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From the editors,

## *Volume 11, Number 2, DECEMBER, 2019*

Dear INT-JECSE readers and contributors,

We are excited to be with you with the second issue of the eleventh volume of the INT-JECSE. We would like to extend our appreciations to all who contributes by submitting or reviewing manuscripts or have been readers of the INT-JECSE. In our second issue of the eleventh year, you will find eight different articles on various topics of young children with special needs and their families or professionals.

The first manuscript was written by Unlu, entitled “Parent Implemented Program for Teaching Toileting Skills for Children with Developmental Disabilities”, The purpose of this study is to determine whether “Program for Supporting Home- and Institution-based Toileting Skills for Families” enables mothers to acquire the skill of teaching toileting control to their children and for children to acquire day-time toileting control. According to the results, children attained toileting skills rapidly and consistently throughout the program. The procedures followed during these activities and the outcomes regarding each participant are discussed in the paper.

Sakarneh, Sabayleh and Alramamneh in the second manuscript studied “The Sensory Characteristics of Children with Autism Spectrum Disorder: Teachers' Observation”. Descriptive surveying approach was used to suit the nature of the study. The researchers selected a simple random sample consisting of (40) teachers from (6) centers for autistic children in Amman, Jordan. The tool used in this study was a checklist consisted of 38 items. The collected data were analyzed and then expressed through means and standard deviations. In addition, t-test was used to determine significance of the differences. The results revealed that the sensory characteristics of children with ASD were often evident in the study sample. The characteristics of children with ASD in the sensory domain were ranked as follows: First; tactile stimuli, second; olfactory and tasting stimulants, third; visual stimuli, and finally the auditory stimuli. The results showed that there were no statistically significant differences in the study sample attributed to age except the tactile stimuli and the differences were in the favour of age (3-6). Implications and recommendations are presented.

In the third manuscript, Coogle, Storie, Ottley, Price and Rahn investigated Prompting Peers’ Use of Choices to Promote Communication in Children with Autism Spectrum Disorder. The main aim of this research was to determine the effect of prompting a preschool student to use choice making with a peer identified with autism spectrum disorder. Single case research design was used in the research. Researchers provided prompting across three thematic play activities. According to results, there was an initial effect in the first activity, which may have resulted in a carry-over effect in the other two activities. While peer-mediated instruction can be an effective method for increasing the dosage of learning opportunities that children with autism spectrum disorder experience in early childhood settings, peers may need more training or ongoing support to sustain their interactions with the child in a meaningful way.

The fourth manuscript written by Senturk-Cesur and Odluyurt examines the opinions and suggestions about the teaching of play skills of parents who have children with between the ages of three and seven who have autism spectrum disorder (ASD), and the teachers working with them A semi-structured interview form was prepared and the final version was validated by seven experts in the field. Easily-accessible case sampling method was applied to determine the participants. Interviews were conducted with 15 selected parents and 15 teachers. The data obtained from the opinions were analyzed descriptively. The findings showed that both parents and teachers defined the play skills as an activity that supports the child's developmental areas. The demonstration of the play skills of children with ASD shows that they find teaching various skills and concepts through games necessary, as well as supporting the play development area of the child.

With the title of “Evaluation of the Effective-ness of Newborn Hearing Screening Program: A Center in Turkey”, Turan and Bas in this study aimed to analyze the effects of newborn hearing screening program in Turkey based on the age of diagnosis, amplification and initiation of education between 2000 and 2017. The study was designed as a retrospective study. The files of 997 children registered with a research and education center for children with hearing loss were analyzed. The findings indicated that the age of diagnosis, amplification and initiation of education significantly decreased after the national newborn hearing screening pro-gram was introduced throughout the years. However, the recommended universal standards were achieved only for a minority of children in terms of timely diagnosis and early intervention. Delay in amplification mostly observed in children with mild-moderate loses and late diagnosis, was found as related to the testing in more than two different clinics. The findings on late initiation of education were discussed based on the reports in relevant literature and monitoring problems after the diagnosis and the problems observed in early education system in Turkey.

The sixth manuscript written by Josephine L. F. Jamero entitled “Social Constructivism and Play of Children with Autism for Inclusive Early Childhood” examined in this article relates part of a research on the play interactions of children with Autism Spectrum Disorders (ASD) within an inclusive early childhood school to the elements of sociocultural theory. Direct observation within the natural play settings of nine children with ASD between two- to five-years old was used to gather data for this study. Interactions within the indoor and outdoor play routines of children with ASD with their peers and educators were observed and recorded for two weeks. The anecdotes of the play interactions derived from the recordings were coded into five play categories to determine how routines for play reflect the interactions experienced by children with ASD. The aim of this article is to provide documentations of the play interactions of children with ASD within their natural educational settings and examine how the elements of social constructivism as a theoretical framework for inclusive practice are reflected. In line with the writings of Mallory, this paper intends to demonstrate how a theoretical framework could guide educational practices.

The seventh manuscript written by Yıldırım and Akçamete aimed to identify the needs of parents with children that have multiple disabilities in early child-hood and to suggest a family-centered training model for parents in line with these needs. The research was designed with qualitative research method. Three mothers, who have children with multiple disabilities, living in Mamak district of Ankara province, participated in the research. The data were collected in a group meeting through face-to-face interviews and analyzed by content analysis. The common needs of the mothers who participated in the group meetings were getting information about the disabilities of the children, learning how to increase the physiotherapy hours for them, getting the entire diaper costs of the children from the Social Security Institution and getting help about their transportation to the hospital. As for the personal needs, the mothers desired to get information about the parent–teacher association, epilepsy, visual impairment, hip dislocation and its treatment, shunt use and space therapy and they also wanted to learn whether robots would be useful for their children or not. In line with these results, it can be said that a screening study based on quantitative data should be carried out for further studies through wider participation with children that have different disabilities.

With the title of “Promoting Friendship Development in Inclusive Early Childhood Classrooms: A Literature Review. Krone and Yu aimed to describe research findings related to how teachers could support friendships in inclusive early childhood classrooms, with particular interests in friendship development for young children with disabilities. This study was conducted with this two questions: (a) how are friendships between young children with and without disabilities defined and measured? And (b) what teaching strategies and intervention programs does research recommend to promote friendships between young children with and without disabilities? A total of eight studies were identified. The results of this review demonstrated that across all studies there were several common characteristics (e.g. mutual liking, spending time together) in defining young children’s friend-ships. The studies reviewed also included various methods (e.g., surveys, interviews, and observations) to measure friendships and suggested effective strategies and intervention programs that teachers could use to support friendship development. However, results also showed that teachers did not readily use the evidence-based practices. Based on the results, implications for future research and practices are discussed.

The last manuscript written by Lundqvist and Sandström was about “A bioecological Content Analysis: An Analysis Technique Rooted in the Bioecological Model for Human Development”. A bioecological content analysis is an analysis technique rooted in the bioecological theory of human development and the Process–Person–Context–Time (PPCT) mod-el. In this article, we outline what a bioecological content analysis is and provide guidelines to researchers, students and others who want to use it in large or small scale life story oriented research on such matters as children with special needs and their families, early intervention and early childhood special education. A discussion of advantages and disadvantages of the bioecological content analysis is provided.

Yours Sincerely,

Ibrahim H. Diken, Ph.D.
Editor-In-Chief

## *CONTENTS*

Unlu, E. (2019). Parent implemented program for teaching toileting skills for children with developmental disabilities. *International Journal of Early Childhood Special Education, 11*(2), 92-104. doi: 10.20489/intjecse.640348
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# Parent Implemented Program for Teaching Toileting Skills for Children with Developmental Disabilities

***Abstract***

*Teaching toileting skills are among the most essential educational objectives for children with developmental disabilities; however, there are few investigations of the utility of various toilet training approaches for children with autism. The purpose of this study is to determine whether "Program for Supporting Home- and Institution-based Toileting Skills for Families" enables mothers to acquire the skill of teaching toileting control to their children and for children to acquire day-time toileting control. The results show that children attained toileting skills rapidly and consistently throughout the program. The procedures followed during these activities and the outcomes regarding each participant are discussed.*

Keywords: *autism spectrum disorder, parent training, toilet training, toileting problems.*

## Introduction

The skill to achieve nocturnal dryness is gained around ages 3-4 in children who show typical development (Blum, Taubman, & Nemeth, 2003). Even though cultural factors affect the age ranges in gaining toileting skills, it has been seen that children are ready to acquire the toileting skills between 2-3 age range and readiness age can decline until 18 months in some children (Schum et al., 2002). On the contrary to children with typically developing; children with autism are appeared to be slow in gaining toilet skills, and sometimes they are not acquired at all (Ando, 1977; Dalrymple & Ruble, 1992; Tsai, Stewart, & August, 1981; Whiteley, 2004; Williams, Oliver, Allard, & Sears, 2003). It is determined that although some children with autism spectrum disorder and children with intellectual disabilities receive a longer training, they might not acquire this ability or they acquire it after a few years of training (Keen, Branni-gan, & Cuskelly, 2007).

Children with autism and developmental disabilities have difficulties in the period of toilet training when compared with typically developing peers (Hong and Matson, 2018). This ability, named as toilet skill, in fact, is a complex ability, which includes performing a wide range of skills independently. Although the toilet skills include skills such as awareness of the need for toilet, sitting on closet, using toilet paper correctly and washing hands properly, toilet training in previous studies only include evacuating and controlling the urge to evacuate (Baker & Brigtman, 1997). Acquiring toilet skills

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is a very important mile stone for individuals with special needs, and it supports acceptance to society as well as personal responsibility and self -confidence (Cicero & Pfadt, 2002). Studies have shown that children with autism have problems with toilet skills and urinary incontinence (Whiteley, 2004; Williams, Oliver, Allard, & Sears, 2003). Performing successful toilet skills enhances the individual's quality of life besides preventing urinary and intestinal problems (Bakker, Vangool, VanSprundel, Van-DerAuwera, & Wyendale, 2002; Barone, Jasutkar, & Schneider, 2009). In addition, having toilet skills make it possible for indirect contributions such as attending to social gatherings fully (Cicero & Pfadt, 2002).

Acquisition of toilet skills not only affect children but their families as well. Today, when we think about the laws and contemporary approaches drawing attention to the integration of children with special needs to society, the acquisition of toilet skills by children with developmental disabilities is regarded as an important goal in an educational environment (Dempsey, 2005). Macias, Roberts, Saylor and Fussel (2006) stated that families having children with toilet training encounter problems due to more stress than families having children with no toilet training, and drew attention to the importance of acquiring toilet skills for children with special needs. Research has shown that behavioral implementations based on applied behavior analysis principles are effective to teach the children with developmental disabilities toileting skills (Wingate, Falcomata, & Ferguson, 2017)

The first example, which is regarded as a foundation in the training for toilet skills of individuals with developmental disabilities and based on classical conditioning principle, was suggested by Ellis (1963). Although there are successful examples following the approach of Ellis, it is recorded that different groups especially children with autism did not acquire toilet skills by this approach, thus different training practices have been developed. It is seen that the behavioral intervention package which is called rapid toilet training -one of the most important practices developed by Azrin and Foxx (1971) is effective with children with intellectual disabilities and individuals with autism (Kroeger & Sorensen-Burnworth, 2009). The components of the original form of this intervention package which was prepared for adults with intellectual disabilities are listed as toilet schedule, reinforcing the evacuation into toilet, check for dry underwear, exces-sive liquid intake and over-correction in accidental cases. The intervention package has been modified in different studies by mak-ing changes in these components (Hanney, Jostad, LeBlanc, Carr, & Castile, 2012). Different modifications are made in rapid toilet training such as the intensity of the period of training and intervention procedures, re-moval of over-correction and punishment periods. Although there are effective practices such as rapid toilet training towards the acquisition of toilet skills, there are limited number of studies regarding the training of children with developmental disabilities for toilet skills, and that in limited studies, special attributes of attendants were not recorded and the procedures applied were not explained clearly (Keen, Brannigan, & Cuskelly, 2007).

It is seen that there are successfully resulted studies regarding the acquisition of toilet skills by children with developmental disabilities via Rapid Toilet Training program (Ardıç & Cavkaytar, 2014; Didden, Sikkema, Bosman, Duker, & Curfs, 2001; Doan & Toussaint, 2016; Foxx & Azrin, 1973; Kircaali-İftar, Ulke-Kurkcuoglu, Cetin, & Unlu, 2009). Besides the classical training for acquisition of toilet skills, there are technologically supported practices such as video model (Bainbridge & Myles, 1999; Keen, Brannigan, & Cuskelly, 2007; Lee, Anderson, & Moore, 2014) and mobile applications (Mruzek et al., 2017). Although there are studies showing successful acquisition of toileting skills, it is stated that people who are responsible for the care of the children may apply malpractices or deficient practices during the toilet training, and for this reason, it is important that they should be systematically trained regarding the toilet training procedures (Doan & Tous-saint, 2016).

It is seen that there are studies in which it is aimed that families teach their children toilet skills at home and children with developmental disorder have acquired toilet training successfully. In studies with regards to families, it is seen that families act as an agent in practices and that the real responsibility of practice is not handed to them (Kroeger & Sorensen-Burnworth, 2009). One of the most important components of efficient practices which will be offered to individuals with Developmental

Disability (DD) is the training and the con tribution of family. However, it is seen as an important issue in literature that there are limited number of studies regarding the participation of families having children with who spend most of their time at home and studies regarding generalization of intermediums (Leblanc, Carr, Crossett, Bennett & Detweiler, 2005; Kroeger & Sorensen, 2010). Kroeger and Sorensen (2010) reported that it is efficient to train children with developmental disabilities for toilet skills at home by their parents. Also, Ardıç and Cavkaytar (2014) suggested de-veloping and designing toilet training pro-grams for parent of individuals with devel-opmental disabilities. Studies found in the literature are centralized generally and that there are limited studies showing interventions with parents. In this study, it is aimed that mothers, two of whom have a child with ASD and one of whom have a child with intellectual disability, who are previously trained for teaching toilet skills, become successful in having their children acquire toilet skills. Within this context in this study, answers were sought after for these two questions: a) on what level do mothers can perform after the training regarding the acquisition of toilet skills? and b) how does the toilet training by the mothers effect the performance of children in acquiring toilet skills?

## Method

This study was designed as a case study in order to be able to find answers for the research questions. Detailed data regarding the performances of the participants during the training period of the study were gathered in their natural environment and analyzed. Data achieved from the study were shown in graphic by using EU pattern of single-subject research patterns and analyzed. The independent variable of this study is the teaching program implemented by parents. There are two dependent variables in this study. The first dependent variable is parent’s performance on teaching toileting skills to their child. The second dependent variable is child performance on discharging in to toilet.

### *Participants*

Participants are composed of three children with developmental disabilities, their mothers, and advisor working in the center which the children are educated and the supervi sor of the study. The children attending to the study have been getting supportive education in a special education and rehabilitation center. The children received no education in another foundation or setting other than rehabilitation center. The fami-lies attending to the study have never taken a systematical toilet training before and have never implemented toilet training systematically.

The 1st Subject is a 2,5-year-old female child with Down Syndrome. She has gone to private special education institution since she was 1-year-old. She has self-care skills such as pulling of socks, removing hat, pull-ing down trousers, etc. She speaks with one-word sentence structures (such as mother, father, water, pee, etc.). Also she follows directions including single action. Mother of the 1st Subject is 25 years old, a high school graduate, mother of one child, and housewife. She has previously attended all family trainings given in the private special education institution. Although traditional toilet training was given before, it was not successful.

The 2nd Subject is a 3,5-year-old male student with autism. He has attended to individualized education program in special education institutions since he was 2 years old. The subject speaks with a one-word sentence structure; however, understandability of speech is low. He shows by gestures that he needs to urinate. He follows di-rections including single action. Mother of the 2nd Subject is 29 years old, a high school graduate, mother of two children, and housewife. She attended to presentation of toilet training made within the scope of the study. She decided to start giving toilet training after the general toilet training seminar.

The 3rd Subject is a 3-year-old male student with autism. He has attended to individualized education program in special education institutions since he was 2 years old. He follows directions including single action, gabbles, removes hat, and has self-care skills such as pulling of socks. Mother of the 3rd Subject is 30 years old, a secondary school graduate and housewife. She attended to presentation of toilet training made within the scope of the study. She decided to start giving toilet training after the general toilet training seminar.

*Advisor*

The role of the advisor was to provide communication and interaction between parents and supervisor. The advisor had 10 years-experience in working with individuals with autism and he had a bachelor degree on special education. Advisor has attended actively to the family meetings and activities which have been carried through with the supervisor. He took responsibility on determining the requirements of parents and their children, preparing the program that how the mothers teach toileting skills to their children, combining the data which came from parents' home implementations and teachers' school implementations, evaluating the suggestions and demands of parents. Advisor met with the each family twice a week and answered the families' questions about the process and supported them. Also, the advisor gave a report to the supervisor weekly about the meeting with the families. Besides the advisor interacted with the supervisor face to face or distant all the time and got information when needed a part from the weekly report or meetings. In the whole process the advisor was in contact with supervisor.

*Supervisor*

He had PhD degree on special education and had 10 years of experience in working with individuals with special needs. He was in contact with advisor via e-mail, phone and face to face interactions throughout the study. Supervisor participated in the study to present the group education for parents, inform and direct the parents and teachers after group education, make decisions related to the issues about the study process and manage the study. Supervisor of the study organized the processes of determining and implementing the components of the study, planning the family meetings and these meetings contents, interpreting and analyzing the data obtained from the study.

*Process*

In this study, a three-stage process was followed. At the first stage of the study, 33 parents who stated that they had been encountering problems with their children in the acquisition of toilet skills were given a 6 hour-seminar regarding the teaching of toilet skills to children with special needs. Training and support were given to three mothers who stated that they need support one week after the seminar. At the last stage, families who take individual support gathered data by teaching their children toilet skills. Activities realized in each phase and their contents are explained in detail below.

*Toilet Training Seminar*

Toilet skill training seminar is planned regarding the parents whose children receive special educational services in a special educational center. Parents of 33 children who have been educated at the center attended the training seminar. The subjects of the training seminar were: a) Importance of Toilet Skills, b) Components of Toilet Skills, c) Factors that harden the acquisition of toilet skills, d) Toilet training techniques, e) Traditional Toilet Training Method, f) Intensified Toilet Training Method. Training session was designed as 6 sessions for 45 minutes, and it was completed in one day. PowerPoint presentations, sample practices, role playing and question-answer techniques were utilized. Training documents used in the seminar and data record forms for toilet skill control and follow-up were distributed to the attendants, and they were taught how to use them via practice. It was requested that families who still encounter a problem with toilet skills after the family training seminar contact with the researchers via the special education center, and the seminar was ended.

*Individual Parent Support*

After the toilet training seminar which was given to a large group, 3 mothers indicated to the counsellor from the special education center that although they applied the practices they had been explained in the seminar, they did not become successful and they needed intense help. After an interview between the counsellor and the supervisor upon the request of the parents, it was decided that a more intense and individual support should have been given to the mothers. The counsellor interviewed the parents one by one and they exchanged information regarding the problems they lived during the toilet training and the level of toilet skills their children acquired. After the interview of the advisor with the par-ents, it was decided that the advisor should train individually the three mothers for teaching toilet skills and that data regarding the toilet control both at home and in the center should be collected. Data collected by the mothers were given to the counsellor periodically and the counsellor was always in contact by face to face with the mothers during the study. Also, the advisor informed the mothers of the children constantly regarding the toilet skill performance of the children.

*Teaching toilet skills to children*

In the study, the rapid toilet training intervention (Kircaali-İftar et al. 2009) which was modi-fied later was taken as a base with the three children whose mothers requested counselling. In the study, without the need to apply the second stage of the toilet training period used by Kircaali-İftar et al. (2009), students acquired toilet training. At the beginning of the study, data regarding the dry periods were recorded on the form seen in Table 1 and the process of acquiring toilet skills were followed. In order to determine the baseline level of every child, the percentage of dry periods for three days were calculated. After the beginning level averages were determined, it was ensured that families provided toilet skill education at home and teachers provided toilet skill education at the special educational center.

During the intervention, every child was taken to the toilet every 30 minutes, their diapers are checked and it was ensured that they sit on the toilet for five minutes. If a bowel movement happens in five minutes, it was ensured that children's behavior is reinforced with social or food reinforcements. The period to take the chil-dren to the toilet for mothers and teachers was gradually raised to 45 and 60 minutes. While increasing these periods, the dryness of the diapers 3 times over or having a bowel movement or urinating three times over were regarded as criteria. In this peri-od, mothers and teachers ensured that the children take lots of liquids and salty food in order to create the need for toilet often. Mothers and teachers used sentences such as "let's poop, let's pee, let's use the potty" or ensured that the children show between their legs with gestures before using the toilet. During the teaching period, if the child communicated his/her need to go to toilet verbally or via gestures, mothers and teachers reinforced socially this act in a joyful manner.

*Teaching Mothers The Skill to Teach Toilet Skills*

This process with the child and the responsibilities of parents in this process were told in individual training sessions with the mothers of the three children who attended the study. A presentation was shown to mothers in the initial training session, a written document was given to them regard-ing the activities they are required to make and the activities were shown with samples and practices. Also, questions of mothers were answered in these training sessions and the subjects that need to be repeated were repeated. These sessions were real-ized after the beginning level data were received from the children. The first session of individual sessions with mothers lasted 90 minutes for each parents. Mothers did not request any other individual sessions after the first session and they asked their questions while handing the previous day's data form. Skills the mothers were required to perform were gathered in 17 steps with the views of teachers and field specialists and studies in the literature, and a form was prepared. These 17 steps which the parents had to perform were also transformed into the data form in Table 1 and this form was used to determine the percentage of the performance of behaviors expected of them.

*Gathering the data*

Children were taken to toilet at the beginning of every hour at both the beginning level and during the teaching, their diapers were checked and 3 minutes were given to the children for a bowel movement. Data recording form in Table 2 was used to record the dry periods of the children during one day. These data received from the children were used to evaluate toilet skills of the children at the beginning level and during the teaching and these data were put into graphic form (Graph 1). The level of performance of mothers regarding their responsibilities during the study was gathered via the form in Table 2.

**Table 1.**
*Data recording form for parent behavior*

| | Parent Behaviors | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | Using oral phrases (e.g. let's go to toilet, let's pee) | | | | | |
| 2 | Taking off child's clothes | | | | | |
| 3 | Checking child's diaper | | | | | |
| 4 | Making child sit on the closet | | | | | |
| 5 | Recording child's diaper condition whether it is wet or dry | | | | | |
| 6 | Using social and symbol reinforcement if child's diaper is dry | | | | | |
| 7 | Making child sit for 3 minutes on the closet | | | | | |
| 8 | If child excretes within 3 minutes allowing child to get out | | | | | |
| 9 | Using edible reinforces if child excretes within 3 minutes | | | | | |
| 10 | Making the child stand up after 3 minutes | | | | | |
| 11 | Dressing up the child | | | | | |
| 12 | Taking child to the toilet every 30 minutes | | | | | |
| 13 | If child's diaper is dry three times consecutively, changing toileting time (from 30 minutes to 45 minutes, then from 45 minutes to 60 minutes) | | | | | |
| 14 | If child excretes three times consecutively, changing toileting time (from 30 minutes to 45 minutes, then from 45 minutes to 60 minutes) | | | | | |
| 15 | Continuing the process till bedtime | | | | | |
| 16 | Starting the process again in the morning | | | | | |
| 17 | Giving daily data to child's teacher | | | | | |

**Table 2.**
*Data recording form for toileting skills of children*

| Date | Time | Diaper was clean | | Urinated into the toilet | | Defecated into the toilet | |
|---|---|---|---|---|---|---|---|
| | | Y | N | Y | N | Y | N |
| | | Y | N | Y | N | Y | N |
| | | Y | N | Y | N | Y | N |
| | | Y | N | Y | N | Y | N |
| | | Y | N | Y | N | Y | N |
| | | Y | N | Y | N | Y | N |
| | | Y | N | Y | N | Y | N |
| | | Y | N | Y | N | Y | N |
| | | Y | N | Y | N | Y | N |
| | | Y | N | Y | N | Y | N |
| | | Y | N | Y | N | Y | N |
| | | Y | N | Y | N | Y | N |

***Y:** Yes, **N:** No*

## Results

Two different kinds of data were collected in this study and these data were analyzed via graphics.

*Results on Parent's Teaching Toileting Skills Behaviors*

According to data obtained from interview at the pre-intervention phase, as it is seen in figure 1, it is understood that the first mother did not have information about accompanying the child to the toilet in compliance when the child's diaper was dry, toilet-ing activity, non-toileting activity and what should be done when there were accidents, the child wanted to go to the toilet on her own; and she accomplished sub-objectives of teaching the skill of day-time toileting control at level "0". In other words, the mother could not accomplished any sub-objectives related to teaching the skill of day-time toileting control which is shown in Table 1. Mother accomplished 14 of 17 sub-objectives of skill of teaching toileting control in the first teaching session, 16 of 17 sub-objectives in the second teaching session, and 17 of 17 subobjectives in the third teaching session during the intervention phase which she attended individual education sessions. Also, she accomplished all of 17 sub-objectives of skill of teaching day-time toileting control in all three end-of-teaching assessments including three ses-sions at the end of implementing teaching unit. When we analyze the graph, it's clear-ly seen that there is difference between the mean points of baseline and intervention phases. However, there is no overlap between the data points of baseline and intervention phases. Also, when trend in intervention phases is analyzed it's seen that there is an upward trend at data points. All these graphical analyzing results (Richards, Taylor, & Ramasamy, 2014) show that there is a clear behavior change between two phases, in other words mother acquired the target skills after the interventions.

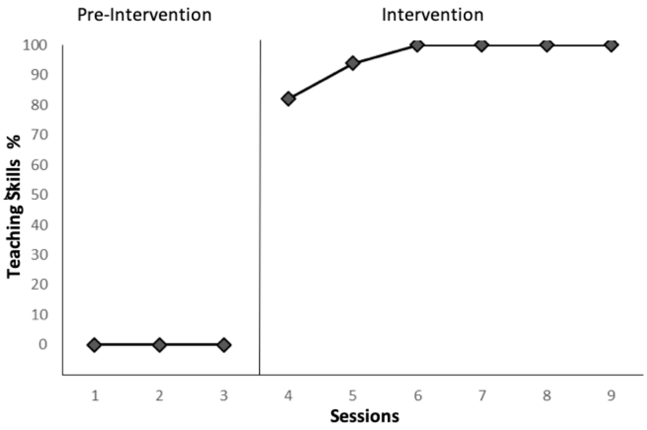

**Figure 1.**
*First mother's performance*

In figure 2, similar to the first mother, the second mother did not have information about accompanying the child to the toilet in compliance when the child's diaper was dry, toileting activity, non-toileting activity and what should be done when there were accidents, the child wanted to go to the toilet on her own; and she accomplished sub-objectives of teaching the skill of day-time toileting control at level "0". In other words, the mother did not accomplish any sub-objectives related to teaching the skill of day-time toileting control. The second mother accomplished 16 of 17 sub-objectives of skill of teaching toileting control in the first teaching session, and 16 of 17 sub-objectives in the second teaching ses-sion during the intervention phase which she attended individual education sessions. Also, she accomplished all of 17 sub-objectives of skill of teaching day-time toilet-ing control in all three end-of-teaching as-sessments including three sessions at the end of implementing teaching unit. When we analyze the graph, it's clearly seen that there is difference between the mean points of baseline and intervention phases. However, there is no overlap between the data points of baseline and intervention phases. Also, when trend in intervention phases is analyzed it's seen that there is an upward trend at data points. All these graphical analyzing results (Richards, Taylor, & Ramasamy, 2014) show that there is a clear behavior change between two phases, in other words the second mother acquired target skills after the interventions.

According to data obtained from interview at the pre-intervention phase, as it is seen in figure 3, the third mother also did not have information about accompanying the child to the toilet in compliance when the child's diaper was dry, toileting activity, non-toileting activity and what should be done when there were accidents, the child wanted to go to the toilet on her own; and she accomplished sub-objectives of teaching the skill of day-time toileting control at level "0". In other words, the mother did not accomplish any sub-objectives related to teaching the skill of day-time toileting control. Mother accom-plished 14 of 17 sub-objectives of skill of teaching toileting control in the first teaching session, 15 of 17 sub-objectives in the sec-ond teaching session, and 17 of 17 sub-objectives in the third teaching session dur-ing the intervention phase which she at-tended individual education sessions. Also, she accomplishes all of 17 sub-objectives of skill of teaching day-time toileting control in all three end-of-teaching assessments in-cluding three sessions at the end of imple-menting teaching unit. When we analyze the graph, it's clearly seen that there is difference between the mean points of baseline and intervention phases. However, there is no overlap between the data points of baseline and intervention phases. Also, when trend in intervention phases is analyzed it's seen that there is an upward trend at data points. All these graphical analyzing results (Richards, Tay-lor, & Ramasamy, 2014) show that there is a clear behavior change between two phases, in other words the third mother acquired target skills after the interventions.

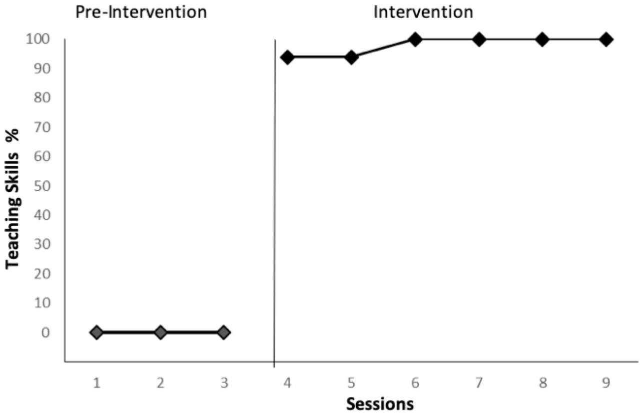

**Figure 2.**
*Second mother's performance*

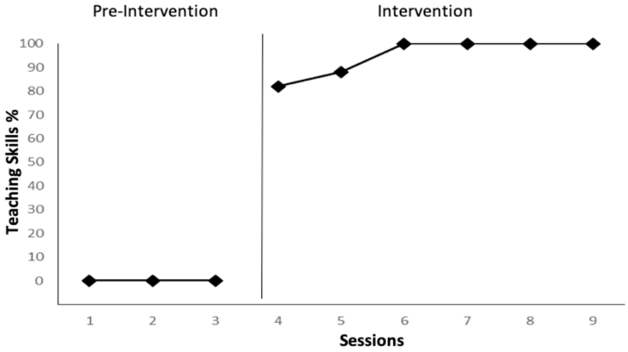

**Figure 3.**
*Third mother's performance*

In conclusion, all three mothers accomplished all objectives of the skill of teaching toileting control to their children in the end-of-teaching assessment at the end of implementing "Program for Supporting Home- and Institution-based Toileting Skills for Families". Accordingly, it is considered that the intervention of "Program for Supporting Home- and Institution-based Toileting Skills for Families" enables mothers to acquire the skill of teaching toileting control to their children.

*Results on Child's Toileting Skills*

On figure 4, it is seen in diaper controls of the first child at the baseline level that child urinated into his diaper during the day, in other words, percentage of urinating into the toilet was 0% while percentage of urinat-ing outside the toilet (in his diaper) was 100%. Considering the records kept by his mother 7 and 14 days after the program ended, it was seen that child always urinates into the toilet. In other words, he sustained toileting control he acquired at level 100%. Accord-ing to curve indicating rates of urination into the toilet, the percentage of urinating regu-larly into the toilet was 80% or higher since the day 15th. When we analyze the graph, it's clearly seen that there is a significant difference between the mean points of baseline and intervention phases. However, there is no overlap between the data points of baseline and intervention phases. Also, when trend in intervention phases is ana-lyzed it's seen that there is an upward trend at data points. Although there are variabili-ties between the data points of intervention phases, the trend is consistent and there is an adequate number of data points to show this consistency. All these graphical ana-lyzing results (Richards, Taylor, & Rama-samy, 2014) show that there is a clear be-havior change between two phases, in oth-er words the child acquired the target skills after the interventions.

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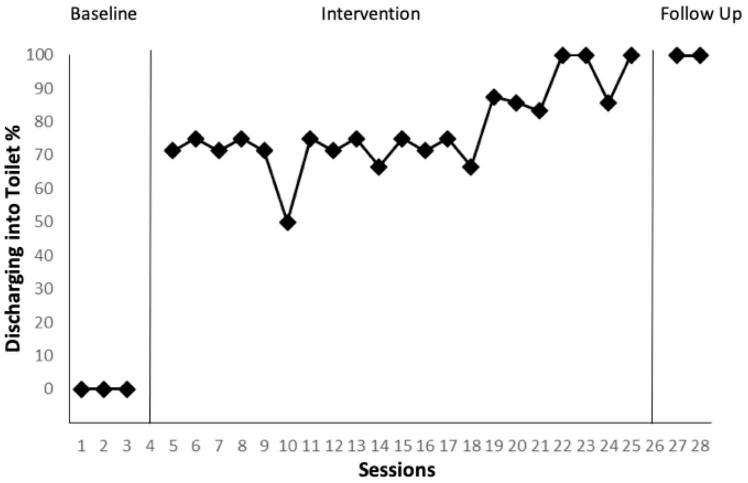

**Figure 4.**
*First child's performance*

When looking at the figure 5, it is seen in diaper controls of the second child at the baseline level that he urinated into his diaper during the day, in other words, percentage of urinating into the toilet was 0% while percentage of urinating outside the toilet (in his diaper) was 100%. Considering the records kept by his mother 7 and 14 days after the program ended, it was seen that he always urinated into the toilet. In other words, he sustained toileting control he acquires at level 100%. According to curve indicating rates of urination into the toilet, the percentage of urinating regularly into the toilet was 80% or higher since the day 12th. When we analyze the graph, it's clearly seen that there is a significant difference between the mean points of baseline and intervention phases. However, there is no overlap between the data points of baseline and inter-vention phases. Also, when trend in inter-vention phases is analyzed it's seen that there is an upward trend at data points. Although there are variabilities between the data points of intervention phases, the trend is consistent and there is an adequate number of data points to show this consistency. All these graphical analyzing re-sults (Richards, Taylor, & Ramasamy, 2014) show that there is a clear behavior change between two phases, in other words the second child acquired the target skills after the interventions.

According to figure 6, it is seen in diaper controls of the third child at the baseline level that she urinated into her diaper during the day, in other words, percentage of uri-nating into the toilet was 0% while percentage of urinating outside the toilet (in her diaper) was 100%. Considering the records kept by her mother 7 and 14 days after the program ended, it was seen that she always urinated into the toilet. In other words, she sustained toileting control she acquired at level 100%. According to curve indicating rates of urina-tion into the toilet, the percentage of urinat-ing regularly into the toilet was 80% or higher since the day 14th. Therefore, it is revealed that "Program for Supporting Home- and Institution-based Toileting Skills for Families" enables mothers to teach toileting con-trol to subjects. When we analyze the graph, it's clearly seen that there is difference between the mean points of baseline and intervention phases. However, there is no overlap between the data points of baseline and intervention phases. Also, when trend in intervention phases is ana-lyzed it's seen that there is an upward trend at data points. Although there are variabili-ties between the data points of intervention phases, the trend is consistent and there is an adequate number of data points to show this consistency. All these graphical analyzing results (Richards, Taylor, & Rama-samy, 2014) show that there is a clear behavior change between two phases, in other words the third child acquired the target skills after the interventions.

