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## A Comparison of the Effectiveness of Distractors Identified Through Stimulus Preference Assessment Versus Caregiver Opinion

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A Comparison of the Effectiveness of Distractors Identified Through Stimulus Preference  
Assessment Versus Caregiver Opinion

By

Jonathan P Steele

A Thesis Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Arts

In

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Minnesota State University, Mankato

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A Comparison of the Effectiveness of Distractors Identified Through Stimulus Preference  
Assessment Versus Caregiver Opinion

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This thesis has been examined and approved by the following members of the thesis  
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### **Abstract**

The effect of a distraction-based intervention on positive affect and aggressive and distress-related behaviors during morning activities of daily living in an elderly dementia patient was tested. Concurrently, the effectiveness of distractors chosen by staff and family report as compared to those chosen through a stimulus preference assessment (SPA) was tested. An alternating treatment design was used to implement identified distractors and a direct observation system was used to measure outcomes. Though staff reported increases in positive affect when using an edible chocolate distractor, no significant changes in positive affect or distress related behaviors were noted by the end of the final treatment phase when compared to initial baseline responding. This was likely due, in part, to the participant's decline in physical health over the course of the study. With regard to the comparison of methods for identifying distractors, data tended to support the usefulness of a SPA for identifying effective distractors over that of family opinion, but was equally as effective as caregiver opinion. Further research is needed to better understand these outcomes.

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## **Chapter 1**

### **Introduction**

#### **Dementia**

Dementia is a pervasive disorder characterized by multiple cognitive deficits, the culmination of which leads to significant impairment in social, occupational, and general daily functioning (APA, 2002). Several causes, both organic and environmental (e.g., Alzheimer's disease, frontotemporal degeneration, traumatic brain injury), have been associated with the development of dementia and, depending on the etiology, may or may not be reversible. Previous studies have identified prevalence rates of general dementia ranging from 1.4-67.7% in individuals 58 years of age or older (APA, 2002; Larrea, Fisk, Graham, & Stadnyk, 2000; Plassman et al., 2007; Rosenblatt et al., 2004; Silver, Jilianskaia, & Perls, 2001). In general, this range is directly correlated with age, with rates of prevalence doubling every five years after the age of 65 (Cummings & Jeste, 1999).

#### **Cognitive and Behavioral Features**

As the disease progresses with age, symptoms associated with the disease become more severe. Cognitive symptoms are those that are necessary for an initial diagnosis, as described by the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition Text Revision (DSM-IV-TR; APA, 2002). These symptoms necessarily include memory impairment, which is characterized by an inability to remember old information or learn new information, as well as one disturbance of language, motor activity, recognition, or executive functioning.

While symptoms related to cognitive impairment are necessary for an official diagnosis of dementia, behavioral symptoms commonly occur as well. Some common behavioral symptoms include, but are not limited to, disruptive vocalizations (Zimmer, Watson, & Treat, 1984), food refusal (Lin, Watson, & Wu, 2008), and wandering (Aud, 2004). Another very common behavior problem that can have important negative consequences is aggressive behavior. According to a review of previous literature on the topic, Buchanan, Christenson, Ostrom, and Hofman (2007) identified that 13-86% of individuals diagnosed with dementia exhibit symptoms labeled as “aggressive.” These aggressive behaviors included both physical indicators such as hitting, pinching, and biting, and verbal indicators such as cursing and threatening. The majority of these behaviors have been shown to coincide with staff-patient interactions such as activities of daily living (ADLs; Colenda & Hamer, 1991; Hagen & Sayers, 1995).

