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Social Interaction among Children with Autism Spectrum Disorders (ASD)

Abstract

The aim of this research is to study the social interaction of children with autism spectrum disorder (ASD). Eleven groups of Finnish children with ASD (N= 45) were observed in organized and unstructured learning situations. The purpose of this article was to identify how children with ASD interact with other children. Based on the results, children with ASD as interaction partners are described. In addition, this article sought to highlight the communication assets of the learners with ASD thus contributing to the discussion of the positive aspects of ASD. The qualitative study revealed that the children with ASD were able to establish interaction and simple play routines with other children.

Keywords: autism, children with ASD, social interaction, play.

Introduction

Autism spectrum disorder (ASD) is a pervasive developmental disorder characterized by the impairment of social interaction, communication, and repetitive behavior and restrictive interests. ASD and its symptoms vary greatly. (Frith, 1989; Happé, 1994; Hill & Frith, 2003; Phetrasuwan et al., 2009; World Health Organization, 1992; Wing, 1997.) While causes of this developmental disorder have not been clearly delineated, research has contributed to the understanding that ASD is a neurologically-based exceptionality that includes challenges in mind blindness (e.g. Baron-Cohen, 1995) and executive dysfunction (e.g. Bogdashina, 2005; Hill & Frith, 2003). Although not formally recognized in the diagnostic criteria of ASD, problems in sensory processing also impact the person with ASD (Frith, 1989; Takarae et al., 2008).

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Initiating, sustaining, and ending an interaction is complex. It demands a variety of abilities: one has to be able to request, listen, respond, ask questions, keep others' interest, and, eventually, end a conversation. Because of the characteristics inherent in ASD, social exchanges are often very difficult. As a result, the exchanges that children with ASD share with others are often limited in function, such as connecting an adult in order to fulfill some personal needs (Bitsika, 2008; Davis, 2011; Kangas, 2008; Mooney et al., 2009). Research on the social interactions of learners with ASD has primarily focused on the structure of interactions and response to instruction (Bitsika, 2008; De Bildt et al., 2005; Mooney, Grey & Tonge, 2006). Few studies have focused on the strengths and sense of enjoyment that individuals on the spectrum incur when interacting with others. This topic is worthy of study (e.g. Duffy & Healy, 2011). Ochs et al. (2004) point out that persons with autism need to be viewed not only as individuals in relation to other individuals, but as members of social groups and communities who act, displaying both social competencies and difficulties, in relation to socially and culturally ordered expectations of behavior (Ochs, 2004, p. 147).

Our purpose is to contribute to the above-mentioned discussion. The present study provides insight into the social world of children with ASD. Research on ASD has most often highlighted the disorder of ASD and its related challenges. In order to meaningfully support children with ASD, we must attend to their potential psychological, social and cognitive resources and to the feelings of positive behavior and their well-being. Thus, the purpose of this article is to present the results of observing the interactions of learners with ASD highlighting their typical interaction patterns.

Children with ASD and Interaction
An interactional episode begins when two or more partners are aware of each other in a natural environment and is continued by their attempt to join an on-going activity or initiating an activity. The interaction ends when a partner leaves the situation which results in the termination of the original action. (Corsaro, 1985.)

According to Corsaro (1985), children's interactions emerge from an attempt to find a mutual understanding about what will be done next or is planned to do. Strandell (1995) refers to this phase as *orientation*. Children create contacts with others and join shared activities and events in order to become oriented or to create an overall picture of a situation. This typically happens non-verbally: children watch, listen, stand or sit nearby, and follow some event closely, wander around or smile to someone.

Children can begin an interaction verbally, as well (Strandell, 1995). The communication problems related to ASD often make verbal initiations challenging. Children with ASD can be nonverbal or their speech can include challenges that limit social interactions, such as lack of meaningful gestures or the use of repetitive phrases. Furthermore, they may be unable to follow conversation. (Happé, 1994.)

Perhaps because of these challenges, it appears that the initiations of children with ASD are regulated by their needs (e.g. Jackson et al., 2003) as well as their limited ability to

be involved in social interaction (Travis, Sigman, & Ruskin, 2001). Yet, some studies have shown that there are more interactional situations within groups that consist of children with autism and non-autistic children than within the groups of only those on the spectrum (e.g. Frith, 1989; Calloway et al., 1999; Arnold et al., 2000). In every aspect, children with ASD typically engage in interacts that are less complex than those of same-age peers without ASD (e.g. Griffith et al., 1999; Ruble, 2001.)

