ASPECTS OF MAORI AND PAKEHA MOTHERS' INTERACTIONS WITH THEIR PRE-SCHOOL CHILDREN: ETHNICITY, EDUCATION, INTERACTIVE BEHAVIOUR, AND CHILD ASSESSMENT

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Valerie Noelle Podmore
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Abstract

An observational approach to the study of parent-child relations and children's early experiences has been recommended for some time. Observations of family members' behaviour are useful because they can add to knowledge about child rearing and child development.

More recently, the need to extend the study of mother-child interaction beyond the confines of middle-class Anglo-American families also has been recognized, and within cross-cultural contexts, the use of naturalistic observational procedures has been advocated.

This study was concerned with observing the interactive behaviours used by Maori and Pakeha mother-child pairs during spontaneous play. One intention was to identify some variables related to the mothers' interactions. On the basis of previous research it was proposed that maternal ethnicity, maternal education level, and child gender would be associated with differences in mothers' interactive behaviour.

A second major intention was to examine the relationships among interactive behaviour and children's competence and self-esteem. It was proposed that mothers' interactions and children's self-concept, cognition, and language scores would show some specified interrelationships.

The sample design included Maori and Pakeha mothers from higher and lower education-level backgrounds, and their 3-year-old sons and daughters. Each of the 75 mother-child dyads was videotaped during playcentre sessions. Subsequently, maternal interactive behaviours were coded, and satisfactory inter-observer reliability correlations were obtained. The children completed the Brown IDS Self-Concept Referents Test, and their cognitive, language, social, and physical development was assessed using the Keele Pre-school Assessment Guide (KPAG).

The maternal verbal behaviours observed most frequently were Direct Commands and Questions, and the incidence of maternal initiations in command form was high. The non-verbal behaviour

observed for the longest duration was the mothers' Attentive Observation of their children. Within the ethnic and education groups, individual variations in behaviour were noted.

Some important group differences in behaviour also were found. For example, Maori pairs spent more time Playing Interactively (with mutual play involvement) than Pakeha pairs, and this probably reflected a practice among Maoris to learn by mutual participation. Marked education-level differences were evident on the maternal verbal behaviours, but child gender was not associated with major differences in maternal interactions.

Some possible Maori-Pakeha variations in the correlates of children's cognitive and language assessments were suggested by the data. However, both Maori and Pakeha mothers' Direct Commands were associated strongly and inversely with their children's KPAG-Cognition and KPAG-Language scores, and this result was consistent with Piagetian and other theoretical perspectives. Fewer important relationships were found between maternal interaction and children's self-esteem, although children's self-concept, cognition, and language scores were strongly interrelated.

This study extended the maternal interactive behaviour research both across cultures and within New Zealand. Furthermore the results affirmed, in the New Zealand context, the association between mothers' education levels and their verbal interactions, and between directive maternal speech and children's lower performance on a cognitive and language measure. Some implications for research and early educational practice were identified from the Maori and Pakeha observational and child assessment data.

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Chapter 1

INTRODUCTION

Overview: This chapter introduces the issues to be examined in the study. The need and rationale for the investigation are set out in terms of the potential contribution that observations of mothers and children may make to knowledge of parent-child relationships and young children's development. The need for the research is summarized further within the New Zealand context, and the scope of the study is outlined.

This study was designed to examine some influences on Maori and Pakeha mothers' interactions with their pre-school aged children, and to investigate the relationships between a set of interactive behaviours, children's self-concepts, and children's cognitive and English language skills. Aspects of children's development have tended to be associated with their interactive experiences with their primary caregivers, usually their mothers, and maternal behaviour in turn has been shown to be related to several variables, including ethnic group membership and education level.

The opportunity to substantiate and generate knowledge of parent-child relationships both within and across cultures has been extended by the direct observation of family members' behaviour. Certainly, during the past 15 years there has been a marked escalation in the specific study of mother-child interaction. The focus primarily on mother-child interaction has been defended on the grounds that, especially in Western contexts, relatively few fathers have been equal or primary participants in the day-to-day child-rearing process. Observing only mother-child dyads also has provided a research basis from which subsequent complex studies have been developed to include both parents, and sometimes references to the role of siblings (examples include Clarke-Stewart, 1973 to 1978; Laosa, 1978 to 1982).

Subjects of many mother-child interaction studies have tended to be middle-class and Anglo-American. Clarke-Stewart (1977) noted similarly the relative neglect of members of other nationalities and social classes, and more recently a culturally pluralistic approach to the study of maternal behaviour has been advocated by Laosa (1981). The need has arisen, then, to extend the current knowledge of mothers' interactive behaviour by observing pairs who represent a wider range of cultural and social groups.

The method of naturalistic field observation of behaviour has been regarded as particularly suitable in cross-cultural research. Earlier American and European approaches, employing highly structured observational and interview techniques, sometimes seemed inappropriate in different cultural contexts. Justifiably then, Longabaugh (1980) has also argued the case for naturalistic observational research, by stressing that "direct measurement of human behavior in settings of its natural occurrence must be a high priority of a transcultural science of human behavior" (p. 117). Therefore a naturalistic cross-cultural study, observing mothers and children engaged in customary activities in a familiar setting, clearly was needed.

Mother-child interaction studies have contributed to understanding not only parent-child relationships, but also the process of children's learning and development. Several studies have demonstrated that young children's experiences with their primary caregivers influence their development. White, a prominent researcher when this field of inquiry was evolving, has stated emphatically that "the mother's direct and indirect actions with regard to her one- to three-year-old child, especially during the second year of life, are, in our opinion, the most powerful formative factors in the development of a preschool-age child" (White, Watts, Barnett, Kaban, Marmor, & Shapiro, 1973, p. 242). The participants in White's series of studies were mothers and young children. More recently, it has been suggested that this essential early social experience may be provided by either parent, or by a skillful caring person (White, Kaban, & Attanucci, 1979).

Because interactive experiences with their caregivers influence young children's development, the combined study of mother-child interaction and comprehensive child assessments has been advocated to enhance understanding of developmental processes (Clarke-Stewart, 1977). Children's developing self-concepts have been related to parents' recalled impressions of their relationships with their children. However, there has been a scarcity of empirical data relating observed interactive behaviours to young children's self-concepts, and this suggested the scope for a study which simultaneously related parent-child interaction, children's self-concepts, and children's cognitive and language development.

In New Zealand, there have been very few investigations of mother-child behaviours or interactions. Occasionally, minority ethnic groups have been represented in the research, but hardly any field-based observational studies have focused on mothers' interactions with their pre-school aged children. Therefore to describe objectively how some Maori and Pakeha mothers relate to their young children, a systematic, naturalistic, observational study, with controlled samples, was required.

This study was designed, then, to observe the interactions of Maori and Pakeha mothers with their children at play. Playcentres provided a naturalistic setting where spontaneous play occurred with the mothers present. Although the constraints of this setting and the study's design precluded the observation of fathers' interactions, it was envisaged that the paternal perspective could be developed in future research.

All playcentres, unlike daycare centres and many kindergartens, require a parent or parent-substitute of each child to attend and help with some sessions. Therefore, the periodic attendance of the mothers occurred naturally, without being scheduled by the observer. In addition, play materials were relatively standard across play-centres, and the equipment within each playcentre was familiar to all regularly attending children. Playcentres were judged, then, to be a suitable environment for obtaining naturalistic observational

data and for assessing children's development using a pre-school guide.

Boys and girls aged 3 years were to be included, and this age was chosen for several reasons. Whereas a greater proportion of 4-year-old children attend kindergartens, playcentre rolls have tended to include relatively large numbers of 3-year-old children (Barney, 1975). Further, the selected age was of interest developmentally. White considered that 3 years marked the terminal point of an important period of development, and demonstrated that by this age differences in children's cognitive and language development were becoming established (White et al., 1979; White, Kaban, Attanucci, & Shapiro, 1978; White et al., 1973). In line with Kagan's (1979) assertion that the self emerges as a stable entity towards the end of the second year, 3 years also was considered the earliest age appropriate for measuring children's self-esteem.

This observational study of mothers and their 3-year-old children in playcentres aimed, then, to examine Maori and Pakeha ethnic group membership, maternal higher and lower educational level, and child gender as potential influences on mothers' interactions with their children. Two related but subsidiary concerns, planned to extend the study beyond group comparisons, were to analyse within-group individual differences in behaviour, and aspects of cultural participation within the Maori sample. A further major objective was to establish whether the interactive behaviours were linked to the children's reported self-concept scores and assessed cognitive and language performance. In addition, the relationship between children's self-esteem and cognitive and language skills was assessed, the importance of other parental and child demographic variables was appraised, and a supplementary assessment of the children's social and physical development was included.

Chapter 2

REVIEW OF THE LITERATURE

Overview: This chapter outlines some theoretical perspectives which have influenced the study of maternal behaviour and mother-child interaction. Investigations of mothers' verbal and physical interactions are described, with a specific focus on studies of maternal behaviour among different social and ethnic groups, and on research which has assessed children's developmental processes or competence. The literature reviewed here is restricted primarily to observational studies of mothers with "normal" pre-school aged children. In addition, pre-school children's self-concept studies are discussed, and then a final section relates the preceding topics to the New Zealand context.

2.1 *Mother-child interaction:*

2.1.1 *A summary of theoretical influences.*

The importance of mothers as caregivers and educators of young children has a long history of recognition in the Western psychological and sociological literature. From such beginnings, the specific study of mother-child interaction has evolved, and has been influenced by several theoretical perspectives. Initially, children's relationships with their mothers were analysed within a psychoanalytic framework. Prominent methodologies employed here included case studies, projective testing, and later, structured interviews. These inquiries, which emphasized children's oral and anal experiences, were useful in a precursory sense. As Yarrow, Pedersen, and Rubenstein (1977) have contended, however, inconclusive findings and a rather limited view of child-care practice have been characteristic of studies which have focused on feeding, weaning, and toilet-training variables.

Bowlby's studies of institutionalization led to the subsequent formulation of attachment theory (Bowlby, 1958, 1969). This theory was based on behavioural and biological origins and stressed more specifically the developmental importance of infants' relationships with their mothers. More recently however, attachment has been seen as a less exclusive mother-related phenomenon that may also apply to fathers and other familiar figures. Attachment theory has generated extensive research but has tended to prescribe a rather narrow age focus from about 6 to 18 months. In consequence, Parke (1977) has already criticized the neglect of the neonatal period, and similarly, the interactive experiences of older, verbal, pre-school aged children also have tended to be disregarded in the attachment literature.

Operant learning theory was instrumental in the emergence of laboratory-based observational studies. Using this approach, Bishop (1951) and Moustakas, Sigel, and Schalock (1956) developed some of the first comprehensive category systems for coding mothers' and children's behaviours. Controlled experimental conditions required laboratory settings and structured play equipment, but quite frequently, the ecological validity of laboratory studies has been questioned. Mothers and children have shown more socially desirable behaviours when observed in a laboratory playroom setting, compared with their patterns of behaviour observed in the home. Moustakas et al. (1956), for example, reported that mothers showed more non-attention, criticism, restriction, and forbidding in their homes than they did in a laboratory setting. Their children, too, ignored and rejected their mothers more frequently when at home. In contrast however, a more recent study by Borduin and Henggeler (1981) did record few important differences between the interactive behaviours used during free play when at home and when in a laboratory. Nevertheless, naturalistic approaches have been recommended as more appropriate when a study has any of the following aims: to reduce the reactive effects of being observed, to equalize the reactions of middle-class and lower-class mothers to the observational setting, or to evaluate the relationships between children's actual interactive experiences and their developmental

processes (Clarke-Stewart, 1977; House, 1978; Parke, 1977; Tulkin, 1973).

Theories from social psychology and child development have contributed to the recent growth of interest in maternal behaviour, mother-child interaction, and the effects of children's early experiences on their development. Some approaches, including Piaget's (1952, 1977a, 1977b) theory of cognitive development and Hunt's formulation of intrinsic motivation, may have influenced the more recent careful control of child variables. Piagetian and intrinsic motivational theories have portrayed children as active participants in the processes of intellectual development. Consistent with this view, there has been an increasingly close scrutiny of child variables, ranging from gender and pre-school to initiating behaviours and intellectual assessments, in the mother-child interaction research. In addition, Hunt's (1961) and Piaget's (1952) emphasis on the importance of young children's environment to their intellectual development has been influential. One related and ongoing focus of interaction research has been the study of the relationships between environmental interactions and children's cognitive development.

Theories of language development also have had a bearing upon mother-child interaction research. Studies which have related mother-child verbal interactions to children's language development have tended to be influenced by, or interpreted in terms of, social-learning or universal-nativist perspectives on language acquisition (Caplan & Chomsky, 1980; Hoff-Ginsberg & Shatz, 1982; Tannock, 1980). Theories of both cognitive and language development, then, certainly have stimulated interest in the developmental implications of care-givers' interactions with their children.

Theoretical formulations, including dyadic style, mutual synchrony and sensitivity, reciprocal and mutual accommodation, and contingent responsiveness, have developed from the mother-infant interaction research (Martin, 1981). When the present study was planned, however, these influences were minimally apparent in the mother-pre-school child interaction literature.

Finally, theories about cultures can influence the study of maternal behaviour. LeVine (1977) has related child-rearing practices to survival, and has developed a theory of adaptation which views child-care customs as "adaptations to environmental pressures experienced by earlier generations of parents seeking to realize the universal goals of parenthood" (p. 26). Furthermore, Laosa (1981) has proposed a "developmental, socioculturally relativistic paradigm" (p. 134) for approaching the study of cultural diversity. Together, these perspectives have highlighted the importance of studying maternal child-rearing behaviour and children's development within their cultural contexts.

2.1.2 *Mother-child interaction studies.*

Some of the preceding theories have exerted a direct or indirect influence on the extensive and methodologically changing mother-child interaction literature. Researchers have stressed, for example, either ecological considerations or experimental control. In turn, these emphases have influenced methodological choices between field or laboratory settings, structured or unstructured task situations, a dyadic or wider family focus, and the assessment of children within or beyond dyadic observations.

The limited mother-child dyadic focus of many studies may be traced to psychoanalytic perspectives on feeding practices, stimulus-response paradigms, or attachment theory. More recently however, researchers have documented the potential direct, and characteristic indirect, contributions which fathers make to their children's development (Clarke-Stewart, 1978; Lamb, 1982; Lynn, 1974; Margolin & Patterson, 1975; Parke, 1977).

Meade (1978) has described New Zealand playcentres as ahead of their time because they involve parents as active participants in early childhood education, but to date, the participants have tended to be mothers. The regular, spontaneous attendance of fathers at playcentre sessions has not become a widespread practice, and consequently, this study and this review were confined to maternal behaviour and mother-child interaction.

This review also has focused on studies which have used direct observational techniques. An observational approach to the study of mother-child relations has been recommended for some time, and this method is consistent with ecological views of behaviour (Barker, 1965; Bronfenbrenner, 1977). Further, from a social learning perspective, observations have facilitated the objective and quantitative description of mothers' relationships with their children (Bishop, 1951). Developmental psychologists also have defended a direct observational approach as the key to understanding the process of children's development (Baldwin & Baldwin, 1973; Clarke-Stewart, 1977). Moreover, cross-cultural and social psychologists have provided additional support for observational methods in that they help to reduce the ethnocentrism, social desirability, and selective recall sometimes associated with interviews or questionnaires.

Numerous studies have examined mothers' speech to their pre-school aged children, and maternal verbal behaviours have been analysed in terms of syntactical complexity and linguistic content, control, feedback, and teaching strategies. These verbal interaction studies have been conducted in both laboratory and field settings, and have used structured and unstructured task situations.

Studies of syntactical complexity have been influenced by the experimental precision required by operant conditioning, and by psycholinguists' understanding of speech patterns. Snow (1972), for example, aimed to examine the assumption of the psycholinguists Chomsky, Lenneberg, and McNeill that children, who already possess an innate knowledge of language structures, receive an input of normal adult speech. In her series of laboratory-based studies, Snow tape recorded the interactions of mothers and other adults with 2-year-old and with 10-year-old children, and coded maternal speech on nine verbal dimensions. Marked age-level differences in interaction were reported and demonstrated that mothers do simplify their speech to younger children. Considerably more repetitions were used by mothers of 2-year-old children, compared with mothers of 10-year-old children. Mothers' speech to their 2-year-old children also showed a reduced length of utterance and of sentence complexity compared with their

normal speech, and this was influenced to some extent by the children's responses. Therefore, Snow's (1972) studies suggest that young children hear modified forms of adult speech, rather than samples of normal speech, and that control of children's age levels is needed in mother-child interaction research.

Subsequent related studies have further examined the influence of children's ages on the complexity of mothers' and children's speech (Longhurst & Stepanich, 1975; Moerk, 1975; Phillips, 1973; Reichle, Longhurst, & Stepanich, 1976). Phillips (1973) also introduced sex comparisons, and reported that the statistically significant age differences detected between speech addressed to 18- and 28-month-old children applied equally to boys and girls. Cherry and Lewis (1976) studied more specifically the relationship between child gender and mothers' speech patterns, and found that mothers of girls aged 2 years were more likely to use questions and repetition, and talked more, than mothers of boys aged 2 years. Also girls talked more than boys in terms of utterances and turns.

More recently, studies of verbal interaction have been conducted in home environments, and increasingly complex category systems have been developed for coding mothers' and children's speech (Moerk, 1975, 1976). In addition, investigations of reciprocal communication and children's communicative competence have been initiated (Tannock, 1980).

Mothers' verbal control of their children's behaviour has been a subsidiary concern of several researchers and is relevant to this study. Coding systems have included different categories related to control, but one aspect frequently examined has been the use of commands and directives (Bishop, 1951; Cherry & Lewis, 1976; Greenberg & Formanek, 1974; Hatano, Miyake, & Tajima, 1980; Lobitz & Johnson, 1975; Lytton, 1980; Zegiob & Forehand, 1975). Categories pertaining to mothers' prohibitions and restrictiveness also have been included in some studies (Lytton, 1977; Minton, Kagan, & Levine, 1971; Radin, 1971, 1974). Some researchers employing these categories have discussed control and more comprehensive dimensions of

maternal behaviour in association with a selection of parent and child variables. For example, Lytton (1977) focused on twinship. Zegiob and Forehand (1975) included the variables of maternal ethnicity, social class, and the child's sex. Minton et al. (1971) stratified their sample by parental education and child gender, and reported that boys received more reprimands than girls. Further, several studies have examined the relationships between parental control and child assessments (Baumrind, 1973; Lytton, 1980; Radin, 1971, 1974). Finally, a developing specialized interest in the balance of control in interaction, and in the sequential analysis of control and obedience, also is evident in some of the more recent research (Lane, 1980; Schaffer & Crook, 1980).

Maternal teaching strategies have become a further focus of the verbal interactive behaviour research. In contrast with several studies of free play cited to date, teaching strategy studies have used structured task situations. The impact of operant learning theory has been apparent here, particularly in investigations of mothers' feedback to their children (Brophy, 1970; Circelli, 1976; Feshbach, 1973). Several studies have examined maternal teaching behaviours and interactions across cultures and are discussed later in that context (section 2.1.3).

Some recent observations of maternal teaching and verbal behaviour have been influenced not only by operant approaches and experimental precision but also by neo-Piagetian perspectives and motivation theory. In a series of such studies, the relationships among parents' beliefs, family structure, parents' teaching strategies, and children's cognitive behaviour during dyadic observations, currently are being examined (McGillicuddy-DeLisi, 1982, in press; McGuillicuddy-DeLisi, Sigel, & Johnson, 1979; Sigel, in press).

The physical aspects of mothers' interactions with their pre-school aged children have received less detailed attention, and this suggested an area requiring further research. Some observations have been made of mothers' physical interactions during teaching situations, and of mothers' non-verbal feedback behaviours (Bee,

Van Egeren, Streissguth, Nyman, & Leckie, 1969; Circelli, 1976; Falender & Heber, 1975; Laosa, 1978; McGillicuddy-DeLisi, in press). Physical components of the global variables of warmth and restrictiveness have been rated (McAdoo & McAdoo, 1979; Radin, 1974), and some socio-cultural variations in the frequency and duration of specific physical interactions also have been reported (Thomas, 1978a; Zegiob & Forehand, 1975).

The observation of both active and passive non-verbal behaviours has been identified as relevant when maternal behaviour is studied in different cultural contexts. Tulkin (1977) has detected a preponderant emphasis on face-to-face looking and talking in interaction studies, and this emphasis has reflected Euro-American expectations of behaviour. There has been a failure to observe and record behaviour described by Tulkin (1977) as "the more passive physical presence and availability of a parent or caretaker who holds a child or lets a young child climb over him" (p. 569).

However, several observational measures have specified categories which do accommodate mothers' more passive physical behaviour with their pre-school children. Bishop (1951), for example, differentiated between contact, where the mother was in verbal or physical contact with her child, and out of contact, where she was not. In Bishop's experimental observations of free play, the mothers' tendency to remain out of contact with their children correlated positively with the children's highly specified control, aggression, and non-cooperation. Those mothers who spent considerable time out of contact also were more specific in their control, and more non-cooperative, when they did interact with their children.

Zegiob and Forehand (1975) subsequently used the above out of contact category and also specified a physical contact category, which aptly described a mother's more passive physical presence. The inclusion of these and other non-verbal categories appeared useful to maximize the possibility of recording culturally relevant behaviours in cross-cultural observations of play.

The logic of studying both the verbal and non-verbal components of maternal behaviour has been well supported, then, because non-verbal behaviours have been recognized as passive substitutes for direct communication forms, and also as alternative forms of control, and as substitutive or complementary types of feedback (Circelli, 1976; Falender & Heber, 1975; Schaffer & Crook, 1978; Tulkin, 1977; Zegiob & Forehand, 1975). Therefore, there appears considerable justification for the recent tendency to replace the speech pattern research by studies that acknowledge the complementary nature of verbal and non-verbal communication.

2.1.3 *Social-class and ethnic differences in maternal behaviour and interactions.*

Social-class differences in maternal interactive behaviour have been extensively documented. Specifically, Anglo-American middle-class mothers have been described as relatively less controlling, directive, or restrictive in their interactions with their children than their lower-class counterparts (Bee et al., 1969; Clarke-Stewart, VanderStoep, & Killian, 1979; Feshbach, 1973; Kogan & Wimberger, 1969; Waters & Crandall, 1964; Zegiob & Forehand, 1975). Comparable findings have been reported with Afro-American samples (Feshbach, 1973; Kamii & Radin, 1967; Zegiob & Forehand, 1975). Research among English middle-class and lower-class mothers also has demonstrated the above class differences (Cook-Gumperz, 1973; Feshbach, 1973; Phinney & Feshbach, 1980).

Studies of mothers' teaching strategies during structured tasks have shown that middle-class mothers have been more likely to offer suggestions in question form, to label materials, and to focus the child's attention, than lower-class mothers (Bee et al., 1969; Brophy, 1970). Further, during free play and structured teaching tasks, middle-class mothers have been described as relatively more verbal than lower-class mothers (Dickerscheid & Kirkpatrick, 1972; Tulkin & Kagan, 1972).

Criticism has been another verbal category on which social-class differences have been demonstrated. Feshbach (1973), Phinney and

Feshbach (1980), and Zegiob and Forehand (1975) all reported that lower-class mothers criticized their children relatively more frequently than did middle-class mothers.

In addition, some researchers have described social-class differences in mothers' physical behaviours. In Kogan and Wimberger's (1969) study, for example, lower-class white American mothers showed relatively more passive involvement with their children than their middle-class counterparts. Lower-class Afro-American mothers have also used more physical feedback than middle-class Afro-American mothers (Hess & Shipman, 1965). Hore (1970) reported that middle-class Canadian mothers showed more mutual glances during a verbal task, and relatively less physical contact during a physical task, than lower-class Canadian mothers. When compared with middle-class English mothers, lower-class English mothers exhibited significantly more non-verbal behaviour during teaching tasks, and lower-class mothers also showed a greater tendency to move task materials and to use physical guidance (Phinney & Feshbach, 1980).

However, several methodological difficulties have been associated with social-class comparative studies. Different studies and measures have placed a dissimilar weighting on the variables of paternal and maternal education and occupation, income, housing, residential area, or economic assets, as indicators of class. Some early studies omitted specifying the measures of social class used. Furthermore, the use of structured observational settings or tasks may have accentuated some social-class differences (Tulkin, 1973). With the exceptions of Tulkin (1977) and Phinney and Feshbach (1980), many researchers also have ignored the important differences in behaviour which may occur within classes. Although more recent studies have tended to employ multivariate techniques and to report more comprehensive demographic data, early studies were characterized by simple one-way analyses. Frequently then, these studies have failed to account for the important related variables of ethnicity, family size, the children's birth order, or maternal age. Therefore, as Laosa (1981) has already pointed out, the absence of control of intervening variables has presented problems in both inter-class and cross-cultural studies of maternal behaviour.

Several studies have reported ethnic differences in mothers' teaching interactions. Bee et al. (1969), for example, extended and replicated Hess and Shipman's (1965, 1967) studies of lower-class and middle-class black mothers' teaching behaviour. In Bee et al.'s (1969) study, speech and teaching behaviours were observed among middle-class and lower-class mothers of children aged 4 to 5½ years. Middle-class families were selected by educational criteria to include university graduate students or staff. All of the middle-class families were white, all but two were intact, and the mean number of siblings or other children in the home was 2.55. For the lower-class sample, however, the selection criteria were public housing residence or application to Head Start Centres. The lower-class sample was about 66% black, fathers were present in only about 44% of the homes, and the mean number of siblings and other children in the home was 3.44. Each dyad was observed in a free-play situation in a waiting room and during a structured block-construction task.

Social-class comparative data were reported, and in addition, Bee et al. found some ethnic differences in behaviour. Black mothers were rated lower than both middle- and lower-class white mothers on three behavioural variables: rate of positive feedback, the frequency of suggestions presented in question form, and total interaction during the structured task. In contrast however, during the unstructured free-play situation in the waiting room no important ethnic differences were found in the mothers' behaviour, although black children did tend to use fewer information statements than white children.

Bee et al.'s (1969) early study illustrated some complexities which have confounded cross-cultural and inter-class sampling procedures. First, as different criteria were used for selecting middle- and lower-class samples, it was not possible to determine the specific influence of education, housing, or occupation on maternal interactive behaviour. Second, although both social-class and ethnic-group differences in maternal behaviour were described, comparative family size and other demographic data were reported only across classes and not across ethnic groups.

Another study by Feshbach (1973) has shown some differences in the reinforcement styles used by lower-class and middle-class black and white mothers with their 4-year-old children. The children included in Feshbach's research were 52 girls and 50 boys drawn from 11 educational pre-schools. Each mother was asked to teach her own child a standard puzzle in a laboratory setting, and the frequencies of the maternal behaviours rewards, praise or criticism, and punishment were recorded. Here, lower-class mothers used more negative reinforcement than middle-class mothers, and the black mothers used more negative reinforcement than the white mothers. This ethnic difference was attributed largely to the high incidence of negative reinforcement observed among the lower-class black mothers. The precise determinants of social-class assignment were not reported, however, nor were family size data.

In a further investigation of teaching behaviour, Steward and Steward (1973) observed six mother and 3-year-old son dyads from each of seven groups. The groups were: English-speaking Chinese-American, Chinese-speaking Chinese-American, English-speaking Chicano (Mexican-American), bilingual Chicano, Spanish-speaking Chicano, middle-class Anglo-American, and lower-class Anglo-American. Each pair was videotaped in a relatively naturalistic setting (at home, or in a school or a community centre) while the mother taught her child two structured tasks. The variables coded during the beanbag-tossing and colour-, size-, and shape-sorting tasks were: the time spent interacting; the input or number of teaching loops initiated by the mother; the mother's pacing, defined as the ratio of teaching loops divided by the total time; the mother's alerting, or method used to gain the child's attention; the informational and affective content of the mother's feedback; and nature of the mother's instructions to the child. The mother's instructions were judged as either identical to those used originally by the experimenter, or novel.

Steward and Steward (1973) reported that the single best predictor of maternal teaching or child response was ethnicity. Specifically, the Chicano mothers used the least teaching loops, the

slowest pacing, the most frequent negative feedback, the highest percentage of instructions identical to those used originally by the experimenter, and the lowest percentage of novel or embroidered instructions.

However, the above results have been subjected to some scrutiny in a recent review by Laosa (1981). Steward and Steward (1973) did not report or control the socio-economic status of their Chinese-American or their Chicano families and, as Laosa (1981) has implied, their results may have reflected to some extent the "unequal distribution of socioeconomic status among the ethnic and language populations represented in the study" (p. 142).

Nevertheless, Steward and Steward (1974) did include middle-class Chicano mothers in a subsequent study, and here, their selected stratified sample included five mothers from each of four socio-cultural groups. The groups were: middle-class Chicano, middle-class Anglo-American, lower-class Chicano, and lower class Anglo-American. Each mother was observed teaching her own son and two other boys the tasks used in Steward and Steward's (1973) earlier study, described above. The Anglo-American mothers initiated more teaching loops and used faster pacing, both with their own sons and with other boys, and used more novel or embroidered instructions. Anglo-American mothers gave their own and other boys virtually no negative feedback, whereas Chicano mothers, and particularly those from the lower-class group, used more negative feedback. Lower-class Chicano mothers used less negative feedback when teaching other boys than they used with their own sons, and mothers from all groups gave more positive feedback to boys who were not their own. In view of these findings, Steward and Steward (1974) maintained that ethnicity remained a potent predictor of both maternal teaching and child response.

Laosa (1978), in the first of a series of studies, has examined further the teaching strategies used by Chicano mothers. Forty-three Chicano mothers were observed in their own homes teaching their 5-year-old children to assemble toy models (a robot and an aeroplane Tinkertoy). Observers recorded the frequencies of nine maternal behaviours: inquiry; directive; negative verbal feedback or

disapproval; modelling, or working on the toy while the child observed; visual cue, or indicating or moving the model to attract the child's attention; physical affection; positive physical control; and negative physical control. The first four categories listed above were verbal behavioural categories, but the remaining five were non-verbal.

The child's gender was not associated strongly with maternal teaching behaviour. However, mothers' education level, measured in terms of the years of formal schooling completed, did relate significantly and positively to the incidence of inquiry and praise, and an inverse relationship was reported between mothers' education level and their tendency to work on the toy model (modelling). Similarly, high paternal education level was associated with mothers' more frequent use of praise and inquiry and their less frequent use of modelling. The Chicano parents' formal schooling levels were not necessarily related to their occupational standing, though, and occupational status did not correlate strongly with the maternal teaching behaviours.

The results described above demonstrated that maternal education may be associated robustly with maternal teaching behaviour. Laosa's (1978, 1980b, 1982) control of the single dimension, mothers' formal schooling, appeared a more useful procedure than previous attempts to control social class, a more complex conglomeration of variables.

In a second study, Laosa (1980b) proceeded to compare Chicano and Anglo-American mothers' teaching behaviour. Eight of the previously described behavioural variables were included in the analyses but physical affection, which had occurred very infrequently, was excluded. Before the samples were controlled for education and occupation, culture (Laosa's term for ethnic group classification) exerted a significant main effect on six of the behavioural variables. When mother's occupational status was held constant, significant cultural differences in the incidence of the same six behaviours remained. Cultural group failed to have a significant main effect on any of the eight behaviours, however, when maternal education level was held constant. On the basis of his results here, Laosa (1980b,

1982) has suggested that in time, Chicano women's increased participation in formal schooling might eliminate differences in Chicano and Anglo-American families' interaction patterns.

The cross-cultural studies of maternal teaching behaviour reviewed above tended to use structured task situations, but such observations could be complemented by more ecologically valid studies of spontaneously occurring play. If children select their own tasks the situation does become less standard. However, this potential disadvantage can be offset because a child is likely to select familiar or intrinsically interesting activities and thus ensures that the situation is personally and culturally more relevant for mother and child. To date, cross-cultural studies of mothers with children engaged in free play have been confined to laboratory settings, or restricted to play situations and materials provided and organized by the researchers. This certainly suggested that there remains scope for a more ecologically valid and spontaneous approach to observing mother-child pairs during play.

As a part of their series of laboratory-based studies of dyads at play, Baldwin and Baldwin (1973) observed 58 black and white mothers and their 5-year-old children interacting in a playroom equipped with a variety of toys. Each of the two ethnic samples was divided into middle- and low-education groups. Recognizing that black men tend to be under-employed in relation to their educational attainments the researchers selected paternal education level, rather than occupation, as the stratifying variable. High-school graduation was the dividing point between the two groups, and where the father was absent, the mother's education level was used. Audio- and later video-equipment recorded a 30-minute period of interaction, and speech was coded using a verbal information exchange system (VINEX). A variable was considered to reflect an ethnic difference, if the difference between the black and white samples was in the same direction for both education levels, and if the combination of the t tests for ethnic difference at the two education levels was significant.

Few significant ethnic differences were found. Black mothers were more likely to use didactic teaching during free play than were white mothers, and the black mothers also used more labelling, more description and behaviour requests, and more utterances containing transitory (specific to the situation) and permanent (applicable outside the situation) information. When education level was held constant, both the amount of interaction and the level of syntactical complexity remained comparable across the two ethnic groups. Punitiveness was rare for both groups.

Baldwin and Baldwin (1973) considered that their above results confirmed the black mothers' expressed concern about their children's future educational attainment, and that the results rejected the language deprivation hypothesis. As in Laosa's (1980b) observations of U.S. Anglo and Chicano mothers, in the above study, controlling the educational background of black and white families minimized the qualitative interpretation of differences between two ethnic groups. In Baldwin and Baldwin's (1973) report no details were provided, however, of the children's gender or of family sizes.

Zegiob and Forehand (1975) also conducted a cross-cultural observational study of mother-child pairs in a laboratory playroom. Their intention was to examine the effects of ethnicity, socio-economic status, and child gender on maternal interactive behaviour. Black and white middle- and lower-class mothers of sons and daughters were included, and the sample comprised 40 dyads with five pairs per each of the eight cells. The Myers and Bean index of social status was used to stratify each family's occupational and educational status. The children were aged from 4 to 6½ years and, although there were no major group differences in maternal age, age of children, or number of intact families, lower-class and black families were larger than middle-class and white families.

During a 20-minute period of free play, one concealed rater coded six timed interactive behaviours, and a second rater scored ten categories requiring frequency counts. (These categories are listed in Appendix B.1, as they were also used in this study). A

further 10-minute period was coded during which the mother gave three commands.

Socio-economic status was related strongly to interactive behaviour. Comparisons across the social-class groups showed that lower-class mothers criticized their children more and, during the command period, used fewer indirect commands and questions than middle-class mothers. Lower-class daughters received more direct commands during the command period than middle-class daughters. In contrast, few statistically significant ethnic differences were found, although during play white mothers did use more cooperation than black mothers.

By reporting the above demographic data and including family size as a covariate in their analyses, Zegiob and Forehand (1975) did attempt to control the intervening variables more carefully than most other researchers in this field. However, the sample size was rather small for three-way analyses of covariance, and also, the socio-economic scale was used inconsistently across the two ethnic groups. Whenever the mother's occupation and education level was higher than that of the father maternal status was used as the stratifying variable, and this meant that maternal status was used for six of the ten families in the middle-class black group. Consequently, the influence of paternal education and occupation was analysed for the white middle-class sample, but for many of the black middle-class group the effect of maternal status was examined. Here, the consistent application of one dimension of one parent's status could have been a more appropriate stratifying procedure.

Finally, the reasons for Zegiob and Forehand's (1975) findings on mothers' cooperative responses remain uncertain. If black mothers had shown both less cooperation and more non-cooperation than white mothers, or if the number of child requests for cooperation had been specified for each ethnic group, a clearer interpretation might have been possible. The question arising from the above results is whether the white mothers' more frequent cooperation occurred partly because their children initiated more requests than did the black children. Farran and Haskins (1980) also have stressed that the inclusion of

references to children's initiating behaviours can help clarify the meaning of some socio-cultural differences in maternal interactive behaviour.

Despite the methodological difficulties identified in the preceding pages, some socio-economic-level, education-level, and ethnic-group differences have been observed in maternal interactive behaviours. The research reviewed has illustrated the usefulness of isolating specific defined components of social class. Also apparent is the importance of avoiding deprivational interpretations first by controlling intervening variables and second by analysing social and ethnic differences within their different cultural contexts.

2.2 *Mothers' interactions and children's cognitive and language development:*

Several studies cited previously have implied that there is a connection between mothers' interactive behaviours and their pre-school aged children's cognitive or language competence (Baldwin & Baldwin, 1973; Bee et al., 1969; Moerk, 1975; Phillips, 1973). A focus on the developmental correlates of children's interactive experiences has produced home-based intervention programmes for mothers and young children (Levenstein, 1970, 1972, 1979; White et al., 1979). Cross-sectional and longitudinal studies also have proliferated to assess more specifically the relationships between mother-child interactions and children's assessed IQ scores, their developmental levels on Piagetian and other cognitive tasks, and their language development.

Clarke-Stewart (1977) has identified a pattern of maternal behaviour which has related both to children's high IQ scores and to IQ gains made during the pre-school period. When reviewing studies of mothers and their 3- to 6-year-old children Clarke-Stewart concluded that certain maternal behaviours were associated positively with the children's cognitive assessments. The behaviours included warmth, sensitivity, and loving; acceptance of the child's behaviour, explorations, and expressiveness; control through reasoning rather than rules; use of more complex, elaborate teaching styles and

language; active encouragement of independence; and stimulation with language and toys.

Similarly, specific characteristics of maternal speech have been related to children's language development. Tannock (1980), who has summarized speech studies of mothers and their children aged 12 to 33 months, has described the positive correlates of children's language growth as mothers' questions, imitations and expansions, descriptions, and acknowledgements or approvals. Conversely, maternal directives or imperatives, and disapprovals have correlated inversely with children's language growth.

An early study of the relationships between mother's interactions and children's intelligence scores was reported by Radin (1971). Subjects were 52 black and white lower-class mothers and their 4-year-old children. While ostensibly conducting an interview with each mother, who was accompanied by her own child, the interviewer also recorded the mother's behaviour towards the child. Observed maternal warmth (or use of positive reinforcement, consultation with the child, and sensitivity to the child) correlated in a significant and positive manner with the children's test results. These scores included a Peabody Picture Vocabulary Test score, a Stanford-Binet IQ score, an academic motivation score on the Pupil Behaviour Inventory, the children's assessed motivation during the Stanford-Binet test, and the children's pre-school gains on the Stanford-Binet. Later, Radin (1974) outlined further analyses showing that boys experienced more restrictiveness (defined as maternal aversiveness and issuing of orders) than girls. However, because child behaviour was not observed it was not known whether the boys, compared with the girls, also made more demands of their mothers during the hour-long interview. Another subsequent finding was that maternal warmth or nurturance related strongly to the Stanford-Binet score only among the girls, and on the basis of partial correlations the motivation to achieve appeared to be an intervening variable between maternal warmth and daughter's IQ score.

In contrast with Radin's (1971, 1974) structured approach, White et al.'s (1973, 1978) longitudinal research has focused on

children's naturally occurring activities in the home. White et al. (1978) showed that the home experiences of 19 children, observed at 18 to 21 months, correlated with their Wechsler Pre-school and Primary Intelligence score obtained later at 60 months. Important experiences that predicted children's intellectual assessments were: gaining attention, gaining information through steady staring, and gaining information by listening to live language directed to the child. The above experiences related positively to the test score, but two further experiences were negative predictors, namely, non-task experience and exploratory experience. These results suggest that mothers who responded to their toddlers' requests for attention, and who talked to them more, were among those likely to have children with a higher IQ by the age of 5 years. Therefore despite differences in observational methods, and in the ages of the children observed, both Radin's and White et al.'s findings imply that aspects of mothers' verbal responsiveness are associated positively with their pre-school children's IQ scores.