Although both verbal and physical aggression can occur during ADLs, patients with dementia may indicate distress/displeasure during ADLs in ways other than physical or verbal aggression. Other researchers have compiled a more comprehensive list of behaviors that also include these non-aggressive behaviors that indicate general distress. For example, Williams, Herman, Gajewski, and Wilson (2009) conducted a study to identify the relationship between infantile speech patterns known as “elderspeak” and behavior problems in long-term care dementia patients. The authors offered a list of 13 problem behaviors (e.g., hitting, pushing, threatening, crying, screaming) to be observed during the study. This abbreviated list consists of both aggressive and non-aggressive indicators of general distress that can be categorized into three primary groups: behaviors



that are physical in nature, those that are verbal, and those that are emotional. This more comprehensive definition may have greater utility than only targeting “aggression” because distress can be expressed in many ways and studies designed to improve ADL interactions would likely want to target this broad class of behaviors as opposed to just aggressive behaviors.

### **Causes**

Given the prevalence of both aggressive and non-aggressive behavior problems during ADLs in persons with dementia, it is reasonable to ask what causes these challenging behaviors. One explanation for the presence of these behaviors is that they are symptoms of the disease itself. In other words, these behaviors may be due to the physical damage that is occurring to the brain as a result of the disease process. The implication of this assumption is that behavior problems should be treated medically (i.e., with medications). However, this approach has significant downsides. Recent research (e.g., Kolanowski, Fick, Waller, & Ahern, 2006) suggests increases in delirium, emotional disturbances, gait disturbances, and hip fractures in dementia patients prescribed antipsychotic medications for behavior problems. Ballard et al. (2009) also identified increased mortality rates among individuals prescribed these medications. Furthermore, the Omnibus Budget Reconciliation Act (OBRA) of 1987 indicates that psychotropic medications should not be the first-line treatment for most behavioral problems unless medically indicated (e.g., anti-psychotics to treat psychotic behaviors). This leaves nursing home staff and administrators to find alternative, restraint-free interventions for behavioral problems (Buchanan, 2006).

The disease itself, however, may not be the only reason for the presence of challenging behaviors during ADLs (or, for that matter, any other behavioral problem exhibited by persons with dementia). The individual's environment may also be related to increases in these behaviors. ADLs, for example, often evoke these responses. Specifically, ADLs such as bathing, dressing, and changing of soiled undergarments have been reported as instances that often result in increased levels of challenging behaviors (Fisher, Buchanan, & Hadden, 2008; Sloane et al., 2004; Somboontanont et al., 2004; Whall et al., 1997).

To understand from a behavior analytic perspective why problem behaviors occur during ADLs, one must first have an understanding of establishing operations. Michael (1982) described establishing operations as changes in the environment that alter two aspects of reinforcement. The first is the strength of a particular reinforcer, and the second is the frequency of behaviors related to obtaining the reinforcer. In other words, as a reinforcer becomes more or less potent there will be a concomitant increase or decrease in behaviors that previously led to obtaining that reinforcer. Michael eventually narrows this discussion by looking specifically at aversive stimulation and its relationship with establishing operations. Specifically, aversive stimulation alters the environment in such a way that escape (negative reinforcement) becomes highly motivating. As a result, there will likely be an increase in behaviors (such as yelling, hitting, cursing) previously associated with escape.

Caregiving tasks can also be conceptualized in this way. Initiating a caregiving task results in a change in an individual's environment. If the individual finds this task

particularly aversive (e.g., the individual is being touched, is having their clothes removed, is cold), this environmental change will likely lead to an increase in the potency of escape as a reinforcer, thereby resulting in an increase in behaviors previously associated with escape (e.g., screaming, hitting). Given an individual's decreased repertoire for communication due to dementia, the individual may not be able to adequately express their aversion to the task verbally (e.g., saying, "please stop, you are hurting me"). As a result, these challenging behaviors may become an individual's primary mode for indicating distress during a caregiving task. In other words, these indicators of distress serve a function or purpose for the individual and are not simply a symptom of dementia. It is this conceptualization of distress upon which the remainder of this paper is based.

