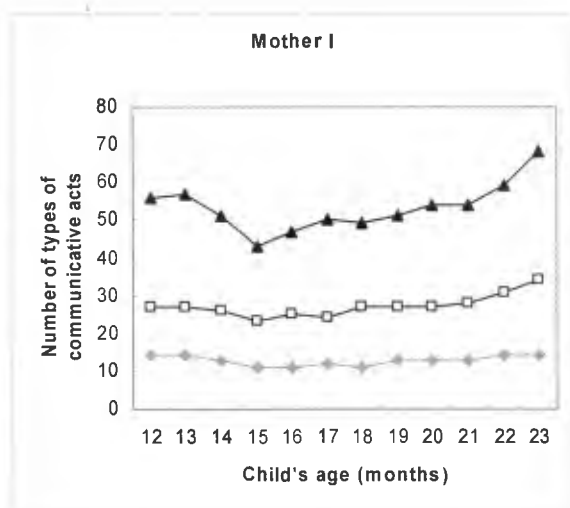
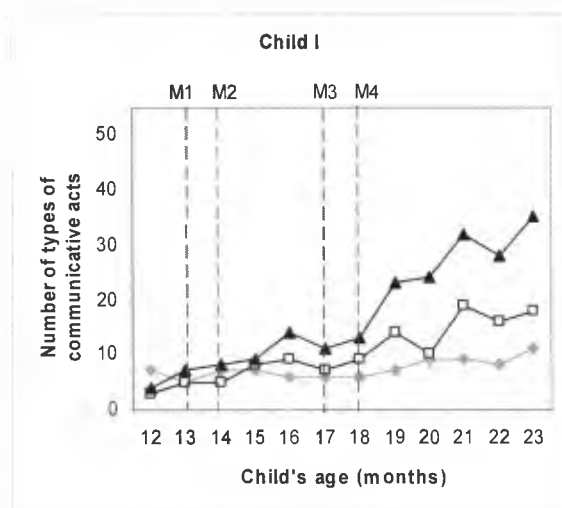
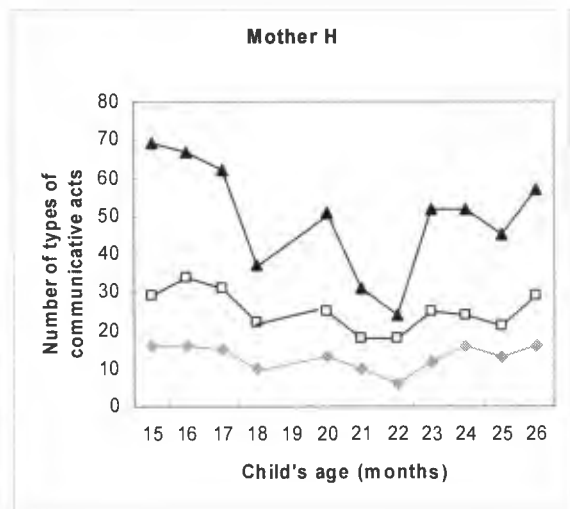
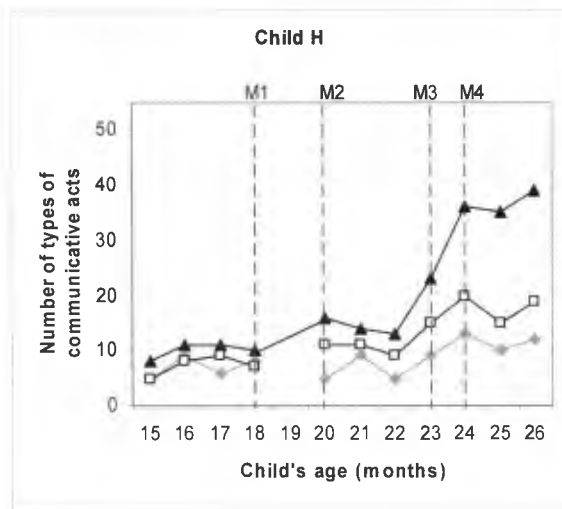
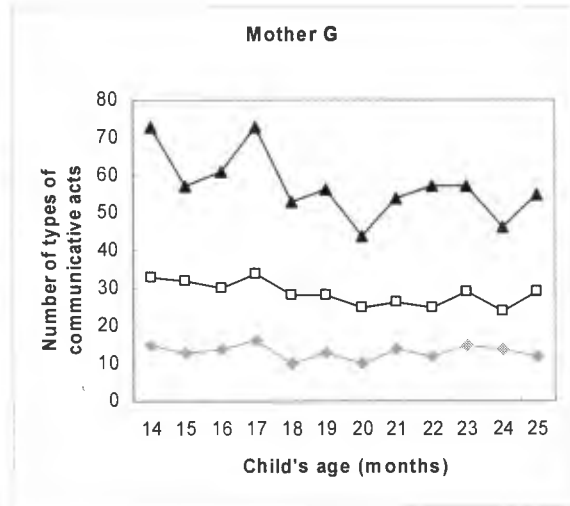
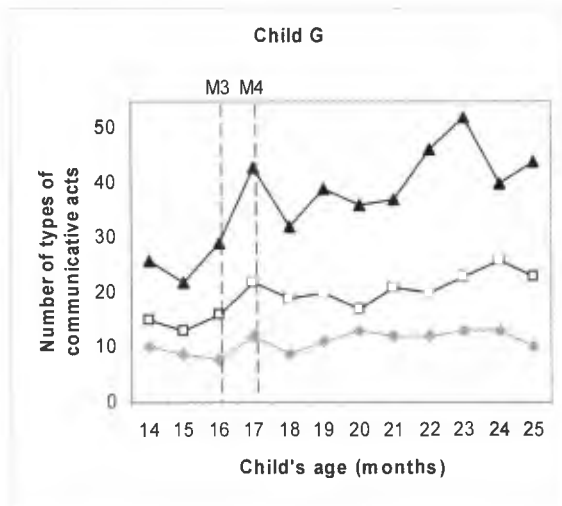
Number of different types of combinations of Interchange-Speech Act

