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Play assessment: The effects of peer interaction on children's cognitive capabilities.

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PLAY ASSESSMENT: THE EFFECTS OF PEER INTERACTION ON CHILDREN'S COGNITIVE CAPABILITIES

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Abstract

Play Assessment (PA) has recently gained the attention of researchers as a potential valid assessment tool for determining the cognitive capabilities in younger children. Of particular importance is the use of PA among various contexts. Specifically, PA can provide insight into the types of contextual situations that promote higher levels of cognitive skills in younger children. The present study explored peer interactions as a contextual aspect of PA using the PACSS empirical coding scheme to determine the highest level of play behavior. According to the present study, results did not yield any significant differences in overall cognitive play behaviors among 3 year-old children when a peer interaction component was added to spontaneous play. The results indicate that using an unfamiliar peer during free play does not elicit optimal levels of play behaviors during Play Assessment.

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Play Assessment: The Effects of Peer Interaction on Children's Cognitive Capabilities

As the need for early special education intervention services for young children continues to grow each year, it is imperative that early childhood assessment measures be developed to identify children in need of these services. Identifying younger children more accurately for early intervention and special education purposes is an area of concern to many professionals (Athanasiou, 2000; Barnett, Macmann, & Carey, 1992; Dunn, Kontos, & Potter, 1996; Eisert, & Lamorey, 1996; Kelly-Vance, Needleman, Troia, & Ryalls, 1999; Lidz, 1986; Malone, & Langone, 1999; Reschly & Grimes, 1995). The earlier children are identified, the better chance they will have at obtaining the resources necessary to assist them in developing their skills to the fullest potential. Professionals are currently seeking ways in which the early childhood assessment process can be enhanced to accurately identify pertinent information about a child's current level of functioning and use this information to apply appropriate early intervention services when necessary. In addition to early identification concerns, educational laws have become more stringent about the ways in which assessments are conducted in early childhood.

The revision of IDEA 1997 attempted to address the issue of accurate assessments in early childhood by focusing on more functional assessments of a child's skills (Athanasiou, 2000; Eisert, & Lamorey, 1996; Kelly-Vance et al., 1999). More specifically, the educational system looks to assessment for purposes of identification, qualification, specific problem recognition, intervention planning, progress monitoring, and goal completion (Kelly-Vance et al., 1999). As part of the functional shift in

assessment proposed by IDEA 1997, assessment procedures are required to provide evidence of direct progress monitoring and intervention evaluation. As a result of these modifications to the educational system, more stringent assessment procedures aimed at providing specific functional measures are crucial in the educational setting. In order to accommodate the growing need for sophisticated and accurate assessment tools within early childhood, professionals are searching for assessment methods that will meet the needs of the early childhood population as well as satisfy the educational law requirements. The use of Play Assessment (PA) as an assessment tool among the early childhood population may provide these professionals with a valuable way of assessing the child's current skills.

The present study contributes to the field of school psychology by generalizing and replicating the procedures of the Play Assessment of Cognitive Skills Scale (PACSS) (Kelly-Vance et al., 2000; Ryalls et al., 2000). Applying the same procedures of PACSS in various types of play settings increases the reliability ratings of this Play Assessment measure. Replicating the procedures to the Play Assessment of Cognitive Skills Scale will enhance the possibility of standardizing the PACSS as an assessment tool for Play Assessment. By taking the necessary steps towards standardization for the future, professionals in the field become closer to using PA techniques, such as the PACSS, as a potential assessment tool for examining the behaviors of many children in early childhood assessment. As a result, more schools as well as school psychologists will begin using PA as a standard method of determining children's cognitive skill levels. If

support is found, school psychologists will be able to use PA in a variety of settings without compromising the empirical value or standardization requirements.

Literature Review

Traditional Assessment

The major strength of traditional assessment is that scores provided by standardized tests can be used for comparison purposes (Eisert & Lamorey, 1996). However, many researchers argue that traditional assessment measures such as standardized tests lack the ability to provide valid and useful information (Athanasiou, 2000). Numerous professionals in the field regard these tests as invalid and inadequate assessment measures for early childhood. In fact, the law also regards these tests as invalid and inadequate assessment measures as the use of traditional tests for the sole means of assessment for preschool children is illegal (Lidz, 1986; Neisworth & Bagnato, 1992). In addition, researchers state that traditional forms of assessment are poor in nature compared to the individualized practices that encompass a wide variety of assessment techniques (Athanasiou, 2000). Unfortunately, many school psychologists and educators still rely heavily on these traditional tests as the primary way of assessing younger children. Is this really the best way to serve children with special needs? Are traditional assessment methods alone sufficient enough for identification, qualification, specific problem recognition, intervention planning, progress monitoring, and goal completion within special educational services? The educational needs of any child are far too important to place such a great emphasis on results obtained from narrowly defined traditional standardized tests. Thus, assessment measures that provide

practitioners with rich and valuable information about the child's strengths and specific skills during development are imperative in order to correctly identify, qualify, recognize, plan, and monitor the child's specific situation. PA has potential to provide practitioners with the information necessary for all of these areas.

Although standardization is important when determining how a child fares compared to other children, more information is necessary to determine the child's developmental capabilities. Many younger children slip through the cracks of traditional assessment measures and fail to be identified as children in need of special educational services (Athanasiou, 2000; Bracken, 1994; Lidz, 1986; Neisworth & Bagnato, 1992). As a result, many children within the preschool age range do not receive the services that are necessary to assist them with their special education needs. If these children are identified for special educational services using traditional assessment methods, many times they do not receive the correct intervention services because traditional assessment procedures are not linked to providing effective interventions. In fact, many intervention strategies developed from traditional assessment measures do not address the deficit areas that are hindering the child's ability to function academically. These reasons constitute the beginnings of a decrease in the use of traditional assessment as the primary assessment tool for early childhood because it is difficult to link standardized tests to appropriate and effective intervention strategies (Reschly & Grimes, 1995).

