Preference Assessments for Older Adults with Dementia: Utility of the MSWO Procedure and Assessment of the Stability of Preference

Paige B. Raetz

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PREFERENCE ASSESSMENTS FOR OLDER ADULTS WITH DEMENTIA:
UTILITY OF THE MSWO PROCEDURE AND ASSESSMENT
OF THE STABILITY OF PREFERENCE

by

Paige B. Raetz

A Dissertation
Submitted to the
Faculty of the Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Philosophy
Department of Psychology
Advisor: R. Wayne Fuqua Ph.D.

Western Michigan University
Kalamazoo, Michigan
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Individuals with dementia suffer from a variety of cognitive deficits that can lead to a lack of engagement in activities. In recent years, researchers have begun to look at ways to assess preferences in hopes that increased identification of leisure items may lead to increases in engagement. Due to the decline in cognitive status a simple questionnaire may not be sufficient to assess preference for this population. As a result, several recent studies have incorporated the use of systematic preference assessments to assess preference for leisure activities with adults with dementia using a paired stimulus format. The purpose of the current study was to assess the predictive validity of a more time-efficient assessment, the MSWO assessment, for older adults with dementia. In addition, the current study assessed the stability of preferences of individuals diagnosed with dementia by administering repeated MSWO assessments. Eleven adults with dementia experienced MSWO preference assessments and 7 of those participants experienced additional administrations of the MSWO assessment over a span of 3 to 5 months to examine the stability of preferences. Engagement analyses were conducted to determine
if the items ranked highly in the MSWO assessments also obtained higher levels of engagement than lower-ranked selections. Ten of the 11 participants diagnosed with dementia completed the first MSWO assessment and a confirmatory engagement analyses. Six of these 10 participants displayed higher levels of engagement for higher ranked stimuli than for lower ranked stimuli. For the remaining 4 participants, results indicated that little to no differentiation occurred between high-ranked and mid to low-ranked items. Five of the 7 participants that experienced repeated MSWO assessments exhibited stable patterns of preference over 3 to 5 months with correlation coefficients exceeding the critical value of .5. These findings suggest that preference may remain stable for individuals with dementia.
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Paige B. Raetz
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Preference Assessments for Older Adults with Dementia: Utility of the MSWO Procedure and Assessment of the Stability of Preference

Older adults represent the fastest growing proportion of the global population. It is predicated that by the year 2030, the population of those 65 years and older could reach 72 million (Hooyman & Kiyak, 2008). One of the major concerns connected to this expanding population is how the current structure of aging services will be able to support the expected growth. With the first group of U.S. baby boomers entering retirement age in 2010 (Hooyman & Kiyak, 2008, Belsky, 1999), current aging service programs will need to enhance their ability to serve a greater number of older adults with medical and psychological difficulties such as Alzheimer's disease (AD). By age 65 an estimated 2% to 4% of the population develops AD, and that percentage increases to 47% for adults age 85 and older. Furthermore, it is estimated that by the year 2050 approximately 14 million individuals in the United States will be suffering from AD (Vierck & Hodges, 2003).

Alzheimer’s Disease is characterized by the global deterioration of one’s intellectual abilities and results in substantial impacts on memory and judgment (Bjorklund & Bee, 2008). The course of the disease typically begins with a gradual onset followed by a slow progressive decline in functioning. Over time an individual will experience changes in judgment, personality, ability to communicate, and activity levels. Progressive declines in engagement in meaningful recreational activity are often associated with a long list of additional risk factors, such as depression, increased risk for infirmity, increased risk of falls and a reduced quality of life (LeBlanc, Raetz, and...
Feliciano, in press). Furthermore, it has been reported that lack of engagement can lead to an increase in behavioral problems (Camp, Orsulic-Jeras, Lee, & Judge, 2005). Consequently, one of the main therapeutic goals for this population is increased engagement.

*Increasing Engagement*

Lack of active engagement is particularly evident among older adults in nursing home care with a direct observation study of 11 older adults revealing resident engagement in activity during only 13% of a 12-hour observation period (Burgio, et al., 1994). These low levels of engagement partly contribute to the overall negative image that many individuals have about nursing home care. In response to this problem, researchers have examined strategies to increase low levels of engagement generally using prompting and reinforcement strategies with one recent study documenting that increased engagement was correlated with increases in positive affect of the residents (Schreiner, Yamamoto, & Shiotani, 2005).

Jenkins, Felce, Lunt, and Powell (1977) conducted one of the earliest studies targeting low engagement in physically and mentally frail elderly living in one of two nursing homes. Individuals were approached while in the lounge area of the home and were provided with four of nine pre-selected activities for an hour-long activity session. Once participants were engaged in an activity the experimenter would assist each resident as needed (e.g., providing additional materials). Individuals who refused to participate were re-approached with a selection opportunity half way through the activity. An increase in the number of individuals who were engaged increased from 2.4 individuals to 6.4 in home A and increased from 0.7 to 4.1 individuals for home B. These results
demonstrate that presenting activities and prompting engagement can increase engagement during pre-established activities times.

Engleman, Altus, and Mathews (1999) conducted a study using similar behavioral strategies (i.e., prompting, praise) in a dementia special care unit of an assisted living facility. Five adults with dementia participated in the study and experienced an intervention referred to as a “check-in procedure”. Certified Nursing Assistants (CNAs) working on the unit were trained to check on each resident every 15 minutes, provide praise to residents who were engaged, and provide a choice of at least two activities for residents who were not engaged. Following training, staff practiced the intervention with specific performance feedback and ongoing written performance feedback was provided throughout the study. The combination of presenting activities to the residents and providing praise for engagement resulted in a mean increase in engagement of 37% for the morning observations and a mean increase of 39% for the afternoon observations, which represented approximate doubling of engagement.

Camp et al. (2005) evaluated the effectiveness of an intergenerational, Montessori-based program as a means to increase engagement in older adults with dementia. This program had older adults with dementia and young children participate together in sensory-based arts and crafts activities with the older adults in the role of mentor. Fifteen adults diagnosed with dementia (age range=50-95 years) and 13 children (age range=2.5-5 years) were randomly assigned to two groups. The intervention group participated in sessions in which one adult and one child would interact for 20 minutes in Montessori-based activities, which emphasized structured use of everyday materials with tasks broken into simple steps and progression to more complex tasks when
appropriate. Group two served as a control group and was observed participating in regularly scheduled activities provided by the day center none of which included regular engagement with children. Each group participated in the respective programming for a 6-month period. A crossover design allowed each group to experience the other condition for an additional 6 months. Observations on four categories of engagement (i.e., constructive engagement, active engagement, passive engagement, and non-engagement) indicated that Montessori-based programming resulted in increased constructive engagement as well as reductions in passive engagement and non-engagement compared to the control condition. This intervention, similar to the previous, incorporated items that were contextually relevant or were generally thought to be appealing to older adults rather than items that were demonstrated to be individually preferred.

Finally, Cohen-Mansfield, Thein, Dakheel, and Marx (2010) assessed the impact that stimuli with personal meaning have on levels of engagement for individuals with dementia. These researchers suggest that stimuli with personal meaning should produce greater engagement based on the idea that personal attributes, environmental attributes, and stimulus attributes all individually and collectively can affect the level of engagement for an individual with dementia. Cohen-Mansfield et al. observed 193 nursing home residents with dementia for a 3-week period during which they were presented with stimuli from 6 different categories in random order: work related stimuli, non-work related stimuli, feminine activities, gender neutral activities, self-identified stimuli, and comparison stimuli. Apart from the self-identified stimuli which were derived from interview, all other stimuli were arbitrarily selected and remained consistent across all
participants. Each stimulus was presented twice across the 3-week period and observations were 15 minutes in duration. Work stimuli resulted in statistically significantly higher duration of engagement and attending to stimuli than non-work related stimuli. Additionally, individualized self-identified stimuli consistently produced longer engagement duration, greater attending, and fewer instances of refusal. Interestingly, participants with higher cognitive status scored exhibited more refusal behaviors during engagement sessions. Overall, these findings suggest that individually selected stimuli based on personal history appear to result in higher levels of engagement than generic stimuli with which the participant may have no history. This finding has been confirmed in several other studies examining direct observation strategies for identifying leisure items for individuals with dementia (Cohn-Mansfeild et. al. 2010; Feliciano, Steers, Elite-Marcandonatou, McLane, & Arean, 2010; LeBlanc, Cherup, Feliciano, & Sidener, 2006; Staal, Pinkney, & Roane, 2003; Teri & Lewinsohn, 1982). This finding is highly consistent with almost 20 years of research examining strategies for assessment of individual preferences for items and activities of individuals with other types of disabilities (i.e., preference assessments).

Preference Assessment Procedures

The use of systematic preference assessments has become common practice for individuals with intellectual disabilities to identify reinforcers for treatment programs as well as for developing leisure activities (Hagopian, Long, & Rush, 2004). Several varieties of preference assessment have been developed beginning with the single stimulus (SS) preference assessment (Pace, Ivancic, Edwards, Iwata, & Page, 1985). In the initial study, Pace and colleagues exposed six individuals with profound disabilities to
16 stimuli with each stimulus presented singly for 5s and recorded approach responses to each stimulus. If the stimulus was approached, access to the item was available for an additional 5s. Stimuli that resulted in the most and least approach responses were then used in a follow up assessment that evaluated if the items did, indeed, function as reinforcers. Results from the second portion of the study indicated that those stimuli approached more often were more potent reinforcers suggesting that the results of the SS assessment procedure were useful in predicting future reinforcer effectiveness.