The purpose
The aim of the original study was to determine whether the children with ASD exhibit some typical interaction and play traits in organized and unstructured learning situations. Specifically, this study sought answers to the following questions:

1) How do children with ASD interact with other children?
1.1) How do the children with ASD begin interactions with other people?
1.2) How is this interaction maintained through conversation and play?
1.3) How does the interaction end?

Based on the findings, we will introduce a categorization of children with ASD as interaction partners and discuss how the interactions of children with ASD could be enhanced.

Method

Participants
The children who participated in the research were observed during the rehabilitation periods at Kolpene Service Centre located in Rovaniemi, in northern Finland. Kolpene Service Center provides services for individuals with cognitive impairments, severe and multiple disabilities, and those with ASD. The rehabilitation periods are two-week courses during which a multi-disciplinary professional work group participates in assessing and teaching children with ASD. During the rehabilitation period, the children usually stay at the service centre and their parents are allowed to spend time there as well. In this research, eleven groups of children (n= 45) were observed. Children were between 6 and 16 years old: 12 children were under six years old, 18 were between six and eleven years old, and 15 children were between 12 and 16 years old. Eleven were girls and 34 were boys. All were diagnosed with ASD (see Table 1). Twenty-eight had co-occurring cognitive impairments, five children had chromosomal abnormalities, and two children had epilepsy. Thirteen children were nonverbal.

This study consisted of two phases. In the first phase, interaction and play were studied via direct and video-taped observations using an ethnographic approach. In the first phase, interaction and play were studied by observing five 6- to 8-year-old children with ASD when they were playing. The remaining children were observed during their leisure time at the second phase of the research. They were observed by videoing and writing notes in eleven groups during their rehabilitation periods. The groups were formed according to the children's age and diagnoses due to the contents and goals of the rehabilitation periods. The transcripted data consisted of 302 pages of which 87 pages

were field notes and 215 pages were from videotaped material. The study focused on the interaction and play of children with ASD and, in this article, we report the traits of social interaction.

Table 1
The diagnoses of the children with ASD in this research (Kangas, 2008, p. 83, according to ICD-10 (WHO) classification)

	Unspecified mental retardation	Mild mental retardation	Moderate mental retardation	Severe mental retardation	Not mentally disabled	Total (n)
Autism	3	8	4	2	8	25
Childhood autism	1	2	1	--	4	8
Autism (mild)	--	2	--	--	1	3
High functioning autism	--	--	--	--	2	2
Autism, aypicality in symptomatology	3	--	--	3	1	7
Total (n)	7	12	5	5	16	45

In line with the principles of the ethnographic method, the children were observed in their own environment. Although the service center was not the children's typical living environment, most of the children (n=42) had participated in the rehabilitation periods earlier or participated in several periods during the research period and thus were familiar with the place and the personnel. In addition, the children knew each other well as they lived together during the two-week rehabilitation periods. Thus the research context was considered familiar to most of the children.

Observation is a suitable way of learning about children with ASD. For example, carrying out interviews would be impossible because of some of the children with ASD were nonverbal. In ethnographic research, the participants' behaviors are studied in their everyday life. In this research, observation was participative in nature (e.g., Grönfors, 2001). In addition to observation and filming, notes and a research diary were written during the observation periods (e.g. Hammersley, 1992). Through video filming, it was possible to get data about interaction while the researchers' effect remained minimal (Elderkin-Thompson & Waitzkin, 1999) and to review situations multiple times (Pramling-Samuelsson & Lindahl, 1999) which made it easier to see patterns and draw conclusions (Fetterman, 1998).

In ethnographic research, the data analysis does not occur separately from the research but is connected with the research theme and defining the research questions

(Hammersley & Atkinson, 1995). Data were analyzed using qualitative content analysis. The researcher's notes and dairy as well as the video data were transformed into a transcript. Then, the data were categorized by child and by event in the context. This categorization formed a ground for further analysis.

The basic unit for the structure according to which the results were sorted was coded as *an episode*. Each episode consisted of a beginning, an actual interaction, and an end. Episodes were categorized by the children's initiations. Three main categories were found: a look, physical touch, and a verbal initiation. The results are introduced according to these main categories. To support our interpretations, we have added some data excerpts that function as examples of concrete situations. Finally, the typical ways that children with ASD engage in interactions are discussed based on their aims and needs for interaction.

