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The Preschool Kitchen Task Assessment (PKTA): A Pilot Study Exploring Executive Functioning in Children Ages 3 to 6 Years

Annette M. Yuson
Dominican University of California

Mallory Hope Engelhardt
Dominican University of California

Fanny Canlas Dizon
Dominican University of California

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The Preschool Kitchen Task Assessment (PKTA): A Pilot Study Exploring Executive Functioning in Children Ages 3 to 6 Years

Annette Yuson

Mallory Engelhardt

Fanny Dizon

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Annette Yuson, Candidate Date 12/17/13

Mallory Engelhardt, Candidate Date 12/17/13

Fanny Dizon, Candidate Date 12/17/13

Ruth Ramsey, Ed.D, OTR/L, Chair Date 12/17/13

Julia Wilbarger, PhD, OTR/L, Thesis Advisor Date 12/17/13

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Abstract

Background and purpose. The Preschool Kitchen Task Assessment (PKTA) is a newly developed assessment tool based on the principles of the Kitchen Task Assessment (KTA) and may be a valuable tool for assessing executive function (EF). There is a lack of age-appropriate assessments for EF in occupational therapy. The purpose of this study was to examine the use of the PKTA as a new assessment and determine if it is a valid measure of EF in preschool children.

Subjects. The total sample consisted of 11 willing preschool-aged children and their parents, with a female to male ratio of 8:3 and a mean age of 4.5 years.

Methods. A non-experimental exploratory design was utilized to examine the relationship between the PKTA and other neuropsychological assessments. A series Pearson's correlation coefficients were calculated to examine the relationship between the PKTA and two other neuropsychological tests: BRIEF-P and a modified Digit Span Backward.

Results. A low, non significant correlation between PKTA total score and BRIEF-P GEC score (r = .12). A moderate to good correlation between the PKTA time and BRIEF-P GEC score (r = .68). Little to fair correlations between PKTA total score and the BRIEF-P clinical scales with a range of .17 to .41. A correlation could not be found between PKTA and Digit Span Backward. A moderate, negative correlation found between age in months and PKTA total scores (r = .74). Through qualitative observations, the PKTA was found to be ecologically valid.

Discussion and conclusion. Results revealed weak support that the PKTA is a valid measure in assessing EF in preschoolers. The PKTA is developmentally sensitive to age with support that it is an ecologically valid assessment. The PKTA may be a beneficial tool in order to gain a complete understanding of a child's needs.

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Introduction

Executive functioning (EF) is a set of cognitive skills associated with problem solving, planning, and everyday functioning (Scope, Empson, & McHale, 2010). For example, EF is tied to academic achievement, play, socialization, learning readiness, and task performance in activities of daily living (ADLs) and instrumental activities of daily living (IADLs). Children need EF skills in order to meet many challenges in the future. According to the Center on the Development Child at Harvard University (2011), EF refer to a set of skills that help us focus and enable us to make decisions, fix errors, and revise plans if necessary. During infancy and the preschool period, core components of EF development form a critical foundation and set the stage for the development of higher cognitive processes that are needed and used well into adulthood (Garon, Bryson, & Smith, 2008). Executive functioning skills are a crucial developmental skill for preschool children that are tied to occupational performance of everyday activities, as well as academic achievement (Biederman et al., 2004). Therefore, it is imperative to address EF in younger children to ensure occupational and academic performances are achieved at a developmentally typical rate.

Occupational therapy (OT) plays an important role in the early diagnosis of developmental delays and behavior problems. Occupational therapists (OTs) are concerned with helping preschool-aged children achieve their fullest participation in school occupations, which includes play and social skills. Occupational therapists are also concerned with occupational performance in basic ADLs and IADL tasks. Among other things, executive functions are critical for developing these skills and capacities. Self-regulation is especially important for preschool children to learn because it plays a significant role in socialization. Therefore, there is

a need for the development of an EF assessment for preschool children in OT (Zhou, Chen, & Main, 2012).

Several EF assessment tools exist today. Current measures of EF in children include the D-KEFs, Wechsler Intelligence Scale for Children - IV, and the Go/No Go tasks (Delis, Kaplan, Kramer, 2011; Wechsler, 2003; Nosek & Banaji, 2001). These EF assessments are created for older children. There are limited EF assessments that exist for younger children, especially those that are preschool-aged. The most current version of The Children's Kitchen Task Assessment (CKTA) was developed to study EF in young children from ages seven to 11 years of age (Rocke, Hays, Edwards, & Berg, 2008). The assessment tool was developed and designed after the Kitchen Task Assessment (KTA), which is used to assess EF in adults (Baum & Edwards, 1993). A positive aspect of the CKTA is that it appears to have more ecological validity when compared to classic neuropsychological tests. Ecological validity is defined as the functional and predictive relationship between performance on a set of neuropsychological tests during a highly structured session and performance in a variety of real-world settings (Zgaljardic, Yancy, Temple, Watford, & Miller, 2011).

Since EF plays a critical role in children's self regulation, interventions that target self-regulatory skills in life situations are important for children to learn before they enter into their school-age years. Few measures of EF have been developed within OT. Examples include the Miller Assessment for Preschoolers (MAP) and the Loewenstein Occupational Therapy Cognitive Assessment (LOTCA) (Miller, 1988; Itzkovich, Averbuch, Elazar, & Katz, 2000). Both of these assessments were developed by OTs and have items that could indicate problems in EF. The Preschool Kitchen Task Assessment (PKTA), developed by Christine Berg at Washington University, St. Louis, is based on the principles of the KTA (Berg, 2009). The

PKTA may be a valuable tool for assessing EF. The PKTA may also be an ecologically valid assessment that answers questions regarding delays in young children's occupational performance. Research is needed to validate the PKTA. Given that there is a lack of age-appropriate assessments, the purpose of this study was to examine the use of the PKTA as a new assessment tool based on the KTA in order to determine if it is a valid measure of EF in preschool children.

Literature Review

Executive Function and Why it is Essential for Performance

Executive function refers to a set of cognitive skills associated with self-regulation, planning, and problem solving (Scope et al., 2010). The key components of EF are described in table 1. These set of skills allow individuals to respond flexibly to their environment in order to be able to engage in deliberate, goal-oriented thought and action (Scope et al., 2010). Core components of EF begin to develop during the infancy and preschool period (Garon et al., 2008). These skills continue to develop throughout the lifespan and are essential for occupational performance. Executive function is vital for social and cognitive competency, which is required for an individual to have a productive lifestyle (Rocke et al., 2008). Deficits in EF can negatively impact performance in meaningful everyday activities of daily living. Occupational therapists can plan for intervention to help the child succeed for the future by detecting early dysfunction in EF during the preschool years.

Table 1

Factors Involved in Executive Function

Executive Functioning Skill	Definition
Initiation	Starts or begins the next action or step without hesitation
Execution	Carrying out the activities of the task through the use of organization, sequencing, and judgment
Sequencing	Performs steps in an effective or logical order for efficient use of time and energy and with an absence of (a) randomness in the ordering and/or (b) inappropriate repetition of steps
Planning	To arrange a method or scheme beforehand
Self-regulation	To control oneself or itself
Problem solving	Recognizing a problem, defining a problem, identifying alternative plans, selecting a plan, organizing step in a plan, implementing a plan, and evaluating the outcome; ability to manipulate knowledge and apply the information to new or unfamiliar situations
Judgment & safety (inhibition)	Avoidance of dangerous situation
Completion	Termination of the task
Attention	Ability to focus on a specific stimulus without distraction

Note. Factors involved in executive function appear here, including their definitions. Definitions derived from Jacobs, K., & Jacobs, L. (2009). *Quick Reference Dictionary for Occupational Therapy* (5th ed.). Thorofare, NJ: Slack Incorporated.