The paired-stimulus (PS) presentation (Fisher, Piazza, Bowman, Hagopian, Owens, & Slevin, 1992; Mason, McGee, Farmer-Dougand, & Reisley, 1989) involves presenting a series of pairs of stimuli for selection until all possible combinations are presented with selection resulting in contingent access. Mason et al (1989) first used this presentation strategy as a means for daily validation of the results from the initial SS assessment. Fisher et al. (1992) directly compared the Pace et al. (1985) SS procedure to the newer PS method, hypothesizing that the SS procedure would identify more preferred items than the PS preparation, and that the PS procedure would better predict items that would subsequently function as reinforcers. The 16 stimuli were presented to four children with mental retardation aged 2 through 10 years using each of the two procedures. Following the preference assessments, reinforcer assessments were conducted with items endorsed as highly preferred (i.e., selected in at least 80% of all trials) on both assessments and items endorsed as high on the SS procedure only. Results indicated that the items endorsed as high preference by both assessments consistently functioned as reinforcers for in-seat or in-square behavior while items endorsed as highly preferred by the SS format but as low to moderate preference on the PS assessment often
failed to function as reinforcers. Collectively the results indicate that the SS assessment procedure produced false positives compared to the PS, which more accurately identified reinforcers. However, one of the noted limitations of the PS method for assessing preference is the length of time required to complete the full assessment.

In response to the time involved in administration of the PS assessment, two variations of another procedure were developed. Windsor, Piche, and Locke (1994) compared the PS method of Fisher et al. (1992) with a variation in which multiple items were presented simultaneously in an array. This Multiple Stimulus (MS) presentation involved presenting an array of six items for selection with multiple presentations of the array. Results from the study indicated that the MS procedure took much less time to complete, however, the MS procedure had the notable limitation of a tendency for individuals to allocate responding exclusively to the most highly preferred stimulus, creating a limited hierarchy of preference.

To negate the limitations of the MS procedure Deleon and Iwata (1996) created an assessment in which the brevity of the MS procedure is sustained while addressing the issue of over-selectivity of the most preferred items. The modified procedure, termed Multiple Stimulus without Replacement (MSWO), involved presentation of an array of 8-10 items for a selection. Unlike the Windsor et al. (1994) procedure, selected items were removed from the array and the remaining items were repositioned for continued selections until all items were selected or selections ceased.

DeLeon and Iwata (1996) compared this new procedure to both the PS and MS procedures in two studies with adults with profound disabilities ages 26 through 45 years. Their analyses compared the procedures with respect to consistency of rank order across
sessions, time required to complete each assessment, and the number of potentially reinforcing stimuli identified. In study one, each assessment procedure was administered several times consecutively with counterbalancing to mitigate potential sequence effects. For four of the seven participants, all assessments resulted in the same top-ranked stimulus. Additionally, the PS and MSWO procedures identified several preferred items that were never selected during the MS procedure, suggesting that the MS procedure has the potential to miss moderate to highly preferred stimuli (i.e., false negative). The second study consisted of an assessment designed to evaluate the reinforcing properties of the items from study one that were identified by the PS and MSWO procedures but not the MS procedure. Baseline rate data were collected for a task and then task completion resulted in access to the potentially preferred stimuli on a fixed-ratio schedule with resulting increases in rate for three of the four participants. Thus, the MS procedure generally failed to identify more than one or two preferred stimuli while the MSWO procedure retained the ease and brevity of the MS procedure while incorporating the precision of the PS procedure.

In 2000, Higbee, Carr, and Harrison attempted to extend the Deleon and Iwata (1996) study with a more extensive examination of procedure’s ability to predict the results of subsequent reinforcer assessments. Nine adults diagnosed with severe or profound mental retardation participated. Individuals who worked closely with each participant were interviewed to identify seven stimuli that were used in the MSWO assessments. MSWO assessments were conducted in a similar fashion to the Deleon and Iwata methods in that all items were placed in front of the individual for selection, which resulted in 20-seconds of access to the item. However, Higbee et al. conducted only three
arrays as compared to the five arrays conducted by Deleon and Iwata. Subsequently, participants were taught to activate a microswitch, and a baseline phase was conducted during which participants were instructed to perform the target response for 1 minute with no consequences in place for performance. During the reinforcer evaluation phase, the effects of the top four ranked stimuli for each participant were evaluated in a multi-element design. For seven of the nine participants, one of the two top ranked items from the MSWO resulted in higher responding when provided contingently. Responding on the microswitch returned to baseline levels when the stimuli were no longer provided contingently. The authors concluded that an even briefer version of the MSWO procedure effectively identifies items that function as reinforcers for most individuals.

Stability of Preferences

Researchers in the area of intellectual disabilities have begun to examine the stability of preferences as well as the utility of different preparations. Thus far, studies have produced mixed results with some indicating relatively stable preference (Carr, Nicolson, & Higbee, 2000; Hanley, Iwata, & Roscoe, 2006) and others finding preference to be unstable (Mason et al., 1989; Zhou, Iwata, Goff, & Shore, 2001). Mason et al. (1989) assessed stability of preferences to determine how often preferences should be reassessed. Three children with autistic symptoms aged 4 through 5 years experienced SS preference assessments as described by Pace et al. (1985). This initial assessment was then compared to an additional SS assessment approximately 1 month after the initial assessment. Their results indicate that preferences shifted over the 1 month period, with data indicating that the children expanded their preferences in the second assessment.
Zhou et al. (2001) continued this line of research with 22 adults (mean age of 41 years) with a diagnosis of profound mental retardation. Participants were able to interact with one of 15 leisure items for 2 minutes while the duration of interaction was recorded for each item. Researchers did not interact with the participant during item access but did return items that fell to the floor. The assessment was repeated 16 months later (range = 12-20 months) and mean change scores (pretest duration minus post-test duration) were computed for each item. Results indicated that stable preferences were identified for only 10 of the 22 individuals, although for all participants, preference appeared to be more stable for the top 5 ranked stimuli.

Carr et al. (2000) also investigated the stability of preference by conducting several assessments within a 1 month period. Three children with a diagnosis of autism aged 2 through 7 years were given eight brief 8-item MSWO preference assessments (3 array procedure) over a 1-month period. Following the initial assessment a reinforcer evaluation was conducted with a top, middle, and low-ranked stimulus. Highly preferred items produced behavior at rates above baseline for all participants. Results from the subsequent MSWO assessments indicated that for two of the three participants, preference remained stable throughout the 1 month period.

Finally, Hanley, Iwata, and Roscoe (2006) preformed a systematic review of the research in the area of stability of preference including the research by Mason et al (1989), Carr et al (2000), and Zhou et al (2001) and concluded that the overall findings indicate that preference is relatively unstable over time. Subsequently, the authors conducted an additional examination of the stability of preference with 10 adults with mild to severe developmental delays. Reinforcer assessment interviews followed by a
series of PS assessments (mean = 11 assessments) occurring immediately and at regular intervals across a 2- to 6-month period with a minimum of 7 days between assessments. Pearson’s correlation coefficients indicated that preference was highly unstable for two participants, slightly unstable for another and stable for the remaining seven participants. These findings replicate the prior studies suggesting that preference appears to be unstable for some individuals. Collectively, these studies (Carr et al., 2000; Hanley et al., 2006; Mason et al., 1989; Zhou et al., 2001) indicate that preference is relatively unstable (i.e., 15 of the 38 pooled participants) (Hanley et al., 2006), though the format of assessment can impact the results. Preferences assessed with a PS/MSWO format (Carr et al., 2000; Hanley et al., 2006) appear more stable than those assessed using a SS format.

Preference Assessments with Older Adults

Although preference assessments have become an important tool for treatment planning for individuals with intellectual disabilities, only a few recent studies have examined the use of direct observation preference assessments for increasing engagement of older individuals with dementia. As indicated previously, prior studies on increasing engagement have used activities that have either been contextually relevant or generally thought to be appealing to elders without specific knowledge of whether the activities were preferred by the target individual. Cohen-Mansfield et al. (2010) used a questionnaire to incorporate individualized personal stimuli as a means for increasing engagement, which appeared to result in increased engagement; however these assessments were based on caregiver and/or participant verbal report rather than direct observation of selection or orienting responses.
This verbal-report strategy is similar to earlier ones used by Teri and Lewinsohn (1982) who used the Pleasant Events Schedule, a 114-item self-report measure with yes-no questions, to assess the subjective enjoyability of several different activities. The PES is often used to interview older adults to identify preferred activities that can be incorporated into daily activities whereas a shortened version, the Pleasant Events Schedule – Alzheimer’s Disease, was developed for interviewing adults with dementia and their caregivers (PES-AD; Teri & Logsdon, 1991). Though widely used, neither assessment incorporates direct observation and neither has been evaluated with regard to the predictive value of the assessment results for subsequent engagement with the activities. Recently, LeBlanc, Raetz, Baker, Stobel, and Feeney (2008) compared the results of the PES-AD verbal reports with a supplemental multi-media version of the assessment and found inconsistencies for virtually all participants. Only those items endorsed on both versions of the assessment consistently produced high levels of engagement during direct observation suggesting that verbal report may not be the most optimal source of information about preferences for this population. Of particular concern is that that the traditional verbal report PES-AD frequently resulted in false negatives (i.e., said “no” but items subsequently produced engagement) for those individuals with moderate to mild dementia suggesting that observation based measures of preference may be necessary to identify the greatest number of items that will produced increased engagement.

Staal et al. (2003) were the first to suggest that the preference assessment procedures that are well-established in use with individuals with intellectual disabilities (i.e., PS, MSWO) should be incorporated into development of programs for individuals
with dementia. As those with dementia often have substantial communication difficulties but often still have intact motor selection responses, systematic preference assessments based on selection might prove useful. Subsequently, researchers have examined the use of the PS preference assessment procedure with individuals with dementia.

