



The Effect of the Home-Centered Mother-Infant Interaction Program on Infant Development Through Mutual Interaction And Mothers' Intuitive Behaviors *

Ayşegül Ulutaş¹, Ayşe Belgin Aksoy²

Abstract

The aim of this study is to examine the effect of The Home-centered Mother-Infant Interaction Program on infant development through the intuitive behaviors of mothers, along with mutual interaction between mother and infant. The study was conducted in the province of Malatya with 44 infants (22 in the control group and 22 in the experimental group) who were nine to twelve months old, and their mothers. The study data were collected using a general information form, susceptibility testing, mutuality testing, and the Denver Developmental Screening Test II. This is an empirical study which used the pretest-posttest permanence test control group model. The study data were analyzed using the Statistical Program for Social Sciences (SPSS) 22 package program. For data analysis, the study used descriptive statistics methods (mean, standard deviation, frequency, and rate). The study used the independent groups t test to compare the two groups' quantitative data with normal distributions, and the Mann-Whitney U test to compare their variables that did not have normal distributions. The study also used the dependent groups t test to make the in-group comparisons of the variables with normal distributions, and Wilcoxon signed rank test to make the in-group comparisons of the variables that did not have normal distribution. The study results indicated that there was a significant difference ($p < 0.05$) between the mothers' pretest and posttest mean intuition scores in the experimental and control groups, to the advantage of the experimental group. There was also a significant difference ($p < 0.05$) between the mothers' mean pretest and posttest mutuality scores in the experimental and control groups, to the advantage of the experimental group. Finally, there was a significant difference ($p < 0.05$) between the infants' pretest and posttest personal-social, fine motor, and gross motor mean scores in the experimental and control groups. However, there was no significant difference ($p > 0.05$) in language abilities between infants in the experimental and control groups.

Keywords

Infant development
Intuition
Mother-infant interaction
Mutuality

Article Info

Received: 11.12.2015
Accepted: 18.07.2016
Online Published: 04.09.2016

DOI: 10.15390/EB.2016.6180

* This paper was generated from the study of doctoral thesis titled "The Effect of the Home-Centered Mother-Infant Interaction Program on Infant Development Through Mutual Interaction And Mothers' Intuitive Behaviors".

¹ İnönü University, Faculty of Health Sciences, Department of Child Development, Turkey, aysegulum44@gmail.com

² Gazi University, Faculty of Education, Division of Preschool Education, Turkey, ayseaksoy@gazi.edu.tr

Introduction

Humans are individual and social beings, family is very important in a human's development as of the prenatal period. Throughout an infant's development, the mother, with whom the infant spends most of his or her time, plays a major role. The environment also plays a significant role. Humans are involved in social interaction as soon as they are born since infants need to be given their vital necessities in order to survive. Thus, the infant quickly begins interacting with his or her mother, the closest person, while these needs are met (Atay, 2011; Özer & Özer, 2012). The effect of parent-infant interaction on the mother's intuition, mutual interaction behaviors, and recognizing that training programs are important in supporting and improving mother-infant interaction show that it is necessary to analyze early social family interactions. For this reason, researchers (Barnett, Gustafsson, Deng, Mills-Koonce, & Cox, 2012; Behrens, Parker, & Haltigan, 2011; Feldman, 2010; Lowinger, 1999; Schoppe-Sullivan et al., 2006) stress that mother-infant interaction is an important field in the early mother-infant analysis.

During mother-infant interaction, it is important for the mother to be aware that all infant behavior is valuable. She should be intuitive to the behaviors and interpret them accurately to give correct responses to these behaviors. It is also important to explain the intuition of the mother to be able to express the mother-infant interaction in the early stages. The mother's intuition is an important element of the interaction patterns in the family. It is a concept used to describe the early phase of mother-infant interaction, and it is described as the ability to be a mother and give continuous and adequate responses to the infant's signals (Öztürk, 2011; Kempainen, 2007).

The mother's intuition is important in creating the affiliation, and it also plays an important role in the natural affiliation characteristic of the infant as well as the affiliation level of the parent that is responsive to the infant (Brenner & Slater, 2004). An intuitive parent will express interest in and awareness of the infant's signals. Parents give an emotional response to the needs of the infant.

If the mother meets the infant's needs in a timely, interested, and intuitive manner, this will become the basis for the mother's intuition and for mother-infant interaction. The infant's attention is directed to the environment by the intuition of the mother, and this improves his or her social awareness. For this reason, it is important to build an interaction based on love, interest, and intuition, and provide rich, stimulating opportunities right from birth (Gülay & Akman, 2009; Bohr & BinNoon, 2014). Bick and Dozier (2013) conducted an empirical study to examine the effect of commitment-based intervention that included activities based on intuition on supporting mothers' intuition towards their infants. They found progress in the intuition of the mothers in the experimental group and an increase in the social and emotional development of the infants. Kempainen, Kumpulainen, Raita-Hasu, Moilanen, and Ebeling (2006) examined the continuity of the intuition of the mothers of infants under two using free games and evaluated interactive play behavior. They found that highly controlling mothers with poor intuition predicted that the children would have weak cooperative skill.

During mother-infant interaction, the mother assessment of the infant's behaviors and her timely response are an expression of the mother's mutual interaction behavior. The mutual balance and interaction of the mother and the infant establishes and balances the mother-infant relationship. The mutuality of the mother is the other important element of the mother-infant interaction.

The mutuality of the mother (simultaneous behavior) is parents' following the behaviors of the infant and responding to these behaviors in a timely manner during their interaction with the infant (Bernard, Meade, & Dozier, 2013). There is a temporary balance between the behaviors of the mother and the infant during mutual interaction. Mutuality is developed in the early years of life, and it is the level of the balance similarity between the mother and the infant. Parents help their infants discover their abilities to behave properly in social situations and take clues from others (Gander & Gardiner, 2010). It is necessary for parents and infants to be in a state of mutual interaction and balance. Parents need help to be able to sense and meet the needs of their infants, and as infants continue to develop and their needs are satisfied, their wishes will gradually decrease (Osofsky & Connors, 1979 as cited in Koşaner, 1987).