Reliability and Ethical Issues
When considering the reliability of this research, some issues were identified. The first question was how to research children with qualitative differences both in interaction and communication. Observation was considered an appropriate form of data collection because it does not depend on the research participant's ability to understand or produce speech. In addition, numerous simultaneous events occur within a group of children and therefore, it would not be possible to record each interaction. Video-taping appeared to be a suitable option. As a research method, ethnography suits well for researching the interaction of children with ASD. Instead of concentrating on comparing children with ASD with so-called typically developing learners, ethnographic research is a positive approach as its aim is to describe the children's interaction and playing skills which allows the researchers to identify their abilities and talents as a valuable and unique expression.

The data in this research can be considered extensive because the entire spectrum of autism was covered among the participants. Furthermore, divergent perceptions were not ignored as the purpose of this study was not to present a uniform picture of the target group but to discover the patterns of interactions among children with ASD. It is worth noting that the children were observed during their rehabilitation periods which inevitably caused a change in their daily routines. Thus, their behaviors may not have been typical for them. On the other hand, most of the children were familiar with the service center and its personnel from their previous rehabilitation periods.

Ethical questions in this research mainly concern protecting the children and their families. Deciding what kind of information should be gathered about the children and how and what to write in the research report were resolved so as not to harm the participants or their families and protect their anonymity and dignity. For example when collecting the data, filming was stopped if a child wanted it to be stopped. In addition, all the names that appear in the text are fictitious (note that adults' names appear in upper case letters and children's names in lower case letters).

Results

How do children with ASD begin interactions?
When studying social interaction among children with ASD, it was noticed that children initiated interactions more often with adults than other children primarily to ask for help, information, food, or television (see also Jackson et al., 2003). The ways of initiating an interaction varied greatly: *looking*, by *touching* or showing a picture, or *verbally*.

The participants in this study used proximity as a means of interacting with each other. That is, they neared other children without joining in the play. They would stop and watch and then return to their previous activity; only seldom did their proximity result in interaction with another child.
Laura (aged 8) comes to see Perce (aged 8) leaning over the backrest of the sofa. Perce takes a look at Laura and then at the camera and carries on playing with a toy by making sounds. (Research Diary, December, 2005)

Others used a physical means, such as hitting or pushing, to begin an interaction. These types of initiation could have been misinterpreted as negative by the potential communicative partner. The physical approach may just be the child's way of inviting the other to play. Only rarely did these kinds of physical moves result in reciprocal interaction.

Aidan (aged 9) comes toward Peter and pushes him (aged 9) against the wall. Peter looks at him surprised and Aidan observes Peter's reaction. As Aidan squeezes Peter's arm, Peter begins to cry and looks at Aidan. Aidan goes on his way toward the day room and after having looked at Aidan with a grimace, Peter moves toward the couches and rolls a cassette box. (Research Diary, October 29)

On occasion, participants appeared to use a glance as a means of starting an interaction. This was generally ineffective because the potential communicative partner did not notice that he was being looked at.

Those children who could start interaction verbally would, for example, repeat an adult's name until that adult responded. Some children seemed to use this strategy to interact with other children or with others. The following example shows how two boys interacted:
    Matt to John: "The engine is broken."
    John to Matt: "The engine is broken."
    Verbal initiations led to interaction more often than other means. Those children who were able to speak might begin an interaction by saying something that the other would find interesting.

William (aged 9) carries toy car to the car mat situated in front of the bedroom doors. At the same time, he looks at the camera and continues with his activity. As he passes two

boys who are sitting on the couch "fishing", he says: "Oops, oops". Oliver (aged 12) and Tim (aged 12) looked toward William briefly but do not respond. They continue "fishing".

Those who were nonverbal interacted by using pictures or by leading an adult to a desired activity or material. Only rarely, did a child want to interact socially with the adult. The following excerpt is an example of one of the exceptions: "LISA gives Henry (aged 2) a picture and asks: 'Shall we go out?' Henry looks at the picture carefully, grasps LISA's hand and takes her where the outdoor clothes are." (Research Diary, January, 17)

It seemed that the children with ASD were interested in other children as evidenced by their observations of other participants. Could it be that they wanted to join activity but did not know how?

> ANN and Roy (aged 12) are chatting about a movie.
> Roy asks ANN: "Did she watch the movie?" as he points to Nina.
> ANN to Roy: "I don't know, you have to ask Nina."

Roy does not ask or even look at Nina although she probably could answer the question. (Research Diary, January 25, 2006)

How is the interaction maintained through conversation and play?