### **Cost of Behavioral Problems**

These behaviors, while clear indicators of distress on the part of the individual with dementia, are shown to have a negative impact on both professional and family caregivers alike. Schoenmakers, Buntinx, and Delepepeire (2010) conducted an extensive review of the relevant literature and identified that, on average, one in three caregivers express depressive symptoms, with these symptoms being more prevalent in caregivers of dementia patients. In addition to caregiver burden and burnout, this disease and its associated symptoms created a financial burden estimated at \$106 billion in the United States and \$422 billion worldwide in 2009 (Wimo, Winblad, & Jönsson, 2010). As discussed previously, these behaviors can also increase the risk of caregiver and

patient injury, and result in the prescription of potent medications that have severe side-effects.

### **Restraint-Free Interventions**

Given the severity of these behaviors and the clear impact they have on caregivers, a great deal of research has been dedicated to investigating ways to decrease their prevalence. Multiple studies have implemented different non-pharmacological, restraint-free interventions. Buchanan and colleagues (2007) identified several of these interventions from a review of the relevant literature. An abbreviated list includes bright light therapy (Haffmans, Sival, Lucius, Cats, & Gelder, 2001), activity-based interventions (Holmberg, 1997), and caregiver training interventions (Gormley, Lyons, & Howard, 2001). In particular, Buchanan et al. (2007) concluded that distraction-based interventions show promise as a relatively simple and low-cost means for reducing aggression during ADLs. A brief description of several of these distraction-based interventions follows.

In 2004, Sloane and colleagues compared the effectiveness of two different interventions (i.e., person-centered showering, towel bath) for the purpose of reducing distress-related behaviors during bathing in nursing home residents with dementia. Both interventions involved keeping the individual covered with towels or blankets for warmth while applying no-rinse soap. Person-centered showering (PCS) utilized preferred bathing products and distraction with edibles, while the towel bath (TB) took place in the residents' beds and incorporated massage-based cleaning. Overall, both interventions

were effective in reducing distress-related behavior with a 53% reduction in the PCS group and a 60% reduction in the TB group.

In a 1997 study by Thomas, Heitman, and Alexander, researchers investigated the effectiveness of music reducing distress-related behaviors during bathing tasks. Residents' family members were interviewed regarding preferred music and identified music choices were incorporated into the bathing task. Aside from implementing preferred music no changes were made to the bathing task. Researchers noted a significant decline ( $p < .001$ ) in aggressive behaviors when comparing intervention and baseline phases (Thomas, Heitman, & Alexander, 1998).

Whall and colleagues (1997) also investigated a distraction-based intervention as applied to the bathing task. During this study, researchers incorporated sounds and pictures of nature into the bathing environment in an effort to reduce instances of distress-related behavior. Orientation to the distractors throughout the course of the task was the only change made to the usual caregiving procedure. Individuals in the treatment condition showed significant improvements in target behaviors when compared to both baseline and individuals in the control condition.

Finally, Fisher et al. (2008) applied distractors to nighttime personal cares. These included tasks such as changing clothes, removing soiled undergarments, and getting into bed. Researchers used a stimulus preference assessment (SPA) to identify potential distractors for the intervention. Before beginning each session, another brief SPA was conducted with two of the four most preferred items. The item attended to most was used for that session of the intervention. The participant was then given free access to the item

for one minute before the caregiving task started. After one minute of access, the caregiving task was carried out as usual with staff orienting the individual to the item throughout the course of the session. Results showed that distractors identified with a SPA were, indeed, effective at reducing instances of these distress-related behaviors.

The Fisher et al. (2009) study marked a novel implementation of a SPA. This was implemented for the purpose of incorporating empirically-identified distractors. Similar studies have been conducted using staff or family opinion to identify potential distractors. Research shows, however, that when comparing results from stimulus preference procedures to family- or staff-identified reinforcers, little agreement is seen (Fisher et al., 1992; Green et al., 1988; Mesman, Buchanan, Husfeldt, & Berg, 2011). Not only do the results of these different methods rarely coincide, they also produce different results when applying them as reinforcers. Green et al. (1988) identified that stimuli chosen through preference assessment procedures were more likely to serve as effective reinforcers for individuals with profound handicaps than those identified through interviews with staff members. Therefore, there is some data to support the use of SPA as a means for developing better intervention programs for persons with developmental disabilities. This is important because if one is going to expend the time and effort to complete a SPA (which often takes 30-60 minutes), the results of the SPA should lead to more effective interventions than quicker methods of identifying preferences such as staff or family member opinion.