Development of Executive Function in Preschoolers

During the preschool years, major developmental changes in EF occurs (Pritchard & Woodward, 2011; Hammond, Muller, Carpendale, Bibok, & Liebermann-Finestone, 2012). The development of attentional control, future-oriented, intentional problem solving, and self-regulation of emotion and behavior begin during infancy and continue to develop throughout the

preschool years (Hammond et al., 2012). Pritchard and Woodward (2011) report that two cognitive executive skills that emerge early in development include inhibition and set-shifting. Set-shifting refers to being able to shift from one task to another task (Pritchard & Woodward, 2011). Pritchard and Woodward (2011) stated that by 12 months of age, set-shifting is evident. These infants continue to have developmental improvements with set-shifting by age six. By age four, children demonstrate basic inhibition and switching skills (Pritchard & Woodward, 2011).

These developmental milestones that emerge during the preschool years are associated with a child's social understanding, as well as his/her school readiness and achievement. When a child experiences difficulties in areas of EF, the child may also experience challenges in areas of ADL and academic competencies, which are important for successful performance and behavior skills. Therefore, it is important to detect any deficits in EF early during the preschool years when critical life skills begin and continue to develop. Detecting and planning for intervention early may benefit these individuals by preventing further dysfunctions in the future.

Executive Dysfunction in Children with Different Diagnoses

Children who have been diagnosed with developmental disorders often have deficits in EF. Children with Autism and Attention Deficit Hyperactivity Disorder (ADHD), for example, have deficits in EF (Fuhs & Day, 2011). Pennington and Ozonoff (1996) found that children with ADHD performed consistently poorer than the control groups on EF measures. Executive functioning deficits in children with Autism and Autism Spectrum Disorder (ASD) include lack of inhibition, poor strategic planning, time management, prioritizing, poor attention, problem solving, and sequencing (Geurts, Verte, Oosterlaan, Roeyers, & Sergeant, 2004). These EF deficits further impact a child's occupational functioning. Without early detection and

intervention for these deficits, an individual may continue these poor habits as they grow into adulthood.

Children with diagnoses affecting EF perform differently in situations when compared to typically developing peers. Children diagnosed with Autism and ADHD are known to engage in higher rates of risk-taking activities (Bruce, Ungar, & Washubusch, 2009). These actions may be due to their lack of inhibition, poor attention and concentration during daily activities. Their lack of inhibition and attention further increases the child's risk for injury. Additionally, these individuals also have poor strategic planning, time management, prioritizing, and sequencing. Their poor problem solving abilities can affect their academic achievement in school. Children with Autism and ADHD often have difficulties with academics and social interaction (Pennington & Ozonoff, 1996). Due to these limitations, children with Autism and ADHD may find it difficult to prosper in academics and maintain friendships in school. Children with Autism and ADHD are also known to be at risk for limitations in occupational functioning. These limitations prevent the child from participating in everyday, meaningful activities that are important for development (Hahn-Markowitz, Manor, & Maeir 2011; Rocke et al., 2008).

Importance of Occupational Therapy in Evaluating and Addressing Performance Issues

In order to detect dysfunction and address performance issues, it is important for OTs to evaluate preschoolers' EF skills. Early detection and intervention of EF deficits in preschoolers may enhance school readiness and facilitate successful performance and development (Fuhs & Day, 2011; Rocke et al., 2008). It is important to directly observe performance in a child's natural environment. This allows the OT to observe the child's overall performance in EF that facilitate or inhibit occupations in the child's own context (Rocke et al., 2008). Through observation and implementing assessments on components of EF, OTs will be able to collect

data on the child's deficits and dysfunction. By gathering this information, OTs can determine the level of assistance needed for the child to function effectively within his or her own environment. Additionally, parents and teachers can be educated on their roles in helping their child succeed (Rocke et al., 2008).

Neuropsychological Assessments

Earlier research favored a single model approach to evaluate preschool children by only looking at the child's test scores. However, over the past two decades, a number of investigators have considered measuring EF in the young child with a comprehensive and team-oriented approach (Willoughby, Wirth, & Blair, 2012). Teachers, psychologists, and psychiatrists have helped with the development of neuropsychological assessments for young children to assess EF. Neuropsychological assessments provide objective, standardized, and reliable measures of human behavior (Baron, 2004). A full assessment substantially adds to the understanding of a child's needs (Baron, 2004). By using diverse assessment tools, the therapist will be able to thoroughly fully assess the child and understand his or her unique capabilities.

Executive Function Currently Being Assessed in Preschoolers

Executive functioning in school-aged children is currently being assessed with the neuropsychological assessment tools such as the Delis-Kaplin Executive Functions Scales (D-KEFS), subtests of the Wechsler Intelligence Scale for Children - IV (WISC - IV), and strategies such as Go/No Go tasks (Delis et al., 2011; Wechsler, 2003; Nosek & Banaji, 2001). The Wechsler Preschool and Primary Scale of Intelligence (WPPSI - IV) is the preschool version of the WISC – IV that measures a cognitive development for preschoolers and young children (Wechsler, 2012). Qualified professionals administer assessments, such as the Behavior Rating Inventory of Executive Function (BRIEF) and First Step Screening Test for Evaluating

Preschoolers (Gioia, Espy, Isquith, 2008; Miller, 1993). Researchers can compare the results of the neuropsychological assessments to the results of the questionnaires. The D-KEFs Sorting Test measures the ability to categorize cards, describe concepts used, and identify sorts made by the examiner (Delis et al., 2011). The Wechsler Intelligence Scale for Children – IV Digit Span calculates verbal IQ, performance IQ, and full-scale IQ (Wechsler, 2003). These measures provide information about general intelligence and problem solving but do not specifically address EF components. These commonly used assessments of EF are not targeted at young children nor do they specifically test EF functions.

There is limited availability of discrete EF tests for very young children (Baron, 2004). There is a need to establish an ecologically valid assessment tool because this will allow for early detection of EF dysfunction. This is especially important in the field of occupational therapy because OTs can intervene early in a child's life if EF dysfunction is detected. Occupational therapists can improve the quality of a child's life at an earlier stage with hopes that the child will develop at a typical rate. In addition, previous neuropsychological EF assessments do not assess multiple domains, such as socioemotional, behavioral, cognitive, and academic development (Zhou et al., 2012). Therefore, there is a need to incorporate these missing elements into a new assessment tool.

Ecologically Valid Assessments

Ecological validity has been defined as the functional and predictive relationship between performance on a set of neuropsychological tests during a highly structured, office-based testing session and behavior in a variety of real-world settings, such as home, work, or school (Zgaljardic et al., 2011). Ecologically valid assessments examine the interaction between the person and the physical and social environments while also considering cultural influences,

socioeconomic status, the value system of the child's family, physical demands, and social expectations of the person's environment (Case-Smith & O'Brien, 2010). In pediatric OT, utilizing ecologically valid assessments is important because they examine the physical, social and psychological features of a person's developmental context (Case-Smith & O'Brien, 2010).

Four Aspects of Measuring Ecological Validity

There are four aspects of measuring ecological validity. The first aspect measured is motivation. The project or task presented must be interesting and fun for the participants. If the participants enjoys the task, their behavior and EF skills can be generalized to their natural environment (Schmuckler, 2001). Secondly, the task must mimic real-life situations. The task presented or assessed must be useful and be generalized to their natural environment. The assessment should adapt and implement the task in such a way that the participants should be able to adapt it to their own natural environment (Alderman, Burgess, Knight, & Henman, 2003). The third aspect that measures ecological validity is the behavior measure. The behavior measure represents that the participant in the study must be behaving naturally during the task at hand. This measurement focuses on the important role the environment plays when dealing with behavior. The environment needs to be as functionally true as possible in order to result in regular behavior (Schmuckler, 2001). Lastly, the research must be activity based. Activity based means that the testing aspect of the study must be related to the participant's meaningful occupation.