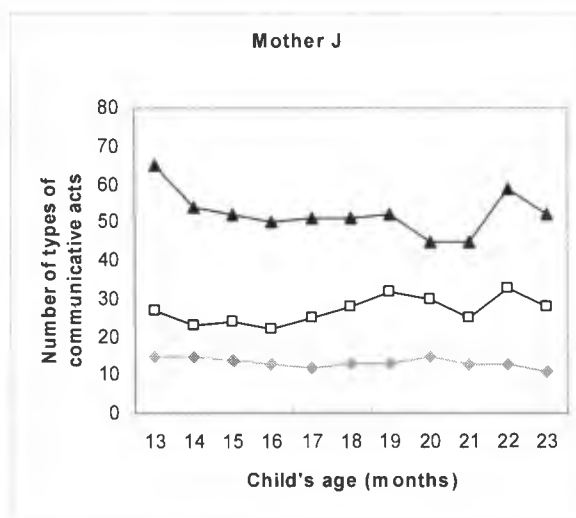
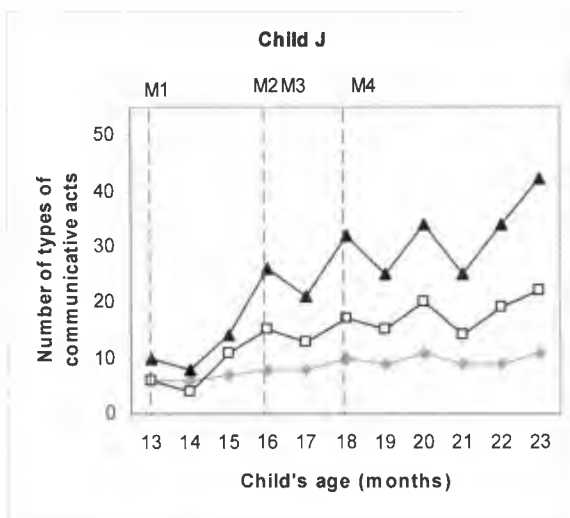
Age (months)	N	Children		Mothers	
		M	SD	M	SD
13	6	7.5	3.1	53.2	15.7
14	9	7.8	7.1	52.3	13.5
15	9	9.8	6.1	51.9	8.9
16	9	14.0	8.6	59.3	7.4
17	10	16.6	10.0	54.0	11.5
18	10	16.0	8.8	47.4	6.3
19	9	20.3	8.1	48.6	8.2
20	10	22.7	8.1	45.7	7.2
21	10	24.9	8.1	50.1	11.4
22	10	29.4	11.1	51.7	13.8
23	10	33.2	8.8	55.5	7.7
24	7	35.3	5.6	51.9	4.6