Mutual interaction includes being face to face, making eye contact, having a common concentration, and responding to the opinions of the communication partner. It gives an opportunity to infants to learn how to use different types of words in different situations (Diken, 2012). Ayçiçeği (1993) conducted an empirical study to determine the effects of a mother training program and whether the mothers acquired a modern perspective in their interaction with their children. That study determined that the mothers in the study sample gave more importance to their infants' social development than their physical and mental development. Similarly, Feldman, Bamberger, and Kanat-Maymon (2013) studied the mutuality of infants and parents in infancy in terms of social sufficiency and conversational skills. They concluded that mutuality between the parents and infants helped the infants to build social partnerships and sincere relationships. When the infant and the mother show mutual and integrated affiliation behaviors, it helps them be harmonious in the interaction "dance" (the simultaneous harmony of the behaviors of the mother and the infant). Mothers wait for the infant to show signs of need, and when the signs appear, they respond. Infants reflect their needs by crying, laughing, or making other noises. When the mother looks at the infant, the infant responds to her. The mother joins this dance of mutual interaction thanks to her interactive skills. Mothers usually smile, stare, lift their eyebrows, widen their eyes, and use their voices in a different way. Mothers also try to imitate the tone of their infants and speak in a similar way (Bee & Boyd, 2009).

It is necessary for mothers to know the developmental characteristics of infants in order to initiate and maintain positive and healthy mother-infant interaction. It is a widely known fact that the toddler years, the first two years of a person's life, are a critical period for human development, and the supportive facilities an individual receives during these years are important in helping the individual to reach his or her full capacity (Avcı, 2003). Infancy is the period when dependence on adults is at its height. During this period, many psychological activities (e.g. language, symbolic thought, sensorimotor simultaneity, and social learning) are initiated (Santrock, 2015). A review of the studies conducted in Turkey and in the rest of the world (Alkan Ersoy, Kurtulmuş, & Çürük Tekin, 2014; Kılınç, 2011; Erdemir, 2009; Akgün, 2008; Temel & Aksoy, 2000; Ceber Bakkaloğlu & Sucuoğlu, 2000; Aksoy, 2011; Gartstein & Iverson, 2014; Murray & Egan, 2014; Feldman et al., 2013; Parfitt, Pike, & Ayers, 2013; Grimes, 2012; Barnett et al., 2012; Fulton, 2011; Feldman, 2010) found many studies on infant development and the interaction between mothers and infants. However, there were no studies that included mothers and 9-12 month old infants in the training program together and considered mothers' intuition, mutual interaction behavior and fostering of the infants' development, tested the effect of the training program and examined the permanency of its effects. The researcher found that mother-infant interaction and infant development have not been analyzed as comprehensively and commonly as desired. It is widely accepted that mothers' participation in training programs is necessary and important, especially to achieve predetermined targets in infancy. Mothers play an important role in preparing children for life, and they have been the topic of many studies, yet the studies have mainly focused on mother training programs. This shows the importance of mother-infant interaction programs to improve the interaction between mothers and infants. This study is important because it prepared the Home-centered Mother-Infant Interaction Program (HMIIP), which is designed to support mother-infant interaction and infant development and generates criteria for future studies. The study is also important because it demonstrates the effectiveness of HMIIP, can guide educators and researchers' future research on mothers and infant interaction in education environments and contributes to the literature.

Study Objective

The relationship between parents and infants determines how the infants will communicate with others later in their lives as well as their attitudes towards the people around them. Today, the role of the facilities provided to infants by their families and immediate environment during infancy, the most rapid developmental period, is becoming a more and more important topic. In Turkey, a developing country, it is important that the effectiveness of realistic and applicable mother support systems be determined and that these systems be put in practice. There are few studies in Turkey that examine the interaction between mothers and infants, infant development and the differences that effect

both of them. For this reason, this study aimed to examine the effect of HMIIP on mothers' intuition, mutual interaction behaviors and infant development.

Assumptions

- Sensitivity and Synchrony tests are assumed to measure mother-infant interaction.
- Denver Developmental Screening Test II is assumed to measure infant's development.

Limitations

- The study is limited with 9-12 month-old infants and their mothers in Malatya province.
- The study is limited with scores obtained from Sensitivity and Synchrony tests and Denver Developmental Screening Test II.
- The study is limited with mothers having the first infant.

Method

This section will explain the model, sample, data collection tools, data collection, and data analysis used in this study, which was conducted to analyze the effect of the Home-centered Mother-Infant Interaction Program on the intuition and mutual interaction behaviors of mothers, and on infant development.

Study Design

This is an empirical study which used the pretest-posttest permanence test control group design. The study used the observation technique to measure the intuition and mutual interaction behaviors of mothers, and it used the longitudinal model to analyze infant development. The longitudinal model monitors the same individuals for a certain period of time. Longitudinal studies focus on consecutive change patterns and individuals' consistency or inconsistency in a period of time (Bee & Boyd, 2009). In longitudinal studies, variables are monitored from a pre-determined starting point continuously or at certain intervals for same persons and units with the purpose of determining their development and change over time. In these studies, the units that are monitored are usually few, yet they are monitored comprehensively to derive broad information (Karasar, 1995).

Study Sample

To perform the experimental procedure, the study sample included nine-twelve-month-old infants and their mothers. Mothers and infants living in an area served by the three primary health care centers that best fit the research criteria were included in the study. The study criteria generated a pool of participants that included 114 mothers with similar histories. The mothers who volunteered were assigned without bias to the experimental and control groups. To eliminate factors that could negatively affect internal validity in the performance of the experimental procedure, the researchers selected mothers who had similar socioeconomic characteristics, were housewives, had only one infant, and delivered their infants after a normal period of pregnancy. The criterion for including infants in the study sample was being classified as normal by the Denver Developmental Screening Test. This minimized possible errors in the unbiased assignment of the mothers to the experimental and control groups. Once participants were selected, 44 infants and mothers were randomly assigned (22 infants and mothers to the experimental group and 22 infants and mothers to the control group) to create the study group. Table 1 shows the demographic distribution of the mothers and infants in the study group.