The Relationship between Ecological Validity and Executive Functioning

In order to accurately test all the different components of EF and for results to be generalized across natural environments the ecological validity must be high. If the assessment has low ecological validity, the results of an EF assessment cannot be generalized in daily life.

There are several non-cognitive factors that can influence the relationship between test performance and everyday performance, such as emotional, functional, motor, health, behavioral, and other cognitive environmental demands. Accounting for all these variables and the performance on both EF and neuropsychological tests allows the researchers to better predict everyday EF (Chaytor, Schmitter-Edgecombe, & Burr, 2006). All of these factors have the ability to affect the assessment's ecological validity, but it is important that all of these biases are taken into consideration in order to acquire the most valid results that can be generalized.

Ecologically Valid Assessments and Occupational Therapy

Ecologically valid assessments are often used in OT treatment to measure and record an individual's functional ability. Occupational therapy's holistic client-centered approach focuses on maintaining a natural environment during an assessment while simultaneously participating in a meaningful activity. Assessing clients in their natural environments allow therapists to plan treatment for their patients to the best of their ability, while maintaining a client-centered approach. One imperative aspect of maintaining an ecologically valid assessment is to provide the participants with an appropriate activity at hand. For example, preschoolers like to color and make art projects, so the PKTA consists of following instructions in order to construct a caterpillar craft. Although the PKTA assessment is new, it was formulated from the idea that children like to create art projects, maintaining an ecologically valid, activity based assessment.

Occupational therapists use and rely on ecologically valid assessments when working with any population. Whether it is typically or atypically developing children, these assessments will be beneficial to the therapist and the client. Although there are some ecologically valid assessments measuring EF for adults and school-aged children, there is a gap in EF assessments

for the preschool population. More ecologically valid EF assessments need to be developed for preschoolers.

Statement of Purpose and Research Questions

Executive functioning skills are critical in early child development. Executive function is a significant issue for academic achievement, play, socialization, learning readiness, and task performance in ADLs and IADLs. Children who have difficulties with EF skills are at risk for developing further complications throughout life. Occupational therapists are concerned with helping preschool-aged children achieve their fullest participation in school, as well as developing their occupational performance in basic ADL and IADL tasks. Without EF skills, children may not be able to achieve success in occupational performance areas such as dressing, hygiene, toileting, etc. Executive functioning skills are especially important for preschool children because it allows for social competence and school readiness. Occupational therapists play an important role in detecting early diagnosis of developmental delays. The occupational therapists role is to determine if there is an EF dysfunction and intervene when it is appropriate and necessary. Therefore, there was a need to establish a useful and ecologically valid assessment of EF for preschool children so that OTs have a tool to use to detect EF delays.

Executive functioning difficulties have the potential to negatively impact a child's life. Research has suggested that the CKTA appeared to be sensitive on assessing EF on school-age children. However, there is little to no research on EF measures on children three to six years of age within OT using a similar ecologically valid assessment procedure. Therefore, there was a need for the development of an EF assessment tool for preschool children. The purpose of this study was to conduct a pilot test of the PKTA for children ages three to six years in order to

establish its usefulness and its criterion-related validity. The research questions for this study include:

1. Is the PKTA a valid measure of executive function as determined by comparing the scores on the PKTA with scores from other neuropsychological assessments? Are there strong correlations between the PKTA and the BRIEF-P? Are there strong correlations between the PKTA and the Modified WISC-IV Digit Span Backward?
2. Is the PKTA sensitive to age as measured by viewing the total amount of cues given to each child and the age of the child in months? That is, do total amount of cues increase or decrease with age? Does the PKTA total score relate to the child's age in months?
3. Is the PKTA an ecologically valid assessment tool as measured by examining the interaction between the child and the physical and social environment? Is the caterpillar-art project an appropriate task for children ages 3-6 years?

Theoretical Framework

The Person, Environment, and Occupation (PEO)

The Person, Environment, and Occupation (PEO) model was utilized to guide this research. The model focuses on the interdependent relationship between three components: the person, environment, and occupation and/or roles where there is a dynamic relationship between all three components (Watson & Haas, 2011).

The person includes the physical, emotional, cognitive, and spiritual characteristics of an individual (Law & Dunbar, 2007). These characteristics influence what the person enjoys doing (i.e. their occupations) and where (e.g. environment) in which the person enjoys performing their occupations. The environment is defined as "those contexts and situations, which occur outside

the individual and elicit responses from them" (Law & Dunbar, 2007, p. 37). Occupational therapists are concerned with the context in which performance occurs. Occupational therapists include social, political, economic, institutional, physical, and cultural considerations as the environment (Law & Dunbar, 2007). An ecologically valid assessment assumes a valid context or environment.

The "O" within PEO is defined as occupation. The occupation is what the individual would like to do. The occupation is self-directed, functional, and what the person does across a lifespan (Law & Dunbar, 2007). As the three elements come together, the result is in occupational performance (Law & Dunbar, 2007). The better fit of the three elements will yield the best results in occupational performance. Performance-based assessments, such as PKTA approximate performance in a typical childhood occupation. Understanding performance in typical occupations is consistent with OT practice.

Occupational performance is the outcome of the overlapping three components. Occupational performance is dependent upon the dynamic relationship between the person and his or her environment. Occupational performance is experienced and chosen by the person within a specific environment (Law & Dunbar, 2007). This coming together and overlapping of the three components is also referred to as the person-environment-occupation fit. When these three components come together and fit closely, occupational performance is most effective (Law & Dunbar, 2007). The goal in the PEO model is to optimize performance by considering all three components.

Cognitive Development Theory

One of goals within this research is to explore EF in preschool children. Therefore, a Piagetian Cognitive developmental perspective was utilized to expand upon the person feature

within the PEO model. Because EF is a critical component of cognitive development, it is imperative that OTs study and research EF in early childhood. When considering the PEO model, within the person (P), EF is a critical component of cognitive development. Piaget documents an explosion of cognitive skills in the three to six year old period that lead from the preoperational period to the operational period. During the preoperational stage, children begin to use symbols, pretend play, and language begins to develop. The concrete operational stage occurs between the ages of seven to 12 years of age. During this stage, individuals are able to successfully complete the tasks by using logic. Executive functions critical to this period are working memory, response inhibition, and shifting (Garon et al., 2008). These skills continue to develop throughout the lifespan, which are essential for occupational performance.

Methodology

Design

The goal of the study is to explore the validity and usefulness of the PKTA. In order to examine the relationship between the PKTA and other neuropsychological assessments, a non-experimental exploratory design was utilized. The non-experimental exploratory design was most appropriate because it can establish the relationships between the new assessment (PKTA) and the established neuropsychological assessments. The researchers compared scores on the PKTA to scores on other established neurological assessments. Qualitative observations during the assessment and an informal questionnaire were gathered to explore the ecological validity of the PKTA.

Participants

Participants consisted of willing preschool-aged children and their parents. The total sample consisted of 11 participants, with a female to male ratio of 8:3. The criteria established

for participation in this study consisted of (1) typically developing preschoolers (2) between the ages of three and six years, and (3) understanding of English. The participants' age ranged from 37 to 83 months, with a mean age of 53.5 months, or 4.5 years. The standard deviation of age was 14 months. Exclusion criteria consisted of a diagnosis or a combination of any learning disorders, developmental or intellectual disability, physical impairments, or communication disorders. All participants in this study were recruited from the Bay Area by word of mouth.