LeBlanc et. al. (2006) experimentally examined the use of preference assessments with older adults with cognitive impairments and a history of very low levels of engagement. The authors compared the results of four different PS presentation formats (i.e., verbal, textual, pictorial, tangible) to determine which format would best predict subsequent engagement. The PES-AD survey was used to identify items to include in the systematic assessments. Four separate PS preference assessments were conducted in counterbalanced order sampling the four stimulus presentation modalities (pictorial, vocal, tangible, textual). Items endorsed as highly preferred on at least one of the four assessments were incorporated into a subsequent engagement analysis. During the engagement analysis, one of the target items was available for 15 minutes and observers scored engagement using a partial-interval data-collection system. The percentage of intervals of engagement with each item was correlated with the percentage selection for the prior preference assessments to determine which modality was most highly correlated with subsequent engagement. For each participant, one of the four modalities was highly correlated with engagement while the other three were not. The optimal modality was subsequently used in an intervention involving presenting a choice every 15 minutes with praise for engagement. This intervention produced significant increases in engagement over baseline. This study confirmed that individuals with dementia and aphasia could
respond systematically and meaningfully to PS preference assessments resulting in the identification of items that increased engagement.

Finally, Feliciano et al. (2010) also used the PS assessment with older adults diagnosed with dementia to identify preferred items that were then utilized in behavior management protocols for the treatment of depression and agitation. Participants in the study consisted of 11 elders with dementia. Each participant experienced a battery of assessment related to depression, functional status, cognitive status, behavioral excesses, and preference. Similar to LeBlanc et al. (2006), the experimenters implemented a PS preference assessment with nine of the 11 participants to identify preferred stimuli to then incorporate into a behavior management system in which the items were presented to the participants during times when agitation was most likely to occur. For seven of the nine participants a significant reduction in agitation was reported on the Cohn-Mansfield Agitation Inventory-Long Form. The authors suggest that the use of individualized preference assessments with adults suffering from dementia in long-term care may be useful in reducing the amount of agitation and increasing quality of life. This study differs from the engagement studies discussed above in that the preferred items were used to reduce agitation as opposed to increase engagement. Results indicate that direct-preference assessments can be useful not only in the identification of preferred items for increased engagement but also for the reduction in disruptive behaviors.

Rationale and Purpose of the Current Study

One of the hallmark features of dementia is a continuous and inevitable decline in functioning that typically leads to drastically decreased engagement. Current research in aging has begun to incorporate direct observation-based preference assessments into
interventions designed to increase engagement of older adults with dementia (LeBlanc et al., 2006; Feliciano et al., 2010). Although these studies have illustrated beneficial effects of the PS procedure, the MSWO procedure can be completed more quickly than the PS procedure. However, no studies have documented whether the MSWO procedure can be used with older adults with dementia to quickly and effectively predict items that result in increased levels of engagement (i.e., predictive validity). In addition, it is unclear whether the preferences of older adults with dementia remain stable or change with progressive declines in functioning. Prior studies on stability of preferences have been conducted with individuals with either autism or mental retardation, and these studies have shown mixed results with regard to stability, but the findings may differ for adults with dementia and such findings might guide clinical recommendations about the need to repeat preference assessments.

The current study was designed to evaluate several experimental questions within the field of gerontology and preference assessment. First, the current study attempted to validate the MSWO procedure for those with dementia. As previously mentioned, the PS procedure was found to be an effective means of assessing preferences with this population to identify items to increase engagement (LeBlanc et al., 2006; Feliciano et al., 2010), however it is lengthy and may result in fatigue thus making it an impractical assessment. In the current study, the top, middle and lowest-ranked items from the MSWO procedure were evaluated in subsequent engagement analyses to determine if differential rankings produced differential levels of engagement. Second, the current investigation examined the stability of preferences for adults with dementia using repeated MSWO assessments over a 2 to 6 month time period. As previously mentioned,
preference may shift over time as functioning declines, thus understanding stability will help to guide the use of preference assessments within clinical practice. Lastly, the study evaluated the necessity of the three-array presentation of the MSWO procedure by comparing the results of the first array of the MSWO to the mean results of the three arrays. Higher functioning individuals with dementia are most likely to exhibit refusal behaviors during assessment so the most acceptable version of a preference assessment should include the fewest repetitive trials necessary to produce effective prediction of items resulting in increased engagement. Additionally, as previously mentioned, fatigue may be a factor to consider when choosing an assessment procedure and one with fewest repetitions may be the most beneficial.

Method

Participants, Settings, and Materials

Eleven adults age 72 through 89 years (see Table 1 for demographics for all participants) served as participants. Of the 11 participants, 10 were females and one was male. Ten participants were Caucasian and one was African American. All participants were recruited from adult day care centers, assisted living facilities, nursing facilities, and/or dementia special care units in the Midwestern United States. Prior to participation informed consent was obtained from all caregivers and assent was obtained by each participant. The exclusionary criteria included a prior history of an intellectual or developmental disability or a significant visual impairment that would preclude scanning an array of stimuli. All participants had a prior diagnosis of dementia by their care-providing physician or other professional which was confirmed with administration of the Mini Mental Status Exam (MMSE; Folstein, Folstein, & McHugh, 1975). Scores on the
MMSE can range from 0 through 30 with a score of 24 or lower indicating cognitive impairment and scores falling at or below 24 are categorized into mildly impaired (≤ 21-24) moderately impaired (≤10-20), and severely impaired (≤9) (Mungas, 1991.)

Table 1
Participant Demographics

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>Gender</th>
<th>Ethnicity</th>
<th>MMSE score and severity</th>
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</tbody>
</table>

All sessions were conducted in a session room or bedroom inside the day center or the facility in which the participant resided. Each room contained a table, two to three chairs and all data collection materials and leisure items needed to complete the session. Participants experienced two sessions per day with the first session consisting of the MWSO preference assessment and the second consisting of a direct observation engagement analysis. Each preference assessment session lasted approximately 10 to 15 minutes and the engagement analysis lasted no longer than 30 minutes including breaks.
Procedure

Initial Assessment. During the initial visit, the cognitive status of each participant was screened using the MMSE. The MMSE (Folstein, et al., 1975) is a cognitive screening tool with questions ranging in value from 1 to 3 points and a total possible score of 30 points. The assessment requires the individual to perform tasks and respond to questions relating to language, orientation and recall. Following the initial visit, participants who received a score of 23 or less, indicating some degree of cognitive impairment, continued on to the preference assessment and evaluation portion of the study. The mean score on the MMSE for all participants at initial evaluation was 9.7 (range 1-20, see Table 1), with five participants falling in the moderate range and six falling in the severe range. The MMSE was repeated once a month in conjunction with preference assessments in order to identify any changes in functioning for as long as the participant continued in the study and provided assent. Results indicated that no participant experienced a change greater than a 3-point decline and no change in score resulted in a re-categorization of severity.

Each participant and their caregiver also filled out separate shortened PES-AD (Teri & Logdson, 1991) assessments in interview format. The PES-AD short form is a 17-item survey pertaining to events that an individual may find pleasurable (see Appendix A). The survey employs a yes-no format and each question was asked of the caregiver and participant individually by the research team. Results from the PES-AD were then used to identify items that were later incorporated into a MSWO preference assessment (see details below).
Preference Assessment. The second visit for all participants consisted of an initial MSWO preference assessment that was repeated on average every 15.5 days (range 12-35 days). All eight items used during the MSWO sessions were selected from the initial PES-AD. These eight items consisted of seven items endorsed as preferred by both caregiver and participant and one item endorsed as non-preferred by both caregiver and participant. Examples of such items were playing cards, working on a jigsaw or word puzzle, and painting. In the case that more than seven preferred items were endorsed by both informants on the PES-AD, items for the MSWO were selected based on ease of presentation. In the case that a mutually endorsed non-preferred item was not identifiable, two reportedly non-preferred items were included with one item identified as non-preferred by the participant and one by the caregiver. Based on LeBlanc et al., (2008) cautions about the possibility of false negatives (i.e., non-endorsed but would produce high levels of engagement), the non-preferred items were included in order to assess if the items reported as non-preferred in verbal report actually resulted in a lower selection rate when the item was presented.

At the beginning of the MSWO sessions, the participant experienced a 1-minute exposure to each of the eight stimuli which were presented in randomized order. Next, the eight items were positioned in a semi-circle configuration on the table in front of the participant spaced equi-distant from each other and the participant. The participant was then instructed to pick one item from the array. Any attempt to pick more than one item was blocked and the instruction to pick one item was repeated. Once an item had been selected the participant was allowed up to 1 minute to engage with the item while the remaining items were re-positioned in the array. After 1 minute, the prior selection was
removed and the remaining items were presented for the next selection. This process
continued until all items were selected or until selection ceased (i.e., no selection was
made within 45 s of the presentation). Similar to Carr et al. (2000), three preference
arrays were presented to the individual during each session. Between each array the
researcher asked the participant if he or she wanted to take a short break. Each break
lasted no longer than 5 minutes and the participant was able to leave the room during the
break. If the participant declined a break, the researcher set up the array and presented
the eight items.

*Engagement Analysis.* Following each preference assessment, an engagement
analysis was completed with items that were highly ranked (i.e., #1), mid-ranked (i.e., #
4), and lowest-ranked (i.e., #8) on the previous MSWO assessment. If two or more items
tied for a ranking, the item was randomly selected from the tied items. This confirmatory
analysis evaluated whether the results of the MSWO consistently identified differences in
preference that resulted in differential levels of engagement (i.e., higher ranked items
produce higher engagement while lower ranked items produce lower levels of
engagement). During the analysis, three sessions were conducted with one of the items
included in each session. The order of items was determined by draw.

