5-1-2003

Assessing language using play-based assessment in a familiar versus an unfamiliar context.

Colleen Ryan Dupuis

ASSESSING LANGUAGE USING PLAY-BASED ASSESSMENT IN A FAMILIAR VERSUS AN UNFAMILIAR CONTEXT

An Ed. S. Field Project

Presented to the

Department of Psychology

and the

Faculty of the Graduate College

University of Nebraska

In Partial Fulfillment

of the Requirements for the Degree

Education Specialist

University of Nebraska at Omaha

by

Colleen Ryan Dupuis

May 2003

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

ED.S. FIELD PROJECT ACCEPTANCE

Acceptance for the faculty of the graduate College,
University of Nebraska, in partial fulfillment of the
requirements for the degree Educational Specialist,
University of Nebraska at Omaha.

Committee

Kathy L Cowell

Brigitte D Ryan

Chairperson Lisa Kelly-Vance

Date 4/23/03

Acknowledgments

I would like to thank Dr. Lisa Kelly-Vance for her support and guidance throughout this project. Thank you also to Dr. Bridgette Ryalls and Dr. Kathy Coufal for their time and assistance in serving as committee members on my field project.

Special thanks to Jennifer Drobny for collecting data with me, and Jennifer Graf and Missy Bruck for their role as speech-language pathologists.

I am very grateful to the parents and their children that participated in the project. I appreciate their willingness to take time out of their busy day to allow us into their home and come down to the university to participate in the play sessions on campus.

Above all, thank you to my husband, Shane for his love and support. Also, much love and gratitude to my parents for instilling in me a desire to learn.

TABLE OF CONTENTS

ASSESSING LANGUAGE USING PLAY-BASED ASSESSMENT IN A FAMILIAR VERSUS AN UNFAMILIAR CONTEXT

Colleen Ryan Dupuis, Ed. S.

University of Nebraska, 2003

Advisor: Dr. Lisa Kelly-Vance

In the last 30 years early childhood assessment has changed because of educational laws. Today, tests must do more than find children with delays; these tools must provide information about problems and lead to interventions. Because of public law younger children are being tested and assessing young children requires that new ways of measuring development be created. Developmental theory suggests that children can be assessed through play. Presently, the ability to assess language skills using play assessment was investigated. Both play in the home setting and play in an unfamiliar playroom was compared to a standardized test (MacArthur Communicative Development Inventory-CDI). The results suggest that there is a moderate correlation between the CDI and play in both the home setting and the unfamiliar playroom. Both types of assessment had benefits because they provided qualitatively different information. The play assessment elicited information that was more descriptive and conducive to intervention planning and the CDI provided quantitative information useful in screening.

Assessing Language Using Play Assessment in a Familiar versus an Unfamiliar Context

All children develop at varying rates, but there is a typical time frame that specific skills are expected to be attained. If a child is not progressing within the typical range, early intervention provides children with the best chance for future success in both education and life. Consequently, assessment tools are important to the process of identifying children that require early intervention to prevent future failure. The role of assessment, however, is changing to be more than just a tool for identification purposes. Changes in educational law have increased the expectations for assessment. Now it is expected that an assessment tool will identify children with special needs, qualify them for special education, determine the specific problem, plan for interventions, progress monitor, and finally, ascertain when the goal is achieved (Hardman, Drew, & Egan, 1999; Kelly-Vance, Needelman, Troia, & Ryalls, 1999). Traditional assessment tools that are used for preschool children have been primarily used for screening and classification purposes. These tests do not provide information about how to intervene when developmental delays are identified, nor can they monitor a child's progress once they are receiving intervention services (Neisworth & Bagnato, 1992). This is especially true in the area of language acquisition and communication skills. Traditional tools are inadequate and additional measures need to be developed that will not only identify children with language delays, but help to explicate ways to mediate the delays. With the development of new instruments that provide more qualitative information about children's skills, not only can children with language delays be identified early,

additionally, educators and parents can intervene in an expedient manner to minimize or eliminate long term problems.

Traditional tests are described as invalid, inadequate, and illegal as the sole means of assessment for preschool children (Lidz, 1986; Neisworth & Bagnato, 1992; IDEA 97). One new assessment technique that has been proposed is play assessment. Play is an alternate method of gathering information to determine if a child is developing normally or if there is concern about a developmental delay. Research supports the parallel development of language and symbolic play (Eisert & Lamorey, 1996; McCune, 1985, 1995; Westby, 1980). Ultimately, this correspondence between language and play lends support to the practice of evaluating language development in the context of play. Therefore, this paper will address concerns about traditional assessment tools, support for play assessment, and how language can be assessed through play. Practitioners will be able to use the present study to support their use of a play assessment to evaluate language skills.

Traditional Assessment Tools

There is growing evidence that challenges the use of traditional measures to evaluate young children's developmental progress. Bagnato and Neisworth (1994) surveyed consumers about the social and treatment validity of the early use of intelligence tests. One of the highlighted limitations of traditional tests is that frequently children are identified as "untestable" because of language deficits. Their results provide confirmation that there are problems with these measures because they are not useful for the very individuals they were intended to assess. Using formal intelligence measures,

children with language deficits are identified, but the traditional measures provide little information that will lead to appropriate interventions. Alternatively, for children that do not have significant language deficits, this research showed that many young children were identified as ineligible for early intervention services when in actuality they should have been found eligible. This means that, using traditional measures, many children needing services are falling through the cracks and are not getting the help that they are entitled to receive.

Bracken (1994), in response to Bagnato and Neisworth, adds that tests used for children not yet in school are lacking in an ability to provide valid and useful information and consequently a number of assessments are necessary to obtain the needed data. Using traditional tests, eligibility can often be determined, but limited intervention suggestions are ascertained through these methods. In the area of communication skills, problems arise because of the complexity of language. Specific areas of deficit must be assessed to determine what aspect of language is impaired and to develop appropriate interventions (Cirrin & Rowland, 1985; Salisbury, Britzman & Kang, 1989).