The participant ethnicity consisted of 64% Asian/Pacific Islander, 27% Caucasian, and 9% from other or unknown background. Three out of the 11 children were shown to have a significant birth history. These birth implications included one-month prematurity, prolonged hospitalization, and cesarean section. One hundred percent of the participants met the developmental milestones and did not take specific medications and/or suffered from a chronic illness.

Instruments

Preschool Kitchen Task Assessment.

Researchers collected data using the Preschool Kitchen Task Assessment (PKTA) (see Appendices F, G, H, I), a test designed to determine the level of assistance the participating child needs in order to complete the task. The child was asked to create a caterpillar using art supplies, which is an age appropriate task for preschoolers. At the start of the timed assessment, the participants were presented a box of materials needed to complete the task. The researcher explained to the child that no communication was going to occur during the assessment time. The child was given a picture booklet with visual examples of step-by-step instructions on how to complete the art project. The level of assistance needed during the test period was determined through a standardized cueing system. Each child was rated on a scale from zero, no cues, to

five, total assistance. At the end of the assessment, each participant's score was calculated. The PKTA yields three scores: Total score, Total cues and Time. Depending on the type of cue the child needed, the score was calculated. In order to calculate the total score of the PKTA, researchers tallied the amount of cues provided. Cues are weighted on the level and type of cue given and then added together to get a composite score. Each of the cues are worth the following points: verbal cue (1), gestural guidance (2), direct verbal guidance (3), physical assistance (4), and do for the participant (5) points. Before moving on to the next level of cueing, researchers were directed to first give two cues from each cueing level. When calculating the total number of cues, the researchers counted the amount of cues provided through observational skills, for a composite score in each column in the scoring sheet. This is the first systematic study to validate the PKTA so no validity and reliability data exist.

Wechsler Intelligence Scale for Children–IV, Digit Span Backward.

The WISC-IV Digit Span Backward is a section of the WISC-IV. The Inter-rater-reliability for the WISC-IV Digit Span was scored at 98%. The Wechsler Intelligence Scale for Children-IV Digit Span Backward (WISC-IV Digit Span Backward), is a standardized assessment measuring children's working memory, was used in the research study. Using a sock puppet named Ernie, the researchers read off a series of numbers from the WISC-IV Digit Span Backward scoring sheet. Ernie repeated the numbers in reverse order (Davis & Pratt, 1996). The child was then asked to repeat the numbers in reverse order, just as Ernie did. When the child correctly repeated the numbers in backwards order, the amount of numbers in a series increased. The numbers started with two digits and increased up to five digits. The amount of digits increased until the child could no longer correctly repeat the sequence in backwards order to the researcher (Davis & Pratt, 1996). The participants were scored on the basis of the total

correct recalled series of numbers (Davis & Pratt, 1996). After the first trial, a second and third trial of the same numbers were implemented. The same procedures were utilized in each trial. The score from all three trials were combined for a total final score.

Behavior Rating Inventory of Executive Function Preschool Version (BRIEF-P).

The Behavior Rating Inventory of Executive Function Preschool Version (BRIEF-P) was completed by the child's parent or guardian. The BRIEF-P is a standardized parent questionnaire designed to assess real-world behaviors in children related to EF in the home (Gioia et al., 2008). The BRIEF-P is useful in assessing preschool-aged children with conditions such as prematurity, emerging learning disabilities, attention disorders, language disorders, traumatic, lead exposure, and pervasive developmental disorders/autism (Gioia et al., 2008). The BRIEF-P Rating Form consists of 63 items that measure various aspects of EF: Inhibition, Control Shifting, Emotional Control, Working Memory, Planning/Organizing (Gioia et al., 2008). These aspects of EF are also known as clinical scales. A Global Executive Composite Score (GEC) is also calculated. The GEC is a summary score that incorporates five out of the eight clinical scales (Gioia et al., 2008). Three index scores can be calculated but are not used in this study. This assessment considered the parent or guardian's occupations, educational level, and the number of adults that care for the child on a daily basis in order to obtain background information. Consequently, the BRIEF-P is an ecologically valid and efficient tool for screening, assessing, and monitoring a young child's EF and development (Gioia et al., 2008).

Data Collection

The children and parents were oriented to the purpose and need of the assessment. Child assent (see Appendix B) and parent proxy consent (see Appendix D) were obtained prior to starting the assessment. The BRIEF-P was given to the parent to complete prior to starting the

PKTA. The parents were instructed to complete the BRIEF-P to the best of their ability. Most parents completed the BRIEF-P and proxy consent while waiting for the child to complete the PKTA.

The PKTA - Before Task was given to the children prior to administering the PKTA Assessment (see Appendix F). The PKTA- Before Task is a set of questions that are verbally asked by the researcher to the child. The questions were asked to determine the level of assistance that the child may need while he/she participated in the assessment. The PKTA - Before Task also asked a question to each participant to establish his/her the experience when participating in art projects.

After the PKTA - Before Task, the child began the assessment in which he/she was shown a model of a completed caterpillar picture. The child was given a book of "recipes" that showed him/her step-by-step pictures of how to construct the caterpillar using various materials that were supplied by the administrator. The administrator then timed the child once he/she started the construction of the caterpillar. During the assessment, the administrator observed the child and scored the child using the PKTA scoring guidelines, measuring EF.

After the child completed constructing the caterpillar, the administrator ended the assessment with the PKTA - After Task (see Appendix H). The PKTA - After Task is a set of questions that are verbally asked by the administrator to the child. The questions are asked to determine the level of assistance the individual needed, how well the child believed that he/she did, and what the child could have done differently.

The administrator completed a follow-up observation of task performance, scoring the child's EF used in the assessment (see Appendix H). Lastly, the WISC–IV Digit Span Backward

was then administered. During this task, the administrator recited a set of numbers in which the child would verbalize the set of numbers in backwards order. Each child was given three trials.

Researchers tested in two community settings. The two settings include the participant's local library or the nearest Barnes and Nobles. The day of the week in which the participants tested were collected on a Saturday or Sunday. If the testing location was held at a local library, the study was conducted in the children's section. Tables and chairs were provided for researchers and participants. Providing a flat working space to complete the art project was beneficial to the participants. While completing the project in the library, the amount of noise and distraction was slim to none. If the testing location was at Barnes and Nobles, the study was conducted on the children's stage. Due to the lack of space and resources available, researchers improvised the working environment by using benches as tables as both participant and researcher sat on the floor. While at Barnes and Nobles, the amount of noise and distraction varied between participants' testing times, but it was much greater than that in the library setting. Out of the 11 participants, eight of the assessments were conducted at a local Barnes and Nobles, while only three of the assessments were conducted at a local library.

Data Analysis

A series Pearson's r correlation coefficients were used to compare and examine the relationship between the PKTA and other neuropsychological tests used in the study. These other neuropsychological tests include the WISC – IV Digit Span Backward and the BRIEF- P. Correlation between the PKTA score and the age of the child were also calculated. Correlations of .00 to .25 indicated little to no relationship; .25 to .50 indicated a fair relationship; .50 to .75 indicated moderate to good relationship; and above .75 indicated good to excellent relationship

(Portney & Watkins, 2009). Researchers also utilized qualitative observations throughout the assessment for each participant in order to examine if the PKTA was ecologically valid.

Ethical and Legal Considerations

The Institutional Review Board of Dominican University of California approved the study. The study was verbally explained to the participating parents and children. Participants provided assent and the parents provided proxy consent prior to starting the assessments. Assessments such as the PKTA, the WISC–IV Digit Span Backward, and the BRIEF-P were used for this study. Commercially available assessments and forms were purchased.