At the beginning of each engagement session the researcher modeled for the
participant how they might engage with the item and then handed the item to the
participant. Next, the researcher told the participant that he or she could engage with the
item as long as he or she liked and that he or she could let the researcher know if they
wanted to stop. Once the researcher placed the item in front of the participant, data
collection began. If at any time during the observation the participant stopped engaging
with the item but did not ask to end the activity, data collection continued until the 5-minute interval was complete. During the 5-minute period the researcher did not engage with the participant. Social engagement was kept to a minimum to isolate the item vs the social attention as accounting for the engagement. It is possible that social interaction may increase or decrease the reinforcing value of the activity. By removing the variable of social interaction it is possible to see if the item alone leads to engagement. Once the 5-minute interval was completed the researcher asked the participant if they were finished with the activity. If the participant indicated that they wished to continue engaging with the item, the researcher ended data collection but engagement continued until the participant ended the activity or asked to be finished.

After each 5-minute observation, the participant was offered a break of up to 5 minutes before the next item was presented for a 5-minute observation. No break lasted longer than 5 minutes, and the participant was able to leave the room. If the participant did not take a break, the researcher presented the next engagement item and continued on with the session. Including breaks, each engagement session lasted 20 to 30 minutes. If at any point the participant indicated that he or she wished to stop the activity, the experimenter complied with the participant’s request, and the item was removed. The researcher then asked the participant if he or she would like to engage in another activity. If the participant agreed to continue, the researcher began the next engagement observation with the remaining items. If the participant requested to stop altogether, the researcher ended the session for the day.
Response Measurement and Interobserver Agreement (IOA)

For the MSWO procedure, a selection response was recorded when the individual participant made physical contact with one of the items in the array. In the event that a participant made contact with two items simultaneously, no response was recorded. The experimenter for each MSWO session also served as an observer, collecting data on all responses. All IOA and procedural integrity measures were conducted live during the experimental sessions. A second independent data collector was present for 63% of all sessions and collected data on all selection responses (see Appendix B for sample data sheet). An agreement was defined as both observers recording the same ranking for a given selection. For MSWO sessions, IOA was calculated by dividing agreements over disagreements plus agreements and dividing by 100%. The mean agreement across all MSWO sessions was 98% (range of 79%-100%).

For all engagement sessions, engagement was defined as any physical contact with the item or orientation to the item. Observers collected data using a 10-s momentary time sampling recording system to record the amount of engagement for each participant with each item. Engagement was scored if the participant was engaged by definition at the end of each 10-s interval. (see Appendix C for sample data sheet). A second independent observer scored 63% of all engagement sessions live during the experimental sessions. An agreement was defined as an interval in which both observers scored the interval identically as either engaged or non-engaged. Agreement was calculated using the formula of agreements divided by disagreements plus agreements multiplied by 100%. During any observation if the participant verbally indicated that they were finished engaging with the item, the observation was stopped and the
remaining intervals were scored as non-engaged. The mean IOA data across all engagement sessions for all participants was 97% (85%-100%).

Procedural integrity data were scored for the administration of the MMSE (26 steps), the MSWO procedure (36-40 steps) and the engagement analyses (10 steps) using checklists. See Appendices D- F for a complete list of the steps. An independent observer scored 11% of all sessions. For each step the data collector indicated whether or not the step was correctly implemented. Procedural integrity was then calculated as the number of steps implemented correctly (across all participants) divided by the total number of steps implemented multiplied by 100. Procedural integrity was 100% accurate for all assessment procedures and engagement sessions.

Results

Effectiveness of the MSWO Procedure

Ten of the 11 participants were able to successfully complete the MSWO assessment by making multiple selections and remaining alert throughout the session. Participant three had the lowest MMSE score and did not complete a single MSWO array as she fell asleep multiple times during the assessment, usually immediately after the removal of each selected item. Three participants (Participants two, five, seven) experienced only one full MSWO assessment and confirmatory engagement analysis while seven others (Participants 1, 4, 6, 8, 9, 10, 11) completed multiple MSWO sessions and confirmatory engagement analyses. Participants two and seven completed the first preference assessment and engagement analysis but declined to continue participation for the subsequent assessments. Participant five was hospitalized and unable to continue with the study after the first assessment and engagement analysis. The results for each
individual participant are presented as bar graphs in Figures 1, 2, 3, 4, 5, 6, 7, and 8 beginning with the individuals who experienced only one assessment and progressing to those for whom multiple assessments were conducted. Each MSWO graph includes bars depicting the mean rank order of the three-array MSWO procedure for each item included in the array. For example, for Participant two (see Figure 1, top panel), the item “dice” was ranked 1\textsuperscript{st} with the highest overall average ranking in the three arrays while “magazine” was ranked 4\textsuperscript{th} (i.e., middle rank) and “paint” was ranked last or 8\textsuperscript{th} based on the mean of the three arrays. The non-endorsed item for this participant was “paint.” For Participant five (see Figure 2, middle panel), the item “cards” was ranked 1\textsuperscript{st} with the highest overall average ranking in the three arrays while “magazine” was ranked 4\textsuperscript{th} (i.e., middle rank) and “coloring” was ranked last or 8\textsuperscript{th} when taking the mean of the three arrays. The non-endorsed item for this participant was “gardening”, which was ranked 5\textsuperscript{th}. For Participant seven (see Figure 2, bottom panel), the item “magazine” was ranked 1\textsuperscript{st} with the highest overall average ranking in the three arrays while “garden” was ranked 4\textsuperscript{th} (i.e., middle rank) and “dice” was ranked last or 8\textsuperscript{th} when taking the mean of the three arrays. The non-endorsed item for this participant was “cards” which was ranked 5\textsuperscript{th} in the MSWO assessment.
Figure 1. Graphs depict the mean rank order results for MSWO assessment for participant 2, 5, and 7. The item selected earliest in the assessment has a rank order of 1 and the item selected last has a rank order of 8.
The predictive utility of the MSW0 assessment procedure for these three participants was evaluated by examining whether rank in the initial assessment resulted in differential levels of engagement during the subsequent engagement analysis (i.e., do highly ranked items produce higher levels of engagement than lower ranked items). The results of the engagement analyses for Participants two, five, and seven can be seen in Figure 2. When orienting to the graph, the x-axis represents the items that were assessed while the y-axis represents the percentage of intervals that the participant engaged with the item during the session in which it was available.

For Participant two (see Figure 2, top panel), the highest-ranked item and the middle-ranked item resulted in equally high levels of engagement (100%), while the lowest-ranked item resulted in lower levels of engagement (53%). The lowest-ranked item was the non-endorsed item from the PES-AD assessment confirming that the non-endorsement on the verbal report was accurate and that the MSW0 procedure accurately predicted that this item would not be an optimal selection for increasing engagement compared to the higher ranked items, although the item did occasion some engagement as indicated on the graph. For shorter durations of engagement, the applied recommendation would be to incorporate high to middle-ranked items identified by the MSW0 into subsequent treatment planning.

For Participant five (see Figure 2, middle panel), the highest-ranked item resulted in the highest level of engagement while the mid-ranked item and the low-ranked items resulted in equally low levels of engagement (20% and 17% respectively). The non-endorsed item of gardening was not assessed during the engagement analysis as it was ranked 5th in the preceding MSW0 assessment. The results of the MSW0 preference
assessment accurately predicted engagement for the extreme ends of the rankings. The mid-ranked item was indistinguishable in effect from the low-ranked item. The applied recommendation for this participant would be that only highly-ranked items should be incorporated into subsequent treatment planning as the mid-ranked item did not produce sustained engagement.

Finally, for Participant seven (Figure 2, bottom panel) none of the items produced sustained engagement. Every item assessed produce engagement in less than 10% of the engagement analysis sessions with the top-ranked item at 6.6% of intervals engaged, the mid-ranked item at 3.3% of intervals engaged and the low-ranked item at 3.3% of intervals engaged. This MSWO assessment did not identify any items that would result in sustained engagement without prompting and reinforcement by a care provider and the differentiated rankings were not related to differential engagement. It is possible that if other, more highly preferred items had been identified and included, then those items might have suppressed the rankings of all of the items included in the MSWO.
Figure 2. Percentage of intervals that resulted in engagement for most preferred, middle preference and low preference items for participants 2, 5, and 7.
The findings for the first three participants who participated in several MSWO assessments are presented in Figures 3 and 4. Each preference assessment (Figure 3) includes multiple bars for each individual item clustered together with each bar representing the mean rank order for that item for consecutive MSWO assessments. Thus, bars of different levels within a given item’s cluster indicate variations in preference for that item over administrations. Participant one (Figure 3, top panel) experienced 10 MSWO assessments over a 5 month period (i.e., 10 bars in each item cluster). For Participant one, the first three assessments resulted in “book” as the top-ranked item. The rankings for the book decreased and became more variable across assessments (i.e., rankings of 3-7) while dice consistently remained ranked as 8th indicating it was the least-preferred item throughout all assessments. Dice was the non-endorsed item from the PES-AD, suggesting that the MSWO correctly identified the non-preferred item for Participant one. Participant four (Figure 3, middle panel) completed nine assessments over a 4.5 month period and the book consistently remained a highly-ranked item (i.e., #1 for the majority of assessments, never lower than 4th ranked). Similarly, the news generally remained a low-ranked item as the 7th or 8th rank in the majority of assessments. The magazine was the non-endorsed item included in the MSWO assessment and was never ranked lower than 5th across all sessions. Thus, Participant four usually selected this item before several items reported to be preferred in the verbal assessment.