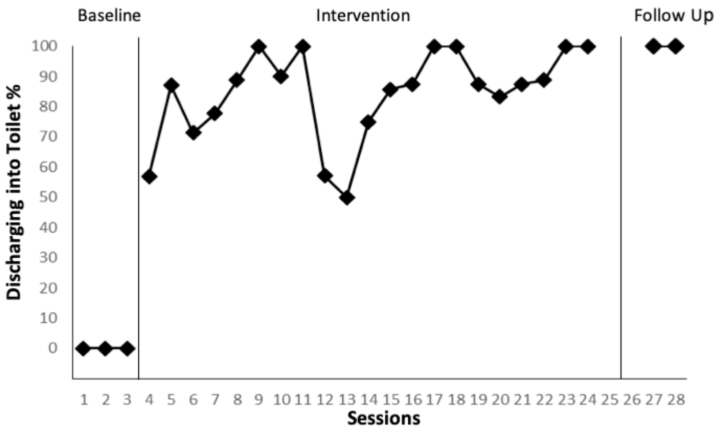

**Figure 5.**
*Second child's performance*

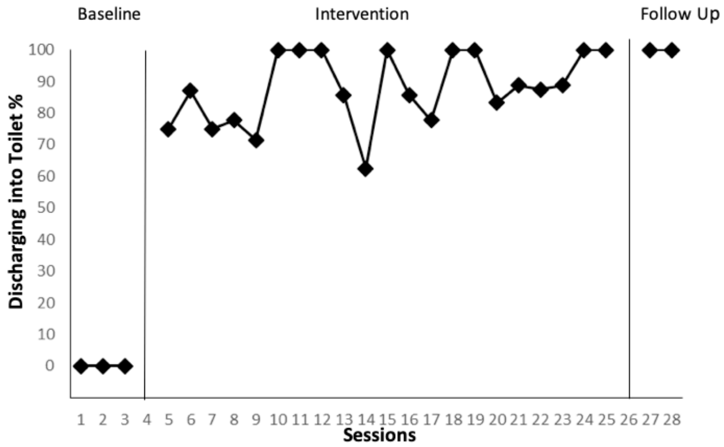

**Figure 6.**
*Third child's performance*

## Discussion and Conclusion

The result of this study has shown that teaching the acquisition of toilet skills which is based on home and institution, and prepared for the mothers of three children two of whom have ASD and one of whom has intellectual disability is effective in teaching parents how to teach their children toilet skills. Data from both homes and the educational center, receiving data at home by parents only and practice at home by mothers made it easy for the children to generalize the acquired skill at home environment. It shows that the mothers performed as they are expected after approximately 3 sessions and they used these skills for their children successfully. Data from the mothers of the children show that they practiced the skills they learned and these skills affected the performance of the children in a positive and fast way.

Findings from this study are consistent with the past studies and it shows that parents are able to teach toilet skills to their children. During and after the study, mothers expressed their contentment to the teachers of their children, the counsellor and the supervisor about the process and their joy as their children acquired toilet skills and they help succeed this achieve-ment. Findings received from the parents are consistent with the result stated by Macias, Roberts, Saylor, and Fussel (2006) as "families having children with toilet train-ing encounter problems due to more stress than families having children with no toilet training". While determining the components of the training, underwear, dense sit schedule and interval reinforcement methods which are thought to be the most efficient components in successful toilet skills training periods were taken as basis. Comunication attempts of children were supported via gestures and verbal supports.

While it is observed that most of the studies included punishment processes, in this study, punishment was not included just like the studies realized only by Cicero and Pfadt (2002) and Keen, Brannigan, and Cuskelly (2007), and only verbal directions and warning after incidents were used.

When investigating the performance graphics of the mothers, it is attracted the attention that performances of the mothers and improvements are so close to each other and there is no difference among them. When investigated the performance data of the children, it has been seen that there are fewer fluctuations in the first participant's performance and progression is more linear. It has been thought that this situation results from second and third participants have the diagnosis of autism spectrum disorder.

In this study, acquiring toilet skills lasted for approximately 20 days. Although most of the children performed 80% successful after 5 days, data was continued to be collected due to variations in data, and at the end of approximately 20 days, the intervention was ended as the data became consistent. In different studies in the literature, in shorter or similar periods toilet skills can be taught (Luiselli, 1994; Hanney et. al., 2013; Ardıç, & Cavkaytar, 2014). In this study, rapid toilet training (RTT) practice by Kırcaali-İftar et al. (2009) was applied with a few modifications and dense toilet training day was not included. In the study, as the mothers were the main performers of practice, there were modifications; however, it is seen that the process resulted in successfully after the intervention. No toilet alarms which are present in the basic study were used in this study. Diapers of the students were checked often and as majority of the study was realized at homes (natural environment) of the children, no such requirements were necessary. Data from the parents show that a limited number of accidents happened at home environment and this situation did not cause any problems for the family. When we take the limited number of studies regarding the toilet training in which families are actively included, it is seen that the active contribution of families is the most important aspect of the studies.

In the study, taking children to the toilet every 30 minutes and sit 5 minutes were taken as basis. The duration of the class recess was gradually increased to 45 and 60 minutes, based on the fact that the diaper was dry three times or the discharge to the toilet was determined in the process. Demetriou and Toussaint (2016) stated that studies are necessary for different sitting and recess periods in their study. Furthermore, the study findings show that the increased duration of the 30-minute period and the later periods are accepted by the families and that the families are able to perform the practice appropriately.

## Limitation of the Study

The present study can be criticized because of the use of the EU pattern and the weakness of this design in terms of experimental validity. Due to the fact that the study will be carried out in a natural environment, it is not possible to use experimentally stronger designs because the variables are difficult to charge and families want to start working quickly and get results quickly. However, the findings show the effect of the intervention and the effect is repeated in different subjects. However, in the new studies to be carried out, the study can be performed by using different experimental designs.

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# The Sensory Characteristics of Children with Autism Spectrum Disorder: Teachers' Observation

**Abstract**

*The study aimed to identify the sensory characteristics of children with autism spectrum disorder (ASD) as estimated by their teachers. Descriptive surveying approach was used to suit the nature of the study. The researchers selected a simple random sample consisting of (40) teachers from (6) centres for autistic children in Amman, Jordan. The tool used in this study was a checklist consisted of 38 items. The collected data were analysed and then expressed through means and standard deviations. In addition, t-test was used to determine significance of the differences. The results revealed that the sensory characteristics of children with ASD were often evident in the study sample. The characteristics of children with ASD in the sensory domain were ranked as follows: First; tactile stimuli, second; olfactory and tasting stimulants, third; visual stimuli, and finally the auditory stimuli. The results showed that there were no statistically significant differences in the study sample attributed to age except the tactile stimuli and the differences were in the favour of age (3-6). Implications and recommendations are presented.*

*Keywords: children, autism spectrum disorder, sensory characteristics, special education teachers, DSM-5.*

## Introduction

Autism spectrum disorder (ASD) is a developmental disability defined by diagnostic criteria that include deficits in social communication and social interaction, and the presence of restricted, repetitive patterns of behaviour, interests, or activities that can persist throughout life (American Psychiatric Association, 2013). In 2018, the Centres for Disease Control and Prevention issued their ADDM autism prevalence report. The report concluded that the prevalence of autism had risen to 1 in every 59 births in the United States – twice as great as the 2004 rate of 1 in 125 – and almost 1 in 54 boys (Baio et al., 2018). It is considering as an international alert to focus and give an attention in terms of diagnosis, assessment, education, training, treatment, early intervention and rehabilitation to this category of disabilities. According to Act of Education of Persons with Special Educational Needs and the Jordanian Law on the Rights of Persons with Disabilities, autism spectrum disorder has been seen as a separate disorder. Its diagnosis requires assessment of the child's condition by a

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multidisciplinary team comprising a neurologist, a psychologist, a psychiatrist, a paediatrician, a language specialist, a speech therapist, a occupational therapist and an educational specialist (Zureiqat & Imam, 2007).

In 2013, the American Psychiatric Association (APA) issued the fifth new version of the Diagnosis and Statistical Manual of Mental Disorders (DSM-5), which resulted in changes in the diagnosis of some psychiatric illnesses that differ from the previous DSM-IV- TR (2000) (American Psychiatric Association, 2013; Kulage, Smaldone, & Cohn, 2014). According to the above-mentioned manual and in addition to the core deficits that have been indicated in the above definition, the sensory characteristics included in more details and included in the criteria for ASD for diagnosis. The common characteristics – according to the DSM-5- are difficulties in social interaction, communication, rigidity and repetitiveness (American Psychiatric Association, 2013). The most described features as well as the neuro-typical features include "tactile sensitivity, auditory filtering and visual processing" (Muratori, Tonacci, Billeci, Catalucci, Igliozzi, Calderoni & Narzisi, 2017, p. 3243).

The social interaction difficulties were confirmed by several researchers who stated that these difficulties are caused by sensory features which was found in the children with ASD with a percentage of 69%-95% (Baranek, David, Poe, Stone, & Watson, 2006; Dugas, Simard, Fombonne, & Couture, 2018; Glod, Riby, Honey, & Rodgers, 2015; Hazen, Stornelli, O'Rourke, Koesterer, & McDougle, 2014; Schaaf & Lane, 2015). Schaaf and Lane (2015) in their literature review focused with more details on the sensory features associated with ASD which cause social development and interaction due to the surrounding social environment as they considered these features as core symptoms of children with ASD (Schaaf & Lane, 2015). According to Dugas et al. (2018) different sensory features were cited such as "atypical hearing reactivity, tactile hyperactivity, and gustatory, olfactory hyperactivity, weakness of endurance and tonicity that could indicate atypical proper inceptive reactivity" (p. 2).

Probably more research from -the medical perspective- have been done in this area, but less research –from educational perspective- has been conducted. It has been reported that these sensory characteristics can influence student behaviour during the teaching- learning process (Caplan, Feldman, Eisenhower & Blacher, 2016; Sakarneh, 2014a). Sensory characteristics of children with ASD may also hinder their interaction and restrict them from acting effectively during their communications with others (Dugas et al., 2018; Samson, Phillips, Parker, Shah, Gross, & Hardan, 2014; Tomchek & Case-Smith, 2009; Watson, Patten, Baranek, Poe, Boyd, Freuler, & Lorenzi, 2011). Sensory characteristics can manifest during the school day, which consume half of the learning time of children with ASD's. Therefore, teachers and other educational stakeholders are considered to be observers, interveners and behaviour modifiers to guarantee that teaching and learning process goes smoothly and productively (Sakarneh, 2015; Sakarneh, Paterson & Minichiello, 2016) Otherwise, the relationship between teachers and students with ASD will be negatively affected (Caplan et al., 2016; Sakarneh, 2014b). Consequently, it is important to explore the types of sensory characteristics so that teachers and other educational stakeholders could consider these characteristics and introduce them to other researchers from different scientific research backgrounds as ground-based observations by teachers.

As mentioned above, most of the research in the field of sensory characteristics on children with ASD has been conducted by researchers with medical and more specific neurological backgrounds. For instance, in the latest study conducted by Posar and Visconti (2018) to explore the main features of sensory abnormalities in children with ASD, the researchers in summarizing the previous studies in the field, found that the research cited the most common features which were hypo-responsiveness, hyper-responsiveness, sensory seeking and enhanced perception. To compare tools of research in the area of sensory features of children with ASD, research found that observations and questions are valid and congruent in exploring the presence of sensory reactivity symptoms (Tavassoli, Bellesheim, Siper, Wang, Halpern, Gorenstein, Grodberg, Kolevzon & Buxbaum, 2016). A study by Yasuda, Hashimoto, Nakae, Kang, Ohi, Yamamori, Fujimoto, Hagihira and Takeda (2016) found that fifteen individuals with ASD reacted to pain in three different stimuli; cold, heat and electricity. Their tools were the visual analogue scale (VAS and the short-form McGill Pain Questionnaire). Another study conducted by Green, Chandler, Charman, Simonoff & Baird, (2016) aimed at comparing groups of children with ASD with other special educational needs categories to examine the applicability of new criteria in DSM-5 in terms of responsiveness to sensory stimuli among these groups. The sample consisted of 116 children with ASD and 72 children without ASD. The researchers reported that atypical sensory behaviour was found in 92 % of ASD especially with severe ASD and 67 % of other categories of special education needs. Other researchers tried to classify children with ASD based on their sensory subtypes in a sample of 228 aged 2-10 years (Lane, Molloy & Bishop, 2014). Moreover, four sensory subtypes were extracted; sensory adaptive, taste smell sensitive, postural inattentive and generalized sensory difference. According to the study, these subtypes – clinically- can be clustered into two main groups in relation to their effect on the children with ASD that are: sensory hyperactivity; and difficulties with multi-sensory processing which by the process of early intervention can be more effective (Lane et al., 2014). To confirm types of sensory in children with ASD, a survey study involved caregivers conducted online by Ausderau, Sideris, Furlong, Little, Bulluck and Baranek (2014). The sample consisted of 1307 caregivers of children with ASD aged 2-12 years using Sensory Experiences Questionnaire Version 3.0 with a confirmatory factor analytic model with four substantive factors of hypothesized sensory response patterns (hyper-responsiveness; hyper-responsiveness; sensory interests, repetitions and seeking behaviours; enhanced perception). The results confirmed the mentioned four factors regardless of the child age, sex or economic background. Other types of cross-cultural studies relied on qualitative methods to understand deeply the symptoms of ASD in different ages (Chamak, Bonniau, Jaunay & Cohen, 2008). The study reported that the core ASD symptoms were atypical perceptions and processing of sensory information and abnormal emotional regulation (Chamak et al., 2008). These symptoms can be stable under the age of six, which can help parents, therapists, teachers in detecting and improving functional and psychosocial outcomes (Repetto, Jasmin, Fombonne, Gisel & Couture, 2017).

Moving from general concepts of sensory features to more specific sensory terms, for auditory sensory, most of the research reported that the individuals with ASD confront difficulties (Ben-Sasson, Cermak, Orsmond, Tager-Flusberg, Carter, Kadlec & Dunn, 2007; Greenspan, Weider, 1997; Tomchek & Case-Smith, 2009) either auditory hypersensitivity (Bettison, 1994; Gillberg & Coleman, 1996) or under-responsivity (Baranek, 1999; Osterling & Dawson, 1994) and some having reasonable auditory discrimination (Jones, Happé, , Baird, Simonoff, Marsden, Tregay, Phillips, Goswami, Thomson & Charman, 2009). For visual sensory, eye contact of individuals with ASD was early documented. Studies showed that children with ASD avoid contacting others and it is a recognized visual sensory feature (Baranek, 1999; Gillberg & Coleman, 2000; Kientz & Dunn, 1997 & Sabatos-DeVito, Schipul, Bulluck, Belger, & Baranek, 2016). Tactile also reported in the early literature as one of the sensory features of individuals with ASD (Baranek, Foster, & Berkson, 1997; Ben-Sasson, Hen, Fluss, Cermak, Engel-Yeger, Gal, 2009). In addition, studies found that children with ASD are sensitive to touch and they feel uncomfortable, confused, distracted and react abnormally (Baranek et al., 1997; Cesaroni & Garber, 1991). Individuals with ASD are under-sensitive in olfactory and having difficulties in identifications, which is related to "peripheral or cortical olfactory structures level" in the brain (Muratori, Tonacci, Billeci, Catalucci, Igliozzi, Calderoni, & Narzisi, 2017, p. 3244).

The importance of the current study is that it is one of the first studies that examined the issue of the sensory features of children with ASD, as most studies was conducted on the fourth manual and there are no studies-as far as the researchers know- in the region on the fifth manual in regarding the sensory features. The new diagnostic criteria of ASD have been reported to be more accurate and more useful in medical and scientific terms regarding to diagnosis of individuals with ASD. The prediagnostic features of the autism spectrum disorder mentioned, in the fourth edition of the manual have been criticized by some specialists (Herman, 2000; Marshall, Spitzer, Liebowitz, 1999; Rounsaville, Alarcón, Andrews, Jackson, Kendell, Kendler, 2002). Therefore, teachers, researchers and parents of children with ASD in Jordan may make use of this study.

The process of detection and identification of the sensory features of the child with ASD is considered very important in terms of their diagnosis. The diagnosis of this category has to be built on different criteria and should be based on accurate measurements to identify it correctly. Such diagnostic tools are supposed to have psychometric features such as the manual (DSM-5). The American Psychiatric Association (APA) has published the manual, which has been confirmed for its validity and reliability (Rellini, Tortolani, Trillo, Carbone, & Montecchi, 2004).) Some individuals who were previously diagnosed with developmental disorders (such as autism) due to some other diagnostic tools may not now be diagnosed with autism disorder when using the most accurate diagnostic features in the new released version of DSM (Rellini et al.,2004). This may be particularly useful for children with attention deficit hyperactivity disorder, who have minor problems with social skills who have been diagnosed with autism disorder in fact (Rellini et al., 2004). The current study is designed to identify the sensory features of children with autism spectrum disorder assessed by teachers by applying the DSM-5 criteria to a group of children with ASD and specifically to answer the following questions:

- What are the sensory features of children with autism spectrum disorder?
- Do teachers' estimates sensory characteristics of children with ASD differ according to the child's age?

## Method

The researchers used a descriptive survey method. The study population consisted of teachers and children with ASD in Amman, Jordan. The researchers chose a simple random sample that consisted of (40) teachers from (6) centres for children with ASD in Amman, Jordan.

### *Participants*

The participants in the current study were 40 teachers working in 6 autism centres in Amman city. Table (1) shows the demographic information of the participants. For confidentiality considerations, the participated centres were given numbers as it can be seen in the table. The children's ages ranged between 3-10 years. Autism centres in Jordan usually accept children with ASD under formal diagnostic measurements, which include medical comprehensive diagnosis and other aspects of diagnosis such as intelligent quotient, adaptive behaviour, language and speech disorders, psychology and educational assessment. Such comprehension diagnosis usually conducted in the National Centre for Early Disabilities Diagnosis, which follows to the Jordanian Ministry of Health. For example, the specialists in the mentioned centre use international standardised diagnostic scales and checklists such as the Autism Behavioural Checklist. Therefore, the child with ASD has to be referring by the National Centre for Early Disabilities Diagnosis. Teachers who work in autism centres must have a special education qualification and have ability to work with ASD under general supervision of the Ministry of Social Development.

### *Instrument*

The researchers developed a survey checklist using two types of resources; the first one was the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) by extracting the items that measure the sensory characteristics of ASD (American Psychiatric Association, 2013), whereas the second resource was the literature related to the topic (mentioned in the introduction). The checklist in its final draft consisted of (38) items that covered four dimensions of the sensory characteristics, namely: Tactile Stimuli, Olfactory and Tasting Stimuli, Visual Stimuli and Auditory Stimuli. The researchers defined the degree to which a child with ASD is diagnosed according to DSM-5 and the related literature in the features of auditory stimuli, tactile stimuli, visual stimuli and olfactory and tasting stimuli. Each item was observed by using a 5-point Likert-type scale that ranged from 5: always, 4: often, 3: sometimes, 2: seldom and 1: never. This means that the minimum score will be 38 and the maximum score will be 190.

**Table 1.**
*Demographic of the Participants*

| Centre's Number | Number of Teachers | Teacher's Qualification | Years of Experience | Teachers' Gender | Number of Students in the Centre |
|---|---|---|---|---|---|
| **1** | 4 | Bachelor/Special Education | 4 | Female | **25** |
| | 2 | Bachelor/Special Education | 5 | Female | |
| **2** | 2 | Bachelor/Special Education | 6 | Female | **20** |
| | 3 | Bachelor/Special Education | 3 | Male | |
| **3** | 2 | Graduate Diploma/ Special education | 7 | Male | **23** |
| | 4 | Bachelor/Special Education | 4 | Female | |
| **4** | 6 | Bachelor/Special Education | 2 | Female | **36** |
| | 2 | Graduate Diploma/ Special education | 5 | Male | |
| **5** | 5 | Bachelor/Special Education | 2 | Female | **32** |
| | 2 | Bachelor/Special Education | 4 | Female | |
| **6** | 6 | Bachelor/Special Education | 3 | Female | **40** |
| | 2 | Graduate Diploma/ Special education | 6 | Female | |
| **Total** | **40** | | | | **176** |

*Validity and Reliability*

The initial draft of the study instrument was written in English before it was translated into Arabic as the first draft consisted of 45 items. After the translation of the checklist into English, the researchers asked an independent English Language specialist (translator) for proofreading who made some changes in the translated version. In order to ensure the validity of the instrument, the researchers ensured the validity of the Arabic version of the instrument by consulting a group of five referees who are specialized in the field of special education at two Jordanian universities; Jordan University and Al-Balqa Applied University. Their role was to confirm whether the content of the instrument was accurate and adequate in terms of language clarity, check the relevance of each item to the related dimension, which is part of the main checklist and to provide any additional comments or corrections. Changes were made according to the recommendations and notes of the validation panel. The checklist was revised according to their feedback by omitting, adding or rephrasing some items, decreasing the number of items from 45 to 38 and then were distributed on the previous dimensions. In order to estimate the reliability of the checklist, internal consistency measures were computed using Cronbach's alpha. The reliability coefficient obtained was 0.80, which is considered sufficient for the purpose of the study.

*Ethical considerations*

The children and the teachers, who participated in the study, were informed by the researchers about the aim of the study and that their participation and responses will be treated confidential and their names will be kept anonymous. The parents signed a consent form. The study protocol was reviewed and approved by the institutional review board in Al-Balqa Applied University where the researchers belong to. The Ministry of Social Development issued an approval letter to the targeted centres.

*Data collection*

After explaining the purpose of the study, the researchers distributed the checklist among the teachers of the children with ASD through the participated centres at the beginning of the second semester of the 2017–2018 academic year. All of these centres are private but under the supervision of the government through the Ministry of Social Development. The Ministry of Social Development identified all these centres, as the Ministry is the main body that authorised and follow up these centres. The researchers encouraged and politely asked the participants to read the checklist carefully and fill it appropriately. Instructions of the study tool were given to the participants to ensure that they understand how to fill the checklist.

*Data analysis*

Data were analysed using the Statistical Package for Social Sciences (SPSS) version 22 to find the means and the standard deviations of the sample responses to the first and second question. In addition to that, T-test was used to analyse the results of the second question to see if there are any variances to determine significance of the differences as the children's age divided into two groups; 3-6 and 7-10.

## Results

To answer the first research question: what are the sensory features of children with ASD? The researchers used the means and standard deviations of the sample responses of the study as shown in Table (2).

As shown in the above table, the estimates of the study sample for the sensory characteristics of children with ASD were averaged (3.67) and indicated that they were present in children with ASD at an estimated (often). The tactile stimuli ranked first with an average of (4.53), features of Olfactory and Tasting Stimuli with an average of (3.50), features of Visual Stimuli came third with an average of (3.36), and features of Auditory Stimuli came fourth with an average of (3.30). This indicates that the diagnostic evidence contributes significantly to the determination of the sensory characteristics of children with ASD as estimated by the teachers. To illustrate the responses to each dimension of the study, the researchers used the means and the standard deviations for each dimension. Tables (3, 4, 5 and 6) present the results.

**Table 2.**
*The Means and Standard Deviations of the Sample Responses of the Study*

| Number | Dimension | Mean | SD | Response |
|---|---|---|---|---|
| 1 | Features of Tactile Stimuli | 4.53 | 0.89 | Always |
| 2 | Features of Olfactory and Tasting Stimuli | 3.50 | 0.81 | Often |
| 3 | Features of Visual Stimuli | 3.36 | 0.97 | Often |
| 4 | Features of Auditory Stimuli | 3.30 | 0.98 | Often |
| **Total** | | 3.67 | 0.91 | **Often** |

**Table 3.**
*Features of Auditory Stimuli*

| N | Item | Mean | SD | Response |
|---|---|---|---|---|
| 1 | Get upset by some sounds that are not considered high | 3.90 | 0.92 | Often |
| 2 | He puts his hands on his ears when he hears any sound that bothers him | 3.51 | 0.97 | Always |
| 3 | Hears sounds not heard by others (excessive hearing sensitivity) | 3.50 | 0.99 | Always |
| 4 | Does not respond to high sounds (low audio sensitivity) | 4.49 | 1.035 | Always |
| 5 | Shows that he does not hear anything (such as deaf children) | 4.29 | 1.16 | Always |
| 6 | It is attracted towards specific types of music | 4.28 | 1.09 | Always |
| 7 | He does not respond to his name when he Called | 4.23 | 1.06 | Always |

**Table 4.**
*Features of Tactile Stimuli*

| N | Item | Mean | SD | Response |
|---|---|---|---|---|
| 1 | Excessive responses towards touching others | 3.90 | 1.12 | Often |
| 2 | He avoids being touched by anyone | 4.43 | 1.16 | Always |
| 3 | He avoids being hugged by anyone | 4.38 | 1.13 | Always |
| 4 | Keep away from others if they approach him | 4.15 | 1.18 | Always |
| 5 | Not feeling any sense of touch | 4.12 | 1.14 | Always |
| 6 | Do not feel pain when hurt | 4.09 | 1.19 | Always |
| 7 | Enjoying games based on physical contact | 4.08 | 1.25 | Always |
| 8 | Do not feel pain when falling hard | 4.75 | 1.20 | Often |
| 9 | He does not feel pain when he is injured | 4.70 | 1.16 | Always |
| 10 | Avoid touching some surfaces | 4.60 | 1.14 | Always |
| 11 | Avoid wearing some clothes | 4.40 | 1.12 | Always |
| 12 | Avoid shaking hands with others | 4.43 | 1.16 | Always |

**Table 5.**
*Features of Visual Stimuli*

| N | Item | Mean | SD | Response |
|---|---|---|---|---|
| 1 | He has difficulty seeing some visual stimuli | 4.10 | 0.97 | Always |
| 2 | Avoid seeing some colors | 4.01 | 1.01 | Always |
| 3 | It makes you feel that he is seeing invisible things | 3.99 | 0.99 | Often |
| 4 | Avoid visual communication with others | 3.91 | 1.02 | Often |
| 5 | Staring for a long time in a space or specific something | 3.71 | 1.05 | Often |
| 6 | Avoid some lights | 3.45 | 1.17 | Often |

**Table 6.**
*Features of Olfactory and Tasting Stimuli*

| N | Item | Mean | SD | Response |
|---|---|---|---|---|
| 1 | Tends to smell exotic odors | 4.45 | 1.17 | Always |
| 2 | Sniffing People before starting to communicate with them | 4.45 | 1.20 | Always |
| 3 | Smells the people's hair | 4.39 | 1.13 | Always |
| 4 | Tends to unusual foods | 4.36 | 1.15 | Always |
| 5 | prefer eating one kind of food for a long time | 4.39 | 1.20 | Always |
| 6 | Licking things with his tongue | 4.20 | 1.20 | Always |
| 7 | Put his clothes or bed covers or curtains in his mouth | 3.45 | 1.17 | Often |
| 8 | Hate specific kinds of food extremely | 3.45 | 1.20 | Often |
| 9 | Recognize medicinal drugs in food or juice | 3.39 | 1.13 | Often |

*Answering the second research question: Do teachers' estimates of sensory characteristics of children with ASD differ according to child's age?*
The researchers used the mean and standard deviations and t-test according to the age variable. Table (7) shows the results.

Table (7) shows that there were no statistically significant differences in the response of the study sample attributed to the children with ASD' age except for the tactile stimuli. The differences were in the favour of age 3-6.

## Discussion

In general, the results revealed that there were overall indications of impairments in the sensory stimuli in children with ASD. These results are consistent with previous literature conducted in this arena (Ausderau et al., 2014; Chamak et al., 2008; Dugas et al., 2018; Kientz & Dunn, 1997; Posar & Visconti, 2018; Samson et al., 2014; Schaaf & Lane, 2015; Tomchek & Case-Smith, 2009; Watson et al., 2011) and confirmed the criteria of the sensory characteristics in the DSM-5. However, the features of auditory stimuli came fourth among the four dimensions and this was in contradiction with most of the studies which found that the auditory stimuli difficulties is the most common feature by which children with ASD can be recognized (Baranek, 1999; Bettison, 1994; Gillberg & Coleman, 1996; Greenspan, Weider, 1997; Osterling & Dawson, 1994; Tomchek & Case-Smith, 2009). Features of tactile stimuli scored high among the four dimensions and this result is consistent with some studies (Baranek et al., 1997; Cesaroni & Garber, 1991) but not in such order as most of the research conducted involving three common perceptions and their findings- respectively- were; auditory, visual and tactile impairments (Schaaf & Lane, 2015).

Moreover, the results showed that there were no statistically significant differences in the response of the study sample attributed to the age of children with ASD's except for the tactile stimuli. The result is inconsistent with some studies (Repetto, Jasmin, Fombonne, Gisel & Couture, 2017) as the mentioned study reported that ASD symptoms are stable under the age of six. However, it compatible with some research, as Ben-Sasson et al. (2009) reported that sensory features increased from 0 to 6 years; peaked at ages 6–9 years and declined after 9 years of age.

**Table 7.**
*Results of T-Test of The Responses of the Study Sample According to the Age Variable of Children with ASD*

| Features / Age | 3-6 | | 7-10 | | | Actual significance level | Significant at α = 0.05 level |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | T | | |
| Tactile Stimuli | 29.320 | 4.07 | 26.561 | 4.35 | 1.054 | 0.01 | Significant |
| Olfactory and Tasting Stimuli | 20.870 | 4.47 | 20.96 | 5.59 | 4.048 | 0.10 | Not Significant |
| Visual Stimuli | 23.960 | 6.64 | 24.01 | 7.10 | 0.82 | 0.051 | Not Significant |
| Auditory Stimuli | 28.670 | 8.065 | 29.07 | 9.43 | 2.36 | 0.28 | Not Significant |
| **Total** | 102.82 | 47.76 | 107.89 | 39.24 | 3.32 | 0.07 | Not Significant |

## Conclusion, Implications and Recommendations

The current study aimed at detecting and identifying the sensory characteristics of the child with ASD. It can be concluded that there are a ground applications of the DSM-5 criteria and this criteria is observable in the centres of the ASD. Therefore, the different perspectives of the sensory features in children with ASD are congruent. Based on the findings of the study, a priority should be given to the measurement and evaluation of tactile stimuli of children with ASD. In more practical terms, educational stakeholders are recommended to apply different behavioural modification programs focusing in developing tactile stimuli in children with ASD and considering the tactile sensory stimuli of autism spectrum disorders when developing an individual therapy program. In addition of that, there are a necessity of developing a programs of treatment based on sensory integration to develop the sensory features of children with ASD. Moreover, more focus should be given to the social integration of children with autism spectrum disorder to reduce the sensitivity of the touch. The diagnosis of children with ASD must be built on different criteria and should be based on accurate measurements to identify it correctly especially before the age of 3 years. It can be suggested that future directions of research in this area could be focus on exploring the correlation between the sensory features and daily life skills of children with autism spectrum disorder.

## Limitations of the Study

The study has some limitations restrict it from generalizations. The study sample was selected from the autism centres in the capital governorate, Amman. The sample of the study was limited to groups of children whose age ranges between (3 - 10) with ASD. The study was limited to the sensory characteristics of children of ASD in autism centres in Amman. The generalization of results is limited to the extent to which the sample of the study responds to the checklist used in this study.

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# Prompting Peers' Use of Choices to Promote Communication in Children with Autism Spectrum Disorder

***Abstract***

*The purpose of this research was to determine the effect of prompting a preschool student to use choice making with a peer identified with autism spectrum disorder. The researchers used a single case research design. Researchers provided prompting across three thematic play activities. Results show that there was an initial effect in the first activity, which may have resulted in a carry-over effect in the other two activities. While peer-mediated instruction can be an effective method for increasing the dosage of learning opportunities that children with autism spectrum disorder experience in early childhood settings, peers may need more training or ongoing support to sustain their interactions with the child in a meaningful way.*

Keywords: *choice making, autism spectrum disorder, peer-mediated intervention, early childhood*

## Introduction

Currently one in 59 children are identified with autism spectrum disorder (ASD; Center for Disease Control [CDC], 2020), and children are receiving their diagnoses of ASD at younger ages (Guthrie, Swineford, Nottke, & Wetherby, 2013; Henderson, 2009). The Division for Early Childhood (DEC, 2014) suggests and IDEA (Individuals with Disabilities Education Act, 2004) mandates that young children with disabilities, including ASD, receive their special education services in their natural or least restrictive environment. For preschool-aged children with ASD, this might be an inclusive early childhood special education (ECSE) classroom (Koegel, Matos-Freden, Lang, & Koegel, 2012). Inclusive ECSE classrooms offer access, support, and participation to all children despite any diverse characteristic a child might present (DEC/NAEYC, 2009). The benefit of these inclusive natural settings is they allow the child to practice various skills across daily routines and activities, increasing the

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likelihood they will use those skills in a functional manner and be able to generalize them to new settings, materials, and people (DEC, 2014; Johnson, Rahn, & Bricker, 2015; Stanton-Chapman, Kaisar, Vijay, Chapman, 2008). One area of targeted intervention for many children with ASD is social-communication, as this is a challenge for children with ASD (Dawson et al., 2004). Moreover, children, particularly those with disabilities, need frequent opportunities to practice social communication skills so that these skills are attained, which is why it is critical to incorporate multiple and varied opportunities to practice communication throughout daily routines and activities (Johnson et al., 2015). One way to embed opportunities to practice social communication skills across daily activities and routines is through providing prompts such as choice making (Coogle, Floyd, Hanline, & Kellner-Hiczewski, 2013).

### *Choice Making*

Choice making is a time delay strategy that involves a play partner providing choices for the child with ASD, and then using wait time to provide an opportunity for the child with ASD to respond by selecting a choice (Coogle et al., 2013). Offering choices is a developmentally appropriate method for supporting children, because the child hears a language model by the play partner labeling items within the environment (i.e., the two or more choices), and then the child has the opportunity to respond and thus engage in a social communicative interaction. Offering choices also creates an interaction in which the child with ASD is pragmatically obligated to respond, and if he or she does not, it is appropriate for the partner to scaffold a response through prompting, wait time, and modeling the target communication. In addition, choice making does not require children with ASD to initiate an interaction, but it does engage them socially, providing opportunities for them to learn how to respond, reject, and take turns during an interaction. Thus, choice making can establish a foundation upon which to build other pragmatic interaction skills.

Although providing opportunities for children to practice target skills is important (Coogle et al., 2013; Grisham-Brown et al., 2000; Horn et al., 2000), research suggests that children do not receive the number of practice opportunities necessary to attain a skill (Pretti-Frontczak & Bricker, 2001; Rahn et al., 2019). For example, research has demonstrated that teachers provide opportunities most often during one-on-one activities with a child, and they typically utilize a limited number of opportunities (i.e., questions), and the opportunities that teachers provide do not always align with the child's individualized education plan (IEP) goals (Rahn et al., 2019). Moreover, research indicates that opportunities such as choice making should be used across daily activities and routines (Pretti-Frontczak & Bricker, 2001). Children with ASD need multiple practice opportunities to attain and generalize social communication skills, making it critical to identify strategies that can increase their number of practice opportunities. Allowing peers to serve as interventionists within natural routines and activities of the environment (e.g., free play, mealtimes, circle time) may be a promising way to increase the frequency of opportunities to practice skills.

### *Peer-Mediated Interventions*

One intervention with documented effectiveness in promoting positive outcomes for children with ASD is peer-mediated intervention (PMI; Katz & Girolametto, 2013; Wong et al., 2014). PMI allows the teacher to pair a child with ASD with a peer without disabilities who provides the intervention, and PMI provides opportunities for peer-to-peer social interactions (Katz & Girolametto, 2013; Wong et al., 2014). Researchers have found positive effects of PMIs in the classroom and on the playground for children between the ages of 3 and 8 years with ASD (Katz & Girolametto, 2013; Sperry et al., 2010; Watkins et al., 2015). Positive outcomes associated with PMIs have included (a) increasing the number of opportunities for interactions between children with ASD and their peers, (b) increasing the frequency and length of interactions between peer-mediators and children with ASD, (c) increasing peers' use of prompts and reinforcement while interacting with children with ASD, and (d) enhancing the independence of peers and minimizing adult supports required during peer interactions (Katz & Girolametto, 2013; Sperry et al., 2010; Watkins et al., 2015; Whalon, Conroy, Martinez, & Werch, 2015).