One of the most recent criticisms of the traditional assessment approach is that it fails to provide functional information. Functional forms of assessment have become an important issue since the revision of IDEA in 1997. School psychologists as well as

educators are responsible for providing assessment materials that incorporate the functional aspect of IDEA 1997 (Athanasiou, 2000; Eisert, & Lamorey,1996; Kelly-Vance et al.,1999). Standardized testing procedures do not involve direct observations of the behavior in a systematic way. Progress or intervention procedures cannot be monitored through traditional assessment practices. Therefore, it is important to expand assessment practices that incorporate functional forms of assessment as a part of the guidelines for conducting the assessment.

Another problem with traditional assessment practices is that it mainly focuses on the child's weaknesses and not the child's strengths. Traditional standardized tests are often used to highlight the areas or cognitive skills that the child is lacking (Kelly-Vance, Ryalls, & Glover, 2002). Standardized testing procedures require the child to answer questions to test items that are only indirectly related to the child's true capabilities. The child is not provided the opportunity to build upon the strengths that he or she already possesses.

Traditional assessment is often delivered in a rigid structured format in which test questions can become intimidating to the child. Traditional assessment is also a very time-consuming process for both the school psychologist and the educators. Due to the strict structure of the testing environment, traditional assessment does not elicit optimal learning opportunities. These types of environments actually hinder the quality of the child's performance compared to other more natural environments (Linder, 1993; Malone, & Langone, 1999).

Play Assessment

Play Assessment (PA) can be defined as an assessment of children playing. PA differs markedly from traditional assessment procedures in the following ways: (a) it provides a more naturalistic setting, (b) it provides information that can be used for eligibility purposes, (c) it provides a functional assessment technique, (d) it provides information that can be used to develop appropriate interventions, (e) it provides a way to conduct progress monitoring and intervention evaluation, (f) it provides more detailed information, and (g) it provides more efficient time costs (Athanasiou, 2000; Eisert, & Lamorey, 1996; Neisworth, & Bagnato,1992). In each of these areas, research suggests that PA is more effective than using traditional methods as the sole means of assessment for early childhood. PA takes place in an environment much like a playroom that the child is exposed to in the home or daycare. The more naturalistic environment is an advantage of PA because it encourages more optimal play behaviors due to its relaxed setting (Athanasiou, 2000; Reschly & Grimes, 1995).

Another advantage of PA is the detailed information that can be gained from this assessment procedure. Standardized testing procedures provide only limited amounts of information about a child's behavior or cognitive skills. Thus, narrow interpretations are often made about a child based upon the child's test scores. However, PA provides a more detailed account of the child's skills and behaviors compared to standardized test scores alone (Kelly-Vance et al., 2000; Kelly-Vance, Needleman, Troia, & Ryalls, 1999; Kelly-Vance, Ryalls, & Glover, 2002; Ryalls et al., 2000). PA focuses on the child's strengths within a variety of developmental areas.

PA serves as a functional assessment tool because it can be used to identify children for eligibility purposes in special education, assist practitioners in developing appropriate interventions, and provide valuable information specific to progress monitoring, intervention, and evaluation. The possibility of using PA as a formal assessment measure has many implications for the quality of education for many of the nations' children. In fact, many children in need of educational changes in their current curriculum could potentially benefit from the advances of PA (Athanasiou, 2000; Linder 1993). PA would provide school psychologists with the functional assessment component that is currently lacking in the field. Many researchers suggest that PA become implemented as a common assessment tool to identify, observe, monitor, and evaluate the cognitive capabilities of typical as well as exceptional children (Beeghly, Weiss Perry, & Cicchetti, 1989). The PA method tries to accurately determine the cognitive functioning of an individual child by assessing his or her play behaviors.

Linder (1993) formally introduced and developed her model of PA, which she called Transdisciplinary Play-Based Assessment (TPBA). Linder (1993) argued that TPBA was the most accurate way to assess a young child's cognitive level. According to this model, the child engages in a free-play session that is approximately 60-90 minutes in length. There are a total of six phases within the free-play session, which include (a) the unstructured facilitation, (b) structured facilitation, (c) child-child interaction, (d) parent/caregiver-child interaction, (e) motor play, and (f) snack (Linder, 1993). TPBA examines play behavior across many different settings, and the professionals involved collaborate with one another in order to develop appropriate educational plans for the

child. Linder's peer component of TPBA is of particular importance because children may interact differently with their peers than with adults.

In order to check the empirical validity for PA, Kelly-Vance, Needelman, Troia, and Ryalls (1999) compared the scores obtained using Linder's TPBA to the scores obtained from traditional assessment measures. Specifically, during a free-play session, they assessed 38 two year-old children with the Bayley Scales of Infant Development Second Edition (BSID-II), then assessed them using TPBA. Results of the study indicate that TPBA scores correlated highly with the Bayley scores and overall performance level was higher using the TPBA method. Another study that contributed to the social validity of PA, analyzed the overall techniques of PA (Myers, McBride, & Peterson, 1996). According to the data collected, play evaluations were reported to be more time efficient than traditional assessments. Professionals and parents regarded the techniques of play evaluations as positive and the reports obtained from the play sessions provided more functional information compared to traditional reports.

Farmer-Dougan & Kaszuba (1999) used a type of PA different from Linder's TPBA model to assess both cognitive and social play behaviors. The free-play session took place in the children's daycare setting. The results of the free-play sessions were compared to two standardized assessment checklists, namely, the Battelle Developmental Inventory (BDI) and the Social Skills Rating Scale—Teacher Form (SSRS-T). The play session findings were highly correlated with the results of the BDI. Although the observers only recorded data on the target child during the free-play sessions, other

children were present during the free-play observations. Thus, peer interactions may have played a role in heightening the children's cognitive and social play behavior.

