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Exploring the Free Play Patterns of Children with Autism Spectrum Disorders: A Pilot Study

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Abstract

Free play opens up a natural and potentially powerful window for the assessment and treatment of children with autism spectrum disorders. The current study employed a cross sectional study design to investigate the nature of play behaviours in 12 children with autism spectrum disorders between the age ranges of 2-5 years. Play behaviour were video recorded in a clinical environment for duration of 10 minutes. The play behaviours were analysed using ELAN software. The particular play behaviours observed were coded by three speech language pathologists. Statistical analysis revealed a significant difference between play behaviours. The results suggested the preponderance of sensorimotor play along with deficits and or delay in other advanced play namely functional play in children with autism spectrum disorder.

Keywords: autism spectrum disorders, free play, sensorimotor play, functional play, symbolic play, ELAN, video analysis

Introduction

Autism spectrum disorders (ASD) are a group of neurodevelopmental disorders characterized by marked deficits in social communication, interaction & the presence of restricted repetitive patterns of interest or behavior (American Psychiatric Association, 2013). Early identification of children at risk for ASD, probably at a younger age is still challenging for the professional as well as medical practitioners even in the presence of several standardized checklists and assessment tools. One of the reasons highlighted could be the lack of culturally valid and reliable assessment tools. As the early identification of children at risk for ASD at a younger age is solely based on the behavior manifestation and is been influenced by the culture of an individual living in a specific ethnographic location, availability of culturally based tools plays a key role. Another reason could be the difference in the response eliciting method, i.e., most of the time a diagnosis of ASD is made based on the parental reports of child's behavior. An over concerned and anxious parent may state

positively even the slightest change in behavior as challenging or atypical leading to the identification of a child at risk for ASD.

On the other hand, an overprotective parent may ignore the behavior challenges of a moderate degree in their children and report the extremely challenging behavior as only challenging. In both the cases, chances of overestimation, as well as underestimation of the true condition, are higher. Play being a ubiquitous and universal aspect of early childhood and the most comprehensive form of child`s expression, can control the extraneous variables and aid in the early identification of ASD whose diagnosis is solely based on spontaneous behavior expression. Knowing the importance of play in the younger period of life, the field of school psychology appreciated the possibility of play in the assessment and intervention for decades. Studies of (Piaget, 1962) and (Vygotskiĭ & Cole, 1978) discussing the changes of play behavior in children along with their development popularized the possibilities of play in the rehabilitation of children with special needs. As play can unveil the social communication, interaction and imagination of a child and these are the core triad deficits pronounced in children with ASD, lots of research was initiated to study their play skills. The paucity of pretend play in children with ASD is well documented too.

Early research in this direction focused on defining the play categories to have a better understanding of play behaviors in both typical and atypical population. A difference of opinion exists in the definition of pretend play. (Libby, Powell, Messer, & Jordan, 1998) referred pretend play as an umbrella term consisting of both functional and symbolic play. When a child uses an object as its function denotes, it can be called as functional play and if the child treats an object as if something else, there appears the symbolic play, typically emerge by 20 months. Leslie (1987) argued that pretend play includes only symbolic play. He extended it with the description of three forms of symbolic play namely a) object substitution b) attribution of false properties and c) reference to an absent object. Infants engage in other early play behaviors before the emergence of pretend play. Sensorimotor play emerges in the first year of life, often repetitive & not functionally determined. This includes spinning, oral exploration & banging of the object. Subsequent to the first year of life, relational play emerges wherein child combines objects in play such as piling of objects, placing one object inside the other (Fein, 1979). The present study adopted the play categories defined by (Libby et al., 1998).

A child begins to play by interacting and exploring with the environment. Hence assessing play to elicit the spontaneous response of children would be ideal in a natural situation. But studies reported that clinical environment can serve as a systematic, reliable and predictable environment for children in the assessment of play (Stagnitti Unsworth & Rodger, 2000). In order to control the confounding variables and to deal with the inherent problems with reliability, the study incorporated clinical setting familiar to the child.

