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Behavioral Measures of Play

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Children with autism frequently display deficits in play skills, such as pretend play and object manipulation. This is described both in the diagnostic criteria for autism (American Psychiatric Association, 1994) and in descriptive studies on children's play (Jarrold, 2003; Williams, 2003). However, the nature of these deficits and the degree to which the play of children with autism differs in complexity and variety from the play of typically developing children is unclear (Vig, 2007).

The purpose of this article is to review the importance of play in a young child's life and to discuss the importance of measuring play when designing interventions for children with autism. Furthermore, this paper will present an example of a consistent and reliable observation system that assesses the complexity and variety of play on children with autism and with typically developing children.

Functional and symbolic play are assigned a pivotal role in a child's development (Vig, 2007; Lifter, Sulzer-Azaroff, Anderson and Cowdery, 1993; Stanley and Konstantareas, 2007). Play also serves as an important diagnostic tool for assessing children at-risk, such as children with autism, and for designing interventions to improve functioning of these children (Glitlin-Weiner, Sandgrund and Schaefer, 2000). Furthermore, several studies in the field of behavior analysis have shown that teaching children with autism appropriate play skills is an effective way to promote language and social interaction (see for example, Goldstein and Cisar, 1992; Jahr, Eldevik and Eikeseth, 2000; Ingersoll and Schreibman, 2006; Zercher, Hunt, Schuler and Webster, 2001). Other studies have also shown that teaching children with autism play can decrease inappropriate behavior (Santarcangelo, Dyer and Luce, 1987; Stahmer and Schreibman, 1992). However, the behavioral research literature is especially limited with regard to studies that aim at increasing play skills per se in children with autism. As a result, few behavioral measures exist on play skills and no comprehensive system exists

within the behavioral field that monitors different types and dimensions of play. It is important to have such a system in place for understanding the complexity of play of children with autism and for gathering important information on their play behavior in a quantitative way. This information is essential for designing effective behavior interventions on play and thus improving the functioning of these children.

When assessing and intervening on play within applied behavioral practice, several aspects need consideration regarding the assessment methods used, the children's play behavior and the context in which the behavior occurs. First, precise measurement of behavior is essential for data-based decision making (Cooper, Heron and Heward, 2007), with direct observation of behavior most often the preferred method of assessment. It is also important to consider the type of materials used and complexity of play, that is different types of play. Also, the variety of play, that is the extent to which the child engages in new or different play actions is an important aspect that needs consideration. Furthermore, it is essential to select a suitable recording system that is sensitive to differences in the play of children at different skill levels as well as to changes in play behavior over time. Finally, it is important to assess behavior in a setting typical for young children and compare the play behavior of children with autism to the play behavior of typically developing children (Guðmundsdóttir, 2001).

A review of the behavioral research literature indicates that most intervention studies on play of children with autism have been conducted in settings typical for and familiar to young children. However, few studies have been conducted in a typical play area for children, with materials that are considered to support different types of play and different levels of complexity. Also, in none of the intervention studies were the materials used during particular play actions recorded. This limits important information on the child's play for assessment and intervention. Very few studies measured complexity and variety of play, that is, the extent to which the child engaged in new or different play actions. This is one difference between the play of children with autism and the play of typically developing children. Also, very few studies used frequency measures in their data collection, which are considered more sensitive to changes in behavior over time than other measures (Poling, Method and LeSage, 1995). Finally, none of the intervention studies compared the play of typically developing children to the play of children with autism (see for example, Jahr and Eldevik, 2007; Guðmundsdóttir, 2001; Ingersoll and Schreibman, 2006; McDonald, Clark,

Garrigan and Vangala, 2005; Stahmer, Ingersoll and Carter, 2003; Zercher et al., 2001).

With these strengths and weaknesses in mind the purpose of this study was to develop a comprehensive frequency measurement system that monitors and differentiates the complexity and variety of play in children with autism and typically developing children in the same setting with a large and varied pool of materials available at any given time.