Table 1. The Distribution of The Experimental and Control Groups Based on Demographic Characteristics

		Total (n=44) n (%)	Experimental (n=22) n (%)	Control (n=22) n (%)
Mother's Age	22-27	13 (29.5)	7 (31.8)	6 (27.3)
	28-33	17 (38.7)	8 (36.4)	9 (40.9)
	34-39	14 (31.8)	7 (31.8)	7 (31.8)
Education Level of the Mother	Literate (Did not finish compulsory education)	11 (25)	5 (22.9)	6 (27.3)
	Primary School	8 (18.5)	2 (9.09)	6 (27.3)
	High School	12 (27.2)	7 (31.8)	5 (22.7)
	Associate Degree	8 (18.2)	6 (27.3)	2 (9.09)
	Undergraduate Degree	5 (11.1)	2 (9.09)	3 (13.7)
Length of Marriage	1-5 years	26 (59.1)	12 (54.5)	14(63.6)
	6 years or more	18 (40.9)	10 (45.5)	8 (36.4)
Length of Pregnancy	37 Weeks	9 (20.5)	5 (22.7)	4 (18.2)
	38 Weeks	10 (22.7)	4 (18.2)	6 (27.3)
	39 Weeks	25 (56.8)	13 (59.1)	12(54.5)
Age During Pregnancy	18-25	15 (34.1)	7 (31.8)	8 (36.4)
	26-35	29 (65.9)	15 (68.2)	14(63.6)
Sex of the Infant	Female	23 (52.2)	12 (54.5)	11(50.0)
	Male	21 (47.7)	10 (45.5)	11(50.0)
Delivery Mode	Normal Delivery	19 (43.2)	9 (40.9)	10(45.5)
	Cesarean Delivery	25 (56.8)	13 (59.1)	12(54.5)

An analysis of Table 1 shows that 38.7% (n=17) of the participating mothers were between the ages 28 and 33. Of the mothers, 27.2% (n=12) were high school graduates, 59.1% (n=26) had been married for between 1 and 5 years, 56.8% (n=25) were pregnant for 39 weeks, and 65.9% (n=29) were between 26 and 35 years old. Of the participating infants, 52.2% (n=23) were females, 47.7% (n=21) were males, and 56.8% (n=25) were delivered by cesarean.

Data Collection Tools

The study data were collected using a general information form along with Subtest of Sensitivity and Subtest of Synchrony of Temperament Assessment Battery. All subscales of Temperament Assessment Battery can be used individually. Two sub-dimensions of the battery were used to assess the mother-infant interaction since mothers' intuition and mutuality are considered as elements of mother-infant interaction in the relevant literature.

General Information Form

The general information form included questions to determine the mother's age, educational level, length of marriage, length of pregnancy, age at the time of pregnancy, infant's age (number of months), infant's gender, and the method of delivery.

Temperament Assessment Battery: Sensitivity and Synchrony Subtests

The Temperament Assessment Battery was created by Gonzalez, Gartstein, Carranza and Rothbart in 2001. It includes six subtests: Sensitivity (10 items), Mutuality (3 items), Pace (3 items), Intensiveness (3 items), Emotional Harmony (3 items), and Direction of the Infant by the Parents (3 items).

Sensitivity Test; The test was created by Gonzalez, Gartstein, Carranza and Rothbart (2001). The test validity and reliability analyses were conducted by Ulutaş and Aksoy (2015). For the reliability analysis, the Cronbach's alpha coefficient was determined by evaluating the independent analysis results of the two observers and using the "harmony between observers" method. The Cronbach's alpha coefficient for the sensitivity subtest was found to be 0.66. Content and structure validity methods were used to perform the validity analysis. The Pearson correlation coefficient of the Sensitivity Test was found to be 0.94. The sensitivity subtest was created with the purpose of examining the intuitive behaviors of mothers during their interaction with their six-, nine-, and 12-month-old infants. The sensitivity test was an eight-point Likert-type test which included ten items. The higher total scores on the test indicated that mothers had higher sensitivity levels. The test scores were calculated by adding the item scores obtained by mothers. The maximum possible score on the scale was $10 \times 8 = 80$, and the minimum possible score was $10 \times 1 = 10$.

Mutuality Test: The test was created by Gonzalez, Gartstein, Carranza and Rothbart (2001). The validity and reliability analyses of the test were conducted by Ulutaş and Aksoy (2015). For the reliability analysis of the Mutuality Test, the Cronbach's alpha coefficient was determined to be 0.60 based on the independent results of two observers using the "harmony between observers" method. The study used the content and structure validity methods to do the validity analysis. The Pearson correlation coefficient of the Mutuality Test was found to be 0.86. The Mutuality Test was created to examine mothers' mutual interaction behaviors. The Mutuality Test is a seven-point Likert type test, and it includes three items. The higher total scores on the test indicate a higher mutuality in the mother. The test score is calculated by adding the item scores obtained by the mothers. The maximum possible score on the test is $3 \times 7 = 21$, and the minimum possible score is $3 \times 1 = 3$.

Denver Developmental Screening Test II; This is a more detailed practical version of the Denver Developmental Screening Test, which was previously standardized and adapted to the Turkish society. The Denver Developmental Screening Test (DDST) was first published by Frankenburg and Dodds in 1967 with the purpose of helping health professionals to diagnose childhood developmental issues. Frankenburg and Dodds reviewed the experiences recorded by the wide use of the DDST in 1990 and created Denver II. It was reviewed and standardized by Yalaz, Anlar, and Bayoğlu in 2009, and it was then offered for national use and tester training (Yalaz, Anlar, & Bayoğlu, 2009). The test evaluates the current development and skills of infants and children under 6 years age based on information obtained from mothers, fathers or baby-sitters who monitor their development closely and know them well. This test includes 116 items in four sections: fine motor, gross motor, personal-social, and language development in infants. The age scales at the top and bottom of the test form represent the six years in months and years. During the test, mothers and infants are evaluated together. The test reveals the development areas that the child needs support, and the expert who prepared the test may make some suggestions. Researchers ask mothers the birth date of children and draw the age line before starting the test. In each sector, three items to the left of the age line in addition to all items that the age line passes are administered to the participants. The results of the DDST II development test are classified as normal, abnormal and suspicious. In DDST II, the subjects "passed" when they could follow the instructions given to them, and they "failed" when they could not. The test was ceased when either the infant or the mother "failed" for the items suitable to the infant's age. If there are no delay elements (K items to the left of the age line) on the entire test, and there is maximum of one caution item (a K item between the 75-90% interval of the age item), the child is evaluated as normal and in the next checkup, the child can be retested.

