

Play Behaviours of Children With ASD: A Comparison Between Direct Observation and Informant Rating Scale

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Abstract

The current study tried to investigate the agreement between parent report and clinical observation on three types of play behaviour in 12 children with ASD. The clinician observed 10 minute long free play session and coded for exploratory, functional and symbolic play. The parent's rating on three questions addressing the play behaviours were elicited. Percentage of agreement between the clinician observation and frequency rating of parents were calculated. The results suggested that the agreement across two types of measurement systems as to the presence of play behaviour on parent report and direct observation was greater than 75% for exploratory and functional play. But the agreement at the molecular level for this play behaviour was considerably poorer.

Keywords: Children With ASD, play Behaviour, free play, autism spectrum disorders, ELAN, agreement

Introduction

Autism spectrum disorders (ASD) are a group of neurodevelopmental disorders characterized by marked deficits in social communication, interaction and the presence of restricted repetitive patterns of interest or behavior (DSM 5). These triads of deficits pose severe challenges in the development of play skills in children with ASD (Beyer & Gammeltoft, 2000). An analysis of play behaviors can touch in to physical, symbolic, communicative and social competencies of children (Knox, 1997). Since Play being a sensitive measure of dysfunction in children with ASD, an assessment of play can aid the early identification of these children (Restall & Magill-Evans, 1994; Baranek et al, 2006).

Early research on object play of young children with ASD reported marked differences compared to their typical peers. These differences are qualitatively reported in terms of more repetitive and stereotypical use of play objects, less flexible and creative play and poor social play among

children with ASD (Baranek et al, 2006 ; Stronach & Wetherby, 2014). Unlike the typical visual examination of object, children with ASD exhibited more atypical exploration of objects such as odd pattern of visual inspection, twisting an object near to the eyes etc (Olof Dahlgren & Gillberg, 1989). Another study by Lewis and Boucher (1988) reported that young children with autism produce more non-exploratory behavior than an active exploratory behavior. They spent more time in looking away than actively engaging with toy objects (Libby, Powell, Messer, & Jordan, 1998). In a similar line, study by De Myer, Mann, Tilton, and Loew (1967) reported a preponderance of sensorimotor play in children with ASD. This preoccupation with the sensorimotor play might hinder the emergence of functional and symbolic play in them (Libby et al, 1998). An impaired functional and symbolic play in children with ASD was reported by a group of researcher including Lewis and Boucher (1988), Ungerer and Sigman, (1981) and Whyte and Owens (1989) in contrast to the findings of deficits limited only to symbolic play (Baron-Cohen, 1987). However, studies reported that with adult modelling and the support of prompt, advanced forms of functional and symbolic play appear in children with ASD (Bornstein, Maurice Haynes, Legler, O'Reilly, & Painter, 1997 ; Charman & Baron-Cohen, 1997).

Information aiding the early identification of children with ASD has often relied on multi-method approach such as retrospective interviews, home videos, descriptive direct observation, parent informant rating, standardized assessment of the autism behaviours etc. Autism Diagnostic Observation Schedule (ADOS) (Lord, Rutter, DiLavore & Risi, 2006) and Autism Diagnostic Interview- Revised (ADI-R) (Rutter, Le Couteur & Lord, 2005) are the most commonly used assessments for diagnosing a child with ASD. ADOS employed a direct observation method for diagnosing children with ASD by a trained professional. ADOS work in the context of a semi-structured play environment. Rather than a direct observation, ADI-R relied more on the parental interview. Both the assessments are expensive, time consuming and required trained professionals to carry out the evaluations. A study by Risi, Lord, Gotham, Corsello, Chrysler, Szatmari (2006) suggested the use of the ADOS, an observational measure and ADI-R, parent report in the diagnosis of ASD. In another study examining the stability of autism diagnosis using ADOS and ADI-R at the age of two to nine years, Lord (2006) found that clinician showed more agreement than the parents on the diagnosis. In contrast to this result, another study by Tomanik, Pearson, Loveland, Lane and Shaw (2007) reported that the reliability of ASD diagnoses improved with the addition of VABS, a parent-report measure along with the use of ADOS and ADI-R.

Thus, there exists a discrepancy between the clinician and the parent agreement on ASD diagnosis. Considering the potential role of play in the early identification of children with ASD, the present study tried to explore the agreement between parent frequency rating and direct observation of play measures in a group of young children diagnosed with ASD.

Purpose and Objective of the Study

The purpose of the study was to explore the agreement between parent frequency rating and direct observations of three types of play behaviours of children with ASD during a free play session. The present study looked into the following research question specifically

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- a) Do the frequency ratings of mothers of children with ASD on play behaviours are in agreement with the observations made by the clinician in a free play session?