An Example of an Observation System that Monitors Play

The initial development of an observation system that monitors play in children with autism and typically developing children, is described here. The observation code was adapted and expanded from two existing observation systems on play; The Developmental Play Assessment (DPA) (Lifter, 2000; Lifter et al., 1993) and Wolfberg's model on integrated play groups (Wolfberg and Schuler, 1993; Yang, Wolfberg, Wu and Hwu, 2003). The development of the measurement system described in this article is still a work in progress. Methods during development, examples of data analysis, and results of consistency and interobserver agreement data will be described below.

Method

Participants

Three typically developing children and four children with autism were selected for the initial development of the code. However, for the purposes of this article, data from one typically developing child (Colette) and two children with autism (Jose and Daniel) will be presented. Colette is a typically developing child who was 3 years and 5 months old at the beginning of the study. According to a survey completed by the preschool staff, Colette was considered to display a high level of play and social skills. The children with autism were Jose who was 4 years and 8 months old at the beginning of the study and Daniel who was 5 years and 5 months old. Jose was considered to display a moderate level of play and social skills and Daniel was considered to display a very low level of play and social skills. The teachers that participated in the study were graduate and undergraduate students in behavior analysis, preschool staff and volunteers.

Setting

The study was conducted at a preschool for typically and atypically developing children in northern Texas. The preschool was operated in conjunction with a center-based program for children with autism where behavior analytic methods were being employed. The instructional activities and physical arrangement of the preschool are consistent with the "zone" procedure (LeLaurin and Risley, 1972) as well as methods from Thomson (1972), Wolfberg and Schuler, (1993) and Bronson (1995). The development of the observation code took place in a play and social zone where the children with autism and typically developing children participated in play and social activities for 15 minutes. Inside the zone was a teacher (Zone leader), a therapist that facilitated play and social interaction for the child with autism and two to three typically developing peers.

Materials

At the beginning of the study, play materials that belonged to the preschool were sorted into four categories: Blocks, manipulatives, figurines and dolls, and vehicles. Eight play themes (play theme props) were also created. A set of play materials from each category was located permanently in the zone and other sets of materials were made available in the zone each day according to a predetermined rotation schedule.

Data Collection and Measures

The behavior of the children who participated in the study was recorded by the author with a video camera during zone sessions for a total of six weeks. Tapes from two of those weeks were used for gathering baseline data and the other four for developing the observation code. Data were taken separately on the number of each type of play action, use of play materials during each play action and the number of play roles. A brief description of the response categories and definitions that are described in this article is included here. For the complete observation protocol contact the authors.

Four types of play actions were recorded. Functional Manipulation required the child to make physical contact with play materials according to their conventional function or characteristics. Simple Manipulation play action required the child to physically manipulate play materials but not according to their conventional function, and not within context of play and providing the child did not make a verbal statement attaching an imaginative function to the play material. Symbolic Toy Play required the child to assign a thematic or imaginative function to play materials. Symbolic Role Play

required the child to pretend to be something or someone else or assign a role to someone else.

Examples of Data Analysis

Assessment data for one typically developing child and two children with autism is described below. Examples will be shown for the range of play skills and material use for all children.

Play actions

Figure 1 displays a profile of all types of play actions for Colette (typically developing child), Daniel and Jose (children with autism). Complexity of play, that is different types of play, was observed with all of the children throughout the observation period. Daniel however, the low functioning child with autism, was engaged mostly in one or two types of play, with Simple Manipulation and Functional Manipulation accounting for most of his play actions. The play of Colette and Jose was more varied both in types of play across sessions and the number of play actions per type. Similar rates of play actions of all types were observed with these two children while Daniel showed much higher rates of Simple Manipulation and no Symbolic Toy Play and role play actions.

Material use

Figure 2 displays the total rate of play actions across all sessions observed with Colette, Daniel and Jose manipulating the different categories of materials. Also displayed is the number of Simple Manipulation, Functional Manipulation, and Symbolic Toy Play observed with each child manipulating each different category of play materials.

Variety in material use can be determined by looking at the number of different categories of materials the child manipulates during the observation period. All of the children showed some degree of variety in material use as they manipulated materials from a majority of the categories. However, the distribution of the number of play actions across categories differed among the children. Daniel mostly manipulated materials from one category with most of his play consisting of Simple Manipulation. The play of Jose and Colette was more equally distributed across categories, with most of their play actions consisting of Functional Manipulation.

