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Exploring the Utility of the Children's Kitchen Task Assessment for Use with Six-Year-Olds

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Exploring the Utility of the Children's Kitchen Task Assessment for Use with Six-Year-Olds

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Submitted in Partial Fulfillment of the Requirements for the Degree

Masters of Science in Occupational Therapy

School of Health and Natural Sciences

Dominican University of California

San Rafael, California

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This thesis, written under the direction of the candidate's thesis advisor and approved by the Chair of the Master's program, has been presented to and accepted by the Faculty of the Occupational Therapy Department in partial fulfillment of the requirements for the degree of Masters of Occupational Therapy. The content and research methodologies presented in this work represent the work of the candidate alone.

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Abstract

Objective

The Children's Kitchen Task Assessment (CKTA) is an ecologically valid assessment that was designed to assess executive functioning skills in children age 7-10. Currently there is a lack of ecologically valid assessments that test executive functioning in children under seven years of age. For this reason, this study explored the utility of the CKTA for use with six-year-olds.

Methods

This study used an exploratory, qualitative, case study design to facilitate its implementation and used quantitative data to make qualitative inferences about the results.

Children were given the CKTA and the Wechsler Intelligence Scale for Children (WISC-IV Digit Span), a neuropsychological assessment of executive functioning. Parents completed a background questionnaire as well as the Behavior Rating Inventory of Executive Functioning – Parent Form (Parent BRIEF). The children's performance on the CKTA was observed and recorded as a narrative and then compared to their performance on the Parent BRIEF and WISC-IV Digit Span.

Results

Two typically developing female participants, six years of age participated in this study. There were patterns of advantages and disadvantages of using the CKTA with six-year-olds. The advantages included physical ability to perform the task, the task was motivational for participants, and the participants were able to problem solve by using the pictures in the recipe book. Disadvantages included difficulties with reading, fractions and the sand timer. Overall,

researchers found that scores on the neuropsychological tests administered to participants did not correspond with performance scores on the CKTA.

Conclusion

The study found that although the CKTA is a feasible assessment to test executive function in children, it poses some challenges for six-year-olds. Based upon the results obtained from this study, researchers suggest several ways to modify the current CKTA assessment in order for it to be better suited for use with six-year-olds. The ideas for modifications were described and it is noted that these changes would not take away the authenticity of this assessment.

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Introduction

Within the occupational therapy profession, there is a growing need for established ecologically valid assessments that evaluate executive functioning skills in children. Executive functioning skills, such as initiation, organization, sequencing and planning, judgment and safety, and completion either facilitate or inhibit success in daily occupations. As stated by Locke, Hayes, Edwards, and Berg (2008):

Participation in everyday life activities requires executive functioning skills to formulate goals, to plan strategies to achieve those goals, and to self-evaluate during these activities. It is a concept considered to be essential for social and constructive performance required for a productive life, and is vital for the performance and maintenance of occupations across the lifespan (p. 528).

These principles coincide with executive functioning as it applies to children in middle childhood.

Occupational therapists often encounter clients with executive functioning deficits. For this reason, there is need for ecologically valid executive function tests in occupational therapy to guide evaluations of children with diagnoses that are characterized by executive dysfunction. Such diagnoses include ADHD and ASD. There is also a gap in assessment tools for six-year-olds. The recent development of the CKTA will assist occupational therapists in the evaluation of a child, which will in turn help to guide treatment. The CKTA is an ecologically valid assessment that utilizes the task of making play dough to evaluate and observe a child's level of executive functioning skills. The purpose of this study is to explore the utility of the CKTA with use in six- year-olds and explore potential modifications that could be made to the CKTA to be better suited for children this age.

Literature Review

The literature on the subject of executive functioning and ecologically valid assessments is sparse. This literature review will address executive function, describe both the CKTA and a neuropsychological assessment that measures executive functioning skills, address the executive function deficits exhibited by children with ADHD and ASD, and emphasize the importance of occupational therapy in the treatment of these individuals.

Defining Executive Functioning and Its Importance

It is important to understand the components of executive functioning in order to accurately measure a person's abilities. Zelazo, Müller, Frye, & Marcovitch (2003) stated that there are varying interpretations of what comprises executive functioning. Some factors of executive functioning described include problem representation, planning, evaluation, and execution. These factors represent a conceptualization by the authors of executive function as a series of problem-solving processes. Henry and Bettenay (2010) described executive functioning as:

Those skills necessary for purposeful, goal-directed activities required for the successful achievement of complex, higher order cognitive goals, including planning future actions, keeping these plans in mind until executed, problem-solving, self-monitoring to check on progress, mental flexibility and the ability to inhibit irrelevant actions (p. 110).

Rocke, et al. (2008) chose to define executive functioning as "... the skills to formulate goals, to plan strategies to achieve those goals, and to self-evaluate during these activities" (p. 528).

Factors involved in executive functioning.

Due to the complexity of executive functioning, researchers must consider the various factors and sub-factors involved. Although there is no universal agreement of what the essential

nature of executive function is, there are a few generally accepted factors. Such executive functioning factors or skills include initiation, sequencing, planning, self-regulation, problem solving, safety and judgment, completion, attention, and inhibition (see Table 1).

Initiation is the ability to begin a task. Once a child begins a task, planning and sequencing are crucial for guiding the child towards an end goal. Planning and sequencing are two skills that go hand in hand in that planning is the mental organization or mapping of steps required for the completion of a task, while sequencing is the actual execution of steps in the correct order. As an internal process, self-regulation is a skill that is important for enabling appropriate responses to changes in the demands or context of an activity. In addition, the skill of problem solving is the ability to adapt when problems or changes occur. During these changes, and prior to even beginning a step or task, safety must be maintained through good judgment. Safety and judgment are important factors involving the evaluation of dangerous situations. Safety relies heavily upon a child's capacity for attention, or ability to maintain focus, as well as on inhibition, or the ability to suppress impulsive behaviors. Lastly, the skill of completion is the ability to finish a task.

Importance of Examining Executive Functioning in Children

Future benefits of examining executive functioning skills.

There are many benefits to examining the executive functioning skills in both typically and atypically developing children. As stated by Rocke, et al. (2008), "Direct observation of performance in context allows an occupational therapist to view the child's strengths and weaknesses and to identify factors that facilitate or inhibit performance" (p.529). In addition, Rocke, et al., (2008) summarized psychologist Vygotsky's view on executive functioning by stating that "determining cognitive capacity and the level of assistance needed for successful task

completion are essential for the promotion of performance and development in children with cognitive impairments” (pg.529). For occupational therapists, knowing to what degree and why a child is having trouble affects the way in which occupational therapists treat each child. This ability to look at the whole person and adapt treatment to fit them as a unique individual is at the core of the occupational therapy profession. In addition, using direct observation of the child within a realistic, everyday environment will better allow occupational therapists and caregivers to transfer therapy techniques across a variety of environments.

Prediction of a child’s executive functioning abilities as they age.

