

**MOTHERS' MEDIATIONAL STYLE AND THE
EFFECTS ON LANGUAGE DEVELOPMENT
IN 3 to 5 YEAR-OLDS.**

By

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Abstract

Mothers and their children aged 3 –5.5 (14 girls and 26 boys) were videotaped in two situations: a) mother reading with the child and b) child constructing a puzzle with the mother. Children's language development was assessed with the CELF, a norm referenced language test. Two scorers rated the videotapes for mediational and interactions and directive interactions. Using Feuerstein's Mediated Learning Experience criteria (MLE) mediational interactions were coded: Regulation of Behavior, Shared Participation, Mediation of Competence, Meaning and Purpose, or Transcendence. Child challenge seeking, Child self talk, and mother's Intrusiveness were also rated. Major findings include: (a) child Language development was positively correlated with mothers' mediational interactions and negatively correlated with mothers' directive interactions; (b) Mothers' education was positively correlated with child language development and with mediational interactions; (c) Intrusiveness of mothers was negatively correlated with child language development; and (d) child challenge seeking and self talk were positively correlated with child language development.

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Table of Contents

Approval	ii
Abstract	iii
Acknowledgement	iv
Table of Contents	v
List of Tables	vii
Introduction	1
Vygotsky's Thoughts on Cognitive and Language Development.....	1
Feuerstein	6
Feuerstein's MLE Criteria	9
Directiveness	11
Social Interaction, Language, Cognition	12
Statement of the Problem.....	21
Purpose of the Study.....	22
Methodology	23
Participants.....	23
Procedure	24
Recruitment	24
Research Procedure.....	25
MLE Coding.....	26
Regulation of Behavior.....	27
Shared Participation	28
Mediation of Competence	28
Meaning and Purpose	29
Transcendence	29
Intentionality and Reciprocity.....	29
Directive Interactions.....	30
Other Ratings.....	30
Interrater Reliability.....	32
Additional Scoring.....	32
Results	34
Demographics	34
Gender Differences	34
Education.....	34
Family Income.....	35

Mothers' Work Status	35
Mothers' Interactions in the Two Research Scenarios	36
Mothers' Education and Mediation	36
Mother's Mediation Interactions and CELF Language Scores	36
Mother's Directive Interactions and Child's CELF Scores	37
Mothers' Intrusiveness and Child's CELF Language Scores	38
Child Behavior in the Two Research Scenarios	39
Child Self Talk and CELF Language Scores	39
Child Challenge Seeking and CELF Language Score	39
Regression Analysis	40
Discussion	41
Conclusions and Implications	49
Limitations	50
Appendices	52
Appendix A: Research Letter	53
Appendix B: Questionnaire	54
Appendix C: MLE Rating Scale	56
References	59
Tables	62
Table 1	62
Table 2	63
Table 3	64
Table 4	65

List of Tables

Table 1: Demographics.....	62
Table 2: Descriptives: Mean Scores and Standard Deviations for Variables	63
Table 3: Correlational Table.....	64
Table 9: Regression Analysis	65

Introduction

This study was designed to examine the relationship between specific aspects of mother-child interactions and children's language development. The framework that guided this research is based on Feuerstein's (1988, 1991) notions of Mediated Learning Experience (MLE) and Structural Cognitive Modifiability (SCM), which are rooted in Vygotsky's (1962, 1986) theories of cognitive and language development.

In the following pages, those aspects of Vygotsky's theories that are relevant to the current study are discussed. Vygotsky's notion of the relationship between mediation, and both language and cognitive development are linked to Feuerstein's theories of SCM and MLE. Current research examining the relationship between the role of the mediator as defined in MLE and cognitive and language development is presented.

Vygotsky's Thoughts on Cognitive and Language Development

While Vygotsky was born over a century ago, his views on language and mental processes and on the role of cultural context in their development are as current today as they were perhaps revolutionary in his

day. Vygotsky argued that the development of language and thought have their origins in social processes (Vygotsky, 1986; Wertsch, 1984, 1985). He argued further that social interaction determines internal cognition. "The very mechanism underlying higher mental functions is a copy from social interaction; all higher mental functions are internalized social relationships." (Vygotsky, 1986, p.89).

Vygotsky suggested that we plan, co-operate, organize, and communicate in ways that are determined by our culture. By this Vygotsky meant that the social environment in which a child grows up, will not only affect the content that a child learns, (e.g. vocabulary associated with certain objects in the household), but that experiences within the household will stimulate ways of thinking. According to Vygotsky's theories, both technological tools (e.g., tools of labor), and psychological tools (e.g., tools of thinking), determine the development of an individual's cognition. He proposed that human cognitive capacities themselves change as a result of historical development. The notion that human history consists of the development of new psychological 'tools' for dealing with the world at large is thought-provoking indeed, suggesting that not only ontogenetic, but also phylogenetic development is affected by social interaction and cultural changes. Decades later, Vygotsky's theories are supported through research into brain development and functioning resulting from exposure to and interaction with modern technology (Healey, 1990).

For Vygotsky, a major challenge was understanding how the individual acquires psychological tools. In his view, concepts, attention, memory and language develop through interactions between the child and another more capable person. He termed these interactions interpersonal. Once the child has acquired these ways of thinking, they are then under the child's voluntary control. Vygotsky then referred to these processes as intrapersonal (Vygotsky, 1986).

Vygotsky argued that although children may develop concepts to some extent on their own, they do not develop purely abstract modes of thought without human interaction. He proposed two levels of development: a child's level of independent functioning, and the level at which a child could function while participating in a social interaction with a more capable mediator. The zone between the independent level and the supported level of functioning was termed by Vygotsky, the Zone of Proximal Development (ZPD). In Vygotsky's theories, the more capable adult plays a vital role in the child's development, structuring stimuli in such a way that the child learns from the experience in a way that may not have been possible if the child had been left on his or her own.

Vygotsky examined in detail the relationship between language and thought. He argued that studies of language in terms of syntax and grammar were inadequate to understand what he referred to as the "living union of sound and meaning" (Vygotsky, 1986, p.4). Vygotsky referred to how the speaking of words relates to the use of words in thought

processes. Vygotsky mentioned how studies of such relationships would ultimately lead to an understanding of consciousness. By this he meant conscious awareness of our thought processes, now commonly referred to as metacognition. It has been proposed by psychologists like Haywood (1986), who have expanded on Vygotsky's teachings, that metacognition is crucial to cognitive and language development, (e.g. not memorizing processes and words, but understanding their form and function).

Vygotsky concluded that in child development a pre-intellectual stage and separate pre-linguistic stage begin to merge "whereupon thought becomes verbal and speech rational" (1986, p.44). Vygotsky suggested that at this point the child actively learns new words, appearing to have discovered the symbolic functions of words. In this developmental process Vygotsky accorded an important role to inner speech. He saw it as the most important mediator of cognitive development. Through self talk the child begins to develop cognitive processes. Self talk eventually becomes internalized and forms the basis of thought processes. This view of self talk contrasts markedly with Piaget's view of self talk which ascribed little importance to this phenomenon in terms of cognitive development. Piaget treated it as an immature stage in language development (Piaget, 1955).