A modified version of Linder's TPBA method called the Play Assessment Cognitive Skills Scale (PACSS) was developed by Kelly-Vance et al. (2000). This form of PA is distinct from Linder's method in that the PACSS model specifically addresses the cognitive functioning of the child using a well developed empirically based coding scheme (Kelly-Vance, Ryalls, & Gill-Glover, 2002 Feb/March). In order to potentially become an assessment tool for professionals, an empirical foundation is especially important when implementing PA as a valid measure of cognitive ability.

Research studies using the PACSS method are very limited because of its recent entry into the realm of psychology. One study conducted by Kelly-Vance, Ryalls, & Glover, (2002) analyzed the play behaviors of 16 typically developing children ages two to three and a half years old using the PACSS method. Results of the study indicated that children displayed high levels of Complex Exploratory Play. Specifically, the Core Subdomains, which include exploratory and pretend play skills, were witnessed within all of the free-play session as children engaged in Complex Exploratory Play followed by Pretend Play. Other types of play behaviors such as drawing and sequencing were rarely witnessed during the free-play session compared to the play behaviors witnessed in the Core Subdomains. In addition, play behavior became more complex from the beginning to the end of the play session (Kelly-Vance, Ryalls, & Glover, 2002). These results coincide with the results found in King (2002). In fact, within the complex exploratory play behaviors, 80% of the time participants within the study spent the majority of their

play engaged in level 5 (Appropriate combinatorial/Complex exploration) play behaviors. The remaining 20% of their play behaviors were distributed to other lower levels and a few higher levels of play within the Core Subdomains (King).

Although PA methods such as TPBA and PACSS lack strong reliability and validity empirically, most researchers agree that an important relationship exists between a child's play behavior and his or her cognitive level of development (Farmer-Dougan & Kaszuba, 1999). In order to increase the reliability and generalizability measures, more studies need to be conducted using the PACSS system.

Examining peer interactions using the PACSS method is one way to increase both generalizability and reliability. Almost all of the literature concerning the use of PA recognizes the importance of peer interactions (Linder, 1993). However, very few studies have examined the relationship of peer interactions during free-play. In order to establish that there is a link between cognitive functioning and peer interactions, future research is needed in the area of peer interaction during free-play sessions.

Peer Interactions

The recognition of the important role that peer interactions have on cognitive development can be traced back to Vygotsky. According to Vygotsky (1967) cognitive development is enhanced in the Zone of Proximal Development, in which a child's behavior increases to a heightened level as a result of interacting with someone who starts from a higher level of development. A peer serves as an individual who promotes cognitive development in a child who is functioning at a lower level of behavior (Hall, & McGregor, 2000; Howes, & Matheson, 1992). Although session facilitators are typically

identified as being able to engage in the highest level of play with the child (Linder, 1993), results from a study conducted by King (2002) demonstrated that adult facilitators did not elicit increased levels of play behavior. However, children interact differently with adults than with other peers (Linder, 1993). Thus, peers may contribute to the child's cognitive development in ways that are distinct from adult facilitators. The peer component is especially important within the school setting as children interact with peers on a regular basis and teachers often have students engage in peer interactions in order to facilitate learning.

In order to produce maximum opportunities for optimal levels of play behavior among peers, contextual factors such as gender, age, familiarization, and types of toys need to promote joint social play. Linder (1993) has suggested that for younger children, approximately 3-years of age, joint social play is enhanced when the peer is familiar to the child and of the same gender and approximate age. Joint social play is also enhanced when the toys provided to the children have a social component (Carter, & Levy, 1988). Some examples of these types of social toys include the shape sorter and blocks (Carter & Levy, 1988; Ivory & McCollum, 1999; Lieber & Beckman, 1991; Martin, Brady, & Williams, 1991). The proposed study will implement these same contextual factors with the exception of the familiar peer. Research studies that use unfamiliar peers are limited; as a result, the proposed study will implement the element of the unfamiliar peer in order to provide more research in this area. The age group of children that will be used in the study is 3-years. Children at this age are just beginning to engage in peer relationships and they are being introduced to these peers in their natural environments. Past research

examining initial social behavior and peer interactions tends to focus on the preschool age range as well (Ivory & McCollum, 1999; Lieber & Beckman, 1991; Martin, Brady, & Williams, 1991). Although Linder stressed the importance of peer interactions during free play, no empirical data were obtained to support this claim. To date, no one has attempted to examine the impact of peer interactions during free play sessions using empirical measures. Thus, the proposed study will examine the affect of peer interactions using the PACSS as the empirical foundation.

Summary

Research has suggested for many years that peer interactions play a crucial role in children's cognitive development. Specifically, peer relationships allow children to interact with other children while using skills such as verbal language, problem-solving, and cooperative play. However, there is very limited empirical research exploring peer relationships. The purpose of this study is to empirically explore peer interactions and their effect on the cognitive behaviors in children during free-play sessions.

Current Study

The present study examines the effects of peer interactions on level of cognitive play behavior using typical developing children. This study is an extension of a large ongoing PA study using the PACSS coding method developed by Kelly-Vance et al. (2000). A comparison between the varying levels of play behavior was conducted to examine any differences in the cognitive capabilities displayed among children within the peer group and the alone group. Although previous research has recognized the importance of peer involvement in the course of a child's development, currently, no

studies have directly examined the aspect of peers influencing cognitive development among children because the impact has been on demonstrating children's skills and their current levels of functioning.