Initial research into the early play behaviors of children with ASD identified the predominance of sensorimotor play (Tilton & Ottinger, 1964)4). A group of researchers including (Lewis & Boucher, 1988a), (Ungerer & Sigman, 1981), and Whyte & Owens (1989) pointed the

functional and symbolic play deficits in children with ASD but the other group (Baron-Cohen, 1987) found deficits only in symbolic play limiting to object substitution. Previous studies reported that with the support of prompt and adult modeling, advanced forms of functional & symbolic play appears in children with ASD (Bornstein, Maurice Haynes, Legler, O'Reilly, & Painter, 1997 ; Charman2 & Baron-Cohen, 1997). (Dominguez, Ziviani, and Rodger (2006) compared the play behaviors of children with ASD to typically developing children revealed significantly greater participation of children with ASD in exploratory, sensorimotor & relational play than the typically developing group. The researcher failed to observe a significant difference for engaging in functional and symbolic play between two groups. Thus, there exist inconsistencies and varying results in terms of deficits in functional play, as well as symbolic play and only few studies, accounts on early forms of play i.e., relational play. Thus, the present study made an attempt to add on to the existing literature by studying the spontaneous play behaviors in young children with ASD.

Purpose and Objectives of the Study

The purpose of the study was to explore the natural and spontaneous play patterns of young children with autism spectrum disorders on a free play session. The present study looked into the following research questions specifically

a) Do children with autism spectrum disorders exhibit any specific play patterns while engaging in a free play session?

Methods

Participants

A total of 12 children with Autism spectrum disorders (ASD) between the ages of 2 and 5 years participated in the study. Four children with Autism spectrum disorders from each age group namely, >2.0 ≤ 3.0 years; >3.0 ≤ 4.0 years and>4.0 ≤ 5.0 years represented the total participants. The children with autism spectrum disorders were selected from an early intervention center in Kerala. Each child had received the primary diagnosis of Autism Spectrum Disorders following the criteria stated in the Diagnostic and Statistical Manual-5 (American Psychiatric Association, 2013) and Childhood Autism Rating Scale (CARS) (Schopler, 2002). An Informed written consent was obtained from the parents to participate in the study. All the participants were enrolled in the study prior to the intervention classes.

Materials

The material consisted of a set of traditional toys. The toys were selected following the guidelines given by (Srinivasan, 2014) in Toy kit for Kids with developmental disabilities and also glean support from the study of (Libby et al., 1998) . A Sony Camcorder fixes in a tripod stand was used to record the free play of children as it was portable as well as convenient for videotaping in clinical rooms.

Procedure

The procedure was designed to be naturalistic and flexible owing to the known difficulties in engaging young children with Autism spectrum disorders. The video recording was carried out in an intervention room with only required furniture and open space for placing the toys. A set of toys were laid out in random order in a semicircular fashion on the floor. The child was made to sit in the middle of the toys and allowed to play. This arrangement was chosen as it allows the child to access the toys at an ease as well as it gives a visual cue to explore all the toys. The parents were allowed to sit either on the same line or behind the child for moral support. They were instructed to respond naturally if their child showed distress or even approached them during recording and to refrain from giving direction or demonstrating particular play behavior. The child was videotaped playing with the toys for a total of 10 minutes. Videotaping was continuous, unless the child wandered out of the view of the camera or became disengaged with the objects for longer than 60 seconds. When this happened, the examiner asked the parent to try and gain their child's attention towards the objects. Videotaping was resumed when the child once again became engaged with the toys. Throughout this process, the examiner tried to remain as unobtrusive as possible.

Scoring

An overall ten minutes of free play of each child were analyzed for coding the types of Play behavior and the toys engaged for the play. The object play with the toy was coded for different types of play behavior following the play coding scheme developed by Libby et al., (1998). ELAN software was employed for analyzing the video recordings. The instances of play behavior and the toys engaged were analyzed and coded for the number of times the child holds the toy. The current study particularly focused on the occurrences of five types of play behavior, Exploratory, Sensorimotor, Relational, Functional & Symbolic play behavior respectively.

Inter-rater reliability measures

Inter-rater agreement for classification of play behavior was calculated using Kappa Coefficient on all of the 12 videos. The scores for the categorization of play behavior ranged from 0.947 to0.997. These obtained scores represent excellent agreement.