When analyzing interactions by placing the children's activities in a simultaneous matrix, it showed that the children tended to act alone. However, although difficulties in directing attention to shared targets are typical for learners with ASD, the children in this study often gathered to watch others who were engaged in videogames or computer games. In addition, they might stand near a child who was watching a television program and watch it without comment. It seemed that the approaching child with ASD wanted the other child to share her point of interest with others or reference an object in order to make others notice it. Overall, this did not result in a reciprocal interaction.

The girls are discussing a new computer game as Ike (aged 11) is watching them and the key board. Roy enters the room again.

> Roy: "It is a trap." At the same time, Roy walks behind the girls to have a look.
> Screaming can be heard from the computer.
> Roy leaned closer: "No, it wasn't. It wasn't a trap after all."

Roy leaves the room while Ike remains standing next to the computer and silently watches the others playing. The girls finish the game again and cheer. They turn to say something about the game to others. Ike points toward Mary (aged 11) with his hand as if trying to urge her into continuing playing. After this, he leans to look at the screen and shows Mary again waiving his hand in front of her. As the menu appears on the screen, Ike touches it with his finger. (Research Diary, January 31)

The children in this study could respond to a physical initiation quite differently but usually they responded in a relatively calm manner. Sometimes, a child interpreted

another's touch as aggressive or as an unwelcome attempt to impose himself on another. Those physical initiations were primarily ignored or misinterpreted as bullying.

John directs small toy cars along a small play mat. He makes two of his cars collide. Then he notices William and crashes into William's car. William does not comment on or react to the crash. John comes back to the small mat to play with his cars. (Research Diary, Sep 30)

Verbal initiatives almost always resulted in a response, such as a look, an initiation, or a verbal answer. Interaction can be analyzed through the choice of words and phrases, the turns in dialogue and the key moments, the phases of conversation as well as tone and style (e.g., Suoninen, 1999). In this research, the phases and turns in conversation appeared to be basic, such as question-answer, saying hello-responding to a greetings, accusation-defense, or appeal-assent.

> John to Matt: "Matt!"
> Matt to John: "What?"
> John to Matt: "Your car is fixed."

> John bumbles and directs two cars on the floor. Matt drops a yellow car over and over again, makes snapping noises, and stops and watches. Matt rolls toy car tires between his fingers.

How do interactions end?

The situations that involved interactions lasted between a few seconds to approximately twenty minutes. During the longest episodes, children tended to keep their partners at arm's length for a while every now and then and then continue interacting or playing together.

Interactions typically ended when the children began to engage in their repertoire of restrictive behaviors or when adults interrupted the situation. The latter occurred when it appeared as if one of the learners was about the entre of the rage cycle. Short interactions appeared positive. The longer the interaction, the more likely it was to result in a tantrum, rage, or meltdown.

Ending the interaction might be difficult for other kinds of children with ASD as well. When the first author of this article was filming the children, she became a part of one girl's repetitive play. When returning to filming, the girl came after the researcher, pulled the researcher's clothes in order to make the researcher sit again and repeated "My turn!" She was behaving in a way that was never noticed before. For example, the researcher had not heard her form two-word sentences.

The results showed how rewarding an interaction can be but also how difficult it is for the learner with ASD to end it. In the following example, Tia's behavior illustrates a pattern. Later on, the researcher attempted to alter the environment in order to change the pattern but did not succeed. The pattern involved interaction with the researcher as they had certain repetitive elements that they did when Tia would come to the researcher's lap.

Again, Tia has run and thrown her bag toward the wall. After that, she runs to touch the opposite wall, the pillar in the middle of the floor, and finally in my lap.
SEIJA to ANN: Look, what a pattern. First she throws, then she has to run over there (Tia touches the wall) and then over there (Tia touches the pillar) and then here (Tia comes to my lap).
ANN to SEIJA: Oh yeah. Ann is videoing us.
SEIJA to ANN: This was the fourth or fifth time. (Video Diary, January 19, 2006)

The same kind of behavior occurred for example in rough-and-tumble play as the children in this study seemed to have difficulties in understanding when their play mates wanted to end the play.

Conclusions

Children with ASD as interaction partners
In this study, it appeared that the interactions among the children with ASD and the socializations among the participants and adults were limited when viewed in a traditional manner. However, the results can be reviewed in relation to the aims and need for interaction of the children with ASD.

First, there were children who played alone, engaging in repetitive and routine schemes and *asserted their own turf*. They would direct their attention to another child when that child created noise or a disturbance. These children appeared not to want to interact with children or adults. If engaged, they would relocate or interact negatively toward the other individual.

