CREATING OUTDOOR PLAY ENVIRONMENTS TO SUPPORT SOCIAL INTERACTIONS OF CHILDREN WITH AUTISM SPECTRUM DISORDER; A SCOPING STUDY

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1. ABSTRACT

Autism Spectrum Disorder (ASD) is a developmental disorder characterized by impairments in social interaction and gestural communication. Various play-based interventions have been used to help children with autism develop social skills. Interventions that consider how children play, instead of the final outcome of the play session, seem to be more effective in addressing each child’s needs. But because children with autism display a large range of variability the results of play interventions are usually very unpredictable. Research suggests that play environments for children with ASD need to be structured in order to be effective and structured teaching strategies are often used in the absence of well-structured environments. However, well-designed outdoor play environments may provide the necessary structure to support social interactions, creating an important place where children with ASD can learn social skills through play. The purpose of this study is to explore best practice outdoor play environment design strategies that support the social skills development of children with ASD.

To do so, a scoping study was conducted to review the literature involving children with ASD, outdoor play environments, and social skill development. Scopus, Google Scholar, and EBSCOHost were searched followed by ancestral and descendent searches. While there are few studies specific to outdoor play environments, the numerous studies examining the play behaviors of children with ASD can be categorized into four primary areas of impacted development: low motor skills and coordination, sensory integration, generative play, and joint attention. Addressing these four primary areas of impacted development in the design of the outdoor play environments likely plays an important role in creating spontaneous and pleasurable play opportunities for children with ASD, and may well support social interactions, creating an important place were children with ASD can develop social skills through play.

1.1 Keywords

Play, autism spectrum disorder, social interaction
2 BACKGROUND

Play is a spontaneous, pleasurable and enjoyable act, which has no goal imposed from the outside (Garvey 1977; Jordan 2003; Mastrangelo 2009; Wolfberg and Schuler 1993). Yet, play is a crucial part of childhood promoting cognitive, physical, social and emotional well-being (Ginsburg 2007). Through play children learn to develop more complex functions and gradually master their behaviors and acquire social skills (Tsao 2002). Play is particularly important for social skills development.

Autism Spectrum Disorder (ASD) is one of the most prevalent developmental disabilities, estimated to be between 1% and 1.5% of the world population (CDC 2014), and the fastest-growing developmental disability (CDC 2008). ASD is a developmental disorder characterized by impairments in social interaction and gestural communication (Baron-Cohen Leslie, and Frith 1985; Ingersoll and Schreibman 2006). Even though children with ASD display a large range of variability in intellectual functioning they are usually characterized by repetitive and stereotyped behavior, verbal delays, aggressive or self-injurious behavior, obsessive routines and rituals, fear of change in the environment, and atypical responses to sensory stimuli (Folstein and Rosen-Sheidley 2001; Gillot, Furniss, and Walter 2001; Mastrangelo 2009). In addition, deficits in reciprocal social interaction and communication in children with ASD create special challenges in initiating and maintaining play as the children are usually unable to relate to others and understand social cues (Jordan 2003; Bruinsma, Koegel, and Koegel 2004; Mastrangelo 2009). The acquisition of social skills does not occur naturally among many children with ASD (Harper, Symon, and Frea 2008).

Various play-based interventions have been used to help children with autism develop social skills. Interventions considering how children play instead of the final outcome of the play session seem to be more effective in addressing each child’s needs. But because children with autism display a large range of variability, the results of play interventions are usually very unpredictable (Bass and Mulick 2007; Mastrangelo 2009). Therefore, applying a multiple method approach appears to be the most effective way to support play behavior for children with autism spectrum disorder.

Mastrangelo (2009) describes two general play-based intervention approaches used for children with ASD’s social skill development, as well as other developmental goals; a behavioral approach focuses on structured planned interventions that rely on behavioral principles for learning, and a developmental approach. Developmental approaches emphasize incidental teaching during child-led interactions (Mastrangelo 2009). Highly structured behavioral-based interventions have been proven effective in addressing social interaction among children with ASD (Brock et al., 2006; National Research Council, 2001). At the same time, the developmental approach is preferred for greater flexibility in play choices based on the child’s strengths and areas of interest, as well as keeping play a spontaneous internally driven act. Proponents of the development approach contend that the developmental approach encourages natural, spontaneous social interactions (Greenspan and Wieder 2006, 2007; Lu et al., 2010).