As identified above, problems exist with using traditional measures, however Siegel (1981) provides evidence that early assessments like the Bayley Scales of Infant Development (BSID) and the Caldwell Inventory of Home Stimulation (HOME) are predictive of future development. The predictive validity of traditional tools supports the use of assessment tools to identify children at risk for developmental problems. Although diagnostic measures are critical, work needs to continue to develop tools that are predictive, but also lead to remediation. Siegel proceeds by highlighting the influence of

the environment and how it can have a positive or negative effect on developmental progress. Knowing that the environment influences development supports the need for identifying children early so that if they are at risk for problems, environmental factors can be enriched to attempt to compensate for the delays. In language acquisition, early intervention is imperative because there is a critical period in learning language (Hetherington & Parke,1999), that once passed, it is unlikely that a child will be able to achieve fluency. These concerns about (a) the need for early intervention and (b) tests that produce information about intervention planning demand that alternatives be developed. One such alternative is a play assessment procedure that provides a naturalistic approach and a more functional means of accessing information about development and language specifically (Barnett, Macmann, & Carey, 1992; Fewell & Kaminski, 1988; Linder, 1993; Lowenthal, 1997; and Wolery & Dyk, 1984.)

Support for Play-based Assessment

A goal of play assessment is to gain information about a child's skills without imposing structured cognitive tasks on children. A formal assessment is awkward and unnatural to young children and may create anxiety that would negatively influence their performance. Conducting assessments using play in a familiar setting alleviates such problems and allows for a potentially more accurate evaluation of children's skills in a natural and comfortable environment.

One of the main advantages of using play assessments is the link between assessment and intervention planning. Additional support for assessing children in a natural setting that also addresses the issue of intervention designing is a review on the

future of assessment practices by Barnett, Macmann, and Carey (1992). Their commentary emphasized the need for using natural environments when trying to effect change in young children. This viewpoint is outlined in their discussion about early intervention and assessment. Completing assessments in a natural setting allows the child to be comfortable and give a more realistic representation of the child's own behavior and knowledge. Having an accurate picture of the child's ability is important when developing interventions because this ensures that the specific deficit of concern is being remedied. If the assessment is done under different conditions than the intervention takes place in then the behavior could be altered solely because of the environmental change and not due to the intervention procedures. An assessment of development as well as an inference about the contributing factors can be ascertained through play assessment and the qualitative data it provides. The contributing factors can then be used to develop relevant and effective interventions.

Support for the evaluation of children's development through a naturalistic approach is expanding. As Siegel (1981) pointed out, the environment is a large factor that needs to be evaluated when assessing children developmentally. Therefore, assessing play is one way to evaluate children in their natural environment. Play provides a situation where functional, everyday skills can be assessed, including communication skills. Linder (1993) advocated for the use of play as an assessment tool for various reasons including that play occurs naturally and play provides qualitative information that can be helpful when developing interventions.

Beyond the benefits of a naturalistic approach, studies of the validity of play

assessment have shown how play behaviors are related to developmental domains such as language and social skills. Farmer-Dougan and Kaszuba (1999) found using two different types of measures (play-based and standardized instruments) that children who have more complex play behaviors also are more intellectually and socially proficient. In order to ascertain reliability and validity, a play-based measure was matched with standardized measures-the Battelle Developmental Inventory (BDI) and the Social Skills Rating Scale (SSRS-T). Positive correlations among the identified measures suggested that play assessment measures could present information that is valid and reliable.

Further evidence of validity and reliability is shown through the work of Myers, McBride and Peterson (1996). They evaluated the social validity of play assessment compared to standardized measures. The researchers divided forty children into two groups and assigned them to either the standardized measure or the play assessment measure. They found that play assessment required less time to administer, parents and teachers viewed it positively and it elicited helpful knowledge to develop appropriate interventions. All of these characteristics are beneficial to the assessment process as a whole. Formal intellectual assessments are time consuming and therefore, require a child to attend to a task for an extended period of time. It is challenging to get preschool children to participate in formal assessment tasks for the duration of the assessment. The play assessment takes less time and is less structured; therefore, a child is more likely to be cooperative under the play assessment condition than the formal cognitive assessment condition. The second finding that parents and teachers view the play assessment more positively is also advantageous to the assessment process. Information gained from an

assessment tool that is viewed positively will likely be perceived as credible and thus used more frequently than information obtained from a tool that is viewed negatively. A third result from Myers, McBride and Peterson was that play assessment provides more detailed information than formal assessments— play assessment provides more than just a score. Play assessment reveals specific information about a child's skills that can lead directly to effective interventions.

Kelly-Vance et al., (1999) compared play assessment to a standardized measure and found that play assessments were highly correlated with the Bayley Scales of Infant Development-II (BSID-II). Thirty-eight two-year olds, considered at-risk due to premature birth, participated in the study. The play assessment resulted in higher scores than the standardized measure, possibly because play assessment is child-directed and allows children to perform at their highest skill level. BSID-II is adult-directed, thus limiting children to certain structured activities. The correlation between the findings suggest that children's play assessment scores are related to formal cognitive measures and that information learned through the play assessment format can be used reliably. However, three of the children assessed were not identified as eligible for early intervention services using the play assessment that were found eligible with the BSID-II. The study suggests that play assessment may not identify some children that are eligible for early intervention services. The study supports the validity of play assessment measures, but also implied that it should be used for intervention planning and not for eligibility purposes.

Salsbury et al., (1989) found evidence supporting the use of qualitative measures

in the assessment process. Their research evaluated the communication skills of six preschool-aged students that were developmentally disabled (ranging from mild to severe). The investigators focused on specific activities (i.e., lunchtime, naptime, free play, etc.) during observation periods. Initiations, interactions, and consequences were analyzed. From the observations, they were able to determine if the individual initiated an interaction, if there was a purpose to the interaction, and if the goal of the interaction was met. Salisbury suggested that whether an interaction occurs through verbal means or nonverbal means, communication could effectively occur. Because communication, whether through vocalizations or other forms of expression, is a natural human interaction, it makes sense that language assessments should be conducted using a procedure that allows children to express themselves without restriction and free play permits such interactions. Salisbury indicated that all of the children in the study initiated some form of communication approach that would not have been identified through traditional measures. This provides evidence of the need for different assessment types for achieving various goals.

As has been repeatedly found, traditional measures are useful for gaining part of the information about children's skills, but they also miss valuable data. Descriptive information can be ascertained from play behaviors and this data can directly influence intervention plans and encourage individualized treatment approaches. Additionally, the play behaviors can be monitored periodically to assess progress in language skills.

The Connection between Play and Language

Observing children's language during play provides a picture of how they

communicate functionally. A less formal language assessment such as play assessment allows children to interact with their environment and display their ability without the stress or awkwardness of a formal language evaluation. Considerable research supports a strong relationship between play and language. According to McCune (1995), mental representation is the necessary element that must be present in order to acquire both language and symbolic play. McCune conducted both longitudinal and cross-sectional studies with 102 participants and ten participants, respectively, evaluating the connection between language and play in children in the process of acquiring language. Timing and formational ties between language and play were found in both. First, language and symbolic play begin to appear at the same time developmentally. The reason for a temporal relationship between language and play is that they both rely on the acquisition and use of mental representations. In symbolic play, children pretend, and in language, words represent tangibles and intangibles in the world. Second, formationally, play and language skills relate to each other in their ability to convey meaning. Therefore, the conceptual basis for the relationship between language and symbolic play is that play is representative of the real world in a way that is parallel to language as a symbolic system that depicts the world verbally.