Trends in the number of different types of communicative act produced by the children and the mothers









Appendix 8: Mean proportions of the major Interchange types produced by the children and the mothers

Interchanges produced by children

Age months	N	Total frequency M (SD)	Relative frequency (%) of the major Interchanges: means and standard deviations					
			NIA	DJF	DHA	PRO	MRK	SAT
13	6	56.2 (32.1)	22.8 (22.2)	16.7 (14.4)	32.3 (33.9)	17.9 (14.7)	1.3 (2.7)	0.2 (0.5)
14	9	58.7 (41.3)	21.9 (10.8)	27.4 (13.3)	9.8 (4.5)	26.3 (25.6)	2.6 (2.8)	2.6 (5.5)
15	9	56.4 (32.5)	24.9 (14.5)	24.3 (19.8)	13.4 (8.0)	16.8 (10.3)	4.4 (4.6)	4.1 (7.5)
16	9	79.3 (46.1)	25.8 (13.6)	23.4 (8.4)	18.6 (9.0)	10.4 (9.0)	4.2 (4.4)	4.3 (6.1)
17	10	82.6 (45.3)	24.4 (10.5)	28.3 (13.9)	12.4 (7.9)	7.3 (5.4)	7.3 (7.5)	4.7 (4.3)
18	10	78.6 (60.0)	28.6 (11.3)	27.6 (18.3)	16.5 (8.8)	11.2 (11.5)	11.3 (10.6)	3.2 (4.2)
19	9	95.0 (47.3)	24.8 (12.7)	32.6 (11.8)	13.9 (5.0)	5.0 (4.2)	5.7 (5.6)	5.5 (4.6)
20	10	126.9 (59.0)	30.8 (9.8)	25.0 (12.0)	8.9 (5.1)	9.3 (6.8)	6.6 (6.0)	6.5 (11.7)
21	10	111.0 (49.6)	31.8 (7.2)	32.3 (11.7)	13.8 (6.4)	7.7 (5.9)	7.7 (7.0)	1.6 (2.2)
22	10	127.2 (51.6)	31.2 (12.0)	28.1 (11.6)	8.9 (5.1)	7.1 (5.5)	6.9 (4.4)	2.6 (2.9)
23	10	149.4 (54.3)	29.0 (7.1)	26.6 (12.4)	13.8 (6.4)	7.1 (4.3)	9.2 (6.6)	1.2 (1.3)
24	7	173.9 (58.9)	27.1 (9.4)	26.5 (12.6)	12.5 (8.4)	7.3 (4.8)	4.0 (3.9)	3.2 (3.1)