Participant six (Figure 3, bottom panel) experienced eight MSWO assessments over a 3.5 month period. The book consistently remained the top or second-ranked item in almost every assessment. When the book was not the 1st ranked item, the magazine generally was ranked 1st and the magazine dropped to the 3rd or 4th rank when the book was the
top-ranked item. The puzzle generally remained a low-ranked item ending up 8th in the majority of assessments. The cards were the non-endorsed item included in the MSWO assessment and were ranked between 5th and 8th for every assessment. However, the puzzle was selected after the cards on almost every assessment.
Figure 3. Graphs depict the mean rank order results for the three arrays of each MSWO assessment for participant 1, 4, and 6. The item selected earliest in the assessment has a rank order of 1 and the item selected last has a rank order of 8.
The predictive utility of the MSWO assessment procedure for Participants one, four and six was evaluated by examining whether rank in any given assessment resulted in differential levels of engagement during the engagement analysis completed later that day. The top, 4th and 8th ranked items for an assessment were used in the subsequent analysis but the specific items changed across analyses as their rankings in the MSWO assessments changed. When orienting to the graph, the x-axis depicts the order of the analyses over the entire span of the study with the three clustered bars depicting the percentage of intervals with engagement for the highly-ranked (leftmost, darkest bar) item, mid-ranked (middle, lightest bar) item, and the lowest-ranked item (rightmost bar) for a given analysis.

For Participant one (see Figure 4, top panel), the highest-ranked item always resulted in very high levels of sustained engagement (M = 98.3% range = 93-100%) while the lowest-ranked item generally resulted in much lower levels of engagement (M = 19.3%, range = 0-60%). The mid-ranked item resulted in high levels of engagement for several of the analyses and somewhat lower levels of engagement during the other analyses (M = 87%, range = 43-100%). These results indicate that the MSWO was very effective in identifying preferred items with a clear gradient of preference, confirming the predictive utility of the MSWO assessment. Additionally, the non-endorsed item, dice, was repeatedly assessed as the low item and engagement remained low as predicted by the MSWO and the verbal report (i.e., true negative on the report measure).

For Participant four, the results were quite variable across analyses. In one analysis (#6), clear parametric effects were obtained such that the highest-ranked item produced higher engagement than the mid-ranked item which produced higher
engagement than the lowest-ranked item. In all other analyses, the relation between MSWO rank and subsequent levels of engagement were much less consistent. In all but one analysis, either the highest-ranked item (M=63%, range=23-93%) or the mid-ranked item (M=30.4, range=0-97%) resulted in higher levels of engagement than the lowest-ranked item (M=25%, range=6-50%). In six of the nine analyses, the highest-ranked item produced higher engagement than the lowest-ranked item. In two of the nine analyses, the middle-ranked item produced higher engagement than the lowest-ranked item. In the final analysis, all items produced only modest levels of engagement with the lowest-ranked item producing higher levels of engagement than either of the other two items. These results do not provide strong support for the relation between MSWO rank and level of engagement but do suggest that the MSWO was generally effective in identifying items that could be provided to produce engagement. The non-endorsed item, magazine, was ranked in the middle on two occasions (sessions 3 and 5) and resulted in low to moderate levels of engagement during the corresponding analyses (3.3% and 3% respectively). This item ranked 1st in assessment eight and resulted in 73% engagement. Results for this participant seem to indicate that the non-endorsed item may have shifted in preference across the repeated measures.

Finally, for Participant six (Figure 4, bottom panel) all items resulted in moderate to high levels of engagement across all analyses. Overall, the highest-ranked (M=92%, range=66-100%) and the middle-ranked items (M=90% range=43-100%) resulted in slightly higher levels of engagement than the lowest-ranked items (M=80%, range=33-100%). Additionally, for Session seven, the lowest-ranked item was the non-endorsed item and engagement with this item was lower than the other two items assessed but was
still occurring at a moderately high level (i.e., 60% of intervals) for a non-endorsed item. These findings suggest that providing virtually any item resulted in engagement for a substantial proportion of the 5-minute session with a slight advantage for those items with the highest to middle ranks in the MSWO.
Figure 4. Percentage of intervals with engagement for the high-ranked, medium-ranked and low-ranked items from the prior MSWO assessment for participants 1, 4, and 6.
Figures 5 and 6 depict the MSWO assessment results and the subsequent engagement analyses for Participants eight and nine. Participant eight (Figure 5, top panel) completed a total of seven MSWO assessments across a span of 4 months. The pattern of preferences was highly variable for this participant. The magazine (M = 3.8, range = 1 to 8), which ranked 1st on the initial preference assessment, did not consistently remain a highly-ranked stimulus with subsequent rankings ranging from 3rd to 8th before returning to the top rank position for the final few assessments. A similarly variable pattern was observed for the lowest-ranked item, word puzzle (M = 5.5, range = 2 to 8). Highly variable results were also observed during the engagement analyses (Figure 6, top panel) with the highest ranked items (M = 62%, range = 0% to 100%) or middle-ranked items (M = 44%, range = 3% - 100%) resulting in higher levels of engagement for five of the eight engagement sessions, but the lowest-ranked items (M = 35%, range = 0% - 100%) resulting in the highest level of engagement for the remaining three. Thus, visual inspection again did not reveal a strong parametric relation between MSWO rank and subsequent engagement. The non-endorsed item was dice which had rankings of 3rd-8th with a decreasing trend over the assessments ranking last in assessment seven. The non-endorsed item was used during the engagement analysis during sessions 1 (Medium), 3 (Medium) and 7 (Low), with results showing engagement low during the 1st and 3rd session but high during the seventh session.

Participant nine (see Figure 5, bottom panel) completed a total of eight MSWO assessments across a span of 4 months with great stability in the highest rankings and
variability in the lower rankings. The top two activities consistently remained highly-rank
d (i.e., coloring and puzzle; ranks 1-3 on all assessments). The other items
frequently shifted in ranking with five different items (TV, exercise, dice, word puzzle,
and news) ranked last in different assessments. The item “dice” was the non-endorsed
item, receiving one ranking of 8th and generally falling in the bottom half of the rankings
(M=6, range=4-8). The engagement analyses (Figure 6, bottom panel) for participant
nine illustrates that all items resulted in high levels of engagement with mean
engagement for high, moderate and low preference items equaling 96%, 98%, 87%
respectively, suggesting that the differentiated findings of the MSWO were not confirmed
but that any of the items used in the preference assessment could be used therapeutically
in programming.
Figure 5. Graphs depict the mean rank order results for MSWO assessments for participants 8 and 9. The item selected earliest in the assessment has a rank order of 1 and the item selected last has a rank order of 8.
Figure 6. Percentage of intervals scored with engagement for the high-ranked, medium-ranked and low-ranked items from the prior MSWO assessment for participants 8 and 9.
Participant 10 (see Figure 7, top panel) completed a total of eight MSWO assessments across a span of 4.5 months. The activity word puzzle consistently remained a highly-ranked item (i.e., #1 for 7 assessments, #2 in the other). Similarly, painting, maintained a low ranking of between 5th and 8th ($M=7$, range 5-8). The items cards and magazine also had relatively stable low rankings (4th-8th) with the exception of one session in which cards was ranked 2nd (session 5) and one session in which magazine was ranked 2nd (session 6). The novel was the non-endorsed item, receiving a middle-ranking across the eight assessments ($M=4.5$ range= 3-7). The engagement analyses (Figure 8, top panel) for participant 10 illustrates little to no differentiation between items for the first four sessions, indicating that all items were highly engaging. For Sessions five, seven, and eight engagement results suggest that there was differentiation in responding similar to the MSWO rankings with the high to middle-ranked items resulting in higher levels of engagement than the lowest-ranked item. Collectively, these data suggest that perhaps any of the items used in the preference assessment could be used therapeutically in programming to increase engagement.

Participant 11 (see Figure 7, bottom panel) completed a total of six MSWO assessments across a span of 3 months. The magazine ($M=2$ range 1-5) and watching sports on TV ($M=2$, range= 1-5) consistently remained highly-ranked while the cards consistently were lower-ranked across all sessions ($M=7$, range 7-8). The cards were the non-endorsed item suggesting that the MSWO did accurately identify both preferred and non-preferred stimuli. The engagement analyses (Figure 8, bottom panel) for Participant 11 illustrates that in half of all analyses highly-ranked to middle-ranked items produced higher levels of engagement (sessions one, two, three) that low-ranked items, while the
other half of the analyses resulted in the low-ranked item generating equal to or higher levels of engagement (four, five, six) than the higher-ranked items. These data suggest that in only 50% of the sessions were the MSWO rankings confirmed.

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**Figure 7** Graphs depict the mean rank order results for MSWO assessments for participants 10 and 11. The item selected earliest in the assessment has a rank order of 1 and the item selected last has a rank order of 8.
Figure 8. Percentage of intervals scored with engagement for high-ranked, medium-ranked and lowest-ranked items from the prior MSWO assessment for participants 10 and 11.
A criterion was established for considering the MSWO procedure as reasonably predicative of subsequent engagement for at least the extreme rankings. The MSWO procedure was considered effective at predicting subsequent engagement if 75% of the engagement analyses for a participant indicated that the high-ranked item resulted in equal to or higher levels of engagement than the low-ranked item. Based on this criterion, the MSWO procedure was effective in predicting subsequent engagement for seven of the 10 participants. For Participants 1, 2, 4, 5, 6, 9 and 10, items with high rankings in the MSWO generally resulted in higher levels of engagement than the lowest-ranked item. For Participants one, two and five the highest-ranked item always (100%) resulted in higher levels of engagement than the low-ranked item. For Participants six and nine, the highest-ranked item resulted in higher levels of engagement 87% of all sessions. For Participants four and 10, results indicated that the high-ranked item resulted in higher levels of engagement for 77% and 75% respectively. These results suggest that the MSWO procedure was effective in identifying preferred items for the majority of participants.

For three other participants (i.e., seven, eight, and 11), the results indicate that the MSWO was not consistently useful in predicting relative levels of engagement in subsequent analyses and thus, may not been a valuable means for identifying preference. For Participant seven, all items produced low levels of engagement in the subsequent analysis suggesting that the MSWO assessment results did not identify items that would result in increased engagement over other items. It is possible that additional prompting and mediation by some care provider would have increased levels of engagement or that other items that were not included in the MSWO assessment might have produced higher
levels of engagement without mediation. For Participants eight and 11, the low-ranked item resulted in higher levels of engagement than the highest-ranked item during more than 25% of the engagement analyses. Additionally, for Participants eight and 11, results suggested that the MSWO assessment may have produced false negative in that the low-ranked items produced high engagement in several of the sessions and would prove useful in clinical programming in spite of their low ranks.