Often PMIs used in early childhood settings are structured so that peer models are taught prior to an intervention how to interact and respond to their peers with

ASD (Ganz & Flores, 2008; Jung, Sainato, & Davis, 2008; Katz & Girolametto, 2013). For example, researchers using PMIs have taught peer models to initiate play with their peers with ASD by using prompts and reinforcement (Jung et al., 2008; Katz & Girolametto, 2013), or by using modeling and visual supports (Ganz & Flores, 2008). Although these results of PMI studies are promising for enhancing the inclusion of children with ASD, there is no research examining the effects of peer models serving as interventionists to target specific IEP goals, such that the child with ASD has multiple opportunities to practice the target goal within the inclusive ECSE environment (Watkins et al., 2015). Most studies of PMI involve training the peer prior to implementing treatment (Watkins et al., 2015). Researchers teach the peer what to do and have them practice it. When peers serve as models and interaction partners to address specific IEP goals within the ECSE environment, such training of the peer in advance is not always feasible. Instead, adults coach the peer to use a specific strategy so that the peer is the interaction partner with the child with ASD. The field currently does not have any data regarding whether these efforts result in any sustained effect on outcomes for the peers interacting with the child. Yet, this information is an important consideration when planning intervention, given the realities of intervention dosage within the classroom setting. Furthermore, using peers as the primary interaction partner during treatment to address social communication goals has practical importance because children with ASD need to learn to socially interact not just with the adults providing treatment (typically teachers, paraeducators, and clinicians), but also with the children in their classrooms.

### *The Current Study*

The focus of the current study was to investigate whether a peer model could be prompted to offer choices to a child with ASD during three different play activities. Although PMI has documented effectiveness in improving targeted outcomes for children with ASD, little research has investigated the effect of systematically prompting peers to serve as the interventionists to embed a specific strategy aligning with an IEP goal within inclusive ECSE classrooms during center play. Furthermore, there is no research revealing whether such prompting during the interactions can result in the peer spontaneously offering choices, or continuing to offer choices after the interventionist stops providing prompts. Therefore, we sought to add to the existing literature by examining the following research questions:

1. Is there a functional relation between prompting a peer to use choice making and the peer's prompted and/or spontaneous use of choice making during play interactions with a child with ASD?
2. What are the child with ASD's associated communicative outcomes?

## Method

### *Participants and Setting*

One child with ASD, Kai, and one peer model, Julianna, participated in the study (both pseudonyms). Both were white non-Hispanic, four-year-old children who attended preschool in one public elementary school in a small Mid-Atlantic city. Kai was a male, identified with ASD. Based upon observation by the first author and confirmed by the teacher through self-report, Kai used vocalizations, single words, and two-word phrases to communicate in the classroom; however, he did not use his language to initiate communication or exchange information. For example, when Kai communicated, his communication was not directed at anyone. In addition, his teacher indicated that she had heard him say approximately 10 different words. Therefore, the teacher shared that one of his goals was using communication to express his wants and needs. Upon explanation of the research, the classroom teacher selected Julianna from several possible options to serve as the peer because she exhibited characteristics that aligned with those identified in the PMI literature (Katz & Girolametto, 2013; Sperry et al., 2010). For example, her teacher reported that she demonstrated strong language and social skills, had good attendance, inquired about where Kai was when absent, and demonstrated curiosity when he became upset.

All sessions were completed in Kai and Julianna's classroom by one of two white, non-Hispanic, undergraduate research assistants who were unfamiliar with research and the purpose of the study (hereafter referred to as the coaches). The setting was an inclusive preschool classroom. The classroom was organized by centers (e.g., dramatic play, blocks, and tub table). Each session took place during choice time in the morning. During each session, Julianna and Kai sat and played with thematic toys that the coaches brought into the classroom to ensure the novelty of the items was consistent across each theme (i.e., Grocery Store, Doctor's Office, or Post Office). Toys included developmentally appropriate items that would typically be found in the sociodramatic play area of a preschool classroom. For example, for the Grocery Store theme, toys included a grocery cart, fruits, and vegetables; for the Doctor theme, toys included a doctor's kit, stroller, and a baby doll; and for Post Office theme, toys included envelopes, paper, and stickers. The goal was to follow the guidelines suggested by previous research, but to maintain what would typically be found in a classroom, and to maintain experimental control (across play routines). An iPad™ was used to video and audio record all sessions and was set up by the coach prior to each session. Upon completion of each session, Julianna received a sticker and Kai received gummies; these were desired items that the classroom teacher suggested we use to provide reinforcement to the children.

### *Research Design*

A single-case multiple-probe design across thematic play routines was used to examine the effect of coaching Julianna to offer Kai choices on Julianna's prompted and spontaneous use of choice making (Horner & Baer, 1978; Gast, Lloyd, & Ledford, 2014). We selected a multiple-probe design because Julianna's use of choice making was not expected to change prior to the onset of intervention. We randomized the order in which we began intervention with each set of play materials to strengthen the design of our study (Kratochwill & Levin, 2010). Based on randomization, we introduced the prompting intervention during Doctor's Office, followed by Post Office, and then Grocery Store. Basic requirements for What Works Clearinghouse standards were met by introducing the independent variable systematically, using two observers to measure all outcome variables, and obtaining inter-observer agreement (IOA; Kratochwill et al., 2010). Our research met What Works Clearinghouse standards with reservations as the Post Office and Grocery Store intervention conditions had four, but not the required five, data points (to meet standards without reservations) within them due to feasibility within the school calendar.

### Measures

A partial interval frequency coding system was used to code all observational data. Intervals were 10 seconds each across 6 min sessions, for a total of 36 possible intervals. We used the time codes on the videos to keep track of the intervals. We based this decision upon our previous research that indicated this was an adequate amount of time to see change, and we selected short, 10-second intervals in order to use a more sensitive measure that could capture regular teaching behaviors (Coogle, Storie, Ottley, Rahn, & Burt, 2019). In the event that a teaching behavior crossed two intervals, data coders only coded the behavior within the interval in which the behavior started to prevent inflation of the frequency of behavior occurrences. Upon completion of each session or series of sessions, each of the coaches (who were trained and achieved reliability in the coding system prior to the start of the study) viewed each video. Each coach coded the following four variables: (a) the number of intervals in which prompts were provided (i.e., when the coach asked Julianna to provide a choice to Kai), (b) the number of times Julianna responded to prompts (i.e., when Julianna provided a choice to Kai by labeling two items), (c) the number of intervals in which Julianna spontaneously offered choices to Kai (i.e., when Julianna offered a choice without being provided a prompt), and (d) Kai's weighted communication. Coaches recorded data on a coding form that included the frequency of prompts provided by the coach, Julianna's response to the coach's prompts to offer a choice, and Julianna's spontaneous use of choice making. We also used the Individual Growth and Development Indicator definitions to code Kai's gestures, vocalizations, single words and multiple words (Greenwood, Carta, Walker, Hughes, & Weathers, 2006; Juniper Gardens Children's Project, 2011). The coach who coded the data also was one of the coaches who implemented the sessions. In order to reduce the risk of bias in coding, the coaches were blind to the purposes of the study. In addition, they knew that another person was conducting random reliability checks of their coding and, therefore, they should strive for high accuracy across all coding sessions.

### Procedure

Prior to beginning any research activities, institutional review board approval was obtained to conduct this research. In addition, we collected written informed consent from the parents of Kai and Julianna. We used our multiple probe schedule throughout the duration of the study. We collected one to three sessions per day depending upon the condition (e.g., we collected more sessions if it was a baseline session) and availability of children during choice time (e.g., sometimes children were pulled out of the classroom for speech language services). During all conditions, each play session lasted 6 minutes. The coach set up the play materials within an area of the classroom, and then the coach invited Kai and Julianna to come play (i.e., “Julianna and Kai, would you like to come play?”).

#### Baseline

During baseline sessions, the coach used the staggered multiple-probe schedule created by the first author to provide Julianna and Kai the set of play materials for one of the play activities (i.e., Doctor’s Office, Post Office, or Grocery Store). The coach observed the children and interacted with them by following their lead and responding when the children communicated with her; however, the coach did not provide any prompts or directions to the children. Rather, both children engaged with the materials and one another in any manner they desired.

#### Intervention

During intervention, the coach observed the children playing for 1 min to identify the child’s interests (i.e., observed the child’s gaze and what toys they selected). During minutes 2-6, the coach provided approximately one prompt per minute for Julianna to provide Kai a choice between two play materials based upon Kai’s interests (i.e., the coach would observe Kai’s visual gaze toward the grocery foods, and then say “Offer Kai a choice between the apple and banana”). If Kai did not respond to the choice that the peer offered, the coach used a least-to-most prompting hierarchy to support Kai in responding to Julianna (DiCarlo, Baumgartner, & Caballero, 2016). Our hierarchy consisted of the coach prompting Julianna to say the child’s name first (i.e., “Kai would you like the apple or banana?”). If Kai still did not respond, the coach used hand-over-hand prompting to support Kai in directing his attention to the choices provided by the peer and selecting a desired item. The coach decreased the use of prompts based upon the spontaneous use of choice making offered by Julianna. For example, if Julianna provided a choice to Kai spontaneously, the coach would not provide a prompt during that minute for her.

#### Maintenance

Maintenance took place in the same setting as intervention and began once intervention concluded. The coach provided no prompting during the maintenance condition. The coach interacted with the target children naturally in the same way as described during baseline.

### Data Analysis

We graphed Juliana’s prompted and spontaneous use of choice making. We used the six aspects of visual analysis (level, trend, variability, overlap, immediacy of effect and consistency of data) to answer our research questions (Horner et al., 2005).

### Inter-observer Agreement

We calculated inter-observer agreement (IOA) using the total agreement method for the required percentage of sessions based on What Works Clearinghouse Standards (20% of videos across all conditions for the dependent and independent variables) (Kratochwill et al., 2013). An undergraduate student who was blind to the purpose of the study and procedures completed the reliability coding. IOA was 91% (range = 57% - 100%) for the coach’s use of prompts for Julianna, 93% (range = 77%-100%) for the coach’s use of positive reinforcement when Julianna offered Kai a choice, and 96% (range = 83%-100%) for when Julianna spontaneously offered Kai a choice.

### Fidelity of Implementation (FOI)

An undergraduate student coded 25% of randomly selected intervention sessions using a fidelity checklist developed by the first and fourth authors. Although 20% is required based on What Works Clearinghouse Standards, we had the resources to code an additional 5% of sessions and chose to code these so that we could observe a greater number of sessions. When measuring FOI, we evaluated the number of prompts, positive feedback, and corrective feedback provided to Julianna (i.e., prompts to offer more intense form of choice making), as well as prompts offered to Kai (i.e., hand-over-hand assistance to make a choice). FOI was 95% (range = 71%-100%).

## Results

We report the results in the order in which we introduced PMI for each play activity. Graphed data are presented in Figure 1.

### *Julianna's Use of Choice Making During Doctor's Office*

During baseline, Julianna used choice making during 1 interval in the first baseline session and during 0 intervals in subsequent sessions. When intervention was introduced, Julianna used choice making spontaneously in an average of 2.17 (range = 0-4) intervals per session, and prompted in an average of 6.66 (range = 4-9) intervals per session. Her data exhibited a gradually accelerating trend with little variability, and one overlapping data point between baseline and intervention (spontaneous use). Julianna received a prompt from the researcher during an average of 32% (range = 23%-50%) of intervals per intervention session. She used choice making in an average of 71% (range = 50%-86%) of intervals during which she was prompted. During maintenance, Julianna did not use choice making during any of the sessions.

### *Julianna's Use of Choice Making During Post Office*

Julianna used choice making during 0 intervals in most baseline sessions; however, she used choice making during 1 interval in the fifth baseline session and during 9 intervals in the final baseline session. When intervention was introduced, Julianna used choice making spontaneously in an average of 2.50 (range = 0-5) intervals per session and prompted in an average of 6 (range = 2-9) intervals per session. Her data exhibited variability, with overlap between all data points in baseline and intervention. Julianna received a prompt from the coach during an average of 34% of intervals across intervention sessions (range = 17%-47%). She used the strategy in an average of 56% (range = 40%-64%) of intervals during which she was prompted. Julianna did not use choice making during any of the maintenance sessions.

### *Julianna's Use of Choice Making During Grocery Store*

Julianna used choice making during 0 intervals in six out of eight total baseline sessions. She used choice making spontaneously during 9 intervals in the fifth baseline session and during 13 intervals in the seventh baseline session, with her use of choice making returning to 0 prior to the introduction of intervention. When intervention was introduced, Julianna used choice making spontaneously during an average of 4.25 (range = 2-8) intervals and prompted during an average of 6.50 (range = 2-9) intervals. Her data exhibited variability, with overlap between all data points in baseline and intervention. Julianna received a prompt from the researcher during an average of 31% of intervals across intervention sessions (range = 13%- 40%), and she used choice making in an average of 67% (range = 50%-75%) of intervals. In maintenance, Julianna used choice making during 1 interval in the first session, but did not use choice making in remaining maintenance sessions.

### *Julianna's Summary of Results*

The data for the first activity revealed that upon introduction of the PMI, a small and delayed effect was observed for Julianna's use of choices. However, as Julianna began offering choices spontaneously during the Doctor's Office intervention condition, she also began offering choices spontaneously in the other two activities during their baseline conditions. She continued to offer choices spontaneously and when prompted during the intervention conditions for Post Office and Grocery Store activities. There was no observed effect on Julianna's use of choice making in the other two activities because her use of choice making overlapped entirely with baseline. For these reasons, we conclude that there was not a functional relation between the intervention and Julianna's use of choice making (i.e., only one demonstration, but not the required three demonstrations necessary for a functional relation). Maintenance data across activities was consistent with baseline.

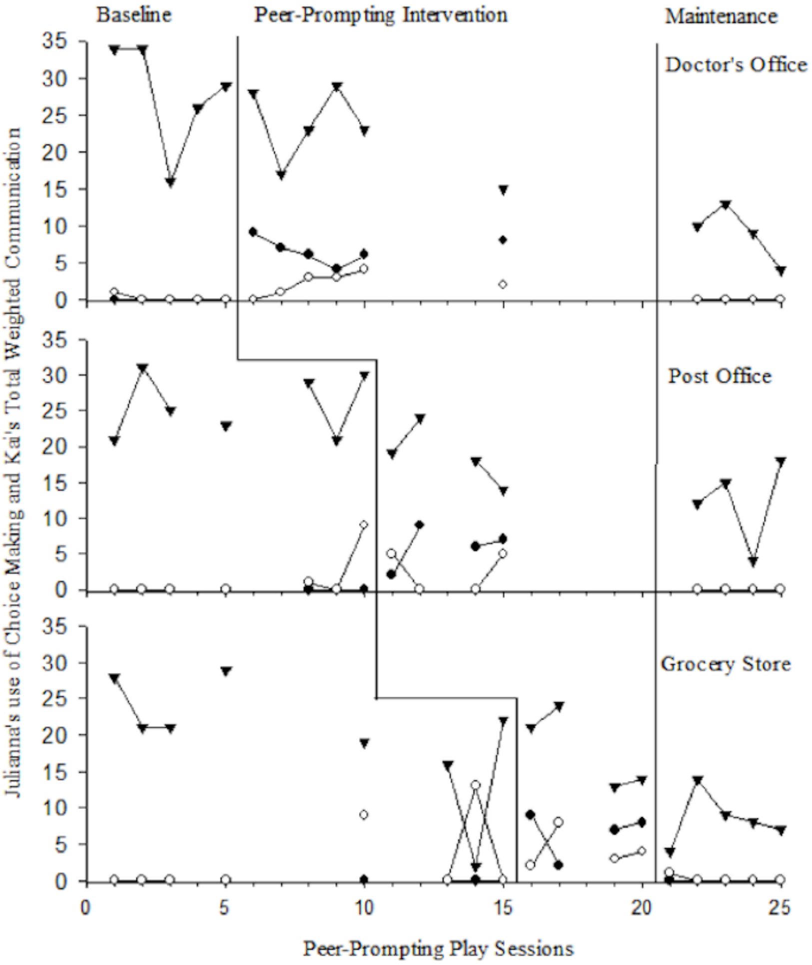

**Figure 1.**
*Frequency with which Julianne (peer) offered prompted choice making (closed circles) and spontaneous choice making (open circles) to Kai along with the total weighted expressive communication used by Kai (triangles) across play-based activities.*

*Kai's Communication During Doctor's Office*
During baseline, Kai's weighted communication range was 16-34 with his average being 27.8 (see Table 1). He used gestures (range = 0-6; mean = 2.6), vocalizations (range = 13-24; mean = 19.6), single words (range = 0-2; mean = 1), and multiple words (range = 0-3; mean = 1.2). During intervention, Kai's weighted communication range was 15-29 with his average being 22.5. He used gestures (range = 0-12; mean = 5), vocalizations (range = 5-19; mean = 15.17), and single words (mean = 0-2; mean = 1.17). During maintenance his weighted communication range was 4-13 with an average of 9. He used gestures (range = 0-5; mean = 1.75), vocalizations (range = 2-12; mean = 6), single words (range = 0-1; mean - .25), and multiple words (range = 0-1; mean = .25).

*Kai's Communication During Post Office*
During baseline, Kai's weighted communication was a range of 21-31 with the average being 25.71. He used gestures (range = 0-1; mean = .29), vocalizations (range = 15-24; mean = 20.71), single words (range = 0-4, mean = 1.42), and multiple words (range = 0-2; mean =.71). During intervention, his weighted communication ranged from 14-24 with the average being 18.75. He used gestures (range = 1-5; mean = 2.5), vocalizations (range = 3-16; mean = 11.75), and single words (range = 0-5; mean = 2.25). During maintenance his weighted communication ranged from 4-18 with a mean of 12.25. He used gestures (range = 0-1; mean = .25), vocalizations (range = 3-16; mean = 10.5), and single words (range = 0-2; mean = .75).

**Table 1.**
*Kai's Total Communication*

| | Gestures | Vocalizations | Single Words | Multiple Words | Weighted Communication |
|---|---|---|---|---|---|
| Doctor's Office | | | | | |
| Baseline Range | 0-6 | 13-24 | 0-2 | 0-3 | 16-34 |
| Baseline Average | 2.6 | 19.6 | 1 | 1.2 | 27.8 |
| Intervention Range | 0-12 | 5-19 | 0-2 | 0 | 15-29 |
| Intervention Average | 5 | 15.17 | 1.17 | 0 | 22.5 |
| Maintenance Range | 0-5 | 2-12 | 0-1 | 0-1 | 4-13 |
| Maintenance Average | 1.75 | 6 | .25 | .25 | 9 |
| Post Office | | | | | |
| Baseline Range | 0-1 | 15-24 | 0-4 | 0-2 | 21-31 |
| Baseline Average | .29 | 20.71 | 1.42 | .71 | 25.71 |
| Intervention Range | 1-5 | 3-16 | 0-5 | 0 | 14-24 |
| Intervention Average | 2.5 | 11.75 | 2.25 | 0 | 18.75 |
| Maintenance Range | 0-1 | 3-16 | 0-2 | 0 | 4-18 |
| Maintenance Average | .25 | 10.5 | .75 | 0 | 12.25 |
| Grocery Store | | | | | |
| Baseline Range | 0-2 | 2-26 | 0-2 | 0-2 | 2-29 |
| Baseline Average | .5 | 16.43 | .63 | .63 | 19.75 |
| Intervention Range | 0-2 | 3-13 | 4 | 0-1 | 13-24 |
| Intervention Average | .5 | 8.75 | 4 | .25 | 18 |
| Maintenance Range | 0-3 | 1-14 | 0 | 0 | 4-14 |
| Maintenance Average | 1 | 7.4 | 0 | 0 | 8.4 |

*Kai's Communication During Grocery Store*
During baseline, Kai's weighted communication ranged from 2-29 with a mean of 19.75. He used gestures (range = 0-2; mean = .5), vocalizations (range = 2-26; mean = 16.43), single words (range = 0-2; mean = .63), and multiple words (range = 0-2; mean = .63). During intervention, Kai's weighted communication ranged from 13-24 with an average of 18. He used gestures (range = 0-2; mean = .5), vocalizations (range = 3-13; mean = 8.75), single words (range and mean = 4), and multiple words (range = 0-1; mean = .25). During maintenance Kai's weighted communication ranged from 4-14 with an average of 8.4. He used gestures (range = 0-3; mean = 1), and vocalizations (range = 1-14; mean = 7.4).

*Summary of Kai's Results*
We observed variability in Kai's associated communication outcomes. He did not increase his weighted communication across any of the three activities; however, some of his communicative behaviors increased during intervention. For example, he demonstrated increases in his gestures during Doctor's Office. During Post Office he increased his average use of gestures and single words. During Grocery Store, he increased his use of single words during intervention. He did not sustain these increases during maintenance.

## Discussion

Research has demonstrated that providing children opportunities to practice target outcomes is effective for enhancing outcomes, and therefore, this is an important component of instructional delivery for children (Rahn et al., 2019; Grisham-Brown, Hemmeter, Schuster, Collins, 2000; Horn et al., 2000). However, research has also documented that children do not receive the number of opportunities necessary to obtain new skills (Pretti-Frontczak & Bricker, 2001; Rahn et al., 2019). Therefore, one important consideration is how to increase the dosage of opportunities provided. Previous research has supported educators to provide children opportunities to practice target outcomes (Coogle et al., 2019). Although this research has demonstrated effectiveness, it is important to consider other individuals in the classroom who can provide naturalistic opportunities to enhance children's target outcomes. Within inclusive classrooms, peers without disabilities can model target skills and with support they can enhance their interactions with children with ASD. Therefore, this research adds to the literature by focusing on peers to provide opportunities for children with ASD to practice target outcomes such as social communication within center play.

This research supports previous findings that suggest when peers are provided support their interactions with children are enhanced (Katz & Girolametto, 2013; Sperry et al., 2010; Watkins et al., 2015). This research adds to the literature by targeting a naturalistic time delay strategy, choice making, with children in an inclusive classroom who are identified with ASD (Kaiser & Hampton, 2017). This is important as children with disabilities need multiple opportunities to practice target skills within their everyday activities and routines (Johnson et al., 2015). Supporting peers to provide this intervention with children identified with ASD within inclusive environments may be one way to increase the opportunities children receive to practice target skills.

### *Julianna's Use of Choice Making*

Visual analysis indicated that upon implementation of intervention in the first play activity, Julianna began to use choice making across all play activities. Because we only observed one demonstration of an effect (but not three), we cannot say that our intervention had an effect on the choices she provided. We hypothesize that when we began providing coaching to Julianna in the first activity, she had a carryover effect into the other two activities, which limited our experimental control. This outcome is important for researchers to consider when using multiple-probe designs. Namely, replication across three contexts with the same participant may not be optimal for single-case studies because the participant may generalize their outcomes. Although this has clinical significance, it prohibits the determination of a functional relation from the study. This finding is important, as it may suggest that upon implementation of coaching, peers may require little support in generalizing their use of strategies such as choice making to new play routines.

Although we did not observe three demonstrations of an effect, it is important to note that most PMIs train the peer ahead of time and ensure they can deliver the intervention independently; however, in this study we selected a peer model given the PMI criteria and the coach provided direct prompts to the peer model to use choice making. We wanted to see if the peer (Julianna) could do this without extensive training ahead of time, and indeed she could (in fact she did this very well and generalized her use of the strategy to the other 2 play activities). We wanted to see if she would spontaneously apply the strategy, and indeed, she did.

Additionally, analysis of our results indicates the peers may or may not be able to maintain offering those choices once prompts are discontinued. It is difficult to determine this with certainty. We wanted to determine if Julianna would maintain use of the strategy when the coach stopped prompting, but unfortunately, she did not maintain her use of choice making. It is important to note that during maintenance we removed all coach supports, instead of gradually fading the supports or offering periodic maintenance supports as one would to ensure maintenance of other school-related skills. It is possible that Julianna interpreted the removal of prompts as a signal not to continue offering choices. It may have been beneficial to remind Julianna about how she can offer choices prior to the play routine starting so that she would have a better understanding of what was expected during this interaction.

### *Kai's Communication Outcomes*

Although not our primary focus for this study, we were interested in Kai's associated communication outcomes. We did not observe growth in his overall weighted communication; however, during intervention of Doctor's Office he increased his mean use of gestures. During intervention of Post Office, he increased his average use of gestures and single words, and during Grocery Store, he increased his use of single words.

## Limitations

Although our data suggest that coaching may have had a positive effect on a peer's use of choice making, clear limitations exist. We did not see a replication of an effect over all three play activities, and consequently, we cannot determine that it was the coaching that caused change in the peer's use of choice making.

### *Implications for Practice and Future Research*

This work provides an important foundation for future practice and research. Researchers have demonstrated the positive effects of providing opportunities for children to practice target skills on child outcomes; however, research has also suggested that teachers do not consistently provide an adequate number of opportunities for children to attain skills (Pretti-Frontczak & Bricker, 2001; Rahn et al., 2019). One reason for this limited implementation may be due to the challenges associated with providing effective instruction for a large group of children with various needs. Therefore, this study provides considerations for enhancing the quality of the PMI and the PMI literature by focusing on coaching peers to target specific IEP goals for young children with ASD in inclusive ECSE classrooms.

In addition, this study provides a foundation for future research. Using a design of multiple probes across three or more participants may allow researchers to see a visual effect of the intervention if a carryover effect does occur across activities for one dyad, as was the case in this study. Providing intervention for a longer period of time and fading the intervention by providing a reminder to the peer before the play routine (e.g., remember you can offer your friend choices of toys to see if he or she wants to play) could also be helpful in supporting the peer in maintaining their use of strategies such as choice making. Researchers might also consider examining associated child outcomes using a more sensitive measure. For example, we were interested in Kai's communication; however, a more sensitive measure may have been communication exchanges between Kai and Julia or a measure of functional communication (communication directed at another individual).

## Conclusion

Whereas research has shown that PMIs can have a positive effect on interaction between children with ASD and their typically developing peers (Katz & Girolametto, 2013; Sperry et al., 2010; Watkins et al., 2015), in previous research these have not been specific to choice making or young children with ASD in inclusive ECSE classrooms, nor have they focused on opportunities for children to practice target IEP goals through play. This study extends the literature by focusing on a new participant group (peers without disabilities and children with ASD in an inclusive ECSE classroom) and a novel type of intervention (coaching peers to use a specific strategy [choice making]). This research provides a foundation that practitioners and researchers can use to inform next steps in PMI research. It is important that children, particularly children with disabilities, have multiple opportunities to practice a skill in the environments and during the activities that are typical for them. Using coaching within a play interaction during center play to support the peers of children with disabilities in their use of strategies can be an effective way to increase the number of opportunities a child receives to practice skills, and could potentially benefit the social communication of children with ASD.

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# An Investigation of the Opinions and Suggestions of Parents and Teachers about The Teaching of Play Skills to Children with Autism Spectrum Disorders*

***Abstract***

*The purpose of this study was to examine the opinions and suggestions of parents who have children with between the ages of three and seven who have autism spectrum disorder (ASD), and the teachers working with them. A semi-structured interview form was prepared and the final version was validated by seven experts in the field. Easily-accessible case sampling method was applied to determine the participants. Interviews were conducted with 15 selected parents and 15 teachers. The data obtained from the opinions were analyzed descriptively. The findings showed that both parents and teachers defined the play skills as an activity that supports the child's developmental areas. The demonstration of the play skills of children with ASD shows that they find teaching various skills and concepts through games necessary, as well as supporting the play development area of the child. Finally, both parents and teachers were found to need visual material for the teaching of play skills to the child diagnosed with ASD.*

*Keywords: Autism spectrum disorder, Play skills, Opinions of parents, Opinions of teachers*

## Introduction

“Game” is a considerably difficult concept to define (Whitebread, Coltman, Jameson and Lander, 2009). The concept of game has many definitions due to its multi-faceted effect on child development, being thought of as a natural part of a child's life, having an abstract structure and having different types (Johnson, Christie and Wardle, 2005; Scarlett, Naudeau, Salonius-Pasternak and Ponte, 2005). In addition to being an activity that entertains the child, it also supports the child's motor, social-emotional, cognitive positive way (Freeman and Kasari, 2013; Warreyn, Paelt and Roeyers, 2014). Children with normal development (ND) learn daily life through play and various developmental areas are supported by games. Most ND children can play when they are modeled or directed verbally (Brown and Murray, 2001). It can be said that ND children complete all the different stages of games hierarchically, albeit at different ages. However, play behaviors differ for children with ASD as they are not at the same developmental stage of social interaction, language development, cognitive development and motor development as their

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peers and they can exhibit atypical behaviors (Hobson, Lee and Hobson, 2009; Rutherford, Young, Hepburn and Rogers, 2007; Williams, Reddy and Costall, 2001). ASD is a neuro-developmental disorder emerging in the first 3 years of life, which is characterized by repetitive behaviors and limitations in the social interaction (American Psychiatric Association, 2013). It is stated that the quality (suitability, variety, creativity, complexity) and quantity (duration, frequency) of the play activities of children with ASD is different from those of ND peers (Hobson et al. 2009; Rutherford et al. 2007; Williams et al. 2001).

Children with ASD exhibit atypical behaviors in playing skills; for example, choosing a limited number of objects / toys or dealing with the physical properties of objects / toys, self-stimulating behaviors such as placing the toy into the mouth, rotating, beating, stringing objects, and so on (Brown and Murray, 2001; Lewis, 2003; Ozonoff et al. 2008; Wolfberg, 2003). The imaginary play of children with ASD does not progress at the same rate as their ND peers and they are delayed in exhibiting these skills (Sherratt 2002; Lifter, Mason and Barton, 2011). When the play behaviors of ND children are examined, characteristics can be observed such as moving from simple to complex, assigning various roles to surrounding objects and producing creative scenarios. However, the steps of the imaginary games of children with ASD are dislocated, unplanned and stereotyped (Chan, Chen, Feng, Lee, and Chen 2016; Wolfberg, 2003). Children with ASD have difficulty in understanding the rules of regular games and how other children will behave (Cardon, 2007). During the process of play, children with ASD have difficulty in understanding the social cues of other children. Therefore, they may not be able to make sense of the social messages brought by the game. As they may have difficulty understanding the rules of the game, they may not be able to easily approach their peers, focus on game activity or play the game (Cardon, 2007; Wolfberg, 1995). Any delay or failure in play development adversely affects all other areas of developmental growth. Therefore, children with ASD can be taught play skills, and they can experience and make sense of new learning during the games (Lifter et al. 2011). In this respect, parents and teachers of children with ASD should provide the systematic implementation of teaching by adding goals to the play skills (Freeman and Kasari, 2013).

Many studies have investigated the views on play skills of the parents and teachers of typically developing children (Brett, Valle Riestra, Fischer, Rothlein and Hughes, 2002; Erden 2001). However, there has been no research investigating the opinions of parents and teachers of children with ASD on their play skills. Learning the opinions of teachers of children with ASD on the teaching of play skills will provide a greater depth of understanding of this issue. In this regard, how the game skills curriculum is prepared in schools in Turkey, and the methods used by teachers to elicit observations are important. However, it is also important to understand the perspectives of the Turkish parents who have children with ASD, the difficulties in the process and the material support they need. Therefore, the aim of this study was to evaluate the opinions of Turkish parents who have children with ASD and the teachers working with them, in respect of play skills and the teaching of these skills. Answers were sought to the following questions:

1) What are the views of parents and teachers on play and the skills involved?
2) What are the views of parents and teachers on the teaching of play skills to the child with ASD?
3) What kind of materials do parents and teachers need to guide their children regarding play?

## Method

### *Research model*

This research was designed as a phenomenological study to investigate the views of parents of children with ASD and their teachers on the teaching of play skills. Phenomenological studies reveal the views, thoughts and experiences of participants about a concept (Gay, Mills and Airasian, 2009).

### *Participants*

The study was who live in Turkey's Eskisehir conducted with 15 parents (13 mothers, 2 fathers) and 15 teachers working with pre-school children with ASD. A targeted, simple sampling method was used to select the participants, and a readily available

2 fathers) and 15 teachers working with pre-school children with ASD. A targeted, simple sampling method was used to select the participants, and a readily available situation sampling method, which is both rapid and practical for the researcher, who chooses a situation that is close and easy to access (Miles and Huberman, 1994). The demographic information of parents and teachers is given in Tables 1 and 2. As shown in Table 1, the teachers comprised 8 females and 7 males in the age range of 21-46 years. The duration of professional experience of the teachers varied between 7 months and 21 years, with 9 working in private education, and 6 were university graduates, working as a pre-school teacher or classroom teacher. No training in the teaching of play skills to children with ASD was reported by 6 teachers whereas 9 had received training during undergraduate education or from the institutions where they worked. The criteria for the inclusion of the teachers in this study were that they were employed as a teacher of children in a formal institution and they participated voluntarily. As seen in Table 2, the13 mothers and 2 fathers in the study were in the age range of 29-50 years, with an educational level ranging from high school to doctoral level. No training for the teaching of play skills to their children with ASD had been received by 10 parents, while 5 parents had received training from a teacher, an expert or the institution where their child was educated. The criteria for the participation of parents in this study was to have a child with ASD, confirmed by a hospital report, with ASD characteristics according to the Gilliam Autistic Disorder Rating Scale-2-Turkish Version (GOBDO-2-TV) (Diken, Ardıç and Diken, 2011) and voluntary participation in the study.

**Table 1.**

*Demographic characteristics of the teachers included in the study*

| **Participants** | **Teacher** |
|---|---|
| Gender | Female (n:8)<br>Male (n: 7) |
| Age (years) | 21-30 (n:7: T1, T4, T6, T7, T11, T12, T15)<br>31-40 (n:5: T2, T3, T5, T9, T13)<br>41-46 (n:3: T8, T10, T14) |
| Bachelor's Degree | Special Education (n:9: T1, T2, T5, T6, T8, T9, T12, T13, T15)<br>Preschool Education (n:1: T14)<br>Child Development Education (n:2: T11, T4)<br>Business Education (n:1: T10)<br>Classroom Teaching Education (n:2: T3, T7) |
| Occupational Experience Duration | 7 months-5 years (n:6: T1, T4, T6, T7, T11, T12)<br>6-10 years (n:4 T13, T3, T5, T15)<br>11-15 years (n:1: T2)<br>16-21 years (n:4: T8, T9, T10, T14) |
| Have you ever received any training in the teaching of play skills? | Yes (n:9: T1, T2, T4, T6, T8, T9, T10, T12, T13)<br>No (n: 6: T3, T5, T7, T11, T14, T15) |

*T: Teacher*

**Table 2**

*Demographic characteristics of the parents included in the study*

| **Participants** | **Parents** |
|---|---|
| Gender | Female(n:13)<br>Male (n: 2) |
| Age (years) | 29-35 (n: 6: M4, M6, M8, M9, M11, M13)<br>36-40 (n: 6 M1, M3, M5, M7, M10, M12,)<br>41-50 (n: 3: M2, F1, F2) |
| Age of the child (years) | 6-7 (n:8: M1, M3, F1, M5, F2, M10, M12, M13)<br>3-5 (n:7: M2, M4, M6, M7, M8, M9, M11) |
| Education Status | High school (n:3: M1, M2, M10)<br>University (n: 8: M3, M4 M5, M6, M7, M9, M12, M13)<br>Master’s degree (n:3: F1, M8, M11)<br>PHD (n:1: F2) |
| Have you ever received any training in the teaching of play skills? | Yes (n:5: M1, M4, F2, M11, M13)<br>No (n: 10: M2, M3, F1, M5, M6, M7, M8, M9, M10, M12) |

*M: Mother, F: Father*

*Instruments and Data Collection*

Data were collected using a semi-structured interview technique. These interviews provided flexibility, with the researcher able to change direction with sub or side questions during the interview and could elaborate on the questions according to the answers (Gay, Mills and Airasian, 2012). In addition to the answers of the interviewee, it is suggested that further questions are asked (Lodico, Saulding and Voegtle, 2006). The interview form used during the semi-structured interview was prepared by the researchers, based on the analysis of previous research that has examined the opinions and suggestions of parents and teachers about play skills. Data collection instruments were sent electronically to seven holding doctorates in special education who had extensive teaching experience in working with parents and teaching children with ASD, qualitative research methods. They suggested to add one question, asking about the meaning of the play skills to both parent and teacher forms. They also suggested rewording two questions to include ‘‘What kind?’’ and revised the grammar for several other questions. Questions were divided into two parts in each data collection instrument: (a) Demographic Questions, (b) Play Skills Questions. There were six open-ended questions in the forms for parents and teachers. The interview questions prepared for the parents and teachers based on the opinion of the experts are given in the Tables 3 and 4 respectively.