Fenson (1984) evaluated language skills, both gestures and speech, using a combination of free play and modeling of pretend play. Seventy-two children at three different age ranges: 20 months, 26 months, and 31 months, participated in the study in which various pretend activities were modeled for the children and then a period of free-play time was allowed. Results showed that the older children (26 and 31month olds)

combined significantly more speech with the play actions than the youngest children did. At 20 months, the language exhibited was minimal before and after the modeling phase, however, at 26 months language expression increased after the modeling phase. Children at 31 months declined a little in the amount of language they used after the modeling phase, however their expression prior to and after modeling was still greater than that of the 26-month-olds. Overall, the presence of language during the play activities increased based on the developmental level of the child.

Theoretical support that play and language develop at the same time is presented by Westby (1980). She outlined 10 stages of symbolic play and corresponding aspects of language for each play stage. The varying stages of play parallel with language acquisition. It is suggested that if certain aspects of language do not coincide with particular levels of play there may be reason to consider a language delay. Specifically, representational abilities (i.e., pretend play) begin between 17-19 months and this is when language use significantly increases. Westby states that the reason for this parallel between language and play occurs because language is made up of symbols and when a child starts exhibiting pretend play they show an understanding of symbols. Furthermore, this understanding of objects as symbols can then be transferred to using words as symbols.

Research also has indicated that play assessment and standardized measures are correlated. Eisert and Lamorey (1996) compared play assessment with two separate standardized measures. In the first study, they assessed the play of 20 children at 12 months and then again at 20 months of age while they were involved in play activities.

The caregiver was present, but was not allowed to direct the play in any way; the play was totally child directed. Then they used the Gessel Developmental Schedules (Knobloch, Stevens, & Malone, 1987) to compare play findings with the assessment of general development, adaptive behavior, language, personal-social, and motor skills. The results Eisert and Lamorey found with the Play Assessment Scale (Fewell, 1986) and the Gesell Developmental Schedules provided support for an association between language and play. At 12 months of age the play assessment was correlated with the motor skills composite ($r = .449$, $p = .05$) on the Gesell and at 20 months of age the language results correlated with the play assessment ($r = .557$, $p = .05$). In a second study of 44 children between the ages of 14 and 36 months, Eisert and Lamorey found another correlation between play and language when they compared the Play Assessment Scale to the Mullen Scale of Early Learning. The Mullen Scale of Early Learning measures visual perception and language development. The play assessment scores were correlated with all of the Mullen subtests (subtests ranged from $r = .822$ to $.905$; $p < .01$) and it was concluded that a child's language skills on the Mullen Scale were more predictive of the child's play skills than was their age. These findings suggest that there is a significant relationship between both of these developmental skills. The results also provide further evidence that assessing play skills will elicit information about communication skills.

The connection between play and language is supported by Spencer (1996) who considered the impact of hearing ability on play behaviors. She found that young children who are deaf need more time to engage in the same play behaviors as hearing children. These results indicate that language delays related to the hearing impairment

may have had an influence on the children's play development. Again, a connection between play behaviors and language skills is suggested because these children with language delays associated with hearing impairments also were delayed in exhibiting certain play behaviors.

Further evidence of the parallel development of language and play was ascertained by Ogura's (1991) longitudinal study. Ogura analyzed the early language of four Japanese children and found that there was a relationship between specific components of language acquisition and varying play elements. These findings provide support that the connection between play and language is cross-cultural. Learning that the connection crosses the bounds of culture provides further evidence that the parallel relationship between play and language is true for all children and is a part of normal human development. The parallel development does not just apply to one country or ethnic group.

Various factors connect language and play in normal development. Cunningham, Reuler, Blackwell and Deck (1981) compared the verbal and social interactions of 18 normally developing preschoolers with the verbal and social interactions of 18 developmentally disabled children. Their results suggested that the children that were developing within normal expectations had more verbal and social interaction with their mothers and were involved in less solitary play than the developmentally delayed children. Their finding provides evidence that if a child is delayed in language the child's play will look different than the normally developing child. The results suggest that play, social interaction, and language all are interrelated and when there is a delay in one area

there is likely to be delays in other related domains. Such evidence that the play is different based on the presence or absence of delays, provides support that play assessment is able to discriminate between children exhibiting normal development and children manifesting a developmental delay.

Another study that used a play assessment format to evaluate language was reported by Dickson, Linder, and Hudson (1993) who described play assessment of language as involving various levels. They state that language is not uni-dimensional; verbal communication involves numerous skills from oral motor skills that allow a person to articulate language to syntax and semantics that show knowledge of the rules in language and an understanding of the meaning of words. Using Linder's Transdisciplinary Play-Based Assessment to assess communication provides descriptive results that elicit this level of data about language skills, including information about (a) methods of communicating, (b) components of language, (c) receptive language skills, and (d) oral motor skills. Traditional assessment tools do not provide the broad information that play assessment is able to provide. Linder's assessment approach provides practical support for play assessment because such natural assessments lead to developing an appropriate intervention that is sensitive to the various levels of language.

Context and Play-based Assessment

Play assessment provides a way to assess language skills and develop interventions, but context may impact assessment findings. The familiarity level of the context is an ecological factor that needs to be considered because it could negatively influence the results of a play assessment. When considering familiarity it is necessary to

determine what constitutes a familiar environment. For the purpose of the present research a familiar context is defined as a setting that a child plays in one or more times a week for at least an hour. An unfamiliar context is a setting that the child plays in less than one time a week or regularly, but for less than one hour per play session. It is hypothesized that children will exhibit skills that represent their true ability in a familiar setting like their own home than in an unfamiliar setting like a clinic play room.

Tobias (1994) found that children with developmental delays exhibited different levels of play skills in various settings. Tobias evaluated 20 different early childhood settings by assessing the play of 40 developmentally delayed children (two children per classroom). The Free Play Classification Scale and the Early Childhood Environment Rating Scale (ECERS) were used to assess the type of play the children produced and the quality of care provided in the various settings. The Free Play Classification Scale evaluates the sequence of social play and the developmental sequence of cognitive development of play behaviors. The ECERS rates the quality of the play environment. Results indicated that the type of play that the children engaged in varied by the type of setting. For example, scores on language reasoning experiences were significantly lower in the day care setting than the segregated center, reversed mainstream center, and the nursery school center. Also, there was more solitary play exhibited by children in the segregated setting and more parallel play exhibited by children in the nursery school setting. Such findings provide evidence that environment does influence the kinds of play (including language skills) children display.