Vygotsky further asserted that while it is obvious that a certain degree of maturation has to be achieved before a child will benefit from teaching, he asked "suppose the child's memory, attention, and thinking have developed to the point where he can be taught writing and arithmetic,

does the study of writing and arithmetic do anything to his memory, attention and thinking, or does it not?" (1986, p.94). Vygotsky concluded that by and large "instruction usually precedes development". However, "once the child has achieved conscious control in one kind of concept, all of the previously formed concepts are restructured accordingly" (1986, p.107). He further concluded that instruction does not begin at school, that in fact many concepts are developed with the help of the more capable adult in the preschool years.

While interactions in the ZPD can be expressed verbally and non-verbally, the modality of these interactions is less important than the nature of these interactions, how such interactions affect cognitive development and, how cognitive development affects language and thought processes. Vygotsky did not perceive language and cognition as separate, but as developing together. Even though the precise relationship between language and cognition remained obscure to him, he believed that consciousness or metacognition was crucial in this relationship. For Vygotsky, language development involved more than the child learning how to produce grammatically correct sentences. In Wertsch's (1979, p.4) words "Vygotsky was mainly concerned with emphasizing the social activity of speech or speaking rather than the structure of the language system." By studying the interpsychological processes in language Vygotsky was seeking to understand how genuine concepts are learned and how language is used to operate on itself.(Wertsch,1985).

Feuerstein

Feuerstein's (1988, 1991) theories of Structural Cognitive Modifiability (SCM) and Mediated Learning Experience (MLE) are based on Vygotsky's notion that the nature of the child's development is powerfully affected by the type of interactions that occur between the child and a more competent adult. For instance, the child's development of higher mental processes, (e.g. deriving commonalities between words, rather than merely acquiring distinct meaning for individual words) can be attributed in Vygotsky's and Feuerstein's views directly to the nature of such interactions. In the original translation of Vygotsky's *Language and Thought*, these interactions are sometimes referred to as "instruction". Examples are provided by Vygotsky, but it was Feuerstein who termed these interactions "mediation" and who developed criteria for the interactions that make a difference in the child's development.

Feuerstein proposed that through mediational interactions, individuals will develop cognitively to their fullest potential. This belief that human beings are capable of changes in the very ability to process information, to think and respond, is basic to Feuerstein's theory of SCM. As Vygotsky proposed before him, Feuerstein believes that the crucial difference between children who may be genetically similar, but who differ in level of functioning, is the quality of social interaction they have experienced. Feuerstein's theories state that a child who has been

receiving sufficient MLE will be able to benefit by direct exposure to stimuli without a mediating adult present, whereas a child who has not received adequate MLE will not be able to function adequately without intervention of the adult. For instance, a child with MLE learns to distinguish what he needs to focus on and what may be less relevant, affecting among other things the ability to follow directions, to hold information and to get the main idea. When children learn ways of thinking through MLE, such as awareness and understanding of 'directionality' and when they acquire the concomitant conceptual language (e.g. left, right, before, after), children are able to apply this understanding to letter and number formation and to telling time. These new ways of thinking must be permanent, pervasive and central to be considered cognitive changes. By this Feuerstein means that these newly acquired ways of thinking cannot be temporary or be restricted to occur only under similar conditions. It must be a change in capacity to learn that goes across domains and that in and of itself continues to increase the individual's ability to learn (Tzuriel, 1993). In the above example of directionality, the child may now apply such understanding to higher level functions, such as seriating and sequencing in a variety of modalities, such as numerical or language, and may apply it even in the social domain.

Feuerstein defined MLE formally as "the interactional process between the developing human organism and the experienced adult who, by interposing him or herself between the learner and the external sources

of stimulation, mediates the experience by selecting, framing, focussing, intensifying, and feeding back environmental experiences in such a way as to produce appropriate learning habits.” (Feuerstein, Falik & Feuerstein, 1998). The mediator frames and schedules stimuli in such a way that the child benefits from the experience, and in a manner that allows the child to eventually benefit from direct exposure to stimuli without the human mediator present. In other words, both cognitive and language development are dependent in their complex interaction upon the presence of a human mediator in order for the child to become a learner; able to know what to listen for, able to organize stimuli in a way that they can be stored and retrieved, able to follow directions because of adequate cognitive and language concept development, able to make sense out of the experience, able to understand the rules which govern the experience, able to engage in rule based learning, including language learning, able to move beyond the experience, able to infer and to predict.

Clearly, Feuerstein proposes that it is not the frequency of caregiver-child interaction that advances cognitive and language development, but that it is the nature of the interaction that is crucial. In Feuerstein’s theory the interaction must take the form of MLE.

Feuerstein's MLE Criteria

Feuerstein developed 12 criteria which characterize the Mediated Learning Experience, (Feuerstein, Klein, & Tannenbaum, 1991; & Feuerstein, Falik & Feuerstein, 1988)

Intentionality and Reciprocity: The mediator is clear in his or her mind about what he/she wants to communicate to the child. He/she then makes a deliberate attempt at ensuring that the child is receptive to the message. The mediator may share his or her agenda with the child either explicitly or implicitly, verbally or non-verbally, and attempts to have the child receive and respond to the agenda.

Meaning and Purpose: The mediator ensures that the interaction is of importance at the child's level of experience, so that it motivates the child to engage in the interaction.

Transcendence: The mediator takes the child beyond the 'here and now' and relates current experiences to experiences or events in another place or time. This moves the child into more abstract thinking.

Mediation of Competence: The mediator ensures that the child experiences a sense of 'I did it', as opposed to 'I got lucky' or worse, 'I can't do it'. The mediator may help the child to succeed, in order for the child to achieve a sense of accomplishment; or the mediator may praise an aspect

of the child's functioning that was desirable, rather than focus on the end product which may or may not be perfect.

Mediation of Shared Behavior: The mediator communicates to the child that they are both in this experience together, using language like 'we' or 'us', sharing not only in the solving of problems but also sharing perspective.

Mediated Regulation and Control of Behavior: The mediator attempts to focus the child, or to help the child control impulsivity, or in some cases to help the child initiate a response.

Mediation of Individuation and Psychological Differentiation: The mediator respects the individuality of the child, valuing the child's opinions regardless of whether they differ from those of the mediator, instilling in the child a healthy and strong sense of self.

Mediation of Goal Seeking, Goal setting, Goal planning and Achieving Behavior: The mediator deliberately sets out to create in the child the cognitive structures that will enable the child to engage in future-directed thinking.

Mediation of Challenge, the search for novelty and complexity: The mediator stimulates curiosity and reasonable risk taking, with a view to helping the child function more independently and ultimately at higher intellectual levels.

Mediation of an Awareness of the Human Being as a Changing Entity:

The mediator communicates to the child that the child can learn. Change may provoke feelings of anxiety in a child, but as Feuerstein points out, 'change and awareness of being modified is certainly a source of stress but need not become a source of distress.' (1991, p. 84).

Mediation of Optimistic Alternative: The mediator encourages the child to work towards positive outcomes. Feuerstein points out that this mobilizes the child's thinking. Negative responses require little or no thinking.

Mediation of the Feeling of Belonging: The mediator creates in the child an awareness of being part of a group, such as a family, instilling in the child a sense of security and stability necessary for intellectual growth.

Directiveness

Not all interactions between mothers' and their children will be mediational. There is a need then to describe these non-mediational interactions. An example of a non-mediational interaction is a direct command, such as "take off your shoes". A mediational equivalent of such a direct command would be "what do you need to do with your shoes?" Non- mediational interactions, such as direct commands, could be termed directive interactions. While there exists a range of interactions from mediational to directive, in order to study effects, the interactions at each end of the continuum are examined in this study.