Results

Relationship between PKTA and BRIEF-P

A low non significant correlation was found between PKTA total score and BRIEF-P GEC score (r = .12). A moderate to good significant correlation was found between the PKTA time and BRIEF-P GEC score (r = .68), as seen in Table 2. Little to fair correlations were found between PKTA total score and the five clinical scales on the BRIEF-P with a range of .17 to .41, as seen in Table 3. A correlation could not be found between PKTA and Digit Span Backward. Through qualitative observations, the PKTA was found to be ecologically valid.

Table 2

Correlation Scores between PKTA Time Score and Clinical Scales of the BRIEF-P

BRIEF-P clinical scales	Total Time to complete PKTA (Pearson Correlation) *r* = n
Working Memory	.67
Inhibitory Control	.67
Shifting	.52
Emotional Control	.54
Planning/Organizing	.57
Global Executive Composite	**.68**

Note. All *r* scores indicate a moderate to good relationship. BRIEF-P = The Behavior Rating Inventory of Executive Function. PKTA= Preschool Kitchen Task Assessment.

Table 3

Correlation Scores between Total Score on PKTA and Clinical Scales of the BRIEF-P

BRIEF-P clinical scales	PKTA total score (Pearson Correlation) *r* = n
Working Memory	.23
Inhibitory Control	**.41**
Shifting	-.22
Emotional Control	-.17
Planning/Organizing	**.32**
Global Executive Composite	*.12*

Note. *r* >.25 are in boldface; all are non-significant. BRIEF-P = The Behavior Rating Inventory of Executive Function. PKTA= Preschool Kitchen Task Assessment.

Relationship between PKTA and Wechsler Intelligence Scale for Children–IV, Digit Span Backward

Correlations between PKTA and the WISC – IV Digit Span Backward could not be tested. There were far too few children who were able to complete the WISC – IV Digit Span

Backward. Therefore, little to no correlation was found between the PKTA total scores and the WISC – IV Digit Span Backward.

Relationship of PKTA scores to age

A moderate negative significant correlation was found between age of the participant in months and total score on the PKTA (r = .74). See Figure 1. As the total score on the PKTA decreased, the number of age in months increased. In other words, children who were older scored less than children who were younger.

Figure 1. Age in Months of each Participant and PKTA Total Score for each Participant

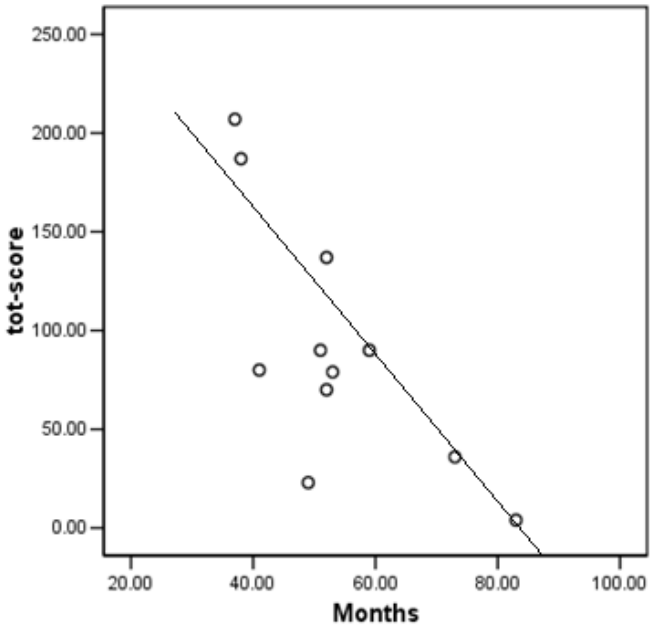

Figure 1. Scatter plot of the the participant's age on the x-axis and the PKTA total score on the y-axis. The circles indicate the PKTA total score for each participant. The straight black line depicts a moderate negative correlation (r = .74).

Participants were asked to answer questions using the PKTA before task questionnaire (see Appendix F). These questions included basic prerequisite questions to determine if the participant could complete the art project. One of the questions asked was, *do you do art work? yes or no? If yes, how? by myself, at school, at home?* Overall, 64% of the participants stated

they could complete a project on their own, 27% stated they completed a projects at school, and 9% stated they had completed an art project at their home. Although the range varied depending on the prerequisite questions, 100% of the participants stated they have completed artwork in the past.

Ecological Validity

Throughout the study, the researchers also conducted qualitative observations of the child's behavior during administration of the PKTA. All of the participants demonstrated interest in the art activity and 100% of them were able to complete the project. The children demonstrated happy dispositions while completing the art project. Researchers noted that almost all of the children smiled and laugh while completing the art activity. After the project was completed, 75% of the children were proud of their accomplished work and wanted to take their project home to show their family. A common statement that was heard by the researchers was, "Can I take this home to show my mom?" Other participants expressed, "Is this mine?"

Discussion

The purpose of this study was to examine the utility and validity of the PKTA as a measure of EF in preschool children. The researchers compared scores from the PKTA to the BRIEF-P and a modified version of the WISC-IV Digit Span Backward to determine if the PKTA is a valid measure of EF. Results from this study indicated that score on the PKTA did not correlate strongly with scores the other neuropsychological assessments. However, the PKTA appears to be sensitive to age and appears to be ecologically valid. In addition, the PKTA provided significant information on functional skills that occupational therapists and other professionals can use with preschoolers.

The first research question explored concurrent validity of the PKTA as a measure of EF by comparing it to two established assessments: BRIEF-P and Modified WISC - IV Digit Span Backward. The correlation between PKTA total score and BRIEF-P GEC total score was small and non significant. However, there were fair correlations between PKTA total score and three out of the five clinical scales on the BRIEF-P. Although the PKTA and BRIEF-P do not have a strong correlation, the PKTA may be tapping into some aspects of EF. Some clinical scales had higher correlation between the PKTA and BRIEF-P. These clinical scales include emotional control, inhibition, and planning. This may reveal that children with good emotional control and inhibition are less impulsive and are more likely able to follow a set of directions and attend to task. Therefore, for future research, the PKTA should be compared to other neuropsychological tests that measure EF in different ways or in broader areas. In contrast to the PKTA total scores moderate to good correlations were found between the PKTA time score for the child to complete the PKTA and all of the clinical scales on the BRIEF-P. This may indicate that more EF skills are being utilized as the child took less time to complete the task. Children who are more advanced in EF skills took less time because they had better planning, problem solving, and working memory. This matches up with the developmental theory that EF skills progress with age. The correlation between the PKTA and the modified WISC-IV Digit Span Backward could not be determined due to the limited amount of children able to complete a trial.

The second research question examined if the PKTA was sensitive to age. A negative correlation was found between the participant's age in months and PKTA total score. Children who were younger scored higher on the PKTA while children who were older scored lower. This further supports the developmental theory that EF skills progress as a child gets older. As mentioned in the theoretical framework, Piaget states that an explosion of cognitive skills

develop in the three to six year old period that lead from the preoperational period to the operational period. These skills continue to develop throughout the lifespan, which are essential for occupational performance.

The third research question explored ecological validity of the PKTA. Through qualitative observations, results support the PKTA's ecological validity. These findings are congruent with principles laid out by Shmuckler (2001), who identified the four aspects ecological validity. The first aspect is motivation (Shmuckler, 2001). Shmuckler (2001) stated that the participants must actively engage in a fun and interesting task in order to generalize his/her behavior to his/her natural environment. In the PKTA- before task, children reported that they frequently participated in art projects. Through qualitative observations, children demonstrated active engagement, enjoyment, and pride in the end project. From the beginning to end of the assessment, the participants displayed full participation and interest with the PKTA assessment.