### **Current Study**

The purpose of the current study was twofold. First, the researchers were interested in expanding the literature on the clinical effectiveness of distraction-based interventions for reducing distress during ADLs. In the current study, distressing behaviors during morning ADLs were targeted in an elderly individual with dementia. Effectiveness of the intervention was measured through direct observation of changes in both negative behaviors (e.g., distress, aggression) and positive affect (e.g., laughing, smiling). The study was also conducted for the purpose of comparing the effectiveness of distractors identified through interviews with staff and family members and those identified via stimulus preference assessment when implemented during the care activity. There were three hypotheses for this study: 1) that the distraction-based intervention would result in a decrease aggressive and distressing behaviors, 2) that the distraction-based intervention would result in an increase in positive affect, and 3) that items identified using a SPA would be more effective than items chosen by staff or family members in terms of producing changes in aggression and distress and positive affect.

## **Chapter II**

### **Method**

#### **Participants**

The participant in this study, “Julie,” was an 87-year-old female diagnosed with Alzheimer’s type dementia. Staff reported that Julie had also been in a car accident several years prior to her admittance and were unsure whether or not traumatic brain injury played a role in her symptoms. Julie resided in a 15-room locked memory care unit of a long-term care facility located in a small midwestern city. Staff reported that Julie would scream, insult caregivers, pull away from caregivers, and occasionally hit caregivers during morning personal cares (e.g., getting out of bed, dressing, administering medications). Julie was given Seroquel for dementia-related symptoms and naproxen for pain.

Caregivers also served as participants in the current study. To be eligible for participation caregivers were required to be licensed CNAs and were required to have worked with Julie for at least six months prior to the study. This ensured that both the caregivers and the resident were acclimated to one another so as to prevent reactivity to an unknown individual. Individuals caring for Julie during the study who had not worked with her for this amount of time were required to be accompanied by a caregiver who had and were not allowed to administer the intervention alone. Three to five caregivers worked in the memory care unit at a time, with two individuals working together with the participant each day. These pairings depended on work schedules and were not assigned by the researchers.



### **Operational Definitions of Target Behaviors**

Changes in two broad categories of behaviors were measured for this study: indicators of distress and positive affect. The term “indicators of distress” was separated into three subcategories: physical indicators, verbal aggression, and emotional indicators. Physical indicators were defined as forceful physical contact with a care provider (e.g., hitting, slapping, kicking) or forceful avoidance of physical contact with a care provider (e.g., pulling away, pushing). Verbal aggression was defined as statements of harm or threat directed toward another person. These included verbal threats (e.g., “I’m going to bite you”, “Shut up”), insults (e.g., “I hate you”, “You’re awful”), or cursing (e.g., “Shit”, “Damn it”). Finally, emotional indicators were defined as any other behavior that indicates the person is unhappy or miserable (e.g., angry, sad) that does not meet criteria for “physical indicators of distress” or “verbal aggression.” This could include statements of displeasure (e.g., “No, no, no!”, “Stop that!”, “Why are you doing this to me?”), complaints (e.g., “You’re killing me!”, “This is terrible!”), or non-verbal behaviors (e.g., yelling, crying, groaning).

Researchers also chose to monitor covariation in indicators of positive affect. Parrish, Cataldo, Kolko, Neef, and Egel (1986) identified response covariation as manipulation of a target behavior that results in concurrent changes in untargeted behaviors. These changes can be direct or inverse depending on their functional relationship. Therefore, for this study, the researchers measured positive affect (untargeted behavior) to identify any changes as a result of manipulating indicators of distress. In addition to its empirical application as a potential covariant with indicators of

distress, positive affect was measured for its clinical application to the caregiving setting. Increases in positive affect may indicate increases in participant enjoyment of the caregiving task and may positively impact caregivers' mood and interactions with the participant.