Isbell and Raines (1991) found additional environmental factors that influence

language and play behavior. Various play materials were evaluated and they discovered that different toys affected language both qualitatively and quantitatively. In their study of 21 children, they indicated that the type of play materials influenced the amount of language produced as well as the nature of the vocalizations. For example, the block center elicited more complex language skills than the housekeeping center. These findings strongly support that several environmental factors influence play and language and that each factor needs to be considered when implementing assessment procedures and when evaluating assessment results. Isbell and Raines have shown that altering the assessment approach and environment can substantially change the outcome. Other contextual factors like the use of a home or clinic setting or a familiar versus an unfamiliar setting may be variables that affect the final results of a language assessment.

Lund and Duchan (1993) recommend assessing children using structural analysis which involves observing a child's language in an environment that is familiar to them. The analysis occurs in everyday environments, for example their home, school or a variety of other familiar contexts that are outside of the clinic setting. The process is described as a method of viewing the world from the child's perspective in order to evaluate the function of the child's language behavior. Fenson et al. (1984) note that a naturalistic assessment is the preferred method by language pathologists and researchers, alike, to obtain the most valid language sample. Using a naturalistic approach is also supported in Rogers' (1998) remarks encouraging the use of functional assessment in the home. She comments from an applied perspective that functional assessment is used to find out the interaction between a child's environment and their behavior and the home is

one of the primary environments in which a child behaves. This is not true of the clinic setting—a child does not regularly spend time in a clinic setting, therefore, it is difficult if not impossible to observe a realistic function of the child's behavior in this setting. Language is behavior and it is relevant, as Lund and Duchan have suggested, to gaining information about the function of the language behaviors when assessing language skills. The findings presented show that the context in which a play assessment occurs will have an influence on the assessment data. Context needs to be evaluated to ascertain the impact various settings have on play assessment results.

Summary

Research supports that language and symbolic play are developmentally related. This connection has created a valuable medium in which to employ assessment techniques that are technically adequate and lead directly to interventions. One final component that needs to be considered is how best to elicit authentic language skills. Rogers (1998) supports the need for functional assessment in the home to acquire a true picture of a child's cognitive skills (including language). In further support of how to capture a valid representation of communication ability, Isbell and Raines (1991) found that different types of toys (i.e., blocks, play house) elicited varying rates of speech and that different toys create a different environment. Therefore, Isbell and Raines' finding that different play materials elicit varying rates of speech provides support that, perhaps, different settings also elicit varying rates of speech. Tobias (1994) found that different settings elicited different play skills. This finding is relevant because of the connection between play and language development. Perhaps different settings not only elicit

varying play skills but also varying language skills. Ultimately, the reason for using play to assess children's skills is because play behavior is believed to be more natural and reflective of children's true ability (Athanasiou, 2000). A familiar setting is more ecologically sound than an unfamiliar setting and consequently, the familiar environment may reflect more representative language abilities.

Current Study

Play-based language assessment using the Assigning Structural Stages (Miller, 1983) occurred within two contexts, a familiar and an unfamiliar setting. The purpose of the present study was to analyze language skills under two different play conditions: a familiar and an unfamiliar environment. The results obtained in the two contexts could then be compared to the findings derived from the parent report using the CDI. Lastly, descriptive differences of the communication information gained through the play-based assessments and the parent report were then analyzed. The unique contribution of this study is intended to provide an analysis of the language performance in two different contexts (familiar versus unfamiliar context) and to compare performance to a parent report measure. The intent is to determine whether context influences language performance when a play-based assessment procedure is employed.

Method

Participants

Twelve, typically developing children (6 males and 6 females) between 18 and 30 months participated in the present study. The children were accepted into the study and assumed to be developing normally if they were between the ages 18 months and 30

months and did not have an existing diagnosis of a developmental or physical disability. The age range was chosen because it is a time when many language skills emerge. The participants were recruited by fliers on a Midwestern university campus, announcements made in psychology classes offered at a university campus, and by word of mouth. There were 2 males and 2 females in each of the following age ranges: 18-22 months, 23-26 months, and 27-30 months. All of the children were Caucasian and their parents were educated beyond the 12th grade, and in a middle to upper class socioeconomic status.

Setting

The assessment occurred in two different settings (familiar and unfamiliar) on two separate dates. The part of the assessment that took place in an unfamiliar setting occurred in speech clinic room on a Midwestern university campus. The clinic setting had a wide variety of toys that were chosen specifically for this study that were placed around the room (see materials). There was a standard arrangement of the toys that did not appear tidy (puzzles have pieces out of place, blocks laying on the floor, crayons out on the table, etc.). The toys were arranged this way help motivate play and to create an environment that was inviting to the children. The part of the assessment that took place in a familiar context occurred in the child's home in a room that was cleared of other toys and had minimal disturbances. The same set of toys was used in the familiar and unfamiliar settings (see Appendix A). Both the play session in a familiar setting and an unfamiliar setting involved a caregiver, a session facilitator, and a speech-language pathologist. The session facilitator ran the camera in the home and in the clinic setting a camera was mounted on the wall to record the session.

Materials

The toys included in the study were determined based on three separate criteria. First, toys were chosen by past child interest in the toy. Child interest was determined by the frequency the toys were played with by children from a larger play study at the University of Nebraska-Omaha. Transcripts were reviewed to ascertain which toys were played with most frequently. If a toy was played with during the session one or more times it was recorded as a toy played with by the child. Each transcript elicited a group of toys the child played with during the session. Twenty-two of the toys were included in the study because 10 or more children played with them. The second criterion that was employed for toy selection was to evaluate the toy's ability to elicit language production. Westby's Stages of Symbolic Play and empirical evidence (Mcune, 1995; Isbell & Raines, 1991), suggest that toys that encourage symbolic play (i.e., a doll, pots and pans, cash register, and a car) are more likely to elicit language. The final criterion for toy selection was to ensure that there were a balanced number of toys that were stereotyped as either male or female toys. All of the toys were selected in criterion one and then they were reevaluated using the second and third criteria to determine if any of the toys should be removed. Seven of the toys were gender neutral. Of the other fifteen toys, they were split almost evenly with seven being male oriented and eight were female oriented (Cherney, Kelly-Vance, Glover, Ruane, & Ryalls, 2003). Sixteen of 22 toys were conducive to symbolic play. Two-thirds of the toys were determined to be likely to encourage language.