Method

Participants

A total of twelve children aged between 2 and 5 years participated in the study. The age range was further divided to form three age group with four children with ASD in each age groups namely, 2-3 years; 3-4 years and 4-5 years. The children with autism spectrum disorders were recruited from an early intervention centre in Kerala. The primary diagnosis of Autism Spectrum Disorders was made following the criteria stated in the Diagnostic and Statistical Manual-5 (DSM-5) and Childhood Autism Rating Scale (CARS). 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 selected from the Toy kit for Kids with developmental disabilities (Venkatesan, 2010). The free play sessions of children with ASD were recorded using a Sony Camcorder fixed in a tripod stand. The questions on play behaviours were chosen from an early screening tool developed as a part of thesis work. The responses of mother were recorded in a 5 point Likert scale, where a score of '0' indicated the absence of behaviour, '1' indicated the behaviour was present for a frequency less than 25 %, '2' indicated the behaviour was present for a frequency between 25 and 50 %, '3' indicated the behaviour was present for a frequency between 50 and 75% and a score '4' was given if the behaviour was present for more than 75% of time. Three types of play behaviour were assessed on observations and using rating scale.

Procedure

Direct Observation: The ten minute long free play sessions of children with ASD were video recorded in an intervention room. The child was made to sit in the middle of the toys, arranged in a semi-circular fashion and allowed to play. This arrangement was chosen as it gives a visual cue as well as easy access to the toys. The parents were allowed to sit either on the same line or behind the child for moral support. They were instructed from giving direction or demonstrating particular play behaviour and asked to respond naturally if their child approached them during recording. 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. 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.

Informant Rating Scale: An interview with the mothers of children with ASD on the 3 questions was carried out. Their responses were recorded in a 5 point Likert scale, where a score of '0' indicated the absence of behaviour and a score '4' was given if the behaviour was present for more than 75% of time. The questions were 1) Does your child explore or manipulate toys by self? 2) Does your child know how to play with the toy object defined by its function such as a ball is to throw, and a car

is to ride? 3) Does your child play by pretending an object for a real object such as imagining a rectangular block as phone and play?

Scoring

The play behaviours of children with ASD were analysed on direct observation following the play coding scheme developed by Libby, Powell, Messer and Jordan, 1998. ELAN software was employed for analyzing the video recordings. The current study particularly focused on the occurrences of three types of play behaviour, Exploratory, Functional and Symbolic play behaviour respectively. The rating scale was used for scoring the frequency of three types of play behaviour namely Exploratory, Functional and Symbolic play behaviour.

Inter-rater Reliability Measures

Three experienced Speech language pathologists involved in the early intervention of children with ASD participated for the inter-rater reliability measures on play behaviours. Inter-rater agreement for classification of play behaviour was calculated using Kappa Coefficient on all of the 12 videos. The scores for the categorization of play behaviour ranged from 0.947 to 0.997. These obtained scores represent excellent agreement between clinicians.

Analysis

Descriptive statistics was used to obtain the frequency of three types of play behaviours exhibited by children with ASD and the agreement between the parent and clinician on the types of play behaviour.

Frequency of Play Behaviour Measured Through Direct Observation by the Clinician

Frequency of each type of play behaviour was obtained by dividing the frequency of specific play behaviour by the total frequency of play behaviour. Likewise, the percentage of frequency of each type of play behaviour was calculated. This obtained percentage was matched for the frequency ratings of questionnaire used with the mother.

Frequency of Play Behaviour Rated by the Parent

Information on frequency of play behaviour exhibited by children with ASD were elicited from the mother on a 5 point Likert scale by administering three questions developed as a part of thesis work. The class mark of each frequency interval was calculated by summing the lower class interval and upper class interval and dividing by two. The class mark is the representation value of entire class interval i.e. Class mark value of 0 represented the first rating of 0%; a value 12.5 represented the second rating of 0-25%; a value of 32.5 represented the third rating of 25-50%; a value of 62.5 represented the fourth rating of 50-75%; a value 87.5 represented the fifth rating of 75-100%.

Agreement between the Frequencies of Play Behaviours Noted by Parents and Measured by Clinician on Free Play Session

The researcher compared the percentage of agreement between whether or not behaviours noted by parents on the questionnaire were actually observed by the clinician on free play session. The

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agreement was examined on two levels; at the molecular level, the frequency of consistent expression of play behaviour was looked between the parent and the clinician on a 5 point scale with least frequency of ‘No occurrence of behaviour to ‘Always’ exhibit the behaviour. At the Mole level, only the presence or absence of play behaviour was examined between the parent and clinician.