Three further studies have related maternal behaviours to children's performance on Piagetian tasks (Adjei, 1977; Hatano et al., 1980; Kirk, 1977). Adjei (1977) observed the behaviour of mothers from rural and urban regions of Ghana, and from a lower-class and a middle-class urban area in Scotland, as they interacted with their 4- to 5-year-old and 7- to 9-year-old children. The 4- to 5-year-old children performed a structured matching and sorting task with their mothers in an observation room. Maternal behaviours rated during these tasks were: social reinforcement, insighting (briefing a child or focusing the child's attention on the task characteristics), encouraging, suggesting, assisting, direct-interfering, participating, intercepting, and directing. The children subsequently were tested on Piagetian intuitive discrimination, seriation, and number tasks.

Positive statistically significant correlations were found between the Ghanaian mothers' insighting behaviours and their children's number performance. Conversely however, among the Scottish pairs, where a higher incidence of insighting and social-reinforcing behaviour was observed, an inverse statistical relationship was reported between maternal insighting and children's

discrimination and seriation performance. Maternal directing and direct interfering behaviours related inversely to both the Scottish and the Ghanaian children's seriation skill, and also to the Scottish children's score on the number task. Accordingly, Adjei (1977) concluded that mothers' interfering and directing, and also their frequent use of reinforcing and insighting, might inhibit their children's development of some Piagetian concepts. This suggestion would appear to be based more specifically on the data for the Scottish dyads.

Kirk (1977) conducted a rather similar Ghanaian study, and here, children aged 5 years were assessed on four Piagetian tasks including conservation of mass using clay. While the children performed an additional puzzle-solving task with their mothers, maternal behaviours were rated. A positive and statistically significant relationship was found between mothers' references to relationships, similarities, and differences, and their children's prior performance on the Piagetian tasks. Kirk (1977) considered that these results, and her later findings from Kenya, validated the relationship between mothers' good teaching and children's development of conservation skill. Good teaching was defined as the use of specific references to relationships, and non-verbal specificity, during teaching interactions.

A longitudinal study of Japanese mothers and their pre-school aged children has been reported by Hatano et al. (1980). Their research examined further the association between maternal behaviour and children's IQ scores and number conservation. Each of 54 mother-child pairs was videotaped for 10 minutes in a laboratory equipped with two sets of pattern-construction toys, and the mothers' behaviour was rated on 12 scales which were factor analysed and produced directiveness and warm scores. Each 4-year-old child was administered a Japanese version of the Peabody Picture Vocabulary Test (PPVT). Two years later, the children completed a number-conservation test, and a Japanese version of the Stanford-Binet IQ test.

Maternal directiveness strongly and inversely predicted the children's number conservation test score, accounting for 17% of the

variance and 27% in combination with the working parent's occupation. This result appeared consistent with Adjei's Scottish findings. As Hatano et al. (1980) commented, the negative impact of directiveness was congruent with Piaget's understanding of the child's spontaneous role in the assimilation process. The children's PPVT scores and the scores for maternal warm concern were not strong predictors of children's number conservation.

However, different variables predicted the children's Stanford-Binet IQ scores. Occupation, PPVT, and warm concern scores, all obtained at 4 years, were associated strongly with children's IQ scores at 6 years, and mothers' warm concern correlated significantly and positively with children's Stanford-Binet IQ scores. In contrast, the relationship between maternal directiveness and children's IQ, although negative, was non-significant.

The studies reviewed above have shown, then, that mothers' directive behaviours tend to relate inversely to children's competence on Piagetian type cognitive tasks, and that this relationship is likely to be sustained over time. The negligible relationship between directiveness and children's IQ scores implies, however, that the connection between maternal behaviour and children's cognitive performance may vary with the assessment criteria employed. Hatano et al.'s (1980) study also provided further support for an association between maternal warmth and children's IQ scores, identified previously (Clarke-Stewart, 1973, 1977; Clarke-Stewart & Apfel, 1978; Radin, 1971).

Maternal behaviour and family interactions have been examined in relation to additional dimensions of children's cognitive development. These dimensions have included instrumental competence, cognitive style, and intolerance of ambiguity.

Baumrind (1971, 1973) has studied the relationships between parental behaviour and instrumental competence. Children's instrumental competence was defined as an aggregate of manifested social responsibility, independence, achievement motivation, and vitality. Five different parenting patterns were identified from behavioural and

interview data collected from parents of 4-year-old children. Authoritarian and authoritative parenting patterns were both characterized by firm enforcement, but unlike authoritarian parents, authoritative parents also encouraged children's independence and individuality. Permissive, non-conforming, and harmonious patterns also were described. Harmonious parents, who were very highly educated, very seldom exercised power but appeared to have control.

Authoritative discipline, characterized by reasoning, was considered to be associated with girls' responsible behaviour and boys' independence and self-assertiveness. Parental discipline that was restrictive and punitive related, however, to children's more dependent and isolated behaviour at nursery school. Black authoritarian parents presented an exception here because their daughters tended to be assertive and independent. Overall though, the authoritative pattern was associated more positively with the children's instrumental competence than were the authoritarian, permissive, or non-conforming patterns.

Frequently the above results have been quoted in support of parents' firm, authoritative disciplinary practices. However, the harmonious pattern, which related to outstanding cognitive competence in girls, was not characterized by parental controlling behaviour, directiveness, or marked concern with obedience. Girls from harmonious families were more achievement orientated and friendly than girls from all other groups combined and scored exceptionally highly on the Stanford-Binet IQ test (Baumrind, 1971). Understanding the association between harmonious parenting and boys' development appeared precluded by the very small sample size.

Thus, the data for the harmonious group did not support a link between firm discipline and children's instrumental competence or their high IQ scores. In a recent more extensive review, Lewis (1981) has also noted this discrepancy. In brief, Lewis has reinterpreted Baumrind's data and, with reference to motivation theory and research, has concluded that the connection between firm parental control and children's effective socialization remains unproven.

Meanwhile, Laosa (1980a) has focused on mothers' and children's cognitive style, and observed field-dependent and field-independent Chicano mothers teaching their 5-year-old children. Relatively field-independent Chicano mothers used inquiry and praise more frequently than relatively field-dependent Chicano mothers, who tended to teach by modelling (physical demonstration). Mothers who used inquiry and praise were likely to have daughters who were relatively field-independent. Conversely, mothers who used modelling, visual cues, and negative physical control tended to have relatively field-dependent sons or daughters. Laosa (1980a) asserted that these latter three techniques could increase children's reliance on external referents.

However, more recently the relative effectiveness of the teaching behaviours inquiry (questions) and modelling (physical demonstrations) has been reappraised. Laosa (in press) has observed modelling, inquiry, and other behaviours used by 50 Anglo-American families. Maternal modelling related strongly and positively to 3-year-old children's scores on Caldwell's Pre-school Inventory, if social class was held constant. Path analyses showed that the mothers' use of inquiry did not exert a statistically significant influence on the children's intellectual development. The above results were contrary to previous assumptions and analyses (e.g. Sigel, 1979). Therefore, Laosa (in press) has proposed that mothers' use of modelling may stimulate 3- to 4-year-old children's learning by observation, whereas the use of questions may be less effective until children have developed more advanced information-processing skills. Alternatively, Sigel (in press) has suggested that questions which place high-level cognitive demands on a child are likely to be associated more positively with cognitive behaviour than are low-level demand questions, which do not require the child to reconstruct an experience.

Children's tolerance of ambiguity has been identified as a further dimension relevant to cognitive performance. Harrington, Block, and Block (1978) studied the relationships between parents' teaching strategies, videotaped in a laboratory, and their children's

concurrent intolerance of ambiguity and subsequent cognitive and personality development. Mothers whose 3½- to 4½-year-old girls were intolerant of ambiguity described themselves as nurturant, and their teaching behaviours were supportive and task-structuring. Young boys who were intolerant of ambiguity tended to have fathers who were distant and authoritarian and whose teaching behaviour was characterized by criticisms, impatience, and limited resourcefulness. These boys' mothers were likely to be protective, intrusive, and controlling. Longitudinal assessments showed that early intolerance of ambiguity in girls related to passive role-taking in stable peer groups at 7 years of age. For boys, intolerance of ambiguity at 3½ to 4½ years was associated with continued intolerance of ambiguity, anxiety, structure-seeking behaviours, and less effective observed intellectual, creative, verbal, and attentive competence at 7 years. The boys' data but not the girls' data suggested, then, that there may be an indirect but inverse relationship between maternal intrusive or controlling behaviour and cognitive and language development.

Thus, maternal behaviours have been related both directly and indirectly to children's cognitive competence. The association between firm parental control and children's cognitive and social development requires further study, and the connection between maternal questions and demonstrations and children's cognitive assessments also is being re-examined.

Another group of studies has been more specifically concerned with explaining the relationships between maternal interactive behaviour and children's language development. Previously described speech research demonstrated that mothers adapt their speech to their young children (Phillips, 1973; Snow, 1972). Several subsequent studies have related observed mother-child interactions to children's language skills, which have been assessed on standardized tests or observed within dyadic sessions.

Nelson (1973), for example, reported a longitudinal study of 18 children aged 1 to 2½ years. Mother-child interaction was observed in the homes when the children were aged 12 to 15 months and again at

2 years. The mothers maintained records of their children's language acquisition, and the children were administered standardized tests at 2 and 2½ years (the Bayley Developmental Test for Mental Development, the Concept Familiarity Index, and the Peabody Picture Vocabulary Test). Indices of the children's assessed language maturity included their mean length of utterance, their vocabulary, and their comprehensibility. The mothers' directiveness consistently correlated quite strongly and inversely with the children's language maturity. The children's language assessments, and in particular their concurrent maturity, in turn correlated highly positively with their scores on the above standardized tests. However, the form of the mothers' speech, coded as questions, length of utterance, and use of stereotypes, did not relate in a statistically significant manner to the children's language performance.

Newport, Gleitman, and Gleitman (1977) observed mothers and their children aged 12 to 15 months, 18 to 21 months, and 24 to 27 months. Mothers and children from each of the above three age groups were re-examined after an interval of 6 months. Maternal utterances that related quite strongly and positively to the growth of the children's language included questions requiring yes or no answers, the use of deixis (examples included "that's a dog", "those are apples"), and expansions. A statistically significant positive relationship was found between the frequency of the mothers' use of deixis and the extent of the children's vocabularies. However, the mothers' imperatives and self-repetitions related quite strongly and inversely to the children's language growth.

In another language study using a more structured observational approach, Masur and Gleason (1980) demonstrated that parents influenced their 3-year-old children's acquisition of lexical information. During a toy car assembling task in a laboratory playroom, mothers who used more labelling and longer utterances had sons and daughters who produced more total vocabulary. This structured task could be described as stereotypically more a masculine one, and fathers used more labels and made more form and function requests than mothers. In turn, children spoke more when with their fathers.

Masur and Gleason concluded that their results supported the previously proposed link between mothers' rich verbal modelling and children's language competence.

Naturalistic home observations of twins and singletons aged 2 to 3 years have produced some findings consistent with the above contention. Lytton (1980) reported that mothers' and fathers' mild suggestions, positively toned actions, reasoning, and mothers' encouragement, correlated positively, and to a moderate to strong degree, with children's speech assessments. Mothers' speech rate to their children predicted the children's speech rate, whereas fathers' speech rate predicted children's speech maturity. The children's speech maturity, or rated articulation, also correlated statistically significantly with their Peabody Picture Vocabulary Test scores. Lytton contended that parental directiveness related quite positively to children's competent development of language when the home environment was generally warm and positive. This assertion was in contrast with the majority of findings on directiveness and language development (Clarke-Stewart, 1977; Hoff-Ginsberg & Shatz, 1982; Nelson, 1973; Newport et al., 1977; Olim, 1975).

In general, then, some forms of mothers' questions, expansions, and labelling, and their encouragement, have tended to be associated positively with children's language development. Maternal directiveness frequently has related inversely to children's language assessments, although Lytton's (1980) work does present a possible exception here.

Since Harper (1975) and Bell and Harper (1977) reviewed studies which have assessed children's effects on their parents, considerable controversy has been apparent concerning the direction of causes and effects in mother-child interaction research. The present review has attempted to avoid unwarranted causal terminology and this was in line with researchers' current recommendations (Carew, 1980). Questions regarding the mother's influence on the child, and the child's influence on the mother, have remained somewhat uncertain, with the more recent study of mutual adaptation in interaction providing a more balanced perspective.

The study of the correlates of young children's competence has remained important, however, for its contribution to theoretical knowledge and educational practice. Further, Clarke-Stewart (1978) has presented some exploratory analyses which suggest that, although maternal, paternal, and child variables are related in a complex way, mothers' behaviour may exert a more powerful influence on young children's intellectual development. Subjects in the analyses were 14 middle- and lower-class families with parents in traditional roles (working fathers, non-working mothers). Cross-lagged panel correlations and partial correlations showed that maternal stimulation and play with toys at 15 months were more closely related to children's assessments on the Minnesota Child Development Inventory at 30 months, than was children's intellectual performance at 15 months related to mothers' verbalization and play at 30 months. This implied a mother-to-child rather than a child-to-mother influence. Correlations indicated an opposite direction for fathers, though, and Clarke-Stewart suggested tentatively that, over time, the direction of family influence may be from mother to child to father to mother.

In summary, an accumulating body of research has supported a relationship between specific maternal interactive behaviours and children's cognitive and language competence. Maternal behaviours have been linked directly to children's scores on IQ and Piagetian tests, and to the intervening variables of achievement motivation, cognitive style, and tolerance of ambiguity. In general, maternal intrusiveness and directiveness have been associated strongly and negatively, and maternal stimulation, praise, and acknowledgement have correlated positively, with children's intellectual and language development. The role of fathers and of siblings has received more recent recognition in the above research areas (e.g. Laosa, in press; Lytton, 1980; Masur & Gleason, 1980; McGuillicuddy-DeLisi et al., 1979; Norman-Jackson, 1982). Researchers have not resolved some issues concerning the direction of influences in mother-child interaction, although recently, Clarke-Stewart (1978) has reported some data favouring a mother-to-child direction in the stimulation of children's intellectual development.

2.3 *Parent-child relationships, children's self-concepts, and children's competence:*

Self-esteem refers to individual self-evaluation and has been defined as "a *personal* judgment of worthiness that is expressed in the attitudes the individual holds toward himself" (Coopersmith, 1967, p. 5). Self-concept is a closely related term which has pertained more specifically to the individual's knowledge or description of self (Beane & Lipka, 1980; Wylie, 1974). Several writers have maintained that specific child-rearing practices influence children's descriptions or evaluations of themselves. Mothers' relationships with their children have tended to be assessed from interview or questionnaire data then related to children's measured self-perceptions (Coopersmith, 1967; Flynn, 1979; Thomas, 1973).

Coopersmith (1967) has contended that certain combinations of parental characteristics or practices are antecedents of children's self-esteem. A combination of two or three of the following factors related to high self-esteem in offspring: parental acceptance of their children, set and maintained behavioural limits, approval of individual action within the stated limits, and parents' own high self-esteem.

Only a limited number of studies relating parental characteristics and children's self-perceptions have focused on families with pre-school aged children. Miller (1975) reported that maternal employment was not related strongly to kindergarten children's self-esteem, and mothers' anxiety has not shown a consistent relationship with pre-school children's self-esteem (Samuels & Griffore, 1979).

More directly relevant to the present study, however, Flynn (1979) has reported the relationships between some child-rearing practices and pre-school aged children's self-concept scores. The hypothetical use of punishment, reward, and power reported by 62 sets of parents was assessed using a Use of Parental Authority measure developed by Gordon in 1970, and the children, aged 3½ to 5 years, were administered the Brown IDS Self-Concept Referents Test (described in Chapter 4, 4.3.2). When compared with parents of boys, both mothers and fathers of girls advocated more control, and this difference was statistically

significant. Here, control included both punishments and rewards. Mothers who advocated more punishment tended to have boys with higher self-concepts, although this relationship was not apparent for girls. In consequence, Flynn concluded that children's self-concepts may be enhanced by moderate control but may suffer from either too little control or, as in the girls' case, from too much control.

Coopersmith's (1967) and Flynn's (1979) findings imply, then, that there is likely to be a relationship between mothers' control and acceptance and their children's self-esteem. Analyses relating directly observed maternal behaviours and pre-school children's self-concepts would expand the current state of knowledge and extend this line of inquiry beyond the hypothetical towards the actual.

One observational study, reported while the present study was being undertaken, has related parental interactions to children's self-concepts. McAdoo and McAdoo (1979) observed 40 black and 44 white sets of U.S. parents as they interacted with their pre-school children during an interview. The procedure and the behavioural measure were similar to those used by Radin (1971, 1974). In addition to rating mothers' and fathers' nurturance and restrictiveness, the researchers coded non-verbal behaviour on five categories: tone of voice, physical touch, meeting implicit needs, no interaction, and also the child's initiations and explicit needs. The parental non-verbal behaviours were recorded as positive or negative. The children, whose mean age was 5.58 years, were administered four measures. Self-concept was assessed using the Thomas Self-Concept Values Test, IQ was measured on the Peabody Picture Vocabulary Test, and racial preference was obtained from two measures.

Generally all children attained a high self-concept score, but there still remained a significant gender difference with boys scoring higher than girls. McAdoo and McAdoo (1979) reported that there were no major ethnic group differences in the children's self-esteem, and that self-concept and racial identity and preference were not related for either black or white children. They found, though, that the relationships between parent and child variables

were different for each ethnic group. The nurturant black mothers had nurturant husbands, and their children had high self-concept scores, showed accurate racial identity, and had high IQ scores. Also, black children with mothers who frequently used positive physical behaviours showed strongly pro-black preferences, but black children with verbally and physically restrictive fathers tended to indicate white racial preferences. Among the white families, however, children's self-concepts were related less strongly to parents' interaction styles, although white mothers who frequently used physical behaviours that were rated as negative did have children with low self-concept scores.

The relationship between black mothers' nurturance and their children's high IQ scores corresponded with some findings cited previously (e.g. Clarke-Stewart, 1977; Hatano et al., 1980; Radin, 1971). The association between maternal nurturance and black children's high self-esteem was in line with Coopersmith's (1967) stress on the importance of maternal acceptance. Although the absence of important relationships between white parents' verbal behaviours and their children's self-concepts was interesting, further research examining a more extensive range of verbal behaviours appears necessary to confirm this finding.

McAdoo and McAdoo (1979) advocated that more research should be initiated among black and other minority group families, and that such research should include analyses of the effects of race and socio-economic circumstances on parenting. There appears an urgent need to extend these investigations to naturalistic settings and task situations. Clearly then, further study of the association between maternal interactive behaviour and young children's self-concepts is required. Recently Lewis (1981) has asserted that the relevance of parents' firmly enforced limits to children's high self-esteem also needs to be reassessed.

As some studies have suggested that pre-school aged children's self-concepts are related positively to concurrent or subsequent academic performance, the above fields of inquiry have become

relevant to early educational practice. Longitudinal studies have reported a connection, for some samples, between high self-esteem at kindergarten level and later school achievement (Bridgeman & Shipman, 1978; Wattenberg & Clifford, 1964).

Wattenberg and Clifford (1964) measured kindergarten children's self-concepts from observers' ratings of the children's remarks. They classified the 128 children into 14 socio-economic, gender, and reading-level subgroups, and described an important predictive relationship between kindergarten self-concept scores and reading progress. However, as Bridgeman and Shipman (1978) have subsequently commented, relatively few of these results reached statistical significance. When Wattenberg and Clifford (1964) correlated children's self-concept scores with their reading scores obtained 2½ years later, positive statistical relationships were found between self-concept of competence and reading scores for 2 of the 24 subgroups, and between quantitative (good-bad) self-concepts and reading assessments for 4 of the 14 subgroups.

As part of their own more recent research programme, Bridgeman and Shipman (1978) examined the relationships between self-concept and achievement motivation at kindergarten and first-grade levels and assessments of reading, mathematics, and problem solving at third-grade level. Scores on the Brown IDS Self-Concept Referents Test for children aged 3½ to 4½ showed a strong negative skew. Nevertheless, these scores were important and statistically significant predictors of reading and mathematics (Cooperative Primary Tests) and problem solving (on the Raven Coloured Progressive Matrices) at third-grade level. Bridgeman and Shipman did question whether the Brown score measured the young children's intrinsic motivation or attentiveness, which had implications for later cognitive performance, rather than their stable self-esteem.

Within the pre-school and kindergarten age level, researchers have analysed the influence of self-concept growth on school readiness, and of high self-esteem on achievement (Flynn, 1975; Ozehosky & Clark, 1970; respectively). Ozehosky and Clark (1970) selected the 25 girls and 25 boys with the highest teacher-rated

self-concepts, and the 25 girls and 25 boys who rated lowest, from a total sample of 1042 kindergarten children. Among these selected extreme groups, positive statistical relationships were found between teacher ratings of self-concept and children's achievement on the Metropolitan Readiness Tests. More generalizable results may have been obtained, though, by correlating self-concept and school readiness scores for the entire sample.

Flynn (1975) reported the results of a 3-month compensatory pre-school programme in self-concept, delay of gratification, self-control, and risk-taking. For girls, growth in self-concept, measured on the Brown IDS Self-Concept Referents Test, correlated significantly and positively with growth in school readiness, assessed on the Cooperative Pre-school Inventory.

Other studies which have correlated pre-school children's self-concepts with their concurrent cognitive assessments have tended to yield fewer statistically significant results. In Bridgeman and Shipman's (1978) study, concurrent performance on the Pre-school Inventory was linked to the Brown score, to a significant degree, for only two of the six subsamples of 3½- to 4½-year-old children (Urban Headstart females and rural other pre-school males). McAdoo and McAdoo (1979) reported that white pre-school children's self-referent score and total (four and five referent) scores on the Thomas Self-Concept Values Test (TSCVT) correlated strongly and positively with their concurrent Peabody Picture Vocabulary Test (PPVT) scores. Among the black children too, significant positive correlations were reported between the total TSCVT score and the PPVT score. However, the relationship between the black children's PPVT scores and their TSCVT self-referent subscores, although positive, was not statistically significant.

Pre-school children's self-concept scores, then, sometimes have predicted subsequent academic performance. Among some subsamples, self-esteem has been associated positively with school readiness or achievement. Cross-sectional studies have reported some strong, positive correlations between pre-school aged children's self-

concept scores and their intellectual assessments. The potency of the positive relationship may vary considerably, though, according to the ethnicity, gender, and urban or rural residence of the children studied.

2.4 *The New Zealand context:*

2.4.1 *Mother-child relations and interaction.*

As in North America and Britain, in New Zealand, the first mother-child relations studies were influenced by psychoanalytic theory. For several decades here, either the research methods used or the variables examined tended to reflect a psychoanalytic theoretical orientation.

Beaglehole and Beaglehole (1946) used an indirect participant observational method and provided an early account of child-rearing and other practices in a Maori community. A series of subsequent studies, conducted within a rural Maori community (at "Rakau"), examined Maori mothers' relationships with their children and their young children's personality development. The methodologies employed here included projective testing, interviews, and participant observation (Earle, 1958; Jane Ritchie, 1957; Ritchie, 1956, 1963). When the research was extended to include migrant urban-dwelling Maori families, projective testing was retained and questionnaires were included (Jane Ritchie, 1964).

More recently, the child-rearing practices of Maori and Pakeha (New Zealand European) urban-dwelling and rural-dwelling parents have been described (Jane Ritchie, 1979; Ritchie & Ritchie, 1966, 1970). The interview schedule used in the above studies had been developed previously, and employed with American samples, by Sears, Maccoby, and Levine (1957). Ritchie and Ritchie (1966, 1970) reported rated interview data from 151 Maori and Pakeha mothers of 4-year-old children. Specific dimensions of child rearing examined included the birth experience, the training of hunger, dependency, sex, and aggression, and perhaps more pertinent to the present study, the mothers' reported use of methods to control their children's behaviour.

In a preliminary report, Ritchie and Ritchie (1966) compared the New Zealand mothers' use of control methods with Sears et al.'s (1957) report of American (U.S.) mothers' practices. A larger percentage of New Zealand mothers objected to using tangible rewards, and a smaller percentage used negative models (by describing the behaviour of another person as an undesirable example), when compared with their U.S. counterparts. Although the New Zealand mothers' use of physical punishment was comparable to that of the U.S. mothers, the New Zealand mothers were more likely to consider physical punishment an effective method.

Ritchie and Ritchie's (1970) later extended report described comparative child-rearing data on New Zealand Maori and Pakeha urban, town, and rural samples. Their results showed that the Maori mothers admitted to rather more frequent use of physical punishment particularly if they lived in an urban environment. Whereas 68% of the urban Maori mothers were rated as "high" users of physical punishment, 34% of urban Pakeha mothers received a "high" rating. These urban Maori and Pakeha samples were not matched, however, by socio-economic, educational, or other levels of status. Subsequently, Ritchie and Ritchie (1981) have noted that *ariki* children (first-born in a family of note, high-born, or from the family of a chief) rarely have received physical punishment.

Ritchie and Ritchie (1970) also reported that the urban Pakehas, compared with their small town and rural counterparts and also with the Maori mothers, were rated as the warmest group who showed the greatest need to demonstrate affection to their 4-year-old children. Although the urban Pakeha mothers made an effort to play with their children, however, the urban and rural *(pa)* mothers expressed delight in playing with their children. Ritchie and Ritchie's interpretations of their interview data suggest, then, that there may be Maori-Pakeha differences in urban mothers' play interactions with their pre-school aged children.

A more recent study by Jane Ritchie (1979) has compared interview data collected from a primarily Pakeha urban-dwelling sample in 1977

with the data collected from the original Pakeha samples in 1963. To assess paternal roles in child rearing, both mothers and fathers were interviewed in the 1977 study. Although Ritchie and Ritchie (1970, 1978) previously had referred to New Zealand parents' low levels of verbal interaction and control, by 1977 mothers showed increased use of verbal reasoning and praise as control techniques. In addition, Jane Ritchie (1979) found that by 1977, more mothers were employed full-time, more separations occurred between parents and children aged over 2 years, and a somewhat higher percentage of mothers never used corporal punishment with their children (10% in 1977, 1% in 1963). Corporal punishment had remained an otherwise prevalent practice.

Jane Ritchie (1979) also described few major differences in reported parental treatment of sons and daughters. However, mothers of daughters did have higher standards of neatness than mothers of sons. Fathers punished daughters less frequently than sons, but there was no difference in mothers' use of physical punishment with sons and daughters. Mothers of daughters used praise more often than did mothers of sons, and boys, who were reported as more frequently disobedient, were more likely than girls to have had their behaviour discussed with the family doctor. The above findings suggest, then, that mothers' use of verbal praise may vary with child gender.

Both mothers and fathers reported that their 4-year-old children were in need of considerable attention. Mothers and fathers were similarly responsive to their children's needs, with 36% of the parents responding to most requests, and 50% responding sometimes (Jane Ritchie, 1979).

Beyond Ritchie and Ritchie's important interview studies, there has been only limited empirical data reported on Maori and Pakeha mothers' relations or interactions with their pre-school aged children. Observations of anthropologists have suggested that some characteristics generally are more prevalent among Maori families than Pakeha families. Metge (1976), for example, has commented that, despite a probable higher incidence of broken marriages among Maoris,

many Maoris strongly emphasize the importance of marriage. Maoris also tend to place high value on having children, and on parent-child relations. Nevertheless their children are likely to be shared, as Maori families are less self-contained than Pakeha families, and are characterized by more frequent adoption and a greater stress on children's relationships with their siblings and grandparents (Metge, 1976).

Maori children's emphasis on sibling interaction may relate, in part, to actual family size. Certainly, several studies have suggested that young Maori children, compared with their Pakeha age-mates, more frequently interact with peers or siblings (Jane Ritchie, 1957; Ritchie & Ritchie, 1970, 1978; Schwimmer, 1966). In addition to their proneness to interact with peers, Maori children's apparently greater tendency to cooperate rather than compete with peers also has been noted (Thomas, 1975, 1978b). However, Thomas' finding here may not be applicable to urban situations, as his data showed that urban Maori children were no more cooperative, and may have been less cooperative with peers, than their urban Pakeha counterparts.

Schwimmer (1973) observed that in an isolated rural Maori community many Maori children's relationships with their grandparents were important and of educative value. In many urban migrant communities, however, Maori mothers are more frequently the primary caretakers of their own children. There has been a decline in informal adoption in the cities and, in some instances, in grandparents' involvement in child rearing. McDonald (1973) interviewed 103 Maori mothers of pre-school aged children and reported an association between marriage to a Pakeha and the decline of adoption out.

Reported observations from Maori cultural contexts have suggested further that Maoris use physical interactions more, and verbal interactions less, than Pakehas. Therefore, while Maori children might be more likely to learn by observation and participation, more Pakeha children might learn from parents' or adults' direct teaching (Metge & Kinloch, 1978). Jane Ritchie (1978) also intimated that verbal communication occurred infrequently among a sample of urban

Maori mothers and their pre-school children. A specific speech characteristic observed among some Maori mothers was the tendency towards using a functional descriptive mode, involving minimal use of nouns. However, the mothers and children described by Ritchie were enrolled in a compensatory pre-school project, and the above observations may not be applicable to Maori mothers in general.

Collectively, the above studies and observations have described some differences between Maori and Pakeha children's interactive experiences with their mothers and other family members. It should also be noted, though, that these differences possibly have been less evident in urban environments or in mixed marriage situations. The observed importance of non-verbal communication among many Maori people nevertheless does support the need to include non-verbal behavioural categories in interaction studies conducted in the New Zealand context. Further, as non-verbal communication and learning by participation have been more characteristic of Maori families, ethnic differences are likely to be observed in Maori and Pakeha mothers' non-verbal, teaching, and play participation behaviours.

International studies of parent-child relations and interactions have indicated that the direct observation of behaviour has tended, at least temporarily, to supersede interview methods which rely on mothers' recollection of child-rearing practices (Clarke-Stewart, 1977; Laosa, 1981). To date in New Zealand, however, only a few observational studies of parent-child interaction have been reported. Consequently, assumptions about parental or home influences on Maori and Pakeha children's cognitive organization have largely been based on the interview data from the child-rearing pattern research.

In addition, the New Zealand research has often been limited to comparisons of Maori-Pakeha behavioural differences expressed in terms of percentages. Some of these studies have used relatively small samples and have not established the magnitude of the differences in proportion (e.g. Ritchie & Ritchie, 1966, 1970; Thomas, 1979). Certainly then, some assumptions about the home experiences which influence rural and urban Maori and Pakeha children's cognitive

organization have been derived from comparative data of unknown statistical significance.

However, several observational studies of Maori and Pakeha children have been conducted, and a number of researchers have observed children's behaviour or teacher-pupil interaction in ethnically mixed classrooms at New Zealand primary schools (Hunkin, 1980; McKessar & Thomas, 1978; Podmore, 1978; Quinnell, 1974; A. St.George, 1978; Sutton & Nicholls, 1977). Some of this New Zealand classroom research has been reviewed by Archer and Wilson (1980). Fewer systematic studies have been reported from ethnically mixed pre-schools, although some aspects of adult-child interaction have been studied naturalistically (Denee, 1972; Graves, 1974; Meade, 1980).

Denee (1972) reported that Polynesians (immigrant Pacific Polynesian Islanders plus Maoris) used different interaction styles from Pakehas when their behaviour was observed at a Polynesian-run Auckland playcentre. Polynesians' style was described as predominantly inclusive (characterized by belonging to and forming integrated groups), but Pakehas tended to use an exclusive style (solitary activities or interacting on a one-to-one basis). Graves (1974) later studied inclusive and exclusive interaction at 13 playcentres or kindergartens and 11 primary schools, and found that the inclusive mode was most in evidence among Polynesians in settings where the proportion of Polynesians exceeded 50%. Where they were a minority group, Polynesians less frequently displayed an inclusive style. Conversely, Pakehas frequently adopted an exclusive style, particularly when they were in the minority. Denee's and Graves' work therefore introduced a direct observational approach to the study of ethnic differences in behaviour in New Zealand pre-schools. Unfortunately however, details of the specific interactive styles of the Maori mothers could not be extracted from the above data.

Few studies have focused specifically on mothers' interactions with their pre-school aged children. Further, with a few notable exceptions (Gamby, 1982; Page, 1979), even the study of mother-

neonate interaction has been relatively neglected here. However, three studies now have examined mother-child interaction both across ethnic groups and at pre-school age level (Fergusson, Horwood, & Shannon, 1982; Lane, 1980; Thomas, 1978a).

Lane (1980), who videotaped Pakeha and immigrant Polynesian (Samoan and Cook Island) mother-child pairs during a structured task and play situation, showed that mothers' reported social stress was not related in a significant way to the balance of control in the mother-child interactions. In Lane's study (and unless otherwise stated in the studies reviewed below) paternal rather than maternal occupation was rated, and socio-economic status (SES) was measured on the Elley and Irving (1972, 1976) scale for the male labour force. Some ethnic and social-class differences in interaction were evident in Lane's subsidiary analyses. Specifically, high SES Pakeha mothers tended to direct the interaction less frequently, and to respond more positively to their children's elicitations, than low SES Pakeha, Samoan, and Cook Island mothers. There were no statistically significant group differences, however, in the children's initiation rates, and no major group differences were found in non-verbal communication. As Lane herself noted, child gender was not controlled, but the influence of child gender is an important consideration in mother-child interaction research.

Thomas' (1978a) earlier mother-child interaction study included Maori dyads, and therefore is particularly relevant to this review. During a structured teaching situation, each of 59 mothers was observed with her child, aged 3 to 5 years. Four groups were represented: higher SES Pakeha mothers, lower SES Pakeha mothers, lower SES Maori mothers, and Cook Island mothers. The Maori and Pakeha mothers were urban-dwelling New Zealanders, but the Cook Island sample was living on Rarotonga. Each mother-child pair was videotaped as the mother demonstrated and the child performed a ball-throwing, a bead-threading, and a block- or leaf-sorting task. Five non-verbal behaviours were rated. Frequency counts were made of the mother's smiling, the child's smiling, the mother's looking at the child's face, and the child's looking at the mother's face; and

in addition, the number of seconds that the child's attention was not on the task was timed.

One-way analyses of variance and subsequent *t* tests showed that the lower SES Pakeha mothers and children smiled less frequently than the mothers and children from the other three groups. The Cook Island children smiled more frequently than the Pakeha children. High SES Pakeha mothers looked at their children more often than low SES Pakeha and Maori mothers. Verbal behaviour frequencies were rated on a small subsample, and the Maori mothers used less verbal feedback than the Pakeha mothers from both SES groups. All the above results were statistically significant.

Thomas considered that the communication style of the Maori mother-child pairs reflected a pattern of change away from the Rarotongan group's style and toward that of the lower SES Pakeha pairs. However, this view was not supported by the apparent differences in smiling and verbal feedback between the lower SES Pakeha and Maori groups, which suggest that the Maori group had retained some emphasis on non-verbal communication. As Thomas (1978a) commented, the results were obtained from relatively small samples. It should be noted, then, that verbal feedback was coded for only eight Maori mothers all of whom had children who were enrolled in a compensatory pre-school project. Furthermore, the Pakeha pairs were drawn from both a playcentre in a middle-class suburb and a kindergarten in a working-class suburb. More high SES than low SES mothers therefore would have been involved in playcentre, where parent education and mothers' regular participation in early education and play could be more characteristic (McDonald, 1982; Meade, 1978).

One other study, a longitudinal investigation of children's development, has included some home-based observations of Pakeha, Maori, and Pacific Polynesian mothers' interactions with their 3-year-old children. Fergusson et al. (1982) measured maternal interaction on the scales for emotional responsiveness, punishment avoidance, and restrictiveness of the HOME inventory (Elardo, Bradley, & Caldwell, 1977). Mothers from two-Pakeha-parent families scored highest on emotional responsiveness, followed by those from one-Pakeha-parent,

both-Maori-parent, then both-Pacific Island-parent families. Mothers' scores on avoidance of restriction and punishment ranged along a comparable continuum, with mothers from two-Pakeha-parent families scoring highest, and those from two-Pacific Island-parent families scoring lowest. The above results were unadjusted for socio-economic and adverse family factors. Socio-economic and family-factor adjustments were made later, but on a complex combined factor score which included not only interaction scores but also assessments of child health and education and home conditions. The results were interpreted, in a deficit framework, as showing that the children with two Pakeha parents remained advantaged and those with two Maori or immigrant Polynesian parents remained disadvantaged.

There certainly remains scope for an observational study of Maori and Pakeha mothers and children drawn from more comparable early educational settings. In the New Zealand research, minimal reference has been made to the verbal and teaching content of interactions, and therefore, the need to study a more comprehensive range of physical and verbal teaching behaviours has also become apparent. Moreover, Metge (1976) has noted that Maori families from the professions have not been included in the child-rearing research, and Maori mothers who hold formal school or tertiary educational qualifications remain unrepresented in studies of mother-child interaction.

Despite some rather equivocal findings several North American observational studies, and the New Zealand self-report data, have suggested that child gender may covary with other variables or exert some influence on mother-child interaction (Cherry & Lewis, 1976; Fagot, 1974; Minton et al., 1971; Ritchie, 1979; Zegiob & Forehand, 1975). To date, observational studies of New Zealand mothers' interactions with their pre-school children have not isolated the variable of child gender, and therefore the relationship between child gender and maternal interactive behaviour also requires examining within the New Zealand context.

Finally, although the inclusion of educationally qualified Maori mothers would reduce sample imbalance and facilitate analysing the

relationships among maternal ethnicity, education level, and interactions, it seems important to point out that education may be perceived differently by some Maoris and Pakehas. Several writers have already shown that socio-economic status may have different meanings and implications for Maori and Pakeha families (Harker, 1978, 1980; McDonald, 1975; Ranby, 1979). Winiata (1967) has observed further that, for Maori women, education may have more complex connotations than mere examination passes. However, education, bilingualism, birth, and age have all been cited as important determinants of status among Maori women leaders (Winiata, 1967).

2.4.2 *Maternal interactions, children's competence and children's self-concepts.*

There has been only limited reference in the New Zealand literature to the relationship between mother-child interaction and children's assessed competence in the domains of cognition and language. Scope remains, therefore, for more systematic research in this field.

Wilton and Barbour (1978) used naturalistic home-based observations and the Interaction Techniques Scale (developed by White et al., 1973) to compare the experiences of New Zealand pre-school aged children described as high risk cases for cultural-familial retardation with those of a contrast group. Here, children who were categorized as high risk had an older sibling in a special remedial class, whereas the otherwise matched control group of children did not have a sibling in a special class. The mean SES level was low for both groups, but the mothers' ethnicity was not mentioned. Mothers of older (30- to 40-month-old) high-risk children less frequently used didactic teaching and encouragement, and more frequently failed at efforts to control their children's behaviour, than did mothers of the matched children from the control group. Small cell sizes limited generalizability, although the above findings were consistent with White et al.'s (1973) results for high-competence and low-competence samples.

Lane's (1980) study included an analysis of the relationship between children's contingency experience (the mother's positive acknowledgements in proportion to the child's elicitations) and children's competence at a structured task. A statistically significant relationship was found between the mothers' proportional acknowledgements and the children's on-task responses. This finding seems consistent with the previously reported positive connection between maternal responsiveness to children's requests for attention, and children's cognitive competence (White et al., 1978). Further, contingency experience appears conceptually a somewhat similar behaviour to maternal cooperation with a child's initiation. Lane's (1980) research could suggest, then, that mothers' cooperative responses and children's performance on some cognitive tasks are positively associated.

Silva and Fergusson (1976) studied 221 4-year-old children, as part of the Dunedin Multidisciplinary Child Development Study, and developed a path analytic model to describe the relationships among SES, maternal general mental ability, mothers' training in child development, mothers' authoritarian attitudes towards child rearing, children's experiences, and children's scores on the Stanford-Binet Intelligence Scale. The children's experiences during the first 4 years (scored from a check list of 30 possible experiences), maternal general mental ability, and mothers' training in child development were the variables intervening between SES and children's IQ which related most strongly to children's IQ scores. Although mothers' authoritarian attitudes showed negligible correlation with children's IQ, no observations were made of the mothers' directive behaviours, nor of the children's interactive experiences. More recently, a link between SES and mothers' authoritarianism has been reported (Silva, McGee, Thomas, & Williams, 1982). Authoritarian attitudes to child rearing and family life were measured, and authoritarian scores increased progressively along the high- to low-SES continuum.