Interchanges produced by mothers

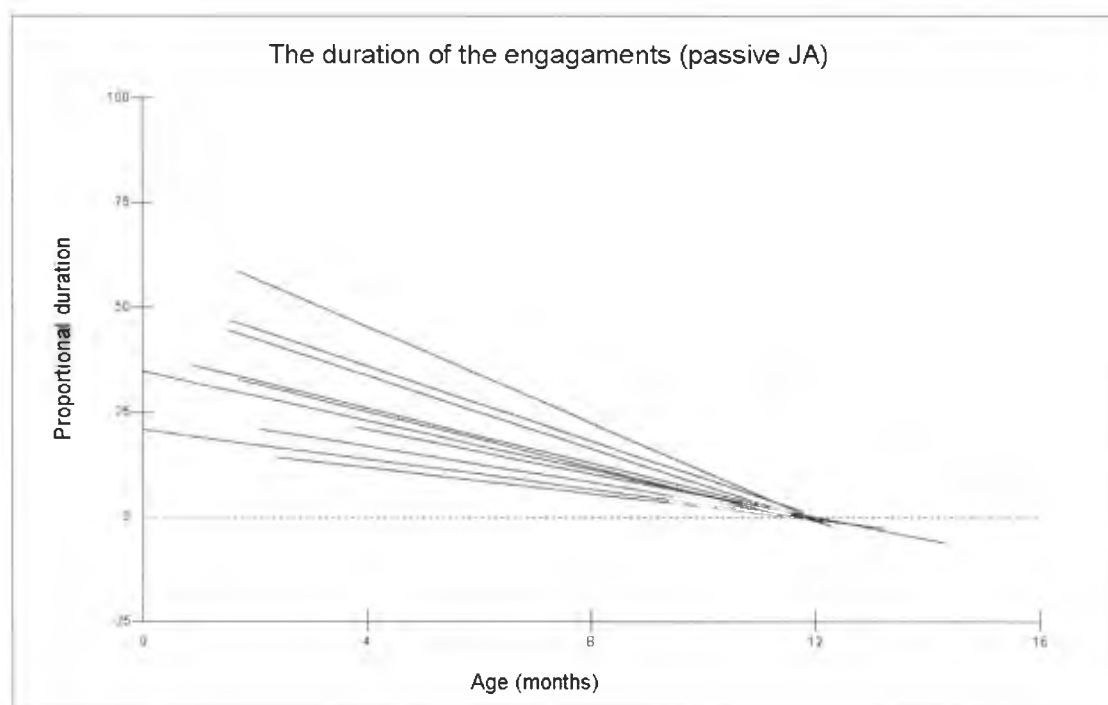
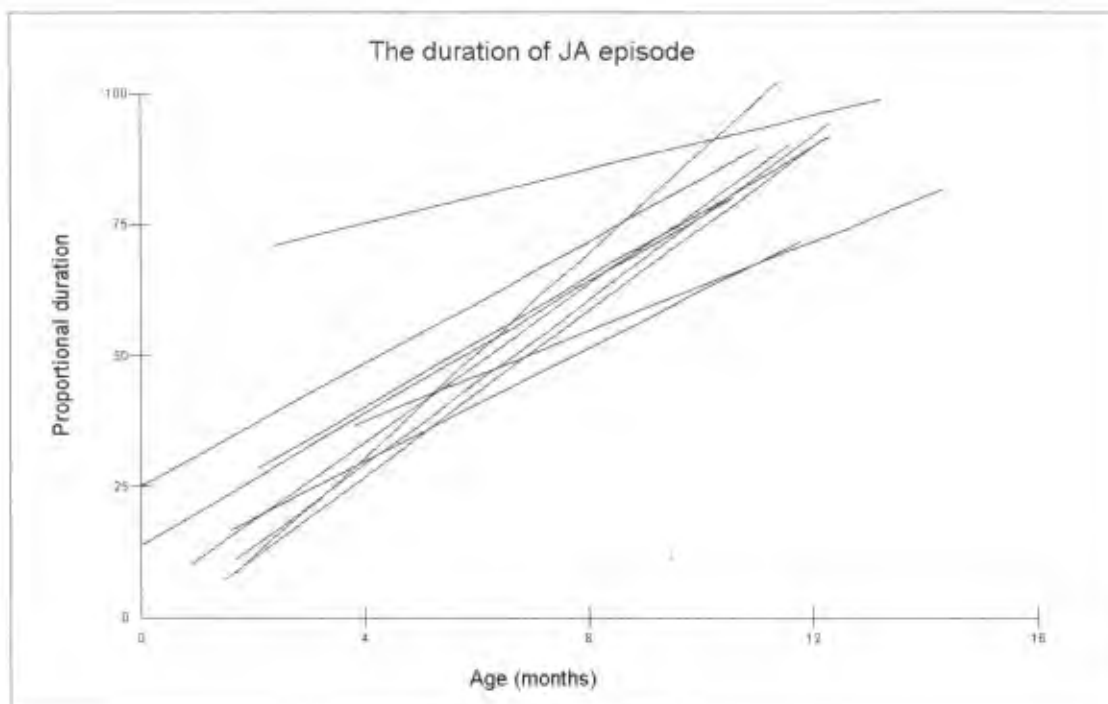
Age months	N	Total frequency	Relative frequency (%) of the major Interchanges: means and standard deviations						
			M (SD)	NIA	DJF	DHA	PRO	MRK	SAT
13	6		303.4 (43.1)	31.0 (11.7)	25.4 (12.0)	14.8 (3.7)	6.8 (4.2)	5.8 (3.9)	4.2 (3.4)
14	9		352.3 (96.3)	31.9 (4.6)	23.7 (8.0)	17.5 (5.5)	6.7 (4.6)	5.6 (2.1)	4.7 (2.4)
15	9		276.6 (63.3)	36.8 (13.3)	19.7 (7.8)	16.2 (6.3)	4.3 (2.6)	5.6 (4.5)	4.0 (2.4)
16	9		345.4 (58.2)	37.8 (12.4)	24.8 (10.1)	12.5 (4.5)	3.2 (2.1)	4.5 (2.3)	5.3 (2.3)
17	10		324.3 (105.1)	35.7 (12.0)	28.1 (10.9)	14.3 (4.8)	1.7 (1.6)	5.5 (2.7)	6.5 (2.3)
18	10		319.8 (41.9)	40.7 (13.2)	24.4 (12.0)	13.2 (5.0)	3.0 (1.7)	5.9 (3.9)	4.7 (1.9)
19	9		318.0 (41.8)	36.3 (11.7)	31.2 (7.9)	15.3 (5.9)	1.8 (1.7)	3.7 (2.6)	5.2 (2.4)
20	10		273.2 (92.8)	37.9 (10.9)	28.4 (7.4)	13.4 (7.4)	2.9 (3.0)	4.4 (3.1)	4.6 (2.5)
21	10		274.9 (76.0)	39.1 (6.2)	26.9 (9.0)	11.8 (7.0)	3.1 (2.5)	5.7 (5.2)	3.0 (2.4)
22	10		300.2 (85.1)	36.9 (6.8)	31.0 (7.0)	9.9 (6.9)	2.3 (2.0)	4.3 (2.7)	4.1 (1.9)
23	10		302.4 (74.5)	33.9 (7.0)	30.0 (8.3)	9.3 (6.8)	3.5 (3.3)	4.4 (2.4)	4.0 (2.1)
24	7		314.6 (99.2)	39.6 (13.6)	34.6 (12.1)	6.7 (4.5)	4.0 (3.0)	4.8 (4.3)	4.8 (1.9)

