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심리학석사학위논문

Mothers and Fathers in
Playing-Teaching Task Situations:
Do They Interact and Influence
Infants' Language Development Differently?

2016년 2월

서울대학교 대학원

심리학과 발달심리학 전공

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: Do They Interact and Influence
Infants' Language Development Differently?

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Abstract

Mothers and Fathers in Playing-Teaching Task Situations: Do They Interact and Influence Infants' Language Development Differently?

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Infants develop and acquire basic language skills as they interact with their caregivers. As sensitive teachers, friendly playmates, or challenging partners, parents aid infants' language development. As active participants, infants, in turn, learn, understand, and express various words and phrases. Therefore, parent-infant interaction is important in early language development in infancy. Most of the previous studies observed mother-infant interaction during free-play situation, and revealed that mothers' responsiveness, didactic behaviors, and emotions aid infants' language achievement. On the other hand,

the study about father-infant interaction has not received attention until recently. Also, researchers have claimed that free-play situation is limited to represent parent-infant interaction as a whole.

Therefore, the current study observed mother- and father-infant interaction during free-play and teaching-task situations to examine behavioral differences between mothers and fathers, and analyze unique relationship between mothers' and fathers' behaviors and infants' language comprehension and production. Parent-infant interaction was observed when the infants were at 9 months, and the interactions were coded with Caregiver-Child Affect, Responsiveness, and Engagement Scale (C-CARES). Also, infants' language comprehension and production were measured with MacArthur-Bates Communicative Inventory-Korean (M-B CDI-K) when infants were at 9 and 12 months of age.

Results indicated that mothers and fathers displayed different behavioral patterns when interacting with their infants. Also, parents' behaviors were different across free-play and teaching-task situations. In addition, significant parent x situation, parent x infant gender, and parent x situation x infant gender interaction effects were found. Moreover, different mothers' and fathers' behavioral variables were associated with infants' language measures. Specifically, mothers' disciplinary and negative verbalization and fathers' teasing

and task-oriented behavior continuously predicted infants' language comprehension and production. Mothers' behaviors can be explained as culture-specific behavioral pattern, and fathers' behaviors can be explained as fathers' unique contribution. Implications and limitations are further discussed.

Keywords: mother-infant interaction, father-infant interaction, free-play, teaching-task, language development

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TABLE OF CONTENTS

Introduction	1
Interaction with Mother and Language Development.....	5
Interaction with Father and Language Development.....	11
Interaction in Free-play and Teaching-task Situations and Language Development.....	16
The Current Study.....	19
Method	23
Participants.....	23
Procedures.....	23
Measures.....	24
Results	29
Differences in Parents' Behaviors by Parent Gender, Situation, and Infant Gender.....	30
Relationship between Parents' Behaviors and Infants' Language Measures.....	38
Predictive Relationship between Parents' Behaviors and Infants' Language Measures.....	47
Discussion	54
Parents' Behaviors: Mother versus Father, Free-play versus Teaching-task Situation and Infant Gender.....	55
Parents' Behaviors and Infants' Language Development.....	59
Mothers' and Fathers' Unique and Longitudinal Contribution to Language Development.....	61
Implications and Limitations.....	64
References	67
국문초록.....	82

LIST OF TABLES

Table 1.	Parent Behaviors.....	26
Table 2.	Means and Standard Deviations for Mothers' and Fathers' Behaviors in Free-play and Teaching-task Situations (Affect).....	32
Table 3.	Means and Standard Deviations for Mothers' and Fathers' Behaviors in Free-play and Teaching-task Situations (Sensitivity).....	36
Table 4.	Means and Standard Deviations for Mothers' and Fathers' Behaviors in Free-play and Teaching-task Situations (Didactic).....	37
Table 5.	Correlation between Mothers' Behaviors during Free-play Situation and Language Measures.....	40
Table 6.	Correlation between Fathers' Behaviors during Free-play Situation and Language Measures.....	42
Table 7.	Correlation between Mothers' Behaviors during Teaching-task Situation and Language Measures.....	44
Table 8.	Correlation between Fathers' Behaviors during Teaching-task Situation and Language Measures.....	46
Table 9.	Hierarchical Multiple Regression for Mothers' and Fathers' Behaviors in Free-play Situation Predicting Comprehension at 12 Months.....	49
Table 10.	Multiple Regression for Mothers' Behaviors in Free-play Situation Predicting Production at 12 Months.....	50

Table 11.	Hierarchical Multiple Regression for Mothers' and Fathers' Behaviors in Teaching-task Situation Predicting Comprehension at 12 Months.....	51
Table 12.	Hierarchical Multiple Regression for Mothers' and Fathers' Behaviors in Teaching-task Situation Predicting Production at 12 Months.....	53

LIST OF FIGURES

Figure 1.	Parent x Situation x Infant Gender Interaction Effect for Negative Affect (Figure 1a. Male Infant & Figure 1b. Female Infant).....	33
Figure 2.	Parent x Situation x Infant Gender Interaction Effect for Negative Verbal Statement (Figure 1a. Male Infant & Figure 1b. Female Infant).....	34

Introduction

Infants develop as they interact with their parents in various situations. By eating meals, reading books, solving problems and playing together, infants form attachment to their caregivers (Bowlby, 1973), understand others' thoughts and minds (Baron-Cohen, 1991), and learn how to control their emotions and behaviors (Feldman, Greenbaum, & Yirmiya, 1999; Raikes & Thompson, 2006).

Moreover, parent-infant interaction facilitates early language development (Carpenter, Nagell, & Tomasello, 1998; Dodici, Draper, & Peterson, 2003; Pancofar & Vernon-Feagans, 2006; Tamis-LeMonda, Bornstein, & Baumwell, 2001; Tomasello & Todd, 1983). During the interaction, parents act as sensitive teachers or challenging partners, and provide various circumstances to help infants to acquire language skills (Baumwell, Tamis-LeMonda, & Bornstein, 1997; John, Halliburton, & Humphrey, 2013; Power & Parke, 1983; Rowe, Coker, & Pan, 2004; Shannon, Tamis-LeMonda, London, & Cabrera, 2002). Infants, in turn, act as active participants, and utilize language as a means of expressing and sharing their intention, emotion, and motivation (Bloom, 1993, 1998; Trevarthen, 1993). Therefore, parent-infant interaction gives infants opportunities to learn various vocabularies, refine their fledgling linguistic skills into sophisticated language, and become competent communicators.

Early in the first year, infants preverbally interact with others by using facial expression, vocal tone, and gestures (Franco, 1997; Friend, 2001). However, as cognitive abilities develop, infants' language skills become more sophisticated. Specifically, around 9 months of age, infants are able to jointly give attention to the same object or event with others (Tomasello, 1995), and realize others' intention to communicate (Baumwell et al., 1997). At the end of the first year, as infants are exposed to various situations, and learn words and phrases from caregivers, they show rapid increase in language abilities. Specifically, infants truly understand the meanings of certain words, and become capable of using language flexibly across different contexts (Tamis-LeMonda & Bornstein, 1990; Volterra, Bates, Benigni, Bretherton, & Camiaoni, 1979). Among early language skills in infancy, language comprehension and production can be considered as basic building blocks (Tamis-LeMonda, Bornstein, Kahana-Kalman, Baumwell, & Cyphers, 1998). Language comprehension is acquired when infants are able to match mental representation with verbal symbols (Tamis-LeMonda et al., 1998). Also, language production is achieved when infants are capable of associating and expressing words with relevant objects (Bates, Bretherton, & Snyder, 1988; McCall, Eichorn, & Hogarty, 1977; Tamis-LeMonda, Bornstein, & Baumwell, 2001).

These basic language abilities can be easily achieved when infants

positively interact with parents. Previous studies have shown that positive parent-infant interaction in early ages predicts later infants' language comprehension (Baumwell et al., 1997; Rollins, 2003), production (Gros-Louis, West, & King, 2014), and even further linguistic achievements, such as 50 words in productive language, combinational speech, and express a memory (Nicely, Tamis-LeMonda, & Bornstein, 1999; Tamis-LeMonda et al., 1998). In other words, by interacting and being exposed to parents' various behaviors and verbalizations, infants understand and use language better and faster.

Although most of the studies about caregiver-infant interaction and language development have focused on mothers' behaviors and influence on infant (Baumwell et al., 1997; Goodman, Dale, & Li, 2008; Gros-Louis et al., 2014; Jeong & Kwak, 2005; Kwak, Kim, & Hahn, 2004; Kim & Kwak, 2004; Kim & Kwak, 2010; Paavola, Kunnari, & Moilanen, 2005; Rollins, 2003; Vibbert & Bornstein, 1989), fathers' behaviors and effect on infants' development have not received attention until recent years. Furthermore, many researchers have observed parent-infant interaction in free-play situation where parents' behaviors are mostly positive. Therefore, researchers have claimed that it is necessary to observe caregiver-infant interaction in more controlled situation to attain broader perspective (Shannon et al., 2002; Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004).

To address these issues, the present study observed mothers' and fathers' behaviors in free-play and teaching-task situations, and examined their unique and longitudinal influence on 9 months infants' language abilities, specifically comprehension and production.

Interaction with Mother and Language Development

Because mothers spend large amount of time with their infants, they are assumed to be main contributors to infants' basic language skills, and, therefore, many studies about parent-infant interaction and language development are based on mothers (Huttenlocher, Vasilyeva, Waterfall, Vevea, & Hedges, 2007). The findings of previous studies have revealed that responsiveness, didactic behaviors, and emotion are the key components of mothers' behaviors which influence infants' language development (Bornstein et al., 1992; Doan, 2010; Kim & Kwak, 2010; Nicely et al., 1999; Park, Soe, & Bornstein, 2005; Stevens, Blake, Vitale, & MacDonald, 1998).