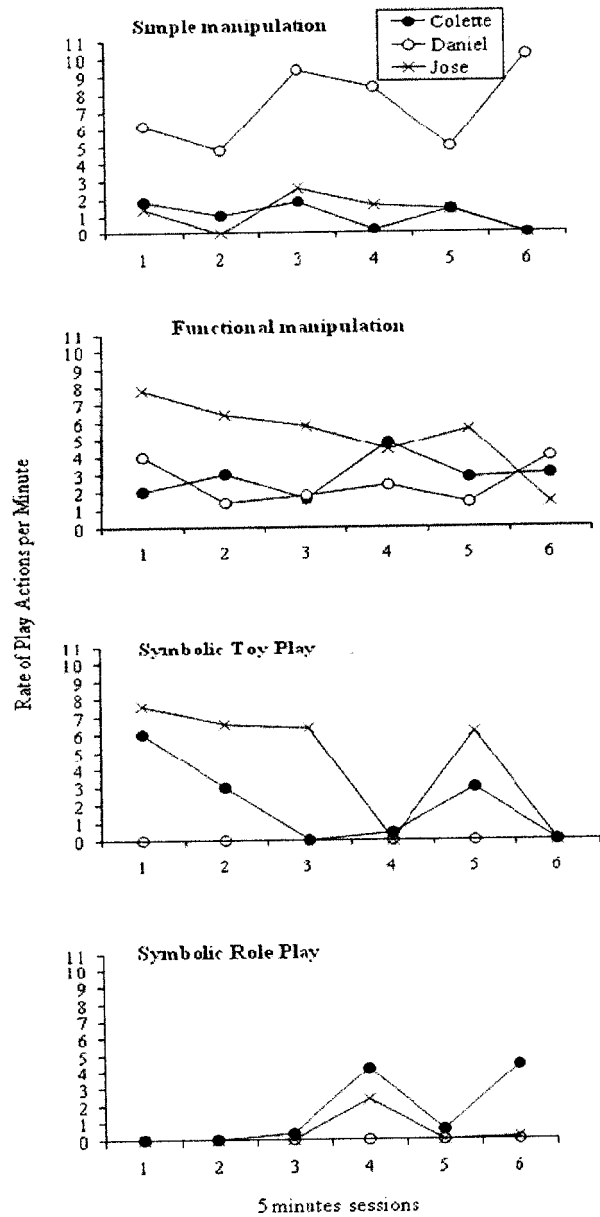


Figure 1. Play profile of all types of play actions for Colette (typically developing child), Daniel and Jose (children with autism)