Considerable research attention has been focused on achievement differences between Maori and Pakeha children. The detailed analysis of achievement and ability testing among Maori and Pakeha children

lies beyond the scope of this study, although these areas have been reviewed comprehensively elsewhere (Harker, 1980; St. George & St.George, 1975; St.George, 1977). Some recent studies and reviews have noted that major quantitative and qualitative differences have not been consistently evident in comparisons of young Maori and Pakeha children's cognitive development (Brooks, 1975; Harker, 1980; Klippel, 1975; A. St.George, 1974; St.George, 1977, 1980). At older age levels, though, Maori-Pakeha achievement differences are still clearly apparent (Reid & Gilmore, 1983). In relation to general methodological issues pertaining to comparative cognitive studies, St.George (1977) has pointed to the need to evaluate the appropriateness and equivalence of measurement scales used, by reporting relevant reliability and validity data separately for Maori and Pakeha samples.

Barrett (1975) has demonstrated already that testing conditions may influence young Maori children's test performance. Maori children, both at 5 years and at 10 years of age, performed lower on the Peabody Picture Vocabulary Test in an interpersonally cool testing situation than in either a standard or a play testing condition, and this result was statistically significant. The performance of matched samples of Pakeha children was not depressed, however, by the cool condition. Although Maori children did perform similarly during the play and standard test conditions, their depressed scores in the cool condition suggest that avoiding an impersonal approach and establishing a rapport may be particularly relevant when testing young Maori children.

In addition there has been some emphasis on the usefulness of observational measures for assessing pre-school aged children within or across ethnic groups, and Smith (1982) has introduced this argument into the New Zealand context. The development of observational measures to assess young children socially and emotionally has been advocated by some North American researchers (Combs, Soper, & Courson, 1963; Walker, 1973).

To date however, no New Zealand study has investigated the relationships between maternal interaction and children's language development or their self-concepts. Further, the association between pre-school aged children's self-esteem and their assessed cognitive and language performance has not been examined here. The one large-scale study of Maori and Pakeha children's self-concepts that has been conducted was among secondary school pupils (Ranby, 1979), and another self-concept of ability study is in progress among Maori and Pakeha children at intermediate schools (Chapman, 1983).

Ranby (1979) measured the self-concepts of 2,762 Pakeha and 2,617 Maori 13- to 17-year-old pupils, using a modified 20-question Coopersmith Self-Esteem Inventory and a semantic differential inventory. Pakeha pupils' mean combined scores were reported as being statistically significantly higher than Maori pupils' mean combined scores. Scores of pupils with one Maori and one Pakeha parent lay between the scores of pupils with two Maori or two Pakeha parents. Among the pupils of mixed parentage, those with Maori mothers were more similar to those with two Maori parents, but pupils with Maori fathers had scores more similar to those with two Pakeha parents. The latter findings were considered somewhat congruent with studies supporting the influence of the mother in self-concept development. Ranby reported that the reliability of both self-concept measures was adequate, and the concurrent validity was moderate, for both Maori and Pakeha samples. However, reliability and validity evidence was consistently lower for the Maori sample.

As Ranby had noted, although the Maori and the Pakeha pupils' responses may have reflected accurate self-evaulations, the Maori binary concepts *whakaiti* (debasing) and *whakahiihii* (conceited) were relevant considerations. Citing Metge (1976), Ranby had observed that Maori pupils might reject some positive responses as arrogant, and make more negative responses as a manifestation of *whakaiti*, an admired tendency not to push oneself forward.

The Maori pupils' combined mean scores did appear lower than those of the Pakeha pupils after age, SES, family size, residence, school

class, and class-for-age were controlled. Maori pupils were rated lower in academic status (measured in terms of teacher rating) than Pakeha pupils. A positive relationship was reported between both Maori and Pakeha pupils' self-concepts and their academic status.

In a previous study, Codd and Stewart (1975) had found Maori-Pakeha differences in adolescent girls' judgements of the relative importance of scholastic success and peer group popularity. Maori and Pakeha girls differed also on the personal characteristics they judged necessary for peer-group popularity. Somewhat similarly, Ranby (1979) indicated that Maori and Pakeha pupils placed a different degree of value on some personal characteristics which were dimensions of self-concept. Maori pupils, for example, scored lower than Pakeha pupils on the clever-dumb valuable-useless self-concept items, but they also ranked the attributes "clever" and "valuable" less highly than did the Pakeha pupils.

Ranby's (1979) study therefore provided a comprehensive analysis of Maori and Pakeha secondary-school aged pupils' self-concepts. The results were interpreted within a Maori cultural context, and two important points were made. First, Maori children could be inclined to respond modestly on some self-concept items. Second, some dimensions of measured self-concept could be more relevant to Pakeha value systems than to Maori value systems.

However, Ranby's methods have been reappraised in a recent paper by Chapman (1983). Chapman questioned Ranby's (1979) procedure of collapsing scores into self-concept levels, and concluded that the Maori-Pakeha differences in self-concept may have been small or unimportant. As Chapman also noted, Ranby's positive correlations between self-concept and academic status appeared too low to support the link between self-esteem and academic status (r's = .11 or less). Chapman's (1983) own study demonstrated that, when actual achievement level was controlled for, no major, meaningful differences were apparent between the scores of 64 Maori and 61 Pakeha Form 1 pupils on self-perception of ability, achievement expectation, and academic locus of control measures.

Thus, few or no important quantitative differences have been found recently in the performance of young Maori and Pakeha children on measures assessing cognition. Furthermore, Chapman's recent scrutiny of the New Zealand self-concept research has suggested that there are also no substantial differences in the academic self-concept scores of older Maori and Pakeha children when their achievement levels are matched.

In summary, the international research has already demonstrated that mother-child interaction is an important phenomenon, probably influenced to some degree by maternal education level, and associated in turn with children's cognitive and language development. In the New Zealand context however, there have been no data reporting relating interactions, self-concept, and cognitive and language assessments among Maori and Pakeha mother-child pairs. Here, much has been asserted about the differences between Maori and Pakeha children's home environments, and the research has shown some Maori-Pakeha variations in child rearing and mother-child interaction. However, such studies have not controlled maternal education level. The question remains then, whether some differences in interactive behaviour and child-rearing practices are related to mothers' education level and not to their ethnic group membership.

Chapter 3

RESEARCH PROPOSALS

Overview: This brief chapter outlines the 11 research proposals derived from the theory and empirical work reviewed in Chapter 2. The study was designed to examine the 11 research proposals presented below.

Both Metge and Kinloch's (1978) informal observations and Thomas' (1978a) empirical data indicated that, in within-group interactions, Maoris and Pakehas are likely to place a different emphasis on physical interaction. Therefore, it was proposed that, during spontaneous play at playcentre sessions,

1. *Maori mothers will show more physical interactions with their children than Pakeha mothers.*

Similarly, Metge and Kinloch (1978) and Thomas (1978a) observed quantitative differences in Maoris' and Pakehas' verbal interactions. In line with these findings, it was predicted that

2. *Pakeha mothers will interact verbally with their children more frequently than Maori mothers.*

Laosa (1978, 1980b) has demonstrated, however, that education level may exert a stronger influence than ethnicity on mothers' teaching behaviour. Holding parents' education levels constant also has moderated ethnic differences in situations such as mother-child interaction during free play (Baldwin & Baldwin, 1973). The above findings point to the importance of examining the relationships among maternal ethnicity, education, and interactive behaviour. It appeared reasonable to suggest that

3. *Maori and Pakeha mothers' education will influence their interactions with their children.*

Further, several studies reviewed in Chapter 2 also described a relationship between child rearing and child gender (Cherry & Lewis, 1976; Fagot, 1974; Minton et al., 1971; Ritchie, 1979). In addition then, it was proposed that

4. *The child's sex will influence maternal interactive behaviour.*

Numerous studies reviewed previously demonstrated strong relationships between aspects of mothers' interactions and their young children's cognitive skills assessed on Piagetian measures or by intelligence tests (e.g. Adjei, 1977; Clarke-Stewart, 1977; Hatano et al., 1980; Kirk, 1977; Laosa, in press; Radin, 1971; White et al., 1973). In accordance with the above international findings, then, the implication was that

5. *There will be a relationship between Maori and Pakeha mothers' interactive behaviour and their children's cognitive performance.*

Similarly, the research has shown a strong, positive relationship between mothers' more complex and less imperative language styles and children's more advanced language development (Clarke-Stewart, 1977; Masur & Gleason, 1980; Newport et al., 1977; Tannock, 1980). Therefore, it was expected that

6. *There will be a relationship between Maori and Pakeha mothers' interactive behaviour and their children's language assessments.*

Some studies have concluded that parent-child relationships also may influence children's self-esteem (Coopersmith, 1967; Flynn, 1979). Despite the general scarcity of empirical data relating observed maternal interactions to young children's self-esteem the above supposition, and McAdoo and McAdoo's (1979) recent findings, suggested that

7. *Mothers' physical interactions will relate to their children's assessed self-concepts.*

However, the lack of data other than the equivocal findings of McAdoo and McAdoo (1979) implied that

8. *There will be no relationship between mothers' verbal interactions and their children's self-concepts.*

The strength of the positive relationship found between pre-school aged children's self-concepts and their concurrent cognitive and language assessments has varied among black and white subsamples (Bridgeman & Shipman, 1978; McAdoo & McAdoo, 1979). In New Zealand, no relevant data have been reported at the pre-school age level, and correlations between Maori and Pakeha adolescents' self-concept scores and their academic status were weak but positive (Ranby, 1979). Nevertheless, on the basis of the findings among some pre-school subsamples in the U.S., it appeared justifiable to propose that

9. *Maori and Pakeha 3-year-old children's self-concepts will relate positively to their cognitive performance.*

At the same time, in view of some of the above research results, it was also considered possible that

10. *Maori and Pakeha children's self-concept scores will relate positively to their language assessments.*

Finally, Winiata (1967) mentioned that education and bilingualism have been associated with Maori women's higher status within the Maori community. Similarly, Metge (1976) and Ranby (1979) have identified a relationship between *mana* (influence or spiritual power) in Maori society and both birth (in terms of senior descent) and bilingual oracy. Metge (1976) has also described the *marae* (Maori meeting house) as a place where Maoris can have natural standing as the organizers and hosts. On the basis of these perspectives, then, it seemed likely that not only Maori mothers' education but also their bilingualism and involvement in Maori cultural activities could be related to their own behaviour or to aspects of their children's development. Therefore it was suggested that

11. *Maori mothers' cultural participation will be related to their observed behaviours and to the child assessment variables.*

Chapter 4

METHOD

Overview: This chapter describes the sample and the methodology employed to investigate the set of proposals outlined in Chapter 3. The selection and characteristics of the mother-child dyads are discussed in detail. Observational and testing instruments are examined and evaluated. The playcentre-based data collection procedures are described, and the data analysis plan is outlined.

4.1 *Definition of terms:*

Ethnic Variable

Maori: The variable *Maori* was a self-descriptive category of ethnic identification, applied to subjects who identified as Maori.

Pakeha: This term defined subjects whose self-description showed predominantly New Zealand European descent or identification.

Defining subjects' ethnicity according to their own perceptions when selecting Maori and Pakeha samples followed the recommendations of McDonald (1973, 1976b) and Pool (1963). This procedure was likely to eliminate the inaccuracies or possible ethnocentrism of the researcher's or playcentre leaders' definitions.

Education-Level Variable

Two education-level categories were developed to classify maternal education.

Higher Education: This category described mothers who had accomplished some form of secondary school or higher qualifications. The minimum qualification here was full School Certificate

(requiring a pass in four subjects including English). Mothers included in this group sometimes held higher school attainments also, and occasionally had completed tertiary qualifications.

Lower Education: The lower education category applied to mothers with secondary schooling, ranging in duration from 1 to 5 years, but with no or only partial School Certificate qualification (i.e. not meeting the full School Certificate requirement).

Sampling limitations prevented the further subdivision of the mothers into a secondary-qualified group, as distinct from a tertiary-educated group. The above definition of higher education also reflected sampling realities. Relatively few Pakeha mothers and very few Maori mothers were highly qualified in terms of the graduated qualifications specified on a 1 to 10 scale (see Appendix D.1). Consequently, the minimum qualifications of University Entrance then Sixth Form Certificate, which had been proposed, later were modified to full School Certificate.

4.2 *Subjects:*

4.2.1 *Sampling design and selection.*

The subjects were 75 mother-child pairs who attended recognized playcentres that were ethnically mixed. The dyads were classified into two maternal ethnic groups (Maori, Pakeha) and two maternal education levels (higher, lower) with male and female children.

Mothers were included in the sample if they consented to their own and their children's involvement, if they attended playcentre regularly with their own children, if they identified as Maori and/or Pakeha, and if they had been educated in New Zealand. Children aged 36 to 47 months were included if they had no diagnosed developmental anomolies of a physical of psychological nature. This criterion was specified because a substantial body of research evidence has shown that characteristic and different patterns of interaction occur among mothers and atypical children, when compared with mothers and

normal children (e.g. Buium, Rynders, & Turnure, 1974; Forehand, King, Peed, & Yoder, 1975; Kogan, Wimberger, & Bobbitt, 1969; Mitchell, 1977; Wulbert, Inglis, Kriegsmann, & Mills, 1975). All children were singletons, and twins were to be excluded from the study. Lytton, Conway, and Sauve's (1976) assertion that twinship is a salient variable, determining the quality and quantity of maternal interactions, supported this decision.

Contact was maintained with the supervisors and liaison officers of 53 playcentres in the greater Wellington region for six school terms to obtain updated sampling information. Playcentres with Pakeha mothers and children, and also one or more Maori mothers attending with a 3-year-old child, were visited. The intention here was to draw the samples from an essentially comparable playcentre population, and to include all available Maori (higher education-level) pairs. Each ethnically mixed playcentre was sampled systematically so that all eligible mothers of 3-year-old children were interviewed.

To examine the influence of maternal ethnicity and education and child gender on maternal interactive behaviour, the sampling design was planned to include equal numbers of subjects from each of eight cells, yielding a total sample of 80 dyads. The eight cells were: Maori (higher education) mothers and sons, Maori (higher education) mothers and daughters, Maori (lower education) mothers and sons, Maori (lower education) mothers and daughters, and the equivalent four cells for the Pakeha pairs.

Locating sufficient Maori (higher education) pairs proved extremely difficult, however, and within this subgroup a marked shortage of mother-son pairs fulfilling the above criteria became evident. Therefore, systematic cyclical sampling was continued, and several centres visited in the early stages of the study were revisited during the final stages of the fieldwork. To obtain a minimally satisfactory mother-son sample, sampling inquiries also were extended to playcentres from the outlying areas of the Wellington Association, throughout the Manawatu, Wairarapa, and Wanganui regions, and later to Hawkes Bay early childhood education centres. Very few

mother-son pairs were located in the above regions, and further difficulties were encountered. For example, after one eligible mother-son pair at a distant city consented to be involved, the researcher resided there for almost two weeks. Unexpected critical illness in the subjects' family and then closure of the playgroup intervened, however, preventing the inclusion of that pair in the sample. In total, then, 74 mother-child dyads from playcentres in the greater Wellington region participated after systematic inclusion of each eligible pair, and one further Maori (higher education) mother-son pair was added after the extensive selective stratified sampling procedure described above.

Throughout the data collection phase, no eligible Pakeha mother refused to participate. Although the researcher was a Pakeha, only two refusals were received. Specifically, one Maori mother (lower education) of a daughter and one Maori mother (higher education) of a son, both of whom were solo parents, described themselves as "too shy".

4.2.2 *Sample characteristics.*

The sample included subjects from 18 playcentres. In Table 4.1 the sample composition is set out in terms of the three selection variables, namely, the mother's ethnicity and education level and the child's gender.

Subjects' ethnic identification was obtained from the mothers' responses to interview questions (see Appendix A.2). The standard question addressed to each mother was: "Would you describe yourself as a Maori, a Pakeha (or New Zealand European) or what?". Including "or what" was modelled on McDonald's (1976a) interview question, and provided appropriate recognition of the complexities of possible responses (Crothers, 1977; McDonald, 1976b). Mothers identifying as "Maori" or "Maori and Pakeha" were included in the Maori sample. Those who described themselves as "Pakeha" (or "a kiwi" or "just a New Zealander") or "mostly Pakeha" were assigned to the Pakeha sample. Including the three mothers who identified as "both" in the Maori sample was in line with McDonald's (1976a) procedure with "Maori and Pakeha" children, and with her comment that the "Maori

Table 4.1

Sample Composition: Number of Mother-Child Pairs in the Maternal Ethnic, Maternal Education-Level, and Child Gender Groups

Maternal Ethnic Group	Child Gender Group		
	Mother-son	Mother-daughter	Combined
	Higher Maternal Education-Level		
Maori	5	8	13
Pakeha	10	11	21
	Lower Maternal Education-Level		
Maori	10	11	21
Pakeha	10	10	20
Combined	35	40	75

and Pakeha" category does not presuppose a separate social group (McDonald, 1976b). Details of the ethnic identity of the children and fathers in the Maori and Pakeha samples are presented in Appendix C, and here some complexities are apparent. Seven mothers from the Maori sample described their children as primarily Pakeha, whereas only one Pakeha mother identified her child as Maori and Pakeha. Some Maori mothers had husbands from other Polynesian groups (Samoan, Rarotongan), and several Pakeha mothers specified their husbands' origins as European (other than Pakeha).

Maternal and paternal education were coded initially on a 1 (university graduate) to 10 (one to two years' secondary schooling) scale (see Appendix D.1). Subsequently, maternal education level was recoded to the higher and lower groups defined previously (section 4.1).

Table 4.2

Demographic Variable Means, Standard Deviations, and Medians

Variable [a]	*M*	*SD*	*Mdn*
Maternal education	6.71	2.92	7.20
Maternal occupation	3.71	1.16	3.69
Playcentre courses	2.91	1.25	3.59
Maternal age in years	28.77	4.56	28.25
Child's age in months	41.60	3.19	41.27
Paternal education	6.55	2.98	7.60
Paternal occupation	3.58	1.22	3.56
Child's birth order	2.08	1.09	1.92
Number of children in the family	2.56	1.03	2.35

Note: Maternal and child variables n = 75, paternal variables n = 64.

[a] Variable definitions are presented in Appendix D.

Demographic data are summarized in Table 4.2. The mothers' ages ranged from 21 to 44 years. For both ethnic groups, the number of children in the family ranged from one to six. Paternal and maternal occupations were coded on the indices for the male and female labour forces (Elley & Irving, 1976; Irving & Elley, 1977). Occupational data are set out in Appendix C, and some updated information also is provided.

Each mother was the primary caretaker of her own child. Many of the 18 Pakeha mothers and six Maori mothers who were employed part-time, and the one Maori mother in current full-time employment, worked at night. Eight Maori mothers and three Pakeha mothers were

solo parents. All dyads had attended a playcentre or playgroup for a minimum period of 3 months. Recording the official enrolled duration of pre-school experience was judged relatively meaningless, though, as many children had attended informally with their mothers since early infancy.

Demographic data means were compared across the ethnic and education-level groups, using *t* tests. Although the samples have included Maori and Pakeha mothers of comparable educational levels, families with Maori mothers were of significantly lower socio-economic status than families with Pakeha mothers. The child's birth order and the number of children in the family did not differ significantly, however, across ethnic or educational groups (Appendix C). Therefore, the ethnic and educational analyses were not likely to be confounded by group differences in children's birth order or family size.

Maori cultural participation variables were coded from the Maori mothers' interview data. The three variables used in subsequent analyses were: attendance at functions on the *marae* (*marae* in this context refers to both the courtyard in front of a Maori meeting house and the adjacent complex of buildings), Maori cultural club involvement, and Maori language fluency. A total of 25 Maori mothers had migrated from their home areas in the North Island to the city. Of these, 10 reported continued involvement on the home *marae*. Maori cultural variables are reported separately for the higher and lower education groups in Appendix C.

In summary then, the sample comprised 34 self-described Maori and 41 self-described Pakeha mothers who were assigned to higher and lower education groups, and their normally developing 3-year-old sons and daughters. The participants were drawn entirely from playcentres and predominantly from urban areas.

4.3 *Instruments:*

4.3.1 *Observational materials, maternal interactive behaviour measure.*

Each mother-child pair's interactive behaviour was recorded using a battery-operated videotape recorder and a portable black-and-white video camera. Later, the tapes were played back on a video monitor, and a microphone and an audiodubbing procedure were used to delimit the sections of videotape to be rated. When coding the videotaped data, Zegiob and Forehand's (1975) observational categories for maternal interactive behaviour were employed (see Appendix B.1).

The use of video equipment was justifiable for several reasons. Zegiob and Forehand (1975) originally used the maternal interactive behaviour instrument in a laboratory setting with two, and often three, concealed raters observing behaviours. In the present naturalistic study, however, observer conspicuousness and considerable confusion may have resulted if three observers had tried to follow each mother-child pair as they moved from one activity to another in a confined space. Here, the use of one observer and the repeated replay of the videotaped observations provided a practical alternative. Zegiob and Forehand's measure comprised two levels of recording, both frequencies and durations, and video recordings facilitated the rating of these two levels. Hartup (1979) similarly has supported the usefulness of video equipment to provide the simultaneous recording of behaviour at different levels. Furthermore, the pilot study trialling procedures showed that 3-year-old children seemed undisturbed by the camera's presence. Lytton (1973) also considered that video recording was an age-appropriate observational procedure to use with 2- and 3-year-old children interacting with their mothers. Several writers have supported both the validity of videotaped records and the reliability of ratings obtained from them (Longabaugh, 1980; Menzel, 1979; Paulson, 1972). Therefore, video equipment was deemed appropriate in view of the maternal interactive behaviour measure selected, the ages of the children observed, and the above research which has evaluated favourably the effectiveness of videotaped observational techniques.

In 1975 Zegiob and Forehand used and published a maternal interactive behaviour measure which comprised 16 behaviour categories. These categories corresponded, in turn, to some degree with those developed and validated by Bishop (1951), Merrill (1946), and Moustakas et al. (1956). Zegiob and Forehand's (1975) measure, then, is a condensed and modified form of the latter authors' code for observing mother-child behaviour. Details of Zegiob and Forehand's category definitions are presented in Appendix B.1, and the scoring procedures are outlined below.

The physical aspects of interaction are the focus of the first three categories Physical Interaction, Out of Contact, and Attentive Observation, and to some extent of the fourth category Playing Interactively. These first four categories are timed and are scored with an ongoing time criterion of 5 seconds. Each time a behaviour is observed for a duration of 5 seconds, one tally is recorded.

Cooperation and Non-cooperation, the fifth and sixth categories, require an initial observation of the child and a timed assessment of the mother's response. These two categories emphasize the child's role as an initiator. To score one tally for Cooperation it is necessary to observe the mother comply, within 5 seconds, with her child's initiation. The absence of a positive reponse within 5 seconds is scored as Non-cooperation. Both physical and verbal maternal responses can be coded.

The other 10 categories are scored each time the specified behaviour is observed. Frequency categories with a verbal component include Attending, Questions, Criticisms, Direct Commands, Indirect Commands, and Teaching. Discipline and Helping are physical in emphasis, and Rewards and Threats can be administered verbally or non-verbally.

The choice of Zegiob and Forehand's (1975) instrument for this study was influenced by its relative objectivity, its appropriateness for use during spontaneous play in a playcentre setting, and its relevance to the stated research proposals. Non-verbal categories

were relevant when observing Maori and Pakeha dyads, and specific verbal categories were required to describe the relationships between mothers' verbal interactions and their children's cognitive and language development. The 16 categories described above demonstrate a relatively comprehensive inclusion of these necessary verbal and non-verbal components. Moustakas et al. (1956) previously had cited comprehensiveness, relevance, and meaningfulness, and also ease of identification, as their criteria for category selection.

Zegiob and Forehand (1975) calculated inter-rater reliabilities, both on the timed and on the frequency categories, for 20% of their mother-child pairs. During both the free play and the command periods, inter-observer reliabilities were high. Percentages of agreement ranged from 80 to 100, and the majority were 90 or higher. Lipinski and Nelson (1974) have described the usual method for calculating inter-rater reliability as dividing the smaller frequency (or shorter duration) count of one observer by the larger frequency (or longer duration) count of the second observer.

In this study, inter-observer reliability data were obtained on a random stratified sample (stratified on the basis of maternal ethnic, education-level, and child gender group) of just over 25% of the mother-child pairs (n = 19). When the above percentage method was used, the mean percentages of agreement ranged from 72.75 to 100 (see Appendix C for details). Minor differences between these percentages and those reported by Zegiob and Forehand could be attributed to the shift from a laboratory to a naturalistic setting and to the change from simultaneous to separate rating by the independent observer.

Johnson and Bolstad (1973) have contended, however, that where precise discrimination of both agreements and disagreements is not possible, observer agreement can be analysed more accurately by correlational methods. When using Zegiob and Forehand's measure, agreement and disagreement could not have been specified on each occurrence of each behaviour without inappropriate segmentation of the taped behavioural data. In accordance with the recommendations

of Hartmann (1977) and Johnson and Bolstad (1973, 1975) it appeared more accurate, therefore, to report inter-observer reliabilities as correlations. Pearson correlation coefficients ranged from .90 to .99 on the timed categories, and from .84 to 1.00 on the frequency categories. Among the Maori subsample the coefficients ranged from .77 to 1.00, and the range for the Pakeha subsample was .62 to 1.00 (see Appendix C). To date only one other published study, by Borduin and Henggeler (1981), has reported using some of Zegiob and Forehand's (1975) categories. Borduin and Henggeler also calculated their inter-observer reliabilities as correlations, and their Pearson correlation coefficients were comparable to those detailed above for the combined sample.

4.3.2 *The Brown IDS Self-Concept Referents Test.*

The Brown IDS Self-Concept Referents Test was selected as one of the few available self-concept instruments suitable for use with 3-year-old children. This measure was developed by Brown in 1966 to assess young children's perceptions of their own ability, appearance, emotions, and preferences. The test uses a self-report method and is administered individually. Each child is photographed, full length, against a standard background. The child views the developed photograph, verifies his or her own identity, and responds to a set of bipolar questions. The first item states, for example, "Is (child's name) (point to picture) happy ____ or is he (she) sad ____? Other ____". In this study, the 15-item ETS version was used. As in Shipman and Gilbert's (1972) study with the ETS version, only the first 14 items were used in the analyses so that the content of the original test was retained. The excluded item 15 concerns the child's perception of whether he or she has a lot of friends.

Three large-scale studies in the U.S.A. have used the test with children enrolled in early educational programmes (Walker, 1973). As described earlier, another smaller study has related 3- to 5-year-old children's self-esteem, measured on the Brown, to school readiness (Flynn, 1975). Shipman and Gilbert (1972) have reported norms for 2866 children's unadjusted Brown score (total positive responses) and adjusted Brown score (percentage of positive responses among responses

clearly scorable as positive or negative). Year 1 subsample (children aged 42 to 59 months) had an adjusted mean score of 82.0% (n = 1371). The adjusted mean score for the youngest subgroup of year 1 (aged 42 to 44 months) was 76.5% (n = 72). Compared with older children, younger pre-school children tend to have lower scores and tend to make more ambiguous responses (Shipman & Gilbert, 1972; Walker, 1973).

Walker (1973) reported that scores on the Brown correlated in the .30's with Peabody Picture Vocabulary Test and Pre-school Inventory scores, but lower correlations were found between scores on the Brown and on some other cognitive measures. Emrick (1972) related unadjusted Brown scores with scores on the Faces Scale (which measures self-concept attitudes). Correlation coefficients were .23 at kindergarten level and .26 at first-grade entrant level (n = 531).

Reported test-retest coefficients were .55 (n = 632) with a 2- to 3-week test-retest interval (Emrick, 1972) and .74 (middle-class white children, n = 31) with a 1-week test-retest interval (Flynn, 1979). Adequate internal consistency was reported in the three large-scale studies, with the values ranging from .72 to .82 (Walker, 1973).

In this study a stratified sample of 20% of the 3-year-old children was retested. Children of Maori and of Pakeha higher and lower education-group mothers were included, and the test-retest interval was 1 week. On the unadjusted score the test-retest coefficient was .73, and the coefficient for the adjusted Brown score was .69 (n = 15). When both Pearson correlation coefficients and Spearman rank order correlations were computed, test-retest correlations were low and non-significant for the Maori subsample, but high and statistically significant for the Pakeha subsample (see Appendix C). Unlike those of the Pakeha children, then, the Brown scores of the Maori children appear unstable. However, considering the particularly restricted range and the limited linear spread of the scores among the retested Maori subsample, and the very small number of cases involved, the above retest results for the Maori children also may

reflect a statistical artifact.

More comprehensive details of norms and validity have been reported on the Brown IDS Self-Concept Referents Test than on the Thomas Self-Concept Values Test, the other pre-school measure of self-esteem that uses the child's photograph (Walker, 1973). The use of the child's own photograph was judged an appropriate method to cater for the ethnically mixed origins of some children. Therefore, the Brown also was chosen in preference to methods which require the child to respond to a series of pictures or drawings. Pictorial self-concept measures have been used with Afro-American and Anglo-American children, but these measures appear more suited to portraying children from either one or other, rather than both, ethnic groups. Further, as such instruments tend to contain 40 to 50 items, they were considered too long for the attention span of 3-year-old children at playcentre (see e.g. Ozehosky & Clark, 1971; Samuels & Griffore, 1979; Walker, 1973).

4.3.3 *The Keele Pre-school Assessment Guide.*

To assess aspects of the children's cognitive, language, physical, and social development, this instrument was administered during play-centre sessions. The Keele Pre-school Assessment Guide (KPAG) was published in 1979 by Tyler at the University of Keele. Tyler developed the KPAG to enable English nursery school staff to record children's progress towards achieving skills, and to determine the specific skills and abilities of selected children. Items in the KPAG have been drawn from psychological tests of ability and developmental charts, from the developmental and educational research of Cazden, Kamii, Piaget, and Inhelder, and from the nursery school observations of Tyler and Foy (1979).

The KPAG is divided into two sections. Part 1 provides scales for rating social behaviours. Part 11 assesses cognitive, social, physical, and English language skills, which are itemized in ascending order of difficulty. For each item, detailed assessment criteria are stated (Appendix B.4). Assessment requires observation of each child during play sessions and participation in play using

additional common objects, blocks, and shapes. Cognition and language scores were of particular interest here and range from 0 to 30, and 0 to 20, respectively.

An inspection of both the cognition and the language items provided logical support for the content validity of these sections. For example, the children were exposed regularly to the puzzles assessed on some cognition items, and to rhymes, which were included in the language section. The socialization section did contain two items of questionable relevance in ethnically mixed playcentres: understanding winning and losing, and ability to use a knife, fork, and spoon properly. However, unlike the centrally important KPAG-Cognition and KPAG-Language variables, the KPAG-Socialization and KPAG-Physical Skills scores were not used in the major analyses of this study, and in Chapter 5, preliminary analyses using the latter scores are simply summarized in tabular form.

Test-retest data were obtained here on the KPAG-Cognition and KPAG-Language scores. A stratified sample of 20% of the children was reassessed within 2 weeks of the initial evaluations, and the test-retest coefficients were .96 on both scores (n = 15). Separate test-retest data for the Maori and Pakeha subsamples showed that the KPAG-Cognition and KPAG-Language scores were significantly stable for both ethnic groups (Appendix C).

In England, an initial study using the KPAG in 16 nursery schools assessed 145 children aged 3 to 5 years. On the basis of that preliminary study, Tyler and Foy (1979) reported the percentages of 4-year-old children who attained some specific items. Further work on the KPAG is in progress at the University of Keele.

Flexible administration, observation of the child, and the use of familiar materials and situations are all recommended in the KPAG manual. The observational emphasis, and the use of playcentre equipment for some items, meant that assessments could be initiated unobtrusively within the spontaneous play sessions, with the additional materials introduced simply as an alternative play activity. Compared

with more formally administered structured ability tests, then, the KPAG seemed relevant for use in playcentres and appropriate for young Maori and Pakeha children.

4.4 *Procedure:*

4.4.1 *The pilot study.*

After testing the video equipment at one playcentre in different noise level and weather conditions, a pilot study was initiated. Three Maori and four Pakeha mothers were interviewed and observed at two playcentres. Thereafter, minor modifications were made to the interview schedule. Boys and girls were included in both ethnic samples. Pakeha mothers from both educational levels were included, but no eligible higher education Maori mothers were located at the two centres.

Within a naturalistic observational context, the feasibility of structuring time and situations was assessed. A first procedure of observing each dyad in three standard situations for 5 minutes on several separate days was evaluated. The three situations proposed for observation were spontaneous "free" play, story reading, and morning tea. Only during the less specific situation of spontaneous play, however, was interaction observed to occur naturally between all seven mother-child pairs. Moreover, as the recorded spontaneous interaction for two pairs totalled less than 4 minutes over 2 days (or 6 hours' observation time), the need to specify a minimum time base was apparent. A second approach considered involved structuring the spontaneous play activity in which each pair engaged. The intention here was to ensure precise comparability of the task situations across pairs, but it was soon evident that asking the mother to stay with her child at the puzzle table and the active play equipment did not comply with several mothers' and children's usual choices of interactive situations.

Therefore, each of the seven pairs' interactions were videotaped during play activities that were both spontaneous and unstructured. The tapes were rated using Zegiob and Forehand's (1975) coding system. All episodes of interactive behaviour were viewed also by a reliability

rater who had been familiarized with Zegiob and Forehand's categories, and complex or ambiguous coding decisions were discussed. Separation of the timed and frequency categories was deemed important to facilitate accurate ratings.

The Brown IDS Self-Concept Referents Test and the Keele Pre-school Assessment Guide were administered to six children after the videotaped observations were completed and after a rapport had been established. Although the Brown test questions were compiled in the language of 4-year-old children, most of the 3-year-old children had no difficulty in responding to the test items. Some children gave clear, non-verbal responses to each option. The KPAG appeared appropriate for use in a playcentre setting, and both the Maori and the Pakeha children responded favourably to the familiar objects used (Appendix B.5).

In view of the sampling situation of the pilot study, extensive cyclical sampling was planned to locate educationally qualified Maori mothers. It was judged necessary to ask specifically that each participating mother stay with her own child, in order to obtain sufficient observational data to address the research questions, and in addition, an observational time base of 15 minutes was proposed for the main study. Videotaped observations would be made, then, in modified naturalistic conditions, or with "tempered naturalness" (Weick, 1968, p. 367). However, only the above essential modifications were to be made, and the child's spontaneously selected play activities were not structured. Further, although the mothers were aware that they would be filmed, to increase spontaneity, no specific appointments were to be made to obtain the observational data. Therefore, the intended observational approach could be described as naturalistic with minor modifications, and also as "known" but "unscheduled" (Fox, 1969).

4.4.2 *Data collection procedures.*

In the main study, each mother was provided with a written statement outlining the procedures involved and confirming the confidentiality of the videotapes (see Appendix A.1). All subjects

were informed that the purpose of the study was to film and observe "3-year-old children with their mothers during play sessions", and that aspects of development and learning would be studied by photographing the children and working with them individually.

The mothers were interviewed in an informal manner to confirm the pairs' eligibility for the sample and to obtain background biographical data. The right to refrain from responding to a question and the confidentiality of the videotapes were explained. None of the mothers objected to answering any of the questions. Paternal information was required only of mothers still in residence with the child's father, and this exemption procedure was justified because some solo mothers did express concern that they could have been questioned about the child's father. Each Pakeha mothers' interview was completed in 10 to 15 minutes. Additional items pertaining to cultural participation and kinship were included for mothers who identified as Maori, and these questions sometimes stimulated considerably more detailed self-examination or explanation (Appendix A.3).

On an unscheduled, unspecified day, each eligible mother was asked to "stay with (her own child's name) in whatever he (she) is doing". A videotape was made of the dyad's interactive episodes until a total minimum record of 15 minutes' duration had been filmed.

Several procedures were adopted to minimize the likely effects on the subjects of an observer using portable video equipment. A minimum of two visits to each playcentre generally preceded recording procedures, and prior to being filmed, the mothers and children had seen the observer with the video equipment at the centre. In addition to affirming the confidentiality of the tapes, the researcher stressed a special interest in 3-year-old children and focused on the role of the child. In related naturalistic and structured studies of mother-child interaction, de-emphasizing the maternal role has been considered an effective procedure to reduce distortion (Lane, 1980; Lytton, 1973).

Observer attributes including age, sex, race, socio-economic status, and professional status have been reported as influences on reactive effects (Johnson & Bolstad, 1973). In this study the observer was within the age range and of the same sex as the mothers. No advice or opinions about child rearing were given, and the researcher emphasized her concurrent identical role as a parent at another playcentre. Consideration was given to the contention that the observer's ethnicity influences reactive effects (Johnson & Bolstad, 1973; Rosenthal, 1966). If a Maori interviewer-observer had been assigned to the Maori sample, though, two observers would have been required at each of the ethnically mixed playcentres. This procedure was rejected as impractical because the fieldwork was extensive and because increasing the number of visiting observers also increases observer conspicuousness (House, 1978).

The ethical importance of obtaining consent, and the instructional set given to the mothers, had necessitated adopting the known observational condition (mothers knew they were being videotaped). However, using the unscheduled observational approach (where the dates and times of observation were not prearranged) probably did reduce reactive effects. Despite the disadvantage of increasing the duration of the data collection procedures, then, the unscheduled approach did have the distinct advantage of reducing the pairs' preparations for being observed.

Finally, mothers who wished to see the videotape were offered to view a playback. Steward and Steward (1973), who adopted a similar procedure, have contended that giving subjects the option of reviewing and accepting or rejecting the data reduces the aversive aspects of being observed.

All spontaneous play activities were included in the observations. The play activities and equipment were relatively standard at the 18 playcentres. Most mother-child pairs were observed in both outdoor and indoor conditions or in active and sedentary play. For each dyad, the activities filmed and the duration of each activity was recorded. Videotaped activites included: puzzles, playdough, collage,

carpentry, painting, construction with blocks, active indoor and outdoor play (on equipment which included climbing apparatus, slides, rockers, tricycles, or swings), water play, sand play, family corner play (dramatic play or dressing up), and drawing or cutting.

Story reading was excluded as many dyads did not read books together spontaneously, and story reading was the only solely "verbal stimulus" situation in evidence (Cazden, 1972; Hanlon, 1977). Most play activities listed above could be described in contrast as primarily non-verbal stimuli situations, and therefore the exclusion of story reading meant that the situations were more comparable across dyads. Periods spent in the bathroom and at morning tea also were excluded from videotaping. At morning tea time peer interaction normally predominated.

Filming proceeded continuously whenever an interactive episode occurred and the pair's faces were clearly visible. In the unusual instance that a child did become fixated on the camera or on the observer, the camera was shut off and redirected momentarily. Similarly if nearby crying or motor mowing raised the noise level markedly, impeding audio recording or verbal interaction, recording was suspended temporarily.

The duration of the interaction that followed the mothers' instructions to stay with their own children suggested that a 15-minute time base was a happy compromise. Several unstructured observational studies of mother-child interaction have reported comparable timed observational periods (Borduin & Henggeler, 1981; Cherry & Lewis, 1976; Reichle et al., 1976; Shatz, 1979). For three pairs participating in the present study, 2 days of observation were required to obtain a 15-minute observational record, but in all other cases videotaping was completed within a single observational day.

During an initial playback of the videotapes, the first 15 minutes of interactive episodes were delimited for subsequent coding, using an audiodubbing procedure. A partial transcript of the mother's verbal utterances and the child's requests was prepared to provide

examples of coding decisions. Zegiob and Forehand's frequency categories 7 to 16 were scored on the coding sheet during a second playback (see Appendix B.2). The timed categories 1 to 6 were rated with a stopwatch during a third playback. Where a child frequently uttered requests, to facilitate accuracy, categories 5 and 6 and then 1 to 4 were coded on two separate playback procedures.

A separate instrument was not used to code child behaviour. However, several child behaviours were embedded in the Zegiob and Forehand (1975) categories. Pilot study observations had shown that careful scrutiny of the child was required to determine whether a pair was Playing Interactively within the child's own conception of play, or whether the mother in fact was Helping her child. Whenever the categories Physical Contact or Playing Interactively were coded the child, as well as the mother, was engaged in those behaviours. A further child behaviour scored was the number of requests, questions, or demands directed from the child to the mother. In all instances where the mother ignored her child's request, within the next 5-second interval the child either terminated that episode of interaction, or repeated the request. As there were no cases of ongoing Non-cooperation with a request then, the child's initiation score was simply the sum of the two existing categories Cooperation and Non-cooperation.