Specifically, responsiveness is parents' prompt, contingent, and appropriate response to infants' verbal and nonverbal cues (Tamis-LeMonda, Kuchirko, & Song, 2014). When infants explore the environment, point at some objects, or verbalize simple words, responsive mothers do not ignore the cues, understand what the infants want to say, and reply appropriately. Through parents' responsive behaviors, infants easily acquire linguistic meanings of objects and events around them. Many research findings have revealed that the effectiveness of parents' responsive behavior is predominant and long-lasting. Compared to mothers' amount of language input, responsive behaviors are better predictor of infant language development (Shin, 2006). Also, Baumwell and her colleagues

(1997) examined whether maternal responsiveness would facilitate language comprehension in infancy. When infants were at 9 and 13 months, the researchers observed mother-infant dyads in free-play situation, and measured infants' language comprehension skills. The results indicated that mothers' responsive behaviors at 9 months uniquely and significantly predicted infants' language comprehension at 13 months. The effect of mothers' responsiveness was still significant even after controlling infants' previous language comprehension ability. This findings confirmed that when mothers promptly, contingently, and appropriately respond to their infants' verbalization and explorative behaviors, infants are more likely to match words with certain objects or events, and understand the meanings of the words and phrases.

Also, the importance of responsiveness in early language development is culturally universal (Bornstein et al., 1992; Kim & Kwak, 2004; Kwak et al., 2004). For instance, Kim and Kwak (2010) found that Korean mothers' responsiveness was correlated with infants' early language comprehension and production at 12 and 15 months of age. Also, combining with infants' non-verbal communicative ability at 12 months, mothers' responsiveness predicted language measures at 12 and 15 months. Thus, many studies have shown that parental responsiveness has prevailing and longitudinal effect on early language development, and this relationship can be observed in different cultures.

Furthermore, previous studies have shown that mothers' didactic, or scaffolding behavior during interaction is also an important predictor of language development in infancy. When a challenging task is given, parents may act as sensitive teachers, help and guide infants to perform the task successfully (Vygotsky, 1979). By encouraging infants to sustain attention on the certain object, structuring the surrounding, and stimulating infants through verbal and nonverbal behaviors, parents may promote infants' word learning (Conner, Knight, & Cross, 1997; Park et al., 2005; Vibbert & Bornstein, 1989). For example, Stevens et al. (1998) observed mothers' didactic behaviors during free-play situation, and measured infants' cognitive and language abilities at 9 and 15 months. The results revealed that maternal scaffolding behaviors were related with infants' cognitive and language development at both time points. When mothers sensitively guided and taught, their infants were more likely to be cognitively competent, and use more words in speech. Moreover, mothers' didactic verbalization were also correlated with infants' developmental measures. Specifically, when mothers labeled objects and suggested some actions to infants at 15 months, the infants were more likely to have higher Bayley MDI score, and larger vocabulary size. Therefore, both didactic behaviors and verbalizations of parents are related to language development in infancy.

Lastly, emotion during parent-infant interaction is also an important factor in early language development. Infants discern, understand, and express emotion even before they learn how to talk. At around 5 months, infants are able to differentiate affective signals from neutral ones in vocal and facial expressions (Kuchuk, Vibbert, & Bornstein, 1986; Walker-Andrews & Grolnick, 1983). While interacting with a securely attached person, 2, 4, and 6-month-old infants cry or fuss when they are frustrated, and smile and make a smile-face when they are happy and satisfied (Cohn, Campbell, & Ross, 1991). That is, infants use emotion as a primary means of communicating with others (Bloom, 1998).

Mothers, too, experience and express various emotions, such as joy and frustration, when they interact with their infants (Martin, Clements, & Crnic, 2002). And by showing different emotions through facial expression, voice, and gesture, mothers' emotional expression can influence infants' language learning. As Doan (2010) explained, when words and phrases are given with emotional information, they are more likely to draw attention, may go through deeper cognitive processing, and may be remembered more easily. Therefore, infants may understand and learn words more easily when verbal input is emotionally loaded. One study has shown that both 7.5 and 10.5 months infants paid more attention listening to the words spoken in positive tone of voice than neutral one. Also, 10.5 months infants were able to recognize those words even from the

sentences spoken in neutral tone (Singh, Morgan, & White, 2004). It can be explained that, because emotional information attracted infants' attention, and was stored in memory longer, infants could recognize the words more easily even in different context.

Moreover, when emotion is shared during interaction, infants acquire words more effectively. Nicely et al. (1999) observed whether mothers matched and appropriately responded to infants' emotional expression during free-play situation. The researchers also measured the timings of infants' first words in production, comprehension, 50 words in productive language, combinatorial speech, and talk about the past from 9 to 21 months. The results indicated that mothers' matched emotion at 9 months predicted infants' earlier language achievement. According to the authors, when mothers understand how their infants feel, and express the same emotion with them, infants are more likely to share thoughts and minds with their mothers. Hence, infants may want to share their intention more, and this process may facilitate language achievements. Therefore, in addition to expressing affect and being exposed to others' emotions, sharing emotional states can be important in acquiring language abilities. Thus, many research findings have revealed that emotion plays an important role in language achievement in early stage of life. By facilitating word learning and enhancing the communication between caregiver and infant, emotion can aid

language development in infancy. However, because the relationship between emotion and language is complicated, and the research examining infants' emotion and language is challenging to conduct, there are only few studies that directly assess emotion and language in infancy (Doan, 2010) and, therefore, more studies are needed in this field.

In summary, among various parental behaviors, studies have shown that mothers' responsiveness, didactic behavior, and emotion are the main contributors to early language achievement in infancy.

Interaction with Father and Language Development

On the other hand, the studies about father-infant interaction and language development had not received attention until recently. Fathers were assumed to be merely breadwinners or financial supporters who would not influence infants' development in daily lives (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000). The studies regarding father-infant interaction in Korea also had been limited. Most of the studies have used only questionnaires or surveys to assess fathers' involvement, engagement, or attitudes about parenting (e.g., Hwang, Chong, & Woo, 2005). However, as the trend in society has changed in recent decades, fathers have become more involved in their infants' daily lives (Cabrera, Hofferth, & Chae, 2011). Consequently, researchers have begun to acknowledge and claim that fathers are, too, important and influential contributors to infants' development. Researchers in Korea also directly observed father-infant interaction, and examined fathers' influence on children's development in recent years (Kwon, Chung, & Yee, 2015; Lee & Lee, 2010). How, then, do fathers influence infants' language development?

Some studies have emphasized fathers' unique behaviors and contribution, and claimed that fathers' playful behavior, challenging verbalization, and task-oriented behavior are the prominent features in interaction which in turn influence early language development in infancy (John

et al., 2013; Leech, Salo, Rowe, & Cabrera, 2013; Pancofar & Vernon-Feagans, 2006; Power & Parke, 1983; Tamis-LeMonda, Baumwell, & Cristofaro, 2012).

First, many researchers have highlighted physical play and teasing as prominent behaviors in fathers (Abkarian, Dworkin, & Abkarian, 2003; Grossmann et al., 2002; John et al., 2013; Labrell, 1994; Power & Parke, 1983). Compared to mothers, fathers are more likely to tease their infants (Labrell, 1994), and physically stimulate infants during interaction (Power & Parke, 1983; Ross & Taylor, 1989). By hiding toys from infants, mischievously calling infants with nicknames, and pretending to have rough fights, fathers tease and stimulate infants (Labrell, 1994). These behaviors contradict infants' anticipation. Thus, infants first show surprised expression, and then laugh as they understand fathers' way of playing. Therefore, infants, in return, prefer fathers as play partners (Clarke-Stewart, 1978; Lynn & Cross, 1974), and express more positive emotion when they playfully interact with fathers than they play with mothers (Volling, McElwain, Notaro, & Herrera, 2002). These playful behavior and verbalization may facilitate language development in infancy. Abkarian et al. (2003) explained that infants' theory of mind, cognitive and linguistic development can be related to fathers' teasing and physical play. Because fathers' teasing goes against infants' expectation, infants have to understand fathers' intention to respond and interact appropriately. Through this process, infants' cognitive and language abilities can

be sophisticated. Therefore, playful behaviors and verbalization may contribute to early language development.

Furthermore, fathers' challenging verbal statements may promote infants' language development. According to 'the bridge hypothesis (Gleason, 1975),' because fathers spend relatively less time with their infants, they are not familiar with infants' linguistic level. Therefore, fathers may use terms that are too challenging for infants, or ask questions that infants have to combine various words to make a complete sentence. In this manner, fathers are assumed to be a bridge to the outside world which prepares youngsters to become competent communicators (Ely & Gleason, 1995; Gleason, 1975; Lovas, 2011; Rowe et al., 2004). For example, in one study, compared to mothers, fathers used more wh-questions ("What are you doing?" "Where do you want to go?"), and asked their infants to clarify themselves ("What did you say?" "Say that again") during interaction (Rowe et al., 2004). The authors of the study explained that challenging conversation with fathers lets infants use sophisticated words and phrases, and finally leads to language development.

Moreover, fathers' task-oriented attitude and behavior may help early language growth. Although mothers are more sensitive to infants' mental and emotional states, fathers may be more demanding and focus more on the given task (Conner et al., 1997; Kazura, 2000). For example, Lundy (2003) examined

mothers' and fathers' mind-related comments during interaction. The results showed that mothers were more likely to speak from infants' mind (e.g., "Mommy, get me out of here"), whereas fathers were more likely to comment about problem-solving and the given task (e.g., "What are you trying to do with that?"). As fathers focus on problem-solving and task-completion, it would be easier that infants may stay focused and learn effectively. In their study, Conner et al. (1997) showed that compared to mothers, fathers were more task-oriented, and through this behavior, children were likely to concentrate on reading task, and had better script knowledge. Therefore, based on the findings from previous studies, some researchers assumed and claimed that fathers are different from mothers, and they can contribute to infants' language development in unique ways.