Overall, this pattern suggests that it may be worthwhile to continue to investigate the usefulness of the MSWO procedure and that a different control condition may be necessary to identify whether items identified by the MSWO produce increased engagement compared to standard conditions in long-term care settings (e.g., no specific activity presented, same activity occurring for all consumers).

Statistical Analysis of Stability of Preference

The stability of preferences was statistically evaluated for the five participants who completed multiple assessments and for whom the engagement analyses consistently confirmed the findings of the prior MSWO assessments. That is, only those participants for whom at least 75% of the engagement analyses confirmed the MSWO findings (see above) were included in the stability analysis as it is only reasonable to examine the stability of assessment results that are at least reasonably accurate at predicting engagement. These five participants completed an average of 8.6 MSWO assessments (range, 8-10) over a period of 3.5 to 5 months.

To statistically evaluate the stability of the results of the MSWO preference assessments, a Spearman rank order correlation coefficient was calculated as suggested by Hanley et al. (2006). This statistical analysis correlates the rank of items in each
assessment with the rank in every other assessment. This measurement was recommended by Hanley et al (2006) as a means of more accurately assessing changes in preferences for multiple MSWO sessions than visual inspection. As can be seen in Figure 3, subtle changes in preferences, particularly once several assessments are conducted can be difficult to decipher using visual inspection of traditional bar graphs. A critical correlation coefficient value of .5 was utilized as the criterion for stability with correlation coefficients of .5 or greater representing stable preference patterns and those below .5 indicating unstable preference patterns. Results from the correlations are presented in graphical form to assist in inspection of stability. Using the same graphing convention as Hanley et al., each graph has a criterion line at the value of .5 and each data point represents the correlation of the results of that particular assessment with every other assessment conducted over the entire span. A participant’s overall pattern of preference over time was considered stable if more than half of all data points fell above the critical value.

For four of the five participants, preference remained relatively stable across assessments. For participant one (see Figure 9), the findings were mixed with half of all correlations exceeding the critical value of .5 while the other half falling below the critical value. In contrast, the correlation coefficients for the four other participants (see Figure 9 all panels) all met the criterion for stability with the majority of the correlations at .5 or greater. The greatest stability was evident for Participant six (see figure 10, top left panel) for whom every correlation exceeded the critical value, suggesting that preference for this individual remained very stable over the course of the study. Participants four, nine, and 10 all demonstrated preferences that remained relatively
stable over the course of the study with more than half of all correlations falling above the critical value.

Figure 9. Spearman rank order correlation coefficients between a given assessment and every other assessment for participant 1. Points above the line indicate strong positive correlations and stable preference.
Figure 10. Spearman rank order correlation coefficients between that assessment and every other assessment for participants 4, 6, 9, 10. Points above the line indicate strong positive correlations and stable preference.

Comparison of 3-Array and 1-Array MSWO Rankings

Results for all 10 participants who completed an MSWO assessment were examined to calculate the agreement between the results of the first array presentation and the mean results of the three-array presentation (as used by Carr et al., 2000) for each MSWO assessment. As previously mentioned, fatigue can often be a concern when working with older adults with dementia. Several participants in the current study explicitly indicated that they did not like the three array procedure, asking why they were being asked to pick again and stating that they had already answered these questions. If the results of the first array correlate well with the mean of the three arrays, the shorter assessment would be preferred for this population. Spearman’s rank order correlation
coefficients were computed comparing the ranked results from the initial array to the mean ranking of all arrays in each completed MSWO. The asterisks in Table 2 indicate the sessions where the MSWO was not confirmed for participants. Results for these sessions should be viewed with caution; while the correlation between the first and third array is strong it may be irrelevant if the MSWO is not effective in indentifying preference. Table 2 shows the correlations between the initial array and the mean ranking of all three arrays for all MSWO assessments for the 10 participants. As can be seen, the mean correlations for all 10 participants were between .43 and .88. Additionally, the vast majority of all correlations were above .5. Overall, for nine of the 10 participants correlations were statistically significant at p =.01. For Participant 11, the 1st correlation revealed that preferences completely shifted between array one and the mean of all three arrays with a correlation coefficient of -.29 for the first session; however, the correlations for the remaining five sessions resulted in statistically significant findings. Collectively, these results indicate that the use of a single item presentation can be as effective in identifying preference as a three item array presentation for individuals diagnosed with dementia as was seen for all 10 participants in this study. These results are important in that a single item array can be done much more quickly than a three array presentation, reducing fatigue and frustration on the part of the client.
Table 2

* Correlation Coefficients Between the Initial Array and the Mean Ranking of all Three arrays for Each MSWO Assessment *

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<tr>
<th>Participant</th>
<th>MSWO Assessment</th>
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<td>1</td>
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* indicates sessions in which the rankings from the MSWO assessment were not confirmed in the subsequent engagement analysis

** every correlation computed was statistically significant at p = .01 level.

Evaluation of Non-Endorsed Items

Results for the 10 participants who completed an MSWO assessment and engagement analysis were further examined to determine if non-endorsed items from the PES-AD that were included in the MSWO assessments resulted in 1) lower ranking on the MSWO assessment than endorsed items, and 2) lower percentages of intervals with
engagement than endorsed items when non-endorsed items were evaluated in the engagement analyses. When assessing these results, six of the 10 participants (Participants 1, 2, 6, 8, 9, 11) selected the non-endorsed item last on at least one occasion. For the remaining four participants (4, 5, 7, 10), the non-endorsed item retained a mid-ranking across the repeated assessments. The amount of engagement the non-endorsed items produced when and if they happened to be included in an engagement analysis due to rank ordering (i.e., only the highest, middle and lowest-ranked items were included in an engagement analysis) was also analyzed. Eight of the 10 participants who completed the study (Participants 1, 2, 4, 6, 8, 9, 10, 11) had a non-endorsed item assessed during an engagement analysis. For Participants one and two, results indicated that the non-endorsed items (i.e., dice, cards) were selected last in the MSWO assessment and further resulted in low levels of engagement during the engagement analyses. These results suggest that the participants’ reports that the items were non-preferred were accurate and that the MSWO provided accurate results consistent with that non-endorsement. For Participants four, eight, and 10, the non-endorsed item resulted in a mid-ranking (4th) and when assessed for engagement, levels of engagement were lower than the other items assessed. These results suggest that the verbal report of the item as non-preferred was accurate, but that the MSWO procedure resulted in falsely positive endorsement for these items.

For other participants, the findings were mixed for the non-endorsed items. For Participant six, the non-endorsed item “cards” was a middle-ranked stimulus (4th for sessions 1, 2, 4, and 5), but the subsequent engagement analysis resulted in high levels of engagement (100% across all 4 sessions). Participant six selected the non-endorsed item
last for sessions seven and eight; however, the engagement analysis showed moderate to high levels of engagement (60% and 100%) with that item. These results suggest that the original report of the item as non-preferred may have been a false negative and that the MSWO procedure did not consistently produce more meaningful information than verbal report. For participant 11, the non-endorsed item was cards which was always ranked 7th or 8th; however, when cards were included in the engagement analyses (sessions 2, 3, 4, 5) engagement was very low for the first two sessions (0% of intervals) and very high (100% of intervals) for the remaining two sessions. Thus, the MSWO appears to confirm the status as non-endorsed but at least some of the time the item would prove useful for increasing engagement. As previously noted, the results of the MSWO assessment were not consistently validated by the engagement analyses for Participant 11 which indicates that the MSWO procedure was not particularly useful for assessment and that verbal report may have been accurate when given but that preferences changed. Finally, for Participant nine, the non-endorsed item “dice” was lowest-ranked during assessment three and middle-ranked during session eight; however, engagement was high for both sessions. This pattern suggests that the verbal report was a false negative and that the MSWO would also have resulted in a false negative even though the item could be useful in increasing engagement.

Discussion

The population of older adults in America is growing exponentially and this growing population is at increased risk of developing dementia, particularly AD (Belsky, 1999). One of the greatest concerns for individuals living with AD is a reduction in pleasurable activities and engagement which can lead to other decreases in functioning
and mood such as depression, increased illness and injury (LeBlanc et al., in press). While new research has begun to address ways to increase engagement in older adults (Camp et al., 2005; Engleman, et al., 1999) only a few studies have looked at direct assessments of preference to identify items to increase engagement for older adults (Cohen-Mansfield et al., 2010; Feliciano et al., 2010; LeBlanc et al., 2006). Those studies have generally either used verbal report of preference (Cohen-Mansfield et al., 2010) or a PS direct observation preference assessment (Feliciano et al., 2010; LeBlanc et al., 2006) to identify items. The current study extended the research in the area of gerontology and preference assessment by assessing the usefulness of a MSWO preference assessment procedure for older adults with dementia, which typically has a much shorter administration time than the PS procedure (DeLeon & Iwata, 1996). Additionally, non-endorsed items on the PES-AD Short Form were included to examine whether non-endorsed items might potentially prove useful in increasing engagement as prior studies have identified the risk of false negatives (i.e., “no” response on verbal assessment, would actually have increased engagement) with verbal report (LeBlanc et al., 2008).

The current findings indicate that the MSWO assessment procedure proved useful for the majority of our participants with dementia. Only one participant (Participant 3) was unable to complete the arrays despite MMSE scores indicating very severe impairment for some participants. This finding is important because as reported by LeBlanc et al., (2006), the PS assessment was lengthy and can be problematic for a population that is often plagued with fatigue. The MSWO was useful in that it could be completed within 20 minutes and allowed for a direct observational assessment of
individual preference. These results support those of Higbee, Carr, and Harrison (2000) as well as Carr, Nicholson and Higbee (2000) in which a three array MSWO was found to be effective in identifying preferred items very quickly.