Results

Frequency of Play Behaviour Measured Through Direct Observation by the Clinician

Analysis of results of descriptive statistics revealed that children with ASD engaged in both exploratory and functional play. Moreover, no single occurrence of symbolic play was noticed. The children with ASD engaged in exploratory play for a frequency of 23.3% of time on free play session as coded by the researcher. This was followed by the sophisticated functional play, which was exhibited only for 14.3% of time by children with ASD. On matching with the frequency interval of rating scale, the children with ASD exhibited these two types of play behaviour for a qualitative rating of ‘Rarely’.

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

Table 1: Percentage of different types of play behaviours observed by the clinician

Participant	Age Range (yrs)	Exp	Fun	Sym
S1	$>2.0 \leq 3.0$	6%	39%	0%
S2		21%	24%	0%
S3		59%	0%	0%
S4		50%	6%	0%
S5	$>3.0 \leq 4.0$	35%	29%	0%
S6		23%	0%	0%
S7		2%	8%	0%
S8		22%	38%	0%
S9	$>4.0 \leq 5.0$	3%	3%	0%
S10		20%	0%	0%
S11		31%	0%	0%

S12		8%	25%	0%
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Note: Exp=Exploratory, Fun=Functional, Sym=Symbolic

Frequency of Play Behaviour Rated by the Parent

Analysis of results of descriptive statistics revealed the presence of functional play and exploratory play in children with ASD as reported by their mothers. A single occurrence of symbolic play was reported. As per the parental report, on an average, children with ASD engaged in Functional play for a frequency of less than 33% of time, which is equivalent to an interval range of ‘Sometimes’. This was followed by the rudimentary exploratory play, which was exhibited for a frequency of less than 27% of children with ASD equivalent to an interval range closer to the lower limits of ‘Sometimes’ (Fig 2). The class mark of each frequency interval was added and divided by the total number of participants to obtain the average frequency of play behaviours.

Table 2: Percentage of different types of play behaviours observed by the clinician

Participant	Age Range (yrs)	Frequency percentage of play behaviours (Class mark)		
		Exp	Fun	Sym
S1	>2.0 ≤ 3.0	50-75% (62.5)	50-75% (62.5)	0-25%(12.5)
S2		25-50% (37.5)	25-50% (37.5)	0%
S3		0%	0%	0%
S4		0-25%(12.5)	0-25%(12.5)	0%
S5	>3.0 ≤ 4.0	0%	75-100%(87.5)	0%
S6		50-75% (62.5)	25-50% (37.5)	0%
S7		0%	0-25%(12.5)	0%
S8		25-50%(37.5)	50-75% (62.5)	0%
S9	>4.0 ≤ 5.0	0-25%(12.5)	25-50%(37.5)	0%
S10		25-50%(37.5)	0%	0%
S11		0-25%(12.5)	0%	0%
S12		50-75% (62.5)	50-75% (62.5)	0-25%(12.5)

Table 2 provides an overview of the frequency data in percentage interval for different types of play behaviour across three age group, $>2.0 \leq 3.0$ years, $>3.0 \leq 4.0$ years & $>4.0 \leq 5.0$ years.

Agreement between the Frequencies of Play Behaviours Noted by Parents and Measured by Clinician on Free Play Session

Percentage agreement between the types of play behaviour endorsed by the parent based on the questionnaire was also directly observed during the free play session. Thus, the parent's rating on the questionnaire agreed with observations as to the presence of two types of play behaviours namely, Exploratory play, Functional play and the absence of Symbolic play. Overall agreement defined as, rated as occurring by the parent and observed during the free play session for Exploratory play was 75%; For Functional play was 91.6% and for Symbolic play was 83.3%. When agreement between clinician observation and parent ratings on frequency scale of 'No occurrence to Always exhibit the play behaviour' were analyzed, however, agreement quotient dropped down to 8.3 % for Exploratory play; 33% for Functional play and 83% for Symbolic play.