Executive functioning is an essential element in social and constructive performance throughout the lifespan; therefore, it is important to evaluate how well children’s executive functioning skills progress. A child’s development will continually affect the way he or she uses executive functioning skills across the lifespan. By looking at executive function and its relationship to adaptive functions, Hughes (1998) and Razza and Blair (2009) found that executive functioning is positively related to social competence (Zhou, Chen, & Main, 2012). There is also a positive relationship to academic achievement and school readiness (Zhou, Chen, & Main, 2012). For this reason, evaluation of executive functioning skills in children early in their school years is important for predicting success. This is particularly true of six-year-olds who are entering kindergarten or first grade. This population is either entering or already enrolled in kindergarten or the first grade. Acknowledging the effects and development of executive function in children throughout their school experience will contribute to the development of early intervention programs supplemented by occupational therapy. The focus of occupational therapy includes the restoration of executive functioning skills and education of

teachers and caregivers on various levels of assistance as needed by the child to succeed in their education process and social world.

What executive functioning supports.

When observing a typical child who is developing and advancing in executive functioning, the skills they possess will transfer into adolescence and adulthood. With this knowledge, occupational therapists can better infer through clinical observation how executive functioning skills support other aspects of life, such as social development, science, and arithmetic skills. This knowledge will contribute to an occupational therapist's ability to help build resilience and self-regulation within a developing child. Overall, executive function helps children acquire the skills needed to participate, strive, and survive in the community.

The Importance of Occupational Therapy in Assessing Executive Functioning Deficits

Occupational therapists are often a part of the treatment team that addresses clients and families of clients with ADHD and ASD. As stated by the Occupational Therapy Practice Framework (OTPF; American Occupational Therapy Association, 2008), “supporting health and participation in life through engagement in occupation” (p. 626) is at the core of occupational therapy. Deficits in executive functioning affect all areas of occupation within all contexts of life. Christiansen et al. (2005) identifies occupations as “goal-directed pursuits that typically extend over time, have meaning to the performance, and involve multiple tasks” (American Occupational Therapy Association, 2008 p. 628).

For children with ADHD or ASD, deficits in executive functioning skills such as planning, safety, and cognitive flexibility impact basic activities of daily living (e.g. sequencing and strategy in dressing), instrumental activities of daily living (e.g. maintaining safety in unexpected dangerous situations), education (e.g. problem solving through a workbook), play

exploration (identifying appropriate activities and toy use), leisure exploration (e.g. planning and participating in a balance of leisure activities), and social participation (e.g. making and maintaining friends at school). Assessing a child's executive functioning abilities and deficits are critical in order to design therapeutic interventions that facilitate that child's occupational success in various life environments and occupations.

Disorders Characterized by Deficits in Executive Functioning

This section will present some of the executive functioning deficits seen in children who have ADHD and ASD, more specifically, challenges with planning and safety in children who have ADHD and focus on problems in planning in children with ASD. In addition, the literature highlights these deficits in executive functioning and demonstrates a high need for occupational therapy intervention.

ADHD and planning deficits.

ADHD is characterized by inattention, hyperactivity, and impulsivity (Re, De Franchis, & Cornoldi, 2010). In addition to these defining characteristics, children diagnosed with ADHD lack inhibition, which leads to other executive functioning deficits such as difficulty planning (Geurts, Verte, Oosterlaan, Roeyers, & Sergeant, 2004). Due to their impulsiveness, children with ADHD often do not take the time to analyze or plan out a task or activity (Barkley, 2006). For this reason, children with ADHD have difficulty with the strategic planning of a task (Johnson, Joseph, Reid, & Robert, 2011; Kofman, Gidley, Larson, & Mostofsky, 2008), which involves time management, prioritizing, remaining focused and attentive, anticipating consequences, deconstructing the task, and temporal sequencing (Kofman et al., 2008). Kofman et al. (2008) reported that, in a simple strategy task, children with ADHD were unable to use strategy consistently, even when they had a clear understanding of the task. One study's findings

suggest that after controlling for IQ and age, there is a significant correlation between working memory and planning in preschool aged children with ADHD (Sonuga-Barke, Dalen, Daley, & Remington, 2002).

ADHD and deficits in safety management.

In addition to poor planning skills, a lack of inhibition negatively influences the safety component of executive functioning by placing children with ADHD at higher risk for injury.

As reported by Bruce, Ungar, and Washubusch (2009), participants (ages 10-12) diagnosed with ADHD expressed overestimation of their physical abilities, high levels of intentional risk taking, and heightened disregard for negative consequences. In a study by Byrne, Bawden, Beattie, and DeWolfe (2003), researchers investigated preschoolers' risk of injury, the thoughts that they had that increased their risk of injury, as well as the number of actual injuries in preschoolers with ADHD. Parent completion of the Injury Behavior Checklist (Speltz, Conzales, Sulzbacker, & Quan, 1990) in this study, yielded 58.3% of participants with ADHD as demonstrating behavior correlated with risk of a physical injury (Byrne et al., 2003). In addition, 86% of the preschoolers with ADHD had significant difficulty with attention and concentration during daily routines, which may contribute to increased risk of injury (Byrne et al., 2003). In accordance with the previously mentioned studies, Clancy, Rucklidge, and Owen (2006) reported that adolescents with ADHD exhibited poor safety behaviors. More specifically, 40% of road crossings done in virtual reality were low on the safety margin and implied increased risk of injury in traffic environments in comparison to typically developing peers (Clancy et al., 2006).

ASD and planning deficits.

As with ADHD, executive functioning deficits are a common characteristic of autism (Geurts et al., 2004). Among one of the ASD population's most prevalent problems in executive

functioning is an impaired ability to plan. With use of the Tower of London (ToL; Krikorian, Bartok, & Gray, 1994) to assess planning, Geurts et al. (2004) reported significant evidence that children with high functioning autism (HFA) need more execution time with increasing difficulty of tasks in order to attain the same score as children in the control group. In support of this finding, Sinzig, Morsch, Bruning, Schmidt, and Lehmkuhl (2008) reported that planning difficulties seen in children with ASD might be due to speed rather than comprehension of the task. Another possible explanation, presented by Turner (1999), may be that stereotyped behavior (e.g. finger flapping or body rocking) causes executive dysfunction in planning capabilities and inhibits generativity of appropriate goals and sequencing of actions (Sayers, Oliver, Ruddick, & Wallis, 2011). This in turn contributes to a low level of spontaneity and creativity in use of time or objects (Sayers et al., 2011).

Ecologically Valid Assessments & Neuropsychological Tests

Ecologically valid assessments.

As stated by Schmuckler (2001), ecological validity is the ability to “generalize from observed behavior in the laboratory to natural behavior in the world” (p. 419). Therefore, in pediatric occupational therapy, ecological assessments examine and record the physical, social, and psychological features of a child’s developmental context (Case-Smith & O’Brien, 2010). Ecological assessments also examine the interaction among the child and their physical and social environments (Case-Smith & O’Brien, 2010). In addition, ecological assessments consider cultural influences, socioeconomic status, the value system of the child’s family, physical demands, and social expectations of the child’s environment (Case-Smith & O’Brien, 2010).

Neuropsychological tests.