At intervals throughout the main study data collection, inter-observer agreement checks were made. Inter-rater reliability was calculated on a stratified sample so that mothers from each ethnic, education-level, and child gender group were represented. Within each stratified cell, the videotapes were selected on a random basis by the second rater. This procedure, where the first observer remains unaware at all stages as to whether reliability checks are being made, has been described as an exceptionally rigorous form of reliability assessment (Johnson & Bolstad, 1973; Romanczyk, Kent, Diament, & O'Leary, 1973).

Two factors which have been shown to restrict bias in behavioural observations have been the use of a specific, well-defined coding

system, and of scientific, objective observers, particularly graduates rather than undergraduates (Johnson & Bolstad, 1973). Accordingly, the second observer trained for reliability rating had studied educational measurement at postgraduate level. The second observer rated each tape separately and independently and was uninformed about the mothers' education levels and ethnic self-descriptions. The inter-observer agreement percentages and correlations have been discussed (section 4.2.1) and presented in detail (Appendix C).

Economic considerations and the erratic attendance at this age level meant that, during the fieldwork, repeated unscheduled observational recordings of the dyads could not be made. Several unstructured, naturalistic parent-child interaction studies also have used one single observational session (e.g. Moerk, 1978; Noller, 1978). However, Gordon (1976) has demonstrated some empirical support for the consistency of maternal behaviour during free-play interactions. Particularly with their younger (5- to 6-year-old) children, mothers' behaviours remained significantly stable after a 1-week observational interval. Questions, directives, and describing statements were highly stable, and criticisms and praise were moderately stable. The above stable categories were comparable to several behaviours rated in the present study (Questions, Direct Commands, Indirect Commands, Teaching, Criticisms, and Rewards).

Several reports or reviews of classroom behaviour studies have shown further that, even when some behaviours have been relatively unstable, they have contributed substantially to achievement prediction equations (Johnson & Bolstad, 1973; Podmore, 1978; Sutton & Nicholls, 1977). The stability of behavioural categories has not necessarily been matched, then, by their psychological or educational importance, and Johnson and Bolstad (1973) have asserted that moderate instability or unknown stability is unlikely to diminish markedly the meaning of positive results.

When the dyad's videotaped observations were completed, child assessment procedures were initiated. The observer had remained

objective and uninvolved during the videotaping phase, to minimize conspicuousness. Later however, rapport was developed with the child. As suggested in the KPAG manual, observation of and participation in the child's play formed the basis of assessment on this measure. Materials developed for a KPAG kit, and introduced as a supplementary play activity, were necessary for assessment on some KPAG-Cognition items (see Appendix B.5). Language assessment was based on observations of the child conversing with his/her mother and with other adults, peers, and siblings, and also on the child's responses to the assessor's questions. The scoring of all items followed the KPAG's suggested criteria outlined in Appendix B.4. Items were administered over two or more play sessions. Cognitive and language items were completed within 1 week, to permit retesting within 2 weeks of the initial assessment. Complete data were obtained on the KPAG for 74 of the 75 children.

When willing, each child was photographed against the standard background of a pale-blue sheet, using the instructional set specified in the Brown IDS Self-Concept Referents Test manual. Many children were eager to participate. Others, absorbed in other tasks or apparently shy or fearful of the camera flash, required two or three approaches over several days to agree to be photographed. Through initial refusal and subsequent infrequent attendance, or as a result of repeated refusals, data on the Brown measure were unobtainable for five children (one boy and one girl from the Pakeha sample, and one girl and two boys from the Maori sample).

Almost all children recognized themselves without help. Each child then was asked the set of 15 questions in the context of the "self" referent. Generally, the original language was maintained throughout but in item 8, which concerned perceptions of ability, the original adjectives "smart" and "stupid" were changed to "clever" and "dumb". This was judged more appropriate to New Zealand usage, and the substituted adjectives were identical to those used by Ranby (1979) with Maori and Pakeha secondary school pupils. With informal testing conditions, the Brown test was administered in 10 to 20 minutes.

To summarize then, each mother was interviewed then videotaped with her child on a known but unscheduled basis. The children were engaged in spontaneous play using self-selected playcentre equipment. During a subsequent 2- to 3-week period, the child's self-esteem and cognitive, English language, social, and physical development were assessed, using the Brown and the KPAG measures. Interactive behaviours were rated from the videotapes, and inter-observer reliability and test-retest stability data were obtained.

4.5 *Data analysis procedures:*

The data were analysed using the Statistical Package for the Social Sciences (SPSS) releases 6 to 9 (Hull & Nie, 1981; Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). Frequency tables and descriptive statistics were computed for the total sample and for each separately selected maternal ethnic, education, and child gender group. *T* tests were used to examine the significance of group differences on demographic variable means.

Inter-observer and test-retest reliabilities, which were discussed in section 4.3.1, are presented as Pearson correlation coefficients in Appendix C. Also, Pearson correlational matrices were computed to examine the relationships between and among parent and child variables. Some paternal demographic data, as well as maternal data, are summarized in the correlational matrix tables and are discussed briefly in Chapter 5, but the paternal data remain only a peripheral concern of this study.

One-way analysis of variance statistics were computed to assess the influence of ethnic group and child gender on the children's assessment scores. The relationship between child gender and maternal interactive behaviour also was examined using one-way analyses of variance. Thereafter, non-parametric Mann-Whitney *U* Tests were calculated for small independent subsamples of boys and girls.

The maternal interactive behaviours were factor analysed. Principal factoring with iteration was employed, and an orthogonal varimax rotation produced simplified factors. Scattergrams were computed to permit visual inspection of the linearity of the correlated

interactive behaviours.

The raw interactive behaviour scores were transformed to square root scores for some analyses, and also to linear *z* scores. Subsequently, the *z* scores of behaviour were used to form composite factor scores.

The KPAG scores were transformed similarly to linear *z* scores, and then a combined cognition plus language score was computed from the KPAG *z* scores. Results of the analyses using this combined score are presented in tabular form, but the main focus of the data analyses was on the separate KPAG-Cognition and KPAG-Language scores.

The children's Brown IDS Self-Concept Referents Test scores were adjusted to account for unanswered or ambiguous responses (Shipman & Gilbert, 1972). This adjusted self-concept score (the percentage of positive responses among the items answered clearly in a positive or negative manner) was used throughout the analyses reported in Chapter 5.

Multivariate and univariate analyses of variance were computed (MANOVA). Using MANOVA the independent variables of maternal ethnicity and education level, and the dependent variables or interactive behaviours and behavioural factors, were analysed. Box-plots were computed to provide within-cell descriptive graphical data (Tukey, 1977).

Multiple regression analyses were employed to identify the most powerful predictors of the children's adjusted self-concept, KPAG-Cognition, and KPAG-Language scores. A stepwise selection procedure was specified, and residuals statistics were examined following the regression procedures.

Homogeneity of variance statistics were computed during MANOVA procedures. The Bartlett Box *M* tested the assumption of homogeneity of variance on each of the maternal interactive behaviours and behavioural factors.

Multivariate tests of significance used included the Pillai-Bartlett trace, the Hotelling-Lawley trace, Wilks's lambda, and Roy's largest root. In view of the controversy about the respective merits of each test, all of the above tests were computed and reported (e.g. Olson, 1976; Stevens, 1979).

The criterion level of significance was predetermined as $p < .01$. This alpha level was adopted to decrease the chances of making Type I errors, more likely with the conventional, less stringent level of $p < .05$. As Fox (1969) and Guilford and Fruchter (1978) have emphasized that decreased alphas are associated with Type II errors, $p < .01$ was judged the strictest level appropriate here. Some additional findings significant at $p < .05$ are also discussed if they are notably important.

Chapter 5

RESULTS

Overview: First, this chapter outlines the preliminary and descriptive analyses. The distributions of the interactive behaviours, and of the children's test scores, are presented. After some within-cell variations in maternal behaviour are noted, the relationships among the interactive behaviours are reported, and then the data reduction procedures are explained.

Second, the results of the analyses are related to the major research questions. Analyses of the relationships among maternal ethnicity, maternal education level, and maternal interactive behaviour are described. Data are also presented that relate the interactive behaviours and the demographic variables to the children's scores on the Brown IDS Self-Concept Referents Test and the KPAG.

5.1 *Descriptive and exploratory analyses:*

The frequencies of the interactive behaviours are summarized in Table 5.1. Direct Commands and Questions were the maternal verbal behaviours observed most frequently (at a mean rate of 22.03 and 16.64 respectively, per 15 minutes' interaction). Attentive Observation was the maternal non-verbal behaviour recorded for the longest duration (with a mean of 20.71 periods of 5 seconds' duration, or 11.5% of the total interaction time). Clearly, Discipline and Threats were exceptionally infrequent behaviours. Only one mother issued Threats, and three used Discipline. Criticisms also were recorded relatively infrequently. The direction of behaviour requests appears predominantly from mother to child because the mean

Table 5.1

Interactive Behaviour Frequency Statistics

Interactive Behaviour	*M*	*SD*	*Mdn*	Mode
Physical Contact	5.15	7.14	2.44	0
Out of Contact	17.53	14.30	15.75	2, 23
Attentive Observation	20.71	15.06	17.25	4
Playing Interactively	16.95	14.52	15.00	0
Cooperation	4.75	2.94	3.94	3
Non-cooperation	1.64	1.71	1.21	0
Attending	9.83	5.29	9.67	8, 12, 13
Questions	16.64	9.54	16.25	17
Rewards	5.65	4.85	4.44	3
Discipline	0.04	0.20	0.02	0
Threats	0.03	0.23	0.01	0
Criticisms	0.71	1.69	0.28	0
Direct Commands	22.03	15.81	18.33	7
Indirect Commands	7.13	4.26	6.85	7
Teaching	3.81	3.71	2.78	2
Helping	9.44	5.30	8.81	9
Child's requests for mother's cooperation	6.39	3.44	5.92	3

Note: Observational time base = 15 minutes; n = 75.

frequencies of mothers' Direct and Indirect Commands to their children were 22.03 and 7.13 respectively, whereas children requested their mothers' cooperation at a mean rate of 6.39 times per 15 minutes of interaction. In response to the children's requests, demands, or questions, maternal Cooperation was rather more prevalent than Non-cooperation.

Before computing parametric statistics, the bimodal distributions of the behaviours Out of Contact and Attending were noted. The distribution of the behaviour scores was checked further on the box-plots, which show some degree of symmetry (see Appendix C). Although the distribution of scores was skewed to the right on some behaviours for some cells, this skew was not apparent on all behaviours and was not specifically characteristic of just one cell group. The MANOVA *F* statistic was judged sufficiently robust to tolerate the above slight to moderate departures from normality. As an additional measure, however, some of the subsequent analyses with the maternal interactive behaviours were repeated replacing each raw interactive behaviour score with a computed square root score. In both the Pearson correlations and the MANOVA results, considerable consistency was found whether the raw scores or square roots were used. In consequence, the results presented hereafter focus on the original analyses with the raw scores of maternal interactive behaviour.

Mean scores and standard deviations were computed separately for each maternal ethnic, maternal education-level, and child gender group (Tables 5.2 to 5.6). Two Maori (lower education group) mothers (one of a daughter, one with a son) used Discipline in the form of smacking, and one Pakeha (higher education) mother (of a son) used Discipline in the form of removing a play material. One of the above Maori (lower education) mothers also issued two Threats to her daughter. As the incidents detailed above were the only occurrences of Discipline and Threats, both behaviours were excluded from subsequent major analyses. Large standard deviations in relation to the mean scores can be seen on some behaviours, including Physical Contact for all groups, and Playing Interactively for the Pakeha samples (Tables 5.2 & 5.6).

Table 5.2

Mean Scores and Standard Deviations on the Maternal Interactive Behaviours for Ethnic Groups

Maternal Interactive Behaviour	Maori[a]		Pakeha[b]	
	M	*SD*	*M*	*SD*
Physical Contact	5.53	6.38	4.83	7.78
Out of Contact	14.32	10.68	20.20	16.37
Attentive Observation	19.21	14.89	21.95	15.28
Playing Interactively	23.21	14.69	11.76	12.30
Cooperation	5.15	3.11	4.42	2.79
Non-cooperation	1.15	1.28	2.06	1.91
Attending	9.29	5.62	10.27	5.03
Questions	17.53	11.08	15.90	8.11
Rewards	7.00	5.66	4.54	3.76
Discipline	0.06	0.24	0.02	0.16
Threats	0.06	0.34	---	---
Criticisms	0.47	0.83	0.90	2.15
Direct Commands	26.62	18.36	18.22	12.30
Indirect Commands	6.00	4.30	8.07	4.03
Teaching	4.50	4.12	3.24	3.28
Helping	9.32	5.66	9.54	5.05

Note: Observational time base = 15 minutes.

Dashes indicate zero frequency.

[a] Maori mothers, n = 34.

[b] Pakeha mothers, n = 41.

Table 5.3

Mean Scores and Standard Deviations on the Maternal Interactive Behaviours for Education Groups

Maternal Interactive Behaviour	Higher[a]		Lower[b]	
	M	*SD*	*M*	*SD*
Physical Contact	5.56	8.60	4.81	5.76
Out of Contact	13.74	13.36	20.68	14.45
Attentive Observation	21.59	16.93	19.98	13.50
Playing Interactively	16.82	15.02	17.05	14.29
Cooperation	5.62	3.10	4.02	2.62
Non-cooperation	1.18	1.36	2.02	1.88
Attending	12.53	4.83	7.59	4.60
Questions	22.06	8.94	12.15	7.53
Rewards	7.29	5.31	4.29	4.00
Discipline	0.03	0.17	0.05	0.21
Threats	---	---	0.05	0.31
Criticisms	0.50	0.93	0.88	2.12
Direct Commands	16.79	11.21	26.37	17.77
Indirect Commands	8.35	4.28	6.12	4.01
Teaching	6.12	4.13	1.90	1.79
Helping	8.71	4.73	10.05	5.71

Note: Observational time base = 15 minutes.

Dashes indicate zero frequency.

[a] Higher maternal education level group, n = 34.

[b] Lower maternal education group, n = 41.

Table 5.4

Mean Scores and Standard Deviations on the Interactive Behaviours for Child Gender Groups

Interactive Behaviour	Boys[a]		Girls[b]	
	M	*SD*	*M*	*SD*
Physical Contact	4.26	5.60	5.93	8.25
Out of Contact	15.97	10.76	18.90	16.82
Attentive Observation	19.71	13.38	21.58	16.52
Playing Interactively	18.60	13.65	15.50	15.27
Cooperation	5.03	2.96	4.50	2.94
Non-cooperation	1.86	1.75	1.45	1.66
Attending	10.60	4.87	9.15	5.61
Questions	17.43	8.60	15.95	10.35
Rewards	5.09	4.36	6.15	5.24
Discipline	0.06	0.24	0.03	0.16
Threats	---	---	0.05	0.32
Criticisms	0.86	2.28	0.58	0.93
Direct Commands	22.29	14.51	21.00	17.05
Indirect Commands	6.31	3.71	7.85	4.61
Teaching	3.63	2.60	3.98	4.49
Helping	10.40	5.23	8.60	5.28
Child's requests for mother's cooperation	6.89	3.18	5.95	3.63

Note: Observational time base = 15 minutes.

Dashes indicate zero frequency.

[a] Mothers of sons, n = 35.

[b] Mothers of daughters, n = 40.

Within-cell differences in behaviours are demonstrated further by the box-plots, which illustrate the spreads from the median of the raw interactive behaviour scores. Outlying or extreme values were detected within maternal ethnic and education groups on several interactive behaviours (Appendix C). For example, in the Pakeha higher education group, individual extreme values were plotted for 10 of the 16 behaviours. One mother from the above group was more similar to the Pakeha lower education group with her extremely long duration of Out of Contact behaviour. The high individual values of other Pakeha higher education-level mothers on Teaching, Rewards, and Playing Interactively were comparable to the patterns of behaviour found among the Maori higher education group. Prior to analysing differences between the groups, then, some marked variations within the groups were already evident.

The distributions of the children's scores on the Brown IDS Self-Concept Referents Test and the KPAG are summarized in Tables 5.7 and 5.8. Consistent with findings from previous large-scale studies, the unadjusted Brown scores were negatively skewed (Bridgeman & Shipman, 1978; Walker, 1973). In contrast, the distributions of all four KPAG scores approximated normality (i.e. KPAG-Cognition, KPAG-Physical Skills, KPAG-Socialization, and KPAG-Language).

Mean scores and standard deviations on the above child assessment variables were computed separately for the ethnic, education-level, and child gender groups (Tables 5.9, 5.10 & 5.11). One-way analyses of variance showed minimal effects of gender and ethnicity on the children's KPAG and self-concept scores. No gender differences that approached significance were found on either the self-concept or the KPAG scores. The only ethnic difference evident, on the KPAG-Language score, failed to reach $p < .01$, but was significant at $p < .05$. Children of Pakeha mothers scored higher on language than children with Maori mothers (Means = 11.20 and 9.41 respectively) $F(1,73) = 4.59$, $p < .05$.

Table 5.5

Mean Scores and Standard Deviations on the Interactive Behaviours of the Maori Higher and Lower Education Groups

Interactive Behaviour	Higher[a]		Lower[b]	
	M	*SD*	*M*	*SD*
Physical Contact	5.85	7.58	5.33	5.70
Out of Contact	12.46	10.70	15.48	10.77
Attentive Observation	20.54	19.20	18.38	11.94
Playing Interactively	24.85	15.15	22.19	14.69
Cooperation	6.77	2.39	4.14	3.12
Non-cooperation	1.00	1.16	1.24	1.38
Attending	13.08	5.53	6.95	4.32
Questions	24.46	10.49	13.24	9.27
Rewards	8.77	6.52	5.91	4.91
Discipline	---	---	0.10	0.30
Threats	---	---	0.10	0.44
Criticisms	0.39	0.65	0.52	0.93
Direct Commands	19.15	9.16	31.24	21.15
Indirect Commands	7.23	4.60	5.24	4.02
Teaching	8.23	3.94	2.19	2.02
Helping	9.31	5.25	9.33	6.02
Child's requests for mother's cooperation	7.77	2.46	5.38	3.50

Note: Observational time base = 15 minutes.

Dashes indicate zero frequency.

[a] Maori mothers, higher educational level, n = 13.

[b] Maori mothers, lower educational level, n = 21.

Table 5.6

Mean Scores and Standard Deviations on the Interactive Behaviours of the Pakeha Higher and Lower Education Groups

Interactive Behaviour	Higher[a]		Lower[b]	
	M	*SD*	*M*	*SD*
Physical Contact	5.38	9.35	4.25	5.91
Out of Contact	14.52	14.97	26.15	15.99
Attentive Observation	22.24	15.83	21.65	15.08
Playing Interactively	11.86	12.91	11.65	11.95
Cooperation	4.91	3.33	3.90	2.05
Non-cooperation	1.29	1.49	2.85	2.01
Attending	12.19	4.46	8.25	4.90
Questions	20.57	7.73	11.00	5.10
Rewards	6.38	4.32	2.60	1.57
Discipline	0.05	0.22	---	---
Threats	---	---	---	---
Criticisms	0.57	1.08	1.25	2.88
Direct Commands	15.33	12.30	21.25	11.85
Indirect Commands	9.05	4.02	7.05	3.89
Teaching	4.81	3.75	1.60	1.50
Helping	8.33	4.47	10.80	5.43
Child's requests for mother's cooperation	6.19	3.89	6.75	3.28

Note: Observational time base = 15 minutes.

Dashes indicate zero frequency.

[a] Pakeha mothers, higher educational level, n = 21.

[b] Pakeha mothers, lower educational level, n = 20.

Table 5.7

Distribution of the Keele Pre-school Assessment Guide Scores

KPAG Subscore	*M*	*SD*	*Mdn*	Mode	Range
Cognition	14.97	4.28	14.90	15	8-25
Language	10.39	3.67	9.85	10	4-19
Socialization	6.39	1.01	6.40	6	3-8
Physical Skills	8.39	1.98	8.44	9	5-13

Note: For the KPAG-Cognition score, n = 74; for the remaining three scores, n = 75.

Table 5.8

Distribution of the Brown IDS Self-Concept Referents Test Scores

Brown Score	*M*	*SD*	*Mdn*	Mode	Range
Unadjusted Brown	8.57	3.27	9.18	9	1-14
Adjusted Brown	75.07	19.98	76.92	100.00	16.67-100.00
Omitted Items	2.87	2.65	2.11	1	0-10

Note: n = 69.

Table 5.9

Mean Scores and Standard Deviations on the Child Assessments for the Ethnic Groups

Child Assessment Score	Maori[a]			Pakeha[b]		
	n	*M*	*SD*	*n*	*M*	*SD*
Self-Concept						
Unadjusted Brown	30	8.43	2.92	39	8.67	3.56
Adjusted Brown	30	76.20	15.61	39	74.20	22.94
KPAG -						
Cognition	34	14.74	4.11	40	15.18	4.47
Physical Skills	34	8.44	1.64	41	8.34	2.24
Socialization	34	6.32	1.01	41	6.44	1.03
Language	34	9.41	3.20	41	11.20	3.87

[a] Children of Maori mothers.

[b] Children of Pakeha mothers.

Table 5.10

Mean Scores and Standard Deviations on the Child Assessments for the Education Groups

Child Assessment Score	Higher[a]			Lower[b]		
	n	*M*	*SD*	*n*	*M*	*SD*
Self-Concept						
Unadjusted Brown	32	9.59	3.25	37	7.68	3.07
Adjusted Brown	32	82.64	18.86	37	68.53	18.77
KPAG -						
Cognition	33	17.82	3.60	41	12.68	3.33
Physical Skills	34	8.71	1.90	41	8.12	2.03
Socialization	34	6.50	1.02	41	6.29	1.01
Language	34	12.65	3.52	41	8.51	2.61

[a] Children of higher education-level mothers.

[b] Children of mothers from the lower education level.

Table 5.11

Mean Scores and Standard Deviations on the Boys' and Girls' Assessments

Child Assessment Score	Boys			Girls		
	n	*M*	*SD*	*n*	*M*	*SD*
Self-Concept						
Unadjusted Brown	32	8.13	3.09	37	8.95	3.42
Adjusted Brown	32	73.78	18.97	37	76.19	21.00
KPAG -						
Cognition	34	14.79	4.79	40	15.13	3.86
Physical Skills	35	8.29	2.09	40	8.48	1.89
Socialization	35	6.29	0.99	40	6.48	1.04
Language	35	10.43	3.64	40	10.35	3.75

Inspection of the frequency data also shows very few notable variations in maternal interactive behaviour as a function of child gender (Table 5.4). Therefore, to increase cell sizes, the possibility of collapsing cells across gender groups was explored. When one-way analyses of variance were computed for the total sample, sex effects did not reach significance on any of the interactive behaviours ($p > .10$). Among the ethnic and education-level subgroups, gender differences were detected on a few behaviours, but these differences invariably failed to reach the significance criterion of $p < .01$. (Details of these non-significant gender differences among the subsamples are summarized in Appendix C). In view of the general lack of gender differences at the prescribed alpha level, child gender was excluded from any further analyses.

The relationships among the 16 maternal interactive behaviours were examined in three stages. First, a logical analysis was conducted, and the logical groups of interactive behaviours are set out in Figure 5.1. Clearly, some of the 16 behaviours seemed separate from the others. For example, if Physical Contact was retained as a separate category, the influence of the mothers' more passive physical presence would remain identifiable (Tulkin, 1977). Similarly, Playing Interactively was isolated as a distinct, independent behaviour likely to reflect the tendency to learn by participating together in activities (Metge & Kinloch, 1978). However, other groups of behaviour were judged conceptually related as verbal questioning and responding, teaching, directing, ignoring, or controlling behaviours.

In a second procedure, the statistical relationships among the behaviours were examined by means of Pearson product-moment correlational matrices. The matrix for the total sample is presented in Table 5.12. Matrices were computed also for all ethnic and education-level samples and subsamples. After generating the separate matrices, the consistency of the relationships among the behaviours between the groups, and the patterns of the behaviours within the groups, were checked. The separate matrices for the Maori and Pakeha mothers are set out in Tables 5.13 and 5.14.

Logical Groups	Maternal Interactive Behaviours
Verbal Responding or Inquiring Behaviours (minimally directive)	Attending Questions
Direct Teaching Behaviour (minimally to moderately directive)	Teaching Rewards Indirect Commands
Directing or Intruding Behaviours (directive)	Direct Commands Helping Criticisms
Ignoring Behaviour	Out of Contact Non-cooperation
Negatively Controlling Behaviour	Discipline Threats
Independent, Separate Behaviours	Physical Contact Attentive Observation Playing Interactively Cooperation

Figure 5.1. Proposed Logical Grouping of the Sixteen Maternal Interactive Behaviours.

The correlational analyses show some consistency with the logical analysis (presented in Figure 5.1). Clearly, the behaviours Attending, Questions, and Teaching correlated strongly and positively for the total sample and for the ethnic and education-level groups. Out of Contact and Non-cooperation correlated positively and significantly for the total sample, and also correlated positively across the subsamples (Tables 5.12, 5.13, & 5.14). Direct Commands related more strongly to Helping for the Maori mothers, but more strongly to Criticisms for the Pakeha mothers. If Threats occurred, they correlated significantly and positively with Discipline. In summary, consistent patterns of teaching (Attending, Questions, and Teaching) versus ignoring (Non-cooperation and Out of Contact) behaviours were found.

In a third stage, the interactive behaviours were factor analysed. Factor analysis further facilitated the identification of the relationships among the behaviours and was used as a data reduction method. A preliminary factor analysis of the complete 16 maternal behaviours yielded six factors. Factor IV had high loadings for Threats and Discipline (Appendix C).

As Discipline and Threats had been judged insufficiently frequent to be included in the major analyses, these two behaviours were excluded from the final factor solution. The factor solution for 14 behaviours (excluding Discipline and Threats) is presented in Table 5.15. Whereas six factors were found in the preliminary 16-behaviour solution, five factors were yielded in the final 14-behaviour solution. The first three factors in the final five-factor solution had eigenvalues of greater than 1.0. With the exception of Physical Contact, all the behavioural variables had moderate (.35+) to high (.50 to .90) loadings on one or more factors. The highest loadings for Factor I (Intrusion) were Direct Commands, then Helping and Criticisms. On the bipolar Factor II (Teaching Style), the highest loadings were Rewards then Teaching versus Non-cooperation and Out of Contact. Factor III (Verbal Stimulation) comprised predominantly Indirect Commands, Questions, and Attending. Two further factors yielded were Factor IV (Cooperation versus Out of Contact) and Factor V (Attentive Observation versus Interactive Play).

Table 5.12 - Correlations among the Maternal Interactive Behaviours

		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
01.	Physical Contact															
02.	Out of Contact	-.16														
03.	Attentive Observation	.07	-.21													
04.	Playing Interactively	.09	.04	-.26												
05.	Cooperation	-.01	-.28*	.07	.18											
06.	Non-Cooperation	-.11	.42**	-.17	-.07	.02										
07.	Attending	.03	-.41**	.25	-.07	.28*	-.35*									
08.	Questions	.10	-.44**	.15	.06	.35*	-.44**	.70**								
09.	Rewards	.12	-.27	-.12	.07	.11	-.37*	.20	.35*							
10.	Discipline	-.05	.01	-.13	-.09	-.01	.16	-.16	-.21	-.14						
11.	Threats	-.02	.03	-.13	-.11	-.15	-.11	-.37*	-.19	-.09	.57**					
12.	Criticisms	-.14	-.10	-.23	-.16	-.13	.22	-.02	-.21	-.22	.20	.23				
13.	Direct Commands	-.21	-.16	-.39**	-.18	-.31*	.13	-.27*	-.27*	.17	.19	.18	.36*			
14.	Indirect Commands	.03	-.10	-.23	-.06	-.03	-.14	.27*	.40**	.12	-.18	-.14	-.04	.12		
15.	Teaching	.06	-.41**	-.01	.07	.24	-.33*	.49**	.65**	.48**	-.06	-.12	-.21	-.08	.36*	
16.	Helping	-.13	-.07	-.25	-.24	-.12	.10	.25	-.26	-.08	.07	.03	.11	.45**	-.09	-.05

Note: Pearson product-moment correlation coefficients (n = 75) significant at:
*p < .01, one-tailed. **p < .001, one-tailed.

Table 5.13 - Correlations among the Maori Mothers' Interactive Behaviours

		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
01.	Physical Contact															
02.	Out of Contact	-.11														
03.	Attentive Observation	.13	-.16													
04.	Playing Interactively	.28	.18	-.21												
05.	Cooperation	.08	-.33	.23	.09											
06.	Non-cooperation	-.27	.39	-.20	-.07	-.04										
07.	Attending	.11	-.41*	.35	-.13	.50*	-.36									
08.	Questions	.25	-.47*	.38	-.04	.47*	-.40*	.83**								
09.	Rewards	-.03	-.32	-.14	-.01	.17	-.28	.22	.21							
10.	Discipline	-.10	.06	-.16	-.29	.03	.17	-.37	-.37	-.22						
11.	Threats	-.04	.11	-.18	-.24	-.24	-.16	-.26	-.26	-.16	.69**					
12.	Criticisms	-.24	.17	-.25	-.28	-.22	.10	-.24	-.27	-.29	.62**	.76**				
13.	Direct Commands	-.35	-.10	-.47*	-.47*	-.44*	.24	-.35	-.37	.26	.21	.19	.24			
14.	Indirect Commands	-.12	-.32	-.08	.06	.16	-.15	.34	.46*	.01	-.24	-.16	-.34	-.10		
15.	Teaching	.09	-.46*	.05	.09	.47*	-.20	.56**	.57**	.41*	-.28	-.19	-.29	-.19	.47*	
16.	Helping	-.17	.01	-.44*	-.31	-.31	.28	-.17	-.32	-.01	.05	.05	.13	.58**	-.06	-.04

Note: Pearson product-moment correlation coefficients (n = 34) significant at:
*p < 01, one-tailed. **p < .001, one-tailed.

Table 5.14 - Correlations among the Pakeha Mothers' Interactive Behaviours

		01	02	03	04	05	06	07	08	09	10	12	13	14	15
01.	Physical Contact														
02.	Out of Contact	-.18													
03.	Attentive Observation	.05	-.27												
04.	Playing Interactively	-.08	.11	-.28											
05.	Cooperation	-.09	-.24	-.05	.21										
06.	Non-Cooperation	-.03	.38*	-.22	.11	.12									
07.	Attending	-.03	-.49*	.15	.07	.09	-.44*								
08.	Questions	-.05	-.45*	-.09	.11	.19	-.50**	.56**							
09.	Rewards	.26	-.19	-.05	-.08	-.04	-.41*	.27	.54**						
10.	Discipline	-.02	-.01	-.08	.09	-.08	.25	.15	.04	-.07					
12.	Criticisms	-.11	-.20	-.26	-.09	.05	.22	.04	-.22	-.21	.08				
13.	Direct Commands	-.13	-.14	-.29	-.12	-.25	.23	-.13	-.20	-.16	.11	.62**			
14.	Indirect Commands	.16	-.08	-.41*	.03	-.16	-.26	.18	.42*	.43*	-.08	-.03	-.01		
15.	Teaching	.03	-.38*	-.03	-.12	-.06	-.39*	.47*	.76**	.54**	.23	-.20	-.05	.38*	
16.	Helping	-.10	-.14	-.08	-.19	.08	-.01	-.33	-.20	-.18	.11	.12	.33	-.13	-.07

Note: Zero frequency of the behaviour 11 Threats, which has been omitted.
Pearson product-moment correlation coefficients (n = 41) significant at:
*p < .01, one-tailed. **p < .001, one-tailed.

Table 5.15

Varimax Rotated Factor Matrix for Fourteen Maternal Interactive Behaviours

Maternal Behaviours	Factors					Communality (h^2)
	I	II	III	IV	V	
Physical Contact	-.20					.07
Out of Contact	-.24	-.48		-.52	.23	.62
Attentive Observation	-.40		-.23		-.86	.99
Playing Interactively	-.30				.49	.38
Cooperation				.63		.45
Non-cooperation		-.56				.39
Attending		.24	.52	.46	-.27	.63
Questions	-.24	.44	.61	.43		.82
Rewards		.65				.47
Criticisms	.47	-.35				.37
Direct Commands	.90					.89
Indirect Commands			.65			.44
Teaching		.54	.47	.27		.59
Helping	.48					.26
Total % of variance	44.3	22.3	15.1	9.8	8.5	
Eigenvalue	3.27	1.65	1.12	.72	.63	

Note: The infrequent behaviours Discipline and Threats were excluded from this analysis. Loadings of less than .20 are omitted. n = 75.

Brislin, Lonner, and Thorndike (1973) and Child (1970) have noted that rectilinear correlations between factorial components are necessary in factor analysis. Accordingly then, after extracting the five factors above, scattergrams were computed to check for linearity. The correlations between the behaviours with the highest loadings for each factor generally were rectilinear, and only one exception was observed. For Factor I (Intrusion), the relationship between Criticisms and Helping was weak, and the correlation was somewhat curvilinear.

Some consideration was also given to Child's (1970) contention that the merging of different sample populations for factor analysis blurs the factorial patterns of each population. In this study, it could be argued that the Maori and Pakeha samples were drawn from a similar, ethnically mixed playcentre population of mothers of 3-year-old children. However, separate factor analyses were computed for the Maori and Pakeha groups. Because the sample sizes were very small, these analyses are viewed with considerable caution and were used only as a guide. The separate solutions demonstrated some similarities and some differences in the factorial patterns for the two ethnic groups (see Appendix C).

On the basis of the final factor analysis for the total sample, factor scores were created using the transformed *z* scores of the 75 mothers' interactive behaviours. The 14-behaviour five-factor solution presented in Table 5.15 was used, and the factor score coefficients are presented in Table 5.16. Although the factor scores could have been obtained more simply using a principal components model during a MANOVA procedure, the factor model has been supported for its comparative effectiveness in reducing error variance (Maxwell, 1977).

5.2 *Influences on maternal interactive behaviour:*

The influences of maternal education (recoded as higher or lower) and of maternal ethnicity (Maori or Pakeha) were examined on 13 maternal interactive behaviours, and then separately on five behavioural factors. As the 2 x 2 MANOVA design featured unequal cell sizes with *n*'s ranging from 13 to 21, homogeneity of variance

Table 5.16

Factor Score Coefficients for Fourteen Linear Transformed Maternal Behaviours

Maternal Behaviour (z scores)	Factor				
	I Intrusion	II Teaching Style	III Verbal Stimulation	IV Cooperation versus Out of Contact	V Observation versus Participation
Physical Contact	.02	.08	-.06	-.04	-.03
Out of Contact	-.10	-.15	.05	-.38	-.09
Attentive Observation	-.17	.15	-.38	-.04	-1.02
Playing Interactively	-.18	.12	-.23	.11	.09
Cooperation	.10	-.07	-.19	.37	.06
Non-cooperation	-.05	-.24	.05	.13	.04
Attending	.11	-.09	.22	.18	-.13
Questions	-.13	.13	.45	.20	-.02
Rewards	-.15	.32	-.07	-.06	.05
Criticisms	.07	-.21	.06	.18	-.14
Direct Commands	.82	.28	-.19	-.10	-.25
Indirect Commands	.03	-.04	.27	-.19	-.17
Teaching	.05	.20	.11	-.03	.05
Helping	.02	-.001	-.004	-.01	-.15

Note: The infrequent behaviours Discipline and Threats were excluded from this analysis. n = 75.

tests were computed and are summarized in Tables 5.18 and 5.19. Departures from the assumption of homogeneity of variance were found on three interactive behaviour categories: Rewards, Teaching, and Direct Commands, and also on behavioural Factor I. The above findings were not viewed as major data limitations, though, as Winer (1971) has demonstrated that *F* tests do remain robust despite moderate departures from the assumption of homogeneity, and MANOVA also has been described as robust to moderate violations of normality and homogeneity (Mendoza & Graziano, 1982; Olson, 1976).

Before moving on to further MANOVA results, some demographic data are considered briefly here in terms of their association with the interactive behaviours. A matrix of the zero-order correlations between the demographic variables and the maternal interactive behaviours is shown in Table 5.17. Few important correlations were found between the child variables of age (in months), family size, and birth order and the 16 maternal interactive behaviours. Nevertheless it was noted that larger family size and the child's later-born position in the family were significantly associated with the mother's greater use of Direct Commands (r = .36, p < .01 and r = .44, p < .001 respectively). The correlations between maternal age and the interactive behaviours were weak. Maternal and paternal education (coded on the 10-point scale) were closely intercorrelated variables (r = .62, p < .001) and in turn both related strongly to maternal interactive behaviour. The MANOVA analyses of the relationships between maternal education level and interactive behaviour, and between maternal ethnicity and interactive behaviour, are examined below in the context of the first three research proposals.

1. *Maori mothers will show more physical interactions with their children than Pakeha mothers.*

Multivariate tests of significance indicated a significant effect for ethnicity on the 13 interactive behaviours. The infrequent behaviours Discipline, Threats, and Criticisms were excluded from these analyses. Results of the multivariate tests of significance are set out in Table 5.20.

Univariate *F* tests, presented in Table 5.21, demonstrated no significant ethnic effect on the non-verbal behaviours Physical

Table 5.17 - Correlations of the Interactive Behaviours with Demographic Variables

Interactive Behaviour	Maternal Variables (n = 75)				Paternal (n = 64)		Child Variables (n = 75)		
	Education	Occupation	Playcentre Course	Age	Education	SES	Age	Birth Order	No. of children in the family
Physical Contact	-.14	-.08	-.10	-.04	-.04	.01	-.02	-.16	-.22
Out of Contact	.23	.07	-.05	.01	.13	.04	.11	-.14	-.17
Attentive Observation	-.11	-.12	.17	-.16	-.17	-.10	-.04	-.11	-.05
Playing Interactively	-.001	-.03	-.08	-.16	.31*	.37*	.18	-.03	.01
Cooperation	-.26	-.17	.01	.01	-.08	.06	.14	-.19	-.10
Non-cooperation	.28*	.09	.15	.01	.34*	.17	.05	-.01	-.02
Attending	-.42**	-.10	-.06	-.15	-.25	-.08	-.12	-.27*	-.16
Questions	-.48**	-.19	-.16	-.11	-.35*	-.03	-.12	-.16	-.06
Rewards	-.35*	-.07	.04	-.03	-.37*	-.06	-.16	-.04	-.03
Discipline	.11	.11	.18	-.10	.21	.06	-.15	-.08	-.11
Threats	.09	.23	.10	-.02	---	---	-.02	-.11	-.06
Criticisms	.16	.10	.08	.15	.26	.17	-.20	.13	.08
Direct Commands	.42**	.33*	.13	.09	.42**	.30*	-.20	.44**	.36*
Indirect Commands	-.29*	-.24	-.28*	.05	-.24	-.15	.06	.003	.03
Teaching	-.47**	-.25	-.05	-.11	-.21	-.06	-.11	-.12	-.06
Helping	.16	.08	.02	.13	-.01	-.33*	-.01	.19	.09
Child's requests for mother's cooperation	-.08	-.10	.08	.01	.11	.14	-.14	-.17	-.09

Note: Dashes indicate zero incidence of Threats among two-parent families.
Pearson product-moment correlation coefficients are significant at: *$p < .01$, one-tailed. **$p < .001$, one-tailed.

Table 5.18

MANOVA with Thirteen Maternal Interactive Behaviours: Univariate Homogeneity of Variance Tests

Interactive Behaviour	Bartlett-Box *F* [a]
01 Physical Contact	2.11
02 Out of Contact	1.49
03 Attentive Observation	1.17
04 Playing Interactively	.40
05 Cooperation	1.77
06 Non-cooperation	1.74
07 Attending	.37
08 Questions	2.90
09 Rewards	9.14**
13 Direct Commands	4.40*
14 Indirect Commands	.16
15 Teaching	6.94**
16 Helping	.58

Note: Discipline, Threats, and Criticisms (the three most infrequent behaviours) were excluded.