Analysis

Non-parametric measures were employed in the study as the variation in the sample failed to follow a normal distribution. Friedman test was performed to find out if the types of play behaviors varied significantly across the whole 12 participants. At the same time, a Kruskal Wallis test was also carried out to find out specifically if the types of play behaviors varied significantly between each age group, namely 2-3 years; 3-4 years & 4-5 years respectively.

Results

Play Behaviour

Table 1 provides an overview of the frequency data in percentage for different types of play behavior across three age group, $>2.0 \leq 3.0$ years,$>3.0 \leq 4.0$ years &$>4.0 \leq 5.0$ years respectively.

Analysis of results using Kruskal Wallis test revealed that there was no significant difference in play behaviours across age groups. Friedman test indicated a significant difference between the play behaviors of children with autism spectrum disorders with a $\chi 2$ (11) = 23.85, p=0.00 (p<0.01). Subsequent to that a post hoc analysis with wilcoxon signed -rank test was conducted to find out the specific patterns of play behaviors exhibited by children with ASD.

Table 1: Percentage of different types of play behaviors

Participants	Age Range (yrs)	Exp	Sen	Rel	Fun	Sym
S1	>2.0 ≤ 3.0	6	3	0	39	0
S2		21	9	0	24	0
S3		59	41	0	0	0
S4		50	17	17	6	0
S5	>3.0 ≤ 4.0	35	3	6	29	0
S6		23	58	0	0	0
S7		2	0	1	8	0
S8		22	13	31	38	0
S9	>4.0 ≤ 5.0	3	59	0	3	0
S10		20	0	0	0	0
S11		31	19	0	0	0
S12		8	0	0	25	0

Note: Exp=Exploratory, Sen=Sensorimotor, Fun=Functional, Rel=Relational, Sym=Symbolic

The results were discussed under the following headings:

Delay in the developmental stages of play.

Exploratory play in relation to other play behaviors.

A statistically significant difference was observed between Exploratory and Relational play (z=-2.668, p<0.05) as well as Exploratory & Symbolic play (z=-3.059, p<0.05) indicates that children with autism spectrum disorders exhibit a delayed play pattern wherein they engaged more in early stage of play namely Exploratory play with a failure to move on to the subsequent developmental stages.

Functional play in relation to Symbolic Play.

A similar delayed pattern was observed in Functional play with a statically significant difference of z Value of -2.52 (p<0.05) wherein children with ASD occupied their play time significantly with few instances of functional play (z Value of -2.52 (p<0.05) in comparison to absent instances of symbolic play suggesting of a delay in the advanced symbolic play.

The preponderance of Sensorimotor play

There was no significant difference between sensorimotor Play and other types of play behavior ie Exploratory, Functional & Relational Play. ie children with ASD showed more interest in the sensorimotor features rather than experiencing the functional potential of toys though not

significant. However, there exists a statistically significant difference between the instances of Sensorimotor play and Symbolic play among children with autism spectrum disorders($z=-2.668$, $p<0.05$) suggesting that children with autism spectrum disorders exhibited more sensorimotor play & it limits them to move on to the subsequent complex play behavior, namely symbolic play.

More Functional play in comparison to Relational Play.

Contrary to the above findings of a delayed pattern of play behavior, children with autism spectrum disorders exhibit significantly more Functional play compared to Relational play ($z=-2.103$, $p<0.05$), which was a typical performance in the development of the play.

Discussion

The present study explored the play behaviors of preschool children with ASD on a free play session. The results suggested that children with ASD showed a greater tendency to sustain in sensorimotor play though they exhibit few instances of exploratory play, relational play & functional play. This dominance of sensorimotor play actually restricts the children from engaging in more complex symbolic play which was also evidenced in the current study as there were no single instances of symbolic play observed.

In a free play, children with ASD often get fascinated by the sensorimotor features of the object & develop an unusual interest, thereby ignoring the functional & symbolic potential of the object. This atypical interest in sensorimotor feature limits the children to move into the subsequent complex stages of play ie symbolic play (C Jarrold, Boucher, & Smith, 1993) (Libby et al., 1998). Studies have shown that symbolic play abilities are more apparent in older children with ASD in structured play situations (Lewis & Boucher, 1988b; (Whyte & Owens, 1989). This could be reasoned to the fact that the prepotent sensory responses are controlled and the functional & symbolic features of the object are made accessible to children in structured play/Adult-directed play. (Meirsschaut, Roeyers, and Warreyn (2011) also supported the dominance of sensorimotor play in ASD. They explained that the heightened sensorimotor play in children with ASD limits their ability to explore, gain knowledge & experience about the functional aspects of the object. Thus, resulting in a delay in the development of play behaviors in them. The findings of the present study also evidenced a delay pattern wherein the instances of exploratory play were more in comparison to the advanced relational & symbolic play.