Child-led play behavior in typically developing young children, or those whose development is not affected by impairment or disability, are particularly influenced by the design of the play environment (Barbour 1999; Bowers 1988). At the same time, research suggests that children with ASD are often isolated and unable to participate on the playground (Locke et al. 2015). The environment is capable of providing functional play experiences by offering developmentally appropriate challenges that support spontaneous play (Bowers 1988; Frost 1987; Beckwith 1988). According to Frost (1988) a developmentally oriented playground “should include space, materials, equipment and activities to enhance, enrich, and encourage all the forms or processes of play appropriate to the age or developmental levels of the children involved.” Outdoor play environments, which are developmentally appropriate, help support social skills development by providing a child-led play environment (Barbour 1999; Bowers 1988; Frost 1987).

Research suggested that play environments for children with ASD need to be structured in order to be effective (Mastrangelo 2009; Wolfberg and Schuler 1993). Well-designed outdoor play environments may provide the necessary structure to support social interactions, creating an important place where children with ASD can learn social skills through play (Burdette and Whitetaker 2005; Menear, Smith, and Lanier 2006). Yet there is little understanding of the design of outdoor play environments which support the social skills development of children with ASD (Yuill, Strieth, Roake, Aspden and Todd 2007).
3 METHODS

The purpose of this study is to explore best practice outdoor play environment design strategies that support the social skills development of children with ASD. Although conducted systematically, this literature review research was approached as a scoping study to inform the purpose across a host of disciplines, rather than a systematic literature review. The scoping study involved a review of the literature conducted using Academic Search Premier (EBSCOhost), Scopus, and Google Scholar. The literature searches were focused on outdoor play environment design, social skill development, and children with ASD. Searches were conducted using the following words and phrases: ((autism OR ASD OR autism spectrum disorder) AND (playground OR outdoor play environment OR play) AND (social interaction OR social behavior OR social communication OR social skills)). Initially, EBSCOhost returned 632 search results (6 identified as relevant), Scopus returned 6 results (2 identified as relevant), and Google Scholar returned 9,910 of which only the first 100 were assessed for relevancy (11 identified). The title and abstracts were reviewed for relevancy according to the stated purpose of the study which, in addition to the three focus topics, emphasized evidence-based understanding. The combination of which greatly limited the applicable results. The literatures identified as relevant were reviewed in their entirety. Ancestral and descendent searches were conducted for those which continued to be relevant after thorough review, slightly expanding the results. Further, the literature was expanded as necessary to explore the play behaviors of children with ASD in the context of social interactions to inform best practice in design. At the same time, some studies were eventually excluded when the play environment was solely the setting for observation of the effect of a non-environmental treatment, such as a peer training intervention (Owen-DeSchryver et al. 2008; Machalicek et al. 2009). An overview of the final results is presented hereafter to help establish best practices in the design of outdoor play environments which support the social skills development of children with ASD.

4 ASD PLAY BEHAVIORS

Numerous studies examine the play behaviors of children with ASD. These studies can be categorized into four primary areas of impacted development which are associated with social skills: low motor skills and coordination, sensory integration, generative play, and joint attention.

4.1 Low Motor Skills and Coordination

Underdeveloped eye-hand and speech coordination, difficulty with balance and other motor impairments, create barriers for the development of social skills in children with ASD (Green et al. 2009; Menear et al. 2006; Folstein and Rosen-Sheidley 2001; Leary and Hill 1996). It is believed that these difficulties in communicating ideas through speech and awkward physical behavior create isolation (social exclusion) from typical developing children (Wolfberg and Schuler 1993; Bass and Mulick 2007). Low muscle strength can greatly affect their play opportunities as children might be unable to perform tasks such as throwing a ball or running (Menear et al. 2006; Hilton, Zhang, White, Klohr, and Constantino 2012). Therefore, outdoor play environments emphasizing physical play or a particular skill level may be detrimental by not offering an appropriate level of physical challenge to children with ASD (Naber et al. 2008) that ultimately results in their exclusion from participating with typically developing children in these play activities.