Table 3 Percentage of agreement and disagreement between parents and clinician

	Play behaviour	Percent agreement	No of Endorsement (Parents & Clinician)	
			Agreement	Disagreement
Molar level	Exploratory	75%	9	3
	Functional	91.6%	11	1
	Symbolic	83.3%	10	2
Molecular level	Exploratory	8.33%	1	11
	Functional	33.3%	4	8
	Symbolic	83.3%	10	2

Discussion

The present study explored the agreement between parent frequency rating and direct observations of three types of play behaviours in children with ASD during free play session. The results suggested that both parental ratings agreed with play behaviour observations as to the presence/absence of Exploratory play; Functional play and symbolic play in children with ASD approximately 83% of time. In the present study, parental ratings of frequency of play behaviours and behaviour observations tended to agree at the molar level (whether the play behaviour is present or absent), but the degree of agreement was lower at the molecular level (5 point ordinal scale). This could be reasoned out to the fact that parents get alert copiously on the pronounced stereotypic behaviour and marked socio communication deficit of children with ASD (Lemler, 2012) which could directly affect their daily life activities, rather than the play behaviour in itself. The good agreement at the molar level indicated that mothers are aware about the play behaviours of their children further; they were sensitized on the types of play behaviour to some extent too. However, the clinical

experience and professional training of the clinicians gave them an upper hand than the mothers who were untrained and found to be less sensitive to recognise the play behaviour on a frequency rating. This could be the reason for poor agreement on the type of play behaviour at the molecular level. This finding was in support with the study of Schroeder, Richman, Abby, Courtemanche, & Oyama-Ganiko, (2014) who reported a good agreement at molar level between parent and clinician on identifying the behaviour problems of toddlers at risk for developmental delay at the molar level. However, noted a decrease in agreement at the molecular level of ranking. On examining the reliability between parental report on ADI-R and clinician observation on ADOS, Lemler, (2012) reported a difference between parent report and clinician observation on the symptoms of ASD.

It is quite interesting to note in the present study that both the parents and the clinician agreed unanimously for the presence of exploratory play, functional play and deficient symbolic play in children with ASD. This is in agreement to the comparative study by Baron-Cohen (1987) who reported lesser symbolic play in children with ASD on a 5 –minute long toy play session. The author attributed the deficit in symbolic play in children with ASD to their deficits in theory of mind. Libby, Powell, Messer, and Jordan (1998) reported that both the children with ASD and typical developing children engaged in functional play for same duration, in contrary to the findings of reduced functional play in children with ASD compared to typically developing children (Jarrold, Boucher, & Smith, 1996). Moreover, children with ASD exhibited less varied, less elaborated, integrated and other directed functional play compared to mental age matched typically developing peers (Sigman & Ungerer, 1984). This could be one of the reasons for the impaired and less frequent symbolic play in them (Leslie, 1987). The presence of exploratory play observed in the current study is in support with the findings of Williams (2003) who reported an increased frequency of exploratory play in children with ASD.

In conclusion, the finding of good agreement between clinician and the mother on the presence of play behaviour indicated the awareness of mother to different types of play. Extrapolating this finding, parental reporting on behaviour symptoms of their children with ASD can be considered as a valid response. However, the finding of poor agreement between parents and clinician at the molecular level prompted the parents to have a keen observation about their child and also press the need for a parental training program. Considering the lack of trained professionals, an extensive training needed for expensive diagnostic procedure such as ADOS and the lack of early identification and intervention services available, parental reports would be a reliable source for a wide level screening. Further, those children failed at the screening level can be recommended for diagnostic evaluation at an earlier time. Future studies can be carried out on examining the agreement between parental report and clinician observation after giving training to the parents.

References

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders*.
<https://doi.org/10.1176/appi.books.9780890425596>
Baranek T Grace, Barnett R Carolyn, Adams M Erin, Wolcott A Nancy, Watson R Linda, C. R. E.