Neuropsychological tests help support and increase the validity of the CKTA in estimating levels of executive functioning skills in children. One neuropsychological test used in conjunction with the CKTA is the Wechsler Intelligence Scale for Children IV (WISC-IV) Digit Span, which assesses a child's working memory. Another neuropsychological test used was the Behavior Rating Inventory of Executive Functioning-Parent form (Parent BRIEF), which is a questionnaire designed for parents to report on their child's behaviors and executive functioning at home.

Ecological assessments and occupational therapy.

The occupational therapy profession views clients as contributing beings of society. In addition, occupational therapists view clients from a functional and holistic standpoint. Ecological assessments, such as the CKTA, are beneficial to occupational therapists, for they assess patients in "real life environments" and contexts that are representative of real life tasks. Assessing clients in their natural, or close to natural environment, allows occupational therapists to better treat their patients in a holistic manner. Ecological assessments are also activity-based and include activities that the patient would typically engage in. For example, the CKTA consists of making play dough, an item many six-year-olds enjoy playing with.

To better understand executive functioning in middle-aged children, researchers must establish and evaluate more ecologically valid assessments such as the CKTA, which resemble a natural environment. By increasing the validity and reliability of ecological assessments, occupational therapists will be able to use these assessments with children who have various developmental delays and conditions such as ADHD and ASD. Whether a child is typically or atypically developing, ecological assessments are beneficial to occupational therapists and their

patients. Although the profession will greatly benefit from using and creating more ecological assessments, more research is necessary in order to make these assessments more generalizable to typically and atypically developing children.

Statement of Purpose

The purpose of this study was to explore the utility of the Children's Kitchen Task Assessment (CKTA), an ecologically valid assessment that evaluates executive functioning, for use with six-year-olds. The researchers looked at patterns of performance on the Children's Kitchen Task Assessment and neuropsychological tests that also evaluate executive functioning skills. The study was guided by the following questions: How do 6 year olds perform on the CKTA? Is the CKTA appropriate for use with six-year-olds? In what ways can the CKTA be modified in order to be better suited for six-year-olds?

Theoretical Framework

The Person-Environment-Occupation (PEO) model, accompanied by various developmental theories, makes up the framework that guided the research on the CKTA.

Person-Environment-Occupation Model

The PEO model looks at occupational performance from an ecological standpoint (Law & Dunbar, 2007). The three major components of the model (person, environment, and occupation) are always changing and interacting with one another to produce an occupational performance unique to each situation, which is also known as the "best fit". The person component is comprised of physical, emotional, cognitive, and spiritual characteristics (Law et al., 1996) and includes a person's skills and abilities (Law & Dunbar, 2007). The environment includes "contexts and situations which occur outside the individual and elicit responses from them" (Law, 1991, p. 175). Lastly, occupations are the purposeful and meaningful activities or

tasks that a person engages in (Law & Dunbar, 2007). These three components come together to determine the quality of occupational performance. The more these components overlap, the greater the chance that a person's occupational performance will be successful (Strong et al., 1999). For example, a child's chance of succeeding at the CKTA increases when they are motivated to make play dough, are in an organized environment, and have all of the necessary equipment needed to make play dough. This is due to the optimal fit or overlap between the environment, person and task components.

This research aimed to explore the utility of the CKTA in assessing executive functions in children six- years- old, which is consistent with occupational therapy practice. Therefore, ecologically valid assessments allow occupational therapists to explore a person's performance of a task that is consistent with their expected occupational performance in daily life.

Occupational therapists in pediatric settings use ecologically valid assessments to evaluate a child's occupational performance within a natural environment. Following directions on the CKTA to make play dough is similar to following a basic recipe in the kitchen to make cookies. The occupational therapist assumes that the child's strength and weaknesses in the natural environment affect occupational performance within the child's daily life. An assessment that is ecologically valid is ideal for determining the fit among a person, their environment, and their occupation. Evaluation of these three components assists occupational therapists in assessing a child's barriers and strengths to successful occupational performance (Law & Dunbar, 2007). Such barriers include poor executive functioning, as measured by the CKTA. Overall, the PEO model provides a holistic approach to the assessment and treatment, and its relation to everyday contexts (Law & Dunbar, 2007).

Developmental Theories

Developmental psychologists such as Piaget and Vygotsky proposed valuable cognitive aspects of development that impact a child's level of executive functioning. From a developmental point of view, the various subsets involved in the development of executive functioning skills in children, such as volitional attentional control, or executive attention, underlies the changes of executive function between 2 and 6 years of age (Conway & Stifter, 2012). Occupational therapists must consider motivation in order to assess and understand executive functions in children from a developmental standpoint. As Vygotsky (1978) stated, control of volition involves the ability to create psychological distance from the pull of the stimulus or the immediate reward. In this study of the CKTA, this would represent the outcome of having play dough to play with, which includes the intrinsic, motivational factor of making something and being able to keep it in the end. Furthermore, there are individual differences in motivation and sensitivity to discomfort or reward when looking at younger children. This has a large impact on the child's ability to delay, hold information in mind, and generate alternative behaviors. In relation to the study, this information would relate to the concept of problem solving within executive functioning.

Among the most wide spread of developmental theories is Jean Piaget's cognitive stages of development. He theorized that children pass through four hierarchical stages of cognitive development: (1) sensorimotor (ages 0-2), (2) preoperational (ages 2-6), (3) concrete operational (ages 7-12), and (4) formal operational (ages 12 and up) (Mitchell, 1992). Piaget explained that each stage was a required building block to reaching the next stage (Mitchell, 1992). Each age range is approximated and therefore, cognitive development is unique to each child. For this reason, six-year-old CKTA participants most likely fall in either the preoperational or concrete

operational stages of development. The preoperational stage is characterized by the development of pretend play, egocentrism, the use of symbols to represent objects, and an inability to reason logically (Mitchell, 1992). In the concrete operational stage, a child can solve real problems and justify their answers using logic (Mitchell, 1992). A child's ability or inability to use logic for performing executive functions such as problem solving, judgment and safety, as well as planning and sequencing, invariably affected that child's performance on the CKTA.

Key Features of Development

There are four key features of development that are important as the basis for healthy human development: (1) age-related patterns of competence and disorder, (2) multiple contexts, (3) developmental tasks, and (4) interactions among biological, psychological, and social factors (O'Connell, Boat, & Warner, 2001, p. 72).

Age-related patterns of competence and disorder.

From the date of conception until age five, children develop at a pace greater than any other age in their lifetime (O'Connell et al., 2001, p. 72). This age range is crucial for healthy development in age-related changes in cognitive, emotional, and behavioral abilities (O'Connell et al., 2001, p. 72). "Developmental competencies established in one stage of a young person's life course establish the foundation for future competencies" (O'Connell et al., 2001, p. 72). This theory mirrors Piaget's theory of cognitive stages of development and is imperative when administering the CKTA, in that the scores on the CKTA will assist in predicting the child's executive functioning abilities in the future.

Multiple contexts.

Human beings develop in multiple contexts, whether it be at home, school, one's own neighborhood, or the larger community. Therefore, assessments and interventions may occur in

various settings and different contexts, which may in turn affect behavioral development (O'Connell et al., 2001, p. 73).

Developmental task.