Appendix 9: Relative frequency of speech acts by children

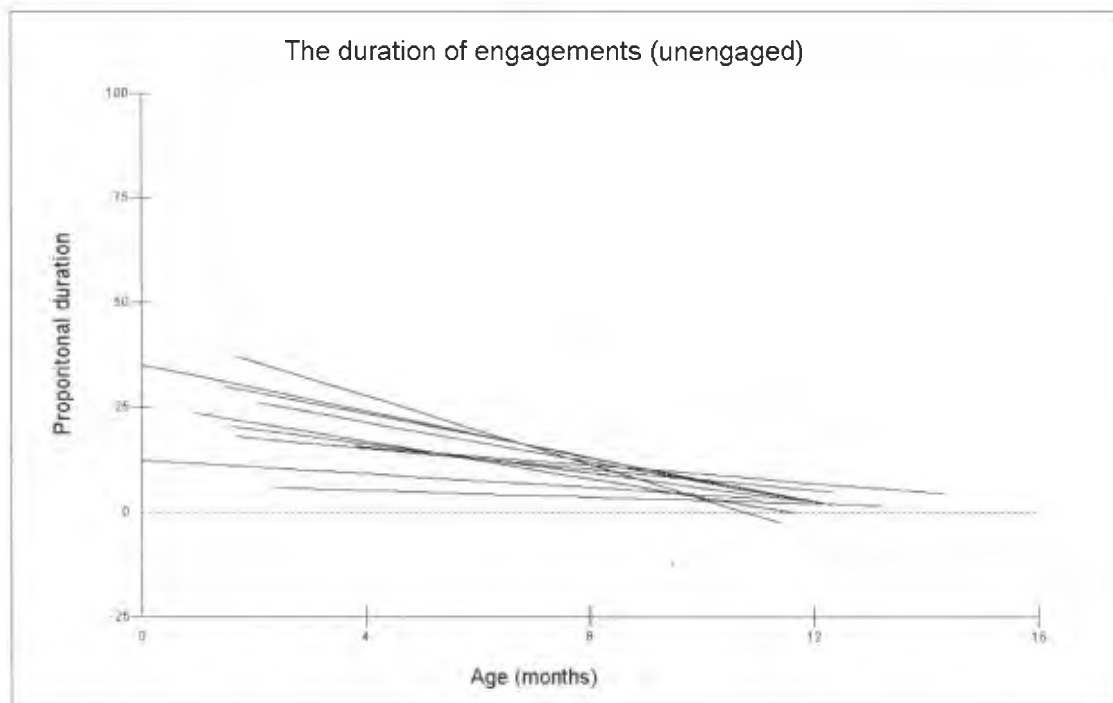
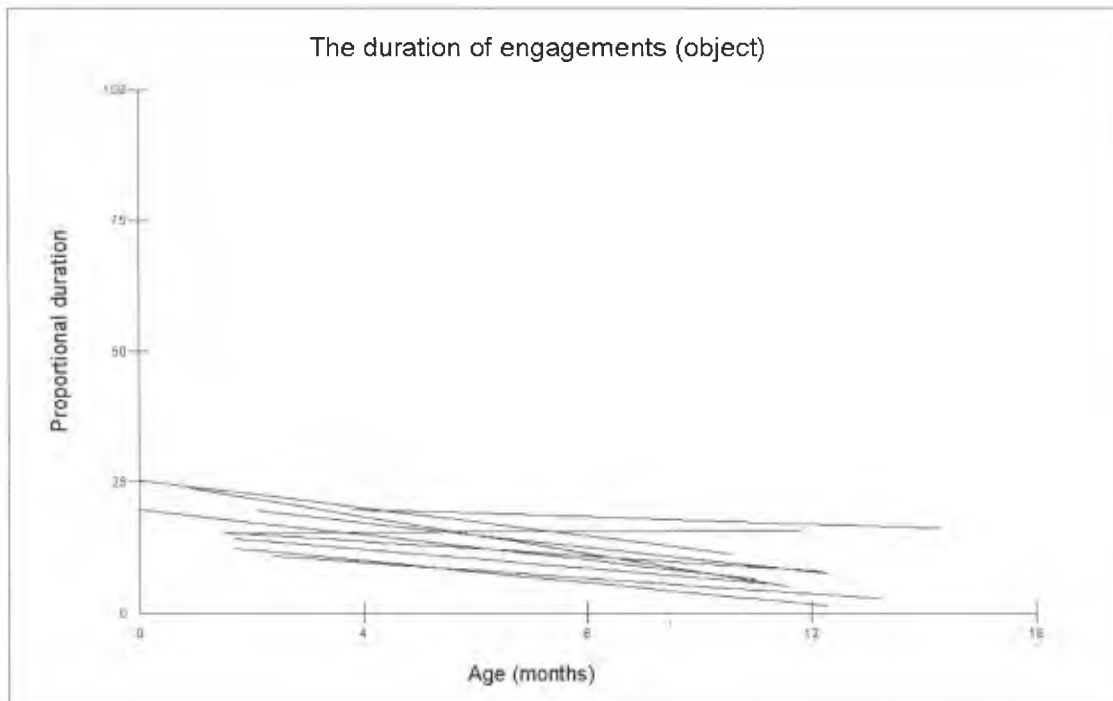
Age (months)	Total number of speech acts		Relative frequency (%) of the major speech acts: means and standard deviations							
	N	M	SD	Directives & responses	Elicited speech	Commitment & responses	Marking & responses	Statements & responses	Questions & responses	performance
13	6	56.2	(32.1)	5.0 (6.8)	2.3 (4.0)	1.7 (3.6)	2.6 (2.9)	9.2 (8.7)	0.2 (0.5)	13.9 (11.7)
14	9	58.7	(41.3)	4.5 (6.1)	3.5 (5.6)	0.4 (0.9)	3.2 (5.1)	11.5 (9.8)	0.4 (1.1)	21.3 (15.4)
15	9	56.4	(32.5)	7.3 (8.7)	3.5 (5.3)	4.8 (8.5)	4.7 (5.9)	16.6 (14.9)	4.3 (6.1)	13.7 (9.2)
16	9	79.3	(46.1)	7.6 (4.1)	4.5 (5.5)	1.4 (1.8)	7.7 (7.6)	16.0 (11.5)	6.7 (8.3)	8.3 (7.8)