Social Interaction, Language, Cognition

There is a significant body of research that addresses the theories of Vygotsky and Feuerstein. Vygotsky asserted that cognitive development involves the internalization, transformation, and use of cognitive routines, concepts, and skills that surround the child in the activities of other members of their culture. These routines are learned socially with competent partners. There exists a reciprocal relationship between children and their caregivers: children and caregivers have complementary roles in fostering a child's development. Rogoff (1990) implied that young children come equipped with ways of ensuring proximity to and involvement with more experienced members of society. In her view, these strategies are complemented by the caregiver encouraging the child's gradual involvement in society. Caregivers facilitate learning and regulate the difficulty of the tasks. While caregivers may rarely regard themselves as teachers of explicit functions, they routinely adjust their interactions to provide support for the child's learning. However, many of these interactions are organized to complete the task of the moment, not for future learning.

Evidence of parental simplification and framing of language is used to support the view that language acquisition rests on social supports. For instance, Rogoff, Ellis, and Gardner (1984) in their study of thirty-two mother child dyads assessed mother-child interactions in relation to task

and the child's age. This study addressed the hypothesis that mothers would provide their children with more assistance, both directional and open-ended in nature, if the child was younger. Specifically, these investigators were interested in two types of interaction: directional and open-ended. Directional was defined as direct commands and statements, while open-ended was defined as posing open-ended questions. These open-ended questions are akin to a mediational style of interaction. Results showed that mothers used more intense instruction of all kinds with younger children than with older children. Younger children were expected to perform less well than the older children on the problem solving tasks in the study. However, the mothers in the dyads adjusted their interactional style for the younger children, with the result that a better performance was achieved by the younger group. These findings support Vygotsky's contention that interactional style is adjusted to fit the learner's needs by the more competent adult in their environment who works within the zone of proximal development. Rogoff et al. concluded that the more in tune with a child's linguistic skills the parent appeared to be and the more attention was paid to the child's previous utterances, the greater the facilitation of language acquisition.

The results of Rogoff et al.'s (1984) study are interesting but do not convey enough about the specifics of maternal interactions with young children and how these interactions support language development. This may be due to the use of the open-ended interaction category used in their

work which was very broad and could encompass a variety of more specific behaviors. A coding system that would differentiate “open-ended” interactions into more specific types of interactions would build on Rogoff’s work and further add to the existing body of knowledge about how mother-child interactions affect language development. The present study attempts to address this need.

Rogoff and Gardner (1984) further studied maternal interactions in a maternal guidance scenario. The researchers had thirty-two middle class mother-child dyads perform a memory test, using categorization of objects. In this study, the more expert individual (the mother) transmitted information to the novice (the child). The tasks were developed to simulate teaching situations in two scenarios. The home task involved putting grocery items into a mock kitchen, while the school task involved sorting common objects into divided trays. The mothers were asked to memorize the organizational structures and then guide their children in the task. The mothers were noted to guide their children by providing information and by asking relevant questions. The child was assisted in experiencing a familiar concept in a new novel setting, such as the lab. Rogoff and Gardner termed this instruction “using the zone of proximal development.” They found that mothers of successful children involved their children in problem solving, instead of simply reporting the solution to them. The mothers not only guided their children by helping them make connections, by the process of asking questions, but also by making them active participants in the

scenarios. However, as in earlier work, the researchers did not develop a formal framework to analyze or code mothers' interactions into specific types of interactions, once more highlighting a gap that the present study addresses.

Snow (1984, cited in Rogoff, 1990, p.156) summarizes her ideas on language acquisition:

A major facilitator of language acquisition is semantic contingency in adult speech. Adult utterances are semantically contingent if they continue topics introduced by the preceding child utterances. Semantically contingent utterances thus include: a) expansions, which are limited to the context of the previous child utterance, b) semantic extensions, which add new information to the topic, c) clarifying questions, which demand clarification of the child utterance, and d) answers to the child questions.

Snow notes that the adult's contingent speech builds from the child's interests and is a shared process. Hoff-Ginsburg (1991) argued that maternal speech contributes to language acquisition by providing the child with information about the regularities of language (i.e., that language is a system of patterns and rules they may generalize). In the process of communication parents provide data and structure that the child can use and apply. Hoff-Ginsberg says nothing about cognitive structures that allow the child to internalize language structures. It could be hypothesized that when parents interact with children in an orderly predictable manner, children develop the cognitive structures that allow them to detect rules and patterns. This is a very different view from teaching rules and patterns. It

suggests that the development of mental functions, such as pattern detection, is dependent upon the parent-child interactions that model these functions.

Later cognitive and linguistic outcomes were researched by Kelly, Morisset, Barnard, Hammond, and Booth (1996) who focused on the effects of early mother-child interactions. The participants in this study were 53 mothers at high social risk and their children. They were observed first in a 'strange situation' when the children were 13 months of age. When the children were 20 months of age, mother-child dyads were observed during play. Then at three years of age the children were assessed with the Preschool Language Scale. Finally, at five years of age they were assessed using the Wechsler Preschool and Primary Scale of Intelligence. At the same time the mothers' IQ was assessed. Results showed that interactive quality of the mother-child interaction at 13 and 20 months made an independent contribution to the child's linguistic and cognitive competencies beyond the contribution of maternal IQ. Specifically, when reciprocal interactions were positive and sensitive, children scored higher on language measures at three years and obtained higher IQ scores at five years. The authors concluded it was the quality of mother-child interactions that was highly related to developmental outcomes.

Khan (1991,1992) also investigated the importance of mother's interactional style over time. She designed an innovative program based on the theoretical framework of MLE. Khan trained parents in MLE and then

studied their children's conceptual and language development over time. She used a battery of standardized tests including the Battelle Developmental Inventory and McCarthy Scales, administered at 1, 2, and 3 years of age. Subjects included 19 children from typically functioning to "at risk" children.

Mothers' and fathers' patterns and rates of mediating were found to be similar to one another. Parents found to be higher mediators varied in terms of socioeconomic status and cultural background. All the children, whether "at risk" or not, made progress in direct relationship to the amount of MLE they received. Interestingly by age three, half the children initially classified as "at risk" obtained developmental quotients on the Battelle Developmental Inventory, Receptive and Expressive Emergent Language Scale, and the McCarthy Scales that were solidly in the normal range. Parents of these children were rated as high mediators during specific interaction times. Khan's study, as she herself points out, included a small number of participants, making it difficult to arrive at solid conclusions regarding the role of mother-child interaction in children's language development. As well, Khan's children were young and not yet fully developed in terms of language, which made the results more difficult to interpret. The study is in need of replication on a larger scale. The current study attempts to further investigate effects of mothers' natural mediational style on a larger more homogeneous group of somewhat older children.

While Khan investigated the effect of MLE in mother-child interactions on language, Tzuriel and Weiss (1988) investigated the effects of MLE in mother-child interactions on cognitive modifiability. They referred to the increasing body of evidence that supports the hypothesis that specific parent-child activities relate concurrently and predicatively to specific aspects of children's cognitive development, (Tzuriel & Weiss, 1988, pg. 80). The crucial difference between this and other studies was in the examination of the child's modifiability, specifically cognitive modifiability.