The second aspect is the task must mimic real-life situations. On the PKTA-before task questionnaire, 100% of the participants stated that they engage in art and crafts, at home or at school, and either alone or with someone else. The process of creating an art project, such as the caterpillar from the PKTA, is an activity that preschool-aged children often engage in. Therefore, this shows that the PKTA is an ecologically valid assessment tool because art activities are commonly practiced by preschoolers.

The third measure, the behavior measure, reports that the participant in the study must be behaving naturally during the task at hand. Through qualitative observations during the assessment, the participant actively engaged with both the researchers and the task at hand. This interaction may be similar to how the participants behave at school, with their friends, their

teacher, or at home. Therefore, the PKTA is an assessment that enables the participants to behave naturally during the task at hand in a child-friendly environment that is similar to their natural setting. Lastly, Shmuckler (2001) identified the fourth aspect of measuring ecological validity is that the research must be activity based. The PKTA is an assessment in which the participant engages in an age-appropriate art project.

Limitations and Future Recommendations

There were several limitations found throughout the study that may reduce the generalizability of our findings. Due to participant and parent schedules, researchers had to drive to an agreed upon location for participant convenience. Parents were willing to drive to local community libraries and Barnes and Nobles locations. The rationale for studying and conducting the assessment at these two locations were that these locations are child-friendly environments. The researchers determined that both of the provided testing locations maintained an ecologically valid environment. Due to the noisy environment in Barnes and Nobles, researchers feel it was too distracting which may have resulted in lower scores than the child would have received in a quieter environment. Researchers believe it is best to maintain a distraction-free environment in order to obtain the truest results. In future studies, researchers advise to continue to explore the PKTA study in one environment. A school classroom may be the most beneficial testing environment because a classroom is where a child is more likely to spend his/her hours in a day. Implementing this change into future studies will allow generalizability and increased knowledge about the ecological validity for the PKTA.

The largest limitation to this study was the sample size. Researchers only included 11 participants in this study due to time constraints to complete the pilot study. It was difficult for researchers to schedule convenient times around the participants busy life schedules, resulting in

a smaller sample size than desired. In the future, researchers may want to include as many participants within this age group in order to generalize the findings across a larger population.

Another limitation found in the study is that the three researchers switched roles throughout the study. There were three different roles fulfilled during the study. The three roles consisted of: one researcher facilitated the PKTA to the participant, another researcher scored the assessment components, and the other researcher observed the participants' behavior throughout the study. There may have been limited inter-rater reliability because the facilitator roles switched throughout the course of this research. In other words, one facilitator may have provided a different means of assistance to a participant, when compared to the first research facilitator. Inter-rater reliability was not specifically tested. Further, over a period of time, each researcher improved their skills in the administration of the PKTA. Therefore, there may be a difference in the PKTA scoring from the start to the end of the study. Due to the newness of the assessment, researchers could not control for this limitation. For future researchers, it would be advisable to allow more time to practice administering the assessment in order to be competent. Another way to resolve this limitation is to assign concrete researcher roles, in order to improve the necessary skills for each role and to increase the inter-rater reliability.

It should be acknowledged that although efforts were made to eliminate selection bias through inclusion and exclusion criteria, these finding may not be generalized to other populations. There may also be a cultural bias in which 64% of the participants were from Asian/Pacific Islander background. Participants from American Indian, Black, and Hispanic backgrounds were not included in this study. In future studies, it would be recommended to include children from diverse backgrounds to increase generalizability.

Implications for Occupational Therapy

Children with developmental disabilities experience a number of difficulties and challenges throughout their lifetime. As the population for school-aged children grows, so will the number of children who require pediatric occupational therapy services. Throughout treatment, OTs incorporate interventions, exercises, play activities, art activities, and standardized assessments to each patient in order to provide the best holistic treatment.

This pilot study examined the effectiveness of the newly developed PKTA tool when measuring EF skills in children ages 3 to 6 years. The results indicate that the PKTA needs further research to determine if it is a valid measure of EF in young children. A gap still remains in pediatric OT assessments measuring EF in young children. Therefore it is important to fill this gap because early detection in EF deficits may enhance school readiness, facilitate successful performance, and development in preschool aged children.

This study also suggests that the PKTA was sensitive to the age of the participants. This result provides OTs, teachers, and parents with important information. As the participant was older in months, they required less cues to complete the assessment. In other words, as the child was older, it is believed that they obtain more EF skills to complete the project with a higher independence. The PKTA provides research for pediatric OT highlighting that as children get older, they obtain more EF skills, scoring lower on the PKTA. Additionally, the PKTA may detect any developmental issues within a particular area including fine motor skills, visual perceptual skills, language, behavior, body awareness, and cognition. The success of this project suggests that OTs may play a major role in helping detect early EF dysfunction in preschool aged children, while also improving quality of life (QOL) and increasing ADL skills.

Conclusion

The desire to research this topic of assessing EF in preschool children using the PKTA was driven by the lack of available age appropriate neuropsychological assessments. Although, there are neuropsychological assessments within other professions, OTs can assist in the full evaluation of a child. According to the Center on the Developing Child at Harvard University (2011), parents, teachers, and most importantly children will benefit from greater access to tools and approaches that provide useful knowledge about EF in early development. In addition, a full assessment substantially adds to the understanding of a child's needs (Baron, 2004). By using a diverse amount of assessment tools, the therapist will be able to fully assess the child and understand his/her unique capabilities. The goal of this research was to provide an assessment tool to detect any problems a child may have in EF skills which may lead to functional problems in the future. Early detection of EF deficits in preschoolers is important to address in order to enhance school readiness and every-day functioning of the child.

This study is important for OT because it is the first pilot study exploring the effectiveness of the PKTA on EF skills in preschoolers. With further research, the PKTA may be a beneficial tool for teachers, parents, psychologists, and therapists in order to gain a complete understanding of a child's needs. Continuation of this study is important to provide valid information about preschool-aged children and EF skills. Findings from an ecologically valid assessment tool will allow OTs to not only utilizes the assessment, but to also formulate possible interventions based on the test results.

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APPENDIX A
RESEARCH PARTICIPANT'S BILL OF RIGHTS

DOMINICAN UNIVERSITY of CALIFORNIA
RESEARCH PARTICIPANT'S BILL OF RIGHTS

Every person who is asked to be in a research study has the following rights:
1. To be told what the study is trying to find out;

2. To be told what will happen in the study and whether any of the procedures, drugs or devices are different from what would be used in standard practice;

3. To be told about important risks, side effects or discomforts of the things that will happen to her/him;

4. To be told if s/he can expect any benefit from participating and, if so, what the benefits might be;

5. To be told what other choices s/he has and how they may be better or worse than being in the study;

6. To be allowed to ask any questions concerning the study both before agreeing to be involved and during the course of the study;

7. To be told what sort of medical treatment is available if any complications arise;

8. To refuse to participate at all before or after the study is stated without any adverse effects. If such a decision is made, it will not affect h/her rights to receive the care or privileges expected if s/he were not in the study.

9. To receive a copy of the signed and dated consent form;

10. To be free of pressure when considering whether s/he wishes to agree to be in the study.
If you have other questions regarding the research study, you should ask the researcher or her/his advisor. You may also contact The Dominican University of California Institutional Review Board for the Protection of Human Subjects by telephoning the Office of Academic Affairs at (415) 257-0168 or by writing to the Associate Vice President for Academic Affairs, Dominican University of California, 50 Acacia Avenue, San Rafael, CA. 94901.

