






## Investigation of eye contact attempts of 3-year-old children and their mothers in a play environment

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### Abstract

Eye contact has been defined as an exchange that mediates a significant part of non-verbal procedures between people. Although studies have been carried out on eye contact between adults, the number of studies dealing with the quality, process and messages of eye contact between children and attachment figures is limited. The goal of this study is to analyse the quality, process and messages of eye contact between 3-year-old children and their mothers during their interaction in a play setting. It is a qualitative case study. Micro analysis was used as the analysis method. 14 children aged 3 years, 8 girls and 6 boys, participated in the study with their mothers. A 10-minute play process was recorded in a standard setting with standard materials. Records were evaluated in periods cut with micro analysis method and transformed into graphics. Study results showed 374 attempts to make eye contact between children and their mothers. It was understood that majority of these attempts were initiated by the mothers and the success/failure rate of these attempts were close each other. It was observed that the success rate of eye contact was higher when it was initiated by children and failure rate of eye contact was higher in cases when it was initiated by mothers. Causes of making eye contact shows that mothers were more likely to make eye contact when they ask questions, wait for an answer and control the child and children tried to make eye contact when they ask for approval of their mothers, chat and exchange ideas with them.

Keywords: Mother, child, interaction, eye contact;

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## 1. Introduction

The attachment theory deals with the development of attachment in the context of early interaction experiences (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969). Mother sensitivity also plays a key role in the development of secure attachment (Stayton, Hogan, & Ainsworth, 1971). Mother sensitivity, based on the suitability of mothers' reactions to the child's signals, is taken as interaction-oriented in time. Mother's negative or unfavourable reactions to the child's signals are the significant causes for development of insecure attachment type by the child.

Interactive synchrony is the basis of social interactions (Seven, Yeşilyurt, & Seven, 2020; Steele, Steele, Croft, & Fonagy, 1999; Tronick & Cohn, 1989). It represents the rhythm and timing of the interaction (Cohn & Tronick, 1987; Fuertes et al., 2006). Eye contact by two people for the same goal is the best example for it. Interaction happens when individuals acts in the same instant for the same purpose. For example, mother and child are making a birthday cake with play dough. Both are thinking over the cake. In this case, it might be said that they are acting synchronously.

Synchrony is a process that begins at birth (Feldman, 2012; Steele et al., 1999; Ulutaş, Ayşegül, & Aksoy, 2015). Infants regulate their messages in various forms according to the mother's rhythm. The infants who smile when the mothers smile are deemed synchronous in social interaction. Synchrony rhythm gives infants basis to estimate the mother. The predictability of mothers is an important quality for secure attachment. As the infants grow, positive synchrony is supported by various activities such as eye contact, face-to-face interaction, peek-a-boo and other games, playing with toys, tidying the house together and preparing meals together (Cohn & Elmore, 1988; Seven & Alabay, 2020).

Eye contact has been defined as an exchange that mediates a significant part of non-verbal procedures between people (Robson, 1967). It is the most apparent sign of synchrony. It is known that positive eye contact experiences are one of the basic interaction components that affect secure attachment.

Although studies have been carried out on eye contact between adults, the number of studies dealing with the quality, process and messages of eye contact between children and attachment figures is limited. The goal of this study, designed in consideration of this significant limitation in literature, is to analyse the quality, process and messages of eye contact that occurs between 3-year-old children and their mothers during their interaction in a play setting.

## 2. Method

### 2.1. Research model

This study was designed as a case study, which is one of the qualitative research patterns. Case study is defined as a 'research method that help the researcher to analyse comprehensively a case or phenomenon that he cannot control based on the questions how and why' (Yıldırım & Şimşek, 2005). The goal of the case study in this research is to reveal the quality, procedural details and messages contained by eye contact attempts of 3-year-old children and their mothers in a play setting.

### 2.2. Study group

The study group of this research was identified with criterion sampling, one of the purposeful sampling methods, and might consist of people, phenomena, situations or objects that correspond to certain qualities (Seven & Seven, 2020). The study group of this research consists of people who possess predetermined qualities. The main criterion in the determination of children in study group of this research was being 3 years old. The study group consisted of 14 children aged 3, including 8 girls and 6 boys, and their mothers. The children were between 30 and 39 months old. Mothers did not work anywhere. Mothers were aged between 25 and 38 years old. Families were in the middle and low socio-economic status. Mothers were graduates of primary school and high school.