The present study attempted to answer the following research questions: (a) Does interacting with a peer increase the cognitive level of play demonstrated by the target child? and (b) How do peer interactions affect the type of play within exploratory play and pretend play skills? The hypothesis was that children would show an increase in their level of play when interacting with an unfamiliar, slightly older, same-sex peer. Research examining peer interactions suggest that peers play a significant role in a child's development (Dunn, Kontos, & Potter, 1996; Howes, & Matheson, 1992). In addition, it was hypothesized that children who engage in peer interactions would display a wider variety of exploratory and pretend play. Examining the areas of exploratory and pretend play is an extension of previous research looking at these areas of play behavior (King, 2002).

Method

Participants

The participants for this study included eleven typically developing three-year-old children. However, data was collected on 10 participants as one of the participants was excluded due to his refusal to remain in the playroom.

All participants were typically developing children from similar socioeconomic status and ethnicity. Information regarding socioeconomic status was based on the parents' reported employment to the investigator. The majority of the children lived in a

two-parent household in which both parents worked full-time. All of the children received daycare services with the majority receiving daycare services within the home. Two of the children were of mixed Caucasian/African-American and Caucasian/Arab-American ethnicity. There was approximately an equal ratio of females to males. A total of 6 (individual play group = 3; peer interaction play group – 3) of the target children were female and 4 (individual play group = 2; peer interaction play group = 2) were male. The peers in the present study consisted of five typically developing children of which 3 were female and 2 were male. The target children in the peer interaction playgroup were paired with an unfamiliar peer who was approximately six months or older than the target child. A different peer was assigned to each target child in the peer interaction playgroup. Research involving unfamiliar peers as part of peer interactions is very limited. Thus, unfamiliar peers were chosen for the current study in order to explore this aspect further. For each of the five peers, the peer interaction play session was their first time in the playroom. All attempts were made to match the target children with a peer according to their gender and the 6-month age range. However, due to complications recruiting male participants and peers with a six-month or greater age difference, one target child was paired with a peer in which the age difference was less than the 6-month age range. The target children in the experimental group were also matched with a target child in the control group on the basis of age and gender for comparison. Children were matched as closely as possible according to their age in months at the time of assessment. The specific age matches for all participants and peers assigned to the individual play and peer interaction playgroups are listed in Table 1.

Participants were assigned to one of two different groups consisting of five participants each. The control group (individual play group) consisted of 5 three-year-olds (between the ages of 35-47 months). The experimental group (peer interaction play group) included 5 three-year-olds (between the ages of 36-47 months). Target children within the peer interaction playgroup were assigned a same-sex peer between the ages of 42-64 months. The age ranges specified were selected because preschool-aged children typically begin to engage in social interactions with their peers at approximately three years of age (Linder, 1993).

Children who participated in this study were recruited through word of mouth and advertisements posted on a midwestern university campus. One of the target participants assigned to the peer interaction playgroup was excluded from this study because he refused to remain in the playroom with the peer. A sixth target child and peer pair was recruited and this data was used in the study to replace the excluded pair.

Setting

A playroom located at the UNO campus was used to conduct the play sessions for each of the groups. The playroom housed toys conducive to joint social play interactions. The child, the child's parent, a camera operator, and a session coordinator were present during each play session.

Materials/Instruments

Toy Selection

Overall, procedures for toy selection were replicated from prior research (Ryan, 2002). Toys were selected based on the following criteria: (a) popularity among children,

(b) ability to elicit play behaviors, and (c) gender stereotypes. Toys were deemed popular if children played with them one or more times during a free-play session (Cherney, Kelly-Vance, Gill, Ruane, & Ryalls, 2003) The ability of a toy to elicit play behavior such as symbolic play was examined using Westby's Stages of Symbolic Play and empirical evidence (Martin, Brady, & Williams, 1991; McCune, 1995; Isabell & Raines, 1991; Ivory, & McCollum, 1999). Toys were evaluated as male, female, or gender-neutral toys, and a balanced number of gender-stereotyped toys were included in the toy selection (Ryan, 2002). As a result, toys that are age-appropriate and conducive to joint social play were provided in the playroom (see Appendix B). The selected toys for the present study included dolls, cars, kitchen sets, tool sets, farm animals, toy telephones, puzzles, tool sets, and blocks.

Coding Measures

Children's play behavior was measured using the Play Assessment of Cognitive Skills Scale (PACSS) developed by Kelly-Vance et al., (2000). The PACCS coding scheme was selected as the coding scheme of choice due to its empirical foundation. This coding scheme has been used to code cognitive skills in prior research involving PA. Therefore, the PACCS coding scheme was applied in the present study to assess the play behaviors displayed by children 36 to 47 months old.

Procedure

A camcorder was used to videotape the play sessions. These videotapes were used for coding purposes at a later time. Prior to each play session written consent of each child's participation was obtained from the child's parent or legal guardian. Children

were accompanied to the play session by a parent. The rules of the play session were explained to the child's parent prior to the play session. The parent was permitted to stay in the room during the play session. The parent was given instructions not to engage in or entice play behavior with the child or peer unless the child or peer directs play behavior towards him or her (Kelly-Vance, Ryalls, & Glover, 2000). Specifically, the parent was told not to initiate play, engage in play activity, make references about play behavior, question play behavior, or engage in any verbalizations regarding play behaviors. However, the parent was allowed to praise the child, make reflective comments, and imitate activities (Ryalls, et al., 2000). Examples of verbalizations that were permitted are one to two-word phrases (e.g., "super!", "great job").

Sessions

Participants engaged in two free-play sessions for 30-minutes each. Each child was observed while he or she played independently during Session 1. During the second play session, each child in the individual playgroup again played independently. However, each child in the peer interaction playgroup was assigned one slightly older, unfamiliar, same-sex peer to play with during the second play session. Thus, Session 2 for the peer interaction playgroup was comprised of the designated target child and an assigned peer within the preschool age range and whom was at least 6 months older than the target child (Dunn, Kontos, & Potter, 1996).