The first author (MSC) conducted a pilot interview with a mother and teacher of a preschool age child with ASD to test the questions, to control the functioning of the interview and to improve the experience. Voice recordings of the pilot interviews were examined by both researchers. After listening to the interviews, it was decided that the questions had to be asked to each participant in the same order, unclear questions had to be repeated and if a question was not answered, it should be expressed in a different way and asked a little more clearly without directing or leading the respondent. Should the participants not respond to the scope of the question despite these explanations, the interviewer could give more information about the subject without guiding.

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**Table 3**
*Interview questions of parents*

1. What comes into your mind when I say “play skills”?
2. What kind of problems do you encounter when you try to play games with your child?
3. What do you think about teaching your child “play skills”?
4. What kind of information and skills do you need while teaching your child “play skills”?
5. What kind of things do you think should be taken into account while teaching “play skills” to a child who is diagnosed with autism?
6. What do you think about using written and visual materials while teaching play skills to a child?

**Table 4**
*Interview questions of teachers*

1. Please tell me what do you understand from ‘‘play skills’’?
2. Do you think it is necessary to teach play skills to students who are diagnosed with autism? Why?
3. How do you evaluate play skills of your students?
4. What kind of games do you think children who are diagnosed with autism find difficult to learn? What do you do to eliminate these problems/hardships?
5. What kind of methods do you think should be used while teaching play skills to children who are diagnosed with autism?
6. What is your opinion about having written and visual materials to guide you while teaching play skills to children with autism?

In order to determine the participants, the following processes were followed. First the necessary permission was obtained from the Anadolu University Social Sciences and Humanities Scientific Research and Publication Ethics Board (decision no: 38129), after which the face-to-face interviews were conducted with the administrators of the institutions where the interviews were to take place. Then, the contact information of the parents and teachers who met the study inclusion criteria were accessed and they were informed about the process. The researcher signed the volunteer participant form, stating that participation in the research was conducted on voluntary basis, the interview would be conducted with a voice recorder and these records would be used for research purposes only. Parents who agreed to participate in the interviews were informed about the process in detail. Interviews with the teachers were conducted in an empty classroom of the institution where they worked, and interviews with parents took place in an empty classroom, at home or in the grounds of the institution where their child was educated. The interviewer diary was written by first author after each interview. This journal included the questions answered extensively by the respondent, whether the participant was informed about the questions, the difficulty of the interview, the views of the interviewee, the duration and the environment of the interview, and the personal opinions of the interviewee. This written record for each participant was a guide for the researchers, especially when editing the findings and making citations. Interviews with teachers lasted an average of 12 mins (range, 4.46 -16.32 mins), while interviews with parents lasted an average of 20 mins (range, 8.39 - 28. 24 mins).

*Data analysis*

First author used three steps suggested by Creswell (2007) to analyze the data. First, the researcher transferred the interview records from the voice recorder to the written text for analysis of the data. The interviews that were transferred on paper were also checked by the first author. All questions were examined separately by each researcher and a coding key for each question was formed. Second, the researcher divided the written texts into categories using the interview coding key. Finally, the researcher used tables to express the data (Merriam, 2009). In addition, the reflective interview log written by first author during the data analysis process was examined for each participant. The interviewer journals were used in the process of examining the findings, establishing the interview coding key and themes, examining the retrospective interview casts and making the quotations.

To determine the reliability of the themes, a total of 10 parent and 5 teacher interview forms were randomly selected and sent to a specialist in the field of special education. The second author was informed verbally and in writing about the purpose and process of the study by MSC. The percentage of reliability was calculated by comparing the markers of the researcher and the scientist with the consensus for each question, and the difference of opinion + divergence x 100 (Miles and Huberman, 1984 cited: Campbell, Quincy, Osserman and Pedersen, 2013). For each question, an average of 98.12% (range: 85-100) agreement was achieved on the Teacher forms and an average of 97.85% on the parent forms (range: 85-100).

## Results

Semi-structured interviews were conducted in order to determine the opinions and recommendations of parents with pre-school-age children diagnosed with ASD and the teachers working with them. The findings of the interviews were reported in response to the following three main headings.

*The Views of Teachers and Parents on Play Skills*

When the teachers were asked what the word 'play' meant in the semi-structured interview, 15 teachers defined play skills in their own terms. Ten teachers defined play skills as supporting activity areas, six teachers defined them as means of expressing oneself, three teachers defined them as a little rehearsal of life and a means of comforting the child. Teacher #13 stated, "*I believe that playing is one of the most important phases in a child's development,"* thereby defining play skills as an activity supporting development areas. Teacher #15 stated that a game is "*a re-*

*duced, compressed form of life for children,"* indicating that play skills are a small rehearsal of life. Teacher #6 emphasized the relaxing effect of the games on the child as follows: "*I use play skills as reinforcement for my students. I use it to motivate the lesson."* Twelve of the parents defined play skills as an activity that supported development areas, eight of them defined the term as an activity that the child was happy with, and three expressed it as an activity that prepared the child for life. Mother #8 defined game playing as an activity which supports development areas of the child as "*It is like communicating with my child, sharing something with each other."* Mother #1 defined the term as an activity that makes her child happy as "*Playing is something fun. It is something that my child laughs at and enjoys."* Father #7 defined a game as an example of life, stating "*It is an example of life. I see it as an environment where my child can learn about life with aspects that he knows and does not know."*

### *The Opinions of Teachers and Parents about Teaching Play Skills to Children with ASD*

The teachers and parents were asked about their opinion on play skills in the semi-structured interview. While both groups of participants stated that it was necessary to teach play skills, one of the parents, Mother #1 was undecided, stating "*I do not know whether it should be taught."*

A total of 10 teachers emphasized its importance as it supports developmental areas, seven teachers emphasized its importance as a teaching tool, six teachers stated its importance in respect of the limitations the students experience, and two teachers emphasized its importance for the student to learn about life. Teacher #14 stated the contributions of games to development areas as *"I think games are the biggest tools in supporting communication, so it's very important. It supports all development areas, especially language development, together with social and emotional development."* Teacher #5 emphasized the importance of teaching play skills as a useful tool in teaching, as follows: "*When you proceed through the interests of the child with a game, it is easy to catch the child's attention and have interaction. As you proceed in the fields of interests, you teach what you try to teach easily. "* Teacher #10 emphasized the significance of teaching play skills because of the limitations of a child with ASD, stating that *"Because there are limitations in this issue, receiver language has some restrictions in tactical skills, so we need to teach these children in a different way."* Teacher #15 emphasized the importance of teaching play skills as they can help children with ASD to participate in life: *"Because, as I said earlier, play skills are actually a reduced, differentiated, maybe more simplified format for children."*

While six parents wanted play skills to be taught as a lesson through games, five of the parents expressed their opinions about the kinds of games and three wanted play skills to be taught to give the child an expression of life itself. Father #5 expressed his opinion about other desired attitudes the child could learn through games as "*I believe that I can give all kinds of desired behavior to .... through games. He learns more easily when he has play skills."* Mother #3 stated that games with rules had to be taught to her child: *"He must know how to play in the classroom or outside in the garden, follow the rules and play sequentially."* Father #7 stated how important games are for a child with ASD as *"A game is an example of life. I see it as an environment in which my child can learn about life with aspects that he knows and does not know. "*

### *The Views of Teachers and Parents on the Materials They Need to Teach Play Skills to the Child with ASD*

The question regarding the views of the parents and teachers of children with ASD on the materials they need to teach play skills was the last question for both groups of participants. seven of the teachers stated that visual material, four written materials, and four both written and visual materials should be provided. Teacher #2 expressed the need for visual material as *"I think it is visual material. When we look at our society, we are not ones who like to read a lot. I think it would be better to see or watch pictures. There may be something like a CD with short videos."* Teacher #4 expressed the need for written material as *"There should be written resources of course. We have written resources in the methods we use during the lesson, so I believe something written is necessary for games, too."* Teacher #10 expressed a need for both visual and written material as *"Both written and visual. In other words, visual material is* *very important, but I think it is much more effective and efficient to read something and then combine it with a visual material."*

Of the parents, six expressed the need for more visual material, five for written materials, and four stated that the number of both written and visual materials should be increased. One of the six mothers who wanted visual material, Mother #6, expressed this need as *"At least when it is shown in practice, I can better understand how to do it."* Mother #4 expressed the need for written material as *"Children's books are very limited. Books with games adapted for them should be produced. There are many books for normal children, but there aren't many for our children... "* Mother #15 expressed the need for both visual and written material as *"The more written and visual materials there are, the more we can develop ourselves in this sense... This type of thing will enlighten the families about how to do it, how to carry out this process. It is necessary."*

## Discussion

The aim of study was to determine the opinions and suggestions of Turkish parents who have children with ASD and the teachers working with them about teaching play skills. To determine the views of the teachers and parents involved in the research about the word “game”, they were asked what this term meant to them. Most teachers and parents defined game as an activity supporting development areas. Although the concept of game has been dealt with according to different theories, it has been stated to be a tool used to support development areas in general. Looking to the explanations of the different theorists about the game, Piaget defined external stimuli as a way of extracting and adapting (As cited in Fisher 2008). Vygotsky suggested that a game was a discovery of new things (As cited in Halmatov, 2017). Erikson emphasized the importance of games in emotional development (As cited in Hoorn, Nourot, Scales and Alvert, 2015). In previous research, where the teachers and their parents of children with normal development have given opinions on the concept of play, most participants have defined a game as a tool that supports development areas (Adak Özdemir and Ramazan 2014; Brett et al., 2002; Doganay 1998; Erbay and Durmuşoğlu Saltalı 2012; Giren 2016; Rothlein and Brett 1987; Tezel Şahin 1993; Tuğrul, Aslan, Ertürk and Altınkaynak, 2014; Ünal 2017). Therefore, the role of the game is supported by both theorists and researchers in literature. On this basis, it can be thought that teachers and parents are aware of the concept of games.

In this study, parents of children with ASD and the teachers working with them were asked their opinions about teaching play skills. Parents stated that their children could be educated with games and teachers should be trained as they support the development area of the child. According to previous literature, children with ASD play less than their typically development peers because of inadequacies in social interaction and communication, and their games are quite simple and superficial (Jarrold, Boucher and Smith, 1996; Jung and Sainato, 2013; Lifter et al. 2011; Ungerer and Sigman, 1981). Therefore, children with ASD should be taught systematic play skills (Hobson et al., 2009). There has been research on systematic symbolic games (D'Ateno, Mangiapanello and Taylor, 2003; MacDonald, Clark, Garrigan and Vangala, 2005; MacDonald, Sacramone, Mansfield and Ahearn, 2009; Reagon, Higbee and Endicott, 2006), imaginary games (Barton, Chen, Pribble, Pomes and Kim, 2013; Barton and Wolery, 2010; DiCarlo and Reid, 2004; Kasari, Freeman and Paparella, 2006, Lifter, Ellis, Cannon and Anderson, 1993; Lifter, Foster-Sanda, Arzamarski, Briesch and McClure, 2005) and games with rules (Odluyurt, 2013) for children with ASD. Since any delay or failure in game development may adversely affect all areas of development, children with ASD with known inadequacy in playing should be provided with play skills, which are internalized and learned during the game (Lifter et al. 2011). Typically, development in preschool is supported by research that all development areas develop in parallel with the development of children's play skills (Russ, 2003; Rutherford and Rogers, 2003; Swindells and Stegnitti, 2006; Toth, Munson, Meltzoff and Dawson, 2006; Trevlas, Matsouka and Zachoopoulou, 2003). Previous studies have shown that social and academic skills can be taught using games as a method for children with ASD (Aslan, Karamustafaoğlu and Kurt, 2018; Baker, 2000).

To summarize, it has been stated in research findings that children with ASD must be supported in play skills, that children's various development areas are supported by the teaching of play skills and that various skills can be taught using games as a method. The findings of the current study of the opinions of the parents and teachers were similar. Therefore, it is thought that disruptions in development areas can be reduced by teaching play skills to children with ASD. In addition, it is mentioned above that many skills are taught to preschool children through games. The teachers and parents who participated in this study can be considered to be aware that games is a field which should be taught and they were aware of the potential positive contributions to the development of a child with ASD if games and play skills are taught, and these findings are supported by the literature (Boudreau and D'Entremont, 2010; D'Ateno et al. 2003; Odluyurt, 2013). The parents and teachers in this study were asked about the material they needed to teach play skills to the child with ASD. Most of the respondents stated that children with ASD needed visual material when learning play skills. Smaldino, Lowther and Russell (2007) described the benefits of visual materials for learning as embracing concepts, ideas and objects, motivating the other side, being remarkable, providing diversity, helping to remember information, reminding previous information, saving time and promise. A cone of life was created in 1946 by Edgar Dale on the learning process. According to the cone of life, the best teaching follows a path from concrete to abstract and from simple to complex (Yalın, 2006). As the number of sensory organs involved in the learning process increases, one learns better and forgets later (Davis and Summers, 2015). There are studies in literature that have demonstrated that ND individuals are better able to perceive information presented through visual materials, and learning is more effective (Cimsir and Hunt, 2017; Kay and Kletskin, 2012; Lin and Tseng, 2012; Reynolds and Mason, 2002; Schreiber, Fukuta and Gordon, 2010; Zhang et al. 2006). Studies in literature and the cone created by Dale support the view that teaching with visual materials can be easier and more permanent. These findings are supported by literature related to children with ASD, as studies have shown that visual stimuli are easier to perceive than other stimuli (Bernard-Opitz, Sriram and Sapuan, 1999; Nikopoulos and Keenan, 2006; O'Riordan, 2004). Visual stimuli have been demonstrated to be effective in providing the environments of children with ASD for tasks such as communicating, performing daily routines, learning new skills and supporting their independent lives (Quill, 1997). In the current study, it can be considered that both parents and teachers preferred visual materials to be able to better understand the stages of teaching themselves and the play skills of the children. In literature, high technology and low-tech visual materials have been used in the teaching of games to children with ASD (Boudreau and D'Entremont, 2010; D'Ateno et al. 2003; Hine and Wolery, 2006; Jarmakowicz, 2015; MacDonald et al. 2005; MacDonald et al. 2009; Nikopoulos and Keenan, 2004; Paterson and Arco, 2007; Reagon et al. 2006; Sancho, Sidener, Reeve and Sidener, 2010). As a result, visual materials are important in the effective learning for themselves and the children / students with ASD. In this respect, it is necessary for parents and teachers to understand how to teach play skills, and that children with ASD should be able to perceive visual materials better. These findings are supported by literature. Assessment tools and matrices can be developed to evaluate different types of games for children with ASD at different stages of development.

Findings obtained from the research are limited to the semi-structured interview form developed by the researcher by taking expert opinion and the answers given to the questions in this form. In addition, the findings obtained from this study are limited to the data collected from parents and teachers of children with ASD living in Eskisehir.

## Conclusion

Parents of children with ASD in the preschool period and teachers working with them believe that children learn many skills by playing games and are thus supported developmentally. In addition, the parents who participated in this research think that they can teach their children using games as a teaching tool. Teachers can support families with their children in different environments and can show them how to play with different materials. It can be seen that teachers and parents need visual materials for the teaching of play skills to children with ASD. Parents can be told how to develop such materials or how to utilize daily life routines. Moreover, teachers can support parents with seminars and conferences on how children should adapt to various types of games at different levels of their development.

This research was carried out as a descriptive study in which semi-structured interviews were conducted. Although this research is limited to the opinions of the parents and teachers who participated in this study voluntarily, to the best of our knowledge, there are no studies in literature that have directly evaluated the opinions of the parents of children with ASD. Despite the limitations of the findings in this respect, the results of this study can provide insights for future research. The data of the study was collected by semi-structured interview technique. Future studies can be collected using different research methods to determine the views of the participants. Findings obtained from the study are limited to parents and teachers in Eskisehir. It can be repeated with different participants to generalize the findings. A variety of visual materials can be designed to teach parents and teachers about the play skills of children with ASD, and the content can be enriched with effectiveness research. Assessment tools and matrices can be developed to evaluate different types of games at different levels of development of children with ASD.

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# Evaluation of The Effectiveness of Newborn Hearing Screening Program: A Center in Turkey*

**Abstract**

*The present study aimed to analyze the effects of newborn hearing screening program in Turkey based on the age of diagnosis, amplification and initiation of education between 2000 and 2017. The study was designed as a retrospective study. The files of 997 children registered with a research and education center for children with hearing loss were analyzed. The findings indicated that the age of diagnosis, amplification and initiation of education significantly decreased after the national newborn hearing screening program was introduced throughout the years. However, the recommended universal standards were achieved only for a minority of children in terms of timely diagnosis and early intervention. Delay in amplification mostly observed in children with mild-moderate loses and late diagnosis, was found as related to the testing in more than two different clinics. The findings on late initiation of education were discussed based on the reports in relevant literature and monitoring problems after the diagnosis and the problems observed in early education system in Turkey.*

Keywords: *newborn hearing screening, age of the diagnosis, intervention age, obstacles to early intervention, loss to follow-up*

## Introduction

Hearing is the most effective modality for the development of spoken language, literacy and cognitive skills (Cole & Flexer, 2019; Moeller et al., 2013). Any type or any degree of congenital Hearing Loss (HL) in infancy or childhood could interfere with the development of a child's spoken language, reading and writing skills, and academic performance (Cole & Flexer, 2019), leading to further problems in adulthood such as low life satisfaction and limited job opportunities (Perkins et.al., 2015). Timely diagnosis and intervention could prevent these adverse effects of HL, leading to significantly better outcomes in language development when compared to delayed cases (Ching, 2015; Kasai et al., 2012**;** Sugaya et al., 2015) and reduces social costs in the long term (Burke, Shenton & Taylor, 2012; Chen et al., 2017). It was demonstrated that children with early intervention initiated in the first twelve months of life exhibited higher language scores when compared to those who received intervention at a later period. Moeller (2000), in her classic study on 112 five-year-old Nebraska children with only HL and no additional disabilities, found that the age of initiation of the intervention predicted 55.5% of the variance in

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language outcome. Similarly, the study conducted on Nebraska and Colorado Home Intervention Program demonstrated that the age of the first intervention (11.4%), level of parental involvement (35.2%), and nonverbal intelligence (2.5%) significantly predicted language outcome at five years-of-age (Yoshinago-Itano, 2003). ). Recent studies confirmed these findings. Kasai, et al. (2012) reported a significant correlation between early education and language development among Japanese children with severe to profound HL. They also showed that participation in Newborn Hearing Screening Program (NHSP) and an early diagnosis may contribute to better language development to some extent, however this effect was not statistically significant. However, NHSP was significantly associated with early intervention. On the other hand, Sugaya et al. (2015) emphasized the importance of early amplification in their study. They demonstrated that use of hearing aids before the cochlear implantation significantly associated with the increase in language scores of school age children.

Considering the significance of early hearing aid fitting and initiation of education in the development of children with HL, newborn hearing screening became a regular practice in several countries during the 1990s and early 2000s to ensure timely diagnosis and intervention (Aurelio & Tochetto, 2010; Nikolopoulos, 2015), and the Joint Committee on Infant Hearing (JCIH) described the steps in a successful NHSP as follows: a) the newborn hearing tests should be conducted before the hospital discharge, b) HL should be confirmed within three months after birth, and c) the child should be fitted with hearing aids and start a family-oriented education program when the child is six months old or earlier (JCIH, 2007). Based on the criteria established by JCIH, NHSP implementation reduced the age of diagnosis to three months or younger in most developed countries and decreased the initiation of education to earlier than six months (Uhler, Thomson, Cyr, Gabbard &Yoshinaga-Itano, 2014; Percy-Smith et al., 2018). In the pre-NHSP period, the mean diagnosis age varied between two years six months and three years in European Union countries and North America (Harrison, Roush & Wallace, 2003; Yoshinaga-Itano, 2003). In developing countries, the conditions were even more critical; the diagnosis age ranged between two and seven years (Özcebe, Sevinç & Belgin, 2005; Jeddi, Jafari & Zarandy, 2012; Lin, Shu, Chang & Bruna, 2002).

Similar to other countries, NHSP became widespread in Turkey during 2000s. The first NHSP was initiated at Marmara University as a pilot project in 1999 and gradually transformed into a national program on December 2004 (Kemaloğlu, 2015). It was reported that by 2016, 98% of the newborns were screened throughout the country in 1000 screening centers (Kemaloğlu, 2018) and 61 reference centers were established for diagnosis (Külekçi-Uğur, 2018). Various centers reported significant decreases in diagnosis age (Vehapoğlu-Türkmen et al., 2013; Yılmazer et al., 2016), however the data on the age of amplification and initiation of education in the early intervention program have been limited in Turkey (Turan, 2018). Kemaloğlu et al. (2016) discussed Gazi Hospital findings and implied that there were delays in NHSP implementation in Turkey when compared to universal standards. Although a decrease was observed in age of diagnosis after the implementation of national NHSP, the data obtained in the above-mentioned study indicated that only 32% of the infants were diagnosed before they were 6 months old and hearing aid fitting was conducted after a delay of several months. Therefore, he questioned the efficiency of the NHSP based on the delay in amplification and initiation of education. On the other hand, certain other centers reported more optimistic findings. Şahlı (2018) reported that the mean diagnosis age was 5.8 months and the age of initiation of education was 6.7 months at Hacettepe University. Similarly, data collected in Istanbul Education and Research Hospital during the December 2010-March 2012 period indicated that the mean diagnosis age varied between 2.7 and 7.4 months for 86 infants and their intervention age varied between 3.8 and 9.6 months (Vehapoğlu-Türkmen et al., 2013). However, it should be noted that 70% of this population included infants under risk, which were usually diagnosed early due to potential risk factors (Dalzell et al., 2000). Similarly, the findings in Bakırköy Dr. Sami Konuk Education and Research Hospital demonstrated that the mean diagnosis age was 6.1 months, mean age of hearing aid fitting was 9.5 months for 53 infants diagnosed between December 2009 and August 2011 (Yılmazer et al., 2016). Only a few studies that explained the delay in diagnosis and the problems encountered in the screening program were conducted in Turkey. These studies reported a need for a more effective follow-up system in the NHSP (Kemaloğlu et al., 2016; Baş, Turan & Uzuner, 2019), and there were shortages for qualified personnel who could clearly and actively explain the findings to the parents (Özcebe, Sevinç & Belgin, 2005; Vehapoğlu-Türkmen et al., 2013) and work with the parents of infants with HL (Altınyay & Ertük, 2012).

Further data were required to analyze the effects of NHSP, to provide information about the current situation in Turkey, and to discuss the possible causes of late intervention in order to plan better services for infants with HL and their families. Thus, the present study aimed to identify the mean diagnosis, amplification and initiation of education ages between 2000 and 2017 in a group of children who were enrolled at an education and research center for children with HL, to compare the findings and quality indicators proposed by JCIH (2007), and to discuss the implications and effectiveness of NHSP in Turkey. The research questions were determined as follows:

1. What are the mean ages of diagnosis, hearing aid fitting, and initiation of education pre- and post- NHSP era at the research and education center for children with HL?
2. Are there significant decreases on the mean ages of diagnosis, hearing aid fitting and initiation of education after the implementation of the NHSP across the years?
3. What is the efficiency of NHSP in the investigated population?

## Method

The study was designed as a retrospective case-control study. A retrospective study is conducted *a posteriori* with the event data that have taken place in the past. The cases with and without the condition of interest are identified and compared. In most cases, some or most of the data has already been collected and stored in a registry (Hess, 2004). A retrospective case-control design was preferred in the present study, since it aimed to analyse the impact of NHSP, which has already been initiated, and to compare the ages of diagnosis, amplification and education before and after implementation of NHSP. Furthermore, the study also aimed to analyse the differences between the registered cases based on regular and irregular attendance in the early intervention program.

### *Data Collection and Selection of the Cases*

The data were collected in an education and research center for children with HL operated by a university in Turkey. The center serves as a day school for children with HL and has adopted an early intervention program. All files of the infants and children registered in the education center between 2000 and 2017 were included in the study. A total of 1230 registry files were accessed. In the first step, all files were analyzed based on diagnostic information. 237 (19.2%) files, which had no information on the hearing status of the child were excluded from the study. Remaining 997 files were classified based on the year to observe the short and long-term effects of NHSP: 2000-2004 (pre-NHSP); 2005-2009 (initial five years of implementation) and 2010-2017 (last eight years of implementation). In the second step, the remaining files were classified based on the availability of complete information on age of diagnosis, amplification and initiation of education. It was found that 397 (39.8%) files had incomplete information on diagnosis, amplification or initiation of education ages. These children only visited the research clinic for tests or hearing aid/implant fitting for a couple of times and missed the follow-up appointments. In the final step, the files were classified into two groups. The first group (GR1) included 600 files that included diagnosis, hearing aid fitting and initiation of education age information. The second group (GR2) included 397 files with missing information on any of the above-mentioned parameters or irregular attendance. GR1 and GR2 were compared to determine the differences between the ages of diagnosis, amplification and initiation of education, and to gain insight about the factors which may be associated with irregular attendance or unattendance in the follow-up sessions.

The data on the degree of HL, type of the HL, additional disabilities, possible cause of the HL, number of clinics attended, and the regions where the children resided during the diagnosis and intervention processes were also collected from the files where they were available. The correlations between these factors and the diagnosis, amplification and initiation of education ages were determined to identify whether there were any correlations between these variables that would explain the delayed cases.

*Analysis of the Data*

One-way ANOVA was used to compare mean diagnosis, amplification and initiation of education ages across the years for the whole group, GR1 and GR2 groups. Mann-Whithey U test was used for the comparison of GR1 and GR2 since the data were not normally distributed. The effect sizes were calculated and analyzed as described by Cohen (1988).

## Results

The descriptive data on GR1, GR2 and group totals are presented in Table 1. As seen in Table 1, most subjects had sensorineural HL. The cause of HL was mostly genetic, the degree of HL was primarily severe to profound, and most subjects came from Central Anatolia and western part of Turkey. The ratio of additional disabilities was similar in both groups. Certain subjects visited several clinics until the diagnosis or amplification.

In Table 2, mean subject age at diagnosis, amplification and initiation of education is presented. The year ranges were categorized as *Group a* for 2000-2004, *Group b* for 2005-2009 and *Group c* for 2010-2017 for clearer representation of the data. As seen in Table 2, all variables decreased throughout the years of analysis.

One-way ANOVA was used for comparison of the means. As seen in Table 3, the differences were significant between the years for all variables. Large effect sizes were observed (Cohen, 1988), indicating newborn hearing screening test as an effective intervention method.

Post hoc Bonferroni multiple comparison tests indicated that the decreases in all variables were statistically significant between the groups at .000 level of significance.

**Table 1.**
*General Descriptive Data for GR1, GR2 and the Whole Group*

| | GR1 | | GR2 | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Severe/Profound hearing loss | 485 | 80.8 | 214 | 53.8 | 699 | 70.1 |
| Sensorineural hearing loss | 548 | 91.3 | 356 | 89.4 | 904 | 90 |
| Genetic causes of deafness* | 246 | 41 | 170 | 42.7 | 416 | 41.7 |
| Causes other than genetics** | 103 | 17.1 | 88 | 22.1 | 191 | 19.1 |
| Unknown causes | 251 | 41.8 | 139 | 34.9 | 390 | 39.1 |
| Additional disabilities | 112 | 18.7 | 86 | 21.6 | 198 | 19.8 |
| Residence area | | | | | | |
| Central Anatolia | 207 | 34.5 | 123 | 30.9 | 330 | 33.9 |
| Agean | 176 | 29.3 | 108 | 27.1 | 284 | 28.4 |
| Marmara | 158 | 26.3 | 84 | 21.1 | 242 | 24.2 |
| Others | 59 | 9.8 | 82 | 20.9 | 142 | 14.2 |
| Attended clinics until diagnosis | | | | | | |
| Less or equal to 2 | 531 | 88.5 | 288 | 72.4 | 819 | 82.1 |
| More than 2 | 68 | 11.3 | 74 | 18.6 | 115 | 11.5 |
| Unknown | 1 | 0.2 | 36 | 9 | 31 | 3.7 |

Note.*=syndromes, high incidence of deafness in family history, reports indicating genetics, first cousin marriages with story of deafness in the family were classified as possible genetic causes.

Note.**=low birth weight, neonatal hyperbilirubinemia, ototoxic medication, infections (cmv, meningitis), intrauterine infections (herpes), severe hypoxia, convulsions were classified as causes other than genetics.

**Table 2.**
*Mean Ages for Diagnosis, Amplification and Initiation of Education Across the Years for the Whole Group*

| | Diagnosis | | | Amplification | | | Initiation of Education | | |
|---|---|---|---|---|---|---|---|---|---|
| Year Groups | n | $\bar{x}$ | SD | n | $\bar{x}$ | SD | n | $\bar{x}$ | SD |
| Group a | 386 | 30.75* | 24.81 | 342 | 35.37* | 25.28 | 202 | 33.09* | 19.07 |
| Group b | 313 | 21.62* | 19.57 | 289 | 24.44* | 18.90 | 194 | 23.32* | 14.88 |
| Group c | 284 | 10.14* | 12.14 | 272 | 13.62* | 13.27 | 206 | 14.05* | 10.92 |

Note.*=Age in months.

### *Findings related to GR1*

The changes observed in diagnosis, amplification and initiation of education across the years for GR1 which included subjects with complete information are presented in Table 4. As seen in Table 4, decrease in mean ages and standard deviation were observed in all variables.

One-way ANOVA was conducted to compare the mean ages based on the year intervals. As seen in Table 5, the differences were statistically significant with large effect sizes for all variables (Cohen, 1988). Post hoc Bonferroni multiple comparison tests indicated that decreases were statistically significant in all variables between the groups (group a, group b, group c) at .000 level of significance.

Although the decrease was significant across the years; it should be noted that in Table 4 that the mean ages for diagnosis, amplification and initiation of education were still higher when compared to the ages recommended by JCIH even in the 2010-2017 period. Thus, we calculated the ratio of children who were in the recommended age range for the study variables.

Table 6 demonstrates the ratio of children who were diagnosed, amplified and initiated education at ages recommended by JCIH (2007) in GR1. The findings indicated that only a small group of children were diagnosed before they were 3 months old, fitted with hearing aids and started education before they were 6 months old even in the Group c, where long term effects should be observed.

### *Findings related to GR2*

Table 7 demonstrates the data from the GR2 with incomplete information. Decreases were observed in all mean ages across the years in GR2 as well. Mean initiation of education age was not calculated in GR2 due to extensive missing data.

**Table 3.**
*Comparison of the Mean Ages of Diagnosis, Amplification, Initiation of Education and Implantation Across the Years for the Whole Group*

| | | Sum of squares | df | Mean square | F | *p* | $n^2$ |
|---|---|---|---|---|---|---|---|
| Diagnosis | Between Groups | 69542,98 | 2 | 34771,448 | 85,558 | .000 | .14 |
| | Within Groups | 398282,26 | 980 | 406,410 | | | |
| | Total | 467825,24 | 982 | | | | |
| Amplification | Between Groups | 71961,65 | 2 | 35980,823 | 87,839 | .000 | .16 |
| | Within Groups | 368658,50 | 900 | 409,621 | | | |
| | Total | 440620,15 | 900 | | | | |
| Initiation of Education | Between Groups | 36998,37 | 2 | 18499,186 | 78,920 | .000 | .20 |
| | Within Groups | 140408,91 | 599 | 234.406 | | | |
| | Total | 177407,28 | 601 | | | | |

**Table 4.**
*Mean Ages for Diagnosis, Amplification, Initiation of Education and Implantation for GR1 Across the Years*

| | Diagnosis | | | Amplification | | | Initiation of Education | | |
|---|---|---|---|---|---|---|---|---|---|
| Year Groups | n | $\bar{x}$ | SD | n | $\bar{x}$ | SD | n | $\bar{x}$ | SD |
| Group a | 201 | 22.28* | 16.4 | 200 | 27.8* | 18.62 | 202 | 33.09* | 19.17 |
| Group b | 194 | 15.49* | 12.45 | 194 | 18.79* | 13.44 | 194 | 23.32* | 14.88 |
| Group c | 205 | 7.68* | 7.72 | 205 | 10.55* | 9.19 | 206 | 14.05* | 10.92 |

Note:*=Age in months.

**Table 5.**
*Comparison of The Mean Ages of Diagnosis, Amplification and Initiation of Education Across the Years for GR1*

| | | Sum of squares | df | Mean square | F | *p* | $n^2$ |
|---|---|---|---|---|---|---|---|
| Diagnosis | Between Groups | 21665,126 | 2 | 10832,563 | 67,399 | .000 | .18 |
| | Within Groups | 95951,268 | 597 | 406,410 | | | |
| | Total | 117616,393 | 599 | | | | |
| Amplification | Between Groups | 30111,658 | 2 | 15055,829 | 74,053 | .000 | .19 |
| | Within Groups | 121173,06 | 596 | 203,311 | | | |
| | Total | 151284,718 | 598 | | | | |
| Initiation of Education | Between Groups | 36951,023 | 2 | 18475,511 | 78,570 | .000 | .20 |
| | Within Groups | 140383,602 | 597 | 235,148 | | | |
| | Total | 177334,625 | 599 | | | | |

**Table 6.**
*Ratio of Children Who Were Diagnosed, Amplified and Initiation of Education at Recommended Ages in GR1*

| Groups | Group a | | Group b | | Group c | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Diagnosis at/before 3 mth. | 2 | 1 | 27 | 13.9 | 70 | 34.1 |
| Amplification at/before 6 mth. | 2 | 1 | 40 | 20.6 | 95 | 46.3 |
| Initiation of education before/at 6 mth. | - | - | 21 | 10.8 | 59 | 28.8 |

One-way ANOVA was conducted to compare the variables. As seen in Table 8, the differences were significant for all variables with a medium effect size for GR2 (Cohen, 1988). Post hoc Bonferroni multiple comparison test indicated that the difference was significant between the groups based on the age of diagnosis and amplification at .00 level of significance.

Table 9 indicates the ratio of children who were diagnosed and amplified within recommended standards in GR2. As seen in Table 9, only 22.1% of the children were diagnosed and 15.1% were amplified within recommended standards in Group c.

Mann-Whitney U test was conducted to compare GR1 and GR2 based on diagnosis and amplification. Non-parametric Mann-Whitney U test was preferred in group comparisons since the data were not distributed normally and the number of participants in certain groups were small.

As seen in Table 10, the children in GR2 were diagnosed and fitted with hearing aids significantly later when compared to the children in GR1 across the years. The factors such as the degree of HL, type of the HL, additional disabilities, possible cause of the HL, number of clinics attended, and the regions where the children lived were further analyzed to find whether there were any correlations between these variables and timely diagnosis, amplification and initiation of education.