### 2.3. Data collection tools

The data collection tool of the study was the 'mother-child data form' involving factors that were considered to affect mother-child synchronisation, such as the mother's age, status, socio-economic status of the family and number of child and mother's siblings. The 'mother-child observation form' was designed to analyse data relating to who attempted to initiate eye contact, why eye contact was made and whether it ended in success or failure.

#### 2.4. Data collection and analysis

Before starting data collection, written consent was received from families who voluntarily participated in the study. Then, the child–mother pairs carried out 10-minute play activities which were recorded on video. The play activities were stable for every mother–child pair. It was carried out in the home setting to make participants feel comfortable. The content of the activity involved four coloured standard play dough in an observation-based natural setting. No play dough pattern was used so that creativity and interaction were not restricted. The camera was placed in a position that did not attract the child’s attention but clearly recorded the mother–child behaviours during the play activity. The author stayed in the same setting with mother–child during the activity but did not intervene. At the end of the activity, the ‘mother–child data form’ was filled with author–mother interviews.

Micro-coded time series analysis was used to analyse the data of this research. Micro-coded time series analysis is an analysis method based on statistical approaches. Micro-coded time series analysis is the most prevalent analysis method used to measure ‘synchronisation’ (Leclère et al., 2014). In this method, coders use a chart and divide it into short-term units for evaluation (Leclère et al., 2014). Micro-coded time series analysis was used in this study for analysing frequency count of eye contact attempts between mother and child, which is an indicator of ‘synchrony’. Before starting to study video records, each lasting for 10 minutes, coders prepared a chart divided into 10-second units showing who started the eye contact attempt, the reason that eye contact was made and whether it ended in success or failure. Then, 10-minute videos were carefully examined by the coders. Thus, coders found out the frequency of eye contact attempts of each mother–child pair, who started the eye contact attempt, the reason that eye contact was made and whether it ended in success or failure.

### 3. Findings and interpretation

#### 3.1. General findings on the eye contact attempts of the mother–child pairs

Table 1 presents the general findings related to eye contact attempts of mother–child pairs in their interaction with each other during the 10-minute play activity (total number of eye contact attempts, total number of successful/unsuccessful eye contact attempts, number of eye contact attempts initiated by mothers/children and success/failure of these attempts).

Table 1. General findings related to eye contact attempts of mother–child pairs

Mother → Child successful	84		
		Mother→ Child total	
Mother→ Child unsuccessful	138	222	
		Child→ Mother total	
Child→ Mother successful	98	152	Total eye contact attempts
Child→ Mother unsuccessful	54		374
Total successful	182		
Total unsuccessful	192		

Information in Table 1 indicates that 374 eye contact attempts were observed between 14 pairs of mothers and children, who constituted the study group of this research. General distribution of 374 eye contact attempts

of 14 pairs of mothers and children shows that 138 attempts were initiated by mothers (36.90%), resulting in failure and 84 attempts (22.45%) ended successfully. On the other hand, 98 attempts initiated by children (26.20%) ended successfully and 54 attempts (14.45%) resulted in failure.

It is understood that 222 of 374 eye contact attempts between mother and child pairs were initiated by the mothers and 152 by the children. According to these data, 59.36% of the eye contact attempts were initiated by the mothers and 40.64% by the children.

Data related to success/failure of 374 eye contact attempts between mother and child pairs shows that 192 eye contact attempts ended in failure and 182 eye contact attempts ended successfully. It is understood that success/failure rates of eye contact attempts are close to each other. 51.34% of total eye contact attempts were unsuccessful, while 48.66% were successful.

It is seen that 138 (71.87%) of 192 unsuccessful eye contact attempts between mothers and children were initiated by mothers and 54 unsuccessful eye contact attempts (28.13%) were initiated by children. It is inferred from these data that majority of unsuccessful eye contact attempts were initiated by mothers. On the other hand, it is understood that 98 (53.85%) of 182 successful eye contact attempts between mothers and children were initiated by children and 84 successful eye contact attempts (46.15%) were initiated by mothers. These rates show that successful eye contact attempts were rather initiated by children, although there is only a minor difference.

222 eye contact attempts between mothers and children were initiated by mothers. It is seen that 138 (62.16%) eye contact attempts initiated by mothers ended in failure and 84 attempts (37.84%) ended in success. On the other hand, 152 eye contact attempts between mothers and children were initiated by children. 98 (64.47%) eye contact attempts initiated by children ended successfully, while 54 attempts (35.53%) ended in failure.

These data show that success rate of eye contact attempts is higher when they are initiated by children and failure rate is higher when these eye contact attempts are initiated by mothers.

#### **Frequency and quality of eye contact attempts of the mother–child pairs**

Table 2 shows the findings related to the frequency and quality of eye contact attempts by the mother–child interaction during the play activity.