The Development of the Home-centered Mother-Infant Interaction Program

The Home-centered Mother-Infant Interaction Program was prepared by the researcher in a few stages with the aim of supporting mothers' intuition, mutual interaction behavior and infant development. Parent training programs are intended to improve coordinately the knowledge, attitudes and skills needed for child rearing by parents, mother-father-child relations, and determination of responsibilities required to be fulfilled by parents. Primary goal of parent training programs is to

strengthen especially self-confidence of mothers and guide in such a way to improve the mothering skills for multi-dimensional development of child. Some of current programs aim to serve for children and their immediate environments, while others aim to serve for both children and their parents (Sanders, Turner, & Markie-Dadds, 2002). The HMIIP serves both mothers and infants. The researcher conducted research to identify the needs and create its content. This content was conveyed to each mother and infant in the experimental group using the same methods and techniques. The duration of the program is three months, and it was prepared based on Bronfenbrenner's Ecological Systems Theory after a review of the literature on mother-infant interaction and infant development. The fundamental philosophy of the program is the ecological systems approach, which led to the inclusion of families in early support programs. The program includes activities to support mother-infant interaction and infant development. The researcher consulted the opinions of seven experts to develop the program. The experts were asked to provide their opinions about the appropriateness of the mother and infant activities for the objectives, the sufficiency of session content for the study's subject and to describe the clarity and understandability of the directions as suitable, partially suitable or unsuitable and give their views in the Explanations section. The program was revised according to the experts' opinions, the study materials were prepared, and the HMIIP was finalized for implementation. Indications regarding infants in EMABEP were prepared based on education program (MEB, 2013) for 0-36 month-old children. Program was introduced by meeting with mothers in the first session of education program which consisted of totally 12 sessions. In the final session, the mothers were recommended about what they can do for development of infant. Mother sensitivity, mother synchrony, and game activities regarding infant's cognitive, language, social, emotional, fine motor and gross motor development were included in other sessions.

Data Collection

The participant who experimental group mothers were informed about the training program content during visits to their homes. During implementation, the researcher visited participants' homes each week, explained the plays to be played that week to the mother, acted as a model to demonstrate behavior, and gave a chance for implementation. The Home-centered Infant-Mother Interaction Program was carried out over the course of three months (12 weeks) using weekly home-centered practices that each took 45 minutes. The relevant tests were administered to the participating mothers and infants, and the study data were collected by administering pretests and posttests to both the experimental and control groups. Three weeks after the administration of the posttest, the mothers and infants in the experimental group took the permanence test to determine whether or not the training was permanent.

Data Analysis

The SPSS 22 package program was used to analyze the collected data. When suitable statistical analysis is used to evaluate the study data, this increases the reliability of the study and helps the results to be interpreted in a consistent way (Çepni, 2007). Researchers need to test whether the study results have a normal distribution to derive the statistical results. In normality tests, researchers may use perpendicularity, curvature D' Agostino-Pearson, Anderson-Darling, chi square, Lilliefors, Kolmogorov-Smirnov, Jargue-Bera and Shapiro-Wilk tests. The Shapiro-Wilk test is stronger than the others. When normal and abnormal distributions are considered together, this test yields the best results and is recommended when the sample size fits the $7 < n \leq 2000$ criterion (Büyüköztürk, 2011; Şencan, 2005). The fitness of the quantitative data for normal distribution was tested using the Shapiro-Wilk test. The study data were analyzed using descriptive statistics: means, standard deviations, frequencies and ratios. The two groups' quantitative data with normal distributions were compared using the independent groups t test. The groups' variables that did not have normal distributions were compared using the Mann-Whitney U test. The in-group comparisons of the variables with normal distribution were conducted using Dependent Groups t Test. The in-group comparisons of the variables that did not have a normal distribution was conducted using the Wilcoxon signed rank test.

Findings and Interpretation

This section will present the study findings in tables and discuss these findings.

Table 2. A Comparison of The Experimental and Control Groups' Pretest and Posttest Scores on The Intuition and Mutuality Test

		Experimental	Control	Test	<i>p</i>
		Mean±SD	Mean±SD	Value	
Intuition Test	Pretest	41.86±2.12	40.74±2.02	<i>t</i> : 0.001	1.000
	Posttest	56.36±4.46	45.23±3.53	<i>t</i> :8.361	0.001
	Accomplishment Score	14.50±4.39	4.36±4.28	<i>Z</i> :-5.078	0.001
Mutuality Test	Pretest	11.23±1.27	13.77±1.63	<i>Z</i> :-4.667	0.001
	Posttest	15.18±1.87	13.36±1.99	<i>t</i> : 3.125	0.003
	Accomplishment Score	3.95±1.62	0.41±2.46	<i>Z</i> :-5.095	0.001

An analysis of Table 2 shows that there was no statistically significant difference between the intuitive behavior pretest mean scores of the experimental and control groups ($p=1.000$; $p>0.05$). Based on these results, it was concluded that the mothers in the experimental and control groups had similar intuitive behaviors before the implementation of the training program, and the groups were homogeneous.

However, the experimental group's intuitive behavior posttest mean score was significantly statistically higher than that of the control group ($p=0.001$; $p<0.01$). There was a significant difference between the intuition pretest measurements and posttest measurements ($p=0.001$; $p<0.01$). The change in the experimental group was significantly greater than the change in the control group.