**Table 7.**
*Mean Ages for Diagnosis, Amplification, and Implantation in GR2 Across the Years*

| | Diagnosis | | | Amplification | | |
|---|---|---|---|---|---|---|
| Year Groups | n | x̄ | SD | n | x̄ | SD |
| Group a | 185 | 39.95* | 28.84 | 142 | 46.03* | 29.34 |
| Group b | 119 | 31.61* | 24.43 | 95 | 35.97* | 22.87 |
| Group c | 79 | 16.51* | 17.93 | 67 | 23.01* | 18.51 |

Note:*Age in months.

**Table 8.**
*Comparison of The Mean Diagnosis and Amplification Across the Years in GR2*

| Mean age* | | Sum of squares | df | Mean square | F | *p* | $n^2$ |
|---|---|---|---|---|---|---|---|
| Diagnosis | Between Groups | 30574,815 | 2 | 15287,408 | 23,363 | .000 | .10 |
| | Within Groups | 248648,746 | 380 | 654,339 | | | |
| | Total | 279223,561 | 382 | | | | |
| Amplification | Between Groups | 24578,535 | 2 | 12289,267 | 19,144 | .000 | .11 |
| | Within Groups | 193223,778 | 301 | 641,939 | | | |
| | Total | 217802,313 | 303 | | | | |

Note:*Age in months.

**Table 9.**
*Mean Ratio of Children Who Were Diagnosed, Amplified, and Initiation of Education at Recommended Ages in GR2*

| Groups | Group a | | Group b | | Group c | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Diagnosis at/before 3 mth. | 3 | 1.6 | 4 | 3.3 | 19 | 22.1 |
| Amplification at/before 6mth. | 1 | 0.5 | 4 | 3.3 | 13 | 15.1 |

**Table 10.**
*Comparison of GR1 and GR Findings*

| Groups | Group a | | Group b | | Group c | |
|---|---|---|---|---|---|---|
| | N | U** | N | U** | N | U** |
| Diagnosis age* | 386 | 11630 | 313 | 6641 | 284 | 5713 |
| Amplification age* | 342 | 8335 | 289 | 4852,5 | 272 | 4005 |

Note:* Ages in months, **Mann-Whitney U significant at $p \leq 0.001$

The findings indicated that there was a significant correlation between the degree of HL and the amplification ($r$= -.144; $p$ <0,001), implying late amplification in children with less severe losses. This finding was confirmed when the degree of HL was compared between GR1 and GR2. 81% and 53% of the children had severe to profound HL in GR1 and GR2, respectively. The difference between the GR1 and GR2 was significant ($\chi^2$=84,42; $p$<0.001).

The same trend was observed between the number of clinics attended and age of diagnosis ($r$=.188, $p$<0.001). 88.5% of children were tested in one or two reference centers in GR1 and remaining 11.5% visited several other clinics. On the other hand, 72% of children were tested in less than two different centers in GR2 and 28% were tested more than two different clinics. The difference between the groups was significant ($\chi^2$=67,33; $p$<0.001). No significant correlations were determined among other variables.

## Discussion

The present study findings indicated a significant trend towards earlier identification of HL, amplification and initiation of education across the years after implementation of NHSP. This finding was consistent with previous studies (Al-Sayed & Al-Sanosi, 2017; Aras-Öztürk et al., 2018; Bruijnzeel et al., 2017; Wasser, Roth, Herzberg, Lerner-Geva & Rubin, 2019). Comparison of the year periods demonstrated significant decreases in the whole group, GR1 and GR2. However, younger ages were observed in GR1 where complete patient information was available for all variables.

Although the decrease was significant, the mean ages in all categories were still above the standards recommended by JCIH (2007). These findings were consistent with other studies conducted in Turkey (Aras-Öztürk et al., 2018; Konukseven et al., 2017; Yılmazer et al., 2016) and some other countries (Holte et al., 2012; Jeddi et al., 2012; Kasai et al., 2012; Saki et al., 2018; Wasser et al., 2019). The time gap between the diagnosis and initiation of education almost seven months in GR1 even during the 2010-2017 period, where long term results were expected. This finding was similar to the results reported by Kemaloğlu et al. (2016). It should also be noted that in all measures, the standard deviation was high, indicating large variations among the subjects.

To explain the late diagnosis, we correlated several factors. Significant correlations were determined between the degree of HL and amplification age, and between the diagnosis age and number of centers attended. Correlations between the degree of HL and late amplification and late diagnosis were reported in certain previous studies (Fitzpatrick et al., 2016; Langagne, Leveque, Schmidt & Chays, 2010; Spivak, Sokol, Auerbach & Gershkovich, 2009). Our findings were further supported by comparison of GR1 and GR2. In GR2, children were significantly diagnosed and amplified later. When the degree of HL was compared for groups, it was found that higher number of children had mild to moderate HL in GR2. Based on this finding, it might be suggested that special attention should be paid in following the infants with mild to moderate HL for timely diagnosis and amplification. Confirmation testing should be organized immediately after the first testing of Auditory Brainstem Responses (ABR).

Attending different centers for confirmation of the HL obviously delays the diagnosis age due to waiting for the available test appointments in busy clinics, cancellation of the appointments due to different reasons, in addition to longer time requirement for ABR in young infants. Conducting ABR takes more time in young infants since the test should be repeated more than twice to confirm the HL, thus obtaining results may take longer even in one center. When families moved from one clinic to another repeating the same procedure, this may require significantly longer time and may delay the diagnosis (Özcebe et al., 2005; Zeitlin, Auerbach, Mason, Spivak & Erdman, 2019).

Considering the fact that the screening program was established country-wide, the most significant finding in the present study was the low rate of the children who were initiated education before or when they were 6 months old. Similar studies indicated several factors that could affect directly the length of the period between the diagnosis and initiation of education. The referral of the children to education by the health sector, the difficulties in scheduling the testing time, and absence of the patients were reported as main reasons for the increase in the time between the diagnosis and the intervention (Krishnan & Hyfte, 2014; Rodrigues, Loiola-Barreiro, Pereira & Pomilio, 2015; McLean, Ware, Heussler, Harris & Beswick, 2019). Further research should be conducted to understand and explain the obstacles specific to Turkey, however clinical observations of the authors were consistent with previously reported findings that implied serious problems in the referral of the patients to education by the legal regulations, and the significant disorganization between the service providers (Baş et al., 2019; Kemaloğlu, 2015; Vehapoğlu-Türkmen et al., 2013). Studies that investigated the special education services in Turkey supported these observations (Diken et al., 2012; Kumaş & Sümer, 2018).

Diken et al., (2012) analyzed *Special Education Services Regulations* (2009) in Turkey. They indicated that although there was a legal background for planning, providing and monitoring early intervention, no model that leads parents to family-oriented education programs was developed after the diagnosis. Early intervention services were defined in the regulations (2005; 2009), but the scope and standards of these services –for whom, by whom and how these services would be provided-were not clearly specified (Diken et al., 2012; Kemaloğlu et al., 2016). Usually when a child is medically diagnosed with a disability, they are referred to Guidance and Research Centers (GRC), which are public centers operated by the Ministry of National Education (MoNE). GRCs are responsible for organizing and providing special education services in each province, city or town for educational diagnosis to place the children in adequate educational institutions. In case of HL, there are no educated personnel in GRC to work with infants and their parents. The parents usually are directed to private rehabilitation centers, which usually employ no specialized personnel to work with children with HL or their parents (Altınyay & Ertürk, 2012). These problems could be resolved by establishing educational units within the diagnosis/referral hospitals. (Fitzpatrick et al., 2008; Serin, Gürbüz, Keçik, İncesulu & Tekin 2011). However, certain regulations should be enacted to organize for the employment of the personnel by a different legal authority (i.e., MoNE) in health institutions.

Furthermore, problems in the post-screening follow-up system were also reported in several studies. When the family leaves the hospital with diagnosis, they drop out of the follow-up system, which makes it impossible to monitor the status of the children' current situation (Baş et al., 2019). Sometimes, families spend a long time due to bureaucracy before they actually obtain the hearing aids and they may prefer not to attend to the provided education (Diken et al., 2012). Moreover, medical personnel who diagnose the child at the hospital do not have adequate knowledge on early intervention programs and they could not counsel and support the family (Baş et al., 2019). Thus, the parents may visit several private special education centers and lose time until they find a facility that suits their needs after the diagnosis (Diken et al., 2012). Unfortunately, these factors negatively affect the educational opportunities of very young children with special needs and may also explain the late initiation of education age found in the present study despite nation-wide screening. All these findings were supported by studies conducted other countries (Barker, Hughes & Wake, 2013; Cavalcanti & Guerra, 2012; Huang et al., 2013).

Our findings also indicated that the children in GR2, did not attend regularly to their appointments and after a while, dropped out of the monitoring system of the center, where the present study was conducted. They might have possibly attended other centers for clinical follow up, however parental inconsistency may also explain certain delayed cases determined in the present study. It should also be remembered that there was a higher number of children with mild-moderate HL in GR2 when compared to GR1. It was more likely that the parents of the children with mild to moderate HL visited several clinics to confirm the HL and were reluctant to use hearing aids. The parents of children with less severe HL usually find it difficult to accept the disability since their behavioral observations were not consistent with the diagnosis (Holte et al., 2012; Langagne et al., 2010). Thus, it could be suggested that clinicians who work in the diagnostic process should be aware of the fact that children with mild to moderate HL are more likely drop from clinical follow up. The parents should be informed meticulously about the detrimental effects of HL even in mild to moderate cases (Zeitlin et al., 2019; Langagne et al., 2010).

The descriptive data indicated that most of our subjects were children with severe-profound sensorineural HL. This finding could be explained by the characteristics of the research center which was originally established as an education center for children with HL. The studies conducted in other facilities such as schools for inclusive education or referral centers may lead to different compositions in the degree and type of HL. It should also be noted that the times of diagnosis and amplification were not particularly delayed for children with additional disabilities in the present study. This might be related to the general delay with respect to JCIH standards (2007) for children with no additional disabilities. However, the group may be analyzed separately and more descriptively in further studies.

The major limitation of this study was the lack of parent Socio-Economic Status (SES) information, since this information was not included in the clinical files of the children. Although there is a study with contradicting findings (Saki et al., 2018), previous studies mainly reported that SES of the parents had a significant effect on diagnosis, amplification and initiation of education age (Gopal, Hugo & Louw, 2001; Jeddi et.al., 2012; Özcebe et.al., 2005). Future studies on SES of the parents may further enlighten the problems related to irregular follow-up and educational attendance. It should also be noted that the results of this study reflects only one center. More data from different centers are needed to reach an exclusive explanation for the current situation in country-wide.

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# Social Constructivism and Play of Children with Autism for Inclusive Early Childhood*

**Abstract**

*It has been more than two decades since Mallory & New (1994) proposed the use of Lev Vygotsky's social constructivist theory as a framework for inclusive practices in early childhood education. This article relates part of a research on the play interactions of children with Autism Spectrum Disorders (ASD) within an inclusive early childhood school to the elements of sociocultural theory. Direct observation within the natural play settings of nine children with ASD between two- to five-years old was used to gather data for this study. Interactions within the indoor and outdoor play routines of children with ASD with their peers and educators were observed and recorded for two weeks. The anecdotes of the play interactions derived from the recordings were coded into five play categories to determine how routines for play reflect the interactions experienced by children with ASD. The aim of this article is to provide documentations of the play interactions of children with ASD within their natural educational settings and examine how the elements of social constructivism as a theoretical framework for inclusive practice are reflected. In line with the writings of Mallory, this paper intends to demonstrate how a theoretical framework could guide educational practices.*

*Keywords: inclusion, play, play interactions, autism spectrum disorder, early childhood education*

## Introduction

Mallory & New (1994) proposed the use of social constructivism as a theoretical framework for inclusive practices. They argued that focus on designs for intervention programs and service delivery has been given attention in lieu of having a sound theoretical basis for practice. While positive outcomes were discovered through some interventions, they had little or no effect in improving the participation of children with disabilities within the inclusive settings where they belong. Their article encouraged professionals to reflect on the framework and the *whys* of their interventions. Further, they proposed for social constructivism to be a possible framework. As Vygotsky's work suggests that learning comes before development, opportunities to practice and learn from more knowledgeable persons become even more significant. It is through experiences such as those in play that opportunities to interact, observe, and try a new skill becomes a part of a child's daily routine. It is through such understanding of learning and development that professionals could provide programs that could serve all children well, regardless of ability.

In the midst of researches on intervention programs, recommendations from

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recent studies call to describe the nature of interactions of children with disabilities within their natural play settings (Guralnick & Groom & Groom, 1987; Kontos, et al., 1998; Odom, et al., 1999; Guralnick, et al., 2006) and to use of direct observation methods (Brown, Odom & Conroy, 2001; Guralnick, et al., 2011; Hestenes & Carroll, 2000; Manning & Wainwright, 2010). These recommendations could imply the need for more information within the natural learning environment of the children to develop materials that could facilitate effective interventions interventions (Garfinkle & Schwartz, 2002; Terpstra & Tamura, 2008; Torres, 2010). The recommendations from these studies in addition to those of Mallory & New (1994) is the basis of this research on children with ASD. By examining their interactions during their play routines, programs could be designed to capitalize more on child-initiated activities that have been found to have the greatest probability of naturally sustaining interactions (Noonan, 2006), and could be translated to more "pull in" rather than "pull out" interventions (Guralnick, et al., 2011; Stanton-Chapman, 2011).

The three features of social constructivism identified by Mallory & New (1994) that could contribute to inclusive practices in early childhood are 1) the sociocultural context of learning, 2) the role of social activity in learning, and 3) the contributions of the active learner to his development. This article aims to relate these features of social constructivism, and concepts from related literature, to the play categories demonstrated by the children with ASD in order to shed light to the nature of their interactions with peers and to the supports that could be further provided for them.

## Method

The design of this qualitative research was derived from previous studies that explored the play and socialization of children with special needs and their peers in various settings. Direct observation within the natural play setting of the children were used to gather data, consistent with the recommendations from recent studies. Seventy-two videos with a total of 844.72 minutes of play routines were observed and recorded from eight classes for children ages two to five years old. Anecdotes of the play interactions of children with ASD with their peers and educators were derived from these recordings. The anecdotes were used to determine opportunities for different play interactions and were coded according to the categories used in the research of Kontos, et al. (1998). The five categories used to code the data included 1) solitary play, 2) parallel play, 3) parallel play with regard, 4) simple social play, and 5) reciprocal play. Other play categories such as those by Parten (1932) and Rubin (2001) were also options for coding, but the author found the classification by Kontos, et al. (1998) could represent the results more effectively. Their categories, especially the differentiation between two types of parallel play proved useful in determining opportunities for increased isolation and meaningful interaction within the actual play routines of the children.

*Setting*

While the Philippines is among the nations who have agreed to move towards inclusion in international agreements, national policies have yet to become more specific on its implementation. Local policies make some references to inclusive practices. However, legislation that propose more specific implementing rules and regulations for inclusion are still in process, including the Senate Bill 3002, Special Education Act, which has been pending since 2012. This lack of specific implementation procedures to effectively include children with special needs means that educational institutions either create their own programs for inclusion or depend on the families for coordinating services for their own children. Some early childhood institutions limit the number of children with special needs that they admit, claiming that their services could only provide for these few.

While it was challenging for the researcher to find an inclusive early childhood institution, there was a private school in Quezon City, Metro Manila that catered to children of all abilities from two- to five-years old. As a research venue, this institution was selected based on criteria specific to the needs of this study. First, this preschool served children with special needs within their general classes with their same-age peers. Second, the school has specific provisions for including children with special needs including administrative policies, teaching philosophies, environmental arrangements, and professional and paraprofessional supports. Educators and administrators of this school collaborate with professionals including include developmental pediatricians, diagnosticians, occupational therapists, speech pathologists, physical therapists, and special education teachers who provide special services within or outside of school routines. Lastly, this school was selected because it has been in operation for 12 years, which means that it is relative stable in terms of its administrative processes, school operations, educational philosophy, curriculum implementation, and home/community partnerships.

*Participants*

Purposive sampling was employed to identify the participants for this study. With the assistance of the school administrators, nine children were identified to meet the criteria for this research. The first criteria that the child must have a valid diagnosis conducted by a professional diagnostician and/or developmental pediatrician. Second, the child must be receiving professional services within and/or outside the school. Professional services received are consistent with the recommendations from the diagnosing professional. At the time of the research, there were 72 enrollees in this early childhood institution. Only nine students from a population of 72 were diagnosed with a special need. By coincidence, all nine children that met the sampling criteria were diagnosed with ASD. Six of the children were diagnosed to have mild autism while three had moderate autism, as determined by the diagnosing professional consulted by the family. No other children were diagnosed with any other developmental delay or exceptionality at the time of the research. Some children were being observed for possible developmental delays, but only these nine children were formally diagnosed and were receiving special services within and outside the school.

*Observation and Recording Procedures*

Direct observation method was used, consistent with recommendations from previous studies. Whole play routines were observed and recorded for this study to gather as many details of the play interactions as possible. A total of 72 videos, equivalent to 845 minutes of play routines, were collected after two weeks of observation in six preschool classes. Data were collected within each class' indoor and outdoor play routines. Most play routines consisted of free play activities, however some structured play was also observed. Free play activities indoors included pretend play activities and child-initiated interactions with manipulatives such as puzzles and blocks. On the other hand, free play activities outdoors included unstructured playground activities and games created by the children. Structured play routines indoors included one-on-one activities, mostly initiated by the teacher or the shadow teacher. These structured activities include coloring, putting puzzles together, and interacting with manipulative materials according to the instructions of the educator. Structured play activities outdoors included games initiated by the educators for the whole class. Play routines ran for an average of 12 minutes per session. The length of time for play routines varied within the two weeks of observation because class schedules were modified to accommodate school activities. Every child participant was recorded for an average of 8 sessions depending on their attendance in class or on their participation in play routines.

**Table 1.**
*Profile of with special needs in general classes*

| Name | Sex | Age of Class | Class Session | With Shadow Teacher | With IEP |
|---|---|---|---|---|---|
| Adam | M | 2 | morning | Y | N |
| Brian | M | 2 | afternoon | Y | Y |
| Christian | M | 3 | morning | Y | Y |
| David | M | 4 | afternoon | Y | Y |
| Eric | M | 4 | afternoon | Y | N |
| Frank | M | 5 | morning | Y | Y |
| Grace | F | 5 | morning | Y | Y |
| Huey | M | 5 | afternoon | Y | Y |
| Ian | M | 5 | afternoon | Y | Y |

**Names of children were replaced to retain their anonymity*

The observers that gathered data for this study included the author and a former colleague. Both observers are educators for early childhood up to tertiary levels, with backgrounds in child development, education, and family life. The observers are trained in use of direct observation method for teaching and research in the University. As participant observers, the researcher and the co-observer were introduced to the children as visiting teachers. Interactions between the observers and the children were limited only to those initiated by the children.

*Analysis*

The members of the research team translated the video recordings into anecdotes, consistent with their training as educators and researchers in the University laboratory preschool. After the researcher and the co-observer collated all the videos, the researcher and the transcriber processed the videos. Each play recording was viewed, and anecdotes were written for each event. Once the anecdotes were submitted by the transcriber, the researcher replayed the videos and reviewed the anecdotes against each recording to validate its contents.

For interactions with peers during play periods, the anecdotes were categorized according to the classifications used in the study of Kontos, et al. (1998). Each child could have anecdotes in various types of play. Consistent with the qualitative nature of this research, the anecdotes were categorized not to examine the frequency by which each type of play was observed for each child. Instead, the anecdotes were categorized to examine if any of the types of play were demonstrated by the children in their play interactions. The anecdotes were also used to describe the nature of their interactions across different types of play. Through these descriptions, the contexts wherein productive and unproductive interactions occur could be identified, and later be used as reference to identify environmental characteristics that enrich interactions or that require support to make productive interactions possible.

## Results

The anecdotes from the observation showed that the nine children with ASD engaged in four out five categories of play. No anecdotes were categorized under the fifth category, reciprocal play. Productive and unproductive interactions for each play category were also identified. The terms 'productive' and 'unproductive' refer to interactions not behaviors of the children. For the purpose of this article, productive interactions pertain to those that lead to successful relations with other children, while unproductive interactions pertain to those that lead to unsuccessful relations with peers.

*Solitary Play*

Anecdotes of solitary play depict children with ASD in child- or educator-initiated play with various materials during free play routines. Their play was separate from peers, and interactions noted under this category were limited to looking at other children's play, peers looking at their play, or brief interactions with peers that were initiated by their educator or shadow teacher.

**Table 2.**
*Coding Description*

| Coding | Description |
|---|---|
| Solitary Play | Child with ASD plays separately from peers<br>The child may be actively engaged in play objects but no participation in their play theme is observed |
| Parallel Play | Play interactions are limited to use of same play objects but with little or no acknowledgement of their peers |
| Parallel Play with Regard | Child interacts with peers by using the same play objects at the same time but for separate play themes<br>Interactions within this category could include brief acknowledgements of peers, such as eye contact or other nonverbal cues |
| Simple Social Play | Child with ASD interacts with peers by using the same play objects together under the same play theme and engaging in conversations |
| Reciprocal Play | Play interactions of children with ASD are characterized by more incidences of turn taking and the presence of role reversal. Role reversal is most evident in cooperative games. |

**Table 3.**
*Solitary Play of Children with ASD*

| Coding | Description |
|---|---|
| Productive Interactions with Peers | • Looking at peers playing near them<br>• Peers looking at child with ASD while playing near them<br>• Shadow teachers naming peers playing nearby, and child with ASD looks at child being referred to by the teacher<br>• Peers allowing child with ASD to move around between them while they were at play |
| Unproductive Interactions with Peers | • Peers not allowing child with ASD to use the same play objects<br>• Peers not allowing child with ASD to borrow an object because he/she did not verbalize intent |

The observations during the free play routines confirm that children with ASD have the tendency to prefer solitary play. As they engage in play materials of their choice or that were provided for them by their shadow teachers, the children had little or no interaction with peers. To encourage interaction during solitary play, shadow teachers sometimes attempted to make the children more aware of their peers who are playing nearby. They did this by pointing at the activities of the other children or naming peers around them. The children responded by briefly looking at the child or activities being referred to by their teacher. The children also tend to remain in solitary play even when surrounded by peers engaged in shared play. Some anecdotes showed that the children played around their peers, but neither the children nor their peers responded to the proximity of their play. At most, the children looked at the other or at the toys being used by the other, but no further interaction was shared.

*Anecdote 1. Solitary Play – Pretend Play*

*Grace lined up four small houses near a set of buildings that she made with blocks. She carefully placed toy people beside each of the four houses. On the other side of each house, she placed a small animal. Grace moved one of the toy people and pretended that it was talking with another, 'Bye bye, Mommy. I'm just going to the doctor, okay?' She moved the other toys around the table and said, 'Woohoo! He's swimming!' 'Let's make a toy sandcastle,' she said as she continued to make a dialogue for the toy people. Then she pounded the toy people on the table together like they were building something with the blocks. The peer who was playing in front of Grace looked at the buildings she made but did not say anything.*

While Anecdote 1 showed solitary play that was a result of the preference of the child with ASD, some cases are results of exclusion from peers. Anecdote 2 demonstrates such an example of solitary play.

*Anecdote 2. Solitary Play – Exclusion from Peers*

*Frank was in the housekeeping table playing with toy food. He looked at his peers who were playing with the toy stove from time to time while he played alone. Frank went near the toy stove and emptied an egg tray. He attempted to put some toy food in place of the eggs, but one of his peers shouted, 'Frank! No!' The boy took all the eggs and the toy food from Frank, including those that Frank played with on the table. Frank followed the boy as he moved to a corner of the room where more of his peers were playing. He looked at the children briefly then went back to the table to play with toy food again. The boy returned to the table where Frank continued his play. He said, 'Frank, stop now…' Then he hit the toy bread on the table with a wooden knife. Frank did not respond. He continued to play with the toy food and pretended to cut them with the wooden spoon. The boy looked at shadow teacher and said, 'Teacher, Frank did not say yet. Frank must say borrow first.' Frank did not say anything.*

One of the differences observed between Grace and Frank was their expressive language. Grace could express herself with minimal help from educators, while Frank's language skills were still very limited even with full assistance from his shadow teacher. The study by Hestenes & Carroll (2000) suggests that the success of a child during play with peers is affected by the disability. This suggestion could be further extended by inferring that the differences in the severity of ASD between the two five-year old children may have had an impact in their play interactions with peers.

*Parallel Play*

Children with ASD engaged in parallel play. They played near their peers and sometimes they use the same play materials but did not share the same play goals.

Anecdotes categorized under parallel play included those wherein the children with ASD played near their peers. Being near their peers is an opportunity for the children to observe the play of others and how their peers use play materials. Anecdote 3 illustrate how children with ASD use the same play objects with their peers who were nearby, but the play themes of both children and their peers remained different throughout the routine.

*Anecdote 3. Parallel Play – Same Play Object, Different Play Themes*

*The teacher opened a box of blocks and called Brian. Brian immediately took some blocks from the box and said, "Thank you!" to his teacher. As he was stacking the square blocks, a girl approached and took some blocks as well. The children did not look at each other but continued to take blocks for their own play. When Brian's tower of blocks became too tall, it fell on the girl. The teacher reminded him to be careful when using the toys. The girl looked briefly at Brian and then to the teacher. Brian looked at his teacher and then picked up the blocks that fell behind his classmate. He started making a tower again. The girl continued to stack her own tower of blocks. Brian put a block on top of the blocks that the girl was playing with. The girl removed this block. Brian tried to put another block on the girl's block, but the girl pulled the block away and turned her back from him. Brian went back to putting together his own tower. The girl turned to her back and gave a quick look at the tower that Brian was building. Another girl joined them in playing with blocks. All three of them made their own block structures.*

While proximity to peers during play make interactions possible for children with ASD , shared play remains to be dependent on the willingness of both parties to engage in a common play theme. The example in Anecdote 3 also showed that neither the child with ASD nor his peer showed sustained observation of each other's play. Notable from this anecdote is how it was the typically developing peer who chose not to respond to initiations for possible shared play by the child with ASD. It seems that it the parallel play described in Anecdote 3 was a product of failed initiation by the child with ASD. Some interactions also showed frustration expressed by peers as they tried to initiate shared play. Anecdote 4 is an example of such occurrence.

*Anecdote 4. Parallel Play – Frustration of Peer*

*Two boys approached Huey while he was playing. They knelt beside him on the floor. One of the boys bent over to look at Huey's face and said, "Huey, can I play with you?" Huey said yes, and the boys stayed beside him. More children came to stay beside Huey but they did not initiate any interaction with him. The teacher asked the other children if they sought permission from Huey to share his play. The children asked Huey, "Huey, can we play with you?" Huey does not look at his classmates. When he did not respond, one of the girls tapped his arm and spoke louder, "Huey! Can we play?... Huey!" When Huey still did not respond, the girl went to the teacher and said, "He's not talking." The teacher encouraged the children by telling them that Huey can talk, and they just needed to ask him properly. The children tried again, this time talking loudly but slowly. Huey still did not respond. The teacher coached the children further by telling them to look at Huey in the face while talking and to use the word 'share'. The girl bent down to level herself to Huey's face and asked, "Huey, can we share?" Huey replied, "Share." The children took this as their cue to use the same toys as Huey.*

**Table 4.**
*Parallel Play of Children with ASD*

| Coding | Description |
|---|---|
| Productive Interactions with Peers | • Sitting beside or across peer while playing<br>• Child with ASD using same play materials as peers<br>• Educators coach child to respond verbally to questions from peers |
| Unproductive Interactions with Peers | • Peers expressing frustration to educators that child with ASD is not responding |

Even though Anecdote 4 seemed to lead towards shared play theme among the children, it did not progress as much. The play interaction among the children was very limited afterwards because of the time and effort that it took to gain a response for their initiations. It is notable however, that in this anecdote the peers sought for the assistance of the teacher to communicate with the child with ASD. Children in this school are encouraged to practice interacting with all their peers and to seek assistance when necessary. Peers requesting for assistance multiple times during this event suggest that peers are motivated to initiate interactions with children with ASD. It is also noteworthy that educators encouraged the peers to try different strategies until they receive a response that satisfies them. Communications with Huey's shadow teacher revealed that he was working on responding verbally to his peers as part of his social development plan during the period of observation.

*Parallel Play with Regard*

Anecdotes of parallel play with regard are distinguished from those of parallel play through the characteristic of the brief but meaningful interactions that occur between the child with ASD and their peers. Parallel play with regard is characterized by brief observations of peer play, eye contact with peers, or exchange of play objects with other children. Children who engaged in this form of play demonstrated more acknowledgement of their peers as they share play objects. However, like in parallel play, events observed under this category involved children using the same objects at the same time but not sharing a play theme.

Except for one child with ASD , all children were observed to have had at least one interaction that could be categorized as parallel play with regard. Frank was the only child among the nine observed who did not engage in this form of play. All the play observed from Frank was categorized as solitary play.

Interactions under this category included children holding hands to guide through activities. According to the shadow teachers, such interactions were prompted in the past. Peers were deliberately partnered with children with ASD for specific activities. In the anecdotes recorded, no prompting from the educators were noted but the helping behaviors remained present. This behavior becomes even more noteworthy when it is considered that it is the peer that initiated the helping behavior during the shared activity. On the other hand, some anecdotes show that children with ASD are only passive recipients of their peers' pretend play. The child did not share conversations with his peers even while his peers were engaged in sustained conversations as they pursued their pretend play activity.

*Anecdote 5. Parallel Play with Regard – Passive Recipient of Pretend Play*

*A girl took David's hand and led him around the classroom as she looked for a place to sit in the "restaurant". She made David stand beside a chair next to hers and nudged him gently to sit down. She adjusted the chair by pulling it backwards so that David had more room for his legs as he sat. The girl called another classmate who was pretending to be the waiter. She ordered milk for David and the waiter brought a box of milk and placed it in front of David. The waiter left and returned with an orange on a spoon. He placed the spoon in front of David as if to feed him. David took the orange from the spoon. When the orange fell on the floor, the girl picked it up and gave it back to David. She put it near his hand, but David was playing with a toy truck and he did not seem to notice. Another classmate pretended to feed David by putting a spoon near his mouth. This girl gave him several spoons filled with food. The shadow teacher approached the children. She gently turned David's face towards the girl. David seemed to finally notice that the girl was feeding him. David smiled. The girl looked at the fish on David's hand. She took the toy fish and pretended to feed him this too.*

On some occasions, two children with ASD of varying severity were paired by the shadow teachers for shared play. Such interactions were designed for the more abled peer to lead the play. Prompting was given by the shadow teachers to guide the children to take turns and to ask permission. Events like this are significant because it demonstrates that even children with disabilities could serve as the more abled peer. These become opportunities for the children to master what they have been learning so far, and for the child to perceive another dimension to his role in the community. Some of the children who were deliberately paired in the past demonstrated that they are able to use play objects with peers. Pairing children is among the strategies used by educators in this school to teach peers how to respond or to play with children with disabilities.

*Anecdote 6. Parallel Play with Regard – Using Play Objects with Peers*
*Huey was holding a several toys in his hands. A boy approached him and asked, "Huey, can I borrow the monkey?" Huey kept his gaze on the toys on his hand and did not respond to the boy. The boy asked again buy Huey continued to play with the toys that he was holding. When Huey did not reply again, the boy leaned closer to him and asked once again if he could borrow the monkey. Huey handed the monkey to the boy without looking at him and his peer said his thanks. The boy held the monkey in the air for the other children to see. He made the monkey hold the banana and then he gave it back to Huey saying, "Here, finish." One of their classmates remarked that what the boy did was "Cool!" Huey accepted the monkey being returned to him and began playing with the banana that the monkey now held.*

For the category of parallel play with regard, some unproductive behaviors were also observed. Some children subtly showed their reluctance to allow children with ASD to join their play. Such behaviors included stopping their activity or signaling other peers to be quiet until the child with ASD moved on to his own activity. Although children with ASD sometimes showed interest in their peers' activity, such behaviors from their peers prevented them from becoming part of a shared play experience.

### *Simple Social Play*

This category represents the most complex form of play interactions that the nine children with ASD observed for this study were able to engage in. In the two weeks of gathering data, this was the highest form of play that the children were able to participate in.

Simple social play interactions are characterized by prolonged use of common play objects within the same play theme. Anecdotes coded as simple social play were also characterized by conversation among children wherein both the child with ASD and their peer were actively engaged. Anecdote 7 is an example of simple social play observed within this inclusive early childhood setting.

*Anecdote 7. Simple Social Play – Conversations*
*Christian was playing with dough with one of the girls from his class. When he handed a piece of dough to the girl, she took it and pulled it into two pieces. Christian seemed delighted by this and said, "Waaaah… yes!" He gave another piece of dough to the girl and said, "Look, a bat!" Christian watched as the girl pressed and pulled the dough and he said, "Wow, a turtle!" Then he took a new piece of dough from the table and pretended to lick it. His shadow teacher approached and asked him, "What's that?" Christian replied and said that it was a lollipop. He stood up and waved the lollipop he made up and down in a waving motion. He showed this to the girl and asked her what she thinks it is. His peer took the lollipop from his hand, took more dough from the tub and molded it. She gave her new creation to Christian and also left some molded dough for herself. Together, they pretended to lick the dough. The girl said, "Yum! Yum!" Christian imitated the girl and said, "Yum! Yum!" too. Next, they made "ice cones" with play dough. The girl put sprinkles on hers and Christian also asked some for his. This made Christian laugh. He held out his ice cone and said, "Ice cream! We're the same ice cream."*

In the anecdote above, the shadow teacher was present for most of the play but provided minimal input. It was observed that shadow teachers gave less assistance for children with ASD when interactions involved using skills that they have almost mastered. In the event cited, the shadow teacher's question seems to have facilitated the extension of play and encouraged both the child and his peer to continue recreating familiar objects using play dough. The anecdotes that show simple social play among children provide a glimpse of how play interactions could extend social skills practice of children with ASD across various activities. It is in these anecdotes that the children were observed to contribute the most and to build on play themes in collaboration with their typically developing peers.

**Table 5.**
*Parallel Play with Regard of Children with ASD*

| Coding | Description |
|---|---|
| Productive Interactions with Peers | • Peers hold the hands of the child with ASD as they walk or play<br>• Child with ASD is the passive recipient of their peers' pretend play<br>• Child and peer share and take turns in using the same set of play objects for different play themes<br>• Educators facilitate shared use of play objects between two children with ASD<br>• Peers acknowledge the child with ASD as part of their group that uses the same play object |
| Unproductive Interactions with Peers | • Peers express reluctance to include child with ASD in their play |

**Table 6.**
*Simple Social Play of Children with ASD*

| Coding | Description |
|---|---|
| Productive Interactions with Peers | • Children with ASD share play objects and play themes with peers<br>• Pretend play with peers<br>• Extended conversations between child with ASD and peers<br>• Recreating familiar objects using toys with peers<br>• Peers offering assistance or reminder to the child with ASD |
| Unproductive Interactions with Peers | • None observed |

## Discussion

The anecdotes in this article describe in detail how play interactions can become opportunities for further isolation or for developing more meaningful experiences with peers. As opportunities for interaction are considered experiences for learning in the social constructivist theory, the sociocultural context of children with ASD could influence how well an environment supports their social and cognitive development (Brown & Bergen, 2002).

### *Solitary Play*

Learning to build meaningful relations with others is one of the key developmental tasks of children in their early childhood stage. Even for children without disabilities, this task could prove challenging (Guralnick, 1993). Today's children were also found to be less able in more complex forms of social play (Frost, Wortham & Reifel, 2012). From this, it could be inferred that the intricate forms of play have become more difficult to achieve for preschoolers today, regardless of their ability.