APPENDIX B
CONSENT FORM-PARENT FORM

DOMINICAN UNIVERSITY of CALIFORNIA
CONSENT FORM TO ACT AS A RESEARCH PARTICIPANT- PARENT FORM

Purpose and Background:
Ms. Fanny Dizon, Ms. Mallory Engelhardt, and Ms. Annette Yuson, undergraduate and graduate students, and Ms. Julia Wilbarger, Associate Professor, Department of Occupational Therapy at Dominican University of California, are conducting a research study on the development of an assessment tool for preschoolers. The purpose of this study is to test executive functioning skills in preschool children ages 3-6, by creating an art project (eg. caterpillar). Currently, there are no assessment tools that test executive functioning skills in preschoolers within occupational therapy. The purpose of this study is to establish the usefulness of an OT assessment tool, the Preschool Kitchen Task Assessment, and compare the results from this assessment to the results on an already established assessment tool, the Backward Digit Span Assessment.

1. I understand that I am being asked to be a participant in a research study designed to establish the usefulness of the Preschool Kitchen Task Assessment tool.

2. I understand that I am being asked to participate because I am a parent(s) of a child who is between the ages of 3-6.

3. I understand that my participation in this study is voluntary and I am free to withdraw my participation at any time.

4. I understand that I may refuse to answer any questions that cause me distress or seem as an invasion of my privacy. I may elect to stop at any time and may refuse to participate before or after the study is started without any adverse effects.

Procedures:
If I agree to be a participant in this study, the following will happen:

1. I will complete the background questionnaire regarding my child's medical history and developmental milestones.

2. I will complete the BRIEF-P for 20 minutes and answer questions regarding my child's executive functions within the context of the natural environment and preschool. The questions consist of different executive functioning skills, where I will be asked to rate each item as never, sometimes, or always a problem.

3. Once I am finished completing the BRIEF-P form, my information will be collected. I understand that all personal references and identifying information will be eliminated, and all subjects will be identified by numerical code only, thereby assuring confidentiality regarding the subject's responses.

Risks and/or Discomforts:
1. I understand that my participation involves minimal physical risk, but may involve some psychological discomfort, given the nature of the questions being asked in the BRIEF-P.

2. I may refuse to answer any questions that causes me distress or seems an invasion of my privacy. I may elect to stop at any time and may refuse to participate before or after the study is started without any adverse effects. Study records will be kept as confidential as possible. The master list for these codes will be entered into another electronic database at Dominican University of California.

Benefits:
There will be no direct benefit to me from participating in this study.

Questions:
I have talked to Ms. Fanny Dizon, Ms. Mallory Engelhardt, and Ms. Annette Yuson about this study and have had my questions answered. If I have further questions about the study, I may contact them at fanny.dizon@students.dominican.edu, mallory.engelhardt@students.dominican.edu, annette.yuson@students.dominican.edu or their research supervisor, Julia Wilbarger, Professor, Department of Occupational Therapy, Dominican University of California (415-458-3731). If I have any questions or comments about participation in this study, I should talk first with the researchers and the research supervisor. If for some reason I do not wish to do this, I may contact the Dominican University of California Institutional Review Board for the Protection of Human Subjects (IRBPHS), which is concerned with the protection of volunteers in research projects. I may reach the IRBPHS Office by calling (415) 257-1389 and leaving a voicemail message, by FAX at (415) 257-0165 or by writing to the IRBPHS, Office of the Associate Vice President for Academic Affairs, Dominican University of California, 50 Acacia Avenue, San Rafael, CA 94901.

Consent:
I have been given a copy of this consent form, signed and dated, to keep.
PARTICIPATION IN RESEARCH IS VOLUNTARY. I am free to decline to be in this study or withdraw my participation at any time without fear of adverse consequences. My signature below indicates that I agree to participate in this study.

_____ _____
SIGNATURE OF THE SUBJECT Date

_____ _____
SIGNATURE OF THE RESEARCHER Date

APPENDIX C

DOMINICAN UNIVERSITY of CALIFORNIA 1890

April 2, 2013

Mallory Englehart
59 Valencia Avenue
San Rafael, CA 94901

Dear Mallory:

I have reviewed your proposal (entitled, The Children's Kitchen Task Assessment for Preschoolers: A Pilot Study) submitted to the Dominican University Institutional Review Board for the Protection of Human Subjects (IRBPHS Application, #10130). I am approving it as having met the requirements for expedited review.

In your final report or paper please indicate that your project was approved by the IRBPHS and indicate the identification number.

I wish you well in your very interesting research effort.

Sincerely,

Martha Nelson, Ph.D.
Chair, IRBPHS

cc: Julia Wilbarger

APPENDIX D
PROXY CONSENT-FORM

DOMINICAN UNIVERSITY of CALIFORNIA
PROXY CONSENT FOR RESEARCH PARTICIPATION

Purpose and Background

Ms. Fanny Dizon, Ms. Mallory Engelhardt, and Ms. Annette Yuson, undergraduate and graduate students, and Ms. Julia Wilbarger, Associate Professor, Department of Occupational Therapy at Dominican University of California, are conducting a research study on the development of an assessment tool for preschoolers. The purpose of this study is to test executive functioning skills in preschool children ages 3-6, by creating an art project (eg. caterpillar). Currently, there are no assessment tools that test executive functioning skills in preschoolers within occupational therapy. The purpose of this study is to establish the usefulness of an OT assessment tool, the Preschool Kitchen Task Assessment, and compare the results from this assessment to the results on an already established assessment tool, the Backward Digit Span Assessment.

Procedures

If I agree to allow my child to be in this study, the following will happen:

1. The researchers will administer a variety of assessments with my child that will test for my child's executive functioning.

Risks and/or discomforts

1. I understand that there is a possibility for minimal physical injury during construction of specific activities that pertain to the assessments.
2. I understand that my child may experience psychological discomfort and I may refuse to continue with the assessment if my child experiences extreme discomfort.

Benefits

There are no direct benefits from participating in this study. However, there are indirect benefits from participation of the study. I will be contributing to the development of the PKTA assessment tool. By participating in this research study, I may help with the establishment of a much needed tool that may benefit other children in the future.

Costs/Financial Considerations

There will be no costs to me or my child as a result of taking part in this study.

Payment/Reimbursement

Neither my child nor I will be reimbursed for participation in this study.

Questions

I have talked to Ms. Dizon, Ms. Engelhardt, and Ms. Yuson about this study and have had my questions answered. If I have further questions about this study, I may call Ms. Dizon (415)823-

4079, Ms. Engelhardt (209)329-2256, Ms. Yuson (209)814-3483 or Ms. Wilbarger (415)457-4440. If I have any questions or comments about participation in this study, I should first talk with the researchers. If for some reason I do not wish to do this, I may contact the Dominican University of California Institutional Review Board for the Protection of Human Subjects (IRBPHS), which is concerned with protection of volunteers in research projects. I may reach the IRBPHS Office by calling (415)257-0168 and leaving a voicemail message, or FAX at (415)458-3755, or by writing to IRBPHS, Office of Associate Vice President for Academic Affairs, Dominican University of California, 50 Acacia Avenue, San Rafael, CA 95901.

Consent

I have been given a copy of this consent form, signed and dated, to keep.
PARTICIPATION IN RESEARCH IS VOLUNTARY. I am free to decline to have my child be in this study, or to withdraw my child from it at any point. My decision as to whether or not have my child participate in this study will have no influence on my child's present or future status. My signature below indicates that I agree to allow my child to participate in this study.