There was a statistically significant difference ($p<0.05$) between the intuition behavior pretest and posttest mean scores of the mothers in the experimental and control groups. The researcher did not intervene in this situation since the groups were selected randomly. The posttest mean score of the mothers in the experimental group on the mutual interaction behavior test was significantly higher than that of the mothers in the control group ($p=0.003$; $p<0.01$). The pretest mean score of the control group was higher than that of the experimental group. However, the posttest mean score of the experimental group was higher than that of the control group after the groups were given the training program. This is an important indicator of the effectiveness of the test. It was found that the difference between the pretest and posttest mean scores of the experimental and control groups was statistically significant to the advantage of the experimental group. This result indicates that the Home-centered Mother-Infant Interaction Program increased mothers' intuitive behaviors. The increase in the experimental mothers' intuitive behaviors were indicated by the mothers better realizing that the infant's every behavior was important, improving at quickly noticing and correctly interpreting the infant's interactive signs, making eye contact with, their infants during play, approving of the infants' behaviors, listening to the infant, and reacting to the infants' sounds. A number of studies conducted in foreign countries (Bigelow et al., 2010; Kivijarvi, Raiha, Kaljonen, Tamminen, & Piha, 2005; Jean, 2009; Bohr & BinNoon, 2014; Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2005) proved that the interaction between mother and infant increased mothers' the sensitive behaviors.

An analysis of Table 2 indicates that there was a significant difference ($p=0.001$; $p<0.01$) between the mutual interaction pretest and posttest scores of the two groups. It was statistically significant ($p=0.003$; $p<0.01$) that the mutual interaction behavior posttest mean score of the mothers in the experimental group was higher than that of the mothers in the control group. There was also a significant difference ($p=0.001$; $p<0.01$) between the changes in the mutuality test pretest and posttest measurements. The change in the experimental group was significantly greater than the change in the control group. The increase in the interactive behaviors of the mothers in the experimental group was indicated by mothers touching and smiling at the infants during the program's interactive play, making

eye contact with the infant, singing to the infant, tapping out (harmony of the behaviors), and responding to the infant's sounds adequately and quickly. Relevant studies found that interactive behaviors that provide mutual joy or satisfaction to the mother and the infant increased mothers' mutual interaction behaviors (Symons & Moran, 1987; Ferber, Feldman, & Makhoul, 2008).

Table 3. A Comparison of Intuition and Mutuality Pretest and Posttest Scores in The Experimental Group

		Experimental	<i>Test Value</i>	<i>p</i>
		Mean±SD		
Intuition Test	Posttest	56.36±4.46	Z:10.669	0.001
	Permanence	52.50±3.95		
Mutuality Test	Posttest	15.18±1.87	t:-3.897	0.001
	Permanence	13.77±1.63		

In the experimental group, it was statistically significant ($p=0.001$; $p<0.01$) that the permanence mean score for the intuition test decreased by 3.86 ± 1.70 compared to the posttest mean score. In the experimental group, it was also statistically significant ($p=0.001$; $p<0.01$) that the permanence mean score decreased by 1.41 ± 0.941 compared to the mutuality test posttest mean score. Based on the study results, it was concluded that the intuition and mutuality behaviors of the mothers in the experimental group, who participated in the Home-centered Mother-Infant Interaction Program, were not permanent because behaviors declined during the three weeks between the pretest and posttest. There are several possible reasons for the failure to maintain, including insufficient length of the training program, mothers not showing enough interest in the training program, mothers not interacting with their infants outside of the training program's daily routines, mothers failing to use the time they spend with their infants effectively in the absence of guidance from a trainer, mothers not enjoying interaction, and mothers being unable to transfer the knowledge and skills they learned during the training to their house environment.

Table 4. A Comparison of The Pretest and Posttest Scores For Personal-Social, Fine Motor, Gross Motor, and Language Sub-Dimensions of The DENVER II (DDST II) Developmental Screening Test

DENVER II		Experimental	Control	<i>Test Value</i>	<i>p</i>
		Mean±SD	Mean±SD		
Personal-Social	Pretest	5.32±0.65	4.86±0.89	Z:-.797	0.072
	Posttest	6.18±0.59	5.55±0.67	Z:-3.014	0.003
	Accomplishment Score	0.86±1.04	0.68±0.99	Z:-0.588	0.027
Fine Motor	Pretest	3.77±0.81	4.05±0.72	Z:-1.395	0.163
	Posttest	5.32±0.57	4.64±0.49	Z:-3.093	0.001
	Accomplishment Score	1.54±0.96	0.59±0.96	Z:-2.907	0.004
Language	Pretest	5.64±0.58	5.59±0.59	Z:-0.280	0.780
	Posttest	6.00±0.82	5.73±0.70	Z:-1.270	0.204
	Accomplishment Score	0.36±1.05	0.14±1.04	Z:-0.615	0.538
Gross Motor	Pretest	4.55±0.51	4.45±0.51	Z:-0.596	0.551
	Posttest	5.32±0.72	4.73±0.55	Z:-3.179	0.001
	Accomplishment Score	0.77±1.02	0.27±0.63	Z:-2.173	0.030

Comparing personal-social sub-dimension mean scores, there was an increase in the posttest mean score of the infants in the experimental group over the pretest mean; this increase was statistically significant ($p=0.002$; $p<0.01$). In the control group, the increase in the posttest mean score compared to the pretest mean score was also statistically significant ($p=0.007$; $p<0.01$). During the training program, a mother's verbal expressions during play help the infant to actively participate in the play, make impressions in the plays, act independently, repeat his or her favorite movements over and over again,

and express emotions using vocalization, gestures and mimicry. The mother's verbal expressions also help to regulate the infant's emotional and social development (Marchand, Hock, & Widaman, 2002; Driscoll & Easterbrooks, 2007; Bick & Dozier, 2013).

There was a significant difference in the mean personal-social sub-dimension posttest score of infants in the control group compared to the pretest mean score. The infants' social abilities developed over time as they began to notice humans and objects. They had daily life experiences, and there were differences in their mothers' attitudes. All of these points can be explained by the fact that mothers became aware of their infants' personal-social development due to the pretests and thus realized that their infants were also individuals.

Compared to the posttest mean score, there was a statistically significant increase in the fine motor sub-dimension pretest mean score of the infants in the experimental group ($p=0.001$; $p<0.01$). In the control group, the increase was also statistically significant compared to the initial measurement ($p=0.016$; $p<0.05$). However, the change measured in the experimental group was significantly greater than the change measured in the control group. The significant increase in the experimental group's fine motor skills might have resulted from the plays in the Home-centered Mother-Infant Interaction Program that used hands and feet, required coordination of different parts of the body, and taught object control skills, all of which affect fine motor development.