In Tzuriel and Weiss's (1988) study, 54 mother-child dyads interacted in a structured scenario and in a free play activity. In the structured situation the mother was given a problem to solve and asked to teach it to her child. The free play situation involved puzzles and games. Mothers were also given questionnaires designed to measure their acceptance of their child and child personality variables. The mother's interactions with her child were coded according to Feuerstein's MLE criteria. Tzuriel and Weiss employed the dynamic assessment paradigm, (e.g., test pre-score, mediation teaching, post-test score), using dynamic assessment instruments specifically designed for young children. The post-test score allowed them to measure the extent to which the child benefited from a mediational interaction. Post-test scores can be said to represent the upper limits of Vygotsky's Zone of Proximal Development (ZPD) because the upper limit of the ZPD is defined as "potential development as determined through problem-solving under adult guidance" which is what

happens in the mediation phase of dynamic assessment (Wertsch, 1985, p.67). The test in this study was the Children's Inferential Thinking Modifiability Test (CITM), which measures cognitive functioning and changes. Results of the study indicated that neither the mothers' attitudes, nor the children's personalities explained post-test scores after mediation. The MLE criteria of transcendence and regulation of behavior, as coded in the structured situation, were predictive of the post teaching scores. Results showed that the higher the mother's overall mediation score in the structured situation, the greater the improvement in children's cognitive performance following a mediational phase within the testing situation. (Tzuriel & Weiss, 1988). The same was not found in the free play situation.

One possible explanation for the difference in outcomes between the structured and free play situations is the fact that mothers engaged in problem solving during the structured situation with their children. Even though they were not taught how to mediate, the strategies that mothers used in the problem solving situation may have been mediational in nature and had an impact on children's post-test scores. Tzuriel and Weiss concluded that MLE criteria were useful tools in assessing mother-child interactions and that MLE interactions are crucial for development of children's modifiability.

While Tzuriel himself considered this study an initial attempt to investigate effects of parental mediation on children's developing cognitive systems, it is of particular interest to the present study that he found MLE

criteria a useful tool for coding mother-child interactions and that Transcendence and Regulation of Behavior were predictive of the children's cognitive modifiability.

Tzuriel's research was based on Feuerstein's mediational criteria. Other researchers, like Wertsch (1984) have also attempted to understand the effects of types of verbal interactions on cognitive development.

Research by Wertsch (1984) on children's conceptual development further illustrates the importance of adult-child interaction. Wertsch had an adult and child construct an object to match a model. Different types of verbal interactions were monitored and the process involved in model completion recorded. Wertsch found that adults interacted with children in two ways: by questioning them about the process of model completion and by telling them what to do next. When the adult simply told the child what to do, the child was not required to problem solve for himself. When adults engaged in advanced discussions with the child, such as how to plan and order, which is one form of mediational interaction, the child's skill and understanding improved. This led to advanced performance. The author concluded from his findings that the adult's interactional style is a crucial factor in the child's development, both linguistically and cognitively.

Most of the studies reviewed thus far have concentrated on the positive effects of mothers' mediational interaction on the children's development, both linguistically and cognitively, as well as on the child's

modifiability. In contrast, Marfo (1992) was interested in the effects of the mothers' non-mediational style, which he referred to as maternal directiveness, and the effects of that directiveness on the child's language development. His research revealed an inverse relationship between maternal directiveness and children's language competence. His study included 25 mother-child dyads, in which the children were developmentally delayed. Marfo videotaped these dyads for 20 minutes performing ring stacking tasks, followed by semi-structured free play. He rated the dyads for six types of child interactions, nine types of maternal interactions, and one dyadic behavior on a five point Likert scale. Marfo found that many directive mothers were intrusive and insensitive to their child's needs. There was a positive correlation between directiveness and intrusiveness. The current study examines the relationship between these aspects of mothers' interactions and child language development in children without identified developmental delays. The decision to exclude children with identified developmental delays was made in order to obtain data on normal development.

Statement of the Problem

Research has shown that MLE interactions between parent and child lead to higher language and cognitive functioning (Khan, 1992; Tzuriel & Weiss, 1988). Directive interactions have been found to be negatively related to cognitive and language development. (Marfo, 1992, Wertsch,

1984). However, more research is needed to clarify which specific types of MLE interactions correlate with the development of cognition and language. It would seem of vital interest to parents to understand how they can enhance language development in their children. If parent educators clearly understood how to bring about such development they would be able to empower parents to use this understanding in daily interactions. To this end, research is needed to better understand the features of parent-child interaction that enhance cognitive and language development.

Purpose of the Study

The purpose of this study is to examine MLE and directive interactions between mother and children, and to examine their relationship to children's language development.

It is hypothesized that (1) mother's MLE interactions will be positively associated with child language development and (2) directive interactions with mothers will be negatively related to child language development.

An additional question addressed is whether specific types of MLE interactions more strongly associated with language development than others.

Methodology

Participants

Participants in this study were 40 mother-child dyads. The children ranged in age from 3.4 months to 5.5 years of age, (M=4.2 years). Twenty-five of the children were boys (mean age = 3.9 years) and 15 were girls (mean age = 5.0 years). The children had no known neurological impairments or any identified disorders.

The annual family income of the participants ranged from \$30,000 to \$130,000, with an average of \$80,000. Thirty-nine of the forty families were intact, and one mother was divorced and single.

Of the 40 cases, 5 mothers were of Chinese descent and 35 mothers were Caucasian. All had acceptable levels of English proficiency and spoke English to their children.

Mother's educational levels ranged from non high school completion ($n=1$) to PhD ($n=1$) status, with the majority of mothers holding technical diplomas ($n=13$) or Bachelors degrees ($n=14$). These women represented a range of work status evenly distributed between stay at home mothers

($n=13$), those who worked part time ($n=14$), and mothers who worked full time ($n=12$).

The original number of cases for this study was 40. However, after the completion of data collection, I discovered that one mother was neither the child's primary caregiver, nor was her house the child's primary residence. After some consideration, this case was excluded from the study.

Procedure

Recruitment

After receiving University ethics approval, parents were approached in writing about participating in the study, (Appendix A). Ten daycares in similar socioeconomic areas in the Lower Mainland were approached. Forty mother-child dyads took part in the study. Participants were mainly those who returned questionnaires indicating willingness to participate in the study. Some participants were also included as a result of referrals from other participants in the study.

Research Procedure

Mothers and children were videotaped in two sessions, each approximately 15 minutes in length. The first session consisted of a structured scenario where the mother read to, or with her child in her typical manner. For contextual consistency, all mothers were given the same reading materials: Walter the Baker and The Very Hungry Caterpillar by Eric Carle and The Marvelous Market on Mermaid by Marianne Kowalski. In the second session, the mother and child dyad were given two Preschool 12-piece puzzles to construct: one of a carousel, and one of underwater life, including large fish and small fish. Again, mothers were instructed to interact with their children in the way they normally would in such a situation. The sessions occurred either at the examiner's house (5 families), at school (1 family), or in the participants' homes (34 families), depending on the preferences of the mother.

Following the video tapings, the Clinical Evaluation of Language Fundamentals (CELF – Preschool) was administered to the children. The CELF – Preschool is a norm referenced standardized language test for children 3 – 6.5 years old. It assesses receptive and expressive aspects of language. Vocabulary, conceptual and grammatical levels of language development are tested as well as listening skills. The researcher was trained in the administration of the test by a registered Speech Language Pathologist.