However, other researchers have opposed to dichotomize between mothers and fathers. They have claimed that fathers are not only rough-and-tumble players, but also sensitive caregivers and teachers (Roggman, 2004; Tamis-LeMonda, 2004). Some findings have revealed that mothers and fathers interact and influence infants' language development in similar manner. In other words, fathers can be just as sensitive and responsive as mothers (Cabrera, Shannon, & Tamis-LeMonda, 2007; Shannon et al., 2002; Tamis-LeMonda et al., 2004). Previous studies have found that both mothers and fathers respond to

infants' smiles and cries (Berman, 1980), and adjust their speech and behaviors to infants' developmental status (Crawley & Sherrod, 1984; Golinkoff & Ames, 1979). Regarding father-child interaction and language development, Tamis-LeMonda and her colleagues (2004) examined mothers' and fathers' play behaviors with their children, and their contributions to children's language and cognitive development. When children were at the age of 24 and 36 months, mothers and fathers participated in free-play situation, and children's language and cognitive development were measured with PPVT and Bayley MDI. The results indicated that mothers and fathers did not differ when they interact with their children. Both caregivers received high scores on sensitivity, positive regard, and cognitive stimulation, and low scores on detachment, intrusiveness, and negative regard. Furthermore, both mothers' and fathers' supportive parenting behaviors (sensitivity, positive regard, and cognitive stimulation) predicted children's language and cognitive measures at both 24 and 36 months. Also, even after controlling mothers' behaviors, fathers' behaviors remained significant predictor of children's development measures. Based on the results of past studies, researchers have increasingly claimed that fathers are also important contributors of infants' development.

Interaction in Free-play and Teaching-task Situations and Language Development

Parent-infant interactions are taken in various situations. In everyday life, family members spend times together eating meals, playing with toys, reading books, and more. Because each situation has distinct characteristic and goal, parents may change and adjust their behaviors (Bornstein, Tamis-LeMonda, & Haynes, 1999; Ryckebusch & Marcos, 2004; Yont, Snow, & Vernon-Feagans, 2003). Consequently, different parents' behaviors may influence infants' language development differently.

Most of the previous studies have observed parent-infant interaction in free-play situation (Baumwell et al., 1997; Nicely et al., 1999; Shannon et al., 2002; Tamis-LeMonda et al., 2004). During this situation, various toys are given to parent-infant dyads, and they can play freely without any rules or restrictions (Bakeman & Adamson, 1984). As parent-infant dyads play and exchange sheer joy and laughter, various behaviors can be observed. Kwon, Bingham, Lewsader, Jeon, and Elicker (2013) emphasized the importance of play by revealing positive aspects of parents' behaviors during free-play situation. Specifically, parents cognitively scaffolded their children, showed less negative behaviors, and used more complicated words during free-play situation. The researchers

claimed that these cognitively stimulating behaviors are beneficial to development of children.

However, some researchers have noted that free-play situation is limited to represent parent-infant interaction as a whole. Because parents mostly present positive and playful behaviors during this situation, their disciplinary or negative behaviors are rarely observed (Shannon et al., 2002; Tamis-LeMonda et al., 2004). Therefore, previous studies suggested to observe parent-infant interaction in more controlled situation where parents interact with infants in structured format.

To address this issue, researchers have examined parent-infant interaction in structured-task situation. Unlike free-play situation, during structured-task situation, parent-infant dyads receive certain number of toys and have to solve problems or complete tasks together. As both parent and infant focus on the given tasks and cooperate with one another, parents have to guide and control infants' behaviors at the same time (Conner et al., 1997; Kwon et al., 2013; Ryckebusch & Marcos, 2004). Therefore, both parents and infants interact in more controlled manner in this kind of situation. Volling et al. (2002) observed mother- and father-infant interaction during free-play and teaching-task situations. The results revealed that both mothers and fathers presented different behaviors in different situations. Specifically, both caregivers were more

emotionally available, presented more positive attitude, and controlled and interfered infants in teaching-task situation.

These kinds of behaviors indeed affect infants' language development. For instance, Conner and his colleagues (1997) observed how mothers and fathers interact with their 2-year-old children during problem-solving and book reading tasks. After parent-child interaction session, researchers measured children's competence in each assignment. The results showed that both mothers and fathers competently scaffolded and guided children to complete the tasks, and consequently, children were better solving problems, retelling stories, and presenting script knowledge. During structured situation, such as problem-solving and book reading situations, parents can facilitate infants' language development by matching their behaviors appropriately to infants' ability, encouraging and guiding infants to finish given tasks, and providing verbal and nonverbal guidance.

The Current Study

The present study examined differences between mothers' and fathers' behaviors during free-play and teaching-task situations. Furthermore, the current study examined the relationship between mothers' and fathers' behaviors while interacting with 9-month-old infants and language development at 9 and 12 months. Because infants begin to coordinate joint attention with interaction partner, and understand other's intent to communicate around 9 months (Baumwell et al., 1997; Tomasello, 1995), and generally show rapid increase in language comprehension and production skills around 12 months (Tamis-LeMonda & Bornstein, 1990), it is appropriate to study the concurrent and longitudinal impact of parent-infant interaction on early language comprehension and production.

Because previous studies, especially in Korea, had mainly focused on mother-infant interaction, father-infant interaction should be observed also. Moreover, studies about father-infant interaction have revealed inconsistent findings (Power & Parke, 1983; Shannon et al., 2002). Some studies have shown that both mothers and fathers are similar during interaction with infants; their responsiveness, didactic and positive behaviors are related to infants' language abilities. Other studies have indicated that mothers and fathers display unique

behaviors that can contribute to infants' language development. Therefore, in-depth investigation about mother- and father-infant interaction is required. Additionally, to understand parent-infant interaction in broader perspective, it is needed to assess mother- and father-infant interaction in different situations (Tamis-LeMonda et al., 2004).

Lastly, the present study examined mothers' and fathers' unique and longitudinal influence on infants' language development. Although previous studies observed mothers' and fathers' behaviors in various situations (Kwon et al., 2013; Lindsey, Cremeens, & Caldera, 2010; Volling et al., 2002), longitudinal relationship between parents' behaviors and infants' language abilities was rarely assessed. Therefore, longitudinal effect of mothers' and fathers' behaviors on infant language development should be examined. More specifically, unique contribution of mother and father should be assessed to attain deeper understanding about parent-infant interaction and language development.

Research Questions and Hypotheses

First, of parents' behaviors, which behaviors are more likely to be observed in mothers or fathers? Also, which behaviors are more prominent in free-play or teaching-task situation? Based on previous findings, it would be more probable that mothers being more sensitive, guiding, and emotional, whereas fathers being more playful as well as task-oriented. Also, both caregivers would display more dynamic and various behaviors during free-play situation, while they would show more controlled and achievement oriented behaviors during teaching-task situation.

Furthermore, of mothers' and fathers' behaviors during free-play and teaching-task situations, which behaviors are significantly related with infants' language comprehension and production skills at 12 months? It would seem possible that mothers' sensitive, didactic, and emotional behaviors, and fathers' teasing and playful behaviors in free-play situation would be associated with infants' language comprehension and production. On the other hand, both parents' task-oriented behaviors in teaching-task situation would be correlated with infants' early language abilities.

Lastly, among parents' correlated behaviors, which mothers' and fathers' behaviors would uniquely and longitudinally predict infants' language comprehension and production? Would fathers' behaviors contribute to

development of infants' language skills even after controlling mothers' behaviors?

It is plausible to hypothesize that mothers' sensitive and emotional behaviors, and fathers' playful behaviors during free-play situation would predict infants' language measures at 12 months. Also, both caregivers' achievement-oriented behaviors during teaching-task situation would predict language development in infancy. Moreover, fathers' behaviors would still predict infants' language measures even after controlling mothers' behavioral variables.

Method

Participants

Thirty seven infants (21 male, 17 female) and their mothers and fathers who resided in Seoul and Gyeonggi province of the Republic of Korea participated in this study. They had participated in a longitudinal study since the infants were 1-month-old. For the current study, the participants were observed and assessed when the infants were at 9 months ($M = 9.09$; range = 8.22 – 10.06 months; $SD = .27$), and 12 months ($M = 11.87$; range = 11.03 – 13.08 months; $SD = .49$). However, because one girl cried and expressed extreme frustration during observation session, she was excluded in this study. Therefore, total thirty six families participated in this study. All of the families were maritally intact, and most of them (56.7%) were low or lower middle class. Furthermore, most of the mothers (45.9%) and fathers (70.2%) attended college or received higher levels of education.

Procedures

When infants were at 9 months of age, families visited the laboratory. Before the actual procedures began, experimenters explained about the study and

the tasks to parents, and parents read and signed a consent form. And then, mothers and fathers participated in free-play and teaching-task situations with infants independently. The order of participating parents (mother - father) and situations (free-play - teaching-task) were counterbalanced. All of the procedures lasted about sixty minutes and the interactions were videotaped.

In addition to the observation sessions, when infants were at 9 and 12 months, mothers reported their infants' language skills via MacArthur-Bates Communicative Development Inventory-Korean (M-B CDI-K; Bae & Kwak, 2011).

Measures

Mother-Infant and Father-Infant Interactions

Free-play Situation: During free-play situation, mother-infant and father-infant dyads were asked to sit on a mat and play just as they usually would. Various toys were given and they included two toy telephones, a ball, a baby doll, a picture book, and a playing house set. Mother-infant and father-infant interactions lasted for ten minutes each.