The definition of positive affect for the current study was taken from previous research related to indices of happiness (Green, Gardner, & Reid, 1997). Positive affect was defined as "any facial expression or vocalization typically considered to be an indicator of happiness among people without disabilities, including smiling, laughing, and yelling while smiling." In addition to this definition, researchers included complimenting (e.g., "You are cute", "You are wonderful"), making positive statements (e.g., "This is delicious", "I like this", "This feels nice", "This sounds nice"), and waving at staff members as they entered her bedroom or bathroom.

### **Procedure**

The study was conducted in four phases.

**Phase 1: Baseline.** Baseline measurements were taken between 8:30 and 9:30 a.m. during morning personal care activities. Each session was videotaped using a digital recorder placed in the corner of the resident's room where it would be both inconspicuous and out of the way of the caregiving task. Before the task began, a researcher quietly entered the participant's room, set up the camera, and left the room. The researcher did not interact with the resident unless prompted. When prompted by the resident, the researcher responded by saying "I am just here to check on something and will be done shortly." After leaving the room, caregivers waited at least five minutes before entering

to minimize any effect the research may have had on the participant's behavior.

Caregivers then entered the room, turned on the camera, and carried out the caregiving task as they normally would. These procedures were carried out for 12 days. A 10-second partial interval system was used to code indicators of distress and positive affect, with interrater reliability data being collected for 25% of the sessions.

**Phase 2: Stimulus Preference Assessment.** Between the baseline and intervention phases, a paired-stimulus preference assessment was conducted to empirically identify potential distractors for the intervention. This was conducted in a fashion similar to that described by Fisher, Buchanan, and Cherup-Leslie (2009). First, items to be used in the assessment were identified through interviews with staff and family members. This provided three to four options for the SPA. More items were identified through previous literature with a similar population (Fisher et al., 2008), providing eight items for the SPA. Before conducting the SPA, a list was constructed with each item paired with every other item. The order in which pairings were presented was randomly determined and each item was presented on the participant's left and right hand sides an equal number of times. While conducting the assessment, paired items were placed within reaching distance of the participant and approximately 18 inches apart. Pairings were presented for 30 seconds. A second researcher recorded the amount of time spent attending to each item using two stopwatches. Attending was defined as the resident looking at, talking about, pointing to, touching, or holding a particular item. In the event that the item was musical in nature, clapping, humming, singing, or conducting were also considered attending. One item was also consumable (i.e., chocolate), so

eating the item was also considered attending. This process was carried out until all pairings had been presented. The percentage of time spent attending to each item was then totaled and a rank-ordered list from most to least preferred was constructed.

**Phase 3: Interviews and Training.** This phase was implemented at two different times. The first occurred before conducting the SPA. During this time staff and family members were interviewed separately to identify background information about the participant's social history, diagnoses, and detailed descriptions of current behavioral problems (i.e., topography, frequency, context). This was also an opportunity to gather information regarding potential distractors. Both the participant's husband and primary caregivers were asked to offer their opinions as to what items Julie would prefer in general and what her most preferred item would be. These items were documented and later used during the SPA.

The second meeting was carried out with staff only. During this session staff was presented with the findings of the SPA and the stimuli chosen for the intervention. The researchers then introduced staff members with a detailed description of the intervention phase and their responsibilities during each session. Opportunities to role-play particular portions of the intervention were offered and remaining questions were answered. Aside from additional reminders as needed before individual sessions, no further training was required.

**Phase 4: Intervention.** An alternating treatment design was implemented during the intervention portion of this study. Three separate distractors were chosen for implementation in an effort to identify whether or not differences existed between staff or

family member opinions and the results of the SPA with regard to effectiveness in reducing distress. These distractors included small pieces of chocolate (ranked first in the SPA and by staff), big band music (ranked first by the participant's husband), and a stuffed dog (ranked last in the SPA). One of these three distractors was randomly chosen each day, while allowing only two consecutive implementations of the same distractor. As with baseline measurements, intervention sessions were conducted in the mornings during the identified personal cares and the same routine for setting up the camera before beginning the caregiving task was used.