The CELF – Preschool Test was normed on 800 children 3 years to 6 years 11 months in the United States (42 States). Psychometric data reported in the test manual indicate that the CELF is a reliable and valid measure of language development in young children. Concurrent validity was addressed by correlating CELF scores with other measures of child language including the Preschool Language Scale, Wechsler Pre-school and Primary Scale, and the Test of Cognitive Achievement Differential Ability Scales. Correlations ranged from .41 to .84. A study to assess the stability of the CELF was conducted with 57 children, 28 male and 29 female, in two groups. Over test intervals of 2-4 weeks test-retest correlations ranged from .86 to .97. Internal consistency was also examined using Chronbach's alpha. Alpha coefficients ranged from .69 to .84.

Mothers were asked to complete a demographic questionnaire (Appendix B) while their children's language was being assessed. The questionnaire included questions about marital status, siblings, family income, mothers' and fathers' education, and mothers' work status. Mothers also signed release forms in compliance with University regulations.

MLE Coding

The videotapes of the mother-child interactions were coded according to an abbreviated version of Feuerstein's MLE criteria and based

on a coding system taken from Klein and adapted by Tzuriel and Weiss (1988). (See Appendix C). This rating scale involved recording number and type of interaction according to the specific verbal behavior. After coding the first tape, the two raters spent several hours discussing their coding criteria and reaching agreement on which interactions constituted which specific MLE codes. In case of disagreement, discussion took place to arrive at mutual consensus.

The two raters were the researcher and a Speech Pathologist. These two raters, both experienced in MLE, selected the first five of these criteria, which Feuerstein deemed among the most crucial to MLE interaction. They included: Regulation of Behavior, Shared Participation, Mediation of Competence, Meaning and Purpose, and Transcendence. While Feuerstein's theory of MLE includes both verbal and non-verbal forms of mediation only verbal mediation was rated in order to increase interrater reliability. It is acknowledged however, that the two raters coded from the tapes instead of from a transcript and may have been influenced by non-verbal behavior. The raters developed and defined their criteria as described below:

Regulation of Behavior

This category was renamed for the purposes of this study as 'Focusing Mediation', because mothers tended to primarily engage in focusing interactions such as: "Look at the tiny egg. Do you see it?", "

Where does that go?', 'What color do you see there?' etc.. Mothers did not engage to any appreciable extent in general regulation of behavior related to non-compliance or acting out. Focusing mediation included the mother focusing the child on an aspect of the story or the puzzle, as well as reorienting the child when there was a tendency to lose attention. For example: "Look, only two more pieces left..."

Shared Participation

This category included all interactions where the mother verbally included herself in the activity, such that the mother and the child were jointly involved in problem solving, perspective taking, decision making, and evaluation. For example: " Do you want to read another book with me?", "We will have to be organized to do this puzzle together", "I would be sick too if I ate all the junk food, what about you?".

Mediation of Competence

This included all positive verbal feedback to the child, which may have been as short as "good". Examples are: "Wow, you amaze me! Mom couldn't do that!", " You are so good at this! Have you done this puzzle before?", " Good job, you are so speedy!".

Meaning and Purpose

This category was judged to have occurred when the mother provided explanations to the child which made meaning out of the story or the activity, or which was additional to the story or the puzzle, for example: "I think that means that the Duke is angry?", " Do you think the man is poor in the story? I think his hat helps us to think that", or " A cocoon is what caterpillars build around themselves when they need to change."

Transcendence

Transcendence was judged to have occurred when a mother related an aspect of the story, or of the story pictures, or of the puzzle to other aspects of the child's past or future experiences, such that the child was mediated to think beyond the 'here and now' to another place or time in the child's life. Some examples are: " What would happen if you put water on your cereal in the morning, like Walter did with the rolls?", " What...another story where the cat chases a mouse! What cat do you know like that?", " Do you remember those things we ate at Costco? That's right...they were pretzels too!", and " Have you seen a fish like that before? That's right! He is like the one in our fish tank!".

Intentionality and Reciprocity

Intentionality is said to have occurred when the mediator deliberately shares his or her intent with the child. This may involve purposefully focusing attention on what is to be learned or on what will happen. Reciprocity is said to

have occurred when the child gives an indication of being receptive and is involved in the learning process. The child will demonstrate co-operation. Very few instances of mothers' use of intentionality were observed, hence, a decision was made to drop this category from the coding system. Mothers' failure to use this type of behavior may have occurred as a result of the instructions provided by the experimenter. The mother-child dyads were told what they were intended to do during the activities prior to them engaging in them. Thus, there was little need for mothers to share the agenda with their child.

Directive Interactions

Mediational interactions contrasted with interactions that were termed 'directive' on the basis of the language used in the interactions. Mediational interactions were noted to be frequently, but not always, in the form of questions. A directive interaction was judged to have occurred when the mother issued a direct command, (e.g. " Put it there!", " I want you to find that piece over there", "Turn it that way", " I know! That is why I am telling you to do it", " I am helping you, I am telling you what to do!")

Other Ratings

Behaviors were counted as they occurred in each of the above categories of interactions and tabulated by each rater independently. Both raters coded all the data. The total number of coded interactions was divided by the length of time of the video, in order to provide a ratio that

would take into account the varying lengths of the video segments. This enabled meaningful comparison across mother-child dyads.

Additionally, mother's intrusiveness and child's tendency to engage in self talk and to seek challenges were rated by the two raters on a Likert scale of 1 - 9. Behavior in these categories that was barely observable was judged to be a 'one', while 'nine' represented strong presence of the behavior. These number values were based on the overall impressions of the mother-child interactions by the two raters upon viewing the tapes.

Mother's intrusiveness was judged by how often the mother interrupted her child's activity, both verbally and non verbally. For instance, a mother who grabbed puzzle pieces from her child, who verbally interrupted or told the child constantly what to do, or who placed or gave the puzzle pieces to her child would be rated as very intrusive.

Self Talk was defined as the child talking to himself/herself while engaged in the activity for the purposes of solving a problem.

Challenge seeking was based on how many books (3 maximum) a child wanted to read and how many puzzles (2 maximum) a child wanted to complete, as well as whether or not a child stopped being engaged or wanted to stop when a task proved to be difficult.

Interrater Reliability

All tapes were coded by both raters. Kappa was selected as an appropriate index of agreement. Kappa was selected over percent agreement due to its superior handling of chance agreement. Hence it is a more conservative estimate of agreement. The Kappa value for all mediational interactions combined was .94 and .92 for irective interactions between mothers and children. Further, Kappa was calculated for each MLE code separately. Values ranged from .89 to .96. These are all well within the acceptable range. It is important to state that although interrater reliability was very high, after comparing their tabulations after each video segment, the rater's engaged in a process of discussion, in order to arrive at consensus in the few cases where there was disagreement. The same process was employed for ratings of intrusiveness, self talk and challenge seeking. Correlations were calculated for interrater reliability for intrusiveness ($r=.96$, $p<.001$), self-talk ($r=.46$, $p<.001$), and challenge seeking ($r=.64$, $p<.001$).

Additional Scoring

Standard scores for the CELF-Preschool Language Test were calculated according to the procedures and protocols in the manual (Weig et al., 1992).The scoring on the CELF Preschool was rechecked by a registered Speech Language Pathologist familiar with the test to ensure

accuracy. This test yields a test age score. 'Child-language score' was defined as the difference between test age and chronological age and is reported in months.

Results

Demographics

A summary of demographic information provided by mothers is found in Table 1. Descriptive statistics for all variables are found in Table 2.

