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Editorial

The Effect of Occupational Therapy Play-based Interventions on Cooperative Behavior in Elementary School Aged Children with Autism Spectrum Disorder

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Abstract

The purpose of this study was to explore the perceptions of occupational therapy practitioners regarding the effect play-based interventions have on cooperative behaviors in elementary school aged children with autism spectrum disorder (ASD). While occupational therapy practitioners use a variety of interventions involving play to enhance skills related to social, self-regulation and communication, the concept of how play affects cooperative behavior, specifically in children with ASD, has not been readily identified. This qualitative research project utilized an anonymous survey to collect the perceptions of occupational therapists (OT) and certified occupational therapy assistants (COTA). The intent of the survey was to gain the insights of these practitioners as to the kinds of play-based interventions (sensory integration, modeling, behavioral and so forth) that are being employed with elementary school aged children and how those interventions impact cooperative behaviors. Evidenced based research is vital to developing OT treatment interventions that support the philosophy and mission of the American Occupational Therapy Organization (AOTA). It is also critical that practitioners have data, backed by research to use in practice. Based on this, more research is required to determine the role of OT in addressing cooperative play behavior in children with ASD.

1. Introduction

Children with autism spectrum disorder (ASD) have a range of performance and occupational issues, making full engagement or participation in school, home and community activities difficult. Social issues, prevalent within this population and are a contributing factor to

poor cooperative behavior, which can result in relational issues with others and poor self-esteem (Case-Smith & Arbesman, 2008). Historically, occupational therapists working in school settings have provided services to children with ASD to evaluate, treat and measure outcomes (AOTA, 2012). A review of interventions used in various settings indicated that multiple strategies incorporating play, such as sensory integration, modeling, behavioral and group therapy have been employed. However, there is little evidence-based research supporting play as a focal part of treatment for children with ASD (AOTA, 2012). Research indicates that play, when incorporated into therapy services, often has a positive impact on behavior (Tomchek, Little, & Dunn, 2015).

In the United States, the prevalence of childhood ASD has most recently been estimated at 1 in 68, a 30% increase since 2008 (Centers for Disease Control and Prevention, 2015). The significant rise over the last few decades in early identification and diagnosis of ASD amongst children, has given cause for increased study of OT treatment outcomes and the approach of interventions within this population. Children with ASD process information in their brains differently than other children, causing social, communication and behavioral challenges (Clements & Zarkowska, 2000).

Play is the main occupation for children and cooperative play is an integral part of social interaction and navigating human relationships. Children who are unable to play well together with others are less likely to be able to work and socialize well with others as adults (Liebal et al., 2007). AOTA (2015) defines play as “any spontaneous or organized activity that provides enjoyment, entertainment, amusement, or diversion”. Play participation is engaging in play, maintaining a balance of play with other occupations, and appropriately obtaining, using, and maintaining toys, equipment, and supplies (OTPF, 2014). Through play, children learn how to make sense of the world. Play promotes the development of physical coordination, emotional maturity, social skills, self-confidence, and exploration (AOTA, 2012).

A defining trait of human communal life is cooperation. Cooperative behavior is critical to social life function. Cooperative behavior is defined as an act or instance of working together towards achievement of a common goal or purpose (Gutman, Raphael-Greenfield & Rao, 2012). Research indicates that cooperative behavior has a positive effect on social interactions, interpersonal relationships, and cooperative problem solving (Ramani, G, 2005). Cooperative problem solving occurs when individuals work together to determine a solution for an external problem. For children, this social function increases understanding within the problem domain, thereby contributing to increased learning and cognitive development (Ashley & Tomasello, 1998). Learnt cooperative behavior in childhood is thus an instrumental factor in social and cognitive development. Moreover, cooperative play skills can also be generalized to other areas of life.