Participants were encouraged to play with any toys of preference during the free-play session. Children assigned to the "Peer" group were introduced to their peers at the beginning of the session. Session 1 for each group consisted of the target child only.

Session 2 for the experimental group consisted of the target child and the assigned peer, and for the control group it consisted only of the target child. During the introduction and play sessions, the children were free to play with the toys of their choice. When the target child did not initiate play behavior within 5 minutes at the beginning of each session, the child was then told, "Go play!" by the session coordinator. In addition, the session coordinator made statements such as "Don't forget to play together" when children were not engaging in interactive play with one another. A session coordinator was present to oversee the child's play and to answer any questions asked by the parents. The camera operator videotaped these 30-minute play sessions. The videotapes were utilized for coding at a later time. A pilot session was conducted as a means to practice and to address any concerns.

During the initial play sessions, parents were asked to fill out a questionnaire. This served as another way of obtaining more background information about the participants in the present study. Snacks and small gift certificates were given to the participants for their participation in the study.

Coding Scheme

The coding scheme developed by Kelly-Vance et al (2000), as a modification to Linder's (1993) original coding system was used to analyze play behavior. Linder's original system was evaluated on characteristics such as item overlap, ease, and accuracy. Based on the results of this evaluation, many of the original guidelines were altered to include empirically validated scales (Kelly-Vance et al., 2000). The final scale consisted of Core Subdomain play behaviors and Supplemental Subdomain play behaviors. The

Core Subdomains examine the exploratory and pretend play behaviors displayed by typically developing children. The Supplemental Subdomains involve pretend play behaviors (Kelly-Vance et al., 2000). Each child was coded on a Core Subdomain first and then the child's behavior was coded for any additional play behaviors in the Supplemental Subdomain category; however, only the Core Subdomains were examined in the present study (see Appendix A).

The present study focused on the Core Subdomains when assessing the play behaviors of the participants as an extension of prior research examining this area of play behavior (King, 2002). The Core Subdomains include Exploratory and Pretend Play Skills. The coding scheme that was utilized for the current study is presented in Appendix A. Once the child displayed a play behavior, the play behavior was recorded and then assigned a specific number obtained from the coding sheet (see Appendix A) The score directly related to the play behavior displayed by the child. Thus, if a child displayed the play behavior of "shaking a rattle", then this play behavior would receive a score of 3 listed on the coding sheet. After the session was complete the highest score was used as the overall score for the child.

Coding Procedures

The PACSS team coded data for each play behavior witnessed during the 30-minute session. The highest level of play in each Subdomain was coded for each child. At the end of each session, the child was assigned a single overall score based on the child's highest level of play behavior witnessed during the play session (see Appendix A). Peer interactions as well as descriptive information were recorded using a facilitation effect

coding sheet (see Appendix C). Each peer facilitated attempt was coded as (a) positive/successful, (b) neutral/ignored, or (c) negative/withdrawn from play. An overall facilitation effect score of (a) positive, (b) neutral, or (c) negative was assigned for each peer facilitated session based on these peer facilitated attempts. Each team member individually assigned an overall score and these scores were compared with the other team member's overall score.

Interobserver Reliability

Two coders from the PACSS team viewed videotaped play sessions simultaneously. To ensure that this reliability level was maintained throughout the study, reliability checks for every fifth session coded were conducted to uphold this reliability standard. If at any time inter-observer reliability for the fifth session dropped below the 90% standard, the play session was to be re-coded using the consensus coding technique. Previous tapes descending in number (e.g., 4..3..2..1) were to be checked in the event that the reliability rate dropped below the 90% standard. However, inter-observer reliability using the PACSS coding procedures was maintained at 100% throughout the present study. Thus, it was not necessary to utilize the consensus coding technique during the current study.

Data Analysis and Design

A 2 x 2 analysis of variance (ANOVA) examining play behavior was used to compare the children's play behavior from Session 1 to Session 2 and to analyze differences in play behavior between the alone and peer groups. The independent variable in the present study was the type of group, alone versus peer, that the target children were

assigned. The dependent variables included the highest level of play behavior between the two groups of participants. In addition, overall peer facilitation and descriptive information about the facilitation sessions were assessed using a facilitation effect coding sheet (see Appendix C). The results of these analyses were evaluated to examine whether the presence of a peer affects the level of play behavior specific to exploratory and pretend play in the observed children.

Descriptive analyses exploring the frequency of occurrence for both the individual playgroup and the peer interaction playgroup, time in session trends, specific items observed in play, peer involvement, and types of toys were conducted within the Core Subdomain.

Results

Analysis of Variance

A 2 X 2 Analysis of Variance was computed for the Exploratory and Symbolic Play Core Subdomain. The highest play score displayed was analyzed across session number (Session 1 and Session 2) and session type (individual and peer interaction). The results of the analysis revealed no main effects of session number, [F (1, 8) = .103, p = .756] or session type [F (1,8) = .159, p = .700] for Exploratory and Symbolic Play. Descriptive analyses indicate that the overall mean highest level of play for the target children in the individual playgroup, (M = 11.0, SD = 2.21) was higher than the mean highest level of play for the target children in the peer interaction playgroup, (M = 10.7, SD = 1.42). The mean highest level of play for the target children in the peer interaction

playgroup increased slightly from session 1 to session 2, however the differences were not significant. (see Table 2). These analyses suggest that the presence of a peer did not elicit higher levels of play behavior than the individual play sessions in which no peer was present. In addition, results showed no significant interaction, $F(1, 8) = .926$, $p = .364$, between session number and session type with regards to the Core Subdomains. Thus, these results found no differences between the mean highest levels of play observed among the target children in either the individual or peer interaction playgroups (see Table 2). Of the 5 target children in the individual play group, two were observed to increase their highest level of play behavior, two maintained the same level of play behavior, and one participant decreased her highest level of play behavior from session 1 to session 2. Of the 5 target children in the peer interaction play group, three participants were observed to increase their highest level of play behavior, one obtained the same level of play behavior, and one target child displayed a decrease in his highest level of play behavior from session 1 to session 2.