Gender Differences

Gender differences were examined for all variables using one way Analysis of Variance (ANOVA). No significant gender differences were found for any of the variables in this study. Therefore, in all subsequent analyses reported, boys and girls are combined.

Education

A positive and significant correlation was found between mothers' education and the children's CELF language scores ($r=.52$, $p<.001$).

Mothers' and Fathers' education levels were found to be significantly and positively correlated ($r=.54$, $p<.001$.) However, Father's education and CELF scores were not related ($r=.243$, $p=.136$).

Family Income

The correlation between family income and child language scores was not significant. ($r=.066$, $p=.689$).

Mothers' Work Status

To assess the relationship between mothers' work status and children's language development, a one-way ANOVA was performed which revealed no differences between CELF scores of the children whose mothers worked full time, part time, or stayed at home.

Mothers' Interactions in the Two Research Scenarios

A total MLE interactions score was arrived at by summing the rates of all types of mediational interactions and dividing by the total rate of all interactions (MLE plus directive interaction), resulting in a relative score, indicating total mediational interactions relative to total interactions.

Mothers' Education and Mediation

Total MLE interaction scores significantly correlated with mothers' education ($r=.43$, $p<.001$), with higher education being associated with greater MLE use . Conversely, mother's educational level was negatively and significantly correlated with directive interactions. ($r= -.43$, $p<.001$).The more directive mothers tended to be less educated. The correlation between mother's educational level and intrusiveness was not statistically significantly ($r=-.25$, $p<.117$).

Mother's Mediational Interactions and CELF Language Scores

In order to determine if MLE interactions were related to child language development, correlations were computed between each of the maternal MLE rate codes and children's language scores from the CELF. It

can be seen in Table 3 that total MLE interactions were significantly and positively correlated with CELF scores. Results indicated that the more mediational interactions the mother engaged in, the higher the language score her child obtained ($r=.59, p<.001$).

With the exception of Transcendence, there were no significant correlations between individual MLE rate scores and child language scores. Transcendence was positively correlated with language development ($r=.36, p<.005$) This finding must be interpreted with caution, however, since there was one outlier in the data. Upon removing this outlier, the result was no longer statistically significant. Removal of this outlier did not affect the correlation between the total rate of MLE and the language development scores, ($r=.587, p<.001$).

Mother's Directive Interactions and Child's CELF Scores

Mother's directive interaction scores were arrived at by totaling the number of directive interactions, and dividing them by the total number of all interactions resulting in the relative score, indicating the number of directive interactions relative to total number of interactions. As can be seen in Table 3, the higher the rate of mother's directive interactions, the lower the child's language score ($r= -.58, p<.001$).

Mothers' Intrusiveness and Child's CELF Language Scores

Mothers' intrusiveness, which was defined as behavior that was in direct opposition to the child functioning independently, was mainly observed during the puzzle activity. There was an impression of mothers not having a sufficient degree of patience or tolerance for the child's still developing abilities. Mothers' intrusiveness in both sessions was significantly and negatively correlated ($r = -.39$, $p < .001$) with child language scores. Further, there was a significant and negative correlation between total MLE interactions and mother's intrusiveness scores, ($r = -.35$, $p < .005$).

Child Behavior in the Two Research Scenarios

Child Self Talk and CELF Language Scores

Child self talk, as mentioned previously, was rated on a scale of 1-9. Child self talk and the child CELF language scores were significantly and positively correlated ($r=.41$, $p<.005$), suggesting that the more the child engaged in self talk, the higher was his or her language development score. In addition, child self talk was positively correlated with mothers' educational level, ($r=.35$, $p<.005$).

Child Challenge Seeking and CELF Language Score

Children's language scores were significantly and positively correlated with challenge seeking ($r=.56$, $p<.001$).

Regression Analysis

In order to address the relative contribution of mothers' education, mediation, and child's self talk to the prediction of child language scores, a hierarchical regression analysis was computed (See table 4). The order of entry of the independent variables was mothers' education, total mediation, and children's self talk. The order of entry was based on the chronology of the variables. Mother's education occurred first in time, then her mediation with her child, and finally child language. Results indicated that mothers' educational level was a significant predictor of child language scores (R^2 change = .27, F change = 13.8, $p < .001$). The total percentage of mediation accounted for an additional 16% of variance in the language scores beyond that accounted for by mothers' educational level (R^2 change = .16, F change = 10.19, $p < .003$). Child self talk did not significantly add to the prediction of child's language score (R^2 change = .015, F change = .95, $p > .38$) beyond mothers' education and mediation. This may be due to the fact that at least one of the conditions (reading with the child), may not have provided sufficient opportunities for observing this behavior.

Discussion

The purpose of this study was to examine the quality of mother-child interactions in relation to children's language development. Mediation interactions by their very nature stimulate thought processes, and hence were hypothesized to support language development. Directive interactions instruct a child in such a way that there is little need for the child to think, and thus were hypothesized to have a lesser impact on language development.

Non-significant correlations were found between the specific types of mediation interactions, such as mediation of competence, and child language scores. However, the total rate of mediation, which included several specific types of mediation, was significantly correlated with child language development. This finding is consistent with results reported by Tzuriel and Weiss (1988).

The non-significant correlations between specific types of mediation and child language scores may be a result of the low rate of occurrences of individual mediation codes. In this study mothers were observed over a relatively short period of time. This snapshot may not have afforded sufficient time to observe enough instances of the different types of mediation, such that significant correlations with child language development could be found. Moreover, the situations in which mothers and

children were observed in this study may not have pulled for high rates of certain types of mediation such as transcendence, that have been previously found to correlate with child language (Tzuriel & Weiss, 1988). For example, in Tzuriel and Weiss' study (1988) mothers engaged more frequently in transcendence in the more structured situations than in the less structured situations. In the present study, which included both structured and unstructured situations, this link between amount of structure and type of mediation used was not apparent.

An alternate explanation for the non-significant correlations between specific types of mediation and child language score is more theoretical in nature. It was Vygotsky's view that social phenomena should be considered in their totality rather than breaking them into constituent parts. Thus, possibly the total MLE is the unit of analysis that is most appropriate to examine, not the individual MLE components. Wertsch (1985) best described this analysis of unity when he discussed Vygotsky's illustration from chemistry. According to Vygotsky, neither chemistry nor psychology should examine their subject matter in its smallest elements as "...the essential feature of such analysis is that it results in products that are alien to the whole being analyzed; it results in elements that do not contain the properties of the whole as such" (1986, p.7).

What exactly happened when the mothers were mediational versus directive? Mediational mothers tended to focus the child verbally, for example, "Where did you see this color?". Mediational mothers tended to

be sensitive to the engagement of the child, knowing exactly when to increase the nature or intensity of their own actions to keep the child engaged. In addition, mothers fed positive words back to their children to keep their children motivated. They tended to have an attitude of being engaged together in the activity, expressed by words and phrases that included them as partners, (e.g. "What do we need now?"). Mothers asked many questions. Usually they mediated comparison and planning in the puzzle activity, and they sometimes transcended the situation, (e.g., "Where did you see that before?" or "Remember when..."). This characteristic of mediational mothers is consistent with Rogoff and Gardner's (1984) description of mothers of children who were able to successfully perform familiar tasks in new settings. These mothers, like those observed in the present study, asked questions and guided children's thinking.