[a] $df = 3$.

*$p < .01$.

**$p < .001$.

Table 5.19

MANOVA with Five Maternal Behaviour Factors: Univariate Homogeneity of Variance Tests

Maternal Behaviour Factor	Bartlett-Box F [a]
Factor I, Intrusion	4.15*
Factor II, Teaching Style	.78
Factor III, Verbal Stimulation	.92
Factor IV, Out of contact versus Cooperation	.22
Factor V, Observation versus Participation	2.31

[a] $df = 3$.

*$p < .01$.

Contact and Attentive Observation. There was, however, a significant ethnic effect on Playing Interactively. Maori pairs played interactively together for a longer duration than did Pakeha pairs $F(1,71) = 13.35$, $p < .001$. Univariate F tests therefore showed significant confirmation of the above proposal on one primarily physical behaviour, Playing Interactively.

2. *Pakeha mothers will interact verbally with their children more frequently than Maori mothers.*

Table 5.21 indicates that there were no significant ethnic differences on the verbal behaviours Attending and Questions. There were some differences in command styles, but these results fell short of the required $p < .01$. Maori mothers used more Direct Commands than Pakeha mothers $F(1,71) = 4.39$, $p < .05$, and Pakeha mothers tended to use more Indirect Commands than Maori mothers $F(1,71) = 3.59$, $p = .06$.

Maori mothers used more Rewards than Pakeha mothers $F(1,71) = 7.74$, $p < .01$. Also, Maori mothers exhibited more Teaching behaviour than Pakeha mothers $F(1,71) = 7.38$, $p < .01$. The ethnic difference on Teaching appears partly attributable to the high

Table 5.20

Multivariate Tests of Significance for the Effect of Mothers' Ethnicity on Thirteen Maternal Behaviours

Test of Significance	Value	Approximate F [a]
Pillai-Bartlett Trace	.50	4.47*
Hotelling-Lawley Trace	.98	4.47*
Wilks's Lambda	.50	4.47*
Roy's Largest Root	.50	

Note: Discipline, Threats, and Criticisms (the three most infrequent behaviours) were excluded.

[a]Hypothesis df = 13.0.

*p < .001.

Table 5.21

MANOVA: Ethnicity Effect on Thirteen Maternal Interactive Behaviours

Interactive Behaviour	*MS*	*F* [a]
Physical Contact	12.04	.23
Out of Contact	867.43	4.73
Attentive Observation	121.58	.52
Playing Interactively	2465.81	13.35**
Cooperation	16.68	2.10
Non-cooperation	19.35	7.87*
Attending	2.09	.09
Questions	160.54	2.41
Rewards	153.90	7.74*
Direct Commands	967.93	4.39
Indirect Commands	60.14	3.59
Teaching	61.49	7.38*
Helping	2.84	.10

Note: Discipline, Threats, and Criticisms (the three most infrequent behaviours) were excluded.

[a] $df = 1,71$.

Univariate F tests significant at:

*$p < .01$.

**$p < .001$.

Table 5.22

Multivariate Tests of Significance for the Ethnicity by Education Interaction Effect on Thirteen Behaviours

Test of Significance	Value	Approximate *F* [a]
Pillai-Bartlett Trace	.25	1.49
Hotelling-Lawley Trace	.33	1.49
Wilks's Lambda	.75	1.49
Roy's Largest Root	.25	

Note: Discipline, Threats, and Criticisms (the three most infrequent behaviours) were excluded.

[a]Hypothesis *df* = 13.0.

All *F* values are non-significant, $p > .10$.

Table 5.23

MANOVA: Ethnicity by Education Effect on Thirteen Maternal Interactive Behaviours

Interactive Behaviour	*MS*	*F* [a]
Physical Contact	1.77	.03
Out of Contact	333.81	1.81
Attentive Observation	11.09	.05
Playing Interactively	26.99	.15
Cooperation	11.84	1.49
Non-cooperation	7.92	3.22
Attending	21.47	.96
Questions	12.28	.18
Rewards	3.78	.17
Direct Commands	171.22	.78
Indirect Commands	.0001	.00001
Teaching	36.07	4.33*
Helping	26.82	.95

Note: Discipline, Threats, and Criticisms (the three most infrequent behaviours) were excluded.

[a] $df = 1,71$.

Univariate F test significant at:

*$p < .05$.

incidence of Teaching among the Maori higher education group (see Table 5.5). An ethnicity by education effect, significant at $p < .05$, occurred on Teaching (Table 5.23).

Pakeha mothers showed more Non-cooperation than Maori mothers $F(1,71) = 7.87$, $p < .01$. Non-cooperation with the child's preceding request was exhibited both verbally and non-verbally. There was, however, no additional significant ethnic difference on maternal Cooperation with the child's requests.

Contrary then to the proposition being researched, Maori mothers in fact used more Teaching and Rewards than Pakeha mothers, whereas Non-cooperation was observed significantly more frequently among Pakeha mothers.

3. *Maori and Pakeha mothers' education will influence their interactions with their children.*

Multivariate tests of significance showed that the ethnicity by education effect was non-significant (Table 5.22). On only one behaviour, Teaching, did the ethnicity by education interaction effect approach significance: $F(1,71) = 4.33$, $p < .05$ (Table 5.23).

Multivariate tests of significance for the effect of education were, however, highly significant (Table 5.24). Univariate F tests for the effect of education were significant at $p < .01$ on five maternal interactive behaviours: Attending, Questions, Teaching, Rewards, and Direct Commands (Table 5.25). Mothers from the higher education group were observed Attending to their children more frequently than were mothers from the lower education group $F(1,71) = 20.25$, $p < .001$. Higher education level mothers also asked more Questions $F(1,71) = 27.41$, $p < .001$, used more Teaching $F(1,71) = 39.64$, $p < .001$, and used Rewards more frequently $F(1,71) = 8.42$, $p < .01$. Lower education group mothers exhibited a somewhat higher incidence of Direct Commands than did higher education group mothers $F(1,71) = 7.73$, $p < .01$.

Table 5.24

Multivariate Tests of Significance for the Effect of Mothers' Education Level on Thirteen Maternal Behaviours

Test of significance	Value	Approximate F [a]
Pillai-Bartlett Trace	.47	3.97*
Hotelling-Lawley Trace	.88	3.97*
Wilks's Lambda	.53	3.97*
Roy's Largest Root	.25	

Note: Discipline, Threats, and Criticisms (the three most infrequent behaviours) were excluded.

[a]Hypothesis df = 13.0.

*p < .001.

Several additional education-level differences in maternal behaviour were found, but here the univariate F tests were significant at only p < .05. Higher education level mothers more frequently used Cooperation and Indirect Commands, but lower education group mothers were more often observed Out of Contact and using Non-cooperation.

To summarize, maternal education level was strongly associated with the mean frequencies of the verbal behaviours. Mothers from the higher education group used significantly more Attending, Questions, Teaching, and Rewards, whereas mothers from the lower education group used significantly more Direct Commands.

In some further analyses, the factor scores of maternal interactive behaviour were used as dependent variables, but ethnic and education-level effects on the behavioural factors tended to be non-significant. On Factor IV (Cooperation versus Out of Contact), though, the univariate test for the effect of education did approach significance. Mothers from the higher education group were higher on Cooperation, whereas their lower education group counterparts tended to be Out of Contact $F(1,71) = 6.94$, $p < .05$.

Table 5.25

MANOVA: The Effect of Mothers' Education Level on Thirteen Maternal Interactive Behaviours

Interactive Behaviour	*MS*	*F* [a]
Physical Contact	10.57	.20
Out of Contact	897.17	4.89
Attentive Observation	48.34	.21
Playing Interactively	.94	.01
Cooperation	47.18	5.93
Non-cooperation	13.36	5.43
Attending	454.32	20.25**
Questions	1826.28	27.41**
Rewards	167.44	8.42*
Direct Commands	1702.88	7.73*
Indirect Commands	92.51	5.53
Teaching	330.25	39.64**
Helping	33.52	1.18

Note: Discipline, Threats, and Criticisms (the three most infrequent behaviours) were excluded.

[a] $df = 1,71$.

Univariate F tests are significant at:

*$p < .01$.

**$p < .001$.

4. *The child's sex will influence maternal interactive behaviour.*

As demonstrated previously, the child's gender did not relate significantly to the maternal interactive behaviours. The only differences within the subsamples which approached significance are outlined in Appendix C.

5.3 *The relationships among the interactive behaviours and demographic variables, and children's self-concept, KPAG-Cognition, and KPAG-Language scores:*

Here, the demographic data are viewed in relation to the children's assessment scores. Pearson product-moment correlations of parents' demographic data and child variables showed significant correlations between maternal education and the children's KPAG-Cognition and KPAG-Language scores and self-concept scores (Table 5.26). Maternal occupation also related strongly to the children's KPAG-Cognition and KPAG-Language scores. For the Pakeha sample, paternal education correlated significantly with the children's KPAG-Cognition and KPAG-Language scores, and among the Maori pairs, a significant and positive correlation was found between mothers' *marae* participation and their children's Brown self-concept scores (Tables 5.27 & 5.28).

Intercorrelations among the child variables are presented in Table 5.29, and correlations between the interactive behaviours and child assessment scores can be examined in Tables 5.30, 5.31, and 5.32. Significant correlations are set out below in relation to the Research Proposals 5 to 11.

Results of the subsequent multiple regression analyses also are outlined in the context of Proposals 5 to 11. Before being entered into the regression analyses, each independent variable was examined in terms of three criteria. First, interactive behaviours and demographic variables generally were included only if they related significantly to the child assessment score being examined as the dependent variable (Pearson correlation coefficient significant at $p < .01$). Second, the interactive behaviours entered were relatively independent of each other (for example, as Attending and Questions

Table 5.26

Correlations between Parents' Demographic Data and Child Variables

Parent variables	Child variables							
	Demographic variables			Self-concept	KPAG scores			
	Age	Birth Order	No. of children in family	Adjusted Brown	Cognition	Physical Skills	Socialization	Language
Maternal Education	-.05	.21	-.01	-.35*	-.73**	-.26	-.15	-.66**
Maternal Occupation	.08	.002	-.09	-.27	-.41**	-.09	-.01	-.37**
Playcentre Courses	.14	-.10	-.08	-.15	-.17	-.01	-.05	-.15
Maternal Age	.03	.55**	.52**	.22	.15	-.05	-.06	.14
Paternal Education	.01	.17	.10	-.15	-.49**	-.08	-.09	.54**
Paternal SES	.08	.01	-.06	-.06	-.34*	-.06	-.07	-.35*

Note: The *n*'s range from 58 to 75 dyads, with pairwise deletion of missing data.

Pearson product-moment correlation coefficients are significant at:

*$p < .01$, one-tailed.

**$p < .001$, one-tailed.

Table 5.27

Correlations between Parents' Demographic Data and Child Variables: Maori Sample

Parent variables	Child variables							
	Demographic variables			Self-concept	KPAG scores			
	Age	Birth Order	No. of children in family	Adjusted Brown	Cognition	Physical Skills	Socialization	Language
Maternal Education	.15	.40*	.26	-.46*	-.60**	-.11	-.05	-.51*
Maternal Occupation	.11	.04	.01	-.41	-.45*	-.24	-.10	-.38
Playcentre Course	-.34	-.02	.004	-.14	-.02	.09	.02	-.01
Maternal Age	-.17	.56**	.55**	.33	.02	-.04	-.12	-.12
Paternal Education	.59*	.22	.25	-.47	-.25	.13	.28	-.30
Paternal Occupation	.34	.14	-.06	-.36	-.17	-.20	-.02	-.12
Mother's *marae* involvement	.08	.13	-.04	-.45*	-.22	.05	.02	-.08
Mother's Maori club membership	.20	-.06	-.18	-.25	-.02	-.04	.03	-.04
Mother's Maori Language fluency	.09	.07	.17	-.31	-.05	.08	.23	-.01

Note: The *n*'s range from 22 to 34 dyads, with pairwise deletion of missing data.
Pearson product-moment correlation coefficients are significant at:
*$p < .01$, one-tailed. **$p < .001$, one-tailed.

Table 5.28

Correlations between Parents' Demographic Data and Child Variables: Pakeha Sample

Parent variables	Child variables							
	Demographic variables			Self-concept	KPAG scores			
	Age	Birth Order	No. of children in family	Adjusted Brown	Cognition	Physical Skills	Socialization	Language
Maternal Education	-.22	-.004	-.30	-.30	-.83**	-.36	-.30	-.74**
Maternal Occupation	.06	-.17	-.29	-.22	-.38*	.01	.12	-.29
Playcentre Courses	-.04	-.19	-.17	-.16	-.29	-.08	-.10	-.26
Maternal Age	.15	.70**	.63**	.19	.22	-.05	-.04	.19
Paternal Education	-.27	.03	-.06	-.09	-.58**	-.15	-.25	-.57**
Paternal SES	-.29	-.22	-.20	.01	-.38	.004	-.06	-.33

Note: The *n*'s range from 36 to 41 dyads, with pairwise deletion of missing data.

Pearson product-moment correlation coefficients are significant at:

*$p < .01$, one-tailed.

**$p < .001$, one-tailed.

were very closely interrelated, they were not included together). These restrictions meant that, third, there were approximately 10 subject pairs per variable entered into a regression equation. The standard SPSS default criteria were used for the entry and removal of variables in the equations (that is, variables were entered only when the probability of the *F* test was equal to or less than .05, and were removed whenever the probability of the associated *F* value was greater than .10).

5. *There will be a relationship between Maori and Pakeha mothers' interactive behaviour and their children's cognitive performance.*

Significant zero-order correlations ($p < .01$) were found between eight maternal behaviours and the children's KPAG-Cognition scores (Table 5.30). Here, Direct Commands, Non-cooperation, and Criticisms correlated significantly and inversely with KPAG-Cognition. Teaching, Questions, Rewards, Attending, and Cooperation all related significantly and positively to the children's KPAG-Cognition scores. Among the Maori pairs, Direct Commands which related inversely, and Teaching which related positively, were significantly associated with KPAG-Cognition (Table 5.31). For the Pakeha pairs, strong inverse correlations were apparent between maternal Direct Commands and Non-cooperation and the children's KPAG-Cognition scores, and significant positive correlations were found between Questions and Rewards and the KPAG-Cognition scores (Table 5.32).

Subsequent regression analyses indicated that maternal education level ($R = .59$), Direct Commands ($R = .65$), and children's self-concept ($R = .69$) were the most potent predictors of the children's KPAG-Cognition scores (Table 5.33). When maternal education level was excluded from the analyses, Teaching became the second maternal interactive behaviour to enter the regression equations.

Separate regression analyses computed for the Maori sample demonstrated that the children's self-concepts ($R = .64$) and maternal Direct Commands ($R = .74$) related most strongly to the KPAG-Cognition scores. For Pakehas, maternal education level ($R = .63$) and Direct

Table 5.29

Intercorrelations among Child Variables

Child variable	Age	Birth Order	No. of children in family	Adjusted Brown	KPAG Cognition	KPAG Physical Skills	KPAG Socialization	KPAG Language
Birth order	.08							
No. of children in the family	.15	.86**						
Adjusted Brown Self-concept	.13	-.01	.01					
KPAG Cognition	.31*	-.13	.01	.42**				
KPAG Physical	.51**	-.08	.04	.25	.51**			
KPAG Socialization	.32*	-.11	-.003	.32*	.36*	.57**		
KPAG Language	.30*	-.25	-.11	.44**	.85**	.45**	.39**	
Observed requests for mother's cooperation	.14	-.17	-.09	.06	.08	.06	.04	.12

Note: The *n*'s range from 69 to 75, with pairwise deletion of missing data.

Pearson product-moment correlation coefficients are significant at:

*$p < .01$, one-tailed.

**$p < .001$, one-tailed.

Table 5.30

Correlations between Interactive Behaviours and Child Assessment Variables

Interactive Behaviour	Self-concept score	Keele Pre-school Assessment Guide Scores				
	Adjusted Brown (n = 69)	Cognition (n = 74)	Physical Skills (n = 75)	Socialization (n = 75)	Language (n = 75)	Cognition plus Language [a] (n = 74)
Physical Contact	.06	.13	.08	.06	.12	.13
Out of Contact	-.05	-.19	.09	.001	-.22	-.21
Attentive Observation	.01	.17	-.14	-.06	.14	.16
Playing Interactively	.18	.12	.20	.18	.05	.09
Cooperation	.23	.27*	.05	.03	.29*	.29*
Non-cooperation	-.28	-.32*	.03	.03	-.27	-.31*
Attending	.30*	.28*	-.07	-.02	.29*	.29*
Questions	.28*	.32*	-.12	-.08	.31*	.33*
Rewards	.25	.29*	.11	.10	.31*	.31*
Discipline	.01	-.21	-.04	-.01	-.17	-.20
Threats	-.09	-.11	-.08	-.04	-.14	-.13
Criticisms	-.17	-.28*	-.24	-.15	-.27	-.28*
Direct Commands	-.15	-.44**	-.15	-.15	-.48**	-.47**
Indirect Commands	.14	.23	.13	.26	.24	.25
Teaching	.23	.32*	-.08	-.06	.30*	.32*
Helping	-.16	-.16	.01	-.14	-.24	-.21

[a]Combined standardized score.

Pearson product-moment correlation coefficients are significant at:

*p < .01, one-tailed.

**p < .001, one-tailed.

Table 5.31

Correlations between Interactive Behaviours and Child Assessment Variables for Maori Pairs

Interactive Behaviour	Self-concept score	Keele Pre-school Assessment Guide Scores				
	Adjusted Brown (n = 30)	Cognition (n = 34)	Physical Skills (n = 34)	Socialization (n = 34)	Language (n = 34)	Cognition plus Language [a] (n = 34)
Physical Contact	-.03	-.10	-.29	-.15	.03	-.04
Out of Contact	-.19	-.03	.04	.01	-.12	-.08
Attentive Observation	.09	.33	.02	-.19	.18	.27
Playing Interactively	.05	.16	.08	.13	.19	.19
Cooperation	.45*	.35	-.02	.02	.30	.35
Non-cooperation	-.19	-.26	.21	.27	-.16	-.22
Attending	.38	.39	-.12	-.18	.26	.35
Questions	.25	.28	-.26	-.23	.20	.26
Rewards	.28	.26	.10	.10	.40	.35
Discipline	-.22	-.32	.01	.17	-.27	-.32
Threats	-.20	-.16	-.16	-.06	-.19	-.18
Criticisms	-.33	-.32	-.23	-.08	-.37	-.37
Direct Commands	-.12	-.44*	.01	.09	-.41*	-.45*
Indirect Commands	.14	.15	.03	.21	.07	.12
Teaching	.35	.42*	-.01	-.01	.40	.44*
Helping	.04	-.07	.23	.002	-.25	-.16

[a]Combined standardized score.

Pearson product-moment correlation coefficients are significant at:

*p < .01, one-tailed.

**p < .001, one-tailed.

Table 5.32

Correlations between Interactive Behaviours and Child Assessment Variables for Pakeha Pairs

Maternal Interactive Behaviour	Self-concept score	Keele Pre-school Assessment Guide scores				
	Adjusted Brown (n = 39)	Cognition (n = 40)	Physical Skills (n = 41)	Socialization (n = 41)	Language (n = 41)	Cognition plus Language [a] (n = 40)
Physical Contact	.10	.28	.26	.20	.20	.24
Out of Contact	.01	-.29	.12	-.02	-.36	-.33
Attentive Observation	-.02	.05	-.23	.04	.08	.07
Playing Interactively	.27	.14	.32	.32	.16	.16
Cooperation	.11	.23	.10	.04	.37*	.30
Non-cooperation	-.30	-.40*	-.03	-.11	-.45*	-.43*
Attending	.28	.18	-.05	.11	.30	.24
Questions	.33	.40*	-.02	.10	.50**	.46*
Rewards	.25	.39*	.13	.27	.42*	.41*
Discipline	.18	-.08	-.10	-.22	-.05	-.06
Criticisms	-.11	-.31	-.25	-.20	-.31	-.32
Direct Commands	-.27	-.46*	-.34	-.41*	-.52**	-.50*
Indirect Commands	.16	.29	.22	.29	.28	.30
Teaching	.17	.25	-.15	-.09	.34	.29
Helping	-.27	-.24	-.14	-.26	-.26	-.26

Note: Zero frequency of the behaviour Threats, which has been omitted.

[a]Combined standardized score.

Pearson product-moment correlation coefficients are significant at:

*$p < .01$, one-tailed.

**$p < .001$, one-tailed.

Commands (R = .71) powerfully predicted KPAG-Cognition (Table 5.34).

However, the maternal interactive behaviour factors did not relate significantly to the KPAG-Cognition score for the total sample nor for the separate ethnic or education level groups. One Pearson correlation coefficient did approach significance for each education group. For mothers from the higher education group, Factor I (Intrusion) related negatively to their children's KPAG-Cognition scores (r = -.33, p < .05). Among the lower education group pairs, Factor III (Verbal Stimulation) related positively to children's KPAG-Cognition scores (r = .32, p < .05).

Clearly then, the maternal behaviour most closely associated with children's KPAG-Cognition scores was Direct Commands. Direct Commands related to cognition significantly and inversely across ethnic and education groups.

6. *There will be a relationship between Maori and Pakeha mothers' interactive behaviour and their children's language assessments.*

Six maternal interactive behaviours related significantly to children's KPAG-Language scores. The behaviours were essentially the same as the above behaviours that correlated significantly with the Cognition score, although Non-cooperation and Criticisms did not reach significance (see Table 5.30). For Maori pairs, Direct Commands was the only behaviour that correlated significantly (and inversely) with KPAG-Language. Among the Pakeha pairs, however, Direct Commands and Questions were highly significant (p < .001) and Non-cooperation, Rewards, and Cooperation also correlated significantly with the children's language assessments on the KPAG (Tables 5.31 & 5.32).

In the multiple regression analyses, the first four predictors of KPAG-Language were maternal education level (R = .53), Direct Commands (R = .63), Rewards (R = .69), and the children's self-concept scores (R = .72) (Table 5.35). The children's self-concept scores and Direct Commands were the best predictors for Maori pairs, and

Table 5.33

A Summary of Stepwise Selection for the KPAG-Cognition Score

Step	Variable	Multiple *R*	*R* Square	*df*	*F* (Equ)[a]	*R* Square Change	*F* Change[b]	Beta In
1	Maternal Education (recoded as higher or lower)	.59	.35	1,67	36.16***	.35	36.70***	-.59
2	Direct Commands	.65	.43	2,66	24.60***	.08	8.96**	-.29
3	Child's Self-Concept (Adjusted Brown Score)	.69	.47	3,65	19.26***	.04	5.42*	.22

Note: $n = 69$. The *F* values reported in the stepwise regression tables are:

[a]*F* (Equ) = the test of *R* Square, or of the sum of squares, in the overall regression equation.

[b]*F* Change = the test concerned with the increment in the proportion of variance accounted for by the independent variable.

*$p < .05$.

**$p < .01$.

***$p < .001$.

Table 5.34

A Summary of Stepwise Selection for the KPAG-Cognition Score: Maori Pairs and Pakeha Pairs

Step	Variable	Multiple *R*	*R* Square	*df*	*F* (Equ)	*R* Square Change	*F* Change	Beta In
			Maori Pairs (n = 30)					
1	Child's Self-Concept (Adjusted Brown Score)	.64	.41	1,28	19.50**	.41	20.19**	.64
2	Direct Commands	.74	.55	2,27	16.67**	.14	8.89*	-.38
			Pakeha Pairs (n = 39)					
1	Maternal Education (recoded as higher or lower)	.63	.40	1,37	24.20**	.40	24.86**	-.63
2	Direct Commands	.71	.50	2,36	18.24**	.11	8.03*	-.34

*p < .01.

**p < .001.

Table 5.35

A Summary of Stepwise Selection for the KPAG-Language Score

Step	Variable	Multiple *R*	*R* Square	*df*	*F* (Equ)	*R* Square Change	*F* Change	Beta In
1	Maternal Education (recoded as higher or lower)	.53	.28	1,67	26.69***	.28	27.09***	-.53
2	Direct Commands	.63	.40	2,66	21.99***	.11	12.83**	-.35
3	Rewards	.69	.48	3,65	20.09***	.08	10.33**	.32
4	Child's Self-Concept (Adjusted Brown Score)	.72	.52	4,64	17.28***	.04	5.17*	.21

Note: $n = 69$.

*$p < .05$.

**$p < .01$.

***$p < .001$.

Table 5.36

A Summary of Stepwise Selection for the KPAG-Language Score: Maori Pairs and Pakeha Pairs

Step	Variable	Multiple *R*	*R* Square	*df*	*F* (Equ)	*R* Square Change	*F* Change	Beta In
			Maori Pairs (n = 30)					
1	Child's Self-Concept (Adjusted Brown Score)	.54	.29	1,28	11.38**	.29	11.79**	.54
2	Direct Commands	.65	.43	2,27	10.07**	.14	6.75*	-.37
			Pakeha Pairs (n = 39)					
1	Maternal Education (recoded as higher or lower)	.60	.37	1,37	21.35***	.37	21.93***	-.60
2	Direct Commands	.72	.51	2,36	18.93***	.15	11.14**	-.39

*p < .05.

**p < .01.

***p < .001.

maternal education level and Direct Commands were the first predictors of KPAG-Language for Pakeha pairs (Table 5.36).

Correlations between the five interactive behaviour factors and the KPAG-Language scores were not significant at $p < .01$ for the total sample nor for the separate ethnic groups. Factor I (Intrusion) did relate inversely to the children's KPAG-Language scores, and these correlations were significant at $p < .05$ for the total sample and the Pakeha pairs, but not for the Maori pairs. Subsequent separate analyses for the higher and lower maternal education groups yielded one significant correlation. Factor III (Verbal Stimulation) correlated in a significant and positive way with the KPAG-Language scores of children in the lower maternal education group ($r = .41$, $p < .01$).

The above results demonstrate strong inverse correlations between the maternal interactive behaviour Direct Commands and the children's KPAG-Language assessments. Maternal education level, Direct Commands, Rewards, and the children's self-concept scores also were important predictors of the KPAG-Language scores.

7. *Mothers' physical interactions will relate to their children's assessed self-concepts.*

Correlations between the physical interactive behaviours and the children's self-concept scores tended to be low or non-significant (see Tables 5.30, 5.31, & 5.32). For Maori pairs, however, a significant and positive correlation was found between mothers' Cooperation (sometimes expressed non-verbally) with their children's requests, and the children's scores on the Brown IDS Self-Concept Referents Test ($r = .45$, $p < .01$ (Table 5.31).

Non-verbal behaviours failed to enter the stepwise multiple regression analyses as predictors of the self-concept score. Multiple regression analyses in which the Brown score was the dependent variable are summarized in Tables 5.39 to 5.41.

Table 5.37

A Summary of Stepwise Selection for the Combined Cognition plus Language KPAG Score

Step	Variable	Multiple *R*	*R* Square	*df*	*F* (Equ)	*R* Square Change	*F* Change	Beta In
1	Maternal Education (recoded as higher or lower)	.58	.34	1,67	34.53***	.34	35.05***	-.58
2	Direct Commands	.66	.44	2,66	26.13***	.10	12.22**	-.33
3	Rewards	.72	.51	3,65	22.75***	.07	9.50**	.30
4	Child's Self-Concept (Adjusted Brown Score)	.74	.55	4,64	19.43***	.04	5.23*	.21

Note: $n = 69$.

*$p < .05$.

**$p < .01$.

***$p < .001$.

Table 5.38

Stepwise Selection for the KPAG Combined Cognition plus Language Score for the Ethnic Groups

Step	Variable	Multiple *R*	*R* Square	*df*	*F* (Equ)	*R* Square Change	*F* Change	Beta In
			Maori Pairs (n = 30)					
1	Child's Self-Concept (Adjusted Brown Score)	.62	.39	1,28	17.59**	.39	18.22**	.62
2	Direct Commands	.74	.54	2,27	15.87**	.15	9.41*	-.40
			Pakeha Pairs (n = 39)					
1	Maternal Education (recoded as higher or lower)	.63	.40	1,37	24.24**	.40	24.90**	-.63
2	Direct Commands	.73	.53	2,36	20.13**	.13	10.36*	-.37

*p < .01.

**p < .001.

The maternal interactive behaviour factors did not relate significantly to the Brown score for the total sample, nor within each ethnic group. Factor I (Intrusion) did relate inversely to the Brown score for both the total sample and the Pakeha sample, but the correlations were significant at only $p < .05$. Only when the higher and lower education groups were examined separately did a correlation reach significance. For the higher education group (Maoris and Pakehas included), a significant and inverse correlation was found between Factor I (Intrusion) and the self-concept score.

Few significant relationships were found, then, between mothers' physical interactions and children's self-concepts. Among Maori pairs, a positive relationship found between maternal Cooperation and children's self-concept was the one exception.

8. *There will be no relationship between mothers' verbal interactions and their children's self-concepts.*

As the above proposal had been stated in the null form, two-tailed tests of significance were applied (Fox, 1969; Guilford and Fruchter, 1978). Positive correlations between the two maternal verbal behaviours Attending and Questions and the children's Brown self-concept scores were evident, but failed to reach $p < .01$. No significant results were found for the separate ethnic groups.

Because few observed behaviours or demographic variables related strongly to self-concept, some variables correlating at the $p < .05$ level were entered into the regression analyses. For the total sample, maternal education level was the only predictor to enter ($R = .35$). When the behavioural variables alone were included as independent variables, Attending was the best predictor ($R = .30$) (Tables 5.39 & 5.40). For the Maori pairs, the best two predictors were maternal education ($R = .50$) and mothers' *marae* participation ($R = .61$). Among the Pakeha pairs, Questions entered ahead of maternal education level and was the only variable to enter (Table 5.41).

Table 5.39

A Summary of Stepwise Selection for the Adjusted Brown Self-Concept Score

Step	Variable	Multiple *R*	*R* Square	*df*	*F* (Equ)	*R* Square Change	*F* Change	Beta In
1	Maternal Education (Recoded as higher or lower).	.35	.13	1,67	9.65*	.13	9.79*	-.35

Note: $n = 69$.

*$p < .01$.

Table 5.40

Stepwise Selection for the Adjusted Brown Self-Concept Score: Maternal Education Excluded as an Independent Variable

Step	Variable	Multiple *R*	*R* Square	*df*	*F* (Equ)	*R* Square Change	*F* Change	Beta In
1	Attending	.30	.09	1,67	6.77*	.09	6.88*	.30

Note: $n = 69$.

*$p < .05$.

Table 5.41

Stepwise Selection for the Adjusted Brown Self-Concept Score: Maori Pairs and Pakeha Pairs

Step	Variable	Multiple *R*	*R* Square	*df*	*F* (Equ)	*R* Square Change	*F* Change	Beta In
				Maori Pairs (n = 30)				
1	Maternal Education (Recoded as higher or lower).	.50	.25	1,28	9.48**	.25	9.81**	-.50
2	Mothers' *marae* Participation	.61	.37	2,27	8.01**	.12	5.31*	-.36
				Pakeha Pairs (n = 39)				
1	Questions	.33	.11	1,37	4.54*	.11	4.67*	.33

*p < .05.

**p < .01.

In summary, two maternal verbal behaviours, Questions and Attending, were related positively to the children's self-concept scores. These relationships were only moderate, however, and the results were non-significant for each ethnic group.

9. *Maori and Pakeha 3-year-old children's self-concepts will relate positively to their cognitive performance.*

Pearson correlation coefficients showed a strongly positive relationship between the children's self-concept and KPAG-Cognition scores (r = .42, p < .001) (see Table 5.29). For the children from the Maori sample the above relationship remained significant (r = .64, p < .001), but among the Pakeha sample the correlation was lower (r = .33, p < .05).

As noted previously, the self-concept score was the third predictor of KPAG-Cognition in the regression analyses, following maternal education and Direct Commands (Table 5.33). For the Maori pairs, the Brown self-concept score was the first predictor (R = .64), although for the Pakeha pairs, self-concept failed to enter the regression equations (Table 5.34).

In summary, the Brown self-concept score was related positively to KPAG-Cognition for both ethnic groups, and this relationship was notably strong within the Maori sample.

10. *Maori and Pakeha 3-year-old children's self-concept scores will relate positively to their language assessments.*

The relationship between the children's self-concept and KPAG-Language scores was significant and positive (r = .44, p < .001) (Table 5.29). This relationship held for both the Maori and Pakeha samples (r's = .54 and .43 respectively, p < .01).

The Brown self-concept score was the fourth predictor of the KPAG-Language score for the total sample, and the first predictor of the KPAG-Language score for the Maori sample, but here again, the Brown

self-concept score did not enter the regression equations for the Pakeha children. Overall then, there was a consistent positive relationship between the Brown self-concept score and the children's KPAG-Language assessments, although this relationship was stronger for the Maori children.

11. *Maori mothers' cultural participation will be related to their observed behaviours and to the child assessment variables.*

Relationships between *marae* participation or Maori language fluency and some interactive behaviours were found, but the Pearson correlation coefficients were significant only at $p < .05$. Maori mothers' *marae* participation was associated positively with their Playing Interactively with their children for a longer duration. More frequent use of Indirect Commands and Non-cooperation was evident among mothers who were not fluent in the Maori language. Too few mothers appeared involved in Maori culture clubs for meaningful results to be found on that variable (Maori mothers' cultural affiliation responses are summarized in Appendix C).

As pointed out already, a potentially important relationship was found between one of the cultural variables and the children's scores on the Brown self-concept measure. Maori mothers' *marae* involvement was associated positively with their children's self-concept assessments. The regression analysis results presented in Table 5.41 show that Maori mothers' *marae* participation was selected as the second predictor of their children's self-concept score.

5.4 *Summary:*

In summary, some statistically significant ethnic and education-level differences in maternal interactive behaviour were found in this study. There was a highly significant ethnic difference on the behaviour of Playing Interactively. Maori mothers and their children played interactively together for a significantly longer duration than Pakeha mothers and their children. Meanwhile, Pakeha mothers responded to their children's demands, requests, and initiations with notably more Non-cooperation. When compared with Pakeha mothers, Maori

mothers also used significantly more Rewards and Teaching, and Teaching was particularly prevalent among Maori mothers from the higher education group.

Some other ethnic differences in interactive behaviour were noted, although these did not meet the prescribed $p < .01$ significance criterion. There was a trend towards a higher incidence of Direct Commands among Maori mothers, whereas Pakeha mothers were rather more likely to use Indirect Commands than Maori mothers. Further, the correlational analyses showed that, within the Maori ethnic group, Maori language fluency was associated inversely with the frequency of Indirect Commands.

Direct Commands were related to different behaviours across ethnic groups. For Maori mothers, Direct Commands correlated positively with Helping and inversely with being Out of Contact with the child, and these results were statistically significant. Among the Pakeha mothers, though, a positive statistical relationship was found between Direct Commands and verbal Criticisms. Overall then, ethnic or linguistic factors tended to be associated, to some extent, with differences in the use of meaning of mothers' Direct and Indirect Commands.

Significant maternal education-level effects were found on the verbal interactive behaviours. Specifically, mothers from the higher education group showed significantly more Attending, Questions, Rewards, and Teaching behaviour than the lower education level mothers, who used more Direct Commands. There was an additional non-significant tendency among higher education level mothers to respond to the child with more Cooperation, while lower education level mothers used more Non-cooperation. Unlike maternal ethnicity and education level, child gender was not an important influence on maternal interactive behaviour.

A highly significant relationship was identified between maternal Direct Commands and children's KPAG-Cognition and KPAG-Language assessments. For both ethnic groups, frequent Direct Commands were

associated with lower KPAG-Cognition and KPAG-Language scores. However, frequent maternal Rewards predicted higher scores on the above measure.

For Maori mother-child pairs, a strong, positive association was found between maternal Teaching and children's KPAG-Cognition scores, but among Pakeha pairs, Questions was the more important variable in relation to both the KPAG-Cognition and the KPAG-Language scores.

The relationships between maternal interactive behaviour and children's self-concept scores were less consistent, and few statistically significant relationships emerged. There was a moderate, positive correlation between Attending and the Brown self-concept score and a significant, positive relationship between Maori mothers' Cooperation and their children's self-concept scores. For the Maori pairs, mothers' education level and *marae* participation were predictors of the children's self-concept scores.

When the scores of the five maternal interactive behaviour factors were used in the analyses in place of the raw scores of interactive behaviour, most of the above results tended to be non-significant. Generally, a partial limited degree of consistency was noted between the results obtained using the raw scores, and the factor scores, of maternal interactive behaviour.

The children's Brown self-concept scores and KPAG-Cognition and KPAG-Language scores were significantly interrelated. This was especially evident among the Maori children, where the self-concept score strongly predicted the KPAG-Cognition and KPAG-Language scores.

Chapter 6

DISCUSSION

Overview: This chapter reviews and discusses the results presented in Chapter 5, and relates the findings to the literature reviewed previously in Chapter 2. The frequencies and correlational patterns of the interactive behaviours are discussed. Ethnic- and education-group differences in maternal interactive behaviour also are examined. The relationships between the maternal behavioural and demographic variables and the children's cognition, language, and self-concept scores are discussed, and the interrelationships of the child assessments are summarized. Finally, the nature and implications of the connections between maternal interactive behaviour and children's cognitive and language development, stemming from this study, are placed in both theoretical and practical contexts.

6.1 *Descriptive data:*

This study provides one of the first descriptions of mother-child interactive behaviours observed within New Zealand playcentre sessions and rated on a specific observational code. At a verbal level of interaction, the mothers most frequently issued Direct Commands during play, although mothers with School Certificate or higher educational qualifications more often tended to ask their children Questions. The verbal behaviours of Attending, Teaching, and Rewards were used less frequently by many of the mothers, but these behaviours do seem important too in some of the subsequent analyses. Overall then, Direct Command was the most frequently observed maternal verbal behaviour, and the mothers' use of Indirect Commands also appears rather frequent when viewed in relation to the mean incidence of child requests and initiations. Therefore in general, the distributions of the interactive behaviours suggest that the command content of the mothers' verbal behaviour is high.

At a non-verbal level, there appears a tendency for mothers to observe their children's play (Attentive Observation), together with a trend among the Maori mothers to participate actively in the play (Playing Interactively). Despite the specific instruction that each mother was to stay with her own child, some mothers spent relatively long periods near to their children, but not engaged in any form of interaction (Out of Contact). Nevertheless, verbal or non-verbal Cooperation with the children's requests was more frequent overall than maternal Non-cooperation, and also, extremely few mothers here used physical punishment (Discipline).

Very few related international studies have reported data that can be compared with the distributions of the interactive behaviour scores, and the only published study that used identical behavioural categories did not report comprehensive frequency data (Zegiob & Forehand, 1975). However, the frequency data reported by Borduin and Henggeler (1981) do provide some basis for comparison. As a preliminary caution it should be noted, though, that Borduin and Henggeler used fewer behavioural categories, somewhat different observational settings, and their sample was Anglo-American.

Although some behaviour frequencies reported by Borduin and Henggeler are comparable to the results here, some appear quite different. In both studies, the behaviours Playing Interactively and mothers' Questions were relatively frequent, occurring on average more than once per 1 minute of interaction. Also in both studies, Non-cooperation and forms of Discipline were infrequent behaviours. These were observed less than once per 3 minutes of interaction. A major difference in the frequency data of the two studies is found, however, on the category Out of Contact. Out of Contact occurred at an average rate of less than once per 3 minutes of interaction in Borduin and Henggeler's study, but more than once per 1 minute in this study. Mothers in the playcentre observations here may have been Out of Contact more because other children and siblings normally were present during the observations. In contrast Borduin and Henggeler's observations, both at home and in a university laboratory, were conducted with only the mother and the child-under-observation present.

Maternal Cooperation was observed less frequently here than in either Borduin and Henggeler's (1981) or Zegiob and Forehand's (1975) study. In the present study, though, the children's requests for cooperation also were relatively infrequent.