_____ _____

Signature of Subject's Parent/Guardian Date

_____ _____

Signature of Person Obtaining Consent Date

(Model letter adapted from USF IRBPHS Handbook)

APPENDIX E
BACKGROUND QUESTIONNAIRE

BACKGROUND QUESTIONNAIRE

Date: _____ **ID # _____**

Age of child:_____ Grade in School:_____

Relationship to participant of person completing this form:
_____

Child's Ethnic Background: (circle one)

American Indian or Alaskan Native
Asian or Pacific Islander
Black, not Hispanic
Hispanic
White, not Hispanic
Other or unknown

BIRTH HISTORY

Any complications or difficulties prior to or during birth of the child: Prematurity, fetal distress, long labor, caesarian birth, oxygen required, prolonged hospitalization, injuries or birth defects?

DEVELOPMENTAL MILESTONES

Did the participant achieve the following milestones more or less on time (typically), or were they delayed?

	Age when child first:
Smiled	
Made eye contact	
Walked	
Colored or drew	
Said first word	
Spoke in phrases	
Caught a ball	
Rode a bike	
Read words	
Wrote name	

MEDICAL HISTORY

Please list all medication taken during the last month:

Please describe any chronic or reoccurring illnesses:

Does the child have a history of any of the following?

		If yes, please describe
Allergies (Food or other)	YES NO	
Vision or hearing problems	YES NO	
Physical limitations	YES NO	
Learning or Developmental disorder	YES NO	
Head injury/ loss of consciousness	YES NO	
Seizures or Neurological difficulties	YES NO	
Participation in Special Education	YES NO	

FAMILY/LIVING SITUATION

Who does the child live with?

How many people live in the child's home?

How many people contribute to the child's daily care?

Mother/Caregiver

Occupation _____

Highest level of education (circle one)

Less than 7th grade
Completed 8th or 9th grade
Completed 10th or 11th grade
Graduated from high school
Some college or specialized training
Graduated from four year co

Father/ Caregiver

Occupation _____

Highest level of education (circle one)

Less than 7th grade
Completed 8th or 9th grade
Completed 10th or 11th grade
Graduated from high school
Some college or specialized training
Graduated from four year college or university
Has graduate degree

APPENDIX F
PRESCHOOL KTA- BEFORE TASK

Preschool KTA- Before Task Date: _____
Part A Participant ID # _____ Tester's Initials: _____

Script

(*Read aloud the italicized writing)*

"I'm going to ask you to make a picture from a recipe by yourself. Before we begin I want to ask you a few questions. Answer them the best that you can."

1. [Present a note card with one step of the recipe: word **STOP** and show real timer]

a) Can you read this to me? STOP Yes No Comments:_____
b) How would you follow this instruction? _____
c) Show timer. How do you use this? Comments:_____

2. *Do you do art work*? Yes No

If yes, how? 0- by myself 1- at school 2- at home with *someone* together What do you make?_____	*If no*: Why?_____ _____ 3- I am unable to

3. *Have you ever used a timer before*? Yes No

Comments: _____

4. *Have you ever made a picture of a caterpillar before*? Yes No

Comments: _____

5. *How much help will you need to make the picture?*

0- None
1- A little help
2- Some help
3- A lot of help

Preschool KTA Date: _____
Part B Participant ID # _____ Tester's Initials: _____

Begin task:

"I want you to make a picture all by yourself. Here is the picture that you will make ***[show the first picture of the caterpillar].*** *Follow the recipe book.* [Show the book] *Everything you need is in this box.* [Point to the box] *I am not going to talk to you. Try to do it by yourself. Do you have any questions? You may begin. Let's turn to the first page* ***[turn to first instruction]****"*

Begin timing immediately after stating "You may begin."

APPENDIX G
PRESCHOOL KTA SCORE SHEET

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PRESCHOOL KTA SCORE SHEET

Preschool KTA Score Sheet Date: ___________

Part B Participant ID # __________ Tester's Initials: ____

Task: Caterpillar Art	Independent 0	Verbal Guidance 1	Gesture Guidance 2	Direct Verbal Instructions 3	Physical Assistance 4	Do For Participant 5	Score
INITIATION: *Beginning the task*							
Upon the request to start, subject moves to container to gather materials							
EXECUTION: *Carrying out the activities of the task through the use of organization, sequencing and judgment*							
Plan/Sequencing: *Execution of the following steps in an appropriate order.*							
1. Adding ingredients a. Adding 1 green circle							
b. Adding 1 pink circle							
c. Adding 1 orange circle							
2. Adding antenae							
3. Adding red stamp							
4. Let stamp dry for 1 minute & timer use							
5. Adding blue cloud and eyes/mouth							
7. Cutting the grass and bending it							
Judgment & Safety (Inhibition)- *Avoidance of dangerous situation.* Participant avoids danger, e.g., scissors, glue stick							
COMPLETION: *Termination of the task.*							
Participant knows he/she is finished as demonstrated by stopping at the word **STOP**							

Total Amount of Cues Required: _________ Time: ____________ Total Score: _________

Highest Level of Cue Required: __________ Organization level ___________

APPENDIX H
PRESCHOOL KTA-AFTER TASK

DOMINICAN UNIVERSITY OF CALIFORNIA
PRESCHOOL KTA –AFTER TASK

Preschool KTA- After Task
Date: _____
Part C Participant ID # _____ Tester's Initials:_____

Ask the following questions to the participant:

1. *How much help did you need to make the picture?*

0- None

1- A little help

2- Some help

3- A lot of help

2. *How well do you think that you did in making the picture*?
Excellent Good Fair Poor

3. *Do you think that you could have done something differently?*

No Yes (explain) _____

_____

_____

_____

_____

"Thank you very much for making the picture. I appreciate all of the time and effort that you put into this. You may take the picture home if you would like. Do you have any questions? Thanks again."

Follow up observation of task performance:

_____ 1. Emotional liability:

a) Participant's emotions did not change while performing the task.

b) Participant became upset during the task, but it did not impact task performance.

c) Participant became upset or frustrated during the task and it did impact task performance.

d) Participant had an outburst during the task and was unable to complete the task.

_____ 2. Attention/Problem Solving:

a) Participant was able to change attention during the task, problem solve, and was flexible to change during the task. Could efficiently complete the task.

b) Participant had difficulty changing attention during the task, was inflexible to change and/or had difficulty problem solving, but it did not impact ability to complete the task.

c) Participant had difficulty shifting attention, problem solving, and/or was inflexible with change. Participant was inefficient at performing the task.

d) Participant had difficulty alternating attention, problem solving, and was inflexible to change. Participant was unable to complete the task.

____ 3. Efficiency/Monitoring

a) Participant worked carefully. Did not rush through the activity to get it finished. Participant fixed any mistakes made.

b) Participant worked quickly. Did not check or correct mistakes. The task was still successfully completed.

c) Participant worked quickly and carelessly. Did not check measurements or recipe. Participant did not correct mistakes. This impacted the participant's ability to effectively complete the task.

d) Participant worked quickly and carelessly. Participant did not correct mistakes made while making the picture. The participant was unable to successfully complete the task.

____ 4. Working Memory

a) Participant was able to remember the ingredients, did not have to continually recheck recipe. Was able to follow the steps of the recipe. Was able to complete the task.

b) Participant had difficulty remembering the steps on the recipe. Had to recheck the recipe several times. Participant was still able to complete the task successfully.

c) Participant had difficulty with remembering the information to complete the task. Had to recheck the information several times. Participant did not efficiently complete the task.

d) Participant unable to remember the information to complete the task. Rechecked the recipe several times. Forgot the step that he/she was on. Could not complete the task.

Additional comments:

_____

_____