The asking of questions by mediational mothers may have stimulated children's thinking and presented children with opportunities to produce and use language. For example, a child who is asked what to do next has to think about what to do next and explain those actions. A child who is told what to do next merely has to follow an instruction.

Directive mothers in contrast to mediational mothers tended to tell children what to do. Questions were rarely asked. They did not tend to model problem solving through self talk. They rarely used inclusive language like 'we' (e.g., "what do we need to do?", "let us see"). They were observed at times to perform the task for the child, not waiting for the child

to find solutions. Typical phrases included: “put it there”, “no, that is not right”, “sit down”, “that was a good story”. Marfo (1992) cautioned that directiveness “has the tendency to deny children opportunities to respond which raises concerns about the long-term implications of excessive directiveness in interactions with children...”(p. 232).

The finding that child self talk was significantly correlated with maternal mediation indicated that children of more mediational mothers engaged in more self talk. This self talk may have stemmed from exposure to the mediational questioning and guiding model. Mimicking of mothers interactional style was evident in the children’s self generated questions and comments such as, “What do I need now?”, “Where is it?”, “That is a part of the fin.” Such self talk may have scaffolded the children’s thinking about the task and hence, supported language development. This interpretation is consistent with Rogoff (1990) who proposed that children model the behavior of their caregivers. While directive mothers were not necessarily less verbal than mediational mothers, they did not tend to engage in self talk. Interestingly, their children were not observed to engage in self talk. Instead of using externalized internal speech for problem solving, these children were noted to direct utterances like “help me” at their mothers. Mothers responded typically by helping the child which took the form of doing the task for them or telling them what to do. These results suggest that when behavior is structured in such a way to stimulate and guide thinking, language is enhanced.

This is in contrast to Hoff-Ginsberg's (1991) position that the quality of the language modeled is not as important as quantity. She argued that it is the quantity of the mother-child interaction that is important, whereas Rogoff suggests that it is the quality of the interaction. Thus, in one view (Hoff-Ginsberg, 1991) self talk could be seen as the result of mothers being highly verbal (quantity) in their interactions with their children, and in the other view (Rogoff, 1990), self talk could be seen as the result of mothers modeling self talk (quality). Outcomes of the present study are also supported by Kelly et al. (1996) who found that the quality of mother-child interactions is highly related to developmental outcomes and that these outcomes include both linguistic and cognitive development

Vygotsky included processes such as listening and paying attention to detail in his psychological tools necessary for learning. The Preschool CELF Test, which was used in this study, taps listening and attention skills in that success on the test requires that these processes are functional in children. It did not just assess whether a child did or did not know a word or a grammatical structure. Thus, it is advanced here that mediational mothers stimulate not only the development of grammatical structures and vocabulary, but also stimulate the processes of listening and attending to detail, that may underlie language development. I propose that mothers who do not engage in these types of interactions, may not provide the necessary stimulation of cognitive processes nor the language modeling that would allow their children to adequately benefit from the stimuli and

experiences in their environment. Similar explanations were given by Tzuriel and Weiss' (1988) for their finding that children of mothers who use transcendence and regulation of behavior are more modifiable in teaching situations.

Taken together, questioning, expansion, transcendence, making a stimulus meaningful, relating past to present experiences, appeared to support child language development. At the other end of the spectrum were directive interactions which included telling, instructing, prompting and directing. In this study mothers' directiveness was found to be negatively correlated with child language development. Directive interactions did not appear to support the acquisition of language in the way that mediational interactions did. However, it is not clear if directive interactions actually inhibit language development or if language development is inhibited by a lack of maternal mediation.

What are the factors which may or may not foster a mediational style in mothers? While this study was not designed to answer such a question, some of the demographic data examined may provide clues.

The relationship between family income and children's language development could not be examined in this study as the participating families were all middle class. This is not to suggest that mothers' mediational style is definitively unrelated to family income. To answer this question, a sample with a wider range of incomes would need to be studied.

Whether mothers worked outside of the home or not, appeared to be of little significance in terms of their child's language development. This may suggest again that quality rather than quantity of interaction with mothers is important. Interestingly, mothers who worked outside the home engaged in more shared participation and competence building interactions. It may be possible that their professional interactions outside of the home tended to carry over into their interactions with their children. This in itself may be an interesting subject for future research. How is the mother modified by her environment and how does this in turn impact her child's development?

The fact that a positive correlation was found between mothers' education and child language development is an intriguing one. One obvious explanation is that mothers who pursue higher education are intellectually more able and therefore produce children who are more capable of learning. This implies that language development has a strong genetic component. However, more consistent with theories on which the current study is based, is the notion that advanced language development in the child can be explained by higher level language functioning in the more highly educated adults in the life of the child. Children of more highly educated mothers may receive richer language input in structure, content, and function that may assist the development of language.

Clearly, the correlation between maternal education and child language development must be considered in light of the positive

correlation between maternal education and total MLE. The findings indicate that more highly educated mothers had children whose language development was more advanced than that of less educated mothers, and that more highly educated mothers were more mediational. It is possible that highly educated mothers better understand the relationship between cognitive stimulation and cognition and language development.

As noted in the results section, intrusiveness of the mothers was negatively correlated with language development. In this study more intrusive mothers were more directive. Directive interactions were found to be not conducive to fostering language development. It is not clear, however which comes first: the slower language development or the mothers' styles.

If intrusiveness is caused by a child's lack of capabilities, then mothers should be less intrusive when the child is able to demonstrate capability. This means that the same activity, as the child masters it over time, should evoke less intrusiveness on the part of the mother. On the other hand, if mothers' intrusiveness is the cause of lack of capability, then the child should not develop some aspects of functioning in a catch-up fashion, but should lag behind, hindered by the mother's intrusiveness. Longitudinal studies may provide some answers.

One final important factor should be noted, namely that challenge seeking was significantly correlated with child language. Haywood et al.

(1986) identified challenge seeking as crucial to the development of intellectual functioning. He suggested that a child who seeks challenges is curious, takes reasonable risks, and is advanced in cognitive development. If we follow Haywood's (1986) reasoning, we can assume that non-intellective factors, such as curiosity and reasonable risk taking play a part in cognitive development. The above findings support this notion. The complexity of the developing systems is again underscored in that cognition, language, and affective factors interact with each other in yet poorly understood ways.

Conclusions and Implications

Feuerstein's MLE criteria proved to be a useful tool in this study of the complex relationship of mother-child interactions and language development. Verbal mother-child interactions could be reliably rated. Non-verbal mediational interactions could be readily observed, but were not measured. Future studies may develop criteria that allow for measurement of these non-verbal mediational interactions.

The results of this study have direct implications for parents, teachers, and therapists in their interactions with children. Since mediational interactions stimulate language development, children of parents who are mediational will be better prepared for academic learning. In children with barriers to learning, such as Down Syndrome, parental mediation may be even more important. If

teachers are mediational, language learning will continue in the children, curiosity will continue to be aroused and intellectual development enhanced as proposed by Haywood's (1986) transactional theory of intelligence.

It is reasonable to suggest that teachers and therapists who work with children who experience barriers to learning must not only be mediational but must possibly increase the frequency of mediational interactions, as also proposed by Feuerstein et al. (1988). Clearly the findings of this study cannot be ignored in the education of parents, teachers and therapists.