There are specific expectations for behavior in any given social context, which professionals refer to as social task demands or developmental tasks (O'Connell et al., 2001, p. 73). The developmental tasks expected from an individual change during the different phases of his or her life, and they may differ depending on the individual's client factors, such as culture and gender (O'Connell et al., 2001, p. 74). The developmental task demands for the CKTA are typical for a typically developing six-year-old.

Interactions among biological, psychological, and social factors.

The way in which individuals develop is the result of complex interactions among biological processes, psychological processes, and multiple levels of social contexts (O'Connell et al., 2001, p. 74). Therefore, a combination of the aspects of the PEO model and numerous developmental theories will allow occupational therapists to better understand the child's executive functioning skills and actions in a more holistic manner.

Methodology

Design

This study explored the utility of the Children's Kitchen Task Assessment, a performance-based assessment of executive function, for use with six-year-olds. This study used an exploratory, qualitative case study design.

Participants

The participants in this study consisted of two female, six-year old children and their caregiver(s), they were recruited by flyers placed into the community and through e-mails sent

out to faculty and staff working at Dominican University of California. Flyers were posted around local shopping centers (Trader Joe's and Whole Foods) in San Rafael, California. The researchers also sent out emails to Dominican University faculty members. Both the email and flyer accurately proposed the study and contact information. Interested parties emailed a group email account or called the CKTA thesis advisor. Inclusion criteria for this sample consisted of typically developing six-year-old children. Exclusion criteria included any diagnoses that affected executive functioning and any age below six years old.

Measures

Children's Kitchen Task Assessment.

The Children's Kitchen Task Assessment (CKTA) is a performance-based assessment of executive functions in children ages six and older. It utilizes "a safe, age-appropriate, and goal-directed activity for children," of making play dough (Schoolmeesters & Wilbarger, 2011). Through this activity, occupational therapists determine the cognitive capacity of a child and the level of assistance that the child needs in order to complete the task (Rocke et al., 2008).

The CKTA measures executive functions in the following areas: initiation, organization, planning and sequencing, judgment and safety, and completion (Schoolmeesters & Wilbarger, 2011; Rocke et al., 2008). The amount and types of cues the child received to complete the activity affected the scoring on the CKTA (see Table 2). In total, there were 15 possible steps for the child to complete and five possible levels of cueing. Each cue is given twice prior to moving to the next level of cueing. Each level of cue has a higher point value score (See Appendix I). Therefore, higher scores indicated lower levels of executive functioning.

Wechsler Intelligence Scale for Children- IV, Digit Span.

The WISC-IV Digit Span (Wechsler, 2003) measures a child's working memory. The child reads a series of numbers and repeats them. The amount of numbers in a series increases until the child can no longer repeat the sequence back correctly. Afterward, the child does the same thing; however, they must recite the numbers backwards.

Behavior Rating Inventory of Executive Function (parent form).

In addition to the neuropsychological tests that the children are assessed with, another measure is used with the child's parent or guardian. The Behavior Rating Inventory of Executive Function (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000) is a questionnaire developed for parents of school-age children. It is designed with 86 items that are used to assess the child's behavior and executive function at home. Behavior includes the child's ability to control impulses, move freely from one situation to the next, modulate responses, and anticipate future events.

The normative data for this assessment is based off of 1,419 parent BRIEFs and children with developmental disorders or acquired neurological disorders. The assessment has high internal consistency ($\alpha = .80-.98$) and test-retest reliability ($r_s = .82$).

Procedures

Primary caregivers completed a demographic questionnaire focusing on the child's history of medical conditions, possible developmental disabilities, and other factors that may impact the child's level of executive functioning.

This study was approved by Dominican University of California's Institutional Review Board. In addition, all primary caregivers and participants provided informed consent or assent prior to testing. Occupational therapy undergraduate and graduate students were adequately

trained in the administration of all assessments, and were required to achieve a 90% or greater inter-rater reliability on the CKTA total scores before they were allowed to administer the test to the child participants.

All participants were invited to the Albertus Magnus building on the Dominican University of California campus and took the tests in a private and quiet environment. Delivered in no specific order, administration of the WISC IV Digit Span and the CKTA took less than one hour per child. In addition, the child's primary caregiver completed the Parent BRIEF and a demographic questionnaire during the testing session.

Data Analysis

The researchers created narratives for each child's performance on the CKTA. Also, a visual analysis of the patterns of cues for each child were incorporated into the case study (see Table 3). In addition, the researchers reported on each child's scores on the Parent BRIEF form. Analysis of the patterns of performance revealed several themes related to the advantages and disadvantages of using the assessment with children under the age of seven.

Results

Participant 1

M.J is a six-year-old Caucasian female. At the time of the study she was enrolled in 1st grade and lived with both parents and her older brother. Both parents graduated from a four-year college or university. According to her mother's answers on the background questionnaire, M.J. has no birth history of complications or difficulties, and has met her developmental milestones early or on time. M.J. did not take medication or have a chronic or recurring illness.

Although M.J. performed well on the CKTA, some of her scores on the BRIEF Parent Form suggest challenges with executive functioning (see Table 4). Higher scores and percentiles

on the BRIEF indicate a greater likelihood of problems with executive functioning (Gioia, Isquith, Guy, & Kenworthy, 2000). During the WISC-IV Digit Span, M.J. did well with reciting digits forward. A strategy she used was mimicking the researcher's tone of voice when reciting the numbers back to her. Her digits forward score was a 9 out of 16 and her digits backward score was 2 out of 14.

Strengths.

Prior to beginning the task of making play dough, M.J. expressed her excitement for the activity by telling the researcher that she could not wait to get started. She also appeared extrinsically motivated by the fact that she was able to take the play dough home after she completed the task. During the actual task of making play dough, M.J. did not require any cueing for the following steps: mix dry ingredients together, add food coloring (3 drops), add water to dry ingredients, let play dough sit for 1 minute & timer use, let play dough sit for 1 minute and timer use, mix together with hands, avoidance of dangerous situation, and placing the play dough in the bag. In fact, even before turning to the page that instructed her to mix the ingredients together with her hands, she stated, "I'm guessing I'll have to mix this all together with my hands." In addition, M.J. required only one cue for the following steps: adding oil into a bowl (1 ½ tsp), measure water (1/2 c.), and heat water in microwave (1 minute).

Weaknesses.

During the Before Task of the CKTA, M.J. stated that she had never used a microwave before, although she does help her mother bake sometimes. She also predicted that she would need some help with the activity. She specifically said that she would need help with reading the directions. In total, M.J. required 15 cues to complete the task of making play dough. The majority of these cues were verbal cues. Three cues were gesture guidance and one was direct

verbal instructions. M.J. had the most difficulty with reading and fractions. For example, if she saw the fraction $\frac{1}{2}$, she would read it as “one-two.” In addition, she did not know abbreviations such as tsp. and c. Even with pictures provided in the book, she would first turn to the researcher and ask for help. Although M.J. had a few difficulties, she was successfully able to complete the task and was very pleased with her play dough in the end.

Participant 2

C.T. is also a six-year-old Caucasian female. She was in the first grade and lived with her two parents and younger brother at the time of the study. Both parents have some college education or specialized training. According to the background questionnaire, C.T. was born via a cesarean section after two days of labor and showed signs of fetal distress. C.T. has met all her developmental milestones early or on time. C.T. does not take any medications or have a chronic or recurring illness.