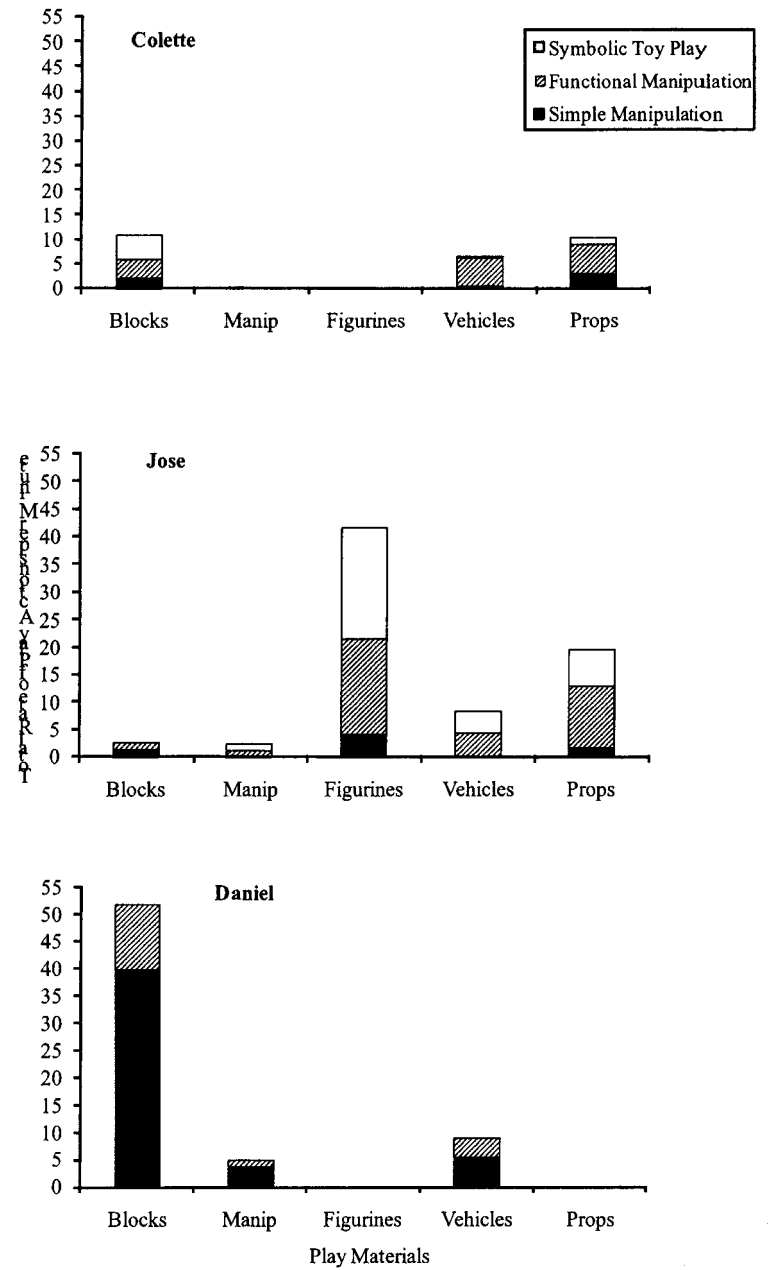


Figure 2. Play profile of material use for Colette (typically developing child), Daniel and Jose (children with autism)

Consistency of Data Collection and Interobserver Agreement

Reliability of data collection on the number of different types of play actions was assessed with consistency checks by the same observer in the study where the initial development of the observation code took place (Guðmundsdóttir, 2001). In addition, interobserver agreement was assessed in two different studies conducted on Icelandic preschool children (Heiðarsdóttir and Tómasson, 2007; Magnúsdóttir and Beekman, 2008). No consistency calculations were done for materials.

Consistency and interobserver agreement was generally high in all studies. In the initial study with children with autism and typically developing children as participants, consistency was highest for Symbolic Toy Play with a mean of 96,3% agreement (Range, 69,2-100) and lowest for Simple Manipulation with mean of 86,3% agreement (Range, 33-100) (Guðmundsdóttir, 2001). In a study on the effects of different types of play materials (conventional and ambiguous), on the number of play actions of typically developing children, interobserver agreement was assessed for all play types except Simple Manipulation. Agreement was highest for Symbolic Role Play with a mean of 97% (Range, 80-100) and lowest for Functional Manipulation (mean 89,9%, Range ,50-100) (Heiðarsdóttir and Tómasson, 2007). In another study on the effects of video modeling on the number of Symbolic Toy Play actions of a child with autism and a bilingual child, interobserver agreement was also generally high, both during baseline with mean agreement of 96,7% and intervention with mean agreement of 89,1% (Magnúsdóttir and Beekman, 2008).

Discussion

The goal of this study was to design a frequency measurement system that monitors and differentiates the complexity and variety of play in children with autism and typically developing peers. Initial results indicate that this was accomplished. Further assessment of interobserver agreement of all play types with typically developing children and children with autism at different skill levels is needed though.

A measurement system that involves the aspects included in this observation system, is likely to provide sensitive measures of a child's play. For example, by assessing play in a setting typical of young children with a

wide range of materials available, it is more likely that the investigator will obtain information about more complex play behavior with different types of materials, thereby obtaining a broader and more complete picture of the child's play.