4.2 Sensory Integration

Children with ASD present atypical responses to sensory stimuli, which intensify their structured and stereotyped behavior (Dawson and Watling 2000). The need for visual boundaries, diminished response to potential hazards, and a preference for exploration through touch, taste and smell versus visual and auditory cues affect play opportunities for children with ASD (Menear et al. 2006; Naber et al. 2008).

4.3 Generative Play

Children with ASD generally exhibit frustration in the generation of spontaneous play, which tends to create detachment and lack of motivation in their social engagement (Mastrangelo 2009; Jordan 2003). Unstructured play environments impact children with ASD’s ability to initiate play with peers, as they increase confusion in the generation of play ideas and development of theory of mind skills that result in
understanding others perspectives (Menear et al. 2006; Mastrangelo 2009; Libby, Powell, Messer, and Jordan 1998), creating a deficit in the ability to apply symbolic meaning and engage in symbolic play (Libby et al. 1998; Hobson et al. 2008; Mastrangelo 2009).

4.4 Joint Attention

Observed as difficulty making eye contact, children with ASD exhibit impairments in establishing joint attention. This results in slower development of social skills through play (Jordan 2003; Bass and Mulick 2007). The reciprocal nature of social interaction creates positive affects in joint attention among typically developing children, compared to neutral affect in children with ASD (Jordan 2003; Bruinsma et al. 2004). These affects can impact the generation of social relationships as typically developing children may feel ignored, thus developing social exclusion towards the child with ASD (Jordan 2003). Social exclusion leads to solitary play and thereby to failure to develop and practice social skills (Jordan 2003).

5 DESIGN CONSIDERATIONS

This study suggests that there is very little empirical evidence-based practices in the design of outdoor play environments which support the social skills development of children with ASD. However, characteristics of outdoor play environments will impact the four areas of children with ASD’s development associated with social skills. In order to create effective outdoor play areas that contribute to the social skills development of children with ASD, outdoor play environments should be structured to appropriately address low motor skills and coordination, sensory integration, generative play, and joint attention. The following discussion represents the available literature, including what direct empirical evidence is available, suggesting how these four development areas may be influenced by the play behaviors the structure of the outdoor play environment supports. Table 1 outlines the design strategies which address each impacted area of development.

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5.1 Low Motor Skills and Coordination

Outdoor play environments are an optimal place where children can practice and develop motor skills (Fjørtoft 2001). The design of the play environment and the inclusion of developmentally appropriate activities can influence motor skills acquisition in young children (Barbour 1999). Children with ASD, who are hesitant to engage in physical activity and/or engage in less physical activity than their peers without disabilities (Pan and Frey 2006), face self-imposed isolation limiting opportunities for interactions and social skill practice. The following elements may be used in outdoor play environments to support motor skills and coordination development meeting the needs of children with ASD.

5.1.1 Movement. Play activities which involve motor planning such as climbing, dancing, running, jumping, hopping, and sliding help children develop core strength and coordination skills, while helping regulate their nervous system (Bowers 1988) (See Figure 1.). The act of walking on stepping
stones, low beams, or uneven surfaces, as well as navigating obstacles of rocks, logs, or play equipment, are more accessible motor planning opportunities that may help children with ASD develop coordination and balance while strengthening their upper and lower extremities. Indeed, these types of repetitive activities may be attractive to children with ASD (Honey, Leekam, Turner, and McConachie 2006; Folstein and Rosen-Sheidley 2001; Mastrangelo 2009).

5.1.2 Swinging. The rhythmic, slow, full body movement (vestibular stimulation) of swinging can have a calming effect. This type of vestibular stimulation is much more accessible to children who are hypersensitive to movement, while simultaneously decreasing hyper-reactive responses to sensory input. In addition, swinging may help develop sequencing and motor coordination skill development, which is often delayed in children with ASD. Swinging is an important vestibular experience for children with ASD. Seesaws, and other similar activities, may also provide opportunities to access similar vestibular stimulation, while also requiring cooperation with another child, thereby increasing opportunities for social interaction.

Figure 1. Movement activity emphasizing motor planning. Photo by the author.