Children with ASD have difficulty understanding the perspective of others and therefore frequently fail to establish interpersonal relationships, especially with peers. Additional behavior variables noted in children with ASD include engagement in more peripheral play, less time spent socially interacting with others, and extended time spent in self-play (Schupp, Simon, & Corbett, 2013). The ability to understand others perspectives and intentions is vital to learning how to imitate and learn from watching. Children who lack the ability to understand another individual's goals, typically also lack motivation to help or join in an activity. Social skills are crucial to successful life function. Children with ASD who are able to improve in this area are more successful in integrating into home, school and community life (Liebal et al., 2007).

Previous studies have shown that play often produces a positive impact in children’s behavior (Tomchek, Little, & Dunn, 2015), but the effect of play on cooperative behavior in children with ASD remains to be seen. In order to answer this question, the perceptions of OT practitioners working with elementary school aged children who have ASD were collected to learn the kinds of play-based interventions used that have an impact on cooperative behavior.

2. Methods

2.1 Subjects and Setting: Responses were provided by participants regarding an estimated 30-40 children. Three responses regarded children younger than elementary age (an estimated 3-5 subjects) and were therefore omitted from the study. Children included in the study were of elementary school age in accordance with the state of Michigan Educational Standards and ranged in age from 4-12. All children are assumed to have an autism diagnosis as indicated on the method of data collection. Participants reflections were derived from four different settings: school, outpatient clinic, private practice and outpatient (community based).

Table 1. Interventions Utilized and Cooperative Behaviors Recalled

Age of subject	Setting where participant’s perception was formed	Interventions utilized	Cooperative behaviors recalled	Other behavior based outcomes recalled
9	School	Sensory integration, modeling, group/interactive	Turn taking, waiting for cues to proceed	Social interactions with adults increased
8,10 and 11	School	Sensory integration, modeling, group/interactive and behavioral intervention	Turn taking, social interaction with peers and working together towards a common goal	Burn out after extended period of cooperative play
Between 3-10	School	Sensory integration, modeling, group/interactive and behavioral intervention	Participation in group activities, including verbal responses	
Between 5-9 (15 children)	School and Clinic	Sensory integration, modeling, group/interactive and behavioral	Working together towards a common goal, cooperative play (games)	

		intervention		
4,6 and 12	Private practice	Sensory integration	Increased attention to task and following directions	Calming, improved eye contact, increased focus
3 and 9	Outpatient community	Sensory integration, modeling, behavioral intervention	Sharing, turn taking, increased attention to task	Increased ability to sit and stand
5 and 6	School	Sensory integration, modeling, group/interactive, behavioral intervention	Motivation to participate and turn taking	Ability to sit in seat
5	School	Sensory integration	Increased compliance, improved interaction, improved cooperation and sharing	Calming
3 and 4	School	Sensory integration	Observing reactions from peers	Stopped crying
4-12	School	Sensory integration, modeling, group/interactive, behavioral intervention	Turn taking, counting with/for the next student	Following the example of the next student
5	Outpatient clinic	Sensory integration, modeling, behavioral intervention	Cooperative play and attention to task	Functional participation in home and community
5 and 6	School	Sensory integration, modeling, behavioral intervention	Ability to share and take turns	Better ability to focus, calming

2.2 Design: This qualitative phenomenological descriptive study was designed to collect the observations and perceptions of OT's and COTA's working with elementary school aged children who have ASD. The objective of the study was to gain insight into the impact typical OT play-based interventions have on cooperative behaviors. A survey method design was used due to the descriptive nature of the study, allowing for participant accessibility and anonymity, as well as timely data collection.

2.3 Participants: Purposive sampling was used to recruit and contact OT practitioners currently working and employing OT play-based interventions with elementary school aged children who have ASD. The sampling population included OT practitioners a) whom previous contact had been established on a personal or professional level, b) who subscribe to the Grand Valley State University Occupational Therapy Alumni website, and c) who have been recommended to the study via direct recruiting from another participant, incorporating a snowball method. Participants were included in recruitment regardless of level of experience or number of years working in the field.