Scores on C.T.’s BRIEF Parent Form suggest that she is typical in her executive functioning skills (see Table 5). During the WISC-IV Digit Span, C.T. received a score of 5 out of 16 on the digits forward score and a 2 out of 14 on the digits backwards score.

Strengths.

C.T. entered the room very motivated and excited to make play dough. She had made play dough once before and therefore knew that it was going to be a fun task. Before beginning, she made sure to ask about color choices and had no reservations when choosing the bright neon pink food coloring that was available during the assessment. C.T. needed no cueing in order to initiate the task, nor did she require any help to complete the planning/sequencing tasks of adding the cream of tartar into the bowl (1 $\frac{1}{2}$ tsp.), adding oil into the bowl (1 $\frac{1}{2}$ tsp.), mixing the dry ingredients together, and adding water ($\frac{1}{2}$ c.) into the dry ingredients. She also used proper

judgment and safety throughout the task without needing to be cued to do so. In addition to completing the previously stated steps independently, C.T. only required one cue in the form of verbal assistance in order to complete the following steps: add flour to the bowl (1 c.), add salt to the bowl (1/4 c.), add food coloring to the water (3 drops), and heat the water in the microwave (1 minute).

Weaknesses.

When going through the CKTA Before-Task Questionnaire, C.T. stated that she sometimes cooked cake at home but needed someone to tell her what to do. She had never used a microwave and predicted that she would need “a lot of help” to make the play dough. In total, C.T. required 21 cues in order to complete the task. A combined total of 12 cues (six each) were given when she was measuring water (1/2 c.) and when it came time to use the timer to let the play dough sit (1 minute). While measuring the water, C.T. both over filled and under filled the cup while repeatedly asking the test administrator if she had the right amount of water. C.T. also had trouble remembering to use the timer when it came time to let the play dough sit, and was overall confused on how to use the timer properly. Both steps required one level 3 cueing each, or direct verbal instructions.

Overall, most of the issues C.T. had during the CKTA were brought about by difficulties with reading the directions, comprehending the written fractions, and using the timer. C.T. had to sound out the words in the instructions and was unsure of her reading abilities. For this reason, she often used the pictures to guide her. The fractions posed a problem as well but C.T. problem solved on most occasions by referring back to the picture in the direction booklet. In addition to reading and difficulty with fractions, C.T. was not sure about how to use the small sand timer and forgot to use it when it was called for. Although she went through the majority of

the CKTA steps quickly, she insisted on playing with the play dough prior to following the directions and mixing the play dough ingredients together with her hands. This part of the assessment stretched her overall CKTA time from what would have been around 25 minutes to a recorded 35 minutes and 13 seconds. The test administrator should have continued with the cueing levels up to direct verbal instructions in order to direct her back to the task and minimize her overall time.

Themes Corresponding to Disadvantages of Using the CKTA with Six-Year-Olds

Reading.

Both Children had difficulty reading the written directions in the CKTA instruction booklet. Both participants attempted to read the instructions aloud by sounding out each word but were often incorrect or unable to sound out the whole word.

Fractions.

Neither of the six-year-olds were able to interpret the written fractions in the instruction booklet. Some steps in the booklet called for measurements that incorporated the use of two different tablespoons in order to achieve the correct amount of ingredients. Such steps proved difficult for the participants.

Sand timer.

Both children had difficulty identifying the small sand timer and using it correctly without cues.

Themes Corresponding to Advantages of using the CKTA with Six-Year-Olds

Physical abilities to complete CKTA.

The activity of making play dough contained the right amount of challenge within it to keep the participants engaged but was not too challenging to result in any inability to physically

complete the task. Both participants were able to complete all of the physical components of the tasks.

Motivational task.

The task of making play dough was both age appropriate and fun. It kept the participants engaged throughout the entirety of the assessment. Having a finished product that they could take home was very motivational for participants of this age group.

Problem solving using pictures in place of words.

Both participants used the skill of interpreting the pictures in the recipe book to follow through with directions that they could not fully read or understand when in writing.

Relationship between Assessment Scores

After observing the two participants and obtaining information from the Parent BRIEF forms and WISC-IV Digit Span, researchers found that there was no correspondence between the two neuropsychological tests and performance on the CKTA.

Discussion

In examining two qualitative cases of six-year-old participants, several themes emerged both as strengths and as weaknesses. The positive attributes were that the children liked the activity, it was highly motivating and engaging for them, they were physically capable of carrying out the activity independently, and it was a useful tool for gathering information about how they are functioning in terms of executive functioning skills. Six-year-olds participating in the CKTA gave researchers information about how well they were able to implement their initiation, planning and sequencing, safety and good judgment, and completion skills.

There were also challenges and concerns that arose while conducting the assessment. One of these challenges was with reading the written instructions in the recipe book. Children

who six-years-old are still are developing their reading comprehension skills in school; therefore, the participants struggled with reading many words. Trouble with the written directions resulted in the children's use of pictures as their primary source of instruction. Another challenge was the participants' difficulty with identifying and interpreting measurements that included fractions. Six-year-olds have not yet addressed fractions in 1st grade. The third challenge that arose was difficulty with identifying and correctly using the sand timer. This may be because sand timers are not often included in games or found in households in today's society.

Therefore, it may be generationally inappropriate to include the sand timer without previous demonstration in the CKTA when assessing six-year-olds.

Given the weight of advantages versus disadvantages, the CKTA has proved beneficial in examining executive functioning skills in children under the age of seven. Reasons for its utility with six-year-olds include its foundation as an ecologically valid assessment and its use of an age-appropriate and motivational task. In addition, typically developing six-year-olds are both physically capable of performing all of the components within the CKTA, and they are mentally capable of problem solving by using the recipe booklet pictures as a guide. Although there are challenges to using the CKTA with six-year-olds, there are potential modifications that may make it better for use with children under the age of seven.

Implications for Future Research

Some simple changes to future versions of the CKTA may include modifications concerned with re-designing the layout of the instructional recipe book. One of these modifications may include updating the measuring materials and ingredient brands to those that children see regularly in their homes and local stores. In addition to updating the materials, another proposed modification to the CKTA booklet includes simplifying the pictorial

instructions. For example, the recipe card could show a picture of the measuring items (e.g. 1 teaspoon, $\frac{1}{2}$ teaspoon), using an addition or plus sign to demonstrate that both items are needed for the task. These are familiar symbols that first graders use in the classroom. The pictured instruction could then include a picture of the ingredient needed (e.g. cream of tartar). An arched arrow will direct the child to use the measuring items to scoop up the ingredient. The use of familiar signs and symbols within the directions may potentially increase participant's understanding of the instructions in that it addresses the issues of readability and clarity within the CKTA for six-year-olds.

Another area of modification to the CKTA would be to address the challenges with using a sand timer with six-year-olds. One suggestion would be to switch the sand timer to a digital timer. A digital timer would be more generationally appropriate and consistent with what most families use in their homes today. A second option would be to include a participant training on the sand timer prior to beginning the CKTA. Researchers would explain what the sand timer is and how to use it. This adaptation would be similar to the portion of the assessment introduction where the examiner shows the participant how to turn the dial microwave in order to heat the water for the play dough.