After positioning the camera and choosing a distractor, caregivers entered the resident's room and greeted her for the morning. Before initiating the task, caregivers sat next to the resident on her bed, introduced her to the distractor for the day, and allowed her free access to the item for one minute. During this time the resident was allowed to look at, talk about, touch, hold, listen, or consume the item if appropriate. After this minute of free access, the caregiving task was carried out as usual. The only difference from care-as-usual was the periodic orientation of the participant to the distractor by staff. Orientation included asking questions about the participant's history with the item, asking if she enjoyed the item, and offering her opportunities or reminders to taste, touch, listen to, or look at the item. Once the caregiving task was completed the participant was allowed another minute of free access to the item. Once this minute was completed and the participant was removed from view of the camera, the session was complete.

Each intervention was carried out as stated above with minor changes based on the distractor being used. Orientation to chocolate consisted of providing the participant

with small pieces to eat throughout the task and conversing with her about chocolate (e.g., “How does that taste?”, “What is your favorite kind of chocolate?”). The participant did not have free access to the chocolate throughout the task. When using the stuffed dog as an intervention, staff members handed the dog to the participant allowing her to hold, pet, and make comments about it. Staff members would also ask her about the dog (e.g., “Does he feel soft?”, “What should his name be?”). As with the chocolate, the participant only had access to the dog when offered by staff. Music, on the other hand, was played throughout the entire session when used as an intervention. During this time staff oriented the participant to the music by asking her questions (“Do you like this song?”, “Can you sing along?”) or singing with the music.

The intervention phase was carried out for 15 days, which allowed for five implementations of each item. After completion of this phase, the most effective distractor was implemented for a final three-day period. As with baseline, a 10-second partial interval system was used to measure target behaviors and 25% of all sessions were coded for interrater reliability. Treatment integrity was tracked for all intervention sessions to ensure staff correctly implemented the procedure. Researchers monitored whether or not free access to the distractor was offered for 60 seconds before the task, whether or not the participant was oriented to the distractor throughout the task, and whether or not free access was offered for 60 seconds after the task. In addition, number of orientations to the distractor was recorded for each session.

## **Chapter III**

### **Results**

#### **Stimulus Preference**

The following is a rank-ordered list of SPA items from most to least preferred with percentage of time spent attending to each item: chocolate, 94%; baby video, 64%; pictures of family members, 45%; music box, 39%; baby doll, 27%; big band music, 26%; box of beads and cloth, 13%; stuffed dog, 13%. As can be seen by these results, chocolate was the most preferred item on the list. Staff also chose this item as the most suitable distractor during the initial interview. The participant's husband, however, suggested music as the most suitable distractor. He specifically suggested big band music as his wife's preferred genre of music. The big band music was attended to 26% of the time. Finally, the dog was the lowest item on the SPA with the participant attending to it only 13% of the time. These three items were chosen by researchers as the treatments to be implemented during the intervention phase. Chocolate and music were included to compare staff and SPA results to family choice. The stuffed dog was chosen to further verify the utility of the SPA in identifying the participant's preference. In other words, it was expected that if the SPA ranking had clinical utility, then the most-preferred item (i.e., chocolate) should be a more effective distractor compared to the least-preferred item (i.e., the stuffed dog).

#### **Interrater Reliability**

Reliability data was collected for 25% of all baseline and intervention sessions. Two independent observers collected data from videotaped sessions using a 10-second

partial interval coding system. Reliability was calculated by dividing the total number of agreements by the number of agreements plus disagreements. Interrater reliability coefficients for baseline measurements ranged from 95-100% for physical indicators, 95-100% for verbal aggression, 80-91% for emotional indicators, and 94-98% for positive affect. Reliability coefficients during the alternating treatment and final implementation phases ranged from 87-100% for physical indicators, 99-100% for verbal aggression, 88-95% for emotional indicators, and 94-98% for positive affect. This indicates that all reliability measurements were within acceptable ranges.