17	10	82.6	(45.3)	10.9 (5.2)	3.2 (3.9)	4.4 (6.1)	7.9 (6.8)	24.4 (19.1)	5.9 (8.7)	12.9 (9.7)
18	10	78.6	(60.0)	12.4 (6.3)	1.9 (1.8)	6.2 (7.1)	11.5 (8.4)	30.2 (22.3)	6.7 (11.2)	11.4 (10.7)
19	9	95.0	(47.3)	10.2 (4.7)	4.4 (4.6)	3.2 (4.2)	9.9 (5.4)	33.6 (12.8)	16.3 (15.7)	6.6 (6.0)
20	10	126.9	(59.0)	16.3 (4.9)	2.8 (2.3)	8.0 (5.1)	7.8 (6.3)	32.4 (14.8)	10.4 (9.2)	10.6 (7.3)
21	10	111.0	(49.6)	11.3 (6.5)	7.0 (7.3)	9.0 (6.4)	10.0 (6.6)	31.9 (11.0)	14.8 (9.6)	9.4 (7.3)
22	10	127.2	(51.6)	15.0 (11.1)	3.6 (3.6)	10.3 (6.7)	10.2 (5.5)	28.9 (4.9)	10.8 (9.0)	8.1 (5.0)
23	10	149.4	(54.3)	13.6 (7.2)	5.2 (5.6)	8.7 (4.7)	10.7 (7.9)	30.5 (11.9)	23.0 (6.4)	10.1 (5.1)
24	7	173.9	(58.9)	9.4 (3.7)	6.0 (9.3)	10.3 (5.6)	7.3 (3.5)	34.6 (9.5)	22.2 (7.3)	8.8 (5.8)