However, the MSWO procedure did not always result in hierarchical preferences that were confirmed in subsequent single-item non-contingent presentation engagement analyses. For Participants eight and 11, less than 75% of the assessments were confirmed with differential levels of engagement for the most extreme rankings and for many participants, the inclusion of the middle-ranked stimulus complicated the findings even more. That is, unlike most preference assessment studies with individuals with autism or developmental disabilities (Hagopian et al., 2004), the highest-ranked item did not reliably produce the highest level of responding in the confirmatory analyses. For these individuals, this study does not provide strong support for the usefulness of either the MSWO procedure or verbal preference assessments in predicting subsequent levels of engagement under the conditions established in this study. There were not demographic variables or cognitive status measures that were correlated with usefulness of the MSWO which means that there is no reliable predictor of whether the MSWO procedure will prove useful for a given individual prior to use and confirmation with an engagement analysis. Additionally, the MSWO assessment only provides information on the reinforcing value of the items assessed. It may be that other items that were not assessed are as reinforcing or more reinforcing the highest ranked items on the MSWO.

Several factors may account for the fact that corresponding parametric effects were not observed in the engagement analyses for several participants. First, a traditional reinforcer assessment (i.e., engage in a response to gain contingent access to the stimulus)
was not employed for this study. The typical uses of preferred stimuli with this population is different than for populations where the primary goal is skill acquisition and the items are provided contingent upon specific behaviors. Instead, for this population access to items is typically provided non-contingently to increase engagement with stimuli and positive affect. It may be that by providing the items non-contingently a gradient of preference is diminished. That is to say, the engagement may be higher than expected for mid to low-ranked items when the items are presented freely. If however, the individuals were asked to engage in behavior to earn access to an item, a more differentiated pattern of responding may have emerged more closely resembling that of the MSWO rankings. Second, other research has shown that providing items in a single operant evaluation often results in a greater number of items with demonstrated reinforcing effects than when items are presented in a concurrent operant evaluation (Roscoe, Iwata, & Kahng, 1999). In a concurrent operant paradigm, responding is often allocated only to the most preferred items even if a lower-ranked item would still produce a reinforcement effect. In single operant evaluations, responding is more likely to be elevated for all items including lower-ranked items because those are the only options available in the environment at a given time (i.e., something is better than nothing when no or little effort is required to gain access). It is possible that the use of the single operant procedure resulted in higher levels of engagement across all items than would have been observed if a concurrent operant or free operant evaluation had been used for the engagement analyses. The single operant procedure was selected due to the clinical rationale of identifying as many preferred activities as possible; however, clearer experimental results may have been obtained with a concurrent operant evaluation.
Finally, the use of a 5 minute evaluation time may have contributed to the engagement findings. It is possible that the length of the evaluation period resulted in satiation for certain activities.

Prior research on preference assessments and older adults with dementia by LeBlanc et al. (2008) indicated that verbal reports about preference can at times result in false negatives and can lead to under-identification of items that could be used therapeutically. The current study also assessed the accuracy of report on the PES-AD for identifying non-preferred items by including a non-preferred item in the MSWO assessment. Results indicated that for only five of the 11 participants, the item indicated as non-preferred on the PES-AD actually resulted in a low ranking (ranking of 7 or 8) on at least one of the MSWO assessments. Furthermore, as previously discussed, many of the non-endorsed items resulted in moderate to high levels of engagement when assessed during the engagement analysis. The non-endorsed item reliably resulted in low levels of engagement for only two participants (one and two). These results are clinically important in that they confirm that using only a verbal report measure may result in failure to identify items that would result in increased engagement, casting further doubt on the usefulness of the most commonly employed preference assessment strategy for this population.

In addition to predictive validity, the stability of the preferences identified by the MSWO procedure was examined over the span of several months. Previous studies have found mixed results when assessing the stability of preferences for individuals with intellectual disabilities Carr et al., 2000 and Hanley et al., 2006 both found relatively stable preference while others have found preferences to be unstable (Mason et al, 1989;
Zhou, Iwata, Goff, & Shore, 2001). Overall, the majority of the participants with preference assessment results that were confirmed in engagement analyses also exhibited stability in preference across the repeated assessment period. The majority of the Spearman rank order correlations computed for Participants 4, 6, 9, and 10 resulted in statistically significant correlations above .5. However, for one individual, preferences were found to be moderately unstable (Participant one). Collectively these results are similar to those found by Hanley et al., (2006) in which seven of the 10 participants exhibited stable preferences and Carr et al., (2000) in which two of the three participants maintained stable preferences. These results are important in that they indicate that it may be valuable to assess preference periodically as preference can shift over time. These results are important as we know from previous research that higher preference is associated with longer duration of engagement and increased engagement is associated with less health risks and mood problems (LeBlanc et al., 2008). As such, if items are no longer preferred the beneficial effects of providing access to those items will quickly diminish. It would be important for future research to further investigate what factors may effect the stability of preference over time for such a population. It may be that as cognitive status declines over time, preference also shifts. It may also be that satiation or deprivation are factors that affect the reinforcing qualities of such activities. Future research should look at systematic ways to manipulate these variables to better understand the variables that can affect stability of preference over time.

Finally, the current study also assessed the need for a three array presentation of the MSWO items as opposed to a one array presentation. Our finding that a single array correlated reasonably well with the results from the three-array presentation support the
prior findings of Carr et al., (2000) who found Spearman rank order correlations between one and three array rankings of .36-.98. During the current study, several participants with dementia found the three-array procedure still quite lengthy and some were visibly agitated when asked to begin the second and third arrays (e.g., “Why are you asking me again? I thought I just did this. I’m confused.”). These results combined with those of Carr et al. indicate that a single array MSWO presentation may be a viable option for individuals that find the three-array procedure laborious or aversive. This is particularly important for the population of older adults as fatigue is often experienced and a shorter assessment can be beneficial in successfully identifying preferences. Future studies should experimentally compare the results of one-array MSWO assessments and three-array assessments rather than relying on correlational analyses.

While the results of the study are important to the fields of behavioral gerontology and preference assessment, there are some limitations to note. First, only a relatively small number of participants completed all portions of the study and no individuals experienced significant cognitive changes during the study. Future researchers might assess a larger number of participants over a longer time to further evaluate whether changes in cognitive status impact preferences and engagement. Second, the use of repeated measures with this population proved difficult as several participants did not enjoy the repeated administrations of the MSWO and MMSE assessments and some participants withdrew from the study due to the aversiveness of the repeated MMSE assessments. Future research should attempt to confirm the accuracy of the single-array assessment procedure for the MSWO as well as use an alternative cognitive screening tool. Third, the results of our study may have been compromised by the use of a single
item engagement analysis rather than a concurrent operant analysis. Future studies might directly compare the use of single-item and concurrent operant engagement analyses to further investigate the accuracy of MSWO assessment procedure. Additionally, it may be useful for future studies to consider the use of a free operant procedure (Roane, Vollmer, Ringdahl, & Marcus, 1998) when assessing preference and engagement. A free operant procedure is one in which all items are freely available for a 5-minute period and data are collected on the amount of time that the participant manipulates each item. This procedure differs from the MSWO assessment in that the items are not removed and the participant can manipulate more than one item at a time. In the free operant assessment, participants are not required to make a selection response as is done in the MSWO assessment. The free operant assessment is similar to the engagement analysis in that items are made available for a given amount of time and data are collected on the amount of interaction with the item. It may be that this procedure can be effective in indentifying preferred activities in a short time without the additional requirement of an engagement analysis. It is important to note however that during a free-operant assessment, the individual may engage with only one highly preferred item, never shifting their engagement, and a hierarchy of preference will not be established. As previously discussed this could be problematic by eliminating the identification of potential reinforcers which could lead to engagement in a clinical setting.

Another important area of future research is the accuracy with which the MSWO procedure can identify items that are truly non-preferred that will consistently result in low levels of engagement. In the current study, a seemingly low preference item (i.e., participant indicated that they would not like to engage in that activity) was included in
the assessment in order to assess if the MSWO would reliably identify the item as low-ranked. Results from the current study indicated a high chance of a false negative when using the MSWO procedure. That is, items that resulted in a low ranking did not always result in low engagement so the MSWO results must be interpreted with caution and should not be used to eliminate items from activity offerings. Future studies should consider ways to further investigate the items endorsed on the MSWO as preferred and perhaps incorporate more non-preferred items as well as assess all items in an engagement analysis or reinforcer assessment for validation of preference.

Finally, future research should continue to investigate the use of single verses concurrent operant procedures. As noted in the current study, a single-operant procedure was utilized to assess engagement of high, mid and low preference items. Results from the study found that engagement levels did not always replicate the preference gradient (i.e., highest preference resulted in highest level of engagement). As previous studies have suggested (Roscoe et al., 1999), a single operant procedure may lead to increased identification of potential reinforcers when compared to a concurrent operant procedure. While it is important to ensure that no items are missed when identifying preference for this population, future research should also examine the utility and feasibility of a concurrent operant procedure to enhance our understanding of the relation between preference and engagement for adults with dementia.
References


Appendix A: Pleasant Events Schedule –AD (PES-AD) Data Sheet

Participant Number: ______
PES-AD shortened version
Administration
Date: ________ Data Collector Initials: _____ Circle One: Primary   Secondary   IOA: _____

Instructions: “I am going to read you a list of things that people sometimes like to do. Tell me Yes if you enjoy this or tell me No if you don’t.” Read each item from the list verbatim.