Erdemir (2009) conducted a study to examine the effect of the early support training program on the development of children aged 18 to 36 months. The study found that the increase in fine motor skills in children aged 18 to 24 months was statistically significant, to the advantage of the control group. The significant difference in the control group might have resulted from the fact that infants thought their mothers' daily routines and practices to meet the infants' varying needs were all a play to imitate. Infants who learn to use their small muscle skills can repeat the model movements they see at home and outside.

In the experimental group, the change in the language sub-dimension score of the DENVER II developmental screening test was statistically insignificant ($p=0.123$; $p>0.05$) when comparing the mean pretest score to the mean posttest score. Likewise, the change in the control group's pretest mean score was statistically insignificant compared to the posttest mean score ($p=0.572$; $p>0.05$). This result was inconsistent with studies asserting that interactive behaviors between mother and the infant have a positive effect on the infant's language development (Magagna, 2013; Gros-Louis, West, & King, 2014). However, the result is consistent with other studies that have found that interactive behaviors between mother and infant are not influential in enhancing the infant's language development (Capirci, Caselli, Iverson, Pizzuto, & Volterra, 2002).

In this study, the Home-centered Mother-Infant Interaction Program did not have an effect on enhancing the infants' language development. This can be explained by the scope and the quality of the program. The program activities were structured to be performed at home for 45 minutes per week. The only content of the play activities were sessions focused on strategies to support the development of 9-12 month old infants as well as the intuition and mutual interaction behaviors of mothers who looked after the infants and were close to them. This may be the reason why the program did not enhance infants' language development.

There was a significant difference ($p=0.030$; $p<0.05$) between the two groups regarding changes in the DENVER II gross motor sub-dimension pretest mean scores compared to the posttest mean scores. The change in the experimental group is significantly greater than the change in the control group. The significant gross motor difference in the experimental group, which was to the advantage of the experimental group, might have resulted from the plays in the Home-centered Mother-Infant Interaction Program, including play activities designed to improve the skills of turning the body in the direction from which a sound comes, holding objects to get into a standing position, crawling, arranging objects, walking with and without support, returning to a sitting position after standing, standing from the crouching position, walking without assistance, and using arms to make specific movements that

require some power (Büyüktaşkapı, 2012). Artan, Öncü, and Oklan Elibol (2003) state that infants who are introduced to stimulants at an early phase can easily improve their gross motor skills, and the most important factor affecting infants' gross motor development is the infant's home environment the people around him or her. This study concluded that a suitable environment, including rich stimulants created by mothers during the training program, supported the infants' motor development.

Table 5. A Comparison of The Posttest and Permanence Scores of The DENVER II Sub-Dimension Developmental Screening Test in The Experimental Group

DENVER II		Mean±SD	Test Value	p
Personal - Social	Posttest	6.18±0.59	t: -3.207	0.001
	Permanence	5.64±0.66		
Fine Motor	Posttest	5.32±0.57	t:-2.919	0.004
	Permanence	4.73±0.83		
Language	Posttest	6.00±0.82	t: -3.217	0.001
	Permanence	5.32±0.72		
Gross Motor	Posttest	5.32±0.72	t:-0.632	0.527
	Permanence	5.41±0.85		

In the experimental group, the decrease in the mean DENVER II Developmental Screening permanence test scores when compared to the posttest mean scores was statistically significant ($p=0.001$; $p<0.01$). In the experimental group, the decrease in the permanence test mean score compared to the posttest mean score regarding the personal-social, fine motor and language sub-dimension mean scores in the DENVER II developmental screening test was statistically significant ($p<0.01$). In the experimental group, the change in the permanence test mean score compared to the posttest mean score regarding the gross motor sub-dimension mean score in the DENVER II developmental screening test was not statistically significant ($p=0.527$; $p>0.05$). According to the study findings, the results of the Home-centered Mother-Infant Interaction Program were not permanent during the three-week period between the pretest and the posttest regarding the DENVER II Developmental Screening Test total mean score and the mean scores in the personal-social, fine motor and language sub-dimensions. However, the gross motor skill sub-dimension was permanent during the three week period between the posttest and the permanence test.

This finding regarding the impermanence of personal-social, fine motor, and language sub-dimensions can be explained using information about child development and education not being put into practice, mothers not playing with infants in the absence of the trainer since they felt unable to complete the activities on their own, mothers not believing in their natural parenting talents (Coleman, 1998), insufficient stimulants given to the infant, and insufficient duration of caring for the infant.

The permanence of the gross motor skills sub-dimension as measured by the DENVER II Developmental Screening Test can be explained by mothers implementing the information and skills they obtained from the training program regarding gross motor skills, being well-informed about gross motor development, offering their infants different opportunities to develop based on the information about child development and education they received in the training program (Alkan Ersoy et al., 2014), and evaluating the training program as beneficial and using this evaluation on the plays of their infants.

Conclusion and Suggestions

The aim of this study was to examine the effect of the Home-Centered Mother-Infant Interaction Program on the mothers' intuition and mutual interaction behaviors and on the infants' development. The study results revealed that the Home-centered Mother-Infant Interaction Program influenced mothers' intuition and mutual interaction behaviors and also influenced the infants' personal-social, fine motor, and gross motor development. However, the program did not increase infants' language

development. For the mothers in the experimental group, the results of the Home-centered Mother-Infant Interaction Program were not permanent during the three-week period between the posttest and permanence test regarding intuition and mutual interaction behaviors. For infants in the experimental group, the DENVER II developmental screening test revealed permanent results in the personal-social, fine motor, and language sub-dimensions, whereas the results were impermanent in the gross motor sub-dimension.

Based on the study findings, it is suggested that nurses, midwives, and child development specialists in health organizations make home visits to mothers and provide them counseling on the importance of the intuition associated with being a mother and on the importance of mutual interaction at an early phase of infant development. They may also distribute pamphlets and brochures that discuss these issues.