Limitations

One limitation of this study is that children's behavior was not coded, hence, there is no way of addressing the impact of child behavior on maternal behavior. It is well understood that actions between children and caregivers are bidirectional. Bidirectional refers to the effects of child's on mother's behavior and mother's on child's behavior. Awareness of bidirectional effects have emerged from the work of Richard Q. Bell who states that parental reactive effects could loop in different directions: Shyness in a child, for example, might elicit either parental protectiveness or parental anger. Thus, different characteristics engender different feedback loops that may be either positive, negative, or unpredictable. (Bell, 1968 & Bell and Chapman, 1986). Maccoby and Martin (1983) also point out that parents could be reacting to their child's behavior rather than causing it. However, Bell (1968) also points out that in experimental operations we can isolate parent effects and child

effects. Future research could include the effect of the child on mothers' mediational style.

Another factor which can be considered a limitation of this study was that this study was correlational in nature and, therefore, the direction of the effect is not clear: does good child language evoke maternal MLE or does maternal MLE support child language development? The correlation between maternal MLE use and child language development is, however, consistent with my hypothesis and suggestive of the importance of MLE.

Appendices

Appendix A: Research Letter

January, 2003

Re: Research Participation

Dear Sir or Madame,

My name is Kathleen Jeffrey. I am a teacher with Vancouver School Board and am currently completing my Masters in Educational Psychology at Simon Fraser University. As a part of my program I am conducting research on the effect of mother-child interaction on young children's language development. I would like to ask for your voluntary participation in my study. Participation would entail being videotaped in play with your preschool child (doing a puzzle) and reading to your child. The entire video taping session will be around 30 minutes long. In addition, the language skills (vocabulary and grammatical development and preschool readiness skills) of your child will be assessed. This part will take about 30minutes. In total about 1 hour of you and your child's time is needed. All information collected will be strictly confidential and used for the purposes of research. The overall findings will be shared with you in an oral format if you wish, which may give you valuable information about your child's readiness for Kindergarten.

Videotaping and assessment can take place either in your home, at my Mother's house in the Tri-cities or at the Variety Learning Centre at 2150 McLean Drive in Vancouver.

Due to the boundaries of this study I am interested in children between 3 1/2 and 5 years old who have no current involvement with a Speech Language Pathologist, no Special Needs Designation, or are ESL (English as a Second Language). All abilities within the language range are welcome to participate.

If you are interested please contact me at 604-727-8301 or you can give the daycare your number and I will contact you. Thank-you for you time.

Kathleen Jeffrey B.A.A., B. A., M. A. Candidate

Appendix B: Questionnaire

Ref No. _____

ALL INFORMATION IS STRICTLY CONFIDENTIAL

Information Questionnaire

1. Mother's Name _____
2. Child's Name _____
3. Child's Age: Years _____ Months _____
Exact Date of Birth _____

4. Sex of child (circle one) M F
5. Contact phone Numer: _____
6. Family status (mother) :

I am currently (circle one): single married divorced co-habitant
7. Financial status family (all members combined) :
Please circle one:

\$00 - \$15,000 \$15,000 - \$30,000 \$30,00 - \$45,000
\$45,000 - \$60,00 \$60,000 - \$80,000 \$80,000-\$100,00
\$100,000- \$130,000 over \$130,000

8. Educational status of mother: (circle one)

- A – did not complete high school
- B – completed high school
- C- some post secondary: university, college, trade program
- D- completed a university degree
- E- graduate work/degree
- F – doctoral work/degree

9. Educational status of father: (circle one)

- A- did not complete high school
- B- completed high school
- C- some post secondary
- D- completed university degree
- E- graduate work/degree
- F- doctoral work/degree
- G- Not applicable – father not involved

10. Any other comments:

11. Siblings? If yes – how many and ages.

12. Do you (mother) work outside of the home? If yes, how much and where.

Appendix C: MLE Rating Scale

Subject Ref. No. _____

MLE Rating Scale

Intentionality:

Telling the child what the parent's intention is, eg: "we will look at a puzzle together"

Number of Observances:

Book

Puzzle

TOTAL: _____

Reciprocity:

Child responds to parent's agenda by engaging in activity.

Number of Observances:

Book

Puzzle

TOTAL: _____

Meaning and Purpose:

Telling child why the parent wants the child to engage in a certain activity or behavior.

Number of Observances:

Book

Puzzle

TOTAL: _____

Transcendence:

Making the child aware or eliciting from the child similar experiences/learning at another time or in another place.

Number of Observances:

Book

Puzzle

TOTAL: _____

Competence:

Making the child aware of desirable aspects of their behavior or learning.

Number of Observances:

Book

Puzzle

TOTAL: _____

Regulation of Behavior:

Letting the child know what is and is not appropriate behavior and helping the child to regulate behavior - FOCUSING

Number of Observances:

Book

Puzzle

TOTAL: _____

~~Direct~~ Interactions

Number of Observances:

Book

Puzzle

TOTAL: _____

Child Self Talk: 1 2 3 4 5 6 7 8 9

Child Challenge Seeking: BOOK 1 2 3 4 5 6 7 8 9

Child Challenge Seeking: PUZZLE 1 2 3 4 5 6 7 8 9

Mother Intrusiveness: 1 2 3 4 5 6 7 8 9

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Tables

Table 1

Demographics of Study Families (n=39)

Gender	
Male	25
Female	14

Marital Status	
Married	38
Divorced	1

Category	A	B	C	D	E	F
Financial Status ¹	0	3	7	9	13	7
Mother's Education ²	1	2	13	14	8	1
Father's Education ³	0	4	10	16	5	4
Mother's Work Status ⁴	13	14	12			

Note:

¹Financial status categories: A:\$15,000 - 30,000, B: \$30,000 - \$45,000, C:\$45,000 – \$60,000, D: \$60,000 - \$80,000, E: \$80,000 - \$100,000, F: \$100,000 – \$130,000 a year.

²Mother's education Categories: A: did not completed high school, B: completed high school, C: some post secondary diploma or trade program, D: completed a university Bachelors degree, E: completed a graduate degree, F: completed a Doctorate degree.

³Father's education categories: A: did not complete high school, B: completed high school, C: some post secondary diploma or trade program, D: completed a university Bachelors degree, E: completed a graduate degree, F: completed a Doctorate degree.

⁴Mother's work status categories: A: stay at home, B: work part time, C: work full time.

Table 2**Mean and Standard Deviations for All Variables**

	M	SD	Range	
			Min	Max
Total MLE Interactions	67.86	20.05	2.5	99.1
Child Language Score	9.2	13.50	-20.00	30.0
Directive Interaction	32.10	20.08	0.99	97.5
Challenge Seeking	4.9	2.8	1	9
Intrusiveness	5.0	3.0	1	9
Self Talk	4.1	2.5	1	9
Mother's Education	3.7	1.0	1	6

Table 3

Correlational Table

Correlations between Child Language Score and Child and Mother Behavior
(n=39)

	Child Language Score
Percentage Mediation	.587 **
Directive Interaction	-.587 **
Intrusiveness of Mother	-.386 *
Child Self-Talk	.410 **
Challenge Seeking	.560 **

**p<.001, *p<.05

Table 4

Regression Analysis Predicting Child Language Scores

Dependent Variable	Predictors	F-Change	R² Change	Cum. R²
Child's Language Score	Mother's Education	13.8***	.272	.272
	Percentage Mediation	10.2**	.161	.432
	Child Self Talk	.947	.015	.447

*** p<.001 **p<.003