Teaching-task Situation: During teaching-task situation, parents were asked to teach and guide infants how to perform tasks successfully. Two tasks were given

in the present study: line drawing and stacking pole. Specifically, mothers and fathers had to teach infants how to draw lines with crayons, and put rings with various shapes on the pole. Teaching-task situations also lasted for ten minutes.

Coding: Mothers and fathers behaviors were assessed with the Caregiver-Child Affect, Responsiveness, and Engagement Scale (C-CARES; Tamis-LeMonda, Rodriquez, Shannon, Ahuja, & Hannibal, 2001). The Scale is composed of three behavioral dimensions: affect, sensitivity, and didactic. Each dimension has several specific behavioral items which leads total eighteen items (see Table 1). Specifically, affect dimension includes positive affect, negative affect, positive touch, negative touch, positive verbal statement, negative statement, teasing. In sensitivity dimension, there are participation with infant, responsiveness to infants' nonverbal cues, responsiveness to infants' verbal cues, emotional attunement, flexibility, intrusiveness. Lastly, didactic dimension is composed of structuring, achievement orientation, toy play, amount of language, and quality of language.

To establish inter-coder reliability, about 20% of video tapes ($N = 30$) were randomly selected, and coded by coders. For mother- and father-infant interaction during free-play situation, inter-coder reliability was ranged from .89 to .93 in Kappa. Inter-coder reliability for mother- and father-infant interaction

during teaching-task situation was ranged from .93 to .97 in Kappa. After inter-coder reliability was established, two to three trained coders coded the remaining video tapes. The coders watched the video tapes together, but coded independently. Coders observed general mother- and father-infant interaction in the first pass. Then, coders focused on mothers' and fathers' behaviors and coded accordingly. When there was a disagreement among coders, they watched the interaction again and discussed, so that they could finalize the coding.

Table 1. *Parent Behaviors (Tamis-LeMonda et al., 2001)*

Behavior items	Definition
Positive affect	Expressions of approval, enjoyment, and affection through facial expression, tone of voice, and body positioning
Negative affect	Expressions of anger, hostility, frustration, impatience, and disapproval through facial expression, tone of voice, and body positioning
Positive touch	Amount and quality of gentle, loving touch or active and playful touch
Negative touch	Amount and quality of forceful or abrupt touch
Positive verbal statement	Expressions of approval, praise, and positive reinforcement
Negative verbal statement	Expressions of disapproval and criticism
Teasing	Contradict infant's actions and expectations in a playful or antagonistic manner

Participation with infant	Amount of involvement with the infant
Responsiveness to infant's nonverbal cues	Contingent and appropriate responsiveness to infant's nonverbal cues
Responsiveness to infant's verbal cues	Contingent and appropriate responsiveness to infant's verbal cues
Emotional attunement	Degree to emulate infant's displays of emotions using body, voice, gestures, and facial expressions
Flexibility	Willingness to let the infant direct an activity
Intrusiveness	Interruptions in the infant's play or overbearing behaviors
Structuring	Extent to organize the play environment to maximize play and learning opportunities
Achievement orientation	Encouragement of the infant's cognitive achievement and knowledge
Toy play	Amount of play with toys by involving in all types and levels of play
Amount of language	Amount of verbal stimulation provided, irrespective of verbal content and style
Quality of language	Quality of verbal stimulation and richness of language provided

Infant Language Development

To assess infants' language development, MacArthur-Bates Communicative Development Inventory-Korean (M-B CDI-K; Bae & Kwak, 2011), the Korean version of MacArthur-Bates Communicative Development Inventory (Fenson et al., 1993) was used. M-B CDI-K has Infant Form (for infant at age 8 to 17 months) and Toddler Form (for toddler at age 18 to 36 months), and in this study, Infant Form was used. When mothers visited the laboratory, they reported their infants' language ability via M-B CDI-K booklet. The booklet contains total 284 words grouped into 19 semantic categories: sound effects and animal sounds, vehicles, animal names, body parts, clothing, toys, food and drink, small household items, furniture and rooms, places to go, outside things, people, games and routines, pronouns and question words, quantifiers, verbs, adjectives, and function words. For language comprehension, mothers read the list of words and checked if their infants "understand" each word. Mothers had to include the words that infants understand, but do not say the word yet. For language production, mothers marked the words that infants "understand and say" across any circumstances. The cases when infants do not understand, but just imitate what mothers say are not considered as the production of language.

Results

In the current study, mothers' and fathers' interaction behaviors with 9-month-old infants in free-play and teaching-task situations were examined. 2 (parent gender: mother, father) x 2 (situation: free-play, teaching-task) x 2 (infant gender: male, female) repeated measure analysis of variance was performed to assess the differences in parents' behaviors. Furthermore, the relationship between caregivers' behaviors in two different situations and infants' early language skills was analyzed. Correlation analysis was conducted to see the specific relationship between parental behaviors in two situations and infants' language comprehension and production at 9 and 12 months. Lastly, mothers' and fathers' unique and longitudinal contributions to infants' language abilities were assessed. Hierarchical multiple regression analysis was used to examine which mothers' and fathers' behaviors would predict infants' language comprehension and production at 12 months of age. Also, the analysis examined whether fathers' behaviors would facilitate infants' early language achievement above and beyond mothers' influence.

Differences in Parents' Behaviors by Parent Gender, Situation, and Infant Gender

To examine whether parents' behaviors differ by parent gender, situation, and infant gender, 2(mother, father) x 2 (free-play, teaching-task) x 2 (male, female) repeated measure ANOVA was performed. Through the analysis, it can be explained whether differences in parents' behaviors are based on main effect of parent gender, situation, infant gender, or interaction effect of parent gender, situation, and infant gender. In the analysis, parent gender and situation were used as repeated measure variables. Furthermore, because parents may expect and enforce gender-typical behaviors on their sons and daughters, parent-infant interaction can be different by infant gender (Brachfeld-Child, Simpson, & Izenson, 1988; Lindsey et al., 2010). Therefore, infant gender was also included in the analysis as between-group variable.

Table 2 presents mothers' and fathers' positive affect, negative affect, positive touch, negative touch, positive verbal statement, negative verbal statement, and teasing in free-play and teaching-task situations. Significant main effect and interaction effect were emerged for each behavioral variables. Specifically, there were significant parent effects for positive affect, $F(1, 34) = 4.79, p < .05$, and positive verbal statement $F(1, 34) = 4.74, p < .05$. During both free-play and teaching-task situations, mothers displayed more positive emotion

and gave more positive comments to their infants than fathers. Also, significant situation effects were emerged from negative affect, $F(1, 34) = 5.57, p < .05$, positive touch, $F(1, 34) = 22.31, p < .000$, negative touch, $F(1, 34) = 7.64, p < .01$, positive verbal statement, $F(1, 34) = 40.32, p < .000$, and teasing $F(1, 34) = 21.25, p < .000$. Both mothers and fathers touched negatively and teased their infants more during free-play situation. On the contrary, both parents showed negative affect, touched positively, and gave positive comments more during teaching-task situation. There were parent x situation interaction effects for positive affect, $F(1, 34) = 4.37, p < .05$, negative affect, $F(1, 34) = 8.80, p < .01$, and teasing, $F(1, 34) = 5.51, p < .05$. The interaction effects revealed that mothers showed positive affect and teased infants more during teaching-task situation, whereas fathers presented positive affect and teased infants more during free-play situation. There was a parent x infant gender interaction effect for negative affect, $F(1, 34) = 4.50, p < .05$, indicating mothers were more negative toward their boys, whereas fathers were more negative to their girls. Lastly, there were parent x situation x infant gender interaction effects for negative affect, $F(1, 34) = 8.80, p < .01$, and negative verbal statement, $F(1, 34) = 5.77, p < .05$. While interacting with male infants, mothers showed negative emotion, and negatively commented on infants' behaviors more during teaching-task situation, whereas fathers presented the same negative behaviors during

free-play situation. Additionally, while interacting with female infants, fathers displayed more negative affect, and gave negative comments than mothers in both free-play and teaching task situations (see Figure 1 and 2).

Table 2. Means and Standard Deviations for Mothers' and Fathers' Behaviors in Free-play and Teaching-task Situations (Affect)

	Mother				Father			
	Free-play		Teaching-task		Free-play		Teaching-task	
	M	SD	M	SD	M	SD	M	SD
Positive affect	4.25	.91	4.44	.69	4.06	.95	3.97	.81
Negative affect	1.00	.00	1.33	.63	1.08	.28	1.06	.23
Positive touch	3.00	1.31	4.17	.70	3.19	1.53	3.69	1.04
Negative touch	1.14	.42	1.06	.33	1.33	.68	1.00	.00
Positive verbal statement	2.83	1.38	3.86	1.31	2.22	1.40	3.64	1.40
Negative verbal statement	1.11	.32	1.47	.81	1.31	.79	1.19	.71
Teasing	1.67	.93	1.28	.66	2.17	1.32	1.08	.28