Children with ASD who experience a certain degree of social exclusion in their unproductive interactions with peers could find relationship building a daunting task. Preference for solitary play could be the result of deficits in peer interaction skills, which is prevalent among children with mild developmental delays (Guralnick & Groom, 1987). Hestenes & Carroll (2000) found that children with disabilities spend a good portion of their play routines in solitary play. Further, Hestenes & Caroll also suggested that the severity of the disability could affect the child's success during such interactions, as demonstrated for instance in the case of Grace and Frank from Anecdotes 1 and 2. Children with disabilities were also observed to have less social engagements than their peers even within inclusive settings (Walker, 2008). The literature, together with the anecdotes on the exclusion of children with ASD resulting in solitary play, could be related to two of the premises of sociocultural theory. First is the importance of the social context of learning and second is the role of social activity to development, are both relevant to the findings of this study. In the case of Frank, it could be interpreted that his observations of peer play, especially those wherein he walked towards a group of children to observe, could be manifestations of his interest to participate. From this, the next point of inquiry would be if observations of peer play such as those seen from Frank were given support, then could instances of exclusion be turned into opportunities for learning and development? The concept of 'participatory appropriation' of Rogoff (1992) come to mind with this inquiry. This concept represents the process wherein the learner gains a new understanding of his role within a group. This new understanding of role in a social group then leads the child to alter his behavior, consistent with how he perceives himself as a member of this group. Erwin, Alimaras, & Price (1999) discovered that children with disabilities continue to engage in solitary play even when the social context is rich in opportunities to interact. This, in relation to the findings of this study and relevant literature, makes the inquiry on providing support even more pressing. It is here, perhaps, where the zone of proximal development and the educator's support could play a critical role in identifying the necessary to make the most out of opportunities for development within daily interactions.

There is another side of solitary play that could also be considered in this discussion. While this form of play could be a venue of social exclusion, solitary play could be a natural and productive occurrence for all children in their early years. Typically developing children and socially competent preschool children were found to engage in solitary play as well (Rubin, 1982). For these children, solitary play is a venue for goal-directed play. It is possible therefore, that solitary play is a product of individual preference rather than the lack of ability to socialize (Frost, Wortham & Reifel, 2012). Recent studies also inferred on the possible reasons why children of all abilities prefer solitary play. Studies such as that of Katz & Buchholtz (1999) suggest that children may have decided to engage in solitary play because they believe that they could complete a task on their own or because of their need for time separate from their peers. It is possible, according to this study, that solitary play could lead to even more productive behavior from the children because it is through time alone that they might be able to experience a sense of peace and control within their environment.

This part of the discussion intends to portray the two faces of solitary play for children of all abilities. The anecdotes derived from the observation suggests that both dimensions of solitary play could be experienced by children with ASD within inclusive environments. Acknowledging both harmful and beneficial aspects of solitary play could be the basis of educators to adjust supports provided for children. For those who engage in solitary play due to exclusion, educators could focus on bridging the gap among peers. They could aid in communicating, specifically for children whose disabilities are magnified due to language delays. For children who have been observed to engage in solitary play for what seems to be a need for time alone or to engage in constructive activities, educators could respond by helping the child achieve such preference even in the middle of shared play. The level of assistance provided by the educator, therefore, is most critical in making solitary play beneficial for the child.

*Parallel Play*

Parallel play is an opportunity for children with ASD to be immersed in social activity where they could be exposed to a myriad of social cues and possible initiations from peers. Such play also allows the child to experience being part of a community within a level of interaction that he is comfortable with at the time. While proximity to peers is one of the benefits of being a part of an inclusive learning environment, the anecdotes of parallel play presented in this article show that scaffolding and continuous practice have an important role in promoting productive interactions among children. Understanding how interactions lead to successful or unsuccessful social relations could be cues for educators on the child's zone of proximal development for belonging in his community.

In Anecdote 3, the children were using the same toys at the same time but apart from brief glances to each other, no further interactions were observed. According to Erwin, et al. (1999), children who engage in either solitary or parallel play may not be seeking to engage the company of their peers. While the benefits of solitary or parallel play have merit, it could be argued that parallel play could also be used as opportunities to create cohesion in the children within the community. In the instance of individual play with the same set of blocks for example, group discussions after the free play routine could include some discourse on the objects recreated by each child during their separate block play. This could be a beginning for productive interactions in two ways. First, it is through group discussions that the educator could promote the children's awareness of the peers that surround them. Second, by pointing out that children sometimes use the same play materials, it becomes possible to encourage collaboration for future play. While the second suggestion could take time to develop, exposing the children to ideas of working collaboratively is a start for encouraging children to try to go beyond their current play skills.

Buysse (2003) recommended that educators try to implement more active strategies as they promote social competency skills. Active strategies could include coaching children to practice their skills in actual interactions and remediating communications with peers. This was evident in the coaching provided by the shadow teacher in Anecdote 4. Teaching peers to try different strategies and to use cues that children with ASD already understand seemed to encourage interaction. Instead of their peers giving up in frustration after a single strategy was implemented, the peers sought further help from the shadow teacher until a response was achieved. This is critical especially for children who have difficulties in communicating. Brown & Bergen (2002) recommended for adults make activities that invite verbal and nonverbal responses to facilitate communication among children. Simple responses, such as “share” in the case of Huey, was effective in encouraging interaction because it is a word that could be understood both the child with ASD and his peers.

### *Parallel Play with Regard*

When children use the same play objects as they develop their individual play themes or when children play within a common play theme but with one as a passive recipient, play interactions become a fertile ground for shared experiences and meaningful encounters. Interactions as simple as holding another’s hand to guide them through an activity is an opportunity to gain understanding of others and to go beyond mere acknowledgement of their peers’ presence in their learning environment.

Deliberately pairing children of varying abilities for structured and unstructured activities is a strategy utilized by educators in this inclusive setting to encourage interactions among children. The anecdotes show some similarities with the findings of Odom and colleagues (1999) wherein they found that the effects of interventions implemented within the natural learning environment could support further interactions because peers will continue to function together within the same setting even after the exercise. Pairings among children with ASD is also a possible strategy, as demonstrated in this study.

Anecdote 5 depicted the pretend play of children in their make-believe restaurant. It is an illustration of the children generalizing their pairings to interactions beyond exercises, which is a possible manifestation of social development. As an implication, educators could see these events as opportunities that could enhance the relations of the child within his learning community. Educators could enrich an inclusive environment by offering initial interventions of pairing children of varying abilities in play, and then later on providing opportunities within the environment for such pairings to be used by the children again. By mediating such circumstances, educators could guide the children in understanding that being part of an inclusive community means developing the social competency of *all* children, as well as preventing discriminatory attitudes from peers. This concept also applies to the unproductive interaction observed from one outdoor play session. When one child was subtly excluded by his peers from their running game, mediation from a more abled peer or an adult could have made a difference in the experience of the child. It could have also influenced the attitudes of the peers towards the child, wherein an adult could have processed with the group what participation in a simple game could mean for the child with ASD .

Parallel play with regard is a category that seems to be a prime representation of the zone of proximal development. It is in within this category of play that mediation from those who are more able seems to allow the child to extend beyond his usual preference for solitary play. Parallel play with regard could be considered as opportunity for further scaffolding to be provided in order to encourage children to experience more complex forms of play.

### *Simple Social Play*

It could be inferred from the observations recorded that the availability of free play routines within the daily school routine contributed to the occurrence of simple social play interactions of children with ASD. It must also be noted that most of the simple social play, as determined in another section of this research, were child-initiated. To help the reader appreciate the significance of this observation it must be explained that in this inclusive early childhood setting, free play routines are sometimes used to deliver structured activities for children with ASD . Consistent with the idea of pull-in interventions, this practice allows the educators to provide activities to the child for cognitive and fine motor skill exercises. Child-initiated free play activities, however, is a practice that must be deemed valuable for social skills development. In lieu of structured exercises for motor or cognitive tasks, free choice play routines could be utilized as a time for the children to be surrounded by peers and to choose peers with whom they were interested in sharing activities with (Buysse, 2003).

Simple social play requires more complex play skills from children. To engage in simple social play, children need to be able to understand social cues and respond appropriately to these cues. This characteristic of simple social play makes it even more significant that such play events were observed when the children with ASD were less supervised by their teachers. It is possible that for less complex play, teachers provided more prompting because the children were just beginning to master social skills for relating with peeres On the other hand, instances of simple social play could have been supervised less because the children were at the point of mastery for play interactions.

Furthermore, it is worthy of discussion that the children who engaged in simple social play were not the oldest among the nine participants of this study. The event used as illustration of simple social play were derived from the observations of the three-year old participant. One of the common characteristics of the children with ASD who engaged in simple social play were their more developed expressive language abilities, relative to the other children observed. Language seems to have a key role in engaging in more complex forms of play. Based on Vygotsky's theory, language is a primary social tool and is crucial to verbal and nonverbal interactions (Walker & Bethelsen, 2008; Essa, 2011). Language abilities also give children the necessary tool to share their knowledge, to invite responses from their peers (Broadhead, 2004), and to contribute in building a common play theme.

Finally, the anecdotes of simple social play depict the active participation in make-believe play from children with ASD . Vygotsky emphasized the importance of make-believe play in the early years for the development of social and cognitive competencies. It is, according to his work, an activity that demands children to recreate imaginary scenes, understand the social norms within these scenes, and to abide by the rules that the scenario requires (Frost, 2012). Pretend play for children with special needs have also been examined in recent studies. It has been related by prior studies to language, cognition, and social skills development of children with disabilities (Frost, 2012). Provision of materials (Winter & Dempsey, 1994) and environmental adaptations (Broadhead, 2004) are among the recommendations to encourage make-believe play in inclusive early childhood settings. Further studies on the play interactions of children with ASD could examine the outcomes of such provisions to the development of their relations within their learning environment. It is possible that open-ended materials provided for the make-believe play of children in inclusive settings could increase the occurrence of simple social and even reciprocal play.

### *Reciprocal Play*

Observations for this study did not reveal the occurrence of reciprocal play within the free play routines of the nine children with ASD . It is possible that the children are just beginning to master skills required for simple social play, that more opportunities for play interaction are needed for reciprocal play to emerge.

## Conclusion

This study on the play interactions of children with ASD within an inclusive early childhood setting aims to emphasize the recommendations made by Mallory& New more than two decades ago of having a sound theoretical framework for inclusive practices. Social constructivism was perceived to be a sound foundation for practices because it views learning and development as deeply embedded and related to the social context & experiences of the child.

This article illustrated how children with ASD engaged in play interactions of varying complexities within an inclusive play setting. The anecdotes described the roles that the peers and adults had in making play interactions productive or unproductive. The findings further emphasize the primacy that the social constructivist framework gives on social relations as a vital instrument in making inclusion a successful reality for all children.

## Limitations

This study aims to document the play interactions of children with Autism Spectrum Disorder (ASD) within an inclusive early childhood education setting. The anecdotes in this article described in detail how play interactions of children with ASD could be opportunities for further isolation or for meaningful interactions with peers and adults. This research could be extended by creating interventions or programs guided by the social constructivist framework as proposed by Mallory & New (1994). Such interventions or programs could be evaluated by future research to determine their impact on the play interactions of children with ASD. This research could also serve as the springboard for more studies conducted within the natural play settings of children with disabilities. Interventions that highlight the importance of the children's sociocultural contexts could also be observed further and could include the use of more unstructured pretend play materials, such as those proposed by Broadhead (2004).

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# A Family Centered Training Model Proposal to Meet the Needs of Parents Having Multiple Disabled Child*

**Abstract**

*The purpose of this study is to identify the needs of parents with children that have multiple disabilities in early childhood and to suggest a family-centered training model for parents in line with these needs. The research was designed with qualitative research method. Three mothers, who have children with multiple disabilities, living in Mamak district of Ankara province, participated in the research. The data were collected in a group meeting through face-to-face interviews and analyzed by content analysis. The common needs of the mothers who participated in the group meetings were getting information about the disabilities of the children, learning how to increase the physiotherapy hours for them, getting the entire diaper costs of the children from the Social Security Institution and getting help about their transportation to the hospital. As for the personal needs, the mothers desired to get information about the parent–teacher association, epilepsy, visual impairment, hip dislocation and its treatment, shunt use and space therapy and they also wanted to learn whether robots would be useful for their children or not. In line with these results, it can be said that a screening study based on quantitative data should be carried out for further studies through wider participation with children that have different disabilities.*

Keywords: *Family needs, family centered practices, special education, multiple disabilities*

## Introduction

Children having multiple disabilities are described as individuals that have intellectual disability and also have one or more motor or sensory disorders and need high level support (Best, Wolff-Heller, Bigge, 2010; Boon, Spencer, 2010; Mastropieri and Scruggs, 2010; 2008). According to Şafak (2012) and Tekin – İftar (2005), the individuals that have more than one disability can take part in social life less independently because of experiencing physical, mental and emotional problems at a single stage or at all stages. As a result of this case, these individuals have educational, psychological, social or mental needs other than the services provided to them in general classroom and special education programs. As stated in this definition, individuals with multiple disabilities experience difficulties in various areas and they have needs as parallel to this. Therefore, individuals with multiple disabilities are a heterogeneous group and have different characteristics from one another. Concerning this subject, Bahcivanoğlu-Yazıcı and

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Akçin (2014) mentions that the term multiple disability is an umbrella term containing a combination of many disabilities and each disability increases the effect of the other. While having a disability leads to a major problem in every stage of life, the people with multiple disabilities face this problem at a doubled level (Cavkaytar and Diken, 2006; Eldeniz Cetin, Sonmez, 2018). Whilst the parents with a child having a single disability have difficulty in coping with their children's disability, the parents with a child having multiple disabilities may experience much more difficulties due to facing multiple disabilities. These difficulties affect all members of the family at various levels (Eldeniz Çetin and Sönmez, 2018) and increase and differentiate the needs of family members.

The needs of parents having children with multiple disabilities differ as their children’s needs due to the reasons such as the type of disabilities, how many disabilities the child has and the age of the child (Jansen and others 2012; 2014). In order to satisfy the differing needs of parents, the needs of the family, difficulties they encounter, the way they cope with them and the support they have should be determined and after that the needs should be satisfied in the most effective way in the light of this information (Putten, Vlaskamp, Reynders & Nakken, 2005). Winton (1986) and Pang (2010) stated that the subjects such as the child’s characteristics, her/his information, support and education needs, the nature of the interaction between the child and the parents, family’s opinion towards raising the child and living with a child having disabilities and family’s existing life cycle and conditions should be evaluated in order to determine the needs of the parents.

Parents with children having multiple disabilities can face many different difficulties such as health, environmental arrangement, educational and emotional issues and thus may not utilize the support provided for parents with children having disabilities and these children adequately (Camara, 2002; Choi and others 2011; Elson, 2000; Sardohan Yıldırım and Akçamete, 2014; Trainor, 2010; Yates, 2012). It has been observed that in Turkey, where the studies concerning the individuals with multiple disabilities and their parents can be found only at a limited level, the researches conducted with regards to this subject have proved that the mothers have been facing problems related to education (Kizir, Çiftçi Tekinarslan, 2018), health (Bahçıvanoğlu-Yazıcı and Akçin, 2014; Eldeniz Çetin and Sönmez, 2018; Sardohan Yıldırım and Akçamete, 2014), transportation (Sardohan Yıldırım, 2017), social and family relations (Karadağ, 2009; Kizir, Çiftçi Tekinarslan, 2018), financial difficulties and future anxiety (Karadağ, 2009) following the diagnosis. The studies carried out with mothers having children with multiple disabilities in the international literature (Camara, 2002; Sterbova and Kdlacek, 2014; Yates, 2012; Wang and Michaels, 2010) have put forward that these mothers are experiencing problems similar to those of the other mothers with children having special needs. It has been found out in these studies that the mothers with children having multiple disabilities are also facing difficulties in the subjects such as financial hardships and future anxiety (Graungaard and Skov, 2007; Camara, 2002), taking part in their children's education, providing support services and learning their legal rights (Camara, 2002; Hiebert-Murphy, Trute and Wright 2011; Yates, 2012), getting accurate and comprehensive information about their children (Kamenopoulou, 2012). For example, Yates (2012) stated in his study that the parents which have children with multiple disabilities expressed that they couldn’t receive accurate information concerning the appropriate support and services from different institutions for different situations of their children, besides, the parents also stated that they had close contact with the schools but could not communicate with local institutions and employees. The results of the studies designated in the literature indicate that parents need to constantly cooperate with various institutions such as health and education since the disabilities of their children are more than one. However, they do not know the terms used by the specialists in this process and have difficulty in making fast and appropriate decisions about their children, and they do not know how to overcome the difficulties they face from time to time. What’s more, they think that they are not sufficient enough for their children and they make wrong and late decisions (Mednick, 2007; Nakken and Vlaskamp, 2007). Thereby, the children with multiple disabilities and their parents need more intensive and advanced level of support to join social, emotional and educational environment effectively than the children having a single deficiency (Eldeniz Çetin and Sönmez, 2018; Jansen and others, 2014; Zijlstra and Vlaskamp, 2005). Because of these reasons, parents should take independent decisions in the process, be a stakeholder in the processes related to their children and actively participate in the processes. It should be known by the specialists that these skills will not be realized in a very short time, first of all the needs of the parents should be determined and then it should be provided not only to gain theoretical knowledge about their needs, but also to provide services to gain practical knowledge. With the aim of determining the needs of the parents and providing services to the parents there are 4 family service models that are frequently used in the literature. These models are professionally-centered, family-allied, family-focused and family-centered (Bailey, Raspa and Fox, 2012; Dempsey and Keen, 2008; Espe-Sherwindt, 2008).

In family-centered practices, specialists, together with parents, strive to support the family's decision-making skills, abilities and competences at the highest level by considering parents as stakeholders. The most important objective of the family-centered model is to strengthen the functions of the parents (Bailey, Raspa, Humphreys, and Sam, 2011; Camara, 2002; Coogle, 2012; Dunst et al., 2007; Kesiktas, 2012).

The elements on which the family-centered model is based are cherishing and respecting the family (Bailey, Raspa and Fox, 2012; Camara, 2002; Dunst, 2002) providing personal services to meet the needs of the parents (Sardohan Yıldırım, 2017; Summers et al., 2005); focusing on the strengths of the parents (Dunst, Hamby, and Brookfield, 2007; Park and Turnbull, 2003; Sardohan Yıldırım and Espe-Sherwindt, 2016); ensuring the active participation of the parents in the processes and their making right decisions (Crais, Roy and Free, 2006; Park and Turnbull, 2003; Summers et al., 2005; Turnbull et al. 2007); constituting effective communication with the family members (Dunst et al., 2007); and and implementing services in the natural habitats and routines of the parents and children (Dunst et al., 2007). The other most important characteristic distinguishing the family centered practices from other family service practices is that it focuses on relational and participatory components that practitioners are required to have (Dunst and others, 2014; Richardson, 2018). These components are;

Practices in *relational components* include effective communication skills such as active listening, empathy, and respect and no judging and being in a positive attitude towards the parents' strengths and capabilities and trusting the parents. These skills are required to be had by specialists or service providers during a training process. That a practitioner listens to the family's worries and demonstrates and details what the family tells are included in the relational component (Coogle, 2012; Sardohan Yıldırım, 2017)

Practices in *participatory components* are individualized. They support flexible practices caring about the family's priorities, providing opportunities for the parents to participate actively in decision making and choices. Also, they include actions containing processed such as cooperation between the family and specialist, informing the family in order to achieve target goals and outcomes. It targets to include the whole family in the process actively (Coogle, 2012; Sardohan Yıldırım, 2017). The parents are helped to increase their capacity and strengthen in order for them to cope with the difficulties. In participatory component, that specialist shares information with the family and information exchange between them, cooperation during training and encouragement at the point of decision-making are focused on (Coogle, 2012; Sardohan Yıldırım and Espe-Sherwindt, 2015). Decision making in cooperation is the main characteristic of participatory component and it emphasizes the participation of family members in the process (Mak, Hiebert-Murphy, Walker and Altman, 2014; Mandak, O'Neill, Light and Fosco, 2017).

Although the family centered practices are rarely implemented in Turkey, in terms of both principles and content (Bingöler Pekcici, Atay, Öztürk and Ertem, 2011; Turan, 2010;2015), it is a commonly used practice in the international literature (Berryhill, 2013; Bustos, 2011; Camara, 2002; Marian, 2011; Yates, 2012). According to this practice, the cooperation created with the family is seen to be more effective than supporting the family's strengths, increasing their capacity of actualization about their child's training and teaching children specific skills by a specialist (Bailey, Raspa and

Fox, 2012; Brown and Nott, 2005; Desjardin, 2006; Turan, 2010; Mahoney, 2009).

The practices to be planned and implemented in the suggested family centered training program are in accordance with the culture of the society which the individual live in and the family's socio-cultural structure make them more effective. Family centered training programs have been used since 1980s in international area studies (Camara, 2002; Dunst, Trivette, Davis and Cornwell, 1988), in these studies positive results have been achieved in terms of parents and children. In Turkey, studies carried out with parents having children with multiple disabilities are seen to be limited (Ayyıldız, 2007; Bahçivanoğlu-Yazıcı and Akçin 2014; Eldeniz Çetin and Sönmez, 2018; Kizir and Çiftçi Tekinarslan, 2017; Sardohan Yıldırım and Akçamete, 2014). Determining the needs of the parents with children who have multiple disabilities in early childhood and proposing a family-centered training program accordingly constitutes the problem of the study. Therefore, the objective of this study is to determine the needs of parents with children having multiple disabilities in their early childhood period and to suggest the parents studying in this field a family centered training program in this direction. When the literature related to the subject was examined, limited studies were found concerning the children with multiple disabilities and their parents. This study, which is thought to provide important and fundamental contributions to the literature, is expected to be guide for the further researches.

## Method

### *Research Design*

The research was designed with a descriptive approach based on qualitative research. By this way, in accordance with the objectives of the research, it was thought that it would be possible to focus on understanding the events and the perspectives of the participants (Denzin and Lincoln, 2000; Yıldırım and Şimşek, 2013), and to understand all the dimensions of the parents' needs related to their children. As the present study is designed with a descriptive approach, it can be said that the views and perspectives of mothers can be understood in depth through this way and with the results obtained, it can serve to create concrete suggestions for improving the quality within the process of service provision for the parents with children having multiple disabilities. What's more, in order to identify the needs of the parents with children having multiple disabilities and within this context for the needs of parents a family-centered training model proposal will be presented.

### *Participants*

3 mothers who have children with multiple disabilities in early childhood aged 0-8 (children with mental disabilities, chronic illness, orthopedic insufficiency and visual impairment) and who are living in Mamak District of Ankara participated in the study, which aimed to determine the needs of parents with children having multiple disabilities. In terms of research ethics, the mothers' approval was received regarding their participation in the study (Miles, Huberman, 1994). An agreement was signed with each mother who agreed to participate in the study, which stated that the purpose of the study was to comply with the ethical rules of the researchers and that their real names would not be used.

As explained in Table 1, it was seen that the mothers who participated in the study had low socio-economic status, 2 mothers were high school graduates, 1 mother was primary school graduate and all of the 3 mothers were housewives and their children had multiple disabilities.

**Table 1.**
*Information about the participants.*

| Mother | Date of Birth | Income | Educational Status | Profession | Children's Disabilities |
|---|---|---|---|---|---|
| Buse | 1984 | Minimum Wage | High School | Housewife | Physical and mental disabilities |
| Sude | 1979 | Minimum Wage | Primary School | Housewife | Visual, physical disabilities and chronic illness |
| Aydan | 1974 | Minimum Wage | High School | Housewife | Physical and visual disabilities, chronic illness |

*Data Collection Technique*

The data were collected at a group meeting held with mothers through face to face interviews. The reason of selecting the group meeting is the mothers' children having similar disabilities, their children's coming to school on the same day, two of the children's  attending the same class and their mothers' statements about their being good friends.These realities may mean that they can empathize with each other, observe one another and be open to cooperation. Besides, when the education levels of mothers are taken into consideration, it has been revealed that the best way for mothers to express themselves is the interview technique. For these reasons, the interview questions were prepared in order to be used in the group meeting. After the interview questions were prepared, in order to enable validity, they were sent to 5 special training specialist. As a result of the feedback from the specialists, the questions were put into their final form and they were directed to the parents. At the group meeting held with the parents, the parents were asked qustions about the strengths of their children, about what they need concerning their children, and about the difficulties they faced in the flow of life. After analyzing the data obtained from the group meeting, the researcher received confirmation considering the needs of the parents for the proposal of a qualified family-centered training model.

*Collection of the Data*

Setting the philosophy of family-centered practices as the basis, some adaptations have been made in data collection. These adaptations include interrupting the meeting when the children need their mothers (such as to take them to the toilet) and when mothers need to keep school, medicine and nutrition routines of the children. The data of the study has been collected through interviews at the group meeting. Interview which can be defined as the form of collecting data from related people within the framework of the questions sought in the research provides in-depth information about a particular research topic or a question (Büyüköztürk, 2008).

The process of the group meeting was sound and video recorded. The interview took an hour and 40 minutes. The research was conducted in Mamak Training School and Vocational Training Center located in the district of Mamak in Ankara. The researcher has carried out the Teaching Practice course of the Students at the Department of Special Education of Ankara University since 2013-2014 academic year. In this process, the researcher recognized the difficulties faced by parents with multiple disabilities and decided to carry out the research at this school. The interviews implemented with mothers were done in school principal's room.

*Analysis of the Data*

The data obtained from the research were collected through content analysis. During the data analysis process, the recorded data, which was converted from the voice recorder into written forms, was placed into the interview coding key and each line was encoded. The coded pages were read one by one and the main concepts were written on the sides of the specially prepared analysis pages (Cohen and Manion, 2007) and were analyzed with content analysis.

In the reliability calculation of the conducted study, the codings obtained by consensus in the interview coding key were divided by the sum of the consented and dissented codings and the reliability was calculated by multiplying by 100. Inter-rater reliability ranged between 80% and 100% and the mean reliability was defined to be 89%.

*Reliability and Validity*

1. The interview questions that were prepared during the data collecting process were created as a result of literature review and then sent to the field specialists, their opinions were get and the questions were re-arranged in this direction.
2. Code names were used in order to protect the participants' private lives.
3. Direct quotations from the interviewers were used to prove the comments and conclusions.
4. The consent of the participants for the data collection tools used were taken, before the research their consents were taken.
5. As a part of the principle of honesty and transparency, the whole data was sound and video recorded, the issues that the mothers wanted to be kept as secret weren't recorded.

## Results

In this chapter, the findings revealed as a result of the analysis of data obtained in the group meeting with mothers were included.

As a result of the group meeting held with the mothers, two themes emerged for their needs. The first theme is the common needs and the second theme is the personal needs of mothers regarding their children.

### *Theme 1: Common Needs*

In the process of obtaining information about their children's inadequacies, mothers want to communicate with specialists in the field to whom they can ask questions they want and who can explain the answers in a way that they can understand, do not use medical terms and are open to communication.

Regarding the issue Mrs. Buse said *"I want to get information about my child's deficiency. We only know what we see on the TV". Doctors use medical terms and I don't understand anything. Some doctors are too strict and I can't even ask a question* (The group meeting, *17.43*").

The mothers stated that the standardized hours of physical therapy and rehabilitation were not sufficient for the recovery and education of their children because their children's disabilities were severe. The mothers suggested the education hours given to their children to be adjusted according to their children's disability levels as a solution. However, mothers stated that they did not know where and how to apply.

Regarding the issue Mrs. Aydan said; "*My child has severe cerebral palsy (CP), and he has mental disability. The physical therapy and education hours aren't adequate. The treatment given to my child and the duration of education are the same as those with mild levels. I want this to be increased but I don't know where I should apply to" (*The group meeting, *19'47")*.

The mothers who participated in the study stated that they could not start toilet training because their children had severe cerebral palsy, and that they used diapers for their children but they had difficulty in affording diapers because of their low financial status. The mothers requested from Social Security Institution to meet their children's diaper expenses. Regarding the issue, Mrs. Sude said: *"My child can't get used to toilet and I can't afford my child's diaper expenses. Why doesn't the state supply the money for diapers?"* (The group meeting, *42'36*").

The mothers stated that they experienced great difficulties in going to the hospital with their children because they did not have a personal car and taxi fares were expensive, that buses were not suitable for disabled people, that there were no bus stops near their houses, and that bus drivers did not allow them to get on the bus with child strollers. Regarding the issue, Mrs Aydan said "*My daughter has severe CP and she uses shunt. I know nothing about that, also we have difficulty when going to the hospital since my child's CP is severe, none of the buses take us with pushchair. I can't get it on the municipality buses on my own"* (The group meeting, *23'08")*.

Finally, parents stated that they wanted to participate in their children's education processes, follow their education, support their children but they did not know how to do it and where to start. About the matter, Mrs. Sude said, "*I don't know what my child is taught in what situation at school. I don't even know what my child needs to learn. If I knew, I would help him study at home. I don't know how to support my child about his lessons, actually we all need that most."* (The group meeting, 43'12").

### *Theme 2: Personal Needs*

The mothers' personal needs appeared in the group meeting conducted. The mothers' personal needs;

Mrs. Buse's need was *"I would like to do something about the children and parents at school. We must have a voice. Everything is for the children"* (The group meeting, *22'42"*). Thus, she needed to be cooperative between parents and school.

Mrs. Sude said that, *"My child's condition is much worse, for example, I can't sleep at night for fear of an epilepsy crisis. My child has a hip dislocation, and sight problems. I need someone who is patient, reliable and specialist to ask the questions that I have in my mind. Because of my son's inadequacies, we go to different doctors in the hospital. I am so depressed and sad that I even forget to ask the questions in my mind. Actually, I don't know whether they will answer all of my questions if I ask."* (The group meeting, *47'06"*). She stated that, "*I asked a doctor to explain me how to use the medications and he told me to ask* *the pharmacist”.* (The group meeting, *48’11”*). Thus, she needed to be informed about epilepsy, visual impairment, hip dislocation and the way to prevent them.

Regarding the issue, Mrs. Sude said “*My child has epilepsy but I don’t know what to do when he is going through an attack, also his teachers say that my son can barely see, I don’t know where to go, what to do about this ”* (The group meeting, *51’37”*).

Mrs. Aydan said that her daughter used shunt and she didn’t understand when the shunt clogged. She added that the place of shunt turned red and she thought something went wrong but she didn’t understand what and she needed information about such matters. She also stated that she was curious about the latest developments and applications about cerebral palsy, but that there were a lot of hope traders on this subject and she could not reach scientific information.

For this reason, her need is to learn about shunt usage and space therapy and whether the robots are useful for her daughter. Mrs. Aydan mentioned her opinions about the issue by saying *“My daughter uses shunt but I don’t know what to do if something happens to the shunt, also we are people who wants to know about every solution for our children, so I want to know whether space therapy and robots are useful for my daughter or not”* (The group meeting *57’21”*).

The common and personal needs expressed by the mothers are grouped and the training sessions that can be applied for the proposed action plan are listed in the table below.

As can be seen in Table 1, common needs expressed by mothers are the need for information about their children's inadequacy, increasing the hours spent on the physical therapy and training of their children, reimbursement of money spent on diapers by the Social Security Institution, supplying vehicles to the hospital and active participation in their children’s education.

For the personal needs expressed by the mothers, the researcher included in the action plan the inclusion of the mothers’ personal needs into the common needs, and into the plans of the specialists carrying out the training sessions. For example, it was suggested that mothers’ need for information on shunt use, hip dislocation and epilepsy should be met by the person who will conduct the training session on cerebral palsy. It was suggested that the need of the mother who wants to take part in the school family union should be met in the session on teaching legal rights. Following the specification of the needs of the parents, the researcher proposed a family training program based on the principles of family-centered practices to meet both common and personal needs.

## Discussion

The needs of the children with multiple disabilities differ since their disabilities are complicated and more than one. Therefore, these children and their parents cannot take advantage of the provided support services, also the parents can face differing obstacles in accessing the services about their children’s education and health (Hanson and Espinosa, 2016). As the support services that the parents need for their children and the difficulties that the children face differ, since their disabilities are more than one, they cannot get into the single service system. Thus, the family training stage towards the parents’ needs are ignored (Williams et. al., 2013 quot Sardohan Yıldırım, 2017). In addition to that, the fact that the parents have difficulty in accessing the support services that their children need to have affects their trust on the services and their thoughts on searching for and taking help and support for issues about their children in the future negatively, therefore affects the issues like parents’ life quality, well-being, and giving support to their children’s education (Bishop, Snyder, Algina, Leite, 2016; Dunst, Espe-Sherwindt, 2016). Such findings as the mothers' need for information about the inadequacy of their children, learning about their legal rights and applying to appropriate places, transportation, participating in the education processes of their children and supporting their children in these processes were obtained from the research. These requirements of mothers are in parallel with the literature. When the inadequacies and needs of the children and their mothers’ potential to meet these needs are taken into consideration, it appears that the service system based on a family-centered model is the most suitable for mothers.

**Table 2.**

*Recommended program content based on common needs of the mothers and family-centered practices*

| Common Needs | The Session Planned to Program via Suggested Family Centered Training |
|---|---|
| The need for getting informed about the child's deficiency | -Informing about Mental Disabilities and Cerebral Palsy and Chronic Illnesses |
| The deficiency of the physical therapy and education hours and the need to get informed about how to increase them<br>The need for making Social Security Institution (SSI) include their children's diaper expenses | -Teaching the process of applying to related institutions according to the need and the legal rights they have |
| The need for transportation services to hospital | -Teaching the opportunities provided by Ankara Metropolitan Municipality for the individuals with disabilities and their parents within social support<br>-Introducing SERÇEV's functions<br>-Endeavoring for the disabled service vehicle to put into service in Mamak district |
| The need for giving support for their children's lessons | -Teaching the skills of playing with the children and develop language skills |

Bronfenbrenner (2000) states that, as the first person to use family-centered early intervention in the literature, working with children's parents, children, and other family members is the best practice for early childhood intervention (Dunst, Espe-Sherwindt, 2016). Accordingly, child centered practices in special education, early intervention and early childhood intervention are seen to focus on family centered practices and accordingly on family systems approach and ecological approach (Sardohan Yıldırım, 2017; Odom, 2016; ). As a result, the concept of family is a holistic system, since all the dynamics in it will affect each other and the children with multiple disabilities cannot be considered separate from the parents (Bailey, Raspo and Fox, 2012; Dunst, Espe-Sherwindt, 2016; Guralnick, 2011), when the related literature is reviewed the family centered practices are suggested due to the following reasons;

- the child's being continuous in the life of the family,
- providing full, clear and noncontradictory information to the family during the parents' decision making process,
- building the strengths of the family and making them aware of the strengths
- creating family-specialist cooperation and the parents' supporting one another
- implementing flexible, accessible and responsive interventions appropriate to the family,
- showing respect for parents of different cultures, races and ethnic origins
- being dependent on evidence-based practices
- helping the family in improving the child that has disabilities and satisfying her/his needs,
- providing high quality parent-child interaction,
- enabling the family to decide independently,
- supporting the parents to be legal representatives,
- strengthening the parents (Camara 2002; Cole, 2014; Dunst, 2002; Dunst, Espe-Sherwindt, 2016; Espe-Sherwindt, 2008; Gregg, Rugg and Souto-Manning, 2011; Hiebert-Murphy, Trute and Wright, 2011; Sardohan Yıldırım, 2017; Seliner, Latal and Spirig, 2016).

Together with all these reasons, it was decided that the family centered practice was suggested in the research since the children with multiple disabilities and their parents were expected to obtain efficiency from the services they took and 7 stages given below were explained. In figure 1.