This was an empirical study. The results also suggests that qualitative studies should be added to future studies on the effect the Home-Centered Mother-Infant Interaction Program has on mothers' intuition and mutual interaction behaviors, or on all studies regarding infant development. The researcher suggests that the authorities establish higher education institutions, local governments and training centers with the cooperation of media and voluntary organizations and provide consultancy about mother-infant interaction outside home visit hours to ensure that education about mother-infant interaction is as widely disseminated as it should be. Multi-purpose early response centers should also be established in localities where disadvantaged families reside, and educators should prepare and provide training programs for parents and children. Specialists should provide training to parents for longer periods and compare the effects of short-term and long-term training programs. EMABEP, which was prepared to support mother sensitivity and synchrony and infant's development may provide opportunity to educate students in this field by including in their undergraduate programs. In order for education program to achieve more efficient results, the number of people to be educated can be reduced via performing group activities, application time of education can be increased, and methods used in program implementation can be enriched.

References

- Akgün, E. (2008). *Anne çocuk ilişkisini oyunla geliştirme eğitiminin anne çocuk etkileşim düzeyine etkisi* (Doctoral dissertation). Ankara University, Institute of Educational Sciences, Ankara.
- Aksoy, A. B. (2011). The impact of play-based maternal support on infant development. *International Journal of Academic Research*, 3(3), 366-372.
- Alkan Ersoy, Ö., Kurtulmuş, Z., & Çürük Tekin, N. (2014). Aile çocuk eğitim programının annelerin çocuk yetiştirme tutumlarına ve ev ortamını düzenlemelerine etkisinin incelenmesi. *Kastamonu Eğitim Dergisi*, 22(3), 1077-1090.
- Artan, İ., Öncü, E. Ç., & Oklan Elibol, F. (2004). *Alt sosyoekonomik düzey annelerin ev ortamındaki materyalleri çocuklarının eğitiminde kullanım şekilleri*. In *OMEP Bildiri Kitabı* (pp. 83-87). İstanbul: YA-PA.
- Atay, M. (2011). *Erken çocukluk döneminde gelişim 2*. Ankara: Kök.
- Avcı, N. (2003). *Gelişimde 0-3 yaş: Yaşama merhaba*. Ankara: Morpa.
- Ayçiçeği, A. (1993). *The effect of the mother training program* (Master's thesis). Boğaziçi University, Graduate School of Health Sciences, İstanbul.
- Barnett, M. A., Gustafsson, H., Deng, M., Mills-Koonce, W. R., & Cox, M. (2012). Bidirectional associations among sensitive parenting, language development and social competence. *Infant and Child Development*, 21, 374-393.
- Bee, H., & Boyd, D. (2009). *Çocuk gelişim psikolojisi* (G. Okhan, Trans.). İstanbul: Kaknüs.
- Behrens, K. Y., Parker, A. C., & Haltigan, J. D. (2011). Maternal sensitivity assessed during the strange situation procedure predicts child's attachment quality and reunion behaviors. *Infant Behavior and Development*, 34, 378-381.
- Bernard, K., Meade, E. B., & Dozier, M. (2013). Parental synchrony and nurturance as targets in an attachment Building upon mary ainsworth's insights about motherinfant interaction. *Attachment and Human Development*, 15(5), 507-523.
- Bick, J., & Dozier, M. (2013). The Effectiveness of an attachment-based intervention in promoting foster mothers' sensitivity toward foster infants. *Infant Mental Health Journal*, 34(2), 95-103.
- Bigelow, A. E., MacLean, K., Proctor, J., Myatt, T., Gillis, R., & Power, M. (2010). Maternal sensitivity throughout infancy: Continuity and relation to attachment security. *Infant Behavior and Development*, 33, 50-60.
- Bohr, Y., & BinNoon, N. (2014). Enhancing sensitivity in adolescent mothers: Does a standardised, popular parenting intervention work with teens?. *Child Care in Practis*, 20(3), 286-300.
- Brenner, G., & Slater, A. (2004). *Theories of infant delopment*. USA: Blackwell.
- Büyüköztürk, Ş. (2011). *Sosyal bilimler için veri analizi el kitabı*. Ankara: Pegem Akademi.
- Büyüktaşkapu, S. (2012). Annelerin özyeterlik algıları ile 1-3 yaş arasındaki çocuklarının gelişimleri arasındaki ilişkinin incelenmesi. *Amasya Üniversitesi Eğitim Fakültesi Dergisi*, 1(1), 18-30.
- Capirci, O., Caselli, M. C., Iverson, J. M., Pizzuto, E., & Volterra, V. (2002). Gesture and the nature of language in infancy: The role of gesture as a transitional device enroute to two-word speech. In *The study of signed languages* (pp. 213-246). Washington DC: Gallaudet University.
- Ceber Bakkaloğlu, H., & Sucuoğlu, B. (2000). Normal ve zihinsel engelli bebeklerde anne bebek etkileşiminin karşılaştırmalı olarak incelenmesi. *Özel Eğitim Dergisi*, 2(4), 47-58.
- Coleman, P. K. (1998). *Maternal self efficacy beliefs as predictors of parenting competence and toddler's emotional, social and cognitive development* (Doctoral dissertation). Morgantown West Virginia University, West Virginia.
- Çepni, S. (2007). *Araştırma ve proje çalışmalarına giriş*. Trabzon: Celepler.
- Diken, İ. H. (2012). *Erken çocukluk döneminde dil becerilerini geliştirme*. Ankara: Maya Akademi.