Direct Commands and Attentive Observation tended to be more prevalent here than among the mothers in Borduin and Henggeler's sample. In Borduin and Henggeler's study, Direct Commands were used on average once per 3 minutes of interaction, whereas here, Direct Commands were observed at a mean rate of at least once per 1 minute of interaction across all maternal ethnic and educational and child gender groups. The higher frequency of Direct Commands observed in this study may be attributed, in part, to the children's younger ages (3 years here, 4 years in Borduin and Henggeler's study). Younger ages are likely to be associated with less advanced language development, and Borduin and Henggeler have suggested that children with less advanced language receive more maternal Direct Commands than do children who are more advanced.

Alternatively, both the Maori and the Pakeha mothers participating in this study may have been more directive or abrupt in language style, or more commanding in child-care practice, than the white, middle- and lower-class mothers in Borduin and Henggeler's (1981) North American study. The tentative comparative data presented above on the categories Direct Commands and Cooperation do support the suggestion that there could be a relatively high degree of maternal directing in the interactions observed here.

New Zealand playcentres actively discourage physical punishment of young children and normally do not permit the use of smacking during sessions. While this study was not designed specifically to examine the mothers' use of corporal punishment, it is of interest to note that Ritchie and Ritchie's interview studies, reviewed previously in Chapter 2, indicate that many New Zealand parents do rely on using physical punishment, and that physical punishment has been prevalent among many Maori families (Jane Ritchie, 1979; Ritchie & Ritchie, 1966, 1970, 1981). Only two cases of smacking were observed in this

study and were mentioned in Chapter 5. Consistent with Ritchie and Ritchie's (1970, 1981) findings, both cases did involve Maori (lower education group) mothers.

As the behaviour Discipline was recorded too infrequently to be included in the subsequent major analyses, however, physical punishment was observed too rarely in this study to derive conclusions about its use. A further investigation, using repeated home-based observations, would be required to observe the actual extent, context, and situations relating to parents' use of corporal punishment.

The within-group differences in maternal interactive behaviour, detected on the box-plots, support Tulkin's (1977) argument that important behavioural differences occur within groups as well as between groups. Although the discussion above does suggest that the mean scores for Direct Commands were uniformly high, there were also some mothers in each of the ethnic and education groups who used very few Direct Commands. Within the Maori lower education group, for example, the range of Direct Commands extended from 3 to 85 per 15 minutes' interaction. In this study then many, but by no means all, of the mothers very frequently addressed their children with Direct Commands.

Consistent patterns of behaviours with a teaching versus ignoring component were found across the ethnic and education-level groups but, in addition, some differences in behavioural correlations were identified between the ethnic groups. The ethnic difference found on the correlates of Direct Commands may suggest a difference in the content or meaning of that behaviour. For Pakeha mothers from both education groups, Direct Commands correlated significantly and positively with Criticisms. Maori mothers' use of Direct Commands was related to Helping their children physically, although among the Maori higher education group, Direct Commands were associated more strongly with Teaching.

The detailed analysis of the length and syntactical content of each occurrence of each behaviour was beyond the scope of Zegiob and Forehand's (1975) measure and the intentions of this research.

However, a preliminary scan of the partial transcripts of the mothers' verbal utterances was made, but this revealed no obvious differences in the context or content of Maori and Pakeha mothers' Direct Commands. Further research designed specifically to provide detailed linguistic analysis could explain more precisely the verbal content of Maori and Pakeha mother-child interactions.

For some Maori and Pakeha mothers the meaning of certain behaviours may have differed, though, as a function of language background. Metge and Kinloch (1978) have observed that some directions that would be polite in Maori such as "do this" (a Direct Command) may seem abrupt in English, where, to Pakehas, a more circuitous form might seem more polite like "would you mind doing this" (without an inflection, this is an Indirect Command). Therefore, some Maori mothers may have used Direct Commands merely as a familiar language form, whereas some Pakeha mothers may have used Direct Commands with more imperative meaning.

Some differences between the maternal interactive behaviour factors extracted for the separate Maori and Pakeha groups could be explained in a similar manner (see Appendix C). In the separate ethnic group factor analyses, high loadings for Direct Commands and Helping versus Attentive Observation are seen on the Maori sample's Factor II, but Criticisms and Direct Commands have high loadings on the Pakeha sample's Factor II. Here again then, the different meanings of Direct Commands for the Maori and Pakeha mothers may be reflected.

The lack of statistically significant ethnic differences in the children's KPAG-Cognition scores and the non-significant ethnic difference on their KPAG-Language scores are relatively consistent with recent findings mentioned in Chapter 2 (Brooks, 1975; Harker, 1980; Klippel, 1975; McDonald, 1976a; A. St.George, 1974; St. George, 1977, 1980). Major qualitative differences are not apparent in the cognitive or language performance of the children from the Maori and the Pakeha samples.

6.2 *Influences on maternal interactive behaviour:*

In this study it was found that, apart from maternal ethnicity and maternal and paternal education and occupation, few maternal, paternal, or child demographic variables related strongly to the interactive behaviours. Exceptions were the child's later birth order and larger family size, which both related significantly and positively to the mothers' use of Direct Commands. In addition, mothers' lack of participation at playcentre courses was associated inversely with their use of Indirect Commands (that is, attendance of playcentre courses related positively to using Indirect Commands). Within the maternal ethnic and education groups, then, the explanation for the marked individual differences in mothers' interactive behaviour seems to lie, to some degree, beyond the variables examined here.

Further interpretation of the importance of the variables cited above (parental education, child's birth order, number of children in the family, and the mother's attendance of playcentre courses in child development) might be derived, however, from a model currently being developed by McGillicuddy-DeLisi (in press) and McGillicuddy-DeLisi et al. (1979). The results of the correlational analyses outlined above do show some preliminary consistency with McGillicuddy-DeLisi's more comprehensive causal model. McGillicuddy-DeLisi has suggested that parents' beliefs about child development intervene between important background variables (identified specifically as parents' education and number and spacing of their children) and influence parents' teaching and interactive behaviours. Individual differences in interaction might be explained further, then, by future motivation-orientated research that examines simultaneously and more specifically parents' perceptions of child development in general, their understanding of their own child, and their interactive behaviours (McGillicuddy-DeLisi, 1982, in press).

Maternal ethnic- and education-group membership were associated with important differences in several aspects of the mothers' interactions with their children. Marked ethnic and education-level differences in interactive behaviour were described in Chapter 5.

The highly significant ethnic effect on Playing Interactively supports Proposal 1, that Maori mothers would use more physical interactions than Pakeha mothers, and this result also substantiates some previous comments on child-rearing practices among Maoris (Metge & Kinloch, 1978; Ritchie & Ritchie, 1970). The longer duration of Playing Interactively among Maori pairs, compared with Pakeha pairs, could reflect a tendency among Maoris to emphasize learning by participation. As one example of a situation in which Playing Interactively was observed, Maori mother-child pairs frequently sat side-by-side and participated mutually in kneading playdough and making "bread", "cakes", or "biscuits". Metge and Kinloch (1978) identified a tendency within Maori families for children to learn by practical participation alongside an adult, and the playdough example above appears to illustrate that tendency.

The trend among Maori mothers to participate actively in their children's play for a longer duration than Pakeha mothers is also comparable with Ritchie and Ritchie's (1970) interview findings. Ritchie and Ritchie commented that, in contrast with urban Pakeha mothers who appeared to make an effort to play with their children, Maori mothers seemed delighted to play with their children. Therefore, all the evidence supports the view that Playing Interactively was a familiar, positive experience for more Maori mothers than Pakeha mothers.

In addition to the playdough example, some other situations where Playing Interactively within the child's conception of play occurred included dramatic or fantasy play in which both the mother and child were actively engaged, mutual construction of houses from blocks, and participation together at carpentry tasks. Both Pakeha pairs and Maori pairs were observed during all the above activities. The statistically significant ethnic effect on Playing Interactively and impressions gained from rating the videotapes suggest, however, that in general, Pakeha mothers were involved less frequently than Maori mothers as active and equal participants in the play.

Once again, however, marked within-group differences did occur, particularly within the Pakeha higher education group, and these

differences were noted in Chapter 5. Some individual Maori mother-child pairs seldom were observed Playing Interactively, whereas several Pakeha pairs played interactively for relatively long periods (see also the box-plots, Appendix C).

Proposal 1 is supported, then, but only on one of the primarily physical behaviours, Playing Interactively. No statistically significant ethnic differences were found on the more passive physical behaviour of Physical Contact, on the more sedentary behaviour of Attentive Observation, nor on the rather more intrusive behaviour of Helping. Therefore, in contrast with Tulkin's (1977) suggestions, the ethnic difference detected here concerns the mothers' active physical participation rather than their passive physical presence.

The verbal behaviour results generally do not lend support to Proposal 2, that Pakeha mothers would interact in a verbal mode more frequently than Maori mothers, and these data differ from some previous observations of Maori mothers (Jane Ritchie, 1978; Thomas, 1978a). Non-cooperation was the only behaviour used significantly more frequently by Pakeha mothers, whereas Maori mothers used more Teaching and Rewards. Additional non-significant ethnic effects were reported on the behaviours Direct Commands and Indirect Commands. Contrary to Proposal 2, then, the Maori mothers tended to praise their children more often, and seldom refused or ignored their children's initiations, compared with their Pakeha counterparts. These findings nevertheless are consistent with Metge and Kinloch's (1978) suggestion that immediate reinforcement of children's behaviour may be more characteristic among Maoris. Metge and Kinloch discussed their proposition primarily in terms of physical rewards and punishments, but the Rewards observed here in this study almost invariably did have a verbal component.

The Maori mothers' relatively high mean frequency of Teaching behaviour here appears comparable to findings among some Afro-American samples. Baldwin and Baldwin (1973), who reported that black American mothers used more didactic teaching during free play than white American mothers, related their results to the black mothers' expressed concern about their children's future educational attainments.

Similarly, during the maternal interviews several Maori mothers spontaneously referred to aspects of their own children's development, and further, some expressed interest in and concern about Maori education in general. Therefore, the higher incidence of Teaching shown by the Maori mothers, and notably by those from the higher education group, seems consistent with a stated concern about education.

Minor variations in the frequency of the Maori and Pakeha mothers' use of Direct Commands and Indirect Commands might reflect possible Maori-English language differences. Both the results pertaining to Maori and Pakeha mothers' command differences, and the inverse relationship between Maori mothers' fluency in the Maori language and their use of Indirect Commands, only approached significance. These results do seem logical though, if indirect forms of requests are more characteristic of the English language than of the Maori language, because Maori mothers who were fluent speakers of both languages might have been less accustomed to using indirect forms of commands (Metge & Kinloch, 1978). However, the influence of the Maori language is not suggested on any of the other verbal behaviours. The mothers' fluency in the Maori language was not related even moderately to their use of Questions and Attending, for example, and no major ethnic group differences were found on the incidence of these verbal behaviours.

In summary, then, the results discussed above in the context of Proposals 1 and 2 show that maternal ethnic group membership was associated strongly with the mothers' use of the behaviours Playing Interactively, Non-cooperation, Teaching, and Rewards. In contrast with Fergusson et al.'s (1982) report that disadvantaged home conditions and early educational opportunities were evident among children from Maori and Pacific Island families, then, environmental disadvantage cannot be inferred from the Maori mothers' interactional data here. Nor are the ethnic group comparisons of verbal interaction examined above consistent with Thomas' (1978a) results, which show that relatively low levels of verbal interaction occurred among Maori mother-child pairs. Controlling the samples, in terms of type of

pre-school attended and mothers' school qualifications, appears to have worked against "deficit" interpretations.

It could be argued that the Maori higher education group included in this study was not at all representative of Maori mothers in general. The sampling endeavours described in Chapter 4 certainly illustrate that there was a relative scarcity of Maori mothers attending the playcentres who had attained a full School Certificate qualification. Nevertheless, extending the New Zealand child-rearing research to include Maori mothers holding formal school or professional qualifications is an important step. Already, Laosa (1982) has demonstrated that examining the impact of formal schooling on mothers' teaching interactions across ethnic groups can yield data that are important both theoretically and practically.

Certainly the New Zealand data reported here are congruent with Laosa's (1982) finding that important ethnic differences in maternal teaching behaviour, favouring the majority Anglo group, did not occur when maternal education level was held constant. In this study, major differences are not apparent in the frequency of the Maori and Pakeha mothers' use of Questions or Attending. However, the Maori mothers' relatively greater use of Rewards and of Teaching does suggest that attempts to control maternal education level led to an additional interesting outcome. Hypothesized quantitative differences in Maori and Pakeha mothers' verbal teaching interactions were not merely eliminated, but on two behaviours they were reversed.

Maternal education level was associated with notable differences on an extensive range of verbal behaviours. Therefore, Proposal 3, concerning the influence of education on Maori and Pakeha mothers' interactions with their children, is confirmed on the behaviours Teaching, Questions, Attending, Rewards, and Direct Commands. With the exception of Direct Commands, the higher education level mothers used the verbal behaviours listed above more frequently than did the lower education level mothers.

The differences across the education groups in mothers' verbal behaviour may be partly attributable to the greater verbal facility,

at least in English, of the mothers from the higher education group. This discussion is confined to English, because apart from very occasional words in Maori, almost all the maternal utterances coded were in English. Although the mothers' verbal abilities were not assessed formally in this study, all mothers assigned to the higher education group had passed at least School Certificate level English, whereas almost all mothers from the lower education group had not. Therefore, a link is suggested here between mothers' English language skills and their verbal interactive behaviour, and this is supported by related research findings. For example, Borduin and Henggeler (1981) and Clarke-Stewart et al. (1979), who did test mothers using the Wechsler Adult Intelligence Scale, demonstrated that maternal verbal intelligence was associated more strongly with mothers' use of questions or other positive verbal behaviours than was either the complex variable of social class or the child's intelligence.

In addition, there may have been a more marked tendency among higher education group mothers, than among lower education group mothers, to perceive themselves as potential teachers, able to influence their children's development. Accordingly, mothers from the higher education group would have stimulated their children more by using more Questions, Attending, and Teaching. Tulkin and Kagan (1972) have already asserted rather similarly that lower-class mothers, with less schooling experience, tend to feel powerless and unable to affect their infants' intellectual development. Again, these interpretations imply the need for further research to assess the motivations that influence individual parents' child-rearing behaviour, parents' understanding of children's learning and development, and their interactions.

The verbal behaviour of mothers from the higher education group may have modelled the teaching styles prevalent in many classrooms. Higher education group mothers generally had spent more time at secondary school and invariably had been more successful there, using the limited criteria of examination passes, than lower education group mothers. Further, two Maori and three Pakeha mothers (or 14.7% of the combined higher education group) were themselves qualified, experienced teachers. It appears reasonable to assume, then, that

the higher education level mothers might have used the teaching behaviours often observed in schools, and previously practiced by some in schools. Archer and Wilson's (1980) review shows that teachers' questioning, attending, and positive reinforcement styles have been observed prominently in the New Zealand classroom interaction research, and the higher education group mothers here relatively frequently used Questions, Attending, and Rewards.

LeVine and Laosa have interpreted rather similarly the high incidence of inquiry and praise observed among some Chicano mothers (Laosa, 1982). When interacting with their 5-year-old children, Chicano mothers who had attended school for a longer duration appeared to imitate the conversational style (inquiry) and positive reinforcement (praise) used in U.S. classrooms. In contrast, Chicano and Anglo-American mothers who had attended school for a shorter duration used more physical demonstrations (modelling) and directives, behaviours considered less characteristic of classrooms (Laosa, 1982).

In the present study too, mothers from the lower education group used more Direct Commands than mothers from the higher education group. This result seems similar to findings from social-class comparative studies, reviewed in Chapter 2. Frequently, the verbal interactions of lower-class mothers have been described as more controlling and directive than those of middle-class mothers (Bee et al., 1969; Clarke-Stewart et al., 1979; Cook-Gumperz, 1973; Kamii & Radin, 1967; Kogan & Wimberger, 1969; Lytton, 1976; Phinney & Feshbach, 1980; Zegiob & Forehand, 1975).

In contrast with Laosa's (1980b, 1981, 1982) studies, which used a structured teaching task, spontaneous play was observed in this study and therefore the mothers' role was less clearly defined. Perhaps more mothers from the higher education group perceived their role during play as one involving teaching or conversing with their children, but more mothers from the lower education group may have seen control or guidance of their children's behaviour as an important objective.

The more frequent use of Direct Commands by many mothers from the lower education group may be related, then, to differing levels of verbal facility, to an abrupt speech style, or to a relatively greater tendency to control their children's behaviour. Conceivably, the data for Direct Commands also could reflect the children's impact on their mothers (Bell & Harper, 1977; Borduin & Henggeler, 1981; Harper, 1975).

It is possible that children of lower education group mothers were less frequently obedient in response to Direct Commands than were children of higher education group mothers. If that were the case, Direct Commands might have been used repeatedly in response to non-compliance. An observational measure that analyses sequences of maternal commands and child compliance would be needed to examine this possibility. However, mothers' frequent use of Direct Commands also may have been part of a stable speech pattern or a characteristic teaching style. Steward and Steward (1974) did demonstrate that some social-class and ethnic differences in teaching behaviour persisted across mothers' interactions with each of three quite different children, only one of whom was their own.

Both the cognition and the language mean scores on the KPAG favoured the children in the higher maternal education group, rather than the children from the lower maternal education-level group. Therefore, lower education group mothers may have used more Direct Commands in response to their children's less advanced development, whereas higher education group mothers may have used fewer Direct Commands because their children were, on average, more competent in the domains of language and cognition. Considering the absence of complex, causal analyses here, though, and in view of some of the research reviewed previously in Chapter 2, the above suggestion provides only a partially tenable interpretation of the data (see Clarke-Stewart, 1978; Steward & Steward, 1974). Clarke-Stewart's (1978) longitudinal causal analysis did suggest a mother-to-child direction in the relationship between maternal interactions and young children's intellectual performance. Therefore, the child's cognitive and language skills, per se, do not appear to explain adequately the education-group differences in the mothers' use of Direct Commands.

Social-class and education-level differences in maternal interaction sometimes have been accentuated by the observational settings or the structured tasks used (Tulkin, 1973). Apart from the suggestion made previously that mothers from each education group may have had different perceptions of maternal roles during spontaneous play, the above assertion appears minimally applicable here. Unlike the laboratory settings of many previous studies, the playcentres were equally familiar for higher and lower education group mothers. Relatively similar involvement in playcentre was apparent, because the mean number of playcentre courses undertaken by the mothers did not differ significantly for the two education groups (see Appendix C). Furthermore, the totally unstructured, child-selected task situation had been designed specifically to facilitate a naturalistic approach and to equalize the familiarity of the tasks across dyads. The results therefore provide evidence of a statistically significant education-level effect on maternal verbal behaviour, and the effect cannot be attributed simply to the external factors of setting or task situation.

Education-level differences on the non-verbal behaviours were, however, invariably non-significant. The analyses both with the interactive behaviour scores and with the maternal interactive behaviour factors do suggest some association between maternal education level and certain aspects of responsiveness (Cooperation, Non-cooperation, and Out of Contact behaviours). In general, though, the results are consistent with Tulkin and Kagan's (1972) report that mothers' education or social class is associated strongly with their verbal stimulation of, but not with their affective or physical interactions with, their infants.

Finally, contrary to Proposal 4, the data show that child gender was not an important influence on the quantitative aspects of either the verbal or the non-verbal maternal interactive behaviours. These results differ from those of earlier observational studies (Cherry & Lewis, 1976; Fagot, 1974; Minton et al., 1971). Similarly, they are in contrast with the more recent findings from the New Zealand interview research (Jane Ritchie, 1979). Interestingly, however, the child gender data reported in Chapter 5 are quite consistent with the results reported from some very recent studies of mothers' teaching

behaviour (Laosa, 1980b, in press). Perhaps then, these data reflect some decline over time in the association between child gender and the frequency and duration of some maternal interactive behaviours.

In summary, there was a relationship between maternal ethnicity and the occurrence of the behaviours dyadic Playing Interactively and maternal Non-cooperation, Teaching, and Rewards. Applying LeVine's (1977) and Laosa's (1981) theoretical perspectives on cultural relativism, some of the above results have been interpreted with reference to aspects of Maori culture. The findings here show some consistency with Laosa's research (1980b, 1981, 1982), which has examined the relationships among maternal ethnicity, mothers' schooling, and maternal teaching behaviour. The impact of sample control on observations of Maori and Pakeha mothers' interactions has been identified. The substantial association that was found between maternal education level and maternal verbal behaviour has been discussed with reference to mothers' verbal facility, their control, their perceived influence on children's intellectual development and their related role perceptions during play, modelling theory, and the child's performance on the KPAG measure. Some implications of the above results are examined further in the following discussion of the children's KPAG-Cognition and KPAG-Language data.

6.3 *The relationships between the maternal interactive behaviours and the children's self-concepts and cognitive and English language performance:*

Several maternal interactive behaviours were associated strongly with the children's KPAG-Cognition and KPAG-Language scores. Accordingly Proposal 5, concerning the likely relationship between maternal interactive behaviour and the children's cognitive skills, is supported by eight of the behaviours in the correlational analyses for the combined Maori and Pakeha samples.

Both the correlational and the subsequent factor analyses of the maternal interactive behaviours indicate that Questions, Attending, Teaching, and Rewards were intercorrelated variables with a stimulating, teaching component (Tables 5.12 to 5.16). In turn, the above behaviours related significantly and positively to the children's KPAG-Cognition

score. Therefore, the results also lend some support to the established link between maternal verbal stimulation and children's intellectual development (Clarke-Stewart, 1977; White et al., 1978).

Further, maternal Cooperation and Rewards were associated positively, and Non-cooperation and Criticisms correlated inversely, with the children's KPAG-Cognition score. The above significant results correspond, then, with the positive relationship found previously between harmonious child rearing or maternal responsiveness and some children's intellectual skills (Baumrind, 1971, 1973; Clarke-Stewart, 1977; Hatano et al., 1980; Lane, 1980; White et al., 1978).

As shown by the multiple regression analyses, however, the single most important result here pertains to maternal Direct Commands. Direct Commands were related in a significant and inverse manner to the KPAG-Cognition scores of the Maori and Pakeha children, and Direct Commands was the second predictor of the KPAG-Cognition score, preceded only by maternal education level.

The above result corresponds with findings from studies that have used Piagetian assessment measures. Maternal directiveness has been associated inversely with children's performance on Piaget's seriation, conservation, and number tasks (Adjei, 1977; Hatano et al., 1980; Kirk, 1977).

Tyler (1977), in developing the KPAG, did acknowledge the direct influence of Piaget's work. In the cognition section of the KPAG the nature of some sorting, classification, and number tasks, and the emphasis on conservation, clearly are Piagetian (see Appendix B.3). Therefore, this study affirms the presence of a significant, inverse relationship between mothers' directive verbal behaviour and children's performance on cognitive assessment measures that have a Piagetian component.

When using Direct Commands, mothers specified directly the behaviours they required of their children. Unlike Questions or Indirect Commands, then, maternal Direct Commands offered the children

very few active choices in decision making (Appendix B.1). Consequently, following Piaget's (1977a, 1977b) theoretical perspective, the above result could reflect that frequent maternal Direct Commands and children's active learning by assimilation of schemes or concepts are incompatible.

Hunt's (1963, 1965) postulate of intrinsic motivation also appears relevant here. Hunt (1963) suggested that the ongoing process whereby young children actively and spontaneously assimilate and process schemes from the environment may be an early manifestation of intrinsic motivation. The result for maternal Direct Commands therefore seems in line with both Piaget's and Hunt's theoretical perspectives. Assimilation and accommodation, and intrinsic or endogenous motivation, all imply an actively learning and inquiring child motivated by the task itself, rather than one accustomed to responding to frequent external directions.

The inverse relationship found by Adjei (1977), Hatano et al. (1980), and Kirk (1977) between maternal directiveness and children's performance on Piagetian tasks has also been described, by Hatano and associates, as congruent with Piaget's stress on the child's spontaneous role in assimilatory activities. Clearly then, the above theoretical suggestions are consistent with, but extend, Hatano et al.'s (1980) interpretations of related research.

Specific cause-effect inferences do lie beyond the scope of the data presented to date in the context of Proposal 5, and of those reported by Adjei (1977) and Kirk (1977). Nevertheless Hatano et al.'s (1980) longitudinal study, described previously in Chapter 2, has supported the inhibiting effect of maternal directiveness on children's development of number conservation. Analyses in which both children's verbal ability (assessed at age 4, when the mothers' interactive behaviour was rated) and SES were partialled out showed that Japanese mothers' directiveness remained a highly robust predictor of their children's number conservation at age 6. In the New Zealand context then, subsequent path analyses and longitudinal research could promote further understanding of the particularly potent inverse relationship found here between mothers' Direct Commands and their children's cognitive performance.

The separate regression analyses for the Maori and Pakeha samples support the importance of Direct Commands across the ethnic groups. However, the Maori-Pakeha differences found on the behavioural correlates of the children's KPAG-Cognition scores suggest that the importance of specific forms of verbal stimulation or teaching does vary for Maoris and Pakehas (see Tables 5.32 and 5.33). For the Maori pairs, Teaching appears singularly important, and Attending also approached significance. Among the Pakeha pairs, though, significant positive correlations were found between maternal Questions and the children's KPAG-Cognition score, and Rewards also seems to be of some importance.

The correlations reported for the Maori mother-child pairs appear to suggest, then, that didactic teaching was more relevant to these children's cognitive development than were question-and-answer teaching strategies. Alternatively however, the relative importance of Questions among the Pakeha pairs also could reflect possible ethnic differences in the nature of the Questions used. It was noted in Chapter 2 that different forms of questions do place high-level or low-level cognitive demands on children, and therefore have different developmental implications (Laosa, in press; Sigel, in press).

Metge and Kinloch (1978) have already identified some minor differences in the form of questions sometimes used by Maoris and Pakehas. Accordingly, the partial verbal transcripts were scanned here to examine the syntax of the questions used. Only mothers who were Maori speakers used some questions in the form of a statement followed by "eh?", and this occurred very rarely. (An example was "How about you mix it up, eh?" with an inflection, as opposed to "Would you like to mix it up?"). Both the above examples offer the child options, and neither form appears to include high-level cognitive demands. Research using a more detailed verbal coding system than that of Zegiob and Forehand (1975) would be required, however, to assess and compare in detail the cognitive demand levels imposed in the question-and-answer sequences.

The above findings for Teaching and Questions do support the usefulness of analysing specific verbal frequency categories, not

merely global behavioural factors. Teaching and Questions were quite closely intercorrelated behaviours for both the Maori and the Pakeha samples. When Teaching, Questions, and other related behaviours were combined into one complex maternal interactive behaviour factor, however, their separate and different associations with children's assessments were indistinguishable. Therefore, compared with the interactive behaviour factors, the separate interactive behaviours contributed considerably more to understanding the relationships between some maternal interactions and children's cognitive performance.

Proposal 6, regarding the relationship between maternal interactions and children's language assessments, is supported by six of the behaviours in the correlational analyses and by the behaviours Direct Commands and Rewards in the regression analyses. Again, the single most important result, which remained constant across ethnic groups, concerns Direct Commands.

The significant inverse relationship between maternal Direct Commands and children's assessed language development corresponds with most previous findings concerning mothers' directiveness or their use of imperatives (Clarke-Stewart, 1973; Hoff-Ginsberg & Shatz, 1982; Nelson, 1973; Newport et al., 1977; Olim, 1975). The above result does contrast, however, with Lytton's (1980) reported positive association between maternal directiveness and children's linguistic competence. Probably some of the difference lies in the aspects of language assessed. Lytton observed younger, 2-year-old boys, and showed that mothers' commands and prohibitions strongly and positively predicted the boys' speech rate, but not their speech maturity. In fact, only mild or reasoned parental suggestions, which probably involved more complex speech, were associated positively with the quality of the boys' language (Lytton, 1980). Here however, the definition of Direct Commands implied abrupt, imperative speech, and Direct Commands were related strongly and inversely to the quality of children's use and understanding of the English language, as assessed on the KPAG.

When reviewing the coded videotapes and partial transcripts, it was apparent that complex verb forms occurred on some behaviours, but

not on Direct Commands. For example, while children worked on cutting-sticking collage activities, some Direct Commands used by the mothers were "Get that one", "Put some glue on", "You get some more pictures", whereas Indirect Commands, Questions, and Teaching included, "You could put some on that one", "Where are you going to paste it?", "Would you like to have some special glitter too?", and "If you press this one down here like this it will spring out". It could be argued, then, that the mothers' extensive use of Direct Commands would not provide children with a speech model using diverse verb tenses and moods.

The children's use of passive verb structures, types of auxiliary verbs, and their understanding of complex questions were all observed and assessed on the language items of the KPAG. However, none of these speech forms was characteristic of maternal Direct Commands which, as the above examples show, contained simple verb forms. In contrast, the children who heard more Indirect Commands, Questions, and Teaching, rather than Direct Commands, could learn auxiliary verbs and more complex structures by observation or modelling of their mothers' speech inputs.

This interpretation reflects a social-learning theoretical perspective, but in addition, it is consistent with more recent explanations of the nativist model of language acquisition (Caplan & Chomsky, 1980; Hoff-Ginsberg & Shatz, 1982; Newport et al., 1977). As Newport et al. (1977) have noted, simple verb forms are universal, but some elements of auxiliaries are not and are learnt from language input. An input of constant Direct Commands therefore would not facilitate children's acquisition of more complex speech.

Recent research also suggests that mothers' frequent use of commands is associated with children's minimal opportunities for conversation (Hoff-Ginsberg & Shatz, 1982). Although the relative proportions of maternal and child speech were not measured here, the above finding possibly could be applicable. A tentative viewing of some of the videotaped data and the verbal transcripts tended to suggest that mothers using up to 85 Direct Commands during 15 minutes of spontaneous play probably had limited time left for reciprocal conversation with their children.

Again, the causal direction of the inverse association between Direct Commands and children's language assessments can not be established by the data presented in Chapter 5. Direct Commands may have been used in response to the perceived developmental levels of the children (Borduin & Henggeler, 1981). Newport et al.'s (1977) study, reviewed in Chapter 2, does suggest, however, that some forms of imperatives used by mothers are antecedents of their children's delayed language growth.

An important positive association was found, both in the correlational and in the regression analyses, between maternal Rewards and children's KPAG-Language scores. This result is consistent with previously reported findings regarding mothers' encouragement, acknowledgements, and approvals and their children's language development (Lytton, 1980; Tannock, 1980).

A positive statistical relationship was found between Pakeha mothers' Questions and their children's KPAG-Language scores, but here too, the Maori mothers' use of Questions was not associated significantly with their children's assessment scores. These data suggest again that the use of question-and-answer teaching strategies may be more appropriate for young Pakeha children than for young Maori children. Alternatively, there could be some underlying variations in the form and content of the Maori and Pakeha mothers' Questions.

In summary, Proposal 6 also is confirmed most markedly on the behaviour Direct Commands. The above finding, which is consistent with some previous research, can be understood from both a social learning and a nativist conception of language development. When the correlation between maternal Questions and the children's KPAG-Language scores was examined, the result varied for the Maori and Pakeha samples.

In contrast with Proposals 5 and 6, Proposal 7, concerning the relationship between mothers' physical behaviours and children's self-concepts, appears to have only very limited support from the data. Overall, the physical maternal interactive behaviours did not relate significantly to the children's self-esteem measured on the Brown IDS Self-Concept Referents Test. The one exception identified concerns the

Maori mothers' use of Cooperation, which did relate significantly and positively to their children's Brown score. In view of the possible instability of the self-concept scores among the Maori sample, though, the above result does require rather cautious interpretation.

It is conceivable however, that Maori mothers' Cooperation with their children's requests or initiations did manifest aspects of their nurturance or acceptance of their children. In that case, the positive relationship found between Maori mothers' Cooperation and their children's self-concept score might correspond with Coopersmith's contention that maternal acceptance is associated with children's high self-esteem. Also, the above result would be consistent with McAdoo and McAdoo's (1979) finding that black mothers' nurturance related positively to their self-concept scores.

The absence of other important relationships between mothers' physical interactive behaviours does contrast, however, with findings from previous interview studies (Coopersmith, 1967; Flynn, 1979). Perhaps some important relationships found between mothers' hypothetical or recalled behaviour and children's self-concepts will not be replicated by studies that directly observe behaviour.

Further, the relationships between mothers' verbal behaviour and their children's self-concept scores were only weak to moderate here, with the results for the behaviours Questions and Attending only approaching significance. In line then with Proposal 8, that stated there would be no relationship between mothers' verbal interactions and their children's self-concepts, the results show no clear, strong association between the verbal behaviours and the children's Brown self-concept scores. Similarly, McAdoo and McAdoo (1979) reported quite weak correlations between the verbal interactions of Anglo-American mothers and their children's self-concept scores. Thus, the observational data reported here, and those of McAdoo and McAdoo, tend to show only limited, partial consistency with the interview research which has related child rearing and children's self-esteem (Coopersmith, 1967; Flynn, 1979).

Both this study and that of McAdoo and McAdoo (1979) did use self-

report measures of self-concept. Here, there was uncertainty about the stability of the scores of the children from the Maori sample. In McAdoo and McAdoo's study, the Anglo-American children's scores showed a very marked ceiling effect, and accordingly, their scores appeared highly positive regardless of parental interaction. There may be scope, therefore, for the additional development and use of observational measures of self-concept which, as several writers suggest, may prove more appropriate and reliable when used with pre-school aged children (Combs et al., 1963; Walker, 1973).

Overall then, the use of minimally directive behaviours, which to some degree may have reflected mothers' responsiveness to or acceptance of their children, related moderately but positively to the children's Brown self-concept score (i.e. maternal Cooperation, Attending, and Questions). This could lend a degree of support to Coopersmith's assertion of a link between parental acceptance and children's high self-esteem. However, Coopersmith also contended that firmly enforced limits are an antecedent of children's high self-esteem. The data here cannot substantiate that assertion because the behaviours sometimes used by the mothers to enforce limits (Direct Commands, Criticisms, and Non-cooperation) tended to correlate weakly but inversely with the children's self-concept scores. As Lewis (1981) has already explained, Coopersmith's comment that firm external management increases children's self-control and confidence is in conflict with attribution theory and related research where, in contrast, it has been shown that excessive pressure to comply is associated with children's non-compliance and low internal control. In line with Lewis' recommendations, then, further research is needed to reappraise the importance of mothers' firmly enforced limits to their children's developing self-esteem. At the same time, however, it should be stressed that, on the basis of the data reported in this study and by McAdoo and McAdoo (1979), self-report measures of self-concept have certain limitations, pertaining to the stability and spread of scores, when used with young pre-school children from different ethnic groups.

The results reported in relation to Proposals 9 and 10, regarding the association between children's self-concept scores and their cognition and language assessments, are comparable to some previous

research findings. Consistent with Bridgeman and Shipman's (1978) results, there was some variation across ethnic groups in the strength of the positive relationship between self-esteem and cognitive performance. In this study, the relationship is more strongly positive for the Maori sample than for the Pakeha sample. In general, the correlations between the children's self-concept score and their concurrent KPAG-Cognition and KPAG-Language scores were significantly positive, and these data are consistent with findings among some subsamples and among Anglo-American pre-school aged children (Bridgeman & Shipman, 1978; McAdoo & McAdoo, 1979, respectively).

Possibly the relationship between the children's self-concept and cognition and language scores could reflect some overlap in the dimensions assessed by the Brown and KPAG measures. Bridgeman and Shipman (1978) suggested that, to some degree, positive responses to items on the Brown measure require verbal facility. In this study, however, when a child did not respond to a complete item on the Brown test and the split sections of the item were presented separately, either verbal or non-verbal responses were scored. For a child to respond positively, then, comprehension of the adjectives was necessary, but neither understanding of more complex questions nor responding verbally was required. Also, as specified in Chapter 4, the adjusted Brown score was used in all the analyses here. Unanswered items, or ambiguous responses which the children may have made through incomprehension of items or adjectives, deflate the unadjusted scores but are accounted for in the adjusted scores. Therefore, using the adjusted scores did help reduce the tendency of the Brown scores to reflect children's language skills or comprehension levels. Overall, then, the data appear to support the proposals that young children's self-concept scores and their competence in the domains of cognition and language are associated positively.

Finally, the results show that, unlike their interactive behaviour, Maori mothers' education level and their *marae* participation were quite potent predictors of their children's self-concept score. Again, considering the limitations of the test-retest data reported on the Brown measure for the Maori sample, the above results justify only very tentative interpretation. Perhaps the data concerning mothers'

involvement on the home *marae* do lend some support to Ranby's (1979) proposition, though, that Maori culture imparted in Maori contexts is likely to relate positively to self-esteem.

6.4 *Summary and implications:*

Here, the research is related to the theories summarized in Chapter 2. This study has emphasized anew the importance of mothers as educators and caregivers of young children, by focusing on children with their mothers in the early educational setting of the playcentres, and by reporting some strong relationships between maternal verbal interactions and children's cognitive and language skills. The research has extended the observation of maternal interactive behaviour to New Zealand playcentre sessions and across ethnic and education-level groups.

As indicated in Chapter 2, early studies of child rearing and mother-child relations and interactions in the U.S. were based on either psychoanalytic, social learning, or attachment theories. However, this study's methodology illustrates a synthesis of behavioural and ecological approaches. The observational measure used here was derived from social learning origins, but at the same time, a naturalistic approach to observation, with only minor modifications, was employed. The results have been related to a large body of Western mother-child interaction research, to observations of maternal interactions across cultures, and to the New Zealand child-rearing research. Following Laosa's (1981) and LeVine's (1977) perspectives, differences in Maori and Pakeha mothers' interactions have been discussed within their cultural contexts. Other results have been interpreted in terms of Piaget's theory of cognitive development, and with brief reference to nativist and social learning theories of language development and to motivation theory. Some important points arising from the discussion now are recapitulated and examined further.

The very marked tendency of Maori mother-child pairs to spend more time Playing Interactively than Pakeha pairs may be understood within a Maori cultural context. No significant ethnic differences were found, however, on the mothers' use of the apparently more passive or intrusive physical behaviours.

The results tend not to support the proposed greater use of verbal interactive behaviour by Pakeha mothers, because Non-cooperation was the only behaviour observed significantly more frequently among Pakeha mothers. However, Maori mothers used significantly more Rewards and Teaching than Pakeha mothers. The above findings appear attributable to this study's control of maternal education level and pre-school setting, and also to some tendencies observed among the Maori mothers. At the macro-level of behaviour, some Maori mothers expressed general concern about their own children's, and Maori, education. At the micro-level, this concern seems reflected in their high incidence of didactic teaching and possibly of positive reinforcement (observed Teaching and Rewards). The more frequent use of Teaching behaviour among Maori mothers does seem in line with McDonald's (1973) finding, from maternal interviews, that many Maori mothers regard preparing children for school as an important function of pre-school education. Certainly, the Maori mothers' greater tendency to use Teaching and Rewards suggests that many Maori mothers here were involved directly in encouraging their children's performance on, or their understanding of, the pre-school activities in which they were engaged. Perhaps as part of their general concern about education some Maori mothers had enrolled their children at playcentres and there, as these data suggest, they had become active participants in their children's playing and learning activities.

Following the Western psychological literature, the Pakeha mothers' tendency to show more Non-cooperation with their children's initiations could be related to a concern with delayed gratification or independence training. It may be possible too that, for some mothers, involvement in playcentre had highlighted a need to use techniques other than physical punishment to guide their children's behaviour. Accordingly, the trend among the Pakeha mothers to ignore some of their children's requests or demands (Non-cooperation), the Maori mothers' more frequent use of positive reinforcement (Rewards), and the overall high incidence of commands, might reflect the mothers' endeavours to develop alternative methods to smacking and spanking their children. This suggestion is consistent with the low incidence of physical punishment (Discipline) reported here, which differs from the findings of previous child-rearing research in New Zealand (Ritchie & Ritchie,

1970, 1978, 1981; Smith, 1982).

The strong relationship described between mothers' education level and their verbal interactions could reflect differences in their verbal facility, and possibly in the children's cognitive and complying behaviour. Alternatively, the data for the higher education group mothers are also interpretable with reference to modelling or observational learning theory.