5.1.3 Loose Parts. According to Nicholson’s Theory of Loose Parts (1971), movable parts empower creativity. Loose parts become anything the child wants them to be, by extending existing forms of play and providing opportunities for cooperative play (Frost 1987; Barbour 1999). Loose parts such as sand, water, blocks, containers, garden tools, mechanical tools, and sports equipment, offer multiple combinations and immeasurable scenarios for varied play experiences (Frost 1987). In particular, one study demonstrated that sand play coupled with other loose parts increased and sustained social interaction among children with ASD (Lu et al. 2010). Loose parts support unstructured play which can influence children to experience new sensory stimuli and learn to respond appropriately (Bowers, 1988). Loose parts may also be used to augment structured play settings. One study found that age-appropriate loose materials, for example playground balls, bubbles, etc., positively impacted the amount of time children with ASD interacted with peers (Ledford, Lane and Shepley 2014). In doing so both the structure to guide the play of children with ASD and the child-led opportunities supporting creative and cooperative
play are available to children with ASD.

Outdoor play environments serve an important role in the development of motor skills and coordination, which prepares children for cooperative play. Understanding that children develop motor skills at their own pace is essential when designing developmentally appropriate outdoor play environments. As a result, there needs to be a continuum of developmentally appropriate opportunities for motor skill development to meet the diverse needs of children with ASD. Appropriate opportunities for vestibular and proprioceptive stimulation, or movement and body positioning, create opportunities for social skill practice.

5.2 Sensory Integration

Sensory processing disorders are relatively common among individuals with ASD (Dawson and Watling 2000; Harrison and Hare 2004; Myles, Cook, Miller, Rinner, and Robbins 2000; Volkmar, Cohen, and Paul 1986). In general, children with ASD present varying responses to sensory stimuli (Adamson, O'Hare, and Graham 2006; Kern, Garver, Grannemann, Trivedi, Carmody, Andrews, and Mehta, 2007; Kern, Garver, Carmody, Andrews, Mehta, and Trivedi 2008; Lane, Young, Baker, and Angley 2010; Leekam, Nieto, Libby, Wing, and Gould 2007). Sensory integration can contribute to the reduction of rigid and stereotyped behavior in children with ASD (Dawson and Watling 2000). The following opportunities in outdoor play environments may be instrumental in the integration of various sensory stimuli.

5.2.1 Structure. Children with autism benefit from structured environments (Jordan 2003). Structure helps emphasize where and how activities are to take place, thereby contributing to reduced stress, anxiety, and behavioral problems in children with ASD by making things predictable (Gillot et al. 2001). Outdoor play environments provide children with ASD with the necessary structure to carry out play activities in a typical manner, reducing conflicts and misperceptions with typically developing children (Thomas and Smith 2004). Thus, greater opportunities for social interaction.

5.2.2 Visual Boundary. Unlike typically developing children, children with ASD do not generally segment their environment, making it difficult for them to understand what is to occur in large open areas (Mostafa 2008). Clear physical and visual boundaries, such as fences, paths, and changes in texture or planting, can help children with ASD to understand where each area of the play environment begins and ends (Mostafa 2008), in essence increasing the recognizable structure of the play environment. Further, clear boundaries assist children with ASD in understanding the social boundaries of play in the area, when the two are designed to correspond.

5.2.3 Sensory Stimuli. Children with ASD are much more likely to demonstrate unusual responses to sensory stimuli than typically developing children (Adrien et al. 1987; Kern et al. 2008; Ornitz 1983), particularly hyporesponsiveness characterized by the absence of the expected response to a stimulus (Watson et al. 2011). Hyporesponsiveness is associated with the appearance of passivity and disengagement (Watson et al. 2011), which understandably has a negative impact on social interaction. Children with ASD may benefit from strong multi-sensory landmarks and activities which will attract the shared attention of all children. In order to engage their senses, sensory cues need to be organized clearly to reduce overstimulation of the child. This can be achieved by clear boundaries and consistent patterns of color, tone, texture, and sound that help define specific areas where particular activities are to occur. Within these areas of sensory consistency, a multi-sensory landmark may be used to focus shared attention between children with ASD and their typically developing peers. Opportunities to pace and regulate sensory stimulation should be available within the play environment, preferably in close proximity to active areas. These spaces may be child-scaled and partially enclosed.