The last change that could potentially help to support the use of the CKTA's with six-year-olds would be to adapt the entire recipe book to fit in with today's trends with technology. This particular modification would be intricate but it is still very much achievable. The foundation for this idea begins with using an interactive touch and motion sensor screen instead of the traditional spiral bound recipe book. Researchers could transform each instructional page and picture of the current recipe book into an electronic application that uses the swiping finger motion and touch screen as used on an iPad or smart phone has. Such applications and motions

are very familiar to kids of this age and generation. The application could be easily constructed using a basic application generator online. This modern substitution for the traditional recipe book would still use the same format of the current recipe book but add in an element that is both engaging and motivating to six-year-olds. Although the recipe would be converted into an application, the child would still be responsible for completing each physical action associated with the instructions. Overall, making the recipe book into an application also does not take away from the authenticity of the CKTA itself. The assessment would still accurately test participants executive function skills and would remain ecologically valid while adding in an element of generational progression, consistent with what today's society uses on a regular basis.

Conclusion

The purpose of this study was to explore the advantages and disadvantages of using the CKTA with children six years of age and utilizing the results to identify potential modifications of the assessment.

After examining the results and themes generated by the performance of the participants, researchers concluded that although the CKTA is a feasible assessment to test executive function in children, it poses some challenges for six-year-olds. The researchers identified these challenges as having difficulties with reading, fractions and using the sand timer. After observing these challenges, researchers suggested several ways in which to modify the current CKTA so it better suits six-year-olds.

The ideas for modifications relate to simplifying the existing recipe book in terms of the pictorial instructions, as well as the possibility of converting the recipe book into an application that could be accessed on a tablet or smartphone device. Researchers believe that these simple modifications would make the CKTA more age and generationally appropriate. In addition,

converting the recipe book into an application incorporates an intriguing element of technology within the assessment that tailors to how the current generation interprets real life tasks such as following a recipe to make play dough.

Limitations

The primary limitation of the study was a small sample size consisting of only two participants. In addition, both of the participants were female and of Caucasian ethnicity. For this reason, the results cannot be generalized to male 6-year-olds or children of other ethnicities. Another limitation of the study was that each female participant had a different examiner. Although the examiners achieved a 90% or greater inter-rater reliability prior to administering the CKTA, there may have been some variation in the presentation of the CKTA to each child.

Implications for Occupational Therapy

Although the CKTA is an ecologically valid assessment for children, the researchers found that it was not sensitive in assessing executive functioning with the two six-year-old participants involved in this study. Young children are participating in everyday activities that involve executive functioning skills such as initiation, sequencing, planning, self-regulation, problem solving, safety and judgment, attention, and completion. Populations in which occupational therapists often see executive dysfunction include children with autism and ADHD. Assessing a child's executive functioning is critical in order to design and implement effective therapeutic interventions that address executive dysfunction. In addition, an ecologically valid assessment takes into account a child's natural environment, which assists occupational therapists in facilitating client success in all life occupations.

In conclusion, the researchers found themes of advantages and disadvantages of using the CKTA with six-year-olds. From these themes emerged potential modifications to better suit

utilization of the CKTA with this age group. Researchers also found that scores on the neuropsychological tests administered to both participants did not correspond to their performance on the CKTA. Further research with a larger sample size is needed in order to continue exploring the utility of the CKTA for use with six-year-olds.

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FUN RESEARCH PROJECT FOR CHILDREN!!!



Children ages 6 are needed to participate in research on an assessment of children's thinking and problem solving skills



Children will **LEARN HOW TO MAKE PLAY DOUGH** while we explore their "doing and thinking" skills



Participation will take approximately 30-40 minutes

**Dominican University of California, Occupational Therapy
Department**



Approved by the Dominican University of California Institutional Review Board

For more information contact:



CKTAtthesis@gmail.com

**DOMINICAN UNIVERSITY of CALIFORNIA
PROXY CONSENT FOR RESEARCH PARTICIPATION**

Purpose and Background:

Alexandra Rodriguez, Charisa Kelly, and Vanessa Mae Carzon, graduate students in the Department of Occupational Therapy at Dominican University of California, are conducting a research study designed to look at a new assessment of thinking and problem solving skills: The Children's Kitchen Task Assessment.

The overall purpose of this research is to understand the usefulness of The Children's Kitchen Task Assessment (CKTA). This assessment tool examines a child's ability to initiate, organize, plan, and sequence a kid friendly activity. Scores reflect the quality of the task completion and the level of assistance needed to accomplish the task. Children's performance on the CKTA will be compared to their performance on the Digit Span subtest of the Wechsler Intelligence Scale for Children (WISC-IV), a neuropsychological assessment of thinking skills. Parent's role in this study is to provide information about the children's past and current developmental, medical, and behavioral history.

My child is being asked to participate because he/she is 6 years of age.

My child will participate at Dominican University of California.

Procedures:

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

1. My child will be observed in a classroom setting while he/she makes play dough by following a step by step instructional picture book. This task will take approximately 30 to 40 minutes.
2. My child will participate in the Digit Span subtest of the Wechsler Intelligence Scale for Children (WISC-IV). During this test the child reads a series of numbers and repeats them. The length of the series increases until the child can no longer repeat the sequence back correctly. Afterward, the child does the same thing; however they must recite the numbers backwards. This process may take approximately 5 minutes.

Risks and/or Discomforts:

1. My child may become frustrated during the assessment period. If this happens, the researchers will attempt to comfort my child. If my child continues to be frustrated, the researchers will return my child to me in the waiting room.
2. My child may be at risk of burning him or herself when handling hot water needed for the recipe. In the event that this accident may occur, proper first aid procedures will be implemented.
3. Study records will be kept as confidential as is possible. No individual identities will be used in any reports or publications resulting from the study. All personal references and identifying information will be eliminated when the data are recorded, and all subjects will be identified by numerical code only, thereby assuring confidentiality regarding the subject's results. The master list for these codes will be kept by the researchers in a locked file, separate from the other records. Only the researchers, their faculty advisor, and research assistants will see the data.

DOMINICAN UNIVERSITY of CALIFORNIA

CONSENT TO BE A RESEARCH SUBJECT

Purpose and Background:

Alexandra Rodriguez, Charisa Kelly, and Vanessa Mae Carzon, graduate students in the Department of Occupational Therapy at Dominican University of California, are conducting a research study designed to look at a new assessment of thinking and problem solving skills: The Children's Kitchen Task Assessment.

The overall purpose of this research is to understand the usefulness of The Children's Kitchen Task Assessment (CKTA). This assessment tool examines a child's ability to initiate, organize, plan, and sequence a kid friendly activity. Scores reflect the quality of the task completion and the level of assistance needed to accomplish the task. Children's performance on the CKTA will be compared to their performance on the Digit Span subtest of the Wechsler Intelligence Scale for Children (WISC-IV), a neuropsychological assessment of thinking skills. Parent's role in this study is to provide information about the children's past and current developmental, medical, and behavioral history.

I am being asked to participate in this study because I am a parent of a six-year-old child.