The recruitment process entailed a no-reply email, as well as a posting on Grand Valley State University's private Occupational Therapy Alumni website. The no-reply email and posting on the private website included an informational handout to provide a description of the purpose of the study, and a brief background on ASD, OT play-based interventions, and cooperative behaviors. Interested OT practitioners volunteered to participate in the study by completing a questionnaire on Survey Monkey after reflecting on the presence or absence of cooperative behaviors recalled from a typical OT play-based intervention completed with elementary school aged child(ren) who have ASD.

The final sample included 12 participants. Of the 12 participants who took part in the study, it is unknown how many were occupational therapists and how many were COTAs. Nine participants reported practicing in an elementary school, one participant was from a community based organization, one participant worked at a private clinic, and two individuals who contributed were at outpatient facilities. There were not any participants from individuals working at an inpatient rehabilitation hospital. The location of the participants was not recorded and could be either from within or outside the state of Michigan.

2.4 Data Collection: A questionnaire on Survey Monkey was used to collect data from participants. Anonymity of participants was ensured by turning on the software option in Survey Monkey to not save IP addresses. Participants provided demographic information: professional title, age of the child(ren) they were reflecting on, and work setting. A list of typical OT play-based interventions was provided, assisting participants to identify the kind of play method employed during practice. Participants offered open-ended reflections on the presence or absence of cooperative behaviors in elementary school aged children with ASD as impacted by the play-based intervention(s) reflected upon.

2.5 Target Behaviors: During the participant recruitment process, a definition of cooperative behavior was disseminated in the form of a handout and attached to the no-reply email, as well as the Grand Valley State University Occupational Therapy Alumni website. Following is the definition:

Cooperative behavior is the ability to share a common goal, with the intention of working towards the achievement of that goal with another individual (Liebal, Colombi, & Rogers, 2007).

In clarifying cooperative behavior, it was the authors' intent to further define and add clarity to the research question:

How do occupational therapy play-based interventions impact cooperative behaviors in elementary school-aged children with ASD?

2.6 Statistical Analysis: Data were analyzed using thematic analysis. This approach involved a) becoming familiar with the data, b) assigning codes, c) reviewing codes to identify themes, and d) connecting themes to give an interpretation of the data. Three authors (Langill, Reiss, and Socia) separately coded transcripts and then met to discuss and generate a list of consensus codes. Demographic data were analyzed and reported to provide descriptive information on subjects.

3. Results

Several themes emerged from the data. All 12 participants reported having used sensory integration, a play-based intervention associated with cooperative behavior outcomes. Also widely employed was the concept of modeling, as noted by nine participants. The use of behavioral intervention was reflected on by eight of the participants. Interventions incorporating group/ interactive concepts were recalled by seven participants. Only four types of play-based interventions (sensory integration, modeling, behavioral intervention, and group/interactive) were recalled by participants as having an impact on cooperative behavior.

Differences in behavioral outcomes were distinguished by age. Children 4-6 years of age were more likely to demonstrate basic foundational skills leading to cooperative behavior. Children 7-12 years of age were noted to portray more complex cooperative behavior. The behaviors of the children in the older group demonstrated the children's capacity to work together with others towards a common goal, as well as participate in group settings. The complex nature of behavioral engagement amongst the older subset indicates the ability to focus on other versus self. The actions of the younger children, while cooperative in nature showed an enlistment in activities that were more simplistic and self-focused.