5.2.4 Sand Play. Research suggests that sand play, when combined with loose parts to support symbolic play, provides multi-layered support for sensory play including social expression (Lu et al., 2010). For children with ASD, the evidence suggests that sand play opportunities provide enough structure to support the development of socialization skills (Lu et al., 2010). Sensory integration in the play environment can help children with ASD to increase alertness, success and productivity, by providing cues that help them construct appropriate, meaningful responses to stimuli.
5.3 GENERATIVE PLAY

Generativity is vital for social skills development in young children. Children with ASD may have difficulty in initiating pretend play because of impairments in the generation of play ideas (Jarrold, Boucher, and Smith 1996). The following elements of the play environment can help support generative play for children with ASD.

5.3.1 Defined Areas for Socialization. Children with ASD have difficulty understanding physical space communication (Arnaiz Sanchez, Segado Vasquez, and Albaladejo Serrano 2011). They are particularly susceptible to the development of proxemics which might lead them to feel threatened by unexpected social intrusion (Jordan 2003). Areas where socialization is expected should be designed to bring children together in cooperative types of activities with clearly defined space for each participant. Clear physical and visual boundaries, as well as play cues, can help reduce distress caused by social interaction in children with ASD (Jordan 2003; Arnaiz Sanchez et al. 2011). This may allow children with ASD to enlarge their intimate zone and comfortably increase peer interaction and dramatic play (Jordan 2003).

5.3.2 Play Cues. The lack of play signals is one of the major inhibitors of social interaction in children with autism (Jordan 2003). Studies show that young children with autism are capable of producing pretend play and generating play ideas when prompted with play cues (Lewis and Boucher 1995). The design of the outdoor play environments may provide these play cues, as prompts to engage in appropriate play. Gentle themes that are not overly prescriptive are ideal to provide children with cues, while not limiting their creative play. However, abstraction in outdoor play environment design is not beneficial due to the unclear play cues which may be confusing, particularly given children with ASD’s impairments in play generativity. For example, a play structure designed to look like a truck with a steering wheel provides a clear play cue suggesting children should pretend they are driving (See Figure 3). While a playground stage designed to look like a boat communicates conflicting messages, should you be sailing or putting on a musical?
5.3.3 Music. Studies have shown that music therapy reduces self-stimulation and encourages self-expression in children with ASD (Stephens 2008; Kern and Aldridge 2006). Reducing self-stimulation increases spontaneous play among children with ASD (Koegel, Firestone, Kramme, and Dunlap 1974). A musical center becomes a place in which children of all abilities are able to participate. That no specific outcome is expected reduces anxiety and frustration in children with ASD.

Providing the necessary structure and play cues may increase children with ASD’s ability to generate play ideas and engage in spontaneous play (Jarrold et al. 1996; Lewis et al. 1995). The structure of the environment serves an essential role in promoting pretend play and thereby increasing peer interaction in children with ASD.

Figure 3. Play setting with clear play cues. Photo by the author.

5.4 JOINT ATTENTION

Mundy (1997) defines joint-attention as “the use of gestural acts to direct attention in order to share the experience of an object with another person.” Eye contact, smiles and gestures provide people with the ability to interact with others nonverbally. Children with ASD may be less able to share attention because deficits in understanding that others have points of view different from one’s own creates impairments in the development of their social abilities (Baron-Cohen et al. 1985; Mundy and Crowson 1997; Kasari, Freeman, and Paparella 2006; Jarrold et al. 1996). Even though there is little literature investigating joint attention in play activity, different type of stimuli may be included in outdoor play environments to promote joint attention in children with ASD.

5.4.1 Parallel and Cooperative Play. Providing comfortable opportunities for playing in close proximity with others, such as in parallel play, where eye contact can be easily made, is beneficial
in fostering social interaction. One study found that playground activities of shared interest among children with ASD and typically developing peers supported increased social interaction through natural proximity, mutually reinforcing events, and reciprocity (Harper, Symon, and Frea 2008). Over time, play activities can become increasingly cooperative and include taking turns, sharing materials or emotional expression which will promote the generation of play ideas and allow the children to share a common focus (Yang, Wolfberg, Wu, and Hwu 2003).