Your child will participate in this project at Dominican University of California.

Procedures:

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

I will be asked to complete a background information questionnaire about my child's developmental and medical history, my education and current occupation. It will take about 10 minutes to complete this form. I will complete the Behavior Rating Inventory of Executive Function (BRIEF) which; asks questions about behaviors such as attention and self-control like: does your child "act wilder or sillier than other in a group" "need help to stay on task" or "is impulsive". It will take about 20 minutes to complete this form. I am encouraged to answer all of the questions but may omit any items that I do not want to answer.

Risks and/or Discomforts:

1. I understand that my participation involves minimal to no physical risk, but may involve some psychological discomfort, given the nature of the questions being asked on the Parent BRIEF.
2. I will be discussing topics of a personal nature and I may refuse to answer any question that causes me distress or seems an invasion of my privacy. I may elect to stop participating before or after the study is started without any adverse effects.
3. Study records will be kept as confidential as is possible. No individual identities will be used in any reports or publications resulting from the study. All personal references and identifying information will be eliminated when the data are recorded, and all subjects will be identified by numerical code only, thereby assuring confidentiality regarding the subject's results. The master list for these codes will be kept by the researchers in a locked file,

separate from the other records. Only the researchers, their faculty adviser, and research assistants will see the data.

One year after the completion of the research, all written and recorded materials will be destroyed.

Benefits:

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

Cost/Financial Considerations:

There will be no cost 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 the student researchers about this study and have had my questions answered. If I have further questions about the study, I may contact them at CKTAtesis@gmail.com or their research supervisor, Julia Wilbarger, PhD, OTR/L, Occupational Therapy Department, Dominican University of California (415-257-0125).

If I have any questions or comments about participation in this study, I should talk first with the research team 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.

SUBJECT'S SIGNATURE

DATE

SIGNATURE OF RESEARCHER

DATE

Child Assent

Title of the Study: Children's Kitchen Task Assessment Project
Student Researchers: Alexandra Rodriguez, Charisa Kelly, and Vanessa Mae Carzon
Principal Investigator: Julia L Wilbarger, Ph.D., OTR
Phone: 415-257-0125; **E-mail:** julia.wilbarger@dominican.edu

You are being asked to be in a research study about thinking skills. If you say yes, you will do two different things. You will work for about an hour. You can take breaks if you need them. Some of the questions might be hard, but just do the best you can. You won't be given a grade.

Today you will:

Make play dough: You will follow a recipe with pictures and words to make play dough. You should try to follow the directions by yourself. We will give you help if you need it. You will be able to keep the play dough that you make.

Number game: We will say some numbers. Then you say the numbers back. Each time we will say more numbers until it is too hard to remember them. Then we say some numbers and you have to say them in a backwards order.

Being in this study will not help you, but may help us learn better ways to test problem solving skills in children.

You can decide NOT to be in this study and you can choose to stop at any time.

_____ has talked to me and answered all of my questions. I agree to be in this study.

Name _____ I am _____ years old.

Signature _____ Date _____

I have described this study and explained the risks and benefits in language that is understandable to the child. I believe the child understood and has assented to participate in the study.

Signature of Investigator or Person Obtaining Consent

Date

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?

	YES	NO	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 college or university
- Has graduate degree

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

Children's KTA – Before Task

Date: _____

Part A

Participant ID # _____ Tester's Initials: _____

Script*(Read aloud the italicized writing)*

"During this activity, I'm going to ask you to make some play dough 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]

a) *Can you read this to me?* Yes No Comments: _____b) *How would you follow this instruction?* _____2. *Do you cook?* Yes No

<p><i>If yes, how?</i></p> <p>0- by myself</p> <p>1- Someone <i>tells</i> me what to do when I cook</p> <p>2- I cook with <i>someone</i> together</p> <p>What do you cook? _____</p> <p>_____</p>	<p><i>If no, why?</i> _____</p> <p>_____</p> <p>3- I am unable to</p>
---	---

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

Comments: _____

4. *Have you ever made play dough before?* Yes No

Comments: _____

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

0- None

1- A little help

2- Some help

3- A lot of help

Children's KTA – Before Task

Date: _____

Part B

Participant ID # _____ Tester's Initials: _____

Begin task:

"Like I said earlier, I want you to make play dough by yourself. Therefore, I am not going to talk to you very much. If you have a problem, try to solve it by yourself. Follow the directions in this the recipe book. [Point at the book] The recipe book has both words and pictures. Be sure to look at both. The supplies and ingredients to make play dough are in this box. [Point at the box] The water is in the faucet. [Point at the water faucet] This is how you turn it on and off. [Demonstrate turning the water faucet on and off] The microwave is on the counter. [Point out the microwave] To turn it on, you turn the dial like this and when it is done, it makes a dinging noise. [Demonstrate turning the microwave on and turning it off to make the dinging noise] Do you have any questions? You may begin when you are ready. "

****Begin timing immediately after stating "You may begin when you are ready."****

Children's KTA - Score Sheet
Part B

Date: _____
Tester's Initials: _____

Participant ID # _____

Task: Play Dough	Independent 0	Verbal Guidance 1	Gestural Guidance 2	Direct Verbal Instructions 3	Physical Assistance 4	Do For Participant 5	Score	Notes
INITIATION: Beginning the task								
Upon the request to start, subject moves to container to gather materials/recipe for making play dough.								
EXECUTION: Carrying out the activities of the task through the use of organization, sequencing and judgment								
Plan/Sequencing:								
1. Adding ingredients. A-D:								
a. Adding 1 c. flour into a bowl								
b. Adding ¼ c. salt into a bowl								
c. Adding 1 ½ tsp. Cream of Tartar into a bowl								
d. Adding 1 ½ tsp. oil into a bowl								
2. Mix dry ingredients together								
3. Measure water (1/2 c.)								
4. Add food coloring (3 drops)								
5. Heat water in microwave (1 minute)								
6. Add water to dry ingredients								
7. Mix all ingredients for 1 minute & timer use								
8. Let play dough sit for 1 minute & timer use								
9. Mix together with hands								
Judgment & Safety (Inhibition)- Avoidance of dangerous situation. Participant prevents or avoids danger, e.g., able to determine when the play is safe to touch, careful with the hot water, does not eat play dough, etc.								
COMPLETION: Termination of the task.								
Participant knows he/she is finished as demonstrated by placing the play dough in the bag.								

of Task Related Questions: _____ Total Amount of Cues Required: _____ Time: _____ Total Score: _____

of Non-Task Related Questions: _____ Highest Level of Cue Required: _____ Organization Score: _____

Sensory Aversion: 1 2 3 4 5
None Refuses to touch play dough
Sensory Notes: _____

Children's 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 play dough?*

0- None

1- A little help

2- Some help

3- A lot of help

2. *How well do you think that you made the play dough?*

Excellent

Good

Fair

Poor

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

No Yes (explain) _____

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

Children's KTA – After Task

Date: _____

Part C

Participant ID # _____ Tester's Initials: _____

Follow up observation of task performance:

- _____ 1. Emotional lability:
- 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 play dough. 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:

Instruction: Measure 1 ½ tsp. of cream of tartar

Current Picture



Proposed Modification of Picture:





March 21, 2013

Vanessa Carzon
406 Grenadine Way
Hercules, CA

Dear Vanessa:

I have reviewed your proposal (entitled, Validation of the Children's Kitchen Task Assessment) submitted to the Dominican University Institutional Review Board for the Protection of Human Subjects (IRBPHS Application, #10117). 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,

A handwritten signature in cursive script that reads "Martha Nelson".