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- (2006). Object Play in Infants With Autism: Methodological Issues in Retrospective Video Analysis. *American Journal Of Occupational Therapy*, (59), 20–30.
- Baron-Cohen, S. (1987). Autism and symbolic play. *British Journal of Developmental Psychology*, 5(2), 139–148. <https://doi.org/10.1111/j.2044-835X.1987.tb01049.x>
- Beyer, J. & Gammeltoft, L. (2000). *Autism and Play*. London: Kingsley
- Bornstein, M. H., Maurice Haynes, O., Legler, J. M., O'Reilly, A. W., & Painter, K. M. (1997). Symbolic play in childhood: Interpersonal and environmental context and stability. *Infant Behavior and Development*, 20(2), 197–207. [https://doi.org/10.1016/S0163-6383\(97\)90022-9](https://doi.org/10.1016/S0163-6383(97)90022-9)
- Charman, T., & Baron-Cohen, S. (1997). Brief Report: Prompted Pretend Play in Autism 1. In *Journal of Autism and Developmental Disorders* (Vol. 27). Retrieved from <https://pdfs.semanticscholar.org/bb14/d22531e52d59a595c377b8324082ed88bf68.pdf>
- Do Lord, C., Rutter, M., DiLavore, P. C., & Risi, S. (1999). ADOS. Autism diagnostic observation schedule. Manual. Los Angeles: WPS. i:10.1001/archpsyc.63.6.694
- De Myer, M. K., Mann, M. A., Tilton, J. R., & Loew, L. H. (1967). Toy play behavior and use of body by autistic and normal children as reported by mothers. *Psychological Reports*, 21, 973–981.
- Jarrold, C., Boucher, J., & Smith, P. K. (1996). Generativity deficits in pretend play in autism. *British Journal of Developmental Psychology*, 14(3), 275–300. <https://doi.org/10.1111/j.2044-835X.1996.tb00706.x>
- Knox, S. (1997). Development and current use of the Knox Preschool Play Scale. In L.
- Lemler, M. (2012). "Discrepancy Between Parent Report and Clinician Observation of Symptoms in Children With Autism Spectrum Disorders." *Discussions*, 8(2). Retrieved from <http://www.inquiriesjournal.com/a?id=803>
- Leslie, A. M. (1987). Pretense and representation: The origins of "theory of mind." *Psychological Review*, 94(4), 412–426. <https://doi.org/10.1037/0033-295X.94.4.412>
- Lewis, V., & Boucher, J. (1988). Spontaneous, instructed and elicited play in relatively able autistic children. *British Journal of Developmental Psychology*, 6(4), 325–339. <https://doi.org/10.1111/j.2044-835X.1988.tb01105.x>
- Libby, S., Powell, S., Messer, D., & Jordan, R. (1998). Spontaneous play in children with autism: A reappraisal. *Journal of Autism and Developmental Disorders*. <https://doi.org/10.1023/A:1026095910558>
- Lord, C., Risi, S., DiLavore, P. S., Shulman, C., Thurm, A., & Pickles, A. (2006). Autism from 2 to 9 years of age. *Archives of General Psychiatry*, 63(6), 694–701.
- Olof Dahlgren, S., & Gillberg, C. (1989). Symptoms in the first two years of life. *European Archives of Psychiatry and Neurological Sciences*, 238(3), 169–174. <https://doi.org/10.1007/BF00451006>
- Rutter, M., Le Couteur, A., & Lord, C. (2003). ADI-R. Autism diagnostic interview revised. Manual. Los Angeles: Western Psychological Services.
- Schroeder, S. R., Richman, D. M., Abby, L., Courtemanche, A. B., & Oyama-Ganiko, R. (2014). Functional Analysis Outcomes and Comparison of Direct Observations and Informant Rating Scales in the Assessment of Severe Behavior Problems of Infants and Toddlers At-Risk for Developmental Delays. *Journal of Developmental and Physical Disabilities*, 26(3), 325–334. <https://doi.org/10.1007/s10882-014-9368-2>

- Sigman, M., & Ungerer, J. A. (1984). Cognitive and language skills in autistic, mentally retarded, and normal children. *Developmental Psychology*, 20(2), 293–302. <https://doi.org/10.1037/0012-1649.20.2.293>
- Srinivasan, V. (2014). Availability of toys for children with developmental disabilities. *Journal of Disability Management and Special Education*, 4(1), 58–70.
- Stronach, S., & Wetherby, A. M. (2014). Examining restricted and repetitive behaviors in young children with autism spectrum disorder during two observational contexts. *Autism*, 18(2), 127–136
- Tomanik, S. S., Pearson, D. A., Loveland, K. A., Lane, D. M., & Shaw, J. B. (2007). Improving the reliability of autism diagnoses: Examining the utility of adaptive behavior. *Journal of Autism and Developmental Disorders*, 37(5), 921-928. doi:10.1007/s10803-006-0227-6
- Ungerer, J. A., & Sigman, M. (1981). Symbolic Play and Language Comprehension in Autistic Children. *Journal of the American Academy of Child Psychiatry*. [https://doi.org/10.1016/S0002-7138\(09\)60992-4](https://doi.org/10.1016/S0002-7138(09)60992-4)
- Venkatesan. S. (2014). Availability of toys for children with developmental disabilities. *Journal of Disability Management and Special Education*, 4(1), 58–70.
- Whyte, J., & Owens, A. (1989). Language and Symbolic Play: Some Findings from a Study of Autistic Children. *The Irish Journal of Psychology*, 10(2), 317–332. <https://doi.org/10.1080/03033910.1989.10557750>
- Williams, E. (2003). A comparative review of early forms of object-directed play and parent-infant play in typical infants and young children with autism. *Autism : The International Journal of Research and Practice*, 7(4), 361–377. <https://doi.org/10.1177/1362361303007004003>
- Williams, E., Costall, A., & Reddy, V. (1999). Children with autism experience problems with both objects and people. *Journal of Autism and Developmental Disorders*. <https://doi.org/10.1023/A:1023026810619>
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