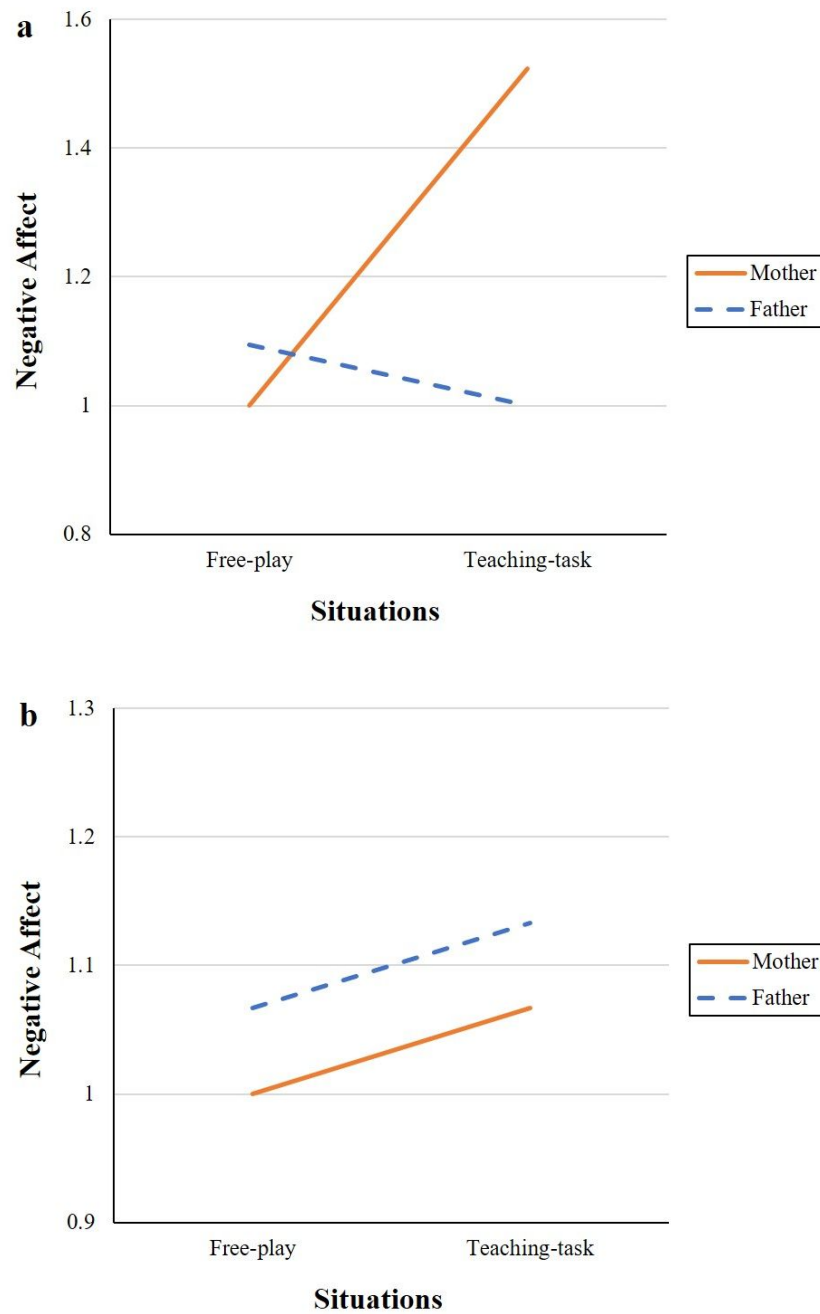


Figure 1. Parent \times Situation \times Infant Gender Interaction Effect for Negative Affect (Figure 1a. Male Infant & Figure 1b. Female Infant)

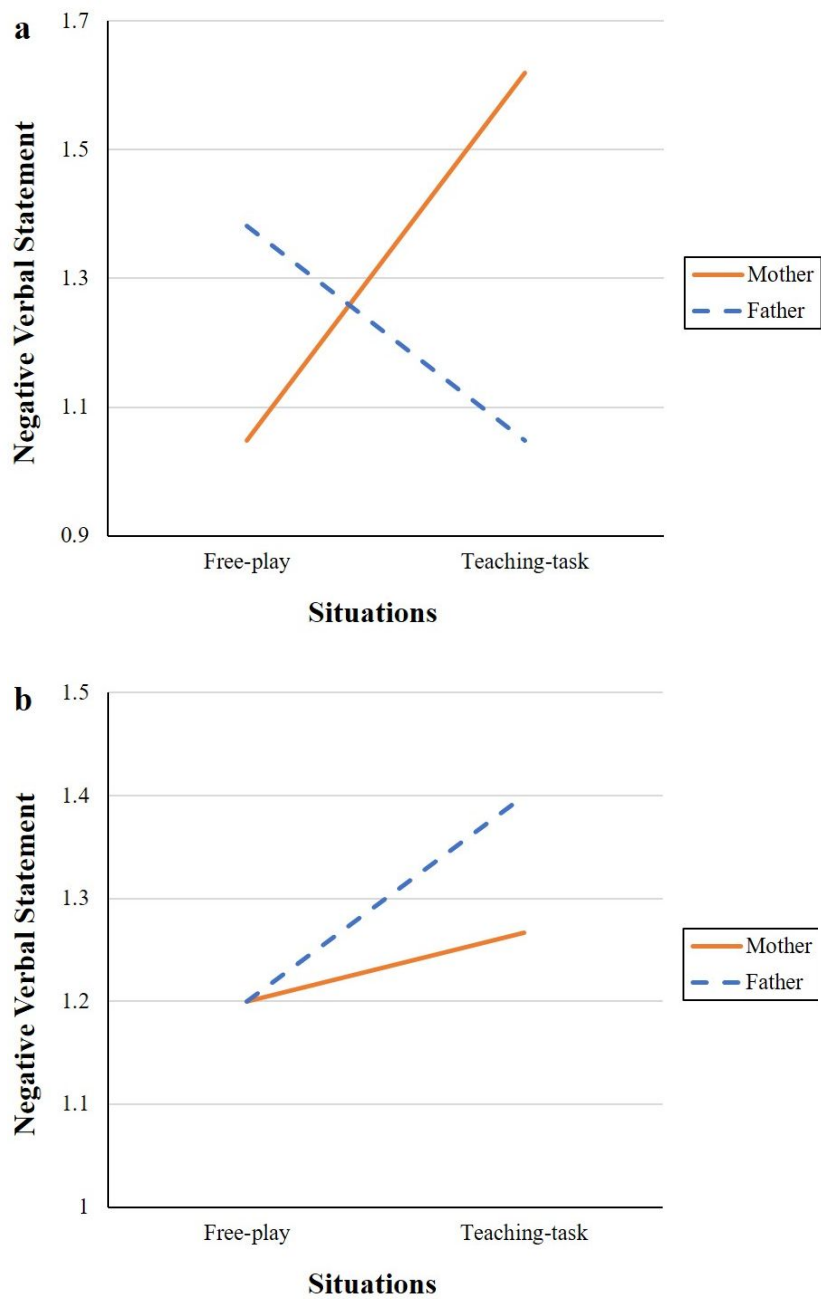


Figure 2. Parent \times Situation \times Infant Gender Interaction Effect for Negative Verbal Statement (Figure 1a. Male Infant & Figure 1b. Female Infant)

Mothers' and fathers' participation, responsiveness to nonverbal and verbal cues, emotional attunement, flexibility, and intrusiveness in free-play and teaching-task situations were shown in Table 3. There were main effect and interaction effect for all variables. Specifically, there were significant parent effects for responsiveness to infants' verbal cues, $F(1, 34) = 4.42, p < .05$ and emotional attunement, $F(1, 34) = 7.56, p < .01$. Mothers were responsive to infants' verbal cues, and matched infants' emotional expression more than fathers. Also, there were significant situation effects for participation, $F(1, 34) = 14.60, p < .01$, responsiveness to nonverbal, $F(1, 34) = 4.45, p < .05$, and verbal cues, $F(1, 34) = 18.35, p < .000$, flexibility, $F(1, 34) = 21.92, p < .000$, and intrusiveness, $F(1, 34) = 7.17, p < .01$. Both mothers and fathers actively participated, responded to infants' nonverbal and verbal signals, played flexibly, and intervened infants more during free-play situation than teaching-task situation. Moreover, there was a parent x situation interaction effect for flexibility, $F(1, 34) = 6.67, p < .01$. Mothers were more flexible during teaching-task situation, and fathers followed infants' lead more during free-play situation. Furthermore, there were parent x infant gender interaction effects for emotional attunement, $F(1, 34) = 5.71, p < .05$, and flexibility, $F(1, 34) = 5.32, p < .05$. Mothers were emotionally attuned and played with flexibility more when they interacted with boys. On the contrary, fathers matched their emotion to infants' emotional

expression and played more flexibly when they interacted with girls.

Table 3. Means and Standard Deviations for Mothers' and Fathers' Behaviors in Free-play and Teaching-task Situations (Sensitivity)

	Mother				Father			
	Free-play		Teaching-task		Free-play		Teaching-task	
	M	SD	M	SD	M	SD	M	SD
Participation	5.00	.00	4.69	.47	4.89	.32	4.64	.49
Responsiveness to nonverbal cues	4.25	.84	4.00	1.01	4.00	1.07	3.50	1.11
Responsiveness to verbal cues	4.39	.77	3.58	1.18	3.81	1.45	3.31	1.24
Emotional attunement	3.81	1.19	3.89	1.14	3.31	1.33	3.22	1.10
Flexibility	4.17	1.03	3.78	1.12	4.22	1.05	3.11	1.09
Intrusiveness	1.53	1.00	1.14	.54	1.42	.91	1.36	.80

Lastly, mothers' and fathers' structuring, achievement orientation, toy play, quality and amount of language were presented in Table 4. Several main effect and interaction effect were emerged from the variables. Specifically, there was a significant parent effect for quality of language, $F(1, 34) = 16.12, p < .000$. Mothers used more various words and explained more thoroughly than fathers. Also, there were significant situation effects for structuring, $F(1, 34) = 20.17, p$

< .000, achievement orientation, $F(1, 34) = 8.88, p < .01$, and quality of language, $F(1, 34) = 8.92, p < .01$. Both caregivers structured the environment more during free-play situation. On the other hand, both mothers and fathers focused on cognitive achievement, and used language in higher quality during teaching-task situation. Moreover, there was a parent x situation interaction effect for amount of language, $F(1, 34) = 6.59, p < .05$. Mothers talked more during free-play situation, and fathers were more talkative during teaching-task situation. Lastly, there was a parent x infant interaction effect for toy play, $F(1, 34) = 4.79, p < .05$. Mothers were more likely to use given toys when they interact with their male infants, whereas fathers played with given toys in various ways with their female infants.