Descriptive Analyses

Exploratory and Symbolic Play

Play behaviors under Exploratory and Symbolic Play were observed for all of the children who participated in the present study. Of the 13 total play behaviors (see Appendix A) included in the Core Subdomain, all but 1 of the play behaviors (mouthing), were observed during free play. The play behavior within the Core Subdomain that was observed to occur most frequently by all of the 3 year-olds for both the individual and peer playgroups was appropriate combinatorial/complex exploration. Children engaged in

this play behavior utilized toys such as nested and non-nested puzzles, shape sorter, gumball machine, farm set, vehicles, flowers, blocks, paper and pencil, medical bag, train, mickey mouse pop-up toy, dinosaurs, pizza and pan, cash register and food, pet kit, ring stand, and legos.

Peer Interaction Results

Each attempt of social interaction initiated by either the target child or peer was rated as positive (+), negative (-), or neutral (o) based upon the reaction to the social interaction attempt. The social interaction attempts considered to be positive included either the target child or peer who did not initiate the interaction as engaging in joint social play. Reactions by the child who did not initiate interaction such as withdrawing from the activity or refusing by making verbal comments were rated as negative attempts. When a child showed no interest and ignored the attempts at social interaction, the attempts were considered neutral. An overall peer interaction effect was assigned to each of the peer play sessions (see Table 2). Results show that of the 5 peer interaction sessions, 60% of the interactions were positive, 16% of the interactions were neutral, and 32% of the total peer interactions were rated as having a negative effect on play levels. In general, the target children initiated half of the total social interaction attempts and the peers initiated half as well. However, analyzed separately within each peer interaction session frequently the older peers initiated more attempts at social interaction.

Overall, results indicate that the effects of attempted peer interactions did not enhance the play scores within the Core Subdomains. Three out of the five sessions received an overall positive peer interaction effect. The play scores of two target children

within these three positive sessions decreased and the play scores remained the same for the other target child under the Core Subdomains. However, the play scores of the two remaining peer pairs, with a combination rating of successful/withdrawal and successful/ignored, displayed increases of higher levels of play under the Core Subdomains.

The amount of time that peer pairs spent interacting was observed to occur in short succinct intervals during each play session. Positive interactions ranged from approximately 5-105 seconds and accounted for approximately .2% to 6.1% of the total session time. Negative interactions lasted approximately 3-105 seconds, and interactions rated as neutral lasted from 3-20 seconds. The frequency and duration of the peer interactions was influenced by the age of the child. Results indicate that the older 3-year olds (43 months or older) interacted longer with peers compared to the younger 3-year olds (36-42 months). Children between the ages of 43-48 months engaged in 2-16 peer interactions ranging from 3-105 seconds. Whereas, children between the ages of 36-42 months demonstrated between 2-3 peer interactions, lasting from 5-20 seconds. Results also demonstrate that the older three-year olds engage in higher frequencies of peer interactions. During this study, children between the ages of 36-42 months performed approximately 17% of the total peer interactions and 83% were performed by children between the ages of 43-48 months.

Discussion

The purpose of the present study was to examine the effects of peer interactions upon the play behaviors of 3 year-olds engaged in free play. It is crucial to study the

effects of peer interactions as peers influence the cognitive functioning of young children (Linder, 1993). By determining the influence of peer interactions regarding high levels of play behavior, professionals are better equipped to acquire innovative techniques that assist in assessing cognitive functioning. High levels of play behaviors in the current study suggest that the child is displaying play behaviors at a cognitive level appropriate for his or her developmental age. It was hypothesized that children would show an increase in their level of play when interacting with a peer compared to those children that played alone. In addition, a wider variety of play behaviors within the Core Subdomains were expected from the three-year old children interacting with peers during the free play sessions.

Core Subdomains

The results of current study indicated that there was no significant differences in the levels of exploratory and symbolic play within the Core Subdomains demonstrated across the 3 year-old children in the alone and peer interaction groups. The target children within each of these groups displayed a wide variety of exploratory and symbolic play behaviors with the majority play behaviors occurring at levels of 5 and above. All of the target children engaged in play behaviors at level 10 and above during at least one of the free play sessions. The most frequent play behavior observed among the 3 year-olds was appropriate combinatorial/complex exploration (level 5). This is consistent with King (unpublished manuscript) in which findings showed that 80% of the participants spent the majority of their time engaged in level 5 play behaviors within the Core Subdomains. The highest play behaviors demonstrated within the core Subdomains

for the alone and peer interaction groups were play levels 13 and 12, respectively. These results indicate that 3 year-olds across both the alone and peer groups were engaged in similar play behaviors for approximately the same amount of time during the free play sessions.

Contrary to expectations, overall, the play behaviors of the 3 year-old children did not increase significantly with the addition of a peer during free play sessions. In fact, 3 year-old children in both the alone and peer groups showed similar patterns of overall increases in play behaviors from session 1 to session 2. For instance, 2 of the target children in the alone group showed an increase in the highest level of play which is comparable to an increase in the highest level of play for 3 of the target children in the peer group. Although no significant differences were found between the target children in the alone and peer groups, the fact that the mean scores for the target children within the peer group increased even slightly suggests that the addition of a peer component does play a role in the cognitive development of young children as proposed by several researchers in the field (Dunn, Kontos, & Potter, 1996; Hall, & McGregor, 2000; Howes, & Matheson, 1992; Linder, 1993).