Table 2. Age Related Behavioral Variances

Subject age range	Cooperative behavior by age	Other behavior based outcomes by age
4-6	Increased attention to task, following directions, increased motivation, increased	Calming, improved ability to sit and attend, improved focus, eye contact, stopped crying

	compliance, improved cooperation, increased interaction, sharing, turn taking, interacting with others	and improved functional ability outside of school
7-12	Turn taking, waiting for cues to proceed, interacting socially with peers, working together towards a common goal, participating in groups, playing games together, sharing,	Increased social interactions with adults, burn out after extended period of cooperative play, and modeling behavior

Behavioral differences were also noted amongst the two different age ranges based on other (non-cooperative) behaviors recalled. Children in the 4-6 age range showed an increase in the ability to sit, attend, and maintain eye contact. These activities are noted as being more self-focused in nature, albeit aiding in cooperative behavior. Children in the 7-12 age range displayed more complex ways of interacting, depicting an ability to focus outside of self. In this older subset, activities included increased social interactions with adults, and the ability to model behavior.

4. Discussion

Given the increasing prevalence of young children diagnosed with autism (CDC, 2015), and the range of issues this population faces impacting performance and daily function, this preliminary study offers promising results. Data gathered from participants indicates that OT play-based interventions have a positive impact on cooperative behavior amongst young children with ASD. Herein are several themes noted from the results of this research.

Dividing the subjects into two subsets based on age, the data showed a varied response in behavior to play-based interventions as related to cooperative behavior. While sensory integration was the most frequently utilized intervention, only a total of four interventions were recalled. Variances in behavior were observed amongst two age categories. The younger subset ranging in age from 4-6 years, and the older from 7-12 years. Differences noted amongst the younger children showed an inclination to exhibit behavior more simplistic and self-focused in nature. The older age subset included a tendency to exhibit behavior considered more outward focused and group-oriented. Non-cooperative behaviors noted also modeled this pattern.

Emerging from the data was the concept of varying outcomes related to cooperative behavior based on subject age. This observation denoted the presence of component skills, building to a more mature, and complete model of cooperative behavior. According to child psychologist Frank Shore, based on normal child development stages, children who can sit and attend, are more likely to mature into individuals who share with others and who can work towards a common goal (2016). Play-based interventions that elicit a positive behavioral response at either a simplistic, or complex level can thus be interpreted as effective in promoting

cooperative behavior. In addition, the behavioral responses noted by both age subsets to play-based interventions indicate a positive effect on cooperative behavior.

Broadly speaking, this research demonstrates that play-based interventions enhance cooperative behavior. Social interaction and navigating human relationships necessitates cooperation amongst individuals. Children with ASD process information in their brains differently than other children, causing social, communication, and behavioral challenges (Clements & Zarkowska, 2000). The specific behaviors noted by participants in this study are relevant to social life function at home, school and within society. Children who play well together are more likely to grow into adults who work well together (Liebal et al., 2007).

Although this study contributes to research regarding the effectiveness of play-based interventions on cooperative behavior amongst children with ASD, some limitations need to be acknowledged. The conclusions of this study are limited by the reliance on the participants' ability to recall and reflect on an intervention previously administered. The structure of the survey used in data collection omitted categorization of behaviors as associated with specific intervention(s) utilized. The review is also constrained by the wide variety of intervention contexts and delivery modes employed. In addition, due to the low response rate to this study, the authors acknowledge the possibility of bias due to nonresponse error.

5. Conclusions and Future Direction

OT practitioners working with children as described in the sample for this study, have not had a broad repertoire of evidence based research to inform their practice. The findings of this research study suggest that there are at least four types of play-based interventions that have a positive effect on cooperative behavior amongst this population. While outcomes portrayed behavioral variances dependent on age, both the simplistic and more complex behaviors reported were noted to have a positive impact on cooperative behavior. These outcomes provide an inauguration for therapists and researchers by enhancing the OT professions understanding of intervention models that have a positive effect on cooperative behavior amongst children with ASD. The results of this study also provide insight into the acquisition of skill components as related to age. Future research in this area would further benefit OT practitioners by increasing the rigor of the study's design, interpreting protocols, as well as to determine if one play-based intervention is more effective than another. In addition, future research in this area could consider the use of a focus group or participant observation method.

Conflict of Interest

The authors declare that there is no conflict of interests regarding the publication of this paper.

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