Appendix 10: Hierarchical linear models in different types of engagement

Hierarchical linear models in joint attentional engagement and passive joint



Note: Age (months) is centred around 12 months; i.e. 0 corresponds to 12 months, 4 corresponds to 16 months, 8 corresponds to 20 months; and 12 corresponds to 24 months.

Hierarchical linear models in object engagement and unengaged

Note: Age (months) is centred around 12 months; i.e, 0 corresponds to 12 months, 4 corresponds to 16 months, 8 corresponds to 20 months; and 12 corresponds to 24 months.

Appendix 11: Summary of the exploratory regression analyses for the mothers' communicative style and joint attentional episode variables that predict the child's pragmatic skills

Children's communicative acts (N of different types)	Predictor variables				R ² (adjusted)	F(2,6)
	Mothers' communicative style (M1)		Joint attentional episode (M2)			
	β	t	β	t		
M3						
Interchange		ns		ns	-	ns
Speech acts	.48	2.90*	.62	3.75**	.82	19.25**
Pragmatic flexibility	.40	2.18 ¹	.67	3.63*	.77	14.97**
M4						
Interchange	.59	2.28 ²		ns	.56	6.03*
Speech acts		ns		ns	-	ns
Pragmatic flexibility		ns	.67	2.47*	.51	5.20*

*: $p < .05$, **: $p < .01$, ¹: $p > .072$, ²: $p > .063$

The mothers' communicative style at M1 and the duration of joint attentional episodes at M2 significantly predicted the child's Speech acts and Pragmatic flexibility at M3 and Interchange and Pragmatic flexibility at M4. In relation to the child's pragmatic skills at M3, each of the mothers' communicative styles and joint attention was a significant predictor of the child's Speech acts, with the weights of .48 and .62, respectively. These predictor variables together accounted for 82% of the variation in the child's Speech acts.

Similarly, the joint attention was a significant predictor of the child's Pragmatic flexibility with a weight of .67 but the mothers' communicative style only appeared to be a possible independent predictor, with the t-value approaching the significant level. Nevertheless, these variables together accounted for 77% of the variation in the child's Pragmatic flexibility.

For the child's pragmatic skills at M4, the predictor variables accounted for 56% and 51% of the variations in the child's Interchange and Pragmatic flexibility, respectively. Moreover, when the joint attention at M2 was held constant, the mothers' communicative style was a significant predictor of the child's Interchange at M4, but the joint attention did not significantly predict the same measure once the mothers' communication style was statistically controlled. The reverse was found in the child's Pragmatic flexibility at M4. When joint attention was held constant, the mothers' communicative style did not significantly predict the child's Pragmatic flexibility, whereas once the mothers' communicative style was controlled, the joint attention significantly predicted the same measure.

In addition to the regression equations summarised above, new lines of regression analysis were carried out to address the influence of joint attentional episodes at M1. Given that there was a significant correlation between joint attention at M1 and the child's pragmatic skills at M3, it is possible that joint attention at M1 would also

contribute to the variation in the child's pragmatic skills at M3. Joint attention at M1 was then entered into the equation in conjunction with the original predictors (the mothers' communicative styles at M1 and joint attention at M2). These variables significantly predicted the child's Speech acts and Pragmatic flexibility at M3, but no unique contribution of joint attention at M1 was found when the other two variables were held constant.