Similar findings were reported by (Baron-Cohen, 1987) studied the pretend play of 10 children each with Autism spectrum, Down`s syndrome and typically developing children. The 5-minute long session of toy play of these children was coded & analyzed. The results revealed that children with ASD exhibit more sensorimotor and less pretend play, than the other two groups

Theoretical underpinnings were provided to explain why children with ASD show deficits in symbolic play. Two prominent theoretical explanation proposed were deficits in theory of mind (Baron-Cohen, 1987) & deficits in executive function (Christopher Jarrold, Butler, Cottington, & Jimenez, 2000). The former theory explained that children with ASD had difficulty in symbolizing

thought, engaging in false belief task due to the deficits in theory of mind. Research attributing play deficits to the impairment in executive functions focused on the difficulties in planning, mental/cognitive flexibility (set shifting), inhibition, generativity, and self-monitoring skills of children. Most of the studies in line to this revealed an inconsistency in results. This could be due to the fact that not all children with ASD exhibit deficits in executive function & those who had mostly have a different profile too.

Some other perspective accounted poor pretend play in these children to lack of interactive context of shared meaning &inter subjectivityi.e. mostly in joint attention activities (Hobson, Hobson, Malik, Bargiota, & Caló, 2013). Few studies conducted in this line revealed that joint attention can predict the development of pretend play in typically developing as well as communication delayed children (Toth, Munson, Meltzoff, & Dawson, 2006 ; (Rutherford, Young, Hepburn, & Rogers, 2007).

As observed in the present study, exploratory play stands next to the sensorimotor play in all but one participant. This was in good agreement with the findings of the study by (Boucher (1999) and Williams (2003), reporting the tendency of children with ASD to engage more in exploratory play in comparison to normal peers & developmental delay group.

In consonance with the findings of previous studies, the present study too witnessed the presence of functional play behavior though limited in children with ASD. According to Leslie, (1987), engaging in potential functional play behavior is crucial for the development of pretend play. Hence children with ASD who engaged in less elaborated, less diverse functional play have a greater probability to show marked deficits in symbolic play. Research investigating the functional play behaviors of children with ASD has pointed out both qualitative as well as quantitative difference. Libby et al., (1998) failed to observe a significant difference in the duration of functional play between children with autism & language matched control group, in contrary to the finding of significantly reduced functional play behaviours in children with autism than typically developing controls (Christopher Jarrold, Boucher, & Smith, 1996; Lewis & Boucher, 1988b). The qualitative deficits of functional play behavior in these children accounted a less varied, integrated, and other-directed play than those produced by controls matched for general mental age (Atlas, 1990; (M. Sigman & Ungerer, 1984).

Few schools of thoughts were proposed to explain the functional play behavior deficits in children with ASD. The proponents of executive dysfunction hypothesis suggest that autism being an executive disorder have difficulty in generating novel & alternative schema, so they showcase simple, less diverse, repetitive play behavior (Christopher Jarrold et al., 1996). According to Social deficit hypothesis, the less elaborate functional play in children with autism may arise as a result of their difficulty in interacting with the people (Williams, Costall, & Reddy, 1999). Parents and Caregiver play a pivotal role in making the child understand the functional aspects of objects through imitation, modeling & shared activities such as joint actions, joint attention activities etc. Since such

kind of social mediation process is disrupted in children with autism, they are unable to use this aid in understanding their own use of objects (M. D. Sigman, Kasari, Kwon, & Yirmiya, 1992).

Conclusion

This study examined the spontaneous play behaviors in children with ASD in a free play session. The preponderance of sensorimotor play along with deficits and or delay in other advanced play namely functional play was observed. No single instances of symbolic play were observed in these children. Future research should be undertaken to investigate more specific subcategories of functional, symbolic play in a larger population.

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