Another reason for the observed findings in the present study may be the result of using an unfamiliar peer. The results of the present study do not support using an unfamiliar peer to elicit peer interactions in 3 year-old children. In fact, previous research suggests that joint social play is enhanced when the peer is familiar to the child (Linder, 1993). In addition, the current study enlisted 3 year-old participants whereas past research has focused on preschool age range children (Ivory & McCollum, 1999; Lieber &

Beckman, 1991; Martin, Brady, & Williams, 1991). Thus, the behaviors demonstrated by the 3 year-olds within the present study may significantly differ from children who are towards the older end of the preschool age range such as 4 year-old children. The present study also utilized an empirical scale to measure optimal levels of play behaviors whereas previous research has not explored the impact of peer interactions during spontaneous play using empirical measures. As a result the empirical measurement scale employed for the current study may not have been the appropriate measurement tool to gauge optimal play behaviors. However, more research using the PACSS method is necessary to support this claim.

Descriptive analyses revealed that 2 of the participants within the peer group increased their highest level of play by two levels from session 1 to session 2. Whereas the 2 participants that demonstrated increases in their highest level of play behavior from the alone group increased one level of play behavior from session 1 to session 2. It is important to note that these 2 participants in the peer group engaged in some form of positive peer interactions when playing with a peer during free play. Although play scores for 1 participant in each group decreased, in particular the highest play score for the participant in the alone group showed a drastic decrease in her highest play behavior. During the first session she played with a variety of the toys and demonstrated a wide range of play behaviors ranging from level 5 to level 13 within the Core Subdomains. However, during the second session she spent the majority of her time with a few select toys including puzzles, shape sorter, gumball machine, and a pop-up toy. These findings suggest that the toy selection may have influenced the play behaviors of the children.

Peer Interaction Effects

Overall level of play scores did increase slightly for the target children within the peer interaction play group, however, the results were not significant. Thus, the results of the current study do not support the hypothesis that play behaviors increase in 3 year-old children when they interacted with aged-matched peers during free play. The variety of play behaviors within the Core Subdomains did not increase from session 1 to session 2 for the peer interaction group. All the 3 year-olds within the peer interaction group demonstrated a variety of play behaviors during both spontaneous play sessions. Although the results were not significant, the fact that overall play scores increased slightly suggests that peer interactions play a role in relation to increased scores for exploratory and symbolic play in young children. Further research is necessary to explore this issue.

One explanation for the obtained results in the present study is that the target children did not experience significant increases in their highest level of overall play behaviors because target children were already demonstrating high mean levels of play behaviors during the first session of spontaneous play. Thus, high scores of play behaviors in the first session remained high with the addition of a peer. Another reason for the observed results may have been due to the time constraints of the peer interactions. First, peers were introduced to the target children for a short amount of time prior to the start of the free play session. This may not have been an adequate amount of time for the target children to become comfortable with their aged-matched peer as suggested by the long amount of time it took for the first peer interaction to take place

during spontaneous play. In fact, many of the first peer interactions did not occur until several minutes had passed in the free play session. Second, these peer interactions were brief and often isolated occurrences during the spontaneous play session. Thus, the target children may not have had adequate opportunities to increase their level of play behaviors. The toys provided during the spontaneous play sessions may have also affected the results of the peer interactions. The majority of the toys were chosen in accordance with Ivory and McCollum (1999) and Martin et al., (1991), in which specific toys were identified as promoting social interactions. However, many peer interactions observed during spontaneous play involved the use of toys such as the tools, shape sorter puzzle, cash register, animals, flowers and vase, and medical kit, which were not identified as promoting social interactions.

Implications for Practitioners

The results obtained from the current study provide several implications relevant to practitioners. First, it is important that practitioners be cautious when deciding to use a peer component in order to promote optimal play behaviors when during play assessment. The current study found that peer interactions, utilizing an unfamiliar age-matched same sex peer, do not lead to higher levels of optimal play behaviors within the Core Subdomains in 3 year-old children using the PACSS method. Therefore, the peer component may not be a reliable source when using play assessment to measure an increase in cognitive play behaviors in young children during free play periods. Second, practitioners should utilize other measurement methods of assessing the cognitive play skills in the areas of exploratory and symbolic play. Results indicated that the level of

play behavior regarding these areas demonstrated by average developing 3 year-old children were already at high levels of cognitive play skills within the Core Subdomains. Other methods should be used in conjunction with play assessment in order to determine the accuracy and reliability of play assessment as a measurement tool for these cognitive skills. Finally, practitioners should explore play assessment using the PACSS method as another method of assessing play skills listed within the Core Subdomains. Although the differences were not significant in the current study, the results indicated that overall optimal play behaviors did increase slightly for children within the peer interaction group. It may be beneficial for practitioners to conduct more research with a larger sample of participants as a means of examining any significant differences using the play assessment method.

Limitations

As with all research, it is important that consumers be cognizant of the limitations presented by the current study. First, generalization may be difficult due to the limited demographics and small sample size of the participants. Second, the present study only focused on observing the play behaviors of typically developing 3 year-old children. Thus, the play behaviors and peer interactions demonstrated by younger or older age groups of children would produce different results. Third, peer interactions were very brief. Peers were exposed to the playroom once which may have affected their interaction time, as they were not as familiar with the playroom setting compared to the target children. Fourth, children were exposed to an unfamiliar setting. Although the playroom used in the current study resembled natural environments such as a daycare or home play

area, it was still an unfamiliar setting for the participants. Fifth, despite the fact that toy selection was based on previous research by Ivory and McCollum (1999) and Martin et al., (1991), personal preferences for specific toys by the children may have affected their play behaviors. Sixth, any increases in play behaviors displayed by the participants from Session 1 to Session 2 could be attributed to factors such as the child's mood, second exposure to the play setting, or amount of exposure to other children.