Table 4. Means and Standard Deviations for Mothers' and Fathers' Behaviors in Free-play and Teaching-task Situations (Didactic)

	Mother				Father			
	Free-play		Teaching-task		Free-play		Teaching-task	
	M	SD	M	SD	M	SD	M	SD
Structuring	4.39	.64	3.92	.60	4.39	.73	4.06	.67
Achievement orientation	4.00	1.04	4.08	.69	3.72	.85	4.31	.62
Toy play	4.42	.69	4.42	.65	4.39	.84	4.22	.68
Amount of language	4.63	.54	4.61	.49	4.14	.93	4.47	.81

Quality of language	4.17	.85	4.39	.64	3.36	1.15	3.92	.87
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Relationship between Parents' Behaviors and Infants' Language Measures

To examine the relationship between mothers' and fathers' behaviors and infants' early language abilities, correlational analyses were conducted. To assess whether mothers' and fathers' behaviors in different situations would uniquely associate with infants' language measures, analyses were performed separately by each parent in free-play and teaching-task situations. Furthermore, to examine concurrent and longitudinal relationships, analyses were conducted separately by language comprehension and production in 9 months and 12 months.

First, correlational relationship between mothers' behaviors during free-play situation and infant language measures were conducted. Because all participating mothers did not show negative affect and actively participated during free-play interaction, mothers' negative affect and participation were excluded from the analysis. The results revealed that during free-play situation, mothers' positive affect was positively correlated with language comprehension at 9 months, $r(34) = .33, p < .05$, language comprehension at 12 months, $r(34) = .38, p < .05$, and language production at 12 months $r(34) = .48, p < .01$. Mothers' negative verbal statement was positively correlated with language comprehension at 12 months, $r(34) = .41, p < .05$, and language production at 12 months, $r(34) = .35, p < .05$. Also, mothers' responsiveness to infants' verbal

cues was correlated with language comprehension at 12 months, $r(34) = .39$, $p < .05$, and language production at 12 months, $r(34) = .35$, $p < .05$. Mothers' emotional attunement was correlated with infants' language comprehension at 9 months, $r(34) = .33$, $p < .05$, and language production at 9 months, $r(34) = .37$, $p < .05$. Moreover, mothers' toy play was positively correlated with infants' language production at 12 months, $r(34) = .35$, $p < .05$. Lastly, mothers' amount of language was positively correlated with infants' language comprehension at 9 months, $r(34) = .70$, $p < .01$, language production at 9 months, $r(34) = .51$, $p < .01$, and language production at 12 months, $r(34) = .35$, $p < .05$ (see Table 5).

Table 5. *Correlation between Mothers' Behaviors during Free-play Situation and Language Measures*

	COM_9M	PRO_9M	COM_12M	PRO_12M
Positive affect	.33*	.29	.38*	.48**
Positive touch	.06	-.03	.17	.03
Negative touch	-.19	-.03	-.00	-.06
Positive verbal statement	.19	.18	.23	.27
Negative verbal statement	.22	.00	.41*	.38*
Teasing	.25	.18	.17	.12
Responsiveness (nonverbal)	.12	-.04	.06	.12
Responsiveness (verbal)	.08	-.03	.39*	.35*
Emotional attunement	.33*	.37*	.16	.14
Flexibility	.10	-.04	.15	.24
Intrusiveness	-.19	-.07	-.06	-.10
Structuring	.15	-.00	.22	.28
Achievement orientation	.21	.26	.06	.18
Toy play	.09	-.14	.25	.35*
Amount of language	.70**	.51**	.19	.35*
Quality of language	.29	.21	.15	.28

Note:

COM_9M = Comprehension at 9 months, PRO_9M = Production at 9 months, COM_12M = Comprehension at 12 months, PRO_12M = Production at 12 months.

* $p < .05$, two-tailed, ** $p < .01$, two-tailed.

As shown in Table 6, several fathers' behaviors during free-play situation were also positively correlated with infants' language measures. Specifically, fathers' teasing was positively correlated with language comprehension at 9 months, $r(34) = .34, p < .05$. Furthermore, fathers' responsiveness to infants' verbal cues was positively correlated with infants' language comprehension at 12 months, $r(34) = .34, p < .05$.

Table 6. *Correlation between Fathers' Behaviors during Free-play Situation and Language Measures*

	COM_9M	PRO_9M	COM_12M	PRO_12M
Positive affect	.27	.29	.21	.19
Negative affect	.18	.01	.12	.14
Positive touch	-.01	.00	-.11	-.21
Negative touch	.10	.06	.04	.12
Positive verbal statement	.18	.24	.16	.12
Negative verbal statement	.21	.16	.09	.23
Teasing	.34*	.24	-.03	.19
Participation with infant	.03	.03	-.17	-.15
Responsiveness (nonverbal)	-.04	.08	.16	.12
Responsiveness (verbal)	.03	.12	.34*	.26
Emotional attunement	.05	-.00	.32	.23
Flexibility	-.18	-.02	-.00	-.06
Intrusiveness	.22	.20	.18	.29
Structuring	-.08	-.05	.13	.05
Achievement orientation	-.24	-.15	.24	.17
Toy play	-.01	-.10	.02	-.10
Amount of language	-.06	.01	.08	.08
Quality of language	-.18	-.05	.20	.16

* $p < .05$, two-tailed.

During teaching-task situation, different parent behaviors were correlated with infants' language development measures. Table 7 indicates that mothers' participation with infant during teaching-task was correlated with infants' language production at 12 months, $r(34) = .37, p < .05$. Also, mothers' structuring was positively correlated with language comprehension at 12 months, $r(34) = .38, p < .05$, and language production at 12 months, $r(34) = .42, p < .05$. Mothers' achievement orientation was correlated with language production at 12 months, $r(34) = .34, p < .05$. Additionally, mothers' toy play during teaching-task situation was positively correlated with infants' language production at 12 months, $r(34) = .41, p < .05$.

Table 7. *Correlation between Mothers' Behaviors during Teaching-task Situation and Language Measures*

	COM_9M	PRO_9M	COM_12M	PRO_12M
Positive affect	.10	-.01	.17	.31
Negative affect	.05	-.14	.04	.02
Positive touch	.01	.28	.07	.14
Negative touch	.14	-.02	-.02	-.04
Positive verbal statement	.04	.14	.19	.19
Negative verbal statement	.12	.00	.18	.14
Teasing	.14	.01	.14	.16
Participation with infant	.12	.16	.28	.37*
Responsiveness (nonverbal)	.11	-.05	.17	.18
Responsiveness (verbal)	.25	.02	.08	-.02
Emotional attunement	.19	.02	.05	.20
Flexibility	.19	.01	.09	.18
Intrusiveness	.08	-.05	-.06	-.05
Structuring	-.09	.05	.38*	.42*
Achievement orientation	.01	.12	.31	.34*
Toy play	.07	.10	.28	.41*
Amount of language	.26	.10	.17	.21
Quality of language	.20	.02	.04	.10

* $p < .05$, two-tailed.

Fathers' behaviors during teaching-task situation showed different relationship with infants' language measures. Similar to mothers' negative affect, all participating fathers did not displayed negative touch during teaching-task situation. Therefore, the variable was excluded from the analysis. As Table 8 presents, fathers' teasing during teaching-task situation was positively correlated with infants' language comprehension at 12 months, $r(34) = .40, p < .05$. Fathers' emotional attunement was correlated with language comprehension at 9 months, $r(34) = .42, p < .05$. Furthermore, fathers' achievement orientation during teaching-task situation was positively correlated with infants' language production at 12 months, $r(34) = .42, p < .05$.

Table 8. *Correlation between Fathers' Behaviors during Teaching-task Situation and Language Measures*

	COM_9M	PRO_9M	COM_12M	PRO_12M
Positive affect	.08	.19	.20	.26
Negative affect	.27	.03	.23	.24
Positive touch	-.13	-.25	-.22	-.09
Positive verbal statement	.02	.18	.04	.09
Negative verbal statement	.19	.02	.04	.06
Teasing	.04	.06	.40*	.33
Participation with infant	-.21	-.10	.16	.27
Responsiveness (nonverbal)	.30	.25	-.00	-.02
Responsiveness (verbal)	.30	.24	.17	.22
Emotional attunement	.42*	.31	.11	.14
Flexibility	.18	.09	.00	.09
Intrusiveness	.07	.05	.12	.11
Structuring	.03	.08	-.07	.05
Achievement orientation	.09	.25	.29	.42*
Toy play	.14	.26	.06	.26
Amount of language	-.04	.00	.02	.08
Quality of language	-.03	.11	-.05	.03

* $p < .05$, two-tailed.

Predictive Relationship between Parents' Behaviors and Infants' Language Measures

Lastly, hierarchical multiple regression analysis was conducted to examine mothers' and fathers' unique and longitudinal contribution to infant language abilities at 12 months. Because parents' behavioral variables in free-play and teaching-task situations were differently correlated with infants' language comprehension and production, four different regression analyses were performed: (1) mothers' and fathers' behaviors in free-play situation predicting language comprehension at 12 months, (2) mothers' and fathers' behaviors in free-play situation predicting language production at 12 months, (3) mothers' and fathers' behaviors in teaching-task situation predicting language comprehension at 12 months, and (4) mothers' and fathers' behaviors in teaching-task situation predicting language production at 12 months.