Measures

MacArthur Communicative Development Inventory: Words and Sentences (CDI).

The CDI (Fenson et al., 1993; 1994) is a standardized questionnaire that is completed by parents. CDI results are represented by three percentile scores (a) vocabulary production, (b) irregular nouns and verbs and (c) sentence complexity. Each of these scores may be compared with other assessments. The format of the vocabulary section of the CDI is a checklist that parents mark to indicate words that their child spontaneously utters. This assessment tool is intended to be used for children between 16 and 30 months of age to investigate children's attainment of expressive language and early sentence development. The MacArthur CDI is made up of two different sections. The first section, "Words Children Use," is a list of words that parents are asked to review and mark words they have heard their child say. Parents are instructed to add words that were not on the list that they know their child has learned. The second part of the assessment, "Sentences and Grammar" provides information about the complexity of sentences and grammar that the child has uttered. This section evaluates the child's morphological and syntactic development through word endings, word forms, and multiple word complexity. The CDI has been used to acquire a large, normative sample of words that children know at various age ranges (Thal, O'Hanlon, Clemmons, & Fralin, 1999). This parent report was normed by age and gender on normally developing children (Fenson et al., 1993). The sample was not a representative sample of the U.S. population because an age range of 18 to 34 years was used to reach parents of young children. The sample was a diverse sample, but the number of African Americans in the sample was low compared to the

1990 Census. The parent's education was high compared to the 1990 U. S. Census. More than 50% of the parent's in the CDI sample had a college degree; the census reflected a national average of 18% of people between 18 and 34 years have a college diploma. A large number of children were used in the sample however, 60 to 100 children for each month from 16 months to 30 months of age. Also, there was an attempt to balance the number of males and females within each month range. The test-retest (1.35 month between tests) showed strong stability with a reliability of .87, .95. and .86 ($p < .01$) for comprehension, production, and gesture, respectively. Additionally, the CDI has been shown to be valid and reliable because of high correlations with other measures of language. For example, a correlation of .72 was reported between the CDI and the Expressive One Word Picture Vocabulary Test. Also, within the same study children were re-tested six months later and there was a correlation of .71 between the first and second CDI score (Fenson et al., 1993). This measure has been found to be both cost effective and to include a broad sample of the context in which child language occurs.

Assigning Structural Stage. The Assigning Structural Stage (Miller, 1983) language assessment is a tool that evaluates a child's communication skills by observing natural, functional language. The function of the Assigning Structural Stage is to provide knowledge about early language acquisition and alert clinicians to the need for early speech/communication intervention. Such an evaluation of a naturalistic speech sample allows several language areas to be evaluated including: (a) syntax and morphology, (b) semantic roles, (c) intentions, (d) agent-object relations, (e) noun phrase, (f) verb phrase, (g) negation, (h) yes/no questions, and (i) wh- questions. The assessment results provide

an assignment of a developmental stage based on the mean length of utterance (MLU) and the child's demonstration of key linguistic milestones. The developmental stage assignment is established by comparing the mean length of utterances a child emits and the child's chronological age. MLU transmits information about the child's structural language development. The number of morphemes can be ascertained by segmenting the language utterances into individual morphemes and counting them. The procedure to calculate an MLU comprises dividing the number of morphemes by the total number of utterances. MLUs have been catorgorized by chronological ages for typically developing children according to Brown's stages (Brown, 1973; Miller, 1983) to assign a developmental stage. The steps of the Assigning Structural Stage are to complete (a) analysis of the 14 morphemes, (b) compare the child's language sample data to the structural developmental charts, and (c) determine the overall developmental stage. The Assigning Structural Stage language assessment must involve a representative speech sample in order to achieve a reliable outcome. This language assessment has no standardized procedures, only general guidelines for speech pathologists to follow. The process requires observing a child for an extended period of time (enough time to observe 50 or more utterances) to obtain a speech sample. A more detailed description of the procedures is available in Miller (1983).

Procedures

The children were assessed independently on two separate occasions. At the first play session, the child played in the playroom while their parent or caregiver completed demographic information and the CDI. This information was completed during the first

session whether it was in the familiar setting or the unfamiliar setting. The first session was chosen to complete the CDI to ensure that parents didn't alter their responses based on participation in the play sessions. There was a session facilitator that interacted with the parent and child during the clinic play session. Procedures for the play sessions were originally developed as part of a larger study at the University of Nebraska-Omaha (Ryalls et al., 2000). Prior to the play session the parents were informed what they could say and how they could interact with the child throughout the session. During the session, neither the facilitator nor the parent initiated play with the child. The session facilitator and the parent were permitted to play with the child, but only if the child initiated the play behavior. Furthermore, the facilitator and parent were allowed to respond to the child, but not to expand on the play scenario. The play assessment format allowed the child to play with toys in the playroom with very limited, non-specific feedback from the session facilitator ("wow", "neat", etc.). The only interactions allowed were a response to a child initiation that was directed at the parent and/or facilitator, praise towards the child, and imitation of the play. In addition, a speech-language pathologist evaluated communication skills using the Assigning Structural Stage while listening to the participant's language throughout the play session. Two different graduate students, both trained in the process of the Assigning Structural Stage language assessment evaluated the children's language samples. The same speech-language pathologists assessed a child in both the home and the clinic setting. Since only one pathologist assessed an individual child, concern about variance due to using more than one speech-language pathologist was minimized. The play session was recorded for 45-

minutes using a video camera beginning when the child starts to play with the toys. The session was recorded to have a permanent product; however during the clinic session the speech pathologist completed the assessment live during the play session rather than by reviewing the video.

At the home session, the children played in their own home using the same toys used in the unfamiliar playroom. Prior to the session at home, parents were asked to clear toys from one room of their home to be used as the setting for the play observation. It was necessary that all toys, other than the ones selected for the study, be removed from the assessment location to prevent the child from playing with toys not included in the study. Again, the session was recorded to have a permanent product, but then the tapes were viewed by the speech pathologists to complete the home language assessments. There was a variation between the home and clinic sessions because the speech-language pathologist was not present in the home, but was present in the clinic. The language assessment was not done live in the home but rather completed using the video recordings of the play session. Other than this difference, the procedures were the same in both the home and the unfamiliar playroom.