Figure 1 shows the stages of the family-centered training program proposed to parents based on their needs. Stage 1 is determining parents' need; stage 2 is determining the educational environment, materials and methods; stage 3 is finding the specialists and institutions; stage 4 is conveying the characteristics, needs, learning resources and materials of parents and children to the specialists; stage 5 is arrangement of the family trainings; stage 6 is determining whether the parents are satisfied with the trainings and in this direction, deciding to renew the training session or to switch to the other session. Stage 7 is a session to assess whether the training sessions are beneficial for parents. Descriptions of the steps in Figure 1 are given below.

*1. Determining the needs of the parents*
The researchers decided to determine the mothers' needs in the group meetings. In the implementation process of the group meeting, characteristics of relational and participatory components of family-centered practices were taken as basis. The aim of arranging group meetings is to create the environment and program appropriate for the mothers' educational levels by the researchers. As the researchers stated, during the process of interviews with the parents, asking questions regarding the daily routines, hopes and expectations about their children is critically important.

*2. Determining the environment, parents' learning sources and teaching materials*
The researchers suggests, to obtain consistent findings and to propose a qualified program, collecting data from multiple sources, children's environment in order to reveal children's performance and mother-child interaction, therefore, hope that they can determine the mothers' needs exactly as they stated with the analysis of the all data collected. This attitude of the researchers shows parallelism with the suggestion given by Bailey and others (2012) in their study. The researchers mentioned about the advantages of executing the family centered practices in the institutions where the children are educated. In addition to data collection, researchers recommend that training sessions should also be conducted where parents' routines will not be disturbed and separated from their children (Childress, 2004; Sardohan Yıldırım, 2017). The opinions of the parents participating in the research should also be taken regarding this issue and a training place should be found in accordance with the parents' choices. In order to ensure the active participation of the parents in the training process, another point suggested in the research is determining the parents' learning sources (e.g. Powerpoint presentation, brochures and etc.) and methods (e.g. Drama, direct teaching and etc.) and the necessity to get the parents' approval about the learning sources for each sessions. In also these planned details, the elements of the participatory and relational components are taken as basis.

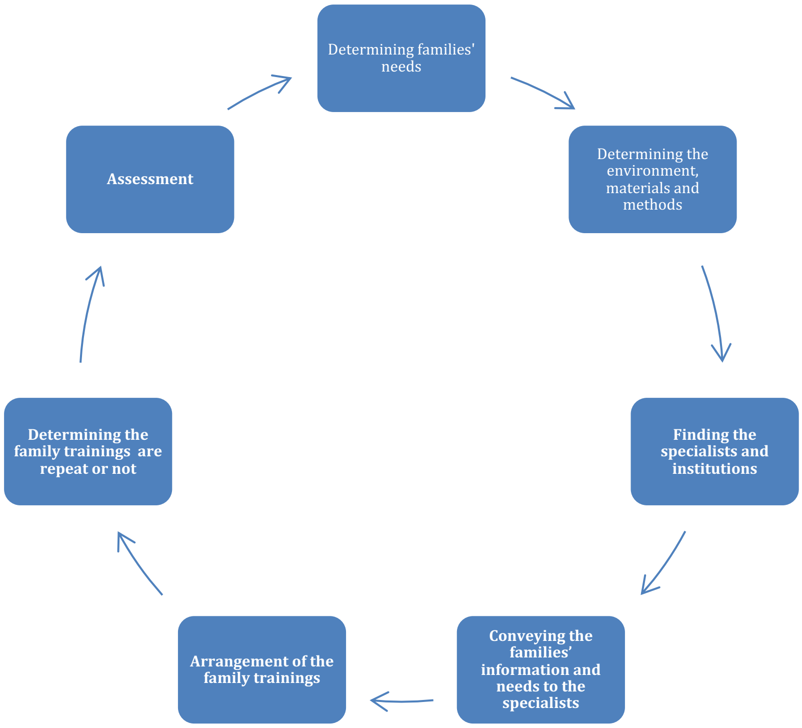

**Figure 2.**
*7 stages*

*3. Finding the specialists and institutions*

During the process of satisfying the parents' needs the participation of the field specialists ( e.g. Physiotherapist studying with the children in special needs, social service specialist, specialist working on the field of legal rights of people with special needs, special training specialist and etc.) whom the parents can get first hand and trustworthy information is suggested in the research. The researchers and the field specialists should be in contact and cooperation during the process of satisfying the parents' needs. It is thought that their communication skills will also improve as parents communicate directly and individually with different specialists. Besides, support should be get by not only field specialists but also sharer institutions and organizations, collaboration should also be enabled with them.

*4. Conveying the parents' information and needs to the specialists*

At this stage, It is suggested that the researchers introduce briefly and give information (e.g. the parents' socio-economic status, literacy levels, learning sources, teaching methods appealing to the family, the children's disabilities and etc.) about the parents to the invited specialist. The researchers should convey the parents' needs to the specialists and the specialists should be asked to include the issues the parents need commonly and personally in the program prepared by the specialists about the issue. Also, the researcher should inform the parents before each session about the field specialists participating in the training sessions.

*5. Arrangement of the family trainings*

According to the findings obtained in the research, the common needs stated by the mothers were getting information about their children's disabilities, inadequate physiotherapy hours and increasing them, learning about legal rights, getting transportation service to the hospital, getting information about applying to the related institutions according to the need and obtaining information on how to support their children in lessons and the need to do practice. Upon examining the needs appearing, it can be stated that the mothers are aware of their needs. Besides, these needs can be categorized in information and practice dimenion in the general frame and show similarity with the needs appearing in Camara (2002), Sardohan Yıldırım (2017) and Yates' (2012) studies. Accuracy of supporting the mothers' personal needs in the frame of individualized intervention is stated in the literature (McCollum and Hemmeter, 2000, quot. Kesiktaş, 2012). In addition, in family-centered practices, when determining family outcomes and family quality of life, it is critical to determine the needs of families and provide appropriate individual services to families. (Epley and others, 2011). When he mothers' needs are examined, it is seen in the examined sources that these are not only the needs of the parents with children having multiple disabilities, they are but also the needs of all parents with children having disability (Bernstein and Barta, 1988; Berger, 2008; Çetinkaya and Öz, 2000; Eldeniz Çetin and Sönmez, 2018; Kesiktaş, 2012; Kizir and Çiftçi-Tekinarslan, 2017; Sucuoğlu, 1995). Here the point that catches the attention is that, Blackhurst (1993) stated, the problems faced by the parents and their needs differ according to their socio-economic status, the severity and number of the child's deficiency, parents' knowledge level about their children's deficiency (Quot., Sağıroğlu, 2006; Ghosh, Parish, 2013; Sardohan Yıldırım, 2017). The thing suggested at this stage is executing the family trainings by taking the parents' personal characteristics into consideration.

*6. Determining whether the family trainings were executed and repeating the training if need*

It is suggested that the parents should be asked if their needs are satisfied and they are satisfied with the training sessions after the training sessions executed. If the parents' responses are affirmative, the next session should be arranged afterwards and their suggestions about the training sessions should be asked. If the parents' responses are negative, it should be understood that their needs aren't satisfied and the reasons should be found out (e.g. not being satisfied with the specialist, the content of the training doesn't appeal to the needs, the teaching materials are inefficient and etc.) and the training should be rearranged and the training should be repeated by taking these reasons into consideration (Wilder, & Granlund, 2015).

*7. Assessment*

In the process of assessing the training sessions, first of all it should be asked if the parents don't understand anything or not, and the points they want to contribute to in the process should be determined. Then, the parents should be given opportunity to practice with their children in the training sessions based on skill teaching and the training is suggested to be assessed generally (Sardohan Yıldırım, 2017).

## Conclusion and Suggestions

It is obvious that the studies executed for the determination of the needs of parents with the children having multiple disabilities are quite limited in the examined literature (Bahçıvanoğlu-Yazıcı ve Akçin, 2014; Eldeniz Çetin and Sönmez, 2018; Kizir and Çiftçi-Tekinarslan, 2017; Karadağ, 2009; Sardohan Yıldırım and Akçamete, 2014; Sardohan Yıldırım, 2017). Indeed, this situation can even be the sign that the children with multiple disabilities and their parents get inadequate support, it can be said that the needs of the children and their parents taking part in this group are ignored. Therefore, providing support and necessary services to the parents with children having multiple disabilities, revealing these parents' strengths, determining contents of training programs, being able to provide necessary support services appropriately, acting in cooperation with local governments and determining the needs of parents to enable family participation, and creating a family centered program based on these needs and the family is an important process (Bailey, Raspa, Humphreys ve Sam, 2011; Caicedo, 2014). For further studies, it is recommended to increase the number of participants, to collect data from different disability groups and to determine the needs of fathers about their children. Besides, the family centered training program suggested in this process is thought to fill the big gap in the local and foreign literature.

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# Promoting Friendship Development in Inclusive Early Childhood Classrooms: A Literature Review

**Abstract**

*The purpose of this literature review was to describe research findings related to how teachers could support friendships in inclusive early childhood classrooms, with particular interests in friendship development for young children with disabilities. This literature review was conducted to examine the following two questions: (a) How are friendships between young children with and without disabilities defined and measured? and (b) What teaching strategies and intervention programs does research recommend to promote friendships between young children with and without disabilities? The following criteria were used to determine the inclusion of articles: studies included teachers, were conducted in inclusive early childhood classrooms in the United States, had measures for friendships, and were published in peer-reviewed journals between 1990 to 2018. A total of eight studies were identified. The results of this review demonstrated that across all studies there were several common characteristics (e.g. mutual liking, spending time together) in defining young children's friendships. The studies reviewed also included various methods (e.g., surveys, interviews, observations) to measure friendships and suggested effective strategies and intervention programs that teachers could use to support friendship development. However, results also showed that teachers did not readily use the evidence-based practices. Based on the results, implications for future research and practices are discussed.*

*Keywords: preschool, friendship, inclusive classrooms, disabilities or developmental delays*

## Introduction

Social relationships are natural and sustaining parts of human interactions. Beginning at birth, infants experience emotions and social relations that are continually evolving (Nugent, Petrauskas, & Brazleton, 2009). During the first three years of life, a period known for rapid brain development, children are primed to absorb and utilize their experiences to develop social and emotional skills (Denham, Ferrier, Howarth, Herndon, & Bassett, 2016; Herndon, Bailey, Shewark, Denham, & Bassett, 2013). The early childhood period serves as a transition from caregivers' social model to an environment's social model (e.g., peers in a classroom). These social experiences provide children with opportunities to develop their social-emotional skills beyond the interactions with their caregivers by including others, such as teachers and peers (Ladd, Herald, & Andrews, 2006).

Children's social relationships during

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the early childhood period are vital to the development of their social lives in the classroom, the community, and within their own lives. Research has established that there is significant economic and social value of developing healthy relationships during early childhood years (Domitrovich, Durlak, Staley, & Weissberg, 2017). For example, through healthy peer relationships, young children can have positive attitudes about school, succeed in their learning, and develop self-esteem (Denham, 2006). In order to develop healthy and meaningful peer relationships, children are expected to have appropriate social skills such as taking turns, sharing, giving and receiving affection, and participating in shared imaginative play (Stanton-Chapman & Brown, 2015). Thus, an early childhood classroom can be a place for young children to develop their social skills by learning how to recognize and manage their emotions, form positive and healthy relationships, and build decision-making skills (Weissberg, Goren, Domitrovich, & Dusenbury, 2012). The development of social and emotional skills is also vital to a child's ability to participate in play, which is essential to social interactions during early childhood years (Stanton-Chapman & Brown, 2015). For example, young children who participate in imaginary and reciprocal play begin making a significant shift from parallel play to cooperative play. These cooperative play interactions lay the foundation of engaging in meaningful social interactions, which evolve in to forming positive peer relationships and friendships with their peers (Ladd et al., 2006).

### *Friendship Development for Children with Disabilities*

Although social relationships look natural and are part of human interactions, children with disabilities often have different and smaller social networks than typically developing children (Brown & Bergen, 2002). Also, children with disabilities may not have the same levels of social skills as their peers, which would affect their abilities to form peer relationships and friendships. Furthermore, children with disabilities are at risk for social isolation and they may engage in challenging behaviors due to their limited communication and social skills (Dietrich, 2005). In fact, several researchers showed that children with disabilities were more likely to be rejected or ignored and have fewer reciprocal relationships with peers, as compared to their typically developing classmates (Ferreira, Aguiar, Correia, Fialho, & Pimentel, 2017; Odom, Zercher, Li, Marquart, Sandal & Brown, 2006). Ultimately, the exclusion and lack of peer interactions for children with disabilities were related to their social adjustment problems (Richardson & Schwartz, 2004) and low self-esteem (Han & Kemple, 2006).

However, as more children with disabilities have been included in regular classroom settings, it is critical to support social emotional development for all children, including children with disabilities in inclusive classroom settings by providing them with access and opportunities to participate in classroom activities through positive peer interactions (Frea, Craig-Unkefer, Odom, & Johnson, 1999; National Association for the Education of Young Children (NAEYC)/Division for Early Childhood (DEC), 2009). The joint statement on inclusion published by the leading organizations in early childhood and early childhood special education (NAEYC/DEC, 2009) addresses the need for further operational and common understanding for early childhood inclusion and includes friendship as a desired outcome of inclusive classrooms. Furthermore, the Policy Statement on Inclusion developed by U.S. Department of Health and Human Services and Department of Education (2015) stresses that the early childhood is a critical period for both children with and without disabilities to lay the foundation for social skills to be used across the lifespan.

### *Teacher Support for Friendship Development of Young Children with Disabilities*

Given the importance and needs for promoting positive peer relationships and friendships of young children, especially children with disabilities, researchers have suggested intervention programs and effective strategies (DEC, 2014). Many of those intervention programs and strategies involve *teachers*. A teacher plays significant roles in a classroom, especially during the early childhood period to organize and construct meaningful social experiences for children (Sazak Pinar, & Sucuoglu, 2013). For example, teachers can provide a social model for all children with and without disabilities by socializing children through reciprocal interactions, modeling how to express themselves emotionally, and illustrating different social roles in the classroom (Denham, 2006).

Over the past thirty years, how teachers can effectively support social relationships between children with and without disabilities in inclusive classrooms has been an important research topic (Barton & Smith, 2015; Brown, Odom, & Conroy, 2001). While there has been an emphasis on teacher training to foster meaningful participation of children with disabilities in the general education curriculum (Shippen, Crites, & Houchins, 2005), there is limited information on how teachers can support friendship development between young children with and without disabilities in early childhood classrooms. Several researchers have suggested that young children with disabilities could benefit from friendship development in their classrooms (Arda & Ocak, 2012; Pickens, 2009). Positive peer relationships such as friendships with peers with disabilities are also a benefit that typically developing children can obtain from inclusive classrooms (NAEYC/DEC, 2009). Therefore, it is vital to understand how teachers can support children with disabilities to develop friendships in inclusive early childhood classrooms. The purpose of this literature review is to describe what we know about *friendship development* for young children with disabilities in inclusive early childhood classrooms and how *teachers* can support young children's friendship development. The research questions guiding the literature review are: (a) How are friendships between young children with and without disabilities defined and measured? and (b) What teaching strategies and intervention programs does research recommend to promote friendships between young children with and without disabilities?

## Method

### *Literature Search*

Two online databases, Educational Research Information Center (ERIC) and PubMed were used to search articles. The first parameter set was the year of publication from the years 1990-2018, which corresponds to when the United States Congress passed the Individual with Disability Education Act (1990). Additional limits were placed that research studies must be published in peer-reviewed journals and written in English. The second parameter was to select research studies that included either early childhood teachers or children aged from two and nine-months old to five-years-old. The search keywords were chosen from the databases' thesaurus and from keywords found in research studies selected for the introduction in the same field. The "explode" function was used to increase the search results to enable broaden the search to include specific keywords, but also include all of the keywords chosen. The keyword, "friendship" was used in combination of other words related to the topic of the current review paper (e.g. inclusion, disabilities or developmental delays, preschool children or early childhood). This electronic literature search yielded 152 articles.

### *Criteria for Inclusion*

The following criteria was used to determine the inclusion of research articles: (a) each study needed to include teachers (e.g., lead teacher, assistant teacher, special educational resource teacher) and children who were between 2.9 and 5 years-old and were enrolled in an early childhood class, thus kindergarten classes were not included; (b) the early childhood classroom environment must be inclusive and include both children with and without disabilities; (c) studies must include data with explicit measures of friendship that are either qualitative data (e.g., observations, interviews) or quantitative data (e.g., observations, questionnaires); and (d) studies must be conducted and published in peer-reviewed journal in the United States. Also, the first author hand selected additional studies by reviewing the reference lists of selected articles that met all of the inclusion criteria. Additional articles were also selected from recommendations, "See more like this one" from the databases (i.e., ERIC and PubMed) and citation software management software (i.e., Mendeley) and from the websites of early childhood journals, (i.e., Early Childhood Research Quarterly, Journal of Early Intervention, Topics in Early Childhood Special Education).

## Results

This literature review search found a total of eight studies that met all of the inclusion criteria. The main purpose of the eight studies was to describe friendships of children with disabilities and identify the teaching strategies or interventions used to promote friendships in inclusive early childhood classrooms. All of the eight studies included in this literature review used *teachers* as the primary source to identify or facilitate friendships in their classroom. Three studies included teachers in childcare settings (Buysse, 1993; Buysse et al., 2002; 2003), whereas five studies were conducted with teachers in preschool classrooms (Chang, Shih, & Kasari, 2016; Dietrich, 2005; Frea et al., 1999; Hollingsworth & Buysse, 2009; Odom et al., 2006). See Table 1 for a summary of the purpose, participants, and friendship measures of the eight studies included in the current literature review.

### *Friendship Definitions*

Results showed that there was not one definition of friendships for children with disabilities in inclusive early childhood classrooms. The definitions of friendships used in the studies reviewed included several common characteristics of friendships (Dietrich, 2005; Hollingsworth & Buysse, 2009) and dynamics of friendships (Buysse, 1993; Chang et al., 2016; Odom et al., 2006). Across all eight studies the major common characteristics of friendships included a desire to be with another child (Chang et al., 2016; Dietrich, 2005; Hollingsworth & Buysse, 2009; Odom et al., 2006) and mutual regard for each other (Hollingsworth & Buysse, 2009, Odom et al., 2006). Dietrich (2005) also defined friendships based on mutual liking and spending time together: (a) being nice to one another (e.g. sharing materials and space, taking turns, providing assistance to their friends as needed, providing comfort, playing together, and demonstrating a lack of aggression with each other), (b) showing affection to each other (e.g. hugging, holding hands), (c) liking one another (e.g. talking about friends), (d) choosing to spend time together (e.g., seeking each other out), and playing and having fun together (e.g., laughing, smiling).

**Table 1.**
*Summary of Recieved Studies*

| Authors/Year | Purpose | Participants | Measures | Title of Survey |
|---|---|---|---|---|
| Buysse (1993) | Examined friendships between CWD and TDC in community-based childcare settings | 58 CWD<br>0 TDC<br>48 Teachers | Survey<br>Interview | *Early Childhood Friendship Survey* |
| Buysse, Goldman and Skinner (2002) | Examined the effects of the types of early childhood settings on friendship formation of CWD and TPC | 120 CWD<br>213 TDC<br>25 Teachers | Survey<br>Interview | *Teacher Ratings of Children's Social Development*<br>*The Playmates and Friends Questionnaire for Teachers* |
| Buysse, Goldman and Skinner (2003) | Explored how teachers' social beliefs and practices in inclusive classrooms supported peer-selected and established friendships between CWD and TDC | 120 CWD<br>213 TDC<br>25 Teachers | Survey | *The Playmates and Friends Questionnaire for Teachers* |
| Chang et al (2016) | Examined friendships in preschool classrooms for children with ASD | 31 CWD<br>0 TDC<br>25 Teachers | Survey<br>Interview<br>Observation | *Friendship Questionnaire*<br>*The Early Social-Communication Scale* |
| Dietrich (2005) | Focused on the dynamics of friendships and what contextual variables influence friendships between CWD and TDC | 8 CWD<br>27 TDC<br>2 Teachers | Observation<br>Interview | |
| Frea et al (1999) | Compared relative treatments effects of group friendship activities and structured play activities on social interactions for two preschoolers with peer relationship difficulties | 2 Focal CWD<br>6 CWD<br>32 TDC<br>5 Teachers | Observation | |
| Hollingsworth and Buysse (2009) | Explored how teachers' social beliefs and practices were related to supporting established preschool friendships between CWD and TDC | 12 CWD<br>12 TDC<br>12 Teachers | Interview | |
| Odom et al., (2006) | Examined friendships, social acceptance, and rejection of young children with disabilities | 5 Focal CWD<br>80 CWD<br>TDC & Teachers from 37 classes | Survey<br>Observation<br>Assessment | *Teacher and Parent Friendship Questionnaire*<br>*Sociometric Peer Rating Assessment* |

*Note: CWD: Children with disabilities; TDC: Typically developing children, ASD: Autism Spectrum Disorders*

The dynamics of friendship included the social nature and interactions between children with disabilities and their classmates (Buysse, 1993; Chang et al., 2016). These friendship dynamics were described based on direct observations of peer interactions between children with and without disabilities (e.g., how much time they spent together for play, how often and who they played with) and through semi-structured interviews with the children's teachers. For example, Buysse (1993) categorized friendships into four domains: Mutual, Type I unilateral, Type II unilateral, and Non-existent friendship. Mutual friendship was defined as a reciprocal relationship, whereas unilateral categories were one-way social interactions. Type I unilateral friendships occurred when the child initiated consistent social interactions with another child and Type II unilateral was when the child was the recipient of a friendship but did not reciprocate back. Chang and colleagues (2016) also examined the dynamics of friendship for children with autism and how they interacted with typically developing children. Three criteria were defined for friendships that included (a) at least 50% of a target child's initiations were responded by a peer, (b) at least one social instance of joint engagement or games occurred during the interaction, and (c) at least one positive affective exchange with a peer occurred.

*Friendships for Children with Disabilities*

Several studies reviewed in this paper described friendships for children with disabilities (Buysse, 1993; Buysse et al., 2002; Dietrich, 2005; Odom et al., 2006). Buysse (1993) examined the percentage of children with disabilities in each category of friendship (e.g., mutual, unilateral, no friends). The results showed that 55% of the children with disabilities had mutual friendships, 7% had type I unilateral, 10% had type II unilateral, 2% had both type I and II unilateral, and 26% had no friendships or unilateral relationships. The participating children with mutual friendships had higher social scores, while children with unilateral friendships had the lowest social scores. In a subsequent study, Buysse and colleagues (2002) measured friendships for children with disabilities in different early childhood settings to examine whether the inclusive setting, childcare or a specialized preschool classroom influenced friendship formation. Overall, children with disabilities were found to have fewer friendships compared to typically developing children. Also, in childcare settings, children without disabilities were found to have similar number of reported friends as the children with disabilities.

Additionally, Dietrich (2005) found that the friendships for children with disabilities changed in dynamics across time and were influenced by similarity in play styles, opportunity to engage in similar activities, similar knowledge and interests, proximity, and parental factors. For example, these friends were able to meet each other's social needs and have fun together while playing. In addition, these friendships naturally developed without a "prescribed intervention plan (Dietrich, 2005, pg. 213)" in an inclusive classroom. She also noted that friendship characteristics for children with disabilities were also similar for what was commonly seen between two typically developing preschool-aged children.

Odom and colleagues (2006) showed that the participating children with disabilities who had mutual friendships were described as having higher social responsivity than children with unilateral friendships. In addition, children with disabilities who had mutual friends had lower scores on teacher-rated negative behaviors that may interfere with friendship formations. These negative social behaviors included behaviors (e.g., humming, pacing, crying, acting shy and withdrawn, acting aggressive and impulsive) that were disruptive to social interactions. Odom and colleagues also identified friendships to measure social acceptance of children with disabilities in inclusive classrooms. In the study, only 22 of 80 (28%) of the children with disabilities were marked as socially accepted and the 22 children with disabilities had at least one mutual friendship identified by both a teacher and a parent. The children with disabilities who had close friendships also had more reciprocal peer relationships than children with disabilities who were rejected by their peers. Children with disabilities were also found to have fewer friends, less playmates and slower social development scores in comparison to typically developing children. Also, children with disabilities had a higher probability of having a friend with a disability than their peers. These results are consistent with other studies reviewed. For example, Chang and colleagues (2016) showed that only 20% of children with autism had friendships and these children were more jointly engaged with peers during play, compared to other children with autism who did not have friends.

### *Friendship Measures*

A variety of methods were used to identify and measure friendships for children with disabilities. The researchers in the studies reviewed used friendship surveys, *Sociometric* peer ratings, semi-structured interviews, and direct observations. See Table 1 for friendship measures used in the studies reviewed.

#### *Surveys*

Five of the eight studies used surveys to identify friendships of children with disabilities. Two research teams (Buysse, 1993; Odom et al., 2006) used the *Teacher and Parent Friendship Questionnaire* revised from the *Early Childhood Friendship Survey* (Buysse, 1991) to identify friendships of children with disabilities by asking parents and teachers to complete the survey. Subsequently Buysse, Goldman, and Skinner (2002, 2003) used *the Playmates and Friends Questionnaire for Teachers (TPFQT)* developed by Goldman, Buysse and Carr (1997) to document the numbers of and nature of children's relationships with peers in early childhood settings. The researchers asked lead teachers to complete the *TPFQT* including questions about common playmates and special friends, and a teacher's roles in friendship formation for specific dyads. Chang and researchers (2016) had both parents and teachers complete a *Friendship Questionnaire* adapted from *The Playmates and Friends Questionnaire for Teachers (TPFQT)*. These results showed that all these friendship surveys were stemmed from the *Early Childhood Friendship Survey* (Buysee, 1991). Although Buysse, Goldman and Skinner (2002) provided evidence for the construct and concurrent validity of the *Teacher and Parent Friends Questionnaire* for identifying friendships by demonstrating that the survey significantly discriminates between children with and without disabilities and it is significantly related to teacher ratings of children's social competence, no specific psychometric data for these surveys were reported.

In addition to the surveys to identify children's friendships, two research teams used teacher rating scales to assess children's social and communication skills (Buysse et al., 2002; Chang et al., 2016). For example, Buysse and colleagues (2002) asked lead teachers to complete *the Teacher Ratings of Children's Social Development* (Profilet & Ladd, 1994) for their students with and without disabilities to identify children's social competence (e.g., prosocial skills, sociability, social initiative, making and keeping friends, and acceptance in peer group) with a rating scale of one to seven. The Chronbach Alpha for this scale was 0.98 indicating high internal consistency. Additionally, Chang and colleagues (2016) asked teachers to complete *the Early Social-Communication Scales* (Mundy, Sigman, & Ungerer, 1986) to measure joint attention and behavior regulation skills of children with autism during social interactions. The reliability intra-class coefficient reported between two independent coders was 0.91 and ranged 0.87 to 0.98.

While most of the friendship surveys were completed by teachers, Odom and colleagues (2006) used a *Sociometric Peer Rating*s with typically developing children. The researchers asked each typically developing child to rate their peers with disabilities by responding to the question, how much they "like" to play with those peers with disabilities by sorting photographs of their classmates into three different boxes with emotional faces indicating happy (like to play with XX a lot), neutral (like to play with XX a little), and sad faces (do not like to play with XX at all). The researchers reported that this sociometric peer rating task had stability coefficient of .71 to .79 across a 2- to 3-month period and a concurrent validity with positive and negative peer nominations.

#### *Interviews*

Five of the eight studies conducted interviews with teachers. For example, Dietrich (2005) interviewed teachers twice using open-ended questions. During the first interview, teachers were asked to identify specific friendship pairs and activities the pair liked to do together, and to explain why they thought the children were friends. In the second interview, the teachers were asked the same questions from the first interviews with additional questions relating to how the friendship had changed over time, how their friendships would change, and what benefits the children received from the friendship. Also, four other studies reviewed in this paper included teacher interviews (Buysse,1993; Buysse et al., 2002; Chang et al., 2016; Hollingsworth & Buysse, 2009) but the purpose of the interviews was to gather information about what strategies teachers used to facilitate friendships, not to measure children's friendships. For example, the four research teams asked teachers about how they taught social skills in their classrooms and supported children's friendships.

### *Direct observations*

Four of the eight studies reviewed included direct observations to measure friendships (Chang et al., 2016; Dietrich, 2005; Frea et al., 1999; Odom et al., 2006). Frea and colleagues (1999) completed quantitative and qualitative observations to record frequency and duration of positive social interactions between the focal children with disabilities and their peers. To observe "more qualitative, or less discrete, features of children's interactions" (Frea et al., 1999, Pg. 233-234), the researchers used the *Observer Impression Scale (OIS)* (Odom & McConnell, 1991), an assessment tool to measure quality of peer interactions by documenting the focal child's behavior in terms of social performance and social impact upon peers (e.g., cooperation, turn-taking, affect sharing) through a 5-point Likert scale. Each observation session using the *OIS* focused on a child in one of the classroom activities including centers, groups, or during free play period. Dietrich (2005) also conducted naturalistic observations of six naturally occurring friendship dyads in two inclusive preschool classrooms. Children's behaviors were observed in terms of whether they were enjoying each other's company, laughing and having fun, and seeking each other out across activities and at various times during the day.

Odom and colleagues (2006) conducted observations of children's social interaction with their peers using the *Code for Active Student Participation and Engagement – Revised* (*CASPER-II*; Brown, Favazza, & Odom, 1995). The *CASPER-II* was developed to record children's behaviors and classroom ecology including positive social behaviors to peers (e.g., talking, greeting, sharing, touching, calling a name to another child) and negative behaviors to peers (e.g., hitting, kicking, biting, negative remarks, crying to the focal child) every 30 seconds for six 30-minute observations sessions.

Chang and colleagues (2016) observed the interactions of children with autism with their peers (e.g., engagement states, child initiations, and adult strategies that were used to engage the child) and teachers during free play in their inclusive classrooms. The researchers used a behavioral coding system during two 15-minute observations to record children's interactions with their peers or teachers over a one-month period. A 15-minute session was broken into 50 second time intervals. The observer recorded information about social skills for each target child (e.g., engagement states and child initiations) during specific interventions designed to improve children's communication skills. In addition, observers documented teacher supports (e.g., gesture or language for joint attention, environmental arrangement, prompting target child, inviting other children to play with target child).

### *Teaching Strategies or Interventions for Friendships Development*

Six of the eight studies reviewed suggested teaching strategies to promote peer relationships and friendships between children with and without disabilities (Buysse, 1993; Buysse et al., 2003; Chang et al., 2016; Dietrich, 2005; Frea et al., 1999; Hollingsworth & Buysse, 2009). The participating preschool teachers in Hollingsworth and Buysse (2009) described their practice of supporting friendships by letting children choose their own friends and talking about all classmates as being friends. The teachers also described providing opportunities for dyadic interactions through intentional strategies such as pairing specific children together by assigning them to be buddies, placing children in a play area where they were less likely to be in conflict over materials, sending children to play areas where only two children were allowed to participate in. The teachers also stated that they provided children with ideas about how or what to play with by suggesting specific activities, redirecting children from inappropriate activities, helping them resolve conflicts, and interpreting children with special needs for their peers.

Buysse (1993) also identified teaching strategies that could promote friendships by giving choices to children with disabilities so they could play near a friend or to sit by a friend during activities such as circle time. Although 44% of the participating teachers mentioned adult involvement, those teachers also reported promoting friendships through proximity by pairing children together during activities and encouraging them to initiate play with peers. However, the teachers who did not report adult involvement as a strategy also indicated that their support was not necessary because children, "formed friendships on their own" (Buysse, 1993, pg. 389). Several research studies reviewed also suggested the idea, encouraging teachers to leave friendship choices to children (Chang et al., 2016; Dietrich, 2005; Frea et al., 2009). Additionally, Dietrich (2005) found that not all teachers implemented an activity that was intentionally planned such as using a student's favorite activity to facilitate friendships and some teachers indicated that they did not intentionally use particular strategies to promote and support friendships for children with disabilities.

Buysse and her colleagues (2003) asked teachers about what teaching strategies they used to support individual friendships in inclusive early childhood classrooms. Using *the Playmates and Friends Questionnaire for Teachers* (Goldman, Buysse, & Carr, 1997) as a tool for a semi-structured interview, the teachers were asked to identify strategies they used to support individual friendships including: comment on a friend's play, invite two children to play together, provide special materials or activities, arrange for a child to be close to his friend, speak or interpret for a child, and provide suggestions to solve problems or resolve conflicts. The most commonly reported strategies were providing sufficient time for free choice, allowing children to form their own friendships, and commenting on children's play with friends.

While most of the studies above described what teaching strategies were used for friendship development through teacher interviews, Frea and colleagues (1999) examined the effectiveness of an intervention called "*Group Friendship Activities (GFA)*" to promote peer relationships and friendships in preschool classroom settings. The *GFA* included three predetermined songs or games that were introduced to the group by a trained activity leader, and included social behaviors (e.g., hugging, giving high fives, tickling, and complimenting) during typical preschool classroom activities. The predetermined songs or games were sung back to back, while the leader focused on activities by involving social interactions with the child who received social supports. The group leader would provide children with prompts to participate in the activities through interacting with other peers. The study revealed that through the *GFA* there was an increase in frequency and duration of positive peer interactions for children with disabilities. However, the participating teachers noted a need to tailor the selection of intervention activities that would be relevant to unique characteristics, skills, and interests of an individual student with a disability. Also, it was recommended that teachers should continually monitor children's behaviors to evaluate whether the interventions are effective over time.

Additionally, Chang and colleagues (2016) focused on friendships of children with autism. They observed the frequency of adult strategies in promoting friendships for children with autism. The participating children with autism were observed during social interactions with their peers in inclusive preschool classrooms. The teachers were asked about what strategies they used to facilitate friendships between children with and without disabilities. The two most commonly reported teaching strategies were behavioral regulation (e.g., managing inappropriate behavior or routine-based activity like cleaning up) and environmental arrangement (e.g., arranging children in the classroom to prevent problem behavior).

## Discussion

The current literature review examined how friendships were defined and measured for young children with disabilities in inclusive early childhood classrooms and what teaching strategies and intervention programs have been suggested to promote friendships for children with disabilities. Although there was not a single definition of friendship between children with and without disabilities, the definitions described by the researchers in the all eight studies reviewed shared some common characteristics of friendships (e.g., mutual liking, being nice to each other, and spending time together). The varying definitions of friendship across the studies are similar to the friendships of typically developing children and consistent with the definitions of friendships in previous research studies (Herndon et al., 2013; Meyer & Ostrosky, 2014).

The current literature review also demonstrates that researchers have used various measures (e.g., surveys, interviews, direct observations) to identify and assess friendships between children with and without disabilities. However, most of the measures in the reviewed studies relied on reports by teachers and/or parents. Of the eight studies reviewed, one study directly asked children about their friends (Odom et al., 2006) and four studies used direct observations of peer interactions (Chang et al., 2016; Dietrich, 2005; Frea et al., 1999; Odom et al., 2006) to assess friendships. Also, most of the friendship surveys were developed based on the *Early Childhood Friendship survey* (Buysse, 1991) more than 10 years ago and no specific psychometric data for these surveys were reported. Thus, future research needs to examine the validity and reliability of the surveys and to develop more developmentally appropriate measures to assess friendship characteristics of young children with disabilities.