5.4.2 Low Degree of Concentration. Children with ASD have clear attention and concentration impairments (Patten and Watson 2011). Play activities that do not require a high degree of concentration can be beneficial in allowing children with ASD to produce functional play and interact with others simultaneously. Activities that require low physical effort and encourage the use of natural body positions can make shared play experiences more enjoyable for children with ASD.

5.4.3 Visual Scripts. Studies have shown that children with ASD are able to engage in functional play when they are taught specifically how to play with a certain toy (Thomas and Smith 2004; Wolfberg and Schuler 1999). These play scripts, or prescribed play responses, can contribute to the structured development of play skills in children with ASD (Thomas and Smith 2004; Rogers 2000). Visual scripts can take the form of graphic cues that will prompt the child on how to play with a specific piece of equipment, without being too prescriptive to leave room for the development of their own play ideas. Appropriate play structured by the use of play scripts can assist children with ASD in appropriately playing with typically developing children, thus promoting cooperative play and social interaction (Thomas and Smith 2004). The use of visual scripts is expected to vanish overtime as the child has learned and mastered the expected behavior (Rogers 2000). Play scripts can be provided in the outdoor play environment using simple signage employing pictorial depictions, such as Mayer-Johnson symbols (see Figure 4), which communicate what the suggested behavior is to the child.

5.4.4 Imitation. Imitating play behavior teaches children with ASD the benefits of shared attention and social interaction (Stephens 2008). Promoting play areas in which reciprocal imitation is encouraged (a seesaw for example) will allow children with ASD to socially interact with others.

The social nature of joint attention makes it a crucial element that needs to be addressed in outdoor play environments. By taking into consideration the elements listed above, children with ASD can learn to enjoy the benefits of sharing a common focus, an essential aspect in the development of their social abilities.

Figure 4. Mayer-Johnson symbols for play area. Photo by the author.

6 SUMMARY

Play is important for social skills development in children with ASD. As children with ASD display a large range of variability in their behavior and functioning, different methods are necessary to guide social interaction through outdoor play environments. The design of the environment can determine the
success or failure of a playground in supporting social interactions for young children with ASD. While there is little empirical evidence on specific design strategies to support social skills development in outdoor play environments for children with ASD, there is a body of support to suggest best practices addressing the four primary areas of play deficits among children with ASD: low motor skills and coordination, sensory integration, generative play, and joint attention. Supporting social interaction among children with ASD may be supported by analyzing the impact of specific design elements on the identified behaviors.

Design opportunities may include easily accessible motor planning activities which may help children with ASD improve their balance and coordination. Other activities such as swinging can have a calming effect for children with ASD who are often hypersensitive to movement. The use of loose parts in structured areas of the play environment provides unstructured play within a structured environment, which promotes creative and imaginative play. A structured play environment in which sensory cues are clearly organized can help reduce overstimulation in children with ASD. This along with the implementation of clear physical and visual boundaries can contribute to addressing sensory integration deficits.

The use of gentle themes as “play cues” can contribute to the generation of play ideas in children with ASD. Play scripts in the form of visual cues can indicate how to participate in a play opportunity without being too prescriptive. Music opportunities can help reduce self-stimulation and anxiety, thereby helping children naturally engage in spontaneous play with their peers.

Design opportunities which address joint attention deficits and promote social skills development in children with ASD include providing opportunities for cooperative types of activities to take place, instead of competitive play. Activities that required low physical effort and low degree of concentration, can contribute to joint attention and social skills development in children with ASD.

7 FUTURE RESEARCH

As discussed earlier, here is little, if any, empirical research or case study evidence which supports these suggested design strategies. It would be meaningful to provide research through empirically based studies to support evidence based design practices focused on how the design of the outdoor play environment can influence social skills development in children with ASD by targeting specific design strategies and aspects of their play behavior. Given the wealth of research supporting the need for play intervention or instruction to provide or model the structure of play for children with ASD, the potential for play environments which are physically structured to inherently provide support for the play of children with ASD is significant.

The design of the outdoor play environment plays an important role in creating spontaneous and pleasurable play opportunities for children with ASD. Well-designed outdoor play environments may support social interactions, creating an important place were children with ASD can develop social skills through play.

REFERENCES

New Beginning, edited by Lawrence D. Bruya.