To examine whether parents' behaviors in free-play situation would longitudinally predict infants' language comprehension, language comprehension at 12 months was entered as the dependent variable. In Step 1 of the equation, mothers' correlated behavioral variables were entered. After putting mothers' positive affect, negative verbal statement, and responsiveness to infants' verbal cues in Step 1, fathers' correlated behavioral variable, responsiveness, was entered in Step 2. As Table 9 indicates, mothers' behaviors during free-play

interaction significantly predicted infants' language comprehension at 12 months by 34%, $F(3, 32) = 5.37, p < .01$. When each maternal behaviors were closely assessed, mothers' negative verbal statement was the only significant predictor, $\beta = .38, p < .05$. When fathers' responsiveness was entered, the model remained significant predicting infants' language comprehension at 12 months by 38%, $F(4, 31) = 4.68, p < .01$. However, only mothers' negative verbal statement continuously remained as a significant predictor, $\beta = .36, p < .05$.

Table 9. *Hierarchical Multiple Regression for Mothers' and Fathers' Behaviors in Free-play Situation Predicting Comprehension at 12 Months*

Variable	B	SE	β	F	R ²	ΔR^2
Step 1				5.37	.34^{**}	
Mother positive affect	10.14	9.26	.19			
Mother negative verbal statement	57.60	21.93	.38[*]			
Mother responsiveness to verbal cues	16.89	10.91	.27			
Step 2				4.68	.38^{**}	.04
Mother positive affect	7.49	9.30	.14			
Mother negative verbal statement	54.91	21.66	.36[*]			
Mother responsiveness to verbal cues	16.02	10.75	.25			
Father responsiveness to verbal cues	7.09	4.94	.21			

* $p < .05$, two-tailed, ** $p < .01$, two-tailed.

For infant language production at 12 months, only mothers' positive affect, negative verbal statement, responsiveness, toy play, and amount of language were entered together. As shown in Table 10, the model significantly accounted for 38% of variance in language production at 12 months, $F(5, 30) = 3.73$, $p < .01$. Specifically, mothers' negative verbal statement was the only predictor, but the effect was marginally significant, $\beta = .29$, $p = .06$.

Table 10. *Multiple Regression for Mothers' Behaviors in Free-play Situation Predicting Production at 12 Months*

Variable	B	SE	β	F	R^2
Mother behaviors				3.73	.38**
Mother positive affect	2.35	1.47	.30		
Mother negative verbal statement	6.49	3.29	.29[†]		
Mother responsiveness to verbal cues	1.20	1.63	.13		
Mother toy play	.64	1.71	.06		
Mother amount of language	2.13	2.04	.16		

[†] $p < .07$, * $p < .05$, two-tailed, ** $p < .01$, two-tailed.

Furthermore, hierarchical multiple regression was conducted to examine whether mothers' and fathers' behaviors during teaching-task situation would uniquely contribute to infants' language comprehension at 12 months. In Step 1, mothers' structuring was entered, and it accounted for 15% of the variance in infants' language comprehension at 12 months, $F(1, 34) = 5.89$, $p < .05$. In Step 2, fathers' teasing was entered into the model. Results indicated that the model predicted infants' language comprehension at 12 months by 25%, $F(2, 33) = 6.81$, $p < .01$. More specifically, as it is presented in Table 11, both mothers' structuring, $\beta = .37$, $p < .05$, and fathers' teasing, $\beta = .38$, $p < .05$, during teaching-task situation were significant predictors of language comprehension.

Table 11. *Hierarchical Multiple Regression for Mothers' and Fathers' Behaviors in Teaching-task Situation Predicting Comprehension at 12 Months*

Variable	B	SE	β	F	R^2	ΔR^2
Step 1				5.89	.15*	
Mother structuring	30.72	12.66	.38*			
Step 2				6.81	.25**	.14
Mother structuring	29.44	11.72	.37*			
Father teasing	65.45	24.23	.38*			

* $p < .05$, two-tailed, ** $p < .01$, two-tailed.

For language production at 12 months, mothers' participation, structuring, achievement orientation during teaching-task situation were entered in Step 1. However, the model did not predict the language measure. When fathers' achievement orientation during teaching-task situation was entered in Step 2, the model accounted for 28% of variance in language production at 12 months, $F(4, 31) = 3.02, p < .05$. Even after controlling mothers' behavioral variables, fathers' achievement orientation was the only, but marginal, predictor of the model, $\beta = .37, p = .07$ (see Table 12).

Table 12. *Hierarchical Multiple Regression for Mothers' and Fathers' Behaviors in Teaching-task Situation Predicting Production at 12 Months*

Variable	B	SE	β	F	R^2	ΔR^2
Step 1				2.63	.20	
Mother participation	2.90	3.11	.19			
Mother structuring	4.34	3.49	.37			
Mother achievement orientation	-.87	3.03	-.09			
Step 2				3.02	.28*	.08
Mother participation	.79	3.19	.05			
Mother structuring	6.00	3.47	.51			
Mother achievement orientation	-3.22	3.17	-.32			
Father achievement orientation	4.16	2.20	.37†			

† $p < .07$, * $p < .05$, two-tailed, ** $p < .01$, two-tailed.

Discussion

The purpose of the current study was to examine the differences between mothers' and fathers' interaction behaviors during free-play and teaching-task situation. Furthermore, the present study examined whether mothers and fathers would contribute to infants' early language achievement, specifically comprehension and production, in different ways. Because most of the studies examined mothers' behaviors and their effect during free-play situation, the current study observed both mother- and father-infant interactions during free-play and teaching-task situations.

As expected, the results indicated that mothers and fathers indeed interacted differently with their 9-month-old infants. Specifically, mothers were caring and sensitive, while fathers were playful and cognitively stimulating. However, parents' behaviors were influenced not only by parent gender, but also type of situation and even infant gender. Furthermore, each parent's had unique relationship with infants' language comprehension and production at 9 and 12 months. Moreover, mothers' and fathers' behaviors during free-play and teaching-task situations had longitudinal influence on infants' early language abilities.

Parents' Behaviors: Mother versus Father, Free-play versus Teaching-task Situation and Infant Gender

While interacting with their infants, mothers expressed more positive emotion, praised and encouraged infants with positive words, responded to infants' verbalization more contingently, matched their emotion to infants' emotion, and used various vocabularies and explained thoroughly than fathers. These results are consistent with previous studies explaining mothers are more caring, sensitive, and better at teaching infants through appropriate guidance than fathers (John et al., 2013; Volling et al., 2002).

However, parents' behaviors were even largely influenced by situation. Even though parents teased and touched infants more negatively during free-play, they did not display these behaviors with hostile or aggressive intention. Rather, by poking with dolls, throwing a ball, and physically stimulating infants, parents were being playful and expressed their intention to have fun. Furthermore, parents participated more actively, responded infants' verbalizations and exploratory behaviors more contingently, flexibly matched their behaviors to infants, structured the environment more appropriately, and intervened infants' play more abruptly during free-play situation. These results were consistent with previous findings (Kwon et al., 2013). Play situation indeed provides parent-infant dyad opportunities to share attention, emotion, and meanings more freely.

On the other hand, parents displayed more negative affect, touched infants more positively, praised and encouraged more, focused on the task and achievement, and used more various words and explained thoroughly during teaching-task situation. Although parents showed more frustration, they used praise and encouragement to motivate infants to stay on the given tasks, and physically guided infants to complete the tasks. Also, by focusing on achievement and using various vocabularies, parents stimulated and challenged infants' cognition. Though these results are not consistent with previous findings (Volling et al., 2002), it can be explained that parents' behaviors during teaching-task situation are still positive and effective to guide infants. Though parents can be less responsive to infants' verbalizations and behaviors in teaching-task situation, they can effectively aid infants' cognitive and linguistic growth by being strict and gentle at the same time.

Furthermore, fathers displayed positive and negative affect more during free-play situation, whereas mothers presented positive and negative affect more during teaching-task situation. Also, during free-play situation, fathers followed infants' lead and teased infants more than mothers, and these behaviors were more noticeable in mothers during teaching-task situation. Lastly, fathers talked more during teaching-task situation, whereas mothers were more talkative during free-play situation. According to John et al. (2013), playful and flexible

behaviors can be considered as distinctive fathers' behaviors, and guiding and teaching behaviors can be distinguished as mothers' behaviors. Consistent with the authors' claim, mothers and fathers in the present study showed unique behaviors during interactions, and these behavioral characteristics were prominent in different situations. Specifically, fathers' dynamic and playful behaviors were more noticeable during free-play where father-infant dyad could play and interact freely. On the other hand, mothers' guiding and didactic behaviors could be easily observed during teaching-task situation.

In addition to parent gender and situation type, infant gender was included to examine whether mothers and fathers would behave differently with their infant boys and girls. Interestingly, the results revealed that there were parent x infant gender interaction effects for several behaviors. Specifically, mothers showed negative affect, matched their emotion, flexibly followed, and played with toys more with their boys. Fathers displayed more negative affect, emotionally attuned, acted with flexibility, and played with toys more with their girls. Furthermore, there were parent x situation x infant gender interaction effects for negative affect and negative verbal statement. While interacting with boys, mothers showed negative emotion and criticized boys more than fathers during teaching-task situation. On the other hand, fathers displayed frustration and criticized more than mothers during free-play situation. While interacting

with girls, fathers showed more negative emotion than mothers in both free-play and teaching-task situation. Also, fathers criticized girls more than mothers during teaching-task situation. As Leaper (2005) noted, higher levels of mothers' involvement and sensitivity to their male infants can be explained as mothers' effort to control their sons. By attending to their sons more closely, mothers may make their sons to be emotionally and behaviorally controlled. Moreover, fathers' high involvement to their daughters was also observed in other previous studies (Brachfeld-Child et al., 1988; Chae & Lee, 2011). According to Chae and Lee (2011), due to decrease in family size in Korea, Korean parents have considered daughters just as importantly as sons in recent years. This social trend has led fathers to become more sensitive and involved in the relationship with their daughters. Therefore, this attitude can be seen from fathers' behaviors during the interactions. However, more studies about Korean father-daughter relationship are needed for deeper understanding.