Additionally, six of the eight studies reviewed described how teachers could promote friendship development between children with and without disabilities. However, one study examined a specific intervention program for friendship development (Frea et al., 1999) and other five studies described general ideas and strategies that teachers used in their typical classroom settings through teacher interviews. Only one study (Chang et al., 2016) reported teachers' actual behaviors (e.g., involvement in children's play interactions) through direct observations. Also, some of the teachers reported that they did not implement an intentionally planned activity for friendship development (Dietrich, 2005). Thus, investigating which strategies would be more effective to support peer relationships and friendships (Yang & Fusili, 2012) would be necessary in future research. Although friendship development for young children with disabilities has been an important research topic, surprisingly there have been limited research studies on how *teachers* could facilitate friendships between children with and without disabilities in their early childhood classrooms. Thus, additional research is needed to examine the effectiveness of the strategies and intervention programs described in this literature review paper.

Research clearly shows that positive peer relationship is vital to children's later adjustment and children who have friends have positive attitudes about school, succeed in their academic learning, and develop self-esteem (Denham, 2006). Thus, it is essential that teachers provide positive and prosocial experiences to support children's positive peer relationships and friendship development (Buysse, 1993). Through teacher support, children with disabilities can increase their social engagement and form stronger peer relationships, including friendships with their peers (Chang et al., 2016; Frea et al., 1999; Stanton-Chapman & Brown, 2015). With this in mind, it is necessary that teachers and researchers establish a better understanding of friendship development in early childhood settings, both for children with and without disabilities. If teachers are given more knowledge and training about how to support emerging friendships, children with disabilities could benefit from teacher support to develop meaningful peer relationships. In particular, researchers have suggested that teacher education programs alone could not increase classroom quality in early childhood settings. Early and colleagues (2017) noted that on-going professional development activities is effective to support teachers' interactions with their students. Thus, it is critical that future research address how teacher education programs and professional development program can support teachers to facilitate friendships for children with disabilities in inclusive early childhood classrooms.

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# A bioecological Content Analysis: An Analysis Technique Rooted in the Bioecological Model for Human Development

***Abstract***

A bioecological content analysis is an analysis technique rooted in the bioecological theory of human development and the Process–Person–Context–Time (PPCT) model. In this article, we outline what a bioecological content analysis is and provide guidelines to researchers, students and others who want to use it in large or small scale life story oriented research on such matters as children with special needs and their families, early intervention and early childhood special education. A discussion of advantages and disadvantages of the bioecological content analysis is provided.

Keywords: *Bioecological content analysis; Bioecological model for human development; Life story research; Matrix; PPCT-model.*

## Introduction

Researchers who investigate human development often use Bronfenbrenner's bioecological theory/model for human development as a theoretical, conceptual and analytical frame in their studies. The reason for this is that the theory provides a comprehensive and reasonable explanation of what influences human development, as well as useful concepts that can be adopted in research descriptions and analyses.

The researchers Lundqvist (2016) and Lundqvist, Allodi Westling and Siljehag (2015), for example, took on the bioecological theory as a theoretical, conceptual and analytical frame in a study about special educational needs and support provisions in Swedish preschools. In their multiple-case study, the children's abilities were described (biosystem) and the children with special educational needs were viewed within preschool settings (microsystem settings) and ongoing proximal processes. Connections between home and preschool on such matters as transitions to the next school form were analyzed, as were the allocation of resources from the community (exosystem), the content of national policy document (macrosystem) and changes during early school years regarding support needs and provisions (chronosystem). The researchers Hanson et al. (2001) also took on Bronfenbrenner's theory on human development as a frame in a study about

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multiple influential factors on children's educational placements decision from inclusive preschools to elementary school. In their longitudinal study, the data were collected via interviews and observations of documents and classrooms. The children's characteristics (biosystem) and the characteristics of classrooms, homes and families (microsystem environments) were analysed, as were the interrelationships between microsystem settings (mesosystem), impact of community and school structure (exosystem) and national values and beliefs related to disabilities, inclusion and early education (macrosystem). Changes over time (chronosystem), regarding inclusion placements were also investigated and discussed. Another example is a study by Rimm-Kaufman and Pianta (2000). They analysed educational transitions to Kindergarten. In keeping with the bioecological theory, they recommended not only to look at a child's characteristics in investigations of educational transitions placement in Kindergarten, but also to look at ecological factors. Several more examples of such bioecological framed studies exist; for example, Sandström, Lundqvist and Axelsson (2019) and Axelsson, Lundqvist and Sandström (2017) in which parents of children in preschool and preschool class describe their children, their children's learning environments, their collaboration with staff in these learning environments and their children's transitions from preschool to preschool class via life story research.

A first draft, in Swedish, to the bioecological content analysis and matrix (Lundqvist, Sandström, & Axelsson, 2016) was developed parallel to life story researches (Axelsson, Lundqvist, & Sandström, 2017; Sandström, Lundqvist, & Axelsson, 2019). One of these was built on data from several longer retrospective interviews (N=27) and the other on a few longer retrospective interviews (N=3) which in the studies were referred to as life stories. These studies were based on Bronfenbrenner's bioecological model and acknowledged proximal processes (e.g. educational activities, routines and free play) as engines for human development. Since then, the analysis technique has been somewhat revised: Phases as well as the terms biosystem subcategories, microsystem subcategories, mesosystem subcategories, exosystem subcategories, macrosystem subcategories and chronosystem subcategories have been added.

In this methodologically oriented article, the revised bioecological content analysis is being outlined and discussed. It is rooted in the bioecological model for human development and makes use of its central ideas and concepts. A matrix (Table 1) is attached to the bioecological content analysis, and is therefore also presented in this article. The bioecological content analysis comes in two versions – one for large scale life story studies and one for small scale life story studies. Life story research, which can also be referred to as a life story study, is a research approach that can be adopted by researchers who aim to investigate and deepen the understanding of people's life experiences and their reflections on these experiences (Bertaux, 1981; Goodson & Sikes, 2001; Jepson Wigg, 2015).

### *The bioecological model and the PPCT-model*

The bioecological model for human development (Bronfenbrenner, 1979, 1992, 2001; Bronfenbrenner & Morris, 1998) is a theory about intellectual, social, emotional and moral development. It took Bronfenbrenner several years to elaborate the conception of the bioecological model and during these years he was inspired by well-known scholars, for example Sigmund Freud, Kurt Levin, George Herbert Mead, Jean Piaget and Lev Vygotskij (Bronfenbrenner, 1979); he was assisted by colleagues, for example Pamela Morris, Richard Lerner and William Damon.Two periods, separated by the year 1979, are worth mentioning during the development of the model. In 1979 his landmark volume 'Ecology of human development: Experiments by nature and design', was published. In this book he presents the famous concepts of microsystem, mesosystem, exosystem and macrosystem, and underlines the role of context on the child's intellectual, social, emotional and moral development. Bronfenbrenner (1992) defined these four systems in the following way:

> *A microsystem is a pattern of activities, roles, and interpersonal relations experienced by the developing person in a given face-to-face setting with particular physical and material features and containing other persons with distinctive characteristics of temperament, personality, and systems of belief. (p. 148)*

> *The mesosystem comprises the linkage and processes taking place between two or more settings containing the developing person (e.g., the relations between home and school, school and workplace). In other words, a mesosystem is a system of microsystems. (p. 148)*

> *The exosystem, encompasses the linkage and processes taking place between two or more settings, at least one of which does not ordinarily contain the developing person, but in which events occurs that influence processes within the immediate setting that does contain that person (e.g., for a child, the relation between the home and the parent's workplace; for a parent, the relation between the school and the neighbourhood group). (p. 148)*

> *The macrosystem consists of the overarching pattern of micro-, meso-, and exosystems characteristics of a given culture, subculture, or other broader social context, with particular reference to the developmentally instigative belief systems, resources, hazards, lifestyles, opportunity structures, life course options, and patterns of social interchange that are embedded in each of these systems. The macrosystem may be thought of as a societal blueprint for a particular culture, subculture, or other broader social context. (p. 149-150)*

According to Bronfenbrenner (1979), environments such as a home, a preschool, a recreation center [school-age educare] and a school can be understood as microsystem environments that influence a child's development through activities that he or she is engaged in, roles that he or she chooses or is given, and relationships that are formed within these microsystem environments. A child can belong to several microsystem environments and carry experiences between these, for example a situation that has taken place at home may impact what is taking place in school. Interplays of different kinds between microsystem environments are located in the mesosystem. The two subsequent systems, the exosystem and the macrosystem, are in comparison to the microsystem and mesosystem more indirect and distal from the children. Two examples of influences related to the exosystem are parents' work (e.g. how much time is spent with work and with their children) and the economics of a child's school districts (e.g. the available resources for a preschool and a preschool class). Four examples of influences related to the macrosystem are cultures, social structures, belief systems and national regulations.

In the period after 1979, during the 80's and the 90's, the ecology of human development was revised so that attention should also be paid to the role of the developing person and the biosystem (e.g. disabilities, abilities and engagement), the role of the proximal processes (i.e. primary engines for development such as group or solitary play, reading, learning new skills, athletic activities and problem solving) and the role of time, along with the role of the context on development (Bronfenbrenner & Morris, 1998). In the bioecological model the proximal processes are defined as "enduring forms of interaction in the immediate environment" (Bronfenbrenner & Morris, 1998, p. 996). Bronfenbrenner (2001) also presents the following description of proximal processes and human development: "Over the life course, human development takes place through processes of progressively more complex reciprocal interaction between an active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate external environment" (p. 6). Proximal processes include significant others for the developing child, such as a mother, a father, a teacher and/or a friend. Thus, the name of the model was changed from the ecological model for human development to the bioecological model for human development and later the Process–Person–Context–Time (PPCT) model.

### *Uses and misuses of the bioecological model for human development in research*

Theoretical reviews (Tudge, Mokrova, Hatfield, & Karnik, 2009; Tudge, Payir, Merçon-Vargas, Cao, Liang, Li, & O'Brien, 2016) have shown that the bioecological model and its mature form in the PPCT-model is sometimes misused by researchers. There are, according to these reviews, researchers who state that the bioecological theory of human development provide the theoretical, conceptual and analytical foundation for their studies, but their studies do not contain, describe, test or evaluate the concepts of proximal processes, person characteristics (i.e. biosystem) and time (i.e. chronosystem). Tudge et al. (2016) and Tudge (2017) recommend researchers, who claim that their research is based on the bioecological model and its PPCT-model, to present Bronfenbrenner's theory correctly in its mature form, to consider all four dimensions of the PPCT-model and to describe, test and analyze the interplay and synergistic relations among those dimensions.

Rosa and Tudge (2013), who have investigated and described the evolution of Bronfenbrenner's theory, have also noticed misuses of the bioecological theory and its PPCT-model. Due to this they recommend researchers to be explicit about which version of the model they us. It can be (a) the ecological model containing the famous concepts of microsystem, mesosystem, exosystem and macrosystem; (b) the bioecological model including these four famous concepts along with the biosystem and the chronosystem; *or* (c) the PPCT-model describing the influences of proximal processes, person, context and time on human development. If researchers are explicit about which version they use, theoretical incoherence, conceptual confusion and misuses can be avoided. They conclude that "scholars should be cautious about stating that their research is based on Bronfenbrenner's theory without specifying which version they are using" (Rosa & Tudge, 2013, p. 243).

## *The bioecological content analysis*

In the following section of the article, the matrix of the biological content analysis is presented, as well as the process and phases of bioecological analyses for large and small scale life story studies.

### *The matrix for the bioecological content analysis*

In Table 1, the matrix for the bioecological content analysis is presented. The matrix encompasses the six systems from the bioecological model and their relation to the notions of person, process, context and time within the PPCT-model. The matrix also encompasses a column for the respondents; a column for the central content in the interviews (life story oriented); and a column for the researcher's reflections that emerge during readings of interviews as well as during analyses of the central content. Each column is expandable and can contain as many notes as necessary. In Table 1, the matrix includes a total of six respondents but it is possible to include as many respondents as needed.

In Table 2, extracts from a bioecological matrix adopted in a life story oriented study with parents (Sandström, Lundqvist, & Axelsson, 2019) is provided. The extracts come from one out of 27 stories analysed in that study.

The analysis technique and the matrix was first and foremost developed to facilitate the analysis of more than a few retrospective (life story) interviews about human development, but it can also facilitate the analysis of one or a few retrospective (life story) interviews.

## *Outline of the bioecological content analysis*

The outline (the process and its phases) of the bioecological content analysis technique is presented in Table 3 and Table 4. The analysis technique is slightly different in a large scale life story study, than in a small scale life story study.

### *Phases and process of a bioecological content analysis – large scale study*

A large scale life story study refers to a study with several retrospective life story oriented interviews that are analyzed and presented in a scholar report. The process and the phases of a bioecological content analysis are the following in a large scale life story study (Table 3):

In *phase 1*, the recorded data are transcribed. In *phase 2*, readings of the transcriptions are conducted in order to gain an overall understanding of the data. In *phase 3*, all the relevant contents in each and every interview that can be related to the biosystem (i.e. the person); the context (i.e. the microsystem, proximal processes, mesosystem, exosystem and macrosystem); and the time that goes by (i.e. chronosystem) are coded. In this phase, the coded data within each and every interview are also checked against each other and re-coded if needed. In *phase 4*, the coded data are transferred into the matrix.

In *phase 5,* the researcher once again reads the biosystem data in the matrix, reflects upon these data and creates biosystem subcategories. Biosystem subcategories are groups of human beings, for example children with special educational needs, typically developing children *or* gifted and talented children. Biosystem subcategories should reflect similarities and differences between the developing persons described in the interviews. Further examples are healthy children *or* unhealthy children; social competent children *or* children with difficulties in social interaction and play; and preterm birth *or* normal birth.

**Table 1.**
*A bioecological matrix – The matrix for the bioecological content analysis*

| System | Respondent | Coded central content in the interviews with parents: | Reflections: |
|---|---|---|---|
| **Person** | | | |
| *Biosystem*: Child's age, characteristics, interests, talents, needs, roles and disabilities, etc. | 1 | … | … |
| | 2 | … | … |
| | 3 | … | … |
| | 4 | … | … |
| | 5 | … | … |
| | 6 | … | … |
| **Context** | | | |
| *Microsystem:* Characteristics of child's home, learning environments and recreation activities, as well as significant others and **proximal processes** in these environments. | 1 | … | … |
| | 2 | … | … |
| | 3 | … | … |
| | 4 | … | … |
| | 5 | … | … |
| | 6 | … | … |
| *Mesosystem*: Characteristics of school-home collaboration and child's transitions between micro environments. | 1 | … | … |
| | 2 | … | … |
| | 3 | … | … |
| | 4 | … | … |
| | 5 | … | … |
| | 6 | … | … |
| *Exosystem*: Distal influences on child's development. The allocation of resources in municipalities, team support for teachers' and parents' work situation. | 1 | … | … |
| | 2 | … | … |
| | 3 | … | … |
| | 4 | … | … |
| | 5 | … | … |
| | 6 | … | … |
| *Macrosystem*: Distal influences on child's development. Cultural aspects and content of national and international declarations, conventions and laws. | 1 | … | … |
| | 2 | … | … |
| | 3 | … | … |
| | 4 | … | … |
| | 5 | … | … |
| | 6 | … | … |
| **Time** | | | |
| *Chronosystem*: Descriptions of changes over time in the biosystem and the other contextually/ecologically oriented systems, as well as turning points. | 1 | … | … |
| | 2 | … | … |
| | 3 | … | … |
| | 4 | … | … |
| | 5 | … | … |
| | 6 | … | … |

*Note.* Spaces for coded data obtained from interviews, (…). "Reflections" refer to the researchers' considerations that emerge during readings of interviews and analyses of the central content. The matrix can not only be used in interviews with parents, but also with others.

**Table 2.**
*Extracts from a bioecological matrix used in a life story research*

| System | Respondent | Coded central content in the interview with the parents: | Reflections: |
|---|---|---|---|
| **Person** | | | |
| *Biosystem*: Child's age, characteristics, interests, talents, needs, roles and disabilities, etc. | 11 | Boy. Six years old. Very clever. Reads very well. Remembers everything you say and that he reads. Thinks a lot. Very shy but very social. High demands on himself. Loves roles. Loves chess. Difficulties in fine motor skills. Fantastic expressions and a large vocabulary, etc. … | The child is described as being gifted and talented. |
| **Context** | | | |
| *Microsystem:* Characteristics of child's home, learning environments and recreation activities, as well as significant others and **proximal processes** in these environments. | 11 | Home: Gives him intellectual stimulations in reading and mathematics, etc. Preschool: Terrible. He cried a lot. The staff did not say hello. He did not like the staff. The staff said he was very able, but that he needed to practice to use scissors, etc. Preschool class: Big group. Play with older children. Recreation activities: Nervous, does not like these. Proximal processes in preschool and preschool class: Were not intellectually stimulating, etc. … | Too few intellectual stimulations in the learning environments over time. Limited knowledge about gifted and talented children. Parents compensate for shortcomings in preschool and preschool class. |
| *Mesosystem*: Characteristics of school-home collaboration and child's transitions between micro environments. | 11 | School-home collaborations: Via meetings, etc. An involved and concerned parent.  Transition to preschool class: A chock. Too few rules, etc. … | A concerned parent. |
| *Exosystem*: Distal influences on child's development. The allocation of resources in municipalities, resource team support for teachers' and parents' work situation. | 11 | No data could be related to the exosystem. | Tells about direct and proximal influences, not indirect and distal influences. |
| *Macrosystem*: Distal influences on child's development. Cultural aspects and contents of national and international declarations, conventions and laws. | 11 | No data could be related to the macrosystem. | Little attention is paid to gifted and talented children at a macro system level in Sweden. |
| **Time**<br>*Chronosystem*: Descriptions of changes over time in the biosystem and the other contextually/ecologically oriented systems, as well as turning points. | 11 | Less shy in preschool class than in preschool thanks to the new social relationships in preschool class. A too quick role change from a child to a student, etc. … | Grows up too quick due to older friends: perhaps they provide him with the intellectual stimulation he needs? |

*Note.* Columns 3 and 4 entitled "Coded central content in the interviews" and "Reflections" contain examples of one coded and analysed retrospective interview (respondent number 11) from a study by Sandström, Lundqvist and Axelsson (2019).

In *phase 6*, the researcher once again reads the microsystem data in the matrix, reflects upon these data and creates microsystem subcategories. Microsystem subcategories are settings that contain the developing person being described in the interviews, for example a warm and well-functioning home situation *or* a destructive and neglecting home situation; a low quality preschool *or* a high quality preschool; an inclusive leisure club *or* a segregated leisure club; and a positive peer interaction *or* victimization. Toward the end of this phase, the microsystem subcategories can be related to the other systems' subcategories. Calculations can be made.

In *phase 7*, the researcher once again reads the mesosystem data in the matrix, reflects upon these data and creates mesosystem subcategories. Mesosystem subcategories are linkages and processes taking place between microsystem settings, for example; low quality cooperation between home and school, linkage between a home and a leisure club, and high quality transition from a preschool to a school. Toward the end of this phase, the mesosystem subcategories can be related to the other systems' subcategories. Calculations can be made.

In *phase 8*, the researcher once again reads the exosystem data in the matrix, reflects upon these data and creates exosystem subcategories. Exosystem refers to indirect and distal influences on a child's development (e.g. how much time parents work; allocations of resources to a child's school from a municipality; cooperation between a special educator/school psychologist working at a local hospital and a child's teachers). Some examples of exosystem subcategories are the following: full *or* part time working parents; sufficient *or* insufficient adequate resources at school; and a meaningful *or* inefficient multidisciplinary cooperation that aims to enhance and facilitate the child's development. Toward the end of this phase, the exosystem subcategories can be related to the other systems' subcategories. Calculations can be made.

In *phase 9*, the researcher once again reads the macrosystem data in the matrix, reflects upon these data and creates macrosystem subcategories. Macrosystem is about overarching patterns such as traditions, cultures and laws and examples of macrosystem subcategories are a fulfilled *or* not fulfilled right of a child; and an achieved *or* not yet achieved national learning objective. Toward the end of this phase, the macrosystem subcategories can be related to the other systems' subcategories. Calculations can be made.

In *phase 10*, the researcher once again reads the chronosystem data in the matrix, reflects upon these data and creates chronosystem subcategories. Chronosystem is about changes over time and examples of chronosystem subcategories are a positive social and academic growth of a child; an improved school situation for a child with special educational needs due to an increase in resources and support to that child's teacher; and an increase in health of a child after a medical treatment. Toward the end of this phase, the chronosystem subcategories can be related to the other systems' subcategories. Calculations can be made.

Finally, in *phase 11*, a written scholarly report is produced. It should encompass a methodological description of the bioecological content analysis conducted, a result presentation and a discussion in which the result is explained and related to prior research.

### *The process and phases of a bioecological content analysis – small scale study*

A small scale life story study encompasses *few* retrospective life story oriented interviews that are to be analyzed and presented in a scholar report. The process and the phases are the following in a small scale life story study (Table 4):

The recorded data from interviews are transcribed (phase 1) and readings of the transcriptions are conducted in order to gain an overall understanding of the data (phase 2). All the relevant contents in each and every interview that can be related to the systems are coded (phase 3). The coded data are then transferred into the matrix (phase 4). In phase 5, a constructed and shortened life story (a summary) for each and every respondent

–by means of data in matrix – is created. In phase 6, the life stories are compared with the aim to find similarities and differences. Finally, a written scholarly report of the analysis is produced (phase 7). It should encompass a methodological description of bioecological content analysis, a result presentation and a discussion in which the result is explained and related to prior research.

The major difference between the bioecological content analysis for large and small scales life story research is that no shortened life stories are created and presented in large scale studies, and that the terms biosystem subcategories, microsystem subcategories, mesosystem subcategories, exosystem subcategories, macrosystem subcategories and chronosystem subcategories are not taken on in small scale studies. These can of course be taken on in small scale studies if considered useful and valuable.

### *Perfomance of a bioecological content analysis – two examples*

#### *An example of a large scale study using a bioecological content analysis*

A bioecological content analysis (the first draft) was taken on in a study about parenthood, development and early childhood education and care in Sweden (Sandström, Lundqvist, & Axelsson, 2019). Bronfenbrenner's bioecological model was adopted as a theoretical, conceptual and analytical frame and proximal processes were acknowledged as engines for human development. A total of 27 parents were interviewed and asked to describe characteristics of their children; characteristics of their children's learning environments; significant others for their children; their collaboration with staff in these environments, their children's educational transition from preschool to preschool class, and changes over time on such matters as support needs. The parents' descriptions of their children's early childhood education and care were discussed and related to national laws and regulations. The scholar report took the form of a research article (Sandström, Lundqvist, & Axelsson, 2019). In accordance with the bioecological content analysis for large scale life story studies, the following process was performed:

The recorded data from the 27 interviews were transcribed (phase 1) and readings of the transcriptions were conducted in order to gain an overall understanding of the data (phase 2). All the relevant contents in each and every interview that could be related to the systems were coded (phase 3). The coded data were then transferred into the matrix (phase 4).

After several readings of the biosystem data in the matrix, similarities and differences between the parents' descriptions of the children emerged (phase 5). The children were by their parents described as children with special educational needs, as typically developing children, *or* as gifted and talented children. Calculations were made on the total number of children in each group (i.e. biosystem subcategory).

After several readings of the microsystem data similarities and differences between the parents' descriptions of the children's microsystem settings emerged (phase 6). The children's preschool and preschool classes were described as (a) low in quality, (b) partly low and partly high in quality *or* (c) high in quality. Calculations were made on the total number of learning environments being low, partly low and high, *or* high in quality. These three microsystem subcategories were related to the children's groups (i.e. biosystem subcategories). One example of this was that the learning environments of the children with special educational needs were commonly considered to be partly low and partly high in quality.

**Table 3.**
*The phases and process of a bioecological content analysis – large scale life story study*

| Phases (N=11) | Process |
|---|---|
| To transcribe (1). | Write out voice recorded data. |
| To become familiar with the collected data (2). | Reading of transcriptions in order to gain an overall understanding of data. |
| To code the data in each and every interview as related to the biosystem (i.e. the developing person); the microsystem, proximal processes, the mesosystem, the exosystem, and the macrosystem (i.e. the context); and the chronosystem (i.e. the time) (3). | All relevant extracts in each and every interview that can be related to the biosystem (i.e. the developing person), the microsystem, the proximal processes, the mesosystem, the exosystem, the macrosystem (i.e. the context), and the chronosystem (i.e. the time) are coded. Different strategies can be used during coding, for example; one colour for each system during coding in transcriptions, or short notes (e.g. bio, micro, p.p. [proximal process], meso, exo, macro and chrono) in the right and/or left margin of transcriptions. The coded data within each and every interview are checked against each other and re-coded if needed. |
| To transfer the coded data into the matrix (4). | Fill in the matrix according to the coding made (column 3 in the table 1). |
| To become familiar with the biosystem data in the matrix, reflect upon these data and to create biosystem subcategories (5). | Reading of biosystem data in the matrix in order to gain an overall understanding of each and every person's characteristics. To reflect upon the biosystem data and fill in the matrix (column 4 in the table 1). To search for similarities and differences between the persons, and to divide them into groups by characteristics (create biosystem subcategories). To review subcategories and to generate clear definitions and names for each biosystem subcategory. |
| To become familiar with the microsystem data in the matrix, to reflect upon these data, to create micro system subcategories and to relate these subcategories to the other system subcategories (6). | Reading of microsystem data in the matrix in order to gain an overall understanding of each and every person's settings and proximal processes. To reflect upon the microsystem data and fill in the matrix (column 4 in the table 1). To search for similarities and differences between the microsystem settings, and to create microsystem subcategories. To review subcategories and to generate clear definitions and names for each category. To search for links between microsystem subcategories and other system subcategories identified in data. |
| To become familiar with the mesosystem data in the matrix, to reflect upon these data, to create mesosystem subcategories and to relate these to other system subcategories (7). | Reading of mesosystem data in the matrix in order to gain an overall understanding of linkages and processes taking place between microsystem settings. To reflect upon the mesosystem data and fill in the matrix (column 4 in the table 1). To search for similarities and differences between persons' mesosystems and to create mesosystem subcategories. To review subcategories and to generate clear definitions and names for each category. To search for links between mesosystem subcategories and other system subcategories identified in data. |
| To become familiar with the exosystem data in the matrix, to reflect upon these data, to create exosystem subcategories and to relate these to the other system subcategories (8). | Reading of exosystem data in matrix in order to gain an overall understanding of indirect and distal influences on development such as parents' workplace. To reflect upon the exosystem data and fill in the matrix (column 4 in the table 1). To search for similarities and differences between persons' exosystems and to create exosystem subcategories. To review subcategories and to generate clear definitions and names for each category. To search for links between exosystem subcategories and other system subcategories identified in data. |
| To become familiar with the macrosystem data in the matrix, to reflect upon these data, to create macrosystem subcategories and to relate these to the other system subcategories (9). | Reading of macrosystem data in the matrix in order to gain an overall understanding of indirect and distal influences on development such as characteristics of a given culture, belief systems and national resources. To reflect upon the macrosystem data and fill in the matrix (column 4 in the table 1). To search for similarities and differences between macrosystem described and to create macrosystem subcategories. To review subcategories and to generate clear definitions and names for each category. To search for links between macrosystem subcategories and other system subcategories identified in data. |
| To become familiar with the chronosystem data in the matrix, to reflect upon these data, to create chronosystem subcategories and to relate these to the other system subcategories (10). | Reading of chronosystem data in the matrix in order to gain an overall understanding of changes over time and turning points on such matters as proximal processes, person characteristics and context. To reflect upon the chronosystem data and fill in the matrix (column 4 in the table 1). To search for similarities and differences between persons' chronosystems and to create chronosystem subcategories. To review subcategories and to generate clear definitions and names for each category. To search for links between chronosystem subcategories and other system subcategories identified in data. |
| To produce a scholarly report of the analysis (11). | Writing the result of analysis, that is to present the created biosystem subcategories, microsystem subcategories, mesosystem subcategories, exosystem subcategories, macrosystem subcategories and chronosystem subcategories, and to present the linkages identified between system subcategories. The result presentation may include text, tables and figures, and these may incorporate quantitative data about linkages between system subcategories. The result presentation should include persuasive extract examples from the interviews. To write the discussion of analysis. |

In phase 7, the authors became familiar with the mesosystem data in the matrix. Examples of mesosystem subcategories identified were (a) low quality preschool class-home collaboration, (b) partly low and high quality preschool class-home collaboration, and (c) high quality preschool class-home collaboration. Another example was low/partly low and high/high quality transitions from preschool to preschool class. Calculation were made, for example, of the total number of collaboration being low/partly low and partly high/ high in quality, and related to biosystem subcategories. One example of this was that the parents of the children with special educational needs commonly felt their collaboration with staff members to be partly low and partly high in quality. Another example of this was that twelve out of the 27 parents (44%) considered the transitions to be high in quality (i.e. smooth, easy and well-prepared).

The interviews, with few exceptions, did not encompass extracts that could be coded as exosystem and macrosystem data (phase 8 and 9). Hence, the study suggests that parents who describe characteristics of their children; characteristics of their children's learning environments; significant others for their children; their collaboration with staff in these environments; their children's educational transition from preschool to preschool class and changes over time on such matters as support needs can be focused on proximal and direct influential factors, and not on distal and indirect influences.

In phase 10, the authors became familiar with the chronosystem data and related these to the other system subcategories. Changes that could be related to time, context, person and proximal processes were found: The study, for example, comprises a description of a child who changed group (i.e. biosystem subcategory) from preschool to preschool class, and descriptions of parents who changed from being unconcerned during child's preschool period to being concerned during child's preschool class period.

**Table 4.**
*The phases and process of a bioecological content analysis – small scale life story study*

| Phases (N=7) | Process |
|---|---|
| To transcribe (1). | Writing out voice recorded data. |
| To become familiar with the data collected (2). | Reading of transcriptions in order to gain an overall understanding of data. |
| To code the data in each and every interview (3) as related to the biosystem (i.e. the developing person); the microsystem, proximal processes, the mesosystem, the exosystem, and the macrosystem (i.e. the context); and the chronosystem (i.e. the time). | Coding of all relevant extracts in each and every interview that can be related to the biosystem (i.e. the developing person), the microsystem, the proximal processes, the mesosystem, the exosystem, the macrosystem (i.e. the context), and the chronosystem (i.e. the time) are coded. Different strategies can be used during coding, for example; one colour for each system during coding in transcriptions, or short notes (e.g. bio, micro, p.p. [proximal process], meso, exo, macro and chrono) in the right and/or left margin of transcriptions. The marked data within each and every interview are checked against each other and recoded if needed. |
| To transfer the coded data into the matrix (4). | Filling in the matrix according to the coding made (column 3 in the table 1). |
| To create a written life story, that is a summary for each and every respondent's retrospective life story interview (5). | Reading of biosystem data, microsystem data, mesosystem data, exosystem data, macrosystem data and chronosystem data in matrix for each and every respondent. To reflect upon these data (column 4 in the table 1). To create a shortened and written life story for each and every respondent by means of the coded data in the matrix. To review life stories created to ensure that aspects related to time, context, person and proximal processes are part of the story. |
| To compare life stories (6). | Comparing life stories and to search for similarities and differences on such matters as proximal processes, person characteristics, context and time, as well as matters such as intellectual, social, emotional and moral development. |
| To produce a written scholarly report of the analysis (7). | Writing the result of analysis: To present the constructed life stories, as well as similarities and dissimilarities. The result presentation should include life stories with extract examples from the interviews. To write the discussion of analysis. |

This written scholar report (Sandström, Lundqvist, & Axelsson, 2019) incorporates descriptions of biosystem subcategories and the other system subcategories, as well as presentations of calculations made between biosystem subcategories and other system subcategories. Worth mentioning is that the term subcategory was not used in that study since subcategories were not part of the first draft of analysis technique and matrix – these had not yet been formed. The term became part of the bioecological content analysis later in its mature version outlined in this article. The result of the written scholar report also incorporates an analysis of the parents' Ideal type approaches to their children's preschool pathways, and a discussion of the result. The use of the bioecological content analysis enabled the authors to create Ideal types, since the different system subcategories were taken into account – thus, different Ideal types emerged.

### *An example of a small scale study adopting a bioecological content analysis*

A bioecological content analysis (the first draft) was taken on in a study of Axelsson, Lundqvist and Sandström (2017) encompassing data from three life story interviews with parents. The study was based on Bronfenbrenner's bioecological model and acknowledged proximal processes as engines for human development. The scholar report took the form of a book chapter. In accordance with the bioecological content analysis for small scale life studies, the following process and phases were conducted:

The recorded data from the three interviews were transcribed (phase 1) and readings of the transcriptions were conducted in order to gain an overall understanding of the interviews (phase 2). All the relevant contents in each and every interview that could be related to the systems were coded (phase 3). The coded data were then transferred into the matrix (phase 4). In phase 5, written shortened life stories for each and every respondent by means of data in the matrix were constructed (phase 5) and in phase 6 these were compared. The study showed, for example, that children's educational pathways from preschool to preschool class differ; that parents can worry about support provisions; and that parents are very much involved in their children's early education and help staff to solve difficult situations. In phase 7, a scholarly report of the analysis was written.

The book chapter (Axelsson, Lundqvist, & Sandström, 2017) incorporates three shortened life stories. These life stories are located in the beginning of the result. All of these have substances that can be related to the systems and the notion of proximal processes, person, context and time. The result of the written scholar report also incorporates identified similarities and differences, and a discussion of the result.

### *Advantages and disadvantages of the bioecological analysis technique*

The bioecological content analysis is a new technique that, from our perspective and experiences, can be useful and valuable in life story research framed by Bronfenbrenner's bioecological theory of human development. There are several reasons for this: The analysis technique (both in large and small scale life story studies) and its matrix reminds that the mature bioecological theory for human development (and the PPCT-model) is not only about contextual influential aspects of human development, but also about personal characteristics, proximal processes and the time that goes by. Hence, the analysis technique may reduce the risk for misuses of Bronfenbrenner's mature theory in research and hold back theoretical incoherence and conceptual confusion. The analysis technique (both in large and small scale life story studies) also makes it possible to take influences of both nature and nurture into account in research analyses on human development. Therefore, the analysis technique can be useful and valuable in multidisciplinary research in which multiple personal, and proximal and distal influential factors, shall be taken into account. Moreover, the analysis technique also makes it possible to integrate both quantitative and qualitative data, and results that are integrating words and numbers.

Furthermore, the analysis technique for large scale studies can be useful and valuable for researchers who plan to present their results in a scholar report taking the form of a research article. Articles often have a word limit that does not allow for the presentation of several life stories, even if the life stories have been much shortened. Therefore, the analysis technique may increase the number of research articles being based on life story research, and this may in its turn increase the knowledge and understanding of several phenomena from individual perspectives. The analysis technique for small scale studies can be useful and valuable for researchers who plan to present their results in a scholar report incorporating written and shortened life stories. The bioecological content analysis technique can help structure life stories from biosystem to chronosystem, and remind of taking into account all the four dimensions of the PPCT-model during the construction of shortened life stories.

Potential disadvantages and limitations of the analysis technique should also be pointed out: The analysis technique is basically keeping with the thoughts of the bioecological theory for human development and does not question, test or evaluate the theory. Another disadvantage is that the analysis technique for large scale life stories suggests that shortened life stories are not needed in written scholar reports. This can be understood as problematical: Life stories are indeed a central part in life story research and they give life to reports.

It is possible, but not yet tested, evaluated or confirmed, that the bioecological content analysis for large and small scales studies can be useful and valuable in research that encompasses other interview types than those used in life story research. It may also be useful and valuable in studies collecting data via focus groups, documents and observation notes. More research on the bioecological content analysis is needed.

The recommendation to future researchers who take on a bioecological content analysis in a large or small scale study (based on life story research and interviews, or other data collection methods and research approaches) on such matters as children with special needs and their families, early intervention and early childhood special education is to incorporate a methodological reflection on the feasibility of the analysis technique in their studies and written scholar reports, and to put forward issues that need to be improved and revised in the bioecological content analysis.

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