Child gender was not associated with important differences in maternal interactive behaviour. This suggests a possible decline during the last decade in the impact of child gender on maternal behaviour, and thus substantiates, to some degree, Ritchie and Ritchie's (1978) prediction that sex-role stereotyped aspects of child rearing could diminish in New Zealand through the 1980's. An interesting parallel trend has been reported recently from playcentres and other early educational settings, and shows that children there do not necessarily choose stereotyped sex-appropriate play activities (Smith, 1983). Perhaps then, both mothers' and children's behaviour in the pre-schools is changing and, in accord with the ideals of many psychologists, educators, and women's and men's groups here, in some instances, aspects of early childhood experiences are becoming rather similar for boys and girls.

Maternal education level and maternal Direct Commands were notably important predictors of children's cognition and language scores on the KPAG. The apparent incompatibility of frequent Direct Commands and children's higher KPAG-Cognition and KPAG-Language scores is consistent with some previously reported empirical data. In addition, this finding is comprehensible in terms of Piaget's (1977a, 1977b) explanations of the assimilation process in cognitive development, of Hunt's (1963, 1965) perspectives on intrinsic motivation, and of social learning and universal-nativist theories of language development.

The few important relationships reported here between maternal interactive behaviour and the children's self-concepts demonstrate only limited, partial consistency with the results of previous interview

research. Coopersmith's (1967) contended link between maternal acceptance and children's high self-esteem was only partially and moderately supported. The data in no way suggest that mothers' firmly enforced limits are associated positively with young children's self-concept scores.

A significant, positive relationship was found between the children's self-concept scores and their cognitive and language assessments. Moreover, Maori culture, when experienced through Maori families' visits to the home *marae*, appeared to be associated positively with Maori children's self-esteem. However, some limitations of the self-concept measure also were noted.

Several recommendations for further research have been made in this chapter, and some practical implications also are apparent. Some research questions arising from this study relate partly to gaps identified in the data, particularly in the descriptive analyses. Marked individual, within-group differences were found on some behaviours, but the data here do not explain why individual mothers differed in their use of the behaviours. Further variables, concerned with parents' perceptions of their children and of child development, would need to be examined to understand the reasons for these variations in behaviour.

The playcentre setting did facilitate effectively both the naturalistic observation of interactions during spontaneous play and the assessment of children using the KPAG. There may be some regional limitations here, though, because most of the mother-child pairs were drawn from urban playcentres in the greater Wellington area. Furthermore, playcentres were not an appropriate environment for examining extensively either punishment procedures or paternal interactions. Some of the paternal data tabulated in Chapter 5 do suggest the importance of the father to the children's intellectual development, and for the Pakeha group, a significant and positive relationship was found between higher paternal education and the children's KPAG-Cognition and KPAG-Language scores. This preliminary finding does point to the need for further research, as a paternal perspective usefully could be developed to explain further the relationships

among parental education, parental interaction, and children's cognitive and language assessments. Systematic home observations of New Zealand families could be designed, then, to extend this avenue of research.

Other suggestions for further research have emerged from the important new findings of this study. The results concerning Direct Commands are new within the New Zealand research context. Ritchie and Ritchie's (1966, 1970, 1978, 1981) interview research suggests that at a physical level many New Zealand parents' child-rearing practices are authoritarian and control-oriented and here, in a playcentre setting where physical punishment was not acceptable, some mothers appeared to focus repeatedly on directives and verbal control of their children's behaviour. For some Maori and Pakeha mothers, Direct Commands may have had different meanings reflecting Maori and English language differences, and therefore, the usefulness of examining behaviours within their cultural and linguistic contexts is apparent. However, for both the Pakeha and the Maori pairs, maternal Direct Commands were related strongly and inversely to the children's cognition and language assessments. Direct Commands may have varied in meaning for the mothers, then, but their implications appear rather similar for the children of each group. The extensive use of corporal punishment in New Zealand has been criticized already by Ritchie and Ritchie (1981), and these data here may suggest in addition the limitations of using a constant verbal "do this" approach, rather than a more reciprocal form of communication, with 3-year-old children. Here again though, further research is certainly needed to explain the causal direction of the very strong inverse relationship found between these New Zealand mothers' Direct Commands and their young children's cognitive and language development.

Consistent with Laosa's (1981) experience, in this study, focusing on the unitary variable of maternal education was a useful research strategy. A marked association between maternal education level and mothers' verbal interaction, and between maternal education level and children's KPAG-Cognition and KPAG-Language assessments, was identified in Chapter 5 and discussed earlier in this chapter. Perhaps not surprisingly then, the data do suggest that the duration and success

of Maori and Pakeha mothers' schooling may be highly relevant to the complexity of their children's English language experience at age 3. Therefore the results here, like those of Laosa (1982), point to the importance of expanding and equalizing, across ethnic groups, the formal educational attainments of women. In turn, this might equalize the verbal interactive experiences and cognitive and English language performance of children from different ethnic origins. However, the results of this study also show that Maori and Pakeha mothers' interactive behaviour did differ in some other ways.

Maori mothers more frequently used didactic teaching than Pakeha mothers. Further, the data suggest some Maori-Pakeha differences in the salience of specific maternal teaching interactions, because the strength of the relationships between maternal Teaching and Questions and the children's cognitive and language assessments varied for the Maori and Pakeha samples. Presumably then, there may be a need for both a Maori model and a Pakeha model for the development of children's cognitive and English language skills. If in fact questioning techniques are more relevant to Pakeha children's cognitive development, but didactic teaching and demonstrations are more appropriate among Maori children, both teaching strategies are likely to be important in ethnically mixed early educational settings. This rationale is consistent with a culturally pluralistic approach and extends Laosa's (1981) application of a culturally relativistic approach to the study of mothers' teaching competence.

However, before asserting that question-and-answer techniques are more especially appropriate for young Pakeha children, more research seems essential. Some preliminary or tentative findings discussed above could generate further research questions. For example, are there differences in the meaning, form, or content of Maori and Pakeha mothers' questions? Do children of Maori and Pakeha mothers differ in their responses to maternal questions? There remains scope to examine in more precise detail the question-and-answer sequences used by Maori and Pakeha parent-child pairs.

The dimensions of competence assessed in this study do have certain limitations. The KPAG was evaluated as a suitable instrument,

appropriate for use in New Zealand playcentres and in the context of the research proposals examined here. However, the children's language performance was assessed only in English, and none of the children was a fluent speaker of Maori. Recently though, a new type of early childhood education centre, *Te Kohanga Reo* (the language nest), has been developed to provide pre-school experience with communication exclusively in Maori (see e.g. Moorfield, 1982). Maori language skills therefore are becoming recognized as important for many young children, and verbal interactive behaviours like Direct Commands might be associated quite differently with children's performance in the Maori language. Perhaps in the future then, a very different third model might be developed within a Maori cultural context to examine young children's competence in the domain of Maori language fluency.

The data suggest that, compared with the Pakeha children, children of the Maori mothers, and particularly of those from the higher education group, would be more accustomed to learning by direct Teaching. Maori mothers' Teaching in turn was related more strongly to their children's KPAG-Cognition scores. Learning by mutual play participation also appeared more familiar to the children of Maori mothers, although Playing Interactively was not associated strongly with the children's cognitive or English language assessments. These results suggest, then, that when Maori mothers are included in their children's early educational programmes, they might spontaneously and more frequently use some behaviours that either are relevant culturally or are particularly important to their own children's development.

Consequently, the importance of including Maori mothers and adults in Maori children's early education could be supported here. Further, the advantages of having mothers in general participating in children's playcentre experience also may be suggested by this study's findings, because the playcentre environment probably influenced the mothers' behaviour resulting, for example, in a very low incidence of physical punishment. This research shows, then, that the study of mothers' or primary caregivers' interactions with their children in early educational settings continues to yield important data of relevance to children's cognitive and language development and also to early educational programmes and practice in general.

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APPENDICES

Appendix A

Maternal Interviews

Massey University

PALMERSTON NORTH, NEW ZEALAND

TELEPHONES, 69-099, 69-089.

In reply please quote:

A.1

Statement of Procedures and Confidentiality

Education Department,

30 May 1980

10 Akatea Road,
Korokoro,
PETONE.

As a part of a university study, I would like to film 3 year-old children with their mothers during play sessions. The children will be photographed and asked some questions too. If you feel happy to be filmed for the study, your involvement will be helpful. First, some information will be needed about you and your child, and you will be asked some questions. This will be confidential. The films are also confidential, and will be seen only by myself and my supervisors at Massey University.

Thank you.

Val Podmore,
Phone: 686-394

A.2
Interview Schedule

Date of Interview: _____

When do you usually attend/
mother-help at Playcentre? _____

MOTHER

1. NAME _____ _____ Subject number M _ _
Surname First name

2. PLAYCENTRE _____ CENTRE ____
Name

3. ETHNICITY Would you describe yourself as ETHNIC ___ 1 Maori 2 Pakeha

1. A Maori _____
or 2. A Pakeha _____
(N.Z. European)

or what? _____

4. EDUCATION Where do you come from_____ and where did you go to school? How many years were you at (name secondary school)? EDUC ____

1. Higher Education. University or Professional (e.g. nursing training, teachers' college, specialist profession).

Specify _____

2. U.E.

3. School Certificate and/or trade training (e.g. clothing, hairdressing).

Specify _____

4. Secondary School, no formal qualifications, specify number of years _____

Occupation: _____

Present
Occupation: _____ OCC ____

5. MOTHER HELPER or other PLAYCENTRE COURSES: What Playcentre courses have you taken? COURSE ____

1. Supervisor, assistant supervisor.

2. Mother helper.

3. Other courses (other than obligatory introductory one)

4. No courses (other than obligatory one)

6. What is your age, please? AGE ___

AGE ____ Age group 1. under 20
2. 20 to 24
3. 25 to 29
4. 30 to 34
5. 35 to 39
6. 40+

CHILD

Subject Number C _ _

1. NAME _____ _____
   Surname First Name

2. PLAYCENTRE _____ CENTRE ____

3. ETHNICITY. Would you describe _____ as

   1. A Maori ___
   or 2. A Pakeha ___ (N.Z. European)
   or what? _____

4. PATERNAL EDUCATION (If married). And (child's name)'s father. Where did he come from? _____. And where did he go to school? _____ How many years was he at (name secondary school)? EDUC ____

   1. Higher Education. University or Professional. Specify _____
   2. U.E.
   3. School Certificate and/or Trade training (e.g. fitter and turner, with apprenticeship). Specify type: _____
   4. Secondary School, no formal qualifications, specify number of years _____

   SES _____

5. PATERNAL OCCUPATION
   What is _____s' father's occupation?
   (child's name)
   (Where applicable) _____
   _____

6. DATE OF BIRTH ___/___/___ AGE _ _
   Age in months:

7. CHILD'S SEX 1. boy ___ 2. girl ___ SEX ___ 1 Male 2 Female

8. BIRTH ORDER What is the child's place in the family? (First, second, third etc) BIRTH ____

   _____

9. FAMILY SIZE What is the total number of children in your family? _____
   Sex of siblings 1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ (list gender and age of each sibling) FAMILY SIZE _____

10. DURATION OF URBAN RESIDENCE How long has _____ lived in the city? _____ _____ URBAN _____
    child's name years months
    1 = Urban
    2 = Urban/rural
    3 = Mostly rural

A.3

Maori Cultural Participation and Residence Questionnaire

	No. Code
1. Would you describe yourself as a Maori or a Pakeha or what?	1 Maori 2 Pakeha 3 Other
2. Would you describe _____ (child's name) as a Maori or a Pakeha? or what?	1 Maori 2 Pakeha 3 Other
3. Would you describe _____ (child's name)'s father as a Maori or a Pakeha or what?	1 Maori 2 Pakeha 3 Other
4. Where do you come from? and/or Where were you brought up?	1 Non migrant 2 Migrant 3 Other
5. Do some of your brothers and sisters live near you now?	1 Near 2 Distant 3 Other
6. Do you see your brothers/sisters often?	1 Often 2 Not often 3 Other
7. Do your parents live near you?	1 Near 2 Not near 3 Other
8. Do your uncles/aunts/cousins/grandparents live near you?	1 Near 2 Not near 3 Other
10. Do you see any of these relatives often?	1 Often 2 Not often 3 Other
11. Who lives in your house other than your child/ren (and husband)? Does a parent, brother, sister, cousin, aunt, or uncle live with you?	1 Extended 2 Nuclear 3 Other
12. Do you regularly attend activities at a *marae*?	1 Regular 2 Not regular 3 Other
13. Have you ever visited a *marae*?	1 Visited 2 Not visited 3 Other
14. Have you ever been involved in a Maori culture club/Polynesian club?	1 Involved 2 Never involved 3 Other
15. Are you involved in a Maori culture club now?	1 Involved now 2 Not involved 3 Other
16. Do you speak Maori?	1 Yes 2 No or little 3 Other
17. Do you understand Maori?	1 Yes 2 No or little 3 Other

Appendix B

Instruments

B.I

Zegiob and Forehand's (1975) Maternal Behaviour Categories

[Illustrations from the present study are given within the square brackets below.]

Physical contact:
Mother (M) is in contact with the child (C) physically; M is not physically rewarding or punishing C.
Example: C is sitting on M's lap.

[Illustration: C's arm is touching M's arm.]

Out of contact:
M is sitting apart from and is not looking at C. Her attention and activity are directed to something other than C. No interaction is taking place.
Example: M is reading.

[Illustration: M is talking to an adult or another child (ignoring C, who is beside her).]

Attentive observation:
M noticeably directs her attention to C and/or C's activity by silently watching.
Example: M watches as C plays with Tinkertoys.

[Illustration: M watches C as C solves a puzzle or as C works with playdough.]

Playing interactively:
M is playing with C within the framework of C's own conception of play. Reading and imitation by M of C are included.
Example: M and C play with toy telephones.

[Illustration: Using playdough, M and C are making "cakes" together; M and C participate together building a house of blocks; M and C play hide-and-seek together in a tunnel.]

Cooperation:
M responds to C's commands, suggestions, or questions within 5 sec by complying.
Example: M puts toys away when C asks her to do so.

[Illustration: C initiates "Hey watch this Mummy" and M replies "yea" and watches; C calls "Mum" and M directs her attention to C.]

Noncooperation:
M ignores C's stimulation by refusing to comply or by not responding within a 5-sec interval.
Example: M refuses to put toys away when asked to do so by C.

[Illustration: C initiates "I want more flour Mum" and M replies "I really think you've got enough"; C asks "Mum, help me" and M answers "You do it now"; C calls "Mum!" but M does not respond.]

Attending:
M attends to C during C's play by verbally describing what C is doing. Nothing new is introduced by M.
Example: "And now you are putting the green block on top of the red one."

[Illustration: Using his hand, C brushes sand from M, and M states "You were helping get the sand off Mummy"; C puts a shell on a sandcastle and then M says "Going to put a shell on" (no inflection); or M repeats C's statement without adding anything.]

Questions:
M interrogates C or asks C questions. There must be an inflection at the end of the phrase.
Example: "What are you going to do with the doll?"

[Illustration: "Where's this one go?"; "How about we make a boat together, eh?" (with inflection); "Do you know how it works?"; "What colour is this?"; "Where are you going to paste it?"; "Where's the funnel?".]

Rewards:
M praises or encourages C. Rewards may be of three types, and all are designed to increase the frequency of the act on which they are contingent.
a) Physical: any positive physical contact administered after a desired behavior has occurred. Example: A kiss.
b) Labeled: M's verbal specification of the exact desirable act performed by C. Example: "Mommy likes it when you put your toys away."
c) Unlabeled: Nonspecific comments indicative of liking or approving C's behavior. Example: "Good."

[Illustration: "Clever boy"; "That's it"; "Oh that's pretty"; "Hey, that's a masterpiece"; "That's the girl"; "That's right"; "Good boy".]

Discipline:
M inflicts pain on C which may be physical, isolation, or deprivation of an object. Her action is meant to decrease the frequency of that behavior.
Examples: Spanking, taking a toy away, or putting C in the corner.

[Illustration: M slaps C's legs; M removes a toy from C and places it on a high shelf.]

Threats:
This is like M's caution signal to C. Statements are of the "if ..., then ..." type.
Example: "If you do not stop bothering me, I'm going to spank you.

[Illustration: M shakes fist at C.]

Criticisms:
M gives a negative evaluation of C or C's activity by employing shame, ridicule, or disparaging remarks.
Example: "You aren't thinking. You are so dumb."

[Illustration: "Silly boy"; "That's naughty"; "You little bugger"; "Silly billy".]

Direct commands:
M uses direct commands to state specifically the course of action she wants C to follow; the nature of the activity is explicitly stated. The commands may be positive, indicating that C is to perform some task, or negative, intending to modify or completely stop C's ongoing behavior.
Example: "Put the doll away."

[Illustration: "Turn it around"; "No, put them on there"; "Don't do that"; "Go and do a *wee*" (points to bathroom); "Watch how you hold it"; "Hurry up"; "Look, put that one on there"; "Do some more".]

Indirect commands:
M facilitates or inhibits C's activity by suggesting and relegates the responsibility of acceptance to C. That is, C has the option of acceptance. Indirect commands may be distinguished from the questions by the lack of an inflection at the end of the phrase.
Example: "Why don't you put the doll into the toy box."

[Illustration: "What about you put some sand over here"; "You could make a road around there"; "What about doing a painting, darling" (no inflections).]

Teaching:
M gives information to C for the purpose of increasing his knowledge; this includes verbal instructions and demonstrations.
Example: "This is a racetrack, and you put marbles in the cars to make them run."

[Illustration: "If you put your container down it will sink like this" (demonstrates); "This colour is pink"; "If you press this one down like this it will spring out".]

Helping:
M assists C in doing his task by physically helping him. C may or may not request M's help. Teaching takes preference over helping.
Example: M helps C put away the Tinkertoys.

[Illustration: "Here'a" (M passes puzzle piece to C); M takes saw from C and saws wood for him (C has not asked for help); "There you are" (M has sorted out puzzle pieces for C).]

(Zegiob & Forehand, 1975, p. 566)

B.2

Coding Sheets for

Zegiob and Forehand's Maternal Behaviour Categories

Subjects: Mother:_____ No. of tape:____

Child:_____ Section of tape rated:_____

Playcentre:_____

Rater:_____ Rating date __/__/198

Date of tape: __/__/198 Play activities and _____

duration in seconds:_____

Subjects: Mother:_____ No. of tape:____

Child:_____ Section of tape:_____

Playcentre:_____ Time sampling type:_____

Rater:_____ Date of tape __/__/____

Rating date __/__/____ CASK (child's total initiations) _____

DURATION CATEGORIES:		FREQUENCY COUNT (IF 5 SECONDS+) REQUIRED ON THESE (1 to 6)				FREQUENCY COUNT ONLY (7 to 16)									
1. PHYSICAL CONTACT	2. OUT OF CONTACT	3. ATTENTIVE OBSERV-ATION	4. PLAYING INTER-ACTIVELY	5. COOPER-ATION	6. NON-CO-OPERATION	7. ATTEND-ING	8. QUEST-ION	9. REWARD	10. DIS-CIPLINE	11. THREAT	12. CRITI-CISM	13. DIRECT COMMAND	14. IN-DIRECT COMMAND	15. TEACH-ING	16. HELPING

Scoring Sheets for the Keele Pre-school Assessment Guide (KPAG)

Name: _____ Assessment Date: ___/___/___

Number: _____ Age of Assessment: ___ (months)

Playcentre: _____ Handedness: Right: ___

Date of Birth: ___/___/___ Left: ___

No Preference: ___

SCORES

Cognition	Subtotals	Totals
C1 Space and Time	___	
C2 Properties of Objects	___	
C3 Sorting and Classification skills	___	
C4 Memory	___	
C5 Number	___	
C6 Problem Solving	___	
	KEELE C	_____
Physical Skills		
P1 Drawing and Writing	___	
P2 Manipulative Skills	___	
P3 Coordination	___	
	KEELE P	_____
Socialization		
S1 Self Help	___	
S2 Play Patterns	___	
	KEELE S	_____
Language		
L1 Language Use	___	
L2 Speech	___	
L3 Vocabulary	___	
L4 Comprehension	___	
	KEELE L	_____

SECTION 1

Please ring one of the seven crosses on each horizontal line, appropriate to the child's present behaviour. The meaning of the extreme points is indicated by the wording below the line, from which the meaning of the other points may be inferred. Try to avoid using the midpoints on the line merely for safety and do not be afraid to use the extreme points when appropriate.

X X X X X X X

TENDS TO PLAY ALONE — MIXES WELL USUALLY PLAYS IN GROUP

X X X X X X X

AGGRESSIVE, OFTEN INVOLVED IN QUARRELS — TIMID, AVOIDS CONFLICT

X X X X X X X

TENDS TO BE CAUTIOUS, DEPENDENT — VERY CONFIDENT, INDEPENDENT

X X X X X X X

FREQUENTLY INITIATES GROUP ACTIVITIES — TENDS TO FOLLOW LEAD OF OTHERS

X X X X X X X

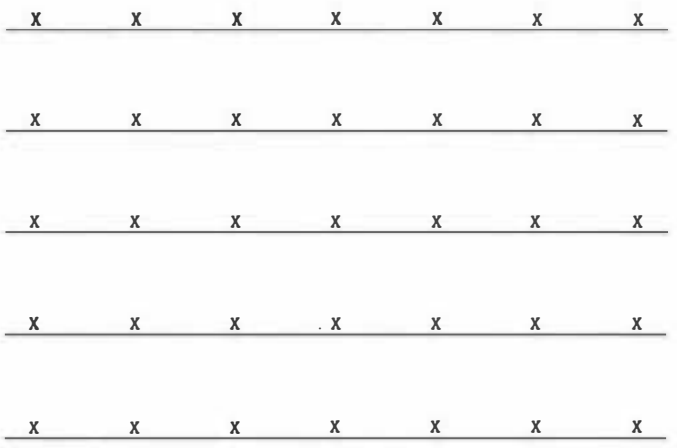
CONSTANTLY MOVES FROM ACTIVITY TO ACTIVITY — OFTEN CONCENTRATES FOR LONG PERIODS

X X X X X X X

CREATIVE IMAGINATIVE — USUALLY REPETITIVE AND UNIMAGINATIVE IN ACTIVITIES

OTHER CHARACTERISTICS

Note any other features of importance here, e.g. anxieties, tantrums, speech impediments etc. If appropriate indicate these features (as has been done in the first part of this section) on the lines provided below and mark the child's present position. The future development of these characteristics may then be charted.



SECTION II

Read the items listed below and tick those which the child performs easily or frequently. In the section on socialization the child's usual performance should be recorded. Thereafter, shade in those sections on the chart corresponding to the items marked. Since the skills have been arranged in the approximate order of their normal development, it can generally be assumed that mastery of the more advanced skills in the outer levels will succeed the acquisition of the skills occupying the inner rings.

(For definition of the items refer to the manual).

COGNITION

C1. Space and Time.

____ 1. Differentiates night and day.
____ 2. Matches patterned arrangements.
____ 3. Knows some names of the days of the week.
____ 4. Differentiates between left and right.
____ 5. Knows today, tomorrow and yesterday.

C2. Properties of objects.

____ 1. Can differentiate objects by size.
____ 2. Can differentiate by weight.
____ 3. Can distinguish elementary properties of materials (soft/hard etc)
____ 4. Understands concepts of sinking and floating.
____ 5. Conserves continuous quantity.

C3. Sorting and Classification Skills.

____ 1. Can match by colour.
____ 2. Can classify by colour.
____ 3. Can perform 3-way classification.
____ 4. Can arrange in order of size and insert in series.
____ 5. Can perform simple set discrimination.

C4. Memory.

____ 1. Can repeat two digits.
____ 2. Can repeat three digits and identify objects from memory.
____ 3. Can repeat four digits.
____ 4. Can name objects from memory and repeat temporal order.
____ 5. Can repeat five digits.

C5. Number.

____ 1. Can count to three.
____ 2. Can differentiate between few and many.
____ 3. Can count to ten.
____ 4. Can perform simple addition and subtraction.
____ 5. Conserves number.

C6. Problem Solving.

____ 1. Can complete elementary puzzles.
____ 2. Can complete simple jigsaws.
____ 3. Can perform simple block designs.
____ 4. Can complete complex jigsaws.
____ 5. Can execute complex block designs.

PHYSICAL SKILLS

P1. Drawing and Writing.

____ 1. Paints strokes, dots, and circular shapes.
____ 2. Draws simple human figure.
____ 3. Draws more complex human figure and other pictures.
____ 4. Can copy letters.
____ 5. Can write simple words.

P2. Manipulative skills.

____ 1. Can cut with scissors.
____ 2. Can string small beads and twiddle thumbs.
____ 3. Can fold paper twice and oppose thumb and fingers.
____ 4. Can cut out pictures accurately.
____ 5. Builds tower of 15 blocks.

P3. Coordination.

____ 1. Climbs easy nursery apparatus and uses play vehicles.
____ 2. Can stand and walk on tiptoe.
____ 3. Uses nursery equipment expertly.
____ 4. Can hop on one leg and skip.
____ 5. Plays ball games and throws and catches accurately.

SOCIALIZATION

S1. Self-help.

____ 1. Cares for self at toilet and washes hands satisfactorily.
____ 2. Uses knife, fork, and spoon.
____ 3. Manages simple fastenings.
____ 4. Manages zips.
____ 5. Dresses self competently.

S2. Play Patterns.

____ 1. Plays in parallel with others and will take turns.
____ 2. Understands concept of sharing; plays associatively.
____ 3. Plays cooperatively with companions.
____ 4. Plays simple games with rules.
____ 5. Understands winning and losing.

LANGUAGE

L1. Language use.

____ 1. Knows full name and a few nursery rhymes.
____ 2. Able to relate experiences and knows several rhymes.
____ 3. Can listen to and tell long stories.
____ 4. Gives full name, sex, age and address.
____ 5. Able to hold coherent and lengthy conversations.

L2. Speech.

____ 1. Uses words other than nouns or verbs.
____ 2. Uses pronouns, plurals, and past tense.
____ 3. Uses complex sentence structures.
____ 4. Uses passive structures and auxiliary verbs.
____ 5. Frequently uses complex sentences with correct order of words.

L3. Vocabulary.

____ 1. Can name simple objects and identify parts of the body.
____ 2. Can name colours and parts of the body.
____ 3. Recognizes own name when written.
____ 4. Can name simple shapes and secondary colours.
____ 5. Recognizes some letters and simple words.

L4. Comprehension.

____ 1. Obeys simple commands and answers simple questions.
____ 2. Can give definitions of simple words.
____ 3. Comprehends stories and answers complex questions.
____ 4. Obeys more complex instructions.
____ 5. Can define differences between pairs of words.

B.4

Suggested Criteria for Items in Section 11 of the KPAG

COGNITION

C1 SPACE AND TIME

1. Differentiates night and day.

   (a) Scored if child answers correctly when asked "Is it night-time or day-time?" or,
   (b) Identifies night and day appropriately in pictures.

2. Matches patterned arrangements.

   Four objects (car, brick, doll, pencil) are arranged in the shape of (a) a line, (b) a square, (c) a diamond. The objects are screened from view. One of the objects is removed from its position, and is given to the child who is asked to replace it in its correct place. Scored if he does so correctly in all three trials.

3. Knows some names of the days of the week.

   To score the child must be able to name three of the seven days, in any order, when asked to do so. If the child does not respond or if it appears that the child does not understand the question, say: "You know the days have names like Monday ... can you tell me the other names?" The item is credited if the child gives three further names.

4. Differentiates between left and right.

   This item is scored if the child responds correctly to all of the following commands or questions:

   (a) "Show me your right hand".
   (b) "Which is your left ear?"
   (c) "Raise your left arm".
   (d) "Point to your right foot".

5. Knows today, tomorrow and yesterday.

   Credit this item if the child is able to name correctly today, and state either the name of yesterday or tomorrow. E.g. say: "You know the days have names. What day is it today? ... And what day was it yesterday?"

C2 PROPERTIES OF OBJECTS

1. Can differentiate objects by size.
   Use three pairs of objects, the members of each pair differing from each other in size (e.g. balls, blocks, pieces of plasticine) Present the child with each pair in turn and ask the child to indicate which is the bigger. The item is credited if he answers correctly on all three occasions.

2. Can differentiate by weight.
   Use three pairs of items which are similar in size but which differ in weight, e.g. ping pong ball and golf ball; light block and heavy block; plastic car and metal car. For each pair, the child is given the two objects to hold, one in each hand. Say: "One of these is heavy and the other is light. Which one is the heavy one?" The item is scored if the child answers correctly on all three occasions.

3. Can distinguish elementary properties of materials (soft/hard, etc)
   (a) Assemble a set of 10 items which differ in terms of softness or hardness, 5 soft and 5 hard. Allow the child to feel each object in turn and ask whether it is hard or soft. Credit if all responses are correct.
   (b) Assemble a second set of 10 objects differing in roughness, 5 rough and 5 smooth. Allow the child to hold each object in turn and ask whether it is rough or smooth. Pass if the child responds correctly to all items. Overall, the item is scored if the child passes on both sections.

4. Understands concept of sinking and floating.
   Obtain three small objects which obviously will float (e.g. cork, plastic block, ping pong ball) and three which obviously will sink (e.g. stone, marble, fork) and a bowl of water. Give the items to the child to hold in turn. Hold each object over the water and ask the child: "What will happen if I put this in water? Will it stay on top of the water, or will it go to the bottom?" Repeat the question if necessary and demonstrate after the child has made a prediction. This item is passed if the child responds correctly for all six objects.

5. Conserves continuous quantity.
   Use two small balls of plasticine of the same size. The child is asked if both have the same amount of plasticine and is allowed to manipulate them until agreement is reached that they are the same. The assessor rolls one ball into a sausage and asks: "Which has more plasticine now, or are they both the same?" The sausage is rolled back into a ball and the experiment is repeated with the other piece of plasticine. The item is scored if the child responds correctly on both occasions.

C3 SORTING AND CLASSIFICATION SKILLS

1. Can match by colour.
   Use eight blocks of different colours for this item (2 red, 2 blue, 2 yellow, and 2 green). Ask the child to pick out the block like the one you pick up; say: "Show me the one that is the same colour as this one". It is not necessary for the child to know the names of the colours. Credit the item if the answers all four correctly.

2. Can classify by colour.
   Use the eight blocks in C3 (1). Ask the child to give you all the red ones; replace them. Then ask for all the yellow ones. If the child picks out the right blocks on both occasions, credit this item.

3. Can perform three-way classification.
Use 12 shapes of different forms, sizes and colours (see B.5). Ask for the small, square, yellow one; replace. Ask for the large, blue, triangle. Item is credited if the child responds correctly on both requests.

4. Can arrange in order of size and insert in series.
(a) Assemble six objects of the same type (e.g. blocks, pencils) but which differ in size. Ask the child to place the objects in order from the smallest to the largest, demonstrating with a second set of objects if necessary. If the child makes a mistake, ask if the order is correct but do not give any further assistance. If the child is still unable to make the sequence, do so for him.
(b) Remove one object from the middle of the series and arrange the objects so that the gaps between them are roughly equal again. Ask the child to replace the object in the correct place in the line. The item is credited if the child completes both parts successfully.

5. Can perform simple set discrimination.
(a) From the shapes used in C3 (3) select 1 small circle, 1 small triangle, 2 small squares, 1 small oblong and 1 large circle. Place shapes in any order on a piece of paper in front of the child and say: "Which one of these does not go with the other ones?" (Large circle).
(b) Place five small shapes on the paper. Present the child with four large shapes and one small shape, in any order. Say: "Which one of these shapes goes with the shapes on the paper?" (Small shape).
(c) Place the big circle and a small circle on the paper. Present the child with two squares, two triangles and the remaining small circle in any order. Ask: "Which of these shapes goes with the shapes on the paper?" (Small circle). Item is credited if the child responds correctly on all parts.

C4 MEMORY

1. Can repeat two digits.
Say: "Let's see how well you can say things after me. Listen. Say 1. (pause) Now say 4". These single digits are used as an introduction and are not scored.
"Now say 5-8; say 2-7". The digits are spoken at the rate of one a second. Item is credited if child responds correctly each time.

2. Can repeat three digits and identify objects from memory.
(a) "Now say 1-4-6; say 5-8-3; say 7-9-2".
(b) Present the child with three objects (e.g. toy car, block, toy animal). Place objects behind paper for a few seconds and cover one with a box. Say: "Which one have I covered up?" Child has to name the object. Item is credited if child responds correctly each time.

3. Can repeat four digits.
"Say 3-8-1-4; say 6-1-8-5".
Item is credited if child responds correctly to each sequence.

4. Can name objects from memory and repeat temporal order.
Attach three objects (e.g. farm animal, car, doll) to a piece of card. Ask the child to name the objects and then push slowly behind a piece of paper so that they disappear from the child's view. Say: "Now they are going behind the paper and they will come out the other side; which one will you see first?", point to the other side of paper. When the child responds say "Good, and which one will you see next?" Repeat for last object. Repeat whole procedure with three more objects. Item is credited if child responds correctly by naming all six objects in their correct order.

5. Can repeat five digits.
"say 4-1-9-6-2; say 5-9-3-6-4".
Item is credited if child responds correctly each time.

C5 NUMBER

This section uses 20 small blocks.

1. Can count to three.
Place ten blocks before the child and ask him to give you three of them. Item is credited if the child hands the assessor 3 blocks. Credit automatically if item C5 (3) is passed.

2. Can differentiate between few and many.
Use twenty blocks: divide into three groups, one with two blocks in it, one with six blocks and one with twelve blocks. Say: "While pile has few blocks in it? Which pile has many blocks in it?" Item is scored if the child responds correctly to both questions.

3. Can count to ten.
Give the child ten blocks and say: "How many blocks do you have?" Score a correct response but if it appears that he might have arrived at the right answer by chance the task should be repeated.

4. Can perform simple addition and subtraction.
Using the blocks ask the child to do 4 additions and 4 subtractions using numbers from 1 to 5, phrasing the questions concretely if necessary, e.g. "You've got two blocks, if I take one away, how many will you have left?" Credit the item if the child can perform 3 additions and 3 subtractions.

5. Conserves number.
Use 16 small blocks. Place them in two equal lines. Get the child to count the blocks in each line and agree that the lines contain equal numbers of blocks. Rearrange one line so that it is twice as long as the other. Ask the child if there are now more or less blocks in the extended line than in the other line, or if the number is still the same. Repeat with second set of objects, e.g. counters, buttons, etc. Credit the item if the child responds correctly on each occasion.

C6 PROBLEM SOLVING

1. Can complete elementary puzzles.
This item is credited if the child can successfully complete three or four hole form boards.

2. Can complete simple jigsaws.
This item is scored if the child is usually able to complete puzzles, such as inset picture trays, containing approximately ten items.

3. Can perform simple block designs.
Use six small blocks, three of one colour and three of another. Show the child the designs in Appendix B and say: "Put the blocks together to look like that". Credit this item if the child can reproduce both designs.

4. Can complete complex jigsaws.
This item is credited if the child is usually able to solve fairly complex jigsaws containing at least a dozen pieces, whether the pieces are fully interlocking or matched by shape.

5. Can execute complex block designs.
Using nine small blocks, four of one colour and five of another, child should be able to construct the designs in Appendix B to score on this item. Procedure as in C6 (3).

PHYSICAL SKILLS

P1 DRAWING AND WRITING

1. Paints strokes, dots and circular shapes.
The item is credited if the child is able to manipulate a paint brush to produce the stated patterns, either spontaneously or upon demonstration.

2. Draws a simple human figure.
Credit is given if the child draws a person with a head and the indication of features and one other part, e.g. legs. The child should also be able to name his drawing. Credit automatically if item P1 (3) is passed.

3. Draws more complex human figure and other pictures.
The point is credited if the child shows reasonably good motor control when drawing a variety of different pictures. Figures of humans should include a head, trunk and arms and facial features, and drawings of houses should show walls, roof, windows and doors.

4. Can copy letters.
To obtain credit the child should be able to copy the letters of his own name, with correct formation of the letters and no reversals.

5. Can write simple words.
To obtain credit the child should be able to print several words, including his own name, without a model.

P2 MANIPULATIVE SKILLS

1. Can cut with scissors.
This item is scored if the child has the ability to make a single long cut (i.e. he can open and close the scissors several times to make a continuous cut across the paper) or to make a short gash in the paper several times. The paper should be cut not torn.

2. Can string small beads and twiddle thumbs.
The item is scored if the child can thread several beads on a string and can, after demonstration, twiddle his thumbs when the hands are folded and the fingers intertwined.

3. Can fold paper twice and oppose thumb and fingers.
Item is scored if child can both:
(a) fold a piece of paper lengthways and crossways when shown how
(b) touch thumb with each finger of the same hand when shown.

4. Can cut out pictures accurately.
This point is credited if the child can usually cut out a simple shape or picture with reasonable accuracy and few errors.

5. Builds tower of 15 blocks.
Give child 20 small blocks and ask him to build a tall tower. Credit the item if the child manages to build a tower of 15 blocks which is able to stand on its own.

P3 COORDINATION

1. Climbs easy nursery apparatus and uses play vehicles.
To score on this item the child must be able to climb onto and into nursery apparatus such as large boxes, slides, etc, and be able to ride a tricycle or pedal car using the pedals.

2. Can stand and walk on tiptoe.
Demonstrate to the child what is required. Say: "Let's see how long you can stand on tiptoe". and "Now, let's see how far you can walk on tiptoe". To gain credit on this item the child must be able to stand for at least five seconds and take at least five steps.

3. Uses nursery equipment expertly.
Credit is given if the child uses all pieces of apparatus in the nursery freely, safely and correctly. For this item the child should be able to use swings and see-saws without adult assistance.

4. Can hop on one leg and skip.
Demonstrate to the child what is required. Say: Let's see how far you can hop". Then say: "Let's see how well you can skip". To gain credit on this item the child must be able to hop on the preferred leg at least five times and skip rhythmically using alternative feet after demonstration.

5. Plays ball games and throws and catches accurately.
This item is scored strictly. To score child should join in simple ball games, and be able to throw and catch small balls accurately with a person at a distance of six feet.

SOCIALIZATION

S1 SELF-HELP

1. Cares for self at toilet and washes hands satisfactorily.
   To gain credit on this item the child must be free of day-time accidents and be able to care for himself at the toilet without adult assistance (except in the adjustment of clothing). The child should wash and rinse his hands so that most of the dirt is removed.

2. Uses knife, fork and spoon.
   This item is included for those nurseries where the child takes a meal in the nursery. It is satisfied if the child holds the cutlery firmly and uses each implement in the correct manner.

3. Manages simple fastenings.
   Credit is given if the child can do up and undo easy buttons or fasteners with little or no assistance.

4. Manages zips.
   The item is credited if the child can do up and undo zip fastenings or smaller, more difficult buttons or clips.

5. Dresses self competently.
   Item is credited if child can cope competently with all aspects of putting on and taking off clothing and footwear without adult assistance, with the single exception of tying shoes.

S2 PLAY-PATTERNS

The pattern of a child's play may be difficult to interpret, e.g. if a child does not play cooperatively it may mean that he is immature or that he simply has a particular personality type. Here we are interested in the child's ability to play in certain ways. His usual style of play may be recorded in section 1.

1. Plays in parallel with others and will take turns.
   Scored if the child tends to carry on own games, paying little attention to others and not interfering with them when using the same materials, while, on occasions, being able to take turns with other children when told to do so by an adult.

2. Understands the concept of sharing; plays associatively.
   To score the child should be able to share items occasionally with other children and be able to play side by side with them lending and borrowing objects but not cooperating fully.

3. Plays cooperatively with companions.
   To score the child should be able to participate with other children in play, such that common goals are shared (e.g. children cooperate to build a tower, or adopt complementary roles such as mother and father). The point is scored whether the child initiates the play or follows the lead of another child.

4. Plays simple games with rules.
   To gain credit the child should be able to compete with minimal adult supervision in simple games e.g. picture lotto, with good appreciation of the rules and aims of the game and the patience to wait his turn.

5. Understands winning and losing.
   For many nurseries this item may not be appropriate. Where it is to be scored the item should be credited if the child competes in games with a clear understanding of the concepts of winning and losing. Where this item is not appropriate, one similar to S2 (4) but specifying more complex games and stricter scoring, might be substituted.