<table>
<thead>
<tr>
<th>Item</th>
<th>PES–AD Shortened</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you like to play dice?</td>
<td>YES</td>
</tr>
<tr>
<td>2. Do you like playing card games?</td>
<td>YES</td>
</tr>
<tr>
<td>3. Do you like to read novels?</td>
<td>YES</td>
</tr>
<tr>
<td>4. Do you like to paint?</td>
<td>YES</td>
</tr>
<tr>
<td>5. Do you like doing jigsaw puzzles?</td>
<td>YES</td>
</tr>
<tr>
<td>6. Do you like indoor gardening?</td>
<td>YES</td>
</tr>
<tr>
<td>7. Do you like looking at magazines?</td>
<td>YES</td>
</tr>
<tr>
<td>8. Do you like to exercise?</td>
<td>YES</td>
</tr>
<tr>
<td>9. Do you like to watch or participate in sports?</td>
<td>YES</td>
</tr>
<tr>
<td>10. Do you like to watch the news?</td>
<td>YES</td>
</tr>
<tr>
<td>11. Do you like watching T.V.?</td>
<td>YES</td>
</tr>
<tr>
<td>12. Do you like looking at photo albums?</td>
<td>YES</td>
</tr>
<tr>
<td>13. Do you like word puzzles?</td>
<td>YES</td>
</tr>
<tr>
<td>14. Do you like to color/draw?</td>
<td>YES</td>
</tr>
<tr>
<td>15. Do you like reading the news?</td>
<td>YES</td>
</tr>
<tr>
<td>16. Do you like to make or eat snack?</td>
<td>YES</td>
</tr>
<tr>
<td>17. Do you like combing or brushing your hair?</td>
<td>YES</td>
</tr>
</tbody>
</table>
### Appendix B: MSWO Assessment Data sheet

#### 8 Stimuli Presented

<table>
<thead>
<tr>
<th></th>
<th>Item 1</th>
<th>Item 2</th>
<th>Item 3</th>
<th>Item 4</th>
<th>Item 5</th>
<th>Item 6</th>
<th>Item 7</th>
<th>Item 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Percentage Selection**

# of times selected

# of times presented

**Item Rankings**

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 

**Notes:**
Appendix C: Engagement Analysis Data Sheet

Participant# _______  Data collector initials: _______  Date: _______

Session Type (circle one):  Pref  Non-Pref  Moderately Preferred

Data Type (circle one):  Primary  Secondary

Instructions:
Score each 10-second interval for the following behaviors:
1) Physical Engagement (P): Participant touches item
2) Oriented Engagement (O): Participant looks at item
3) Not Engaged (N): Participant did not look at or touch item

<table>
<thead>
<tr>
<th></th>
<th>P</th>
<th>O</th>
<th>N</th>
<th>P</th>
<th>O</th>
<th>N</th>
<th>P</th>
<th>O</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P</td>
<td>O</td>
<td>N</td>
<td>P</td>
<td>O</td>
<td>N</td>
<td>P</td>
<td>O</td>
<td>N</td>
</tr>
<tr>
<td>2</td>
<td>P</td>
<td>O</td>
<td>N</td>
<td>P</td>
<td>O</td>
<td>N</td>
<td>P</td>
<td>O</td>
<td>N</td>
</tr>
<tr>
<td>3</td>
<td>P</td>
<td>O</td>
<td>N</td>
<td>P</td>
<td>O</td>
<td>N</td>
<td>P</td>
<td>O</td>
<td>N</td>
</tr>
<tr>
<td>4</td>
<td>P</td>
<td>O</td>
<td>N</td>
<td>P</td>
<td>O</td>
<td>N</td>
<td>P</td>
<td>O</td>
<td>N</td>
</tr>
<tr>
<td>5</td>
<td>P</td>
<td>O</td>
<td>N</td>
<td>P</td>
<td>O</td>
<td>N</td>
<td>P</td>
<td>O</td>
<td>N</td>
</tr>
</tbody>
</table>
Appendix D: MSWO Procedural Integrity Data Sheet

<table>
<thead>
<tr>
<th>Question</th>
<th>Y/N</th>
<th>ITEM 1</th>
<th>ITEM 2</th>
<th>ITEM 3</th>
<th>ITEM 4</th>
<th>ITEM 5</th>
<th>ITEM 6</th>
<th>ITEM 7</th>
<th>ITEM 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Were there 8 items presented in the array?</td>
<td></td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td>2. Were all items placed in a semi circle?</td>
<td></td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td>3. Was the participant given 45s of interaction with each item prior to the first selection?</td>
<td></td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td>Did the researcher say, &quot;pick one&quot;?</td>
<td></td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td>If the participant reached for 2 items, did the researcher block?</td>
<td></td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td>Did the researcher allow for 45s access to the item after it was selected?</td>
<td></td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td>Did the researcher remove the item after 45s or the item was put down?</td>
<td></td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td>Did the researcher reposition all remaining items?</td>
<td></td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
</tbody>
</table>
Appendix E : Engagement Procedural Integrity Data Sheet

<table>
<thead>
<tr>
<th>Question</th>
<th>Y/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the researcher say, “here is _____, you can do ______ for as long as you like” when presenting item 1?</td>
<td></td>
</tr>
<tr>
<td>Did the researcher start the timer when item 1. was presented to the participant?</td>
<td>Y/N</td>
</tr>
<tr>
<td>Did the researcher remove item 1?</td>
<td>Y/N</td>
</tr>
<tr>
<td>Did the researcher say, “here is _____, you can do ______ for as long as you like” when presenting item 2?</td>
<td></td>
</tr>
<tr>
<td>Did the researcher start the timer when item 2. was presented to the participant?</td>
<td>Y/N</td>
</tr>
<tr>
<td>Did the researcher remove item 2?</td>
<td>Y/N</td>
</tr>
<tr>
<td>Did the researcher say, “here is _____, you can do ______ for as long as you like” when presenting item 3?</td>
<td></td>
</tr>
<tr>
<td>Did the researcher start the timer when item 3. was presented to the participant?</td>
<td>Y/N</td>
</tr>
<tr>
<td>Did the researcher remove item 3?</td>
<td>Y/N</td>
</tr>
</tbody>
</table>
Appendix F: MMSE Procedural Integrity Data Sheet

<table>
<thead>
<tr>
<th>Question</th>
<th>Y/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Did the researcher say, “What is the year?” in Question 1</td>
<td></td>
</tr>
<tr>
<td>2. Did the researcher say, “What is the season?” in question 1</td>
<td></td>
</tr>
<tr>
<td>3. Did the researcher say, “What is the date?” in question 1</td>
<td></td>
</tr>
<tr>
<td>4. Did the researcher say, “What is the day?” in question 1</td>
<td></td>
</tr>
<tr>
<td>5. Did the researcher say, “What is the month?” in question 1</td>
<td></td>
</tr>
<tr>
<td>6. Did the researcher say, “What is the State?” in question 2</td>
<td></td>
</tr>
<tr>
<td>7. Did the researcher say, “What is the county?” in question 2</td>
<td></td>
</tr>
<tr>
<td>8. Did the researcher say, “What is the town or city?” in question 2</td>
<td></td>
</tr>
<tr>
<td>9. Did the researcher say, “What is the Purpose of this building?” in question 2</td>
<td></td>
</tr>
<tr>
<td>10. Did the researcher say, “What floor are we on?” in question 2</td>
<td></td>
</tr>
<tr>
<td>11. Were the three words apple, table, penny said clearly and articulately for item 3?</td>
<td>Y/N</td>
</tr>
<tr>
<td>12. Was the participant instructed to repeat the words back for item 3?</td>
<td>Y/N</td>
</tr>
<tr>
<td>13. Was there a 1 s delay between each word on item 3?</td>
<td>Y/N</td>
</tr>
<tr>
<td>14. If the participant was unable to repeat the words for item 3, did the researcher represent the words until they could?</td>
<td>Y/N</td>
</tr>
<tr>
<td>15. Did the research ask question to count backwards by seven? If they could not was the offer to spell WORLD backwards presented?</td>
<td>Y/N</td>
</tr>
<tr>
<td>16. Did the researcher say, “can you repeat the three words I told you a few moments ago?” for question 5?</td>
<td>Y/N</td>
</tr>
<tr>
<td>17. Did the researcher have pencil and watch to point to?</td>
<td>Y/N</td>
</tr>
<tr>
<td>18. Did the researcher ask the participant to name each item (pencil and watch)</td>
<td>Y/N</td>
</tr>
<tr>
<td>in question 6</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>19. Did the researcher ask the participant to repeat the phrase, “no if, ands, or buts” in question 7?</td>
<td>Y/N</td>
</tr>
<tr>
<td>20. Was there paper to give to the participant</td>
<td>Y/N</td>
</tr>
<tr>
<td>21. Did the researcher ask the participant to follow the three steps written in question 8?</td>
<td>Y/N</td>
</tr>
<tr>
<td>22. Did the researcher have the paper with the written command for question 9?</td>
<td>Y/N</td>
</tr>
<tr>
<td>23. Did the researcher ask the participant to follow the written command in question 9?</td>
<td>Y/N</td>
</tr>
<tr>
<td>24. Did the researcher ask the participant to write a sentence in question 10?</td>
<td>Y/N</td>
</tr>
<tr>
<td>25. Did the research ask the participant to copy the picture of the hexagon in question 11?</td>
<td>Y/N</td>
</tr>
</tbody>
</table>
Appendix G: HSIRB Approval Form

WESTERN MICHIGAN UNIVERSITY
Human Subjects Institutional Review Board

Date: January 14, 2008
To: Linda LeBlanc, Principal Investigator
Paige Raetz, Student Investigator for dissertation
From: Amy Naugle, Ph.D., Chair
Re: HSIRB Project Number: 07-11-11

This letter will serve as confirmation that your research project entitled "Preference Assessments for Older Adults with Dementia: Use of Repeated MSWO Assessments to Evaluate Stability over Time" has been approved under the full category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: November 21, 2008