Parents' Behaviors and Infants' Language Development

In free-play situation, mothers' positive affect, negative verbal statement, responsiveness to infants' verbal cues, emotional attunement, toy play and amount of language were correlated with infants' language comprehension and production at 9 and 12 months. As expected, mothers' responsiveness, didactic behaviors, and emotion were correlated with infants' early language abilities, and these results were also consistent with previous findings (Baumwell et al., 1997; Nicely et al., 1999; Rollins, 2003; Stevens et al., 1998). However, it was surprising that mothers' negative verbal statement was correlated with language comprehension and production at 12 months.

On the other hand, fathers' teasing and responsiveness in free-play situation were correlated with infants' language comprehension at 9 and 12 months. Although it was hypothesized that only fathers' playful behaviors would related with infants' language skills, fathers' responsiveness was also associated with language development in infancy. Based on the results, it can be assumed that fathers can influence infants' language skills as playmates as well as sensitive teachers.

Unlike the behaviors in free-play situation, mothers' behaviors in teaching-task situation were more correlated with infants' language abilities at 12 months. Specifically, mothers' structuring was correlated with both language

comprehension and production at 12 months, and participation, achievement orientation, and toy play were correlated with infants' language production at 12 months. These expected results were also consistent with previous findings (Conner et al., 1997). As sensitive teachers, mothers structured the environment, focused on the given tasks, and actively participated, and these didactic and guiding behaviors might help infants to acquire language more easily.

Moreover, fathers' behaviors in teaching-task situation were also positively correlated with infants' early language skills. Specifically, fathers' emotional attunement was correlated with language comprehension at 9 months, teasing was correlated with language comprehension at 12 months, and achievement orientation was correlated with language production at 12 months. In addition to achievement-oriented behaviors, fathers' emotional responsiveness and teasing influenced infants' early language skills. It was noteworthy that fathers' teasing continuously correlated with infants' language comprehension from 9 to 12 months.

Mothers' and Fathers' Unique and Longitudinal Contribution to Language Development

Constantly, among mothers' behavioral variables, negative verbal statement was the only significant predictor. This behavioral variable remained as the only significant predictor even after fathers' responsiveness was entered. This finding is surprising, and even seems counterintuitive. Previous studies have shown that negative parenting behaviors would prohibit language development in infancy (e.g., Tamis-LeMonda et al., 2004). However, caregiver's, especially mothers' negative verbalization can be benign, even beneficial to infants' early language abilities in East Asian culture. Including Korea, in East Asian countries, being a mother is considered to be "the most important social role" for women (Kim & Choi, 1994). Therefore, Korean mothers spend most of their time caring and interacting with their children (Yee, 2012), and try their best to nurture and educate their children (Chao, 1994; Cote, Kwak, Putnick, Chung, & Bornstein, 2015). They assume their children's appropriate behaviors and achievement depend on their parenting (Cote et al., 2015). Therefore, for the success of their children, mothers sometimes strictly discipline and control the children's behaviors (Chao, 1994). In other words, Korean mothers' disciplinary behaviors can be interpreted as their "concern, caring, and involvement" (Chao, 1994). When infants inappropriately played with toys or behaved uncontrollably,

to sustain infants' attention and interest, mothers in the present study criticized ("Don't do that," "That's not right") and lightly threatened their youngsters ("You don't want to play with me?" "Hey, stop!"). This maternal behavior can facilitate early language development in Korean culture. In fact, some studies (Chao, 2001; Leung, 1998) have found that Asian parents' disciplinary and authoritarian parenting behaviors were positively associated with adolescent's academic performance. This strict and disciplinary parenting behaviors can positively influence even infants' language development.

Fathers' teasing and task-oriented behavior were significant predictors of infants' language production at 12 months. In other words, fathers' contribution to infants' language skills is as powerful as mothers' influence. Even after controlling mothers' behavioral variables, fathers' teasing and task-oriented behaviors predicted infants' early language comprehension and production skills. According to the correlational and regression analyses, the positive relationship between fathers' teasing and infant language development was constantly found both in free-play and teaching-task situations. As Abkarian and his colleagues (2003) claimed, fathers' teasing and playful behaviors can facilitate young infants' cognitive and language growth. Furthermore, when this fathers' friendly and playful behavior is accompanied with task-oriented behavior, interaction with father may even strongly influence infants' early language comprehension

and production abilities.

Implications and Limitations

By examining mothers' and fathers' behaviors and their influence on infants' early language abilities in two different situations, the current study has several meaningful and practical implications. First, the study provided specific depiction of Korean fathers' interaction behaviors with their infants. Because the study about father-infant interaction is scarce especially in Korea (Kwon et al., 2015; Lee & Lee, 2010), the current study has meaningful value by revealing how Korean fathers interact with their infants, and influence infants' early language development. Therefore, educators and policy makers should emphasize the importance of fathers in infants' development, and establish appropriate and effective parenting education for fathers in Korea.

Also, the present study broadened the perspective on parent-infant interaction by using free-play and teaching-task situations. Researchers have claimed that there are only few studies examining mothers' and fathers' behaviors in different situations (e.g., Kwon et al., 2013). The findings of the current study indicated that the situation where caregiver-infant interaction is taken can largely influence mothers' and fathers' behaviors. This fact suggests future studies should focus on the types of situations when examining parent-infant interaction.

Furthermore, not only observing caregivers' behaviors in various

situations, the current study also examined the relationship between mothers' and fathers' behaviors and infants' early language abilities. The results revealed that both mothers and fathers are important contributors to infants' language development. Through mothers' sensitive, didactic, and negative verbal statement, and fathers' playful and task-oriented behaviors, infants learn words and become better communicators.

Nevertheless, the current study has several limitations. First, it is cautious to generalize the results because the sample size was small. However, even with small sample size, the current study was effective enough to support the findings from previous studies. Also, the observation was only taken at laboratory where parents and infants were not familiar and comfortable enough to freely interact. Because mothers and fathers may present different behaviors at home (Fagot, 1998), observation should be taken at home to strengthen ecological validity. Moreover, future studies should observe parent-infant interaction for long-term to examine consistency and stability of mothers' and fathers' behaviors. Furthermore, in addition to caregiver's behaviors, infants' behaviors should be included in future study. By observing behaviors from both sides, it will describe parent-infant interaction more specifically. Lastly, to examine whether the relationship between mothers' negative verbal statement and infant language development is culture-specific, cross-cultural study should

be conducted. Because Asian mothers are more strict, disciplinary, and controlling than the mothers from Western culture, caregiver-infant interaction itself and its influence on infant language achievement can be different. Therefore, cross-cultural study may provide much deeper understanding about caregiver-infant interaction and language development across cultures.

However, even with some limitations, the current study provided specific depiction of parent-infant interaction, and the relationship between mothers' and fathers' behaviors and infants' early language skills. These findings indeed provide valuable empirical insight to researchers, educators, and caregivers.

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국문초록

영아는 부모와 상호작용을 함으로써 발달하며 초기 언어 능력을 습득한다. 부모는 민감한 교사로, 친근한 놀이상대로, 혹은 도전적인 파트너로서 상호작용하며 영아의 언어발달을 돕는다. 영아 역시 적극적인 참여자로서 단어와 구절을 배우고, 이해하며, 표현한다. 이와 같이, 부모-영아 상호작용은 영아기 초기 언어 발달에 중요한 역할을 한다. 부모-영아 상호작용을 알아본 대부분의 연구는 어머니를 대상으로 자유놀이 상황에서 이루어졌으며, 이러한 선행연구 결과에 의하면 어머니의 반응성, 교훈적 행동, 그리고 정서가 영아의 언어 습득을 돕는다. 반면, 아버지-영아 상호작용에 대한 연구는 최근 들어서야 주목을 받기 시작했다. 또한, 연구자들은 자유놀이 상황이 전반적인 부모-영아 상호작용을 대표하는데에는 제한적이라고 주장해왔다.

이러한 필요성에 의해, 본 연구는 어머니- 그리고 아버지-영아 상호작용을 자유놀이와 구조화된 과제 상황에서 관찰하였다. 이를 통해 본 연구는 상호작용 동안 어머니와 아버지의 행동 차이를 알아보고, 어떠한 어머니, 아버지의 행동들이 영아의 초기 언어 이해와 산출 능력과 관계가 있는지 알아보고자 했다. 부모-영아 상호작용은 영아가 9 개월 때 관찰되었으며, 부모의 상호작용 행동은 Caregiver-Child Affect,

Responsiveness, and Engagement Scale (C-CARES)을 사용하여 코딩하였다. 또한, 영아의 초기 언어 이해와 산출 능력은 영아가 9, 12 개월 때에 MacArthur-Bates Communicative Inventory-Korean (M-B CDI-K)를 통해 측정되었다.

연구 결과, 영아와의 상호작용 동안 어머니와 아버지는 서로 다른 행동 패턴을 보였다. 그리고 어머니와 아버지 모두 주어진 상황에 따라 다른 상호작용 행동을 보였다. 부모, 상황의 주효과를 넘어서, 부모, 상황, 그리고 영아의 성별의 상호작용 효과 역시 관찰되었다. 더 나아가, 어머니와 아버지의 서로 다른 행동들이 영아의 초기 언어 능력들과 상관을 보였다. 또한, 어머니의 규제적인 말과 아버지의 장난스러운 행동과 과제중심적인 행동이 지속적으로 영아의 초기 언어 이해와 산출을 예측하였다. 이러한 어머니의 행동은 문화 특징적인 행동 패턴으로 볼 수 있으며, 아버지의 행동은 영아의 언어발달에 기여하는 아버지만의 행동이라고 볼 수 있다.

주요어: 어머니-영아 상호작용, 아버지-영아 상호작용, 자유놀이 상황, 구조화된 과제 상황, 언어발달

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