Each child participated in the two 45-minute play sessions within a 1-week time frame. The familiar and unfamiliar sessions were counterbalanced between participants, with half the children being assessed in their homes first and the university speech room second and half the children being assessed in the university speech room first and their homes second. The order was determined by parent availability, as well as clinic availability. Home sessions and clinic sessions were on alternating weeks and sessions

were generally planned on weekend mornings to accommodate the families' schedules.

Analysis

A statistical analysis of the language data was conducted. First, the counterbalancing of the context was tested using a t-test to discover if the context order had a significant impact on the assessment procedures with the Assigning Structural Stage. The Assigning Structural Stage was used to determine the developmental stage for each of the conditions (familiar and unfamiliar) and then a t-test was implemented to determine if similar results were found between the two different contexts. A correlation analysis was conducted to determine if there is a relationship between the CDI percentile scores and the developmental level determined by the Assigning Structural Stage. A correlation was used because the Assigning Structural Stage does not have a standard score to compare to the CDI. Finally, descriptive differences between the two contexts based on the Assigning Structural Stage data were considered.

Results and Discussion

Familiar versus Unfamiliar Context

First, the individual child results for each assessment type are provided in Table 2. Then, the counterbalancing of the context was tested using a t-test to discover if the context order had a significant impact on the assessment procedures with the Assigning Structural Stage. The results indicated that there was no order effect and it did not matter if a child was observed in the home ($M = 3.00$, $SD = 1.13$) or the clinic ($M = 3.08$, $SD = .99$) first ($t(11) = .586$, $p > .05$).

Second, the Assigning Structural Stage was used to determine the developmental

stage for each of the conditions (familiar and unfamiliar) and then compared to ascertain if similar results were found between the two different contexts. A t-test determined that no statistically significant difference existed between familiar ($M = 3.00$, $SD = 1.04$) and ($M = 3.08$, $SD = 1.08$) unfamiliar context ($t = .561$, $p > .05$). In fact, there was a high correlation between the home and clinic language results ($r = .88$, $p < .05$) meaning that language scores tended to be consistent across contexts whether a child was assessed in the familiar, home setting or the unfamiliar, clinic setting. It was expected that the results would show that the play assessment format in a familiar context was more effective in assessing language skills than play assessment format in an unfamiliar context because it was assumed that being in a familiar and comfortable environment would encourage more language elicitation.

Tobias (1994) found that different levels of play were presented depending on the setting; therefore it was expected that different levels of language would be observed due to the changing setting. The findings did not support this hypothesis, but rather showed that language output was similar in both a familiar and an unfamiliar setting. Tobias considered settings that included groups of children like preschools, nursery and daycare centers and the context of the present study involved children playing independently. The differences in the results may be due to group-play versus independent-play situations. Additionally, perhaps using the same toys in both the clinic and home settings made the home and the clinic settings more alike than different, and therefore, created similar language results.

The implications of not finding a significant difference between the contexts lends

support that language can be assessed confidently within a clinic environment. Additional research, however, using a larger number of participants and a much more diverse population is required to further investigate the present findings. One advantage of a clinic setting is that it does not require moving toys from place to place. It is more cumbersome to employ a play assessment in the home because it requires that a barrage of toys be transported to and from a child's home. Other challenges encountered with assessment in a home setting are that a child is able to leave the testing room, they play with other toys or household items, and other children or pets in the home can be a distraction, just to name a few. In a clinic session it is far easier to control the play session and more possible to implement a standardized procedure. A clinic environment allows for consistency across play assessments that are not possible in a family's home.

There are many reasons why a clinician would prefer to implement a language assessment in a clinic setting and most of the reasons involve convenience as already mentioned. However, a naturalistic assessment is the preferred method of language pathologists to gain the most valid language sample (Fenson et al., 1984). A clinician may assume that there are more therapeutic advantages to the home setting, for example, in the uncontrolled home environment there are an endless number of naturalistic situations that could elicit more language. It may be perceived that the clinic is a particularly sterile environment that stifles language opportunities and intuitively it is expected that the home would elicit more language. However, in the present study nine of the 12 children presented in the same structural stage from one setting to the other. Most of the children assessed exhibited the same level of language in both settings which

suggests that doing the assessment in the home is no better than the clinic environment. In fact, in the present findings there were two children that scored at a lower stage in the home setting compared to the clinic setting giving evidence that in some cases it is better to assess in the clinic. There was one child in the study that did receive a higher language score in the home versus the clinic setting. Because some children did score higher in one setting over another, it is recommended that if a child does not exhibit speech at a rate that is expected based on the age of the child and the parents' estimate of ability that alternate settings and measures be considered. Multiple assessment tools need to be used when investigating a child's ability because when the same result is discovered using different measures it allows greater confidence in the findings.

Finally, there were child differences that impacted the language results between settings. For example, there was one child that was very shy in the clinic setting and he was resistive to leaving mom's lap. However, in the home setting he exhibited more language skills and played with greater freedom. Two other children responded to the contrary and had higher language scores in the clinic. Each of the children had siblings that typically play with them in the home and during both play sessions they played alone. It is possible that the children were tentative when playing in the home because under normal circumstances they would be playing with their other siblings. Playing alone in their home might have been a more unfamiliar situation than playing alone in a clinic setting. At the individual level the differences between the two contexts did signify that there are pros and cons to each method and the best approach is dependent on distinctive child characteristics. At the group level however; the results showed in

general, children did not perform differently in the area of language production due to their environment. This finding is in conflict with some of the research considering the impact of environment on language (Isbell & Raines, 1991; Lund & Duchan, 1993). The reason for the conflict may not be that environment isn't important, but rather that familiar was inaccurately defined in this study as a place the child regularly spends time. Perhaps familiar should have been defined as a level of informality. The clinic setting may in actuality be a familiar setting because children go to the doctor and dentist's office or other similar locations. The setting itself is not necessarily determining whether it is familiar or unfamiliar to the child, but rather the level of structure imposed within the environment. Therefore, the familiar environment is established not through location, but the atmosphere created by the assessor. It might be that all environments are considered natural until formal assessments are imposed on a child. This research suggests that for most children it doesn't matter if the informal play-based assessment is administered in the home or clinic environment.