Table 2. Frequency of eye contact attempts of the mother–child pairs

Minute	Mother → Child	Child → Mother	Total
0-1	28	13	41
1-2	29	12	41
2-3	16	20	36
3-4	20	19	39
4-5	28	10	38
5-6	24	14	38
6-7	28	14	42
7-8	16	17	33
8-9	16	17	33
9-10	17	16	33
<b>Total</b>	<b>222</b>	<b>152</b>	<b>374</b>

Information in the table shows that eye contact attempts initiated by mothers in the first 2 minutes of the 10-minute play activity are intense but eye contact attempts initiated by children in these first 2 minutes are rare. The number of eye contact attempts initiated by mothers dropped and eye contact attempts of children

intensified in 2–4 minutes. The number of eye contact attempts initiated by mothers, which fell between 2 and 4 minutes, intensified between 4 and 7 minutes and the number of eye contact attempts rose. It is seen that the number of eye contact attempts initiated by children declined again in these minutes. It is understood that eye contact attempts initiated by mothers decreased, but eye contact attempts initiated by children increased in the 3-minute period between 7 and 10 minutes.

These data show that the number of children’s attempts to make eye contact decreased in the minutes that mothers intensely attempted to make eye contact (between 0–2 and 4–7 minutes) and the number of eye contact attempts initiated by mothers fell in the minutes that children’s attempts to make eye contact intensified (2–4 and 7–10 minutes). It is observed that there is a reverse correlation and eye contact attempts are balanced in this way.

Information in Table 2 shows that the most intense consecutive eye contact attempts occurred in the first 2 minutes and the period that consecutive eye contact attempts were minimised was the period between 7 and 10 minutes. It might be clearly suggested that eye contact attempts which were very intense at the beginning of play activity decreased at the end of the activity.

### ***Causes of eye contact attempts of the mother–child pairs***

Table 3 shows the findings related to the causes of eye contact attempts by the mother–child pairs in their interaction during play activity.

Table 3. Causes of eye contact attempts by the mother–child pairs

<b>Causes to Try to Make Eye Contact</b>	<b>Mother→ Child Successful</b>	<b>Mother→ Child Unsuccessful</b>	<b>Child→ Mother Successful</b>	<b>Child→ Mother Unsuccessful</b>	<b>Total</b>
1-) Eye contact attempt while asking question	4	50	6	13	73
2-) Eye contact attempt to be approved	3	4	39	24	70
3-) Eye contact attempt during question–answer	50	3	12	1	66
4-) Eye contact attempt to chat/exchange ideas	12	20	18	3	53
5-) Eye contact attempt to control	2	43	1	1	47
6-) Eye contact attempt for demand	5	3	7	4	19
7-) Eye contact attempt for instruction	3	12	1	1	17
8-) Eye contact attempt for approval	2	1	8	0	11
9-) Eye contact attempt for expressing emotional reaction	3	2	1	4	10
10-) Eye contact attempt to demand help	0	0	5	3	8
<b>Total</b>	<b>84</b>	<b>138</b>	<b>98</b>	<b>54</b>	<b>374</b>

Information in the table indicates that eye contact attempts among the mother–child pairs who constituted study group of this research were explained with 10 causes. It is understood that causes of making eye contact for the mother–child pairs is ordered from maximum to minimum.

Table 3 shows that the mother–child pairs attempt to make eye contact mostly while asking question. Eye contact attempt while asking question, involving 73 (19.52%) of 374 total eye contact attempts, is used to indicate that eye contact is maintained only while the question is being asked and the attempt is over once the question is asked. Therefore, it is seen that 54 attempts initiated for this cause belong to mothers and 19 attempts to children. It is clearly observed that vast majority of eye contact attempts initiated for this causes ended negatively.

The second cause for eye contact attempts of the mother–child pair is ‘eye contact attempt in order to be approved’. Eye contact, 70 (18.71%) attempts, is used to define the eye contact attempt initiated in order to be approved by the opposite person. Only 6 of the attempts initiated for this cause belong to mothers and 63 were initiated by children. These data might reveal the fact that children feel the need to be approved than mothers.

The third cause for eye contact attempts of the mother–child pairs is ‘eye contact attempt during question-answer’. Eye contact attempt during question person answer, which corresponds to 66 (17.65%) of the total attempts, is used to define the eye contact that is maintained while both asking the question and listening to the answer. 53 eye contact attempts in question–answer were initiated by mothers and only 13 by children. Data related to the first and third causes clearly show that mothers asked too many questions during play activity but children made very few attempts to ask questions.