- Driscoll, J. R., & Easterbrooks, M. A. (2007). Young mothers' play with their toddlers: Individual variability as a function of psychosocial factors. *Infant and Child Development*, 16, 649-670.
- Erdemir, S. (2009). *Erken destek eğitim programının 18-36 aylık çocukların gelişimine etkisinin incelenmesi* (Master's thesis). Marmara University, Institute of Educational Sciences, İstanbul.
- Feldman, R., Bamberger, E., & Kanat-Maymon, Y. (2013). Parent-specific reciprocity from infancy to adolescence shapes children's social competence and dialogical skills. *Attachment & Human Development*, 15(4), 407-423.
- Feldman, R. (2010). The relational basis of adolescent adjustment: Trajectories of mother-child interactive behaviors from infancy to adolescence shape adolescents' adaptation. *Attachment & Human Development*, 12, 173-192.
- Ferber, S. G., Feldman, R., & Makhoul, I. R. (2008). The development of maternal touch across the first year of life. *Early Human Development*, 84, 363-370.
- Fulton, J. M. (2011). *Dula supported childbirth: An exploration of maternal sensitivity, self efficacy, responsivity and parental attunement* (Doctoral dissertation). University of California, Davis.
- Gander, M. J., & Gardiner, H. W. (2010). *Çocuk ve ergen gelişimi* (B. Onur, Trans.). Ankara: İmge.
- Gartstein, M. A., & Iverson, S. (2014). Attachment security: The role of infant, maternal, and contextual factors. *International Journal of Psychology Therapy*, 14(2), 261-276.
- Grimes, L. (2012). The role of parental self-efficacy and parental knowledge in parent-infant interactions during the transition to parenthood (Doctoral dissertation). Bowling Green State University, USA.
- Gros-Louis, J., West, M. J., & King, A. P. (2014). Maternal responsiveness and the development of directed vocalizing in social interactions. *The Official Journal of the International Society on Infant Studies*, 19(4), 385-408.
- Gülây, H. ve Akman, B. (2009). *Okul öncesi dönemde sosyal beceriler*. Ankara: Pegem Akademi.
- Jean, A. D. L. (2009). Functions of maternal touch and infants' affect during face-to-face interactions: New directions for the still-face. *Infant Behavior and Development*, 32, 123-128.
- Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2005). The importance of parenting in the development of disorganized attachment: Evidence from a preventive intervention study in adoptive families. *Journal of Child Psychology and Psychiatry*, 46(3), 263-274.
- Karasar, N. (1995). *Bilimsel araştırma yöntemi*. Ankara: 3A Araştırma Eğitim Danışmanlık Ltd. Şti.
- Kemppinen K. (2007). *Early maternal sensitivity continuity and related risk factors* (Doctoral dissertation). University of Kuopio, Kuopio.
- Kemppinen, K., Kumpulainen, K., Raita-Hasu, J., Moilanen, I., & Ebeling, H. (2006). The continuity of maternal sensitivity from infancy to toddler age. *Journal of Reproductive and Infant Psychology*, 24(3), 199-212.
- Kılınc, F. E. (2011). *Anne eğitim programı ile anne çocuk etkileşim programının 24-36 aylık çocukların bilişsel becerilerine ve annelerin çocuk yetiştirme davranışlarına etkisinin incelenmesi* (Doctoral dissertation). Selçuk University, Institute of Social Science, Konya.
- Kivijarvi, M., Raiha, H., Kaljonen, A., Tamminen, T., & Piha, J. (2005). Infant temperament and maternal sensitivity behavior in the first year of life. *Scandinavian Journal of Psychology*, 46, 421-428.
- Koşaner, S. (1987). *0-6 aylık ilk bebekler* (Master's thesis). Gazi University, Institute of Social Science, Ankara.
- Lowinger, S. (1999). Infant irritability and early mother-infant reciprocity patterns. *Infant and Child Development*, 8, 71-84.
- Magagna, J. (2013). The development of language in the early months of life. *Infant Observation*, 16(2), 112-129.
- Marchand, J. F., Hock, E., & Widaman, K. (2002). *Parent-toddler play interaction and its relation to the home environment*. USA: State University.

- MEB. (2013). 0-36 aylık çocuklar için eğitim programı. Retrieved from <http://tegm.meb.gov.tr/dosya/okuloncesi/0-36baderegitimcikitap.pdf>
- Murray, A., & Egan, S. M. (2014). Does reading to infants benefit their cognitive development at 9-months-old? An investigation using a large birth cohort survey. *Child Language Teaching and Therapy, 30*(3), 303-315.
- Özer, D. S., & Özer, M. K. (2012). *Çocuklarda motor gelişim*. Ankara: Nobel.
- Öztürk, S. (2011). *Roy adaptasyon modeli'ne göre postpartum dönemdeki annelere verilen eğitimin anne duyarlılığına etkisi* (Doctoral dissertation). Atatürk University, Graduate School of Health Sciences, Erzurum.
- Parfitt, Y., Pike, A., & Ayers, S. (2013). Infant developmental outcomes: A family systems perspective. *Infant and Child Development, 23*, 353-373.
- Sanders, M. R, Turner, K. M. T., & Markie-Dadds, C. (2002). The development and dissemination of the triple p-positive parenting program: A multi-level, evidence-based system of parenting and family support. *Prevention Science, 3*(3), 173-198.
- Santrock, J. W. (2015). *Yaşam boyu gelişim: Gelişim psikolojisi* (G. Yüksel, Trans.). Ankara: Nobel.
- Schoppe-Sullivan, S. J., Diener, M. L., Mangelsdorf, S. C., Brown, G. L., McHale, J. L., & Frosch, C. A. (2006). Attachment and sensitivity in family context: The roles of parent and infant gender. *Infant and Child Development, 15*, 367-385.
- Symons, D. K., & Moran, G. (1987). The Behavioral dynamics of mutual responsiveness in early face-to-face mother infant interactions. *Child Development, 58*, 1488-1495.
- Şencan, H. (2005). *Sosyal ve davranışsal ölçümlerde güvenilirlik ve geçerlik*. Ankara: Seçkin.
- Temel, Z. F., & Aksoy, A. B. (2000). Home-based mother training program for 0-3 years of age and its effects on home environment. *Psychologie and Education, 25*(2), 51-58.
- Ulutaş, A., & Aksoy, A. B. (2015). Duyarlılık ve karşılıklılık testi: Geçerlik ve güvenilirlik çalışması. *Akademik Bakış Uluslararası Sosyal Bilimler E-Dergisi, 48*, 18-30.
- Yalaz, K., Anlar, B., & Bayoğlu, B. (2009). *Denver II gelişimsel tarama testi. "Türk çocukları standardizasyonu"*. Ankara: Gelişimsel Çocuk Nörolojisi.