Future Research

Future research is necessary to explore several areas within play assessment, with the most obvious being replication. Replicating the current study using the PACSS method and altering sample sizes, age groups, and diverse demographics of the participants is important in order to determine if the current results remain the same. Future studies could explore the differences in play behaviors and peer interactions with a familiar peer versus an unfamiliar peer using the PACSS method. In addition, future research could analyze the highest level of cognitive play skills among peers and explore any differences among peers as well. Analyzing the social skills of the target children and peers prior to play sessions is another area that future studies could explore. Other areas to examine include varying the amount of peers and amount of toys within the playroom.

Conclusions

The purpose of the present study was to explore the relationship of peer interactions as a function of cognitive play behaviors among 3 year-old children using play assessment. In addition, it was hypothesized that children who engaged in peer interactions would demonstrate higher cognitive play levels within the Core Subdomains

compared to children who did not have a peer component during free play. This premise was based on Vygotski's (1967) Zone of Proximal Development theory. However, the results of the present study did not support this theory. In fact, the results showed that there was no significant differences in play behaviors among 3 year-old children with the addition of an unfamiliar same-sex peer during free play sessions. However, more research exploring the effects of peer interactions using play assessment is necessary to support these claims.

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Table 1

Participant Matched Pairs for Age and Gender

	Individual Group		Peer Interaction Group		Peers	
Child Pairs	Age	Gender	Age	Gender	Age	Gender
Pair 1	39	F	39	F	49	F
Pair 2	42	F	44	F	50	F
Pair 3	46	F	47	F	64	F
Pair 4	45	M	45	M	49	M
Pair 5	35	M	42	M	56	M

Note. Age = Months

Table 2

Highest Scores During Individual and Peer Interaction Play for Core Subdomains

Participant	Exploratory/Symbolic Play		
Individual Group	Session 1	Session 2	
1	13	5	
2	12	12	
3	11	12	
4	11	12	
5	11	11	
Mean Scores	11.6	10.4	
Peer Interaction Group	Session 1	Session 2	FE
1	12	12	+
2	11	12	+/-
3	9	11	o/+
4	8	10	+
5	12	10	+
Mean Scores	10.4	11.0	
Total *M*	11.0	10.7	

Note.
Total *M* = total mean scores for each variable FE = Facilitation Effect;
+ = Positive; - = Negative; o = Neutral.

Appendix A

PLAY ASSESSMENT: COGNITIVE DEVELOPMENT

CORE SUBDOMAINS

EXPLORATORY and SYMBOLIC PLAY

1. Mouthing (e.g., sucks block)
2. Simple manipulation (e.g. holds object and visually examines it, bangs object)
3. Unitary functional activity (i.e., performs one action with an object) (e.g., shakes rattle, rolls ball, opens doors, presses buttons, turns wheel on car)
4. Inappropriate combinatorial (i.e. random combinations of objects and functions) (e.g., puts toy dish in car)
5. Appropriate combinatorial/Complex exploration (i.e., performs two or more actions with object; combines object and label) (e.g., moving objects in and out of containers, puts all animals in barn, combines cup and saucer)
6. Transitional play (i.e., approximation of pretend play without confirmatory evidence; e.g., puts phone to ear but doesn't talk or make sounds, touches comb to head of doll, but does not make combing gesture)
7. Self-directed acts (e.g., child eats from an empty spoon, combs hair, washes hands)
8. Passive other-directed acts (acting on another person or lifelike object with a toy) (e.g., child feeds a doll, grooms a dog) OR Object-directed acts (child on or with inanimate objects (e.g. child pours from a pitcher to a cup, arranges bedclothes)
9. Single-scheme combination (i.e., the same play behavior is directed toward two or more different objects/people or same play behavior with different toys on one/object person) (e.g., child puts empty cup to a doll's mouth, then to the mouth of the experimenter and self or child pretends to eat a sandwich, then a cookie, then a carrot)
10. Active other-directed acts (action is attributed to animate or lifelike objects) (e.g., child makes a doll drive a car, makes a doll shovel sand, makes a toy dog bark or bite)
11. Multischeme combinations: short sequences (i.e., two or three different play behaviors appear in logical order) (e.g., child pours juice into a cup and gives a doll a drink from the cup)
12. Events (i.e. four or five play behaviors are combined in a logical order) (e.g., child stirs a pot, feeds a doll, takes off the dolls clothes and puts the doll to bed)
13. Episodes (i.e., six or more play behaviors are combined in a logical order) (e.g., child combs a doll's hair, looks for a mirror, keeps it in front of the doll's face. Child puts clothes on doll, makes it sit down on table, makes tea and offers some to doll.)

Appendix B

Toy List:

1) Phone	F, S
2) Barn and animals	M
3) Car	M, S
4) Baby and accessories	F, S
5) Camera	M
6) Tool set	M
7) Balls	N, S
8) Puzzle	N
9) Cash register	N
10) Pots, pans, plates, cups, food	F, S
11) Blocks	N, S
12) Pizza and pan	F
13) Truck	M, S
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, bucked and shovel	N
20) Play-school house	F

21) Crayons and paper	N
22) Puppets	N, S

Note. M = male stereotyped toys; F = female stereotyped toys; N = gender neutral toys; S = social toys

Appendix C

FACILITATION RESULTS

NAME:	**CODE:**			
DESCRIPTION OF PLAY	**RESULT**	***TOY***	***PEER ATTEMPT***	**RESULT**

GENERAL DESCRIPTION:_____

_____

_____

Overall F effect = _____