The fourth cause of eye contact attempts of the mother–child pairs is ‘eye contact attempt to chat/exchange ideas’, which is used to define situations that mother and child chat and exchange ideas during play activity. It is seen that 53 (14.17%) eye contact attempts were made in order to chat/exchange ideas. 32 of those attempts were initiated by mothers and 21 attempts by children. Eye contact attempts for chatting/exchanging ideas rather failed when they were initiated by the mother but ended more in success when initiated by the child.

The fifth cause for eye contact attempts of the mother–child pairs is ‘eye contact attempt for control’. Eye contact attempt for control defines the eye contact attempts initiated by mother or child to control behaviours and actions of the other person and accounts for 47 (12.56%) causes. It is seen that 45 eye contact attempts for control were initiated by mothers and only 2 attempts by children. It is clearly seen that almost all of the 45 attempts initiated by mothers ended negatively. Based on this data, it is very clearly understood that mothers’ attempts to control the process failed.

Studying the data distribution in the Table 3 shows that 5 of the 10 most prevalent causes of eye contact attempts account for 82.61% of the total. It is understood that the remaining 5 causes account for 17.39% of the total.

The sixth cause for eye contact attempts by the mother–child pairs is ‘eye contact attempt for demand’, which is used to define the situation where mother or child asks each other for something and accounts for 19 (5.10%) of the total 374 eye contact attempts. The seventh cause for eye contact attempts, ‘eye contact for instruction’, is used to define mother or child instructing each other during a play activity. 17 (4.54%) eye contacts were made for instruction, 15 by mothers and only 2 by children. It is clearly seen that almost all of the 15 attempts initiated by mothers ended unfavourably. This data shows that children are not likely to find it positive to be instructed during a play activity.

In addition to the causes explained above, there are other causes such as eye contact attempt for approval, eye contact attempt for expressing emotional reaction and eye contact attempt to ask for help. ‘Eye contact attempt for approval’ (11; 2.94%) is defined as the eye contact attempt initiated by mother and child to approve a request or a situation. ‘Eye contact attempt for expressing emotional reaction’ (10; 2.67%) is used to define eye contact attempts initiated by mother or child to reflect their emotional condition such as surprise, happiness and sorrow. The least prevalent cause (8; 2.14%) ‘eye contact to demand help’ is used to describe a situation that mother or child demands an assistance. The most remarkable part here is that eye contact attempts for demanding help were initiated only by the child and mothers demanded no help.

#### **4. Discussion and Suggestions**

The process shows that the superiority of the number of mother’s attempts for eye contact passed between mother and child every 2 minutes. This is a sign of the efforts of both parties to repair their interaction, as indicated by Tronick and Cohn (1989). Thus, eye contact was used by mothers for superiority, control and training. It is understood that play duration was often problematic. On the contrary, the child tries to repair the relationship by making eye contact for causes such as approval or demanding help. This finding overlaps with finding of Seven et al. (2020) in his study of interactive synchrony situations of 3-year-old children with their mothers where interaction is repaired by the children.

It was observed that eye contact attempt from mother to child often failed, while eye contact attempt from child to mother ended in success. Thomson et al. (2011) regarded eye contact failure between mother and child as a sign of discord. This study overlaps with finding of Seven (2017) that mothers’ eye contact attempts in mother–child interaction often end in failure. The fact that majority of children’s messages are not noticed by

mothers was reported in another study dealing with sensitivity of mothers (Seven & Alabay, 2020). It is also considered that frequent eye contact attempts of mothers were found preventive of the game by children.

The most unsuccessful eye contact attempts of mothers were for controlling purpose. Mothers' successful eye contact attempts occurred during chat and question–answer. It is considered that mothers' tendency to discipline and train their children is the reason of their intervention during the game. Mothers' efforts to teach are similar to the findings of Akgün and Yeşilyaprak (2011) that mothers were anxious to teach and use informative statements very often. Teaching aspect of mothers, as a natural tendency supported by Cohn and Elmore (1988) and Dunham and Dunham (1995), might be seen by Vygotsky (1978) as an action fit for proximal development theory.

The study's findings indicate that mothers' effort to practice discipline and control the process was found negative by children. Therefore, mothers are recommended to realise children's plans and act accordingly. Again, it was observed that instructing children during a play activity was not found positive by children. Therefore, mothers should avoid instructive statements and questions during a play activity. This study dealt with eye contacts of 3-year-old children with their mothers. Studies in future might deal with eye contact process in older ages. The relationship between eye contact and attachment and eye contact processes in mothers' sensitivity might be separately studied.

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