Some of the children in this research tended to watch other children's activities, but did not initiate with them. Most did not initiate interactions with adults either but preferred their solitary play. They also appeared to reject adults. These children could be called *privacy-loving children*.

In this research, there were also children who started an interaction actively by using pictures, leading by hand, or talking. Frequently, their interactions were with adults. Often, their purpose was to get something or to engage in repetitive questioning. These children could remain in an interaction if an adult was willing to answer their repetitious questions. These children wanted to act in highly predictable situations and were referred as *children who seek adult companionship*.
The fourth category consists of those children who pursued active interactions with other children. These children could change their behaviors to match that of their interaction partner. For example, one boy engaged in physical play with another who liked this type of play schema. This same boy could play calmly with the third boy. Most often, the most isolated or passive children who represent the first category tended to drive off these *peer-group-oriented* children when wishing to be alone.

It should be noted that, children seemed to represent different types depending on the day and moment, activity, or interaction partner. For example, every child had moments when he or she wanted to retire from play and then return to active interaction. Furthermore, this grouping does not cover all characteristics of autism. Autism does not explain comprehensively children's behavior: children with ASD can also miss, feel anger and be annoyed. On the other, one does not have to be autistic to love privacy or defend one's turf. Therefore, interaction is not bound to autism.

The fact that children with ASD can typify more than one of the above-mentioned types depending on the situation places a challenge for rehabilitation and teaching. It is essential that the immediate care givers of children with ASD notice children's interaction patterns when selecting teaching methods (see also Krantz, 2000). Moreover, children with ASD should be provided a variety of interaction opportunities. Furthermore, teaching should begin by recognizing how children begin an interaction and expanding their repertoires.

Discussion

How to support the interaction of children with ASD
The study showed that children with ASD need support to learning not only how to start an interaction but also how to end the interaction. Thus, it is important to teach the rules of dialogue and how to listen to others (Wing, 1997). As revealed in this study, many children with ASD have difficulty accommodating different interaction styles—these children need special guidance in this area. Video modeling (Parsons, 2006; Bellini, Akullian, & Hopf, 2007; Reagon, Higbee, & Endicott, 2006); and using highly motivating activities, such as electronic games (Scarlet et al., 2005; Bauminger & Kasari, 2000) are good vehicles for this instruction and support.

Since the adults' role as organizers of learning environments is significant, it is crucial to get information both about autism and how to support interactions. Currently, emphasis is placed on the ecology of children's social interactions in natural settings with a greater focus on social interactions with peers. Peer-mediated interactions (see Nieminen & Rautakallio, 2003) have been identified as an evidence-based practice. Peers can be taught to initiate an interaction, or they can be taught to respond to the child with ASD whose initiation is prompted by another person. Furthermore, peers can be taught to be tutors for both schoolwork and other activities (Rogers, 2000). Some forms of peer-mediated interactions include: integrated peer groups (see Wolfberg & Schuler, 1999; Wolfberg, 2004); Circle of Friends (see Gus, 2000; Kalyva & Avramidis, 2005; Whitaker, Barrat, Joy, Potter, & Thomas, 1998). Jordan (2007), at the International European Congress of Autism, suggested that typically developing peers participate in a play routine that is mastered by the child with ASD. In this way, the children with autism and their play skills would be viewed more positively by their peers.

The ways to support the ASD-children's interaction and play should be individualized and based on precise observation (e.g. Gillis, Callahan, & Romanczyk, 2011). The focus

of support and teaching should be on highly-motivating themes and special interests. In addition, every sector of the interaction process plays an important role in establishing fluent interaction.

Unquestionably, finding a way to interact is one of the most fundamental needs of children with ASD. Research that aims to understand the interactions of children with ASD and to develop new means for it is extremely important as it corresponds to the modern foci on well-being and individual strengths (Carruthers & Hood, 2005; Magnusson & Mahoney, 2006). This kind of action requires a loving and caring attitude (Paldanius, 2002; Määttä & Uusiautti, 2011) from educators (van Manen, 1991; Skinnari, 2004), nurses and other health care personnel (Janako, 1993; Eriksson, 1989), and from parents as well (Määttä, 2007).

It is important to trust in the resources and strengths of children with ASD instead of focusing solely on their challenges—to understand that children can and deserve to have the skills to interact with others regardless of their diagnosis. We wanted to contribute to this discussion by bringing the voices of children with ASD into the conversation.

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