Martha Nelson, Ph.D.
Chair, IRBPHS

cc: Julia Wilbarger

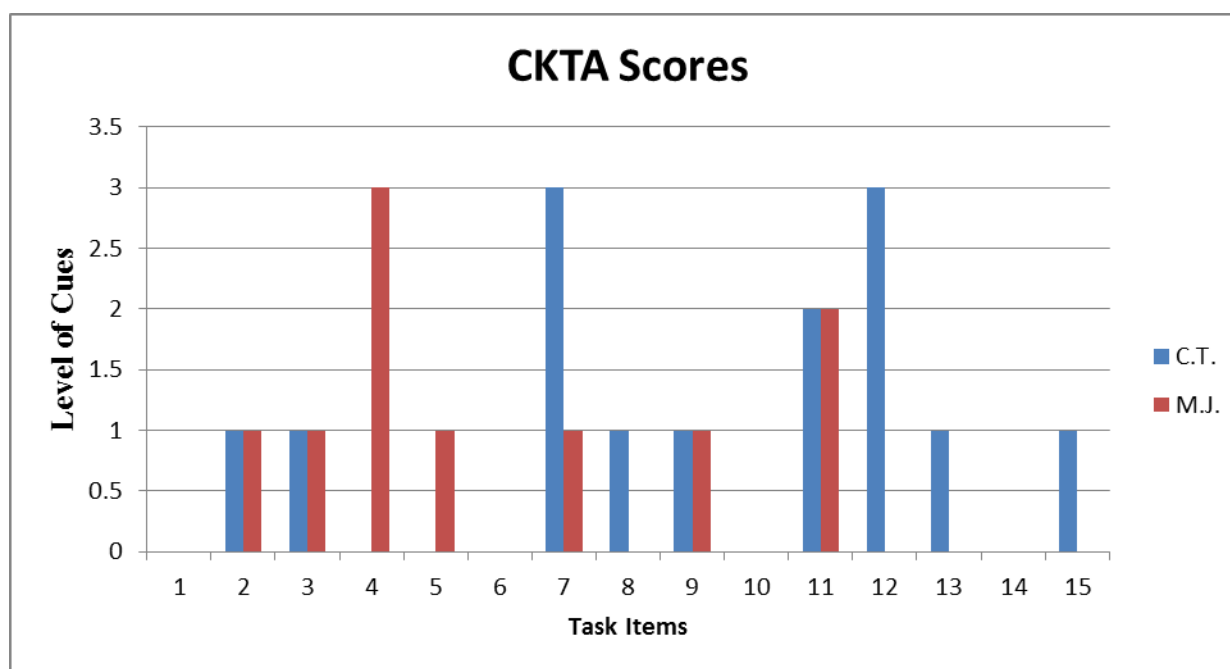
Table 1
Factors Involved in Executive Function

Executive Functioning Skill	Definition	Example Related to CKTA
Initiation	The act of beginning a task by voluntary choice	Having material out and seeing if the child begins to start the play dough making process on their own
Sequencing	The following of one thing after another within a task	Reading each direction and completing each step prior to moving on to the following step
Planning	The ability to think about and organize the activity such as gathering things needed and planning steps required for the task	The child's ability to reason through all materials and organize their environment to establish success in play dough making process
Self-regulation	Internal process that enables an individual to guide his/ her goal directed activities over time and across changing contexts (Zhou, Chen, Main, 2012)	The child's ability to respond appropriately to potential mistakes
Problem solving	Ability to change/ alter and adapt the task due to changing context or situation	Looking at the pictures provided in the book if written instruction is not understood
Safety judgment	The ability to evaluate a situation as being safe or dangerous before making a decision of continuing the step/task	Child checks the temperature of the play dough before manipulating it with his/her hands
Completion	Efficiently completing a task and obtaining a product of that task	Completing the CKTA with a result of colored play dough
Attention	Both selective and divided (set- shifting) ability to concentrate on someone or something. Selective meaning: being able to select out or maintain focus on one thing while external factors could be a distraction Divided or set shifting, when referring to our study: Ability to focus between different steps of the task	While waiting for the water to heat, begin next step of play dough task
Inhibition	Restrain or suppress one's own impulses	Six-year-old making play dough wanting to add the food coloring too soon

Table 2
CKTA Cueing Levels

Score	Cues	Description
0	No cues required	The participant requires no help or reassurance.
1	Verbal guidance	The participant requires prompting with an open-ended question or an affirmation that will help her or her move on.
2	Gesture guidance	The participant requires gesture prompting; tester is not physically involved with the task.
3	Direct verbal assistance	The participant requires a direct phrase or command; tester tells the participant what to do.
4	Physical assistance	Tester is physically assisting the participant with the step but not doing it for the participant.
5	Do for participant	The tester is required to do the step for the participant.

Table 3

**Task Items**

1. Initiation: Beginning the task
2. Adding 1 c. flour into a bowl
3. Adding $\frac{1}{4}$ c. salt into a bowl
4. Adding 1 $\frac{1}{2}$ tsp. cream of tartar into a bowl
5. Adding 1 $\frac{1}{2}$ tsp. oil into a bowl
6. Mix dry ingredients together
7. Measure water ($\frac{1}{2}$ c.)
8. Add food coloring (3 drops)
9. Heat water in microwave (1 minute)
10. Add water to dry ingredients
11. Mix all ingredients for 1 minute & timer use
12. Let play dough sit for 1 minute & timer use
13. Mix together with hands
14. Judgment & Safety (Inhibition) – Avoidance of dangerous situation
15. Completion: Termination of the task

Table 4

BRIEF Parent Form – M.J.

<u>Scale/Index</u>	<u>Raw Score</u>	<u>T Score</u>	<u>%ile</u>	<u>90% CI</u>
Inhibit	14	48	54	43-53
Shift	11	49	54	41-57
Emotional Control	12	41	25	35-47
BRI	37	45	37	41-49
Initiate	11	47	49	38-56
Working Memory	12	42	29	36-48
Plan/Organize	17	51	61	44-58
Organization of materials	12	52	67	45-59
Monitor	11	43	33	35-51
MI	63	46	40	42-50
GEC (BRI +MI)	100	45	37	42-48

Table 5

BRIEF Parent Form – C.T.

<u>Scale/Index</u>	<u>Raw Score</u>	<u>T Score</u>	<u>%ile</u>	<u>90% CI</u>
inhibit	20	63	89	58-68
Shift	19	80	98	72-88
Emotional Control	26	75	98	69-81
BRI	65	75	97	71-79
Initiate	17	71	96	62-80
Working Memory	21	65	92	59-71
Plan/Organize	24	69	94	62-76
Organization of Materials	16	66	94	59-73
Monitor	17	65	94	57-73