LANGUAGE

L1 LANGUAGE USE

1. Knows full name and a few nursery rhymes.
   Point is scored if the child can give his full name on request and repeat three simple rhymes fairly accurately.

2. Able to relate experiences and knows several rhymes.
   To score on this item the child should be able to talk coherently about a sequence of events, e.g. the morning's activities, a school visit, etc, and repeat the salient points of a simple story without prompting. The child should also be able to repeat six nursery rhymes fairly accurately.

3. Can listen to and tell long stories.
   To gain credit on this item the child must listen attentively to fairly long stories and be able to repeat the main elements of the stories in their correct sequence.

4. Gives full name, sex, age and address.
   To score child must give these pieces of information accurately and comprehensibly.

5. Able to hold coherent and lengthy conversations.
   This item is scored very strictly. Credit is given if the child frequently holds conversations with adults and other children lasting several minutes on diverse subjects and with coherent expression of thoughts.

L2 SPEECH

1. Uses words other than nouns and verbs.
   Credit is given for frequent use of adjectives (e.g. brown, small, pretty, etc) and adverbs (e.g. quickly, softly, etc).

2. Uses pronouns, plurals and past tense.
   This item is passed if the child is able to use pronouns (e.g. you, me, and especially, I), plurals and the past tense of some verbs, although usage in some instance may be inaccurate (e.g. says 'mouses' instead of 'mice').

3. Uses complex sentence structures.
To gain credit on this item the child should be able to use sentences containing prepositions (of, in, on, beside, etc), conjunctions (and, but, because, etc) and questions.

4. Uses passive structures and auxiliary verbs.
To score child must be able to use correctly passive sentence structures, e.g. "It's been broken", "I just been stung by a wasp" and sentences containing 'must' and 'should', etc.

5. Frequently uses complex sentences with correct order of words.
To gain credit here the child must frequently use complex, grammatically correct sentences and very rarely make errors in speech.

L3 VOCABULARY

1. Can name simple objects and identify parts of the body.
To score the child should be able to name simple objects (e.g. car, chair, doll, bed, etc) from pictures and be able to point to parts of his body (nose, eyes, mouth, hair, feet, hands) when asked.

2. Can name colours and parts of the body.
To gain credit on this item the child should be able to name colours (red, yellow, green, blue, black, white) from pictures and name parts of the body when pointed to.

3. Recognizes own name when written.
To score child should be able to identify his own full name from amongst several others.

4. Can name simple shapes and secondary colours.
To score the child must be able to name circle, square, triangle, and rectangle ('round' and 'oblong' are accepted for 'circle' and 'rectangle' respectively), and name the colours pink, orange, brown and purple.

5. Recognizes some letters and simple words.
To obtain credit on this item the child should be able to name several letters when shown them and read a few simple words, e.g. cat, dog, etc.

L4 COMPREHENSION

1. Obeys simple commands and answers simple questions.
Credit is given if the child understands and acts upon simple verbal instructions containing the prepositions on, in, under, beside, and can respond correctly to simple questions, e.g. "What do we drink out of"?, "What do we ride in"? etc.

2. Can give definitions of simple words.
Credit this item if the child is able to define verbally simple words, e.g. chair, window, ball, cup, hat, etc, either in terms of their use or the material used in their construction.

3. Comprehends stories and answers complex questions.
To score child should be able to select pertinent pictures and answer questions while listening to a story and be able to answer more complex questions about objects e.g. "What are houses made of?", "why do we have cars"? etc.

4. Obeys more complex instructions.
To obtain credit child should be able to comply with instructions containing in front of, behind and between, e.g. "Put the brick behind the books"; "Put the scissors between the car and the brick", etc. Care should be taken to avoid ambiguity in the phrasing of the questions.

5. Can define differences between pairs of words.
The child is asked to explain in what ways three pairs of items are alike and unalike, e.g. apple and orange, bird and dog, ship and car. To gain credit the child should be able to supply one similarity and one difference for each pair without prompting.

(Tyler, 1979, pp. 9-21)

B.5

Assessment Materials included in the KPAG Kit

In addition to the playcentre equipment, the following materials were used:

Four common objects for matching patterned arrangements (toy car, block, doll, pencil).

Three pairs of large and small objects (small and large blue comb, small and large yellow wooden block, small and large playdough balls added).

Three pairs of heavy and light objects (plastic and wooden block, metal and plastic spoon, ping-pong plus golf ball).

One set of 10 common objects, five rough and five smooth (one smooth red brick, one rough red stickle brick; one small square of brown paper, one matched piece of sandpaper; strip of white ribbon, strip of matching elastic; one smooth hazel nut, one similar sized walnut; one smooth red button, one rough red button).

One set of 10 common objects, five soft and five hard (one ping-pong ball, one matched cotton-wool ball; identical children's books, one cloth, one hard-covered; similar children's bags, one cloth, one plastic; one soft blue hairbrush, matching blue scrubbing brush; infant boots, one white leather, one white woollen).

Six common objects, three of which sink and three of which float (metal knuckle bone, stone, metal spoon; cork, ping-pong ball, plastic horse).

Six objects of the same type but different sizes (six round blocks).

Eight small wooden blocks for specified block designs (four yellow, four blue).

Eight small plastic blocks (two red, two yellow, two blue, two green).

Twelve shapes, cut from plastic ice-cream containers.
(Squares: one small red, one small yellow, one large green;
Circles: one small blue, one small red, one large yellow;
Triangles: one small yellow, one small green, one large blue;
Rectangles: one small green, one small blue, one large red).

Coloured stars, used to add extra interest on colour and laterality items (distribution not contingent on child's correct or completed performance).

List of three names at the child's playcentre, with the child's own name placed in the middle (for language item on recognition of own name).

Knife, fork, spoon, playdough sausage, and zipper for self-help socialization items.

Appendix C

Supplementary Tables and Figures

Table C.1

Ethnic Description of the Children and Fathers in the Maori and Pakeha Samples

Mothers' ethnic sample	*n*	Ethnic description						
		Maori	Maori/ Pakeha	Maori/ Samoan	Samoan	Rarotongan	Pakeha/ mostly Pakeha	Other European[a]
Children (*n* = 75)								
Maori	34	19	7	1	0	0	6	1
Pakeha	41	0	1	0	0	0	40	0
Fathers (*n* = 64)								
Maori	26	11	0	1	1	1	11	1
Pakeha	38	1	0	0	0	0	32	5

[a] Includes Scottish, German, English, Swiss, and Argentinian.

Table C.2

Distribution of Fathers' Occupations on the Elley and Irving (1976) Socio-economic Index for New Zealand

Socio-economic level	Maori[a]	Pakeha[b]	Total[c]		Urban New Zealand[d]	
	n	*n*	*n*	%	%	%
1	0	3	3	4.0	7.0	4.7
2	1	8	9	12.0	11.0	9.0
3	6	13	19	25.3	23.0	26.6
4	7	9	16	21.3	29.0	29.2
5	11	4	15	20.0	21.0	18.1
6	1	1	2	2.7	9.0	12.4
Solo mother	8	3	11	14.7		

[a] Husbands of Maori mothers, $n = 26$.

[b] Husbands of Pakeha mothers, $n = 38$.

[c] Total sample of fathers, $n = 64$.

[d] Percentages published by Elley and Irving (1976) for the New Zealand urban and total male labour force.

Table C.3

Distribution of Maori and Pakeha Mothers' Occupations on the Irving and Elley (1977) Socio-economic Index for the Female Labour Force in New Zealand

Socio-economic level	Maori (n = 34)	Pakeha (n = 41)	Total (n = 75)		Urban[a]	New Zealand[a]
	n	n	n	%	%	%
1	1	1	2	2.6	3.5	2.3
2	3	5	8	10.6	8.5	5.9
3	7	16	23	30.6	23.0	23.8
4	10	14	24	32.0	32.0	34.8
5	9	4	13	17.3	22.0	20.7
6	4	1	5	6.6	11.0	12.5

[a] Percentages reported by Irving and Elley (1977) for New Zealand urban and total female labour force.

Table C.4

Distribution of the Fathers' Occupations on Johnston's Revision of the Socio-economic Indices for New Zealand

Socio-economic level	Maori (n = 26)	Pakeha (n = 38)	Total (n = 64)		New Zealand[a]
	n	n	n	%	%
1	0	4	4	5.3	7
2	1	10	11	14.7	14
3	7	11	18	24.0	28
4	6	11	17	22.7	29
5	11	2	13	17.3	14
6	1	0	1	1.3	8
Solo mother	8	3	11	14.7	

Note: This scale is used here to provide recently updated information. However, the correlational analyses reported in Chapter 5 were based on codings on Elley and Irving's (1976) index (Table C.2).

[a] Percentages for the total New Zealand male labour force reported by Johnston (1983).

Table C.5

Distribution of the Mothers' Occupations on Johnston's Revision of the Socio-economic Indices for New Zealand

Socio-economic level	Maori (n = 34)	Pakeha (n = 41)	Total (n = 75)		New Zealand[a]
	n	n	n	%	%
1	2	3	5	6.6	7
2	3	9	12	16.0	14
3	13	22	35	46.6	29
4	8	4	12	16.0	23
5	4	2	6	8.0	18
6	4	1	5	6.6	9

Note: This scale is used here to provide recently updated information. However, the correlational analyses reported in Chapter 5 were based on codings on Irving and Elley's (1977) index (see Table C.3).

[a] Percentages for the total New Zealand female labour force reported by Johnston (1983).

Table C.6

T-test Comparisons of the Maori and Pakeha Samples on Demographic Variables

Variable	Maori (n = 34)		Pakeha (n = 41)		t	df
	M	*SD*	*M*	*SD*		
Maternal education	7.21	2.87	6.29	2.93	1.36	73
Maternal occupation	4.03	1.27	3.44	1.00	2.25*	73
Playcentre courses	2.91	1.29	2.90	1.24	0.03	73
Maternal age in years	27.59	3.87	29.76	4.88	-2.10*	73
Child's age in months	41.50	3.31	41.68	3.13	-0.25	73
Paternal education	7.85	2.28	5.66	3.10	3.07**	62
Paternal occupation	4.19	0.98	3.16	1.20	3.64**	62
Child's birth order	2.32	1.12	1.88	1.03	1.79	73
Number of children in family	2.74	1.08	2.41	0.97	1.35	73

Note: Pooled variance estimate used for t values.

Demographic variables are defined in Appendix D.

*p < .05, two-tailed.

**p < .01, two-tailed.

Table C.7

T-test Comparisons of the Maternal Education Groups on Demographic Variables

Variable	Higher[a]		Lower[b]		*t*	*df*
	M	*SD*	*M*	*SD*		
Maternal occupation	3.12	1.12	4.20	0.95	-4.49**	73
Playcentre courses	2.71	1.29	3.07	1.21	-1.27	73
Maternal age in years	29.44	4.67	28.22	4.44	1.16	73
Child's age in months	41.56	3.33	41.63	3.11	-0.10	73
Paternal education	4.77	2.92	8.12	2.01	-5.28**	50.57
Paternal occupation	3.10	1.16	4.00	1.13	-3.15*	62
Child's birth order	1.88	1.04	2.24	1.11	-1.44	73
Number of children in family	2.56	1.05	2.56	1.03	-0.01	73

Note: Pooled variance estimate used for *t* values, except on paternal education, where the separate variance estimate was used. Demographic variables are defined in Appendix D.

[a] Higher maternal education level, $n = 34$.

[b] Lower maternal education level, $n = 41$.

*$p < .01$, two-tailed.

**$p < .001$, two-tailed.

Table C.8

The Cultural Participation Responses of Groups of Maori Mothers

Cultural affiliation response	Maternal Education Group		
	Higher (n = 13)	Lower (n = 21)	Combined (n = 34)
Marae participation			
Involved	6	4	10
Not involved	7	17	24
Maori club affiliation[a]			
Involved	3	1	4
Not involved	10	20	30
Maori language fluency			
Speaks and understands	2	4	6
Does not speak and understand	11	17	28

[a] Maori clubs included cultural clubs and Maori Women's Welfare League.

Table C.9

Mean Percentages of Inter-observer Agreement across the Maternal Interactive Behaviour Categories

Maternal Interactive Behaviour Category	Ethnic Group		
	Maori (n = 10)	Pakeha (n = 9)	Combined (n = 19)
01 Physical Contact	64.68	81.71	72.75
02 Out of Contact	90.55	84.82	87.84
03 Attentive Observation	83.19	89.99	86.41
04 Playing Interactively	87.80	81.92	85.02
05 Cooperation	96.67	87.87	92.50
06 Non-cooperation	92.50	82.27	87.66
07 Attending	82.49	76.90	79.84
08 Questions	85.76	80.30	83.17
09 Rewards	78.12	89.08	83.31
10 Discipline	100.00	---	100.00
11 Threats	100.00	---	100.00
12 Criticisms	100.00	94.40	97.37
13 Direct Commands	93.81	91.32	92.59
14 Indirect Commands	85.23	74.25	80.03
15 Teaching	86.80	93.52	89.78
16 Helping	76.84	87.79	82.02

Note: Dashes indicate agreed zero frequency.

Table C.10

Inter-observer Reliability Correlation Coefficients across the Maternal Interactive Behaviour Categories

Maternal Interactive Behaviour Category		Ethnic Group		
		Maori (n = 10)	Pakeha (n = 9)	Combined (n = 19)
01	Physical Contact	.95**	.99**	.99**
02	Out of Contact	.94**	1.00**	.98**
03	Attentive Observation	.92**	.97**	.96**
04	Playing Interactively	.98**	.98**	.98**
05	Cooperation	.99**	.90**	.95**
06	Non-cooperation	.96**	.88**	.90**
07	Attending	.86**	.81*	.86**
08	Questions	.97**	.94**	.95**
09	Rewards	.92**	.97**	.93**
10	Discipline	1.00**	---	1.00**
11	Threats	1.00**	---	1.00**
12	Criticisms	1.00**	1.00**	1.00**
13	Direct Commands	.98**	1.00**	.99**
14	Indirect Commands	.94**	.62	.84**
15	Teaching	.98**	.94**	.97**
16	Helping	.77*	.97**	.87**

Note: Dashes indicate agreed zero frequency.
Pearson product-moment correlation coefficients are significant at:

*p < .01, one-tailed.

**p < .001, one-tailed.

Table C.11

Test-Retest Coefficients on the Keele Pre-school Assessment Guide (KPAG) Cognition and Language Scores for the Ethnic Groups

KPAG-	Ethnic Group		
	Maori (n = 7)	Pakeha (n = 8)	Combined (n = 15)
Cognition	.97**	.93*	.96**
Language	.95**	.96**	.96**

Note: The test-retest interval was 2 weeks. Pearson product-moment correlation coefficients are significant at:

*p < .01, two-tailed.

**p < .001, two-tailed.

Table C.12

Test-Retest Pearson and Spearman Correlations on the Brown IDS Self-Concept Referents Test Scores for the Ethnic Groups

Brown Self-Concept Score	Ethnic Group		
	Maori (n = 7)	Pakeha (n = 8)	Combined (n = 15)
Pearson product-moment correlations			
Unadjusted	.25	.79	.73*
Adjusted	.11	.90*	.69*
Spearman rank-order correlations			
Adjusted	.11	.85*	.59

Note: The test-retest interval was 1 week.

*p < .01, two-tailed.

Table C.13

Varimax Rotated Factor Matrix for the Sixteen Maternal Interactive Behaviours

	Factors						Communality
Maternal Behaviour	I	II	III	IV	V	VI	(h^2)
Physical Contact		-.21					.08
Out of Contact	-.51				-.44		.58
Attentive Observation		-.38				-.87	.99
Playing Interactively		-.29				.46	.36
Cooperation					.71		.55
Non-cooperation	-.64						.49
Attending	.28		.53		.40	-.28	.63
Questions	.47	.24	.60		.39		.81
Rewards	.64						.47
Discipline				.59			.40
Threats				.96			.96
Criticisms	-.29	.42		.27			.35
Direct Commands		.90					.91
Indirect Commands			.66				.47
Teaching	.54		.44		.27		.57
Helping		.50					.27
Total % of variance	38.7	19.5	14.3	11.3	8.7	7.5	
Eigenvalue	3.43	1.73	1.27	1.00	.78	.67	

Note: Loadings of less than .20 are omitted. n = 75.

Table C.14

Varimax Rotated Factor Matrix for Fourteen Maternal Interactive Behaviours: Maori Mothers

	Factors				Communality
Maternal Behaviour	I	II	III	IV	(h^2)
Physical Contact		-.32	.27	.23	.23
Out of Contact	-.44			-.51	.48
Attentive Observation		-.71	-.25		.59
Playing Interactively			.99		.98
Cooperation	.55	-.29			.39
Non-cooperation		.31		-.58	.45
Attending	.71	-.35		.24	.72
Questions	.72	-.41		.33	.80
Rewards	.23	.22		.54	.40
Criticisms	-.27		-.25	-.22	.21
Direct Commands	-.26	.82	-.42	.23	.98
Indirect Commands	.55				.31
Teaching	.79			.26	.71
Helping		.59	-.23		.41
Total % of variance	50.8	25.0	15.6	8.7	
Eigenvalue	3.88	1.91	1.19	.66	

Note: The infrequent behaviours Discipline and Threats were excluded from this analysis. Loadings of less than .20 are omitted. n = 34.

Table C.15

Varimax Rotated Factor Matrix for Fourteen Maternal Interactive Behaviours: Pakeha Mothers

	Factors						Communality
Maternal Behaviour	I	II	III	IV	V	VI	(h^2)
Physical Contact						.75	.57
Out of Contact	-.57	-.41	.42	-.34		-.25	.87
Attentive Observation		-.24	-.94				.96
Playing Interactively			.26	.30	-.24		.24
Cooperation				.80			.64
Non-cooperation	-.61						.44
Attending	.62		-.21		-.38		.63
Questions	.91			.22			.93
Rewards	.61					.28	.52
Criticisms		.78					.64
Direct Commands		.77		-.25	.25		.76
Indirect Commands	.46		.45			.20	.49
Teaching	.80						.65
Helping					.84		.75
Total % of variance	36.9	18.8	16.1	12.0	8.7	7.5	
Eigenvalue	3.36	1.71	1.47	1.09	.79	.68	

Note: The infrequent behaviours Discipline and Threats were excluded from this analysis. Loadings of less than .20 are omitted. n = 41.

Table C.16

ANOVA: A Summary of Child Gender Effects on Maternal Behaviours for the Ethnic and Education Groups

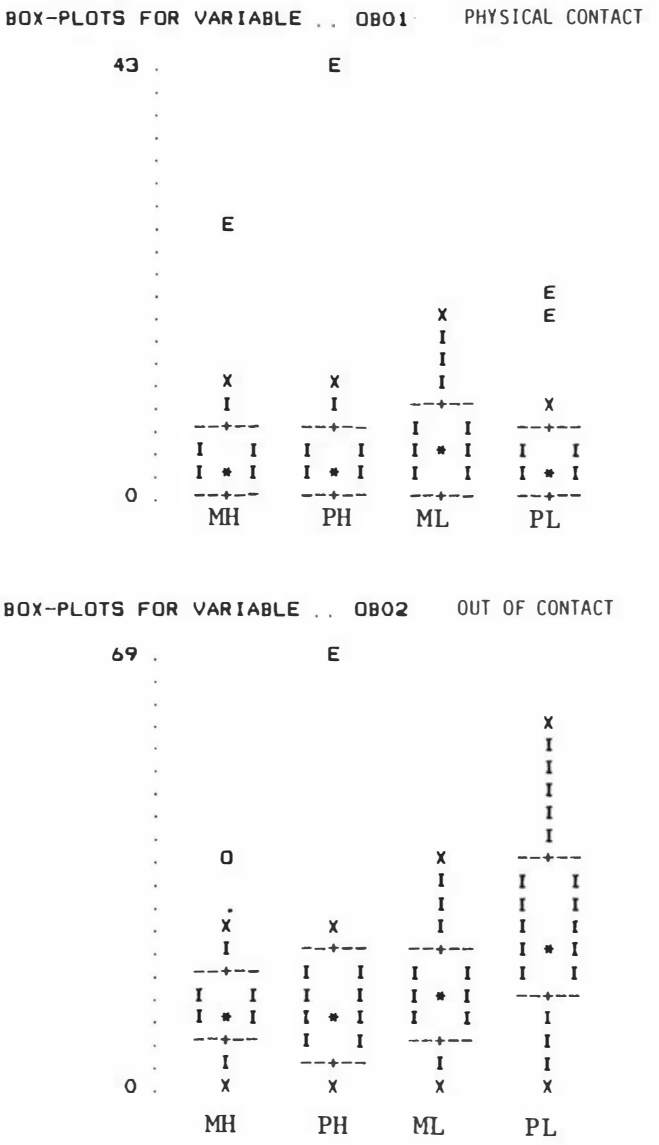
Maternal Interactive Behaviour	Boys			Girls					
	n	*M*	*SD*	*n*	*M*	*SD*	*df*	*MS*	*F*
	Pakeha Pairs (*n* = 41)								
Helping	20	11.20	3.68	21	7.95	5.72	1,39	108.04	4.62*
	Higher Education Level Pairs (*n* = 34)								
Indirect Commands	15	6.73	3.13	19	9.63	4.69	1,32	70.41	4.22*
	Lower Education Level Pairs (*n* = 41)								
Physical Contact	20	2.95	3.61	21	6.57	6.87	1,39	134.35	4.40*

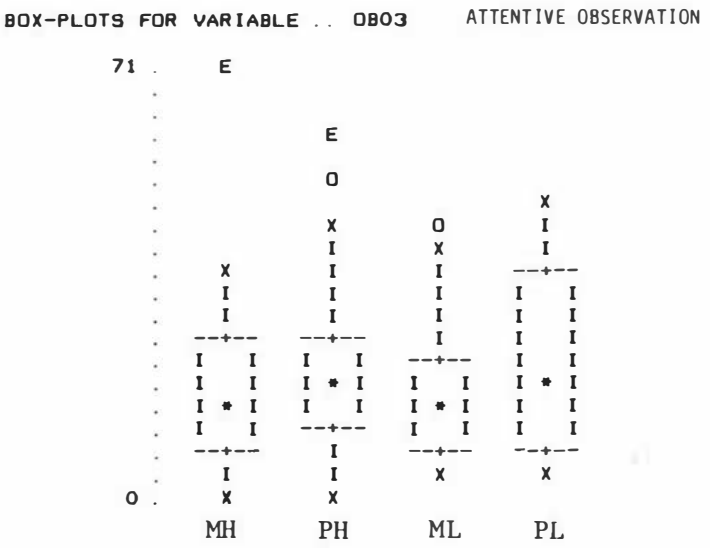
Note: *F* values listed only if significant at $p < .05$.

*$p < .05$.

Figure C.1. Box-plots for Thirteen Maternal Behaviours, Showing the Median and the Extreme Values, for the Four Maternal Ethnic and Education-Level Groups.

(* = Median, 0 = Outlier, E = Extreme Value.
The groups of mothers shown are, from left to right: MH = Maori, higher education; PH = Pakeha, higher education; ML = Maori, lower education, PL = Pakeha, lower education.)





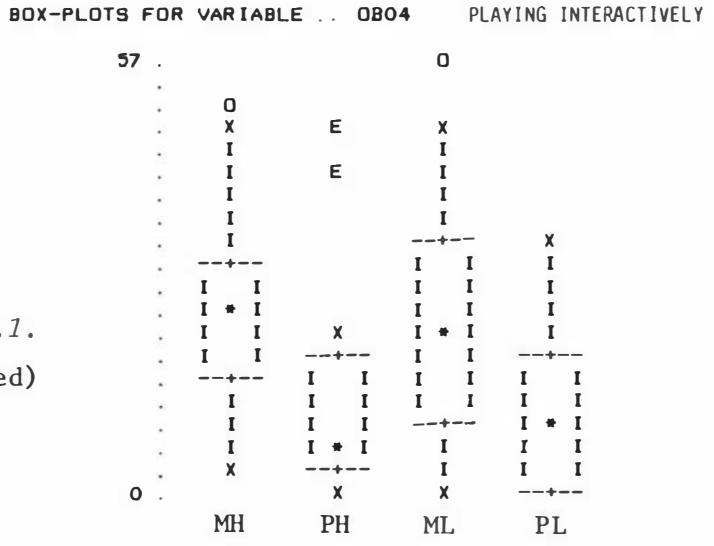
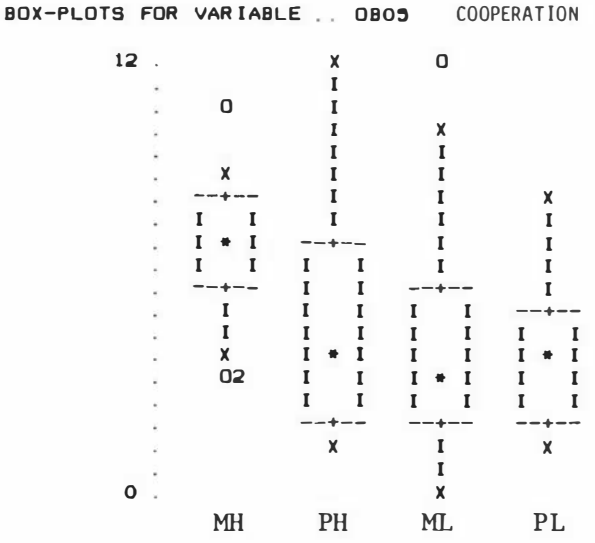
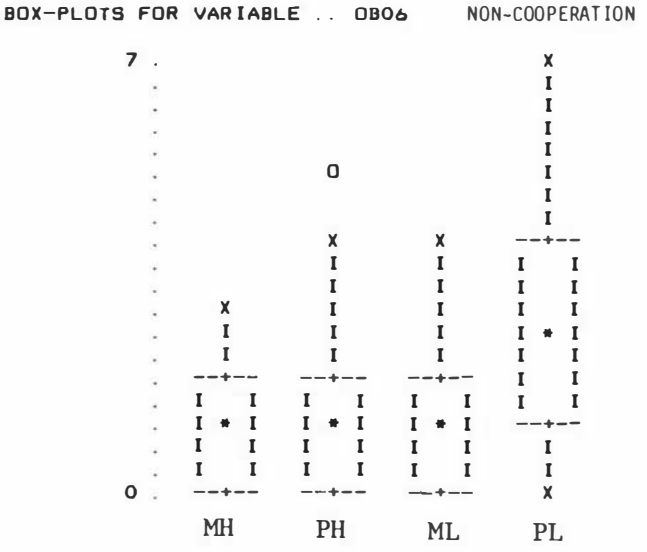
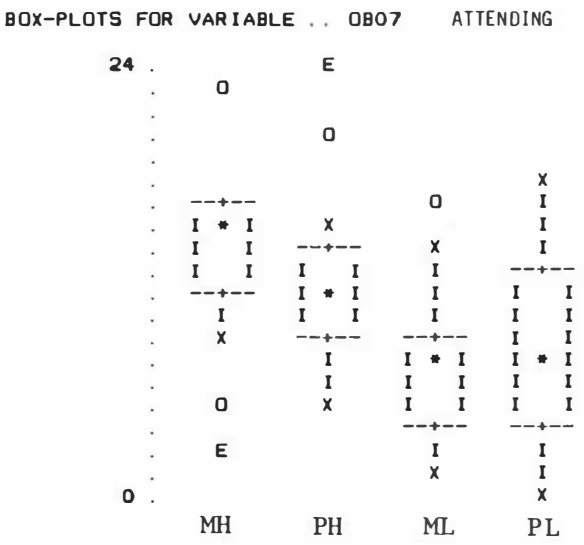
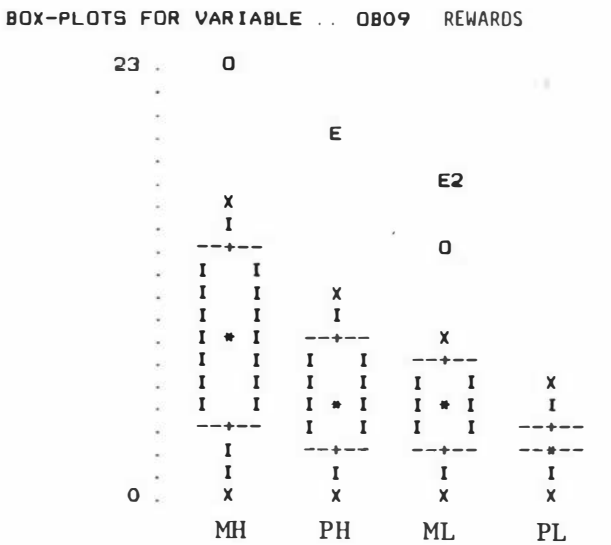


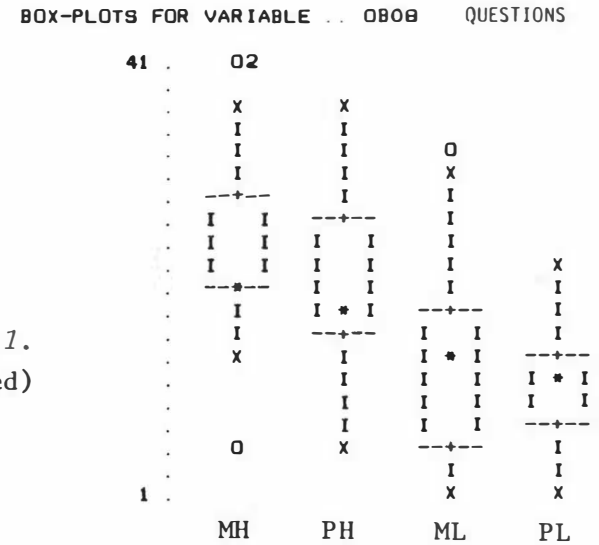
Figure C.1.
(continued)











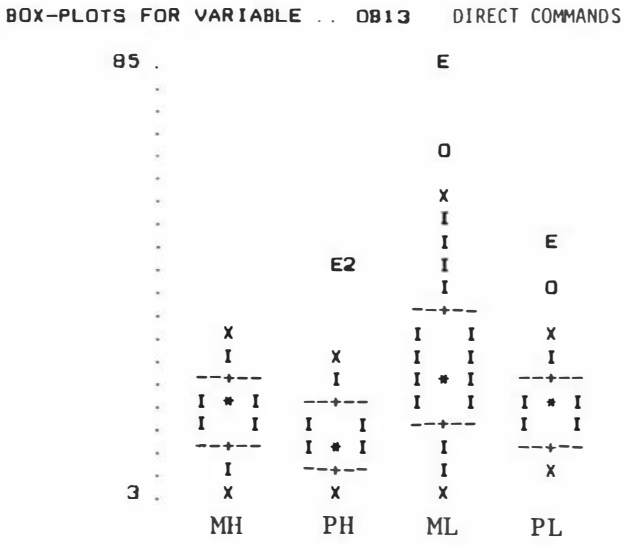
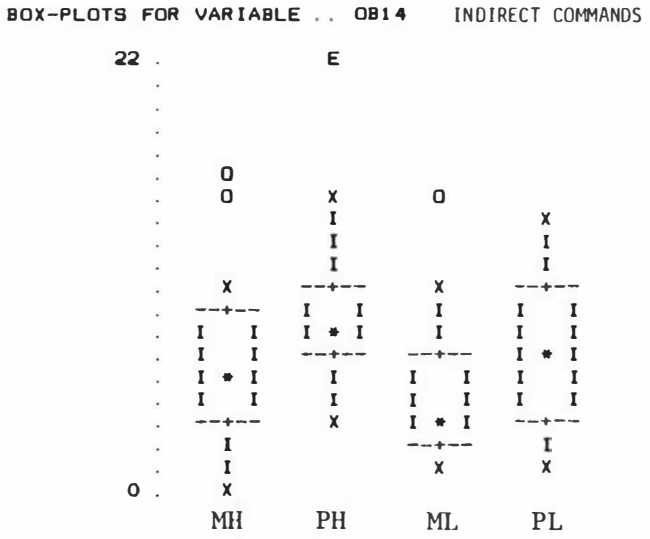
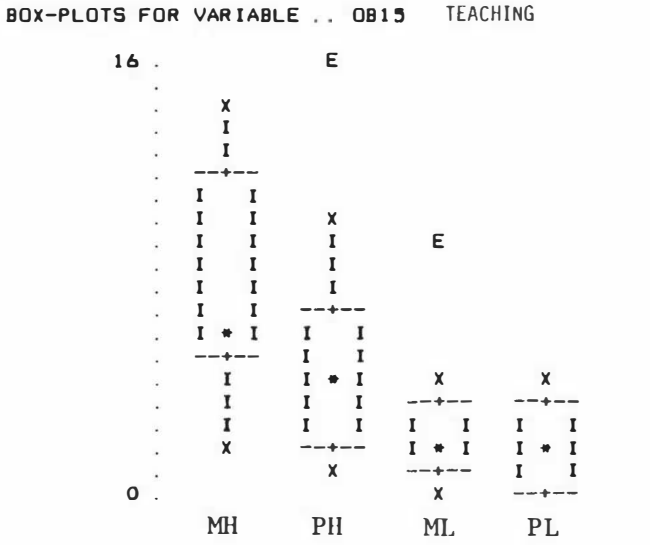


Figure C.1.
(continued)





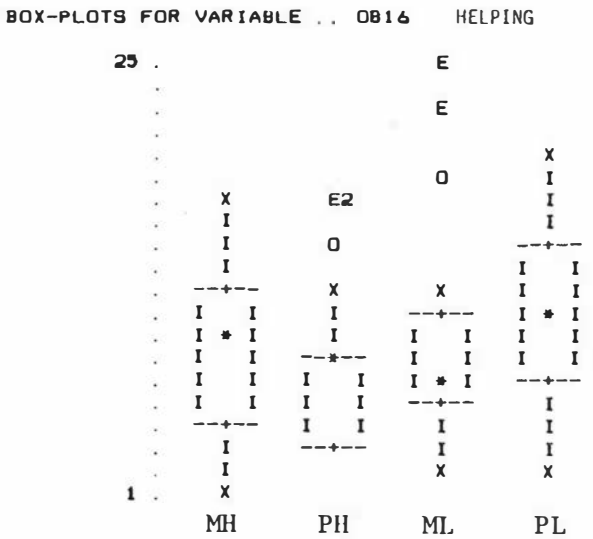


Figure C.1.
(continued)

Appendix D

Variable Definitions and Raw Data

D.1

Scale for Maternal and Paternal Education Levels

01 University Degree

02 University Entrance, and Professional Course
(e.g. teachers' college, general nursing, certificates of science).

03 University Entrance

04 Sixth Form Certificate

05 Full School Certificate, and Professional Course
(e.g. dental nursing, apprenticeships)

06 Full School Certificate

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07 Partial School Certificate Pass

08 No School Certificate, but Trade Training Course
(e.g. police, hairdressing, secretarial)

09 3, 4, or 5 years' Secondary Schooling
(no school or subsequent qualifications)

10 1 to 2 years' Secondary Schooling
(no subsequent qualifications)

Note. Higher education group = categories 1 to 6.
Lower education group = categories 7 to 10.

D.2

The List of Variables and their Labels

VARIABLES ARE TO BE READ AS FOLLOWS:

VARIABLE	FORMAT	RECORD	COLUMNS	
NUMBERM	F 2. 0	1	2-	3
CENTRE	F 2. 0	1	4-	5
ETHNIC	F 1. 0	1	6-	6
EDUC	F 2. 0	1	7-	8
OCC	F 1. 0	1	9-	9
COURSE	F 1. 0	1	10-	10
MAGE	F 2. 0	1	11-	12
OB01	F 2. 0	1	16-	17
OB02	F 2. 0	1	18-	19
OB03	F 2. 0	1	20-	21
OB04	F 2. 0	1	22-	23
OB05	F 2. 0	1	24-	25
OB06	F 2. 0	1	26-	27
OB07	F 2. 0	1	28-	29
OB08	F 2. 0	1	30-	31
OB09	F 2. 0	1	32-	33
OB10	F 2. 0	1	34-	35
OB11	F 2. 0	1	36-	37
OB12	F 2. 0	1	38-	39
OB13	F 2. 0	1	40-	41
OB14	F 2. 0	1	42-	43
OB15	F 2. 0	1	44-	45
OB16	F 2. 0	1	46-	47
ROB01	F 2. 0	1	48-	49
ROB02	F 2. 0	1	50-	51
ROB03	F 2. 0	1	52-	53
ROB04	F 2. 0	1	54-	55
ROB05	F 2. 0	1	56-	57
ROB06	F 2. 0	1	58-	59
ROB07	F 2. 0	1	60-	61
ROB08	F 2. 0	1	62-	63
ROB09	F 2. 0	1	64-	65
ROB10	F 2. 0	1	66-	67
ROB11	F 2. 0	1	68-	69
ROB12	F 2. 0	1	70-	71
ROB13	F 2. 0	1	72-	73
ROB14	F 2. 0	1	74-	75
ROB15	F 2. 0	1	76-	77
ROB16	F 2. 0	1	78-	79
CETHNIC	F 1. 0	2	6-	6
EDUCP	F 2. 0	2	7-	8
SES	F 1. 0	2	9-	9
AGE	F 2. 0	2	10-	11
SEX	F 1. 0	2	12-	12
BIRTH	F 1. 0	2	13-	13
SIZE	F 1. 0	2	14-	14
URBAN	F 1. 0	2	15-	15
BROWNP	F 2. 0	2	16-	17
BROWNN	F 2. 0	2	18-	19
BROWNO	F 2. 0	2	20-	21
KEELEC	F 2. 0	2	22-	23
KEELEP	F 2. 0	2	24-	25
KEELES	F 2. 0	2	26-	27
KEELEL	F 2. 0	2	28-	29
CASK	F 2. 0	2	32-	33
RBROWNP	F 2. 0	2	34-	35
RBROWNN	F 2. 0	2	36-	37
RBROWNO	F 2. 0	2	38-	39
RKEELEC	F 2. 0	2	40-	41
RKEELEL	F 2. 0	2	42-	43
MARAE	F 1. 0	2	44-	44
CLUB	F 1. 0	2	45-	45
MAORIL	F 1. 0	2	46-	46

VARIABLE LABELS

EDUC MATERNAL EDUCATION LEVEL/COURSE PLAYCENTRE COURSE/
MAGE MATERNAL AGE IN YEARS/OB01 PHYSICAL CONTACT/
OB02 OUT OF CONTACT/OB03 ATTENTIVE OBSERVATION/
OB04 PLAYING INTERACTIVELY/OB05 COOPERATION/
OB06 NON-COOPERATION/OB07 ATTENDING/OB08 QUESTION/
OB09 REWARD/OB10 DISCIPLINE/OB11 THREAT/
OB12 CRITICISM/OB13 DIRECT COMMAND/
OB14 INDIRECT COMMAND/OB15 TEACHING/OB16 HELPING/
EDUCP PATERNAL EDUCATION LEVEL/
AGE CHILD'S AGE IN MONTHS/BIRTH CHILD'S BIRTH ORDER/
SIZE NUMBER OF CHILDREN IN FAMILY/
BROWNP RAW POSITIVE BROWN SCORE/
KEELEC KPAG COGNITION SCORE/KEELEP KPAG PHYSICAL/
KEELES KPAG SOCIALIZATION/
KEELEL KPAG LANGUAGE SCORE/
CASK CHILD'S DEMANDS OF MOTHER/
MARAE MARAE PARTICIPATION/CLUB MAORI CLUB INVOLVEMENT/
MAORIL MAORI LANGUAGE FLUENCY

VALUE LABELS

ETHNIC (1)MAORI (2)PAKEHA/COURSE (1)SUPERVISOR
(2)HELPER (3)OTHER (4)NO COURSES/
SEX (1)MALE (2)FEMALE/URBAN (1)URBAN DWELLING
(2)TOWN OR MIXED (3)RURAL/MARAE (1)INVOLVED
(2)NOT INVOLVED/CLUB (1)INVOLVED (2)NOT INVOLVED/
MAORIL (1)SPEAKS AND UNDERSTANDS (2)MAORI NOT SPOKEN

D.3

The Raw Data

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