Play Assessment versus Parent Report

In the present study a standardized measure was compared to the play assessment to further consider the validity of both assessment procedures. Language samples and a parent report were used to consider the impact of the assessment setting when evaluating language of preschool aged children. Two correlations were used to compare both the home and clinic contexts to the CDI. A moderate relationship was found between CDI percentile scores and the Assigning Structural Stage developmental level for both home ($r=.52$) and clinic ($r=.50$). A stronger correlation between the two measures was

expected because it is assumed that parents' would report observing the same level of language as what a therapist observes during the language sample. No parent in the study reported that their child was speaking at a different level than what they normally observe throughout the day, but when the two assessment tools were compared there were discrepancies in one quarter of the language results. Four of the 12 CDI results did not match the results that were found from the play-based assessment. Due to the extreme nature of these four parent reports it was concluded that there was some question about the validity of the reports. All four of the children were identified as exhibiting language within the expected structural stage according to their ages, however two of the CDI results based on parent report were below the 5^{th} percentile, another one below the 10^{th} percentile and the fourth CDI result was found to be above the 95^{th} percentile. It is suspected that three of the four parent reports underestimated the children's communication ability and the other one overestimated the child's language ability. These discrepancies highlight the importance of using several assessment procedures. If the parent report cannot always be relied upon then other means of assessing language need to be employed, like play-based assessment. Even though there were some discrepancies found between the standardized assessment (parent report) and the play-bases assessment overall there is a correlation between the two measures thus, adding to Kelly-Vance's et al. (1999) findings that play assessment is correlated with standardized measures. The present results enhance the existing data that indicate that play assessment is valid and correlates with standardized assessment tools.

Limitations

The present research showed that play-based assessment in a clinic setting can be an effective approach to assess language; however there may be some individual circumstances when a home setting would be a better choice. This research extends the support for the use of play to assess children's skills, (Athanasiou, 2000; Fenson, et al., 1984; Kelly-Vance, et al., 1999; Linder, 1993; and McCune, 1995) but there are some limitations that need to be considered. First, play-based assessment is not standardized. Research efforts should continue to standardize both play-based assessment procedures, as well as coding systems to evaluate play for the purpose of correlating language performance with developmental play levels. A second limitation of the present study is that collecting representative language samples is a very challenging and time consuming process compared to more formal language assessments. In either the case of formal assessment or play-based procedures, there will always be questions as to whether or not a representative language sample has been ascertained. Toddlers are complicated to assess because they have a mind of their own and they are not always compliant participants. The third limitation is that a non-random, non-representative, as well as, small sample was used in the study and therefore, generalizations should be made with care. Future research should be done on a larger scale so that participants are randomly chosen and are representative of the population.

Future Research

Albeit there is evidence building that validates play as an assessment context, more research is needed. First, techniques of eliciting language production should be

explored. For example, assessing two or more children together may be a more effective way to ensure that a representative language sample is obtained. Also, it would be useful to do more in depth ratings of the amount of language elicited by each toy so that the fewest number of toys could be used to access the best language sample. Another approach to consider is having parents videotape their child in the home to gain a natural language sample. Second, more empirical data is necessary to develop and support the use of play-based assessment methods, especially replication of existing play research. Additionally, replication needs to be done with more children, greater ethnic and language diversity. Advancement in play research adds to the reliability and validity of the assessment methods available. Such empirical evidence is beneficial because it supports the use of play procedures that are less traumatizing to both children and clinicians when doing assessment of very young children. Toddlers often are not willing to sit through formal testing methods and therefore, research is necessary to develop valid and reliable forms of play-based assessment and to increase the empirical support for child-friendly assessment procedures.

Conclusion

There is a need and a demand for less intrusive assessment tools, like play-based assessment. The results of the present study provide support for the use of play-based assessment to evaluate early language production. It is also apparent from this research that the assessment context, whether familiar or unfamiliar, does not typically impact the language results. In practice, then, it is reasonable to assess a child's language in an unfamiliar setting and expect to get reliable results. With that said, it is still imperative

that multiple measures be used to assess a child's language skill because consistent findings are necessary to make appropriate conclusions about a child's speech and language abilities. As it has been shown here, parent reports can sometimes be an exaggeration of a child's language strengths or weaknesses. Consequently, other language assessment procedures should be used to corroborate the parent's report. It is felt that the use of standardized play-based procedures as the context to assess language is an effective methodology because it incorporates two attributes that are considered best practices in assessment. First, in the present study play assessment was used that involved a standard procedure that allowed for the consistency necessary in good assessment technique. Second, it employed the unstructured, relaxed environment that is less intimidating for children so that the most reflective portrait of a child's skills can be captured. This is, after all, the primary reason for assessment-to gain an accurate reflection of a child's ability and use this knowledge to develop interventions.

Reference

Athanasiou, M. S. (2000). Play-based approaches to preschool assessment. In B.A. Bracken, *The Psychoeducational Assessment of Preschool Children*. (3rd ed., pp. 412-427). Needham Heights, MA: Allyn & Bacon.

Brown, (1973). *A first language.* Cambridge, MA: Harvard University Press.

Bagnato, S. J., & Neisworth, J. T. (1994). A national study of the social and treatment "invalidity" of intelligence testing for early intervention. *School Psychology Ouarterly, 9,* 81-102.

Barnett, D. W., Macmann, G. M., & Carey, K. T. (1992). Early intervention and the assessment of developmental skills: Challenges and directions. Topics *in Early Childhood Special Education, 12,* 21-43.

Bracken, B. A. (1994). Advocating for effective preschool assessment practices: A comment on Bagnato and Neisworth. *School Psychology Quarterly, 9,* 103-108.

Cherney, I. D., Kelly-Vance, L., Glover, K. G., Ruane, A., & Ryalls, B. O. (2003). The effects of stereotyped toys and gender on play assessment in 18-47 months old children. *Educational Psychology, 22* (5).

Cirrin, F. M., & Rowland, C. M. (1985). Communicative assessment of nonverbal youths with severe/profound mental retardation. *Mental Retardation, 23* (2), 52-62.

Cunningham, C. E., Reuler, E., Blackwell, J., & Deck, J. (1981). Behavioral and linguistic developments in the interactions of normal and retarded children with their mothers. *Child Development, 52,* 62-70.

Dickson, K, Linder, T, & Hudson, P. (1993). Observation of communication and language development. In T.W. Linder, *Transdisciplinary Play-Based Assessment: A Functional Approach to Working with Young Children* (rev. ed., pp. 163-215). Baltimore: Paul H. Brookes.

Eisert, D., & Lamorey, S. (1996). Play as a window on child development: The relationship between play and other developmental domains. *Early Education and Development, 7,* 221-234.

Farmer-Dougan, V. & Kaszuba, T. (1999). Reliability and validity of play-based observations: Relationship between the play behaviour observation system and standardised measures of cognitive and social skills. *Educational Psychology, 19,* 429-441.

Fenson, L. (1984). Developmental trends for action and speech in pretend play. In Symbolic Play. *The Development of Social Understanding. ed. I.* New York, NY; Bretherton. Academic Press.