By recording the materials for a particular play action, the investigator obtains information on several aspects of play. First, general information on what toys the child is manipulating and the variety of material use is obtained. Furthermore, information on how different materials are affecting different types of play becomes available. And finally, in intervention studies, information on generalization is more readily achieved.

By measuring complexity of play, the investigator obtains information on how specifically the child is manipulating play materials and how play is reflected in the child's verbalizations, vocalizations and nonverbal behavior. Frequency measures may suit the recording of play behavior better than interval recording. Play behaviors can vary in duration and therefore an interval system can either inflate or deflate the occurrence of the behaviors. Thus, frequency measures are a more accurate method of assessment.

Finally, information is obtained about the play behaviors of different skill levels of players, among the typical children. For example, observing exemplar players can aid in establishing intervention aims for the complexity and frequency of the various types of play with particular materials (Haughton, 1972; Gilbert, 1978). Also, observation of a wide variety of players allows further development of sensitive measurement systems across all play types. Finally, observing and then targeting responses that are common to the typical peer group enhances the likelihood that favorable intervention outcomes will allow children entrance into the natural community of reinforcement (Baer and Wolf, 1970; McConnell, 1987).

With this measurement system, consistent information is obtained about play of children with autism and typically developing exemplars, assessed in a specific play setting familiar to young children. This information is valuable for assessment and research on young children's play and should contribute to the design of effective interventions for children with autism.

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Nýjustu tilraunir á stolti

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Hræra geðshræringar (*emotions*) hugann, geðið, gerðir okkar? Örvast fólk af stolti (*pride*)? Getur verið að fólk sækist eftir stolti (og forðist niðurlægingu, sektarkennd, smán, hneisu)? Já, já, auðvitað. Ef geðshræringar væru bara aukageta (*epiphenomenon*) sálarlífsins eða kannski líffærananna væri lítil ástæða til að fást við þær frekar (sjá til dæmis de Sousa, 1987; Goldie, 2000; Harré, 1997; Kristján Kristjánsson, 2002; Taylor, 1980). Geðshræringar vekja aðrar geðshræringar og þær hafa líka sitt að segja um athafnir okkar. Ákvarðanir byggjast á þeim — þrátt fyrir alkunna fordóma um að geðshræringar stjórni helst röngum ákvörðunum¹.

Samt eru ekki allir vissir. Til dæmis Williams og DeSteno (2008). Þau vita raunar að stolt í venjulegri merkingu (*simple pride*) (sjá Kristján Kristjánsson, 2002) er geðshræring og geðshræringar hræra. Þau eru þó ekki viss um að stolt hræri fólk til verka. Þess vegna hafa þau prófað svokallaða „hvatningartilgátu“ sína um stolt. Hún er í meginmáli svona: „[S]á sem er stoltur af verki sínu vill standa sig vel á því sviði“ (*Put simply, when feeling proud about a recognized accomplishment, an individual might feel an incentive to pursue further action in that valued domain*), Williams & DeSteno, 2008, bls. 1008; hikorði sleppt í þýðingu). Þótt Williams og DeSteno takmarki tilgátu sína hér við verk hins stolta, er ljóst að þau gera líka ráð fyrir að fólk geti verið stolt af verkum þeirra sem það telur sig tengjast eða vera hluta af. Jón getur verið stoltur af afrekum barna sinna og árangri landsliðsins í skák.

Til að prófa tilgátu sína gerðu Williams og DeSteno tvær tilraunir. Sú fyrri var í grófum dráttum svona: Hópi stúdenta var skipt í þrennt. Allir fengu sömu verkefni sem voru lögð fyrir hvern og einn í einrúmi. Fyrst áttu þátttakendur að kasta tíu sinnum tölu á fjölda rauðra punkta innan um aðra litada punkta á skjá á tveimur sekúndum — en það er alltof stuttur tími til að ná fjölda þeirra. Síðan áttu þeir að leysa eins margar af hinum kunnunúningsþrautum Shepards og Metzlers (1971) og þeim sýndist og vera að eins lengi og þeir vildu. Þátttakendum var skipt í þrjá hópa: Í Stolt-hópnum

1 Ég þakka Pétri Tyrfinngssyni fyrir að leiðrétta þennan stíl.