Fenson, L., Dale, P.S., Reznick, J.S., Thai, D., Bates, E., Hartung, J.P., Pethick, S., & Reilly, J.S. (1993). *MacArthur Communicative Development Inventories: User's guide and technical manual.* San Diego, CA; Singular Publishing Group, Inc.

Fenson, L., Dale, P.S., Reznick, J.S., Bates, E.,Thal, D. J., & Pethick, S. (1994). *Variability in early communicative development.* Chicago, IL; University of Chicago Press.

Fewell, R.R, (1986). *Play Assessment Scale.* Unpublished document. Seatle, WA; University of Washington.

Fewell, R.R., & Kaminski, R. (1988). Play skills development and instruction for young children with handicaps. In S. L. Odom & M. B. Karnes (Eds.). *Early intervention for infants and children with handicaps* (pp. 145-158). Baltimore: Paul H. Brookes.

Hardman, M. L., Drew, C. J., & Egan, M. W. (1999). Human exceptionality: Society, school, and family. (6th ed.) Boston: Allyn and Bacon.

Isbell, R., & Raines, S.C. (1991). Young children's oral language production in three types of play centers. *Journal of Research in Childhood Education, 5,* 140-146.

Hetherington, E.M. & Parke, R.D., (1999). *Child psychology: A contemporary viewpoint.* Boston, MA; McGraw-Hill College.

Kelly-Vance, L., Gill, K., Schoneboom, N., Cherney, I., Ryan, C., Cunningham, J., & Ryalls, B. (March, 2000). Coding play-based assessment: Issues, challenges, and recommendations. Poster presented at the annual meeting of the National Association of School Psychologists. New Orleans, LA.

Kelly-Vance, L., Needelman, H., Troia, K, & Ryalls, B.O. (1999). Early childhood assessment: A comparison of the Bayley Scales of Infant Development and play-based assessment in two-year old at-risk children. *Developmental Disabilities Bulletin. 27*(1), 1-15.

Knobloch, H., Stevens, F., & Malone, A. (1987). *Manual of developmental diagnosis: The administration and interpretation of the Revised Gessell & Amatruda Developmental and Neurological Examination.* Houston, TX; Developmental Evaluation Materials.

Lidz, C.S. (1986). Preschool assessment: Where have we been and where are we going? *Special Services in the Schools, 2,* 141-159.

Linder, T.W. (1993). Transdisciplinary play based assessment (Rev. ed.). Baltimore, MD: Paul H. Brookes Publishing.

Lowenthal, B. (1997). Useful early childhood assessment: Play-based, interview and multiple intellingences. *Early Child Development and Care, 129*, 43-49.

Lund, N. J. & Duchan, J. F. (1993). *Assessing children's language in naturalistic contexts* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

McCune, L. (1985). Play-language relationships and symbolic development. *Play and Developmental Processes,* 38-45.

McCune, L. (1995). A normative study of representational play at the transition to language. *Developmental Psychology, 31,* 198-206.

Miller, J. F. (1983). *Assessing language production in children: Experimental procedures.* Baltimore, MD: University Park Press.

Myers, C.L., McBride, S. L., & Peterson, C. A. (1996). Transdisciplinary, play-based assessment in early childhood special education: An examination of social validity. *Topics in Early Childhood Special Education.,16,* 102-126.

Neisworth, J. T., & Bagnato, S.J. (1992). The case against intelligence testing in early intervention. *Topics in Early Childhood Special Education, 12*, 1-20.

Ogura, T. (1991). A longitudinal study of the relationship between early language development and play development. *Journal of Child Language, 18,* 273-294.

Rogers, E. L. (1998). Functional assessment in the home. *Preventing School Failure, 43*

(1), 31-50.

Ryalls, B., Gill, K., Ruane, A., Cherney, I., Schoneboom, N., Cunningham, J., Ryan, C. (March, 2000). Conducting valid and reliable play-based assessments. Poster presented at the annual meeting of the National Association of School Psychologist. New Orleans, LA.

Salisbury, C. L., Britzman, D., & Kang, J. (1989). Using qualitative methods to assess the social-communicative competence of young handicapped children. *Journal of Early Intervention, 13,* 153-164.

Siegel, L.S. (1981). Infant tests as predictors of cognitive and language development at two years. *Child Development, 52,* 545-557.

Spencer, P.E. (1996). The association between language and symbolic play at two years: Evidence from deaf toddlers. *Child Development, 67,* 867-876.

Thal, D.J., O'Hanlon, L., Clemmons, M., & Fralin, L. (1999). Validity of a parent report measure of vocabulary and syntax for preschool children with language impairment. *Journal of Speech, Language, and Hearing Research, 42,* 482-496.

Tobias, E. (1994). The play behaviors of special needs children in integrated and non-integrated child-care settings, 148-160.

Westby, C. (1980). Assessment of cognitive and language abilities through play. Language, *Speech and Hearing Sciences in the Schools, 11,* 154-168.

Wolery, M., & Eyk, L. (1984). Arena assessment: Description and preliminary social validity data. *Journal of the Association for the Severely Handicapped, 3,* 231-235.

Table 1

Participant Age, Gender, Home Stage, Clinic Stage, and CDI Percentile

Participant	Age (months)	Gender	Home Stage	Clinic Stage	CDI %ile
1	24	F	2	3	35-40
2	20	F	1	1	<5
3	27	F	4	4	40
4	21	M	2	2	90-95
5	22	M	4	4	90
6	27	M	5	5	50-55
7	25	M	3	3	5-10
8	21	M	3	2	55-60
9	24	F	3	3	5
10	21	F	3	3	10
11	29	F	3	4	15-20
12	23	M	3	3	25-30

Note. Stage and corresponding age, 1=0-24 mo, 2=18-20 mo, 3= 19-26 mo, 4= 27-30 mo, 5= 31-34 mo.

Appendix A

Toy List

1) Phone	F
2) Barn and animals	M
3) Car	M
4) Baby and accessories	F
5) Camera	M
6) Tool set	M
7) Pop-up toy	N
8) Puzzle	N
9) Cash register	N
10) Pots, pans, plates, cups, food	F
11) Blocks	N
12) Pizza and pan	F
13) Truck	M
14) Doctor bag and accessories	M
15) Plastic flowers with vase	F
16) Gumball machine	M
17) Nesting cups	F
18) Salt and pepper shakers	F
19) Colored bears, bucket and shovel	N
20) Play-school house	F

21) Crayons and paper	N
22) Stacking rings	N