### **Treatment Integrity**

Treatment integrity was tracked for each session of both the alternating and final treatment phases of the study and is illustrated in Table 1 (Appendix B). Providing approximately 60 seconds of free access to the distractor before commencing ADLs, orientation of the participant to the to the distractor throughout the session, and approximately 60 seconds of free access after completion of ADLs were required for complete implementation of the intervention. Free access to the item was given before the task in 15 of 18 sessions (83%). Access was also provided after the task in 11 of 18 sessions (61%). Orientation to the distractor throughout the task occurred in all 18 sessions. Number of orientations ranged from 4-17 across all sessions (4-14% of intervals across sessions), with an average of seven orientations per session (9% of intervals per session). When considered together, 10 of 18 sessions (56%) met all three requirements for complete implementation and 16 of 18 sessions (89%) met at least two of the three requirements.



**Distress Data**

During baseline, the percentage of intervals containing physical indicators of distress ranged from 1-6% with an average of 4% across sessions. Though lower levels were seen during the alternating treatment phase, these levels did not change dramatically from baseline. Both chocolate and music interventions averaged 2% across sessions with the stuffed dog averaging 3%. Implementation of chocolate as the best intervention showed similar levels to that of the alternating treatment phase with an average of 2% across the final three sessions. This data suggests that the interventions had little effect on physical indicators of distress. This may be due to a floor effect given that low levels of physical indicators of distress were observed during baseline measurements.

Similar results were found when examining verbal aggression data. On average, 1% of baseline intervals contained indicators of verbal aggression with a range of 0-3%. Both the chocolate and the dog interventions maintained this level during the alternating treatment design, while the music intervention averaged 0% across sessions. Implementation of chocolate during the final sessions also averaged 0%. Again, a floor effect is a likely explanation for the similar levels of responding across phases.

Figure 1 (Appendix A) illustrates data collected for emotional indicators of distress (e.g., moaning, yelling). Baseline sessions ranged from 10-28% of intervals containing indicators of emotional distress. On average, emotional indicators were present in 20% of baseline intervals. Baseline data indicate that emotional distress was much more frequent than physical or verbal aggression. Clearly, emotion-related behaviors were the participant's primary means of indicating distress throughout all

phases of the study. As a result, this is the target behavior that will be focused on for the remainder of the paper.

A great deal of variability was seen with all interventions during the alternating treatment phase. Aside from one data point nearly 15% higher than average baseline sessions, distress maintained baseline levels throughout the chocolate intervention, the item identified by staff and the SPA as most preferred. More specifically, percentage of intervals containing distress during this intervention ranged from 10-35% with an average of 19% across sessions. This indicates an average only 1% lower than baseline.

The participant's husband indicated that music would likely be the most useful distractor, while the results of the SPA suggested otherwise (music was ranked 6th out of 8 items). The data shows a range from 4-22% of intervals containing distress during the music intervention. Two of the data points within this range were below baseline levels. Overall, the average percentage of intervals containing distress was 8% lower than baseline and 7% lower than the chocolate intervention. Based on this data alone it would appear that this intervention was superior to the other two interventions. However, due to problems associated with the volume of the music as well as results regarding positive affect data, music was not implemented during the final phase of the study. This point will be further elaborated during the discussion portion of the paper.

The stuffed dog intervention produced the poorest results of all three interventions. A steady upward trend over the course of the first four implementations can be noted, with the final point indicating a decrease in distress from previous implementations. This decrease, however, was well within the upper range of baseline

levels, indicating no significant change in behavior. Overall, indicators of distress averaged 30% across all sessions with the stuffed dog. This indicates the only overall increase from baseline of all three interventions.

### **Positive Affect Data**

Table 2 (Appendix C) separates positive affect data by phase and by specific interventions within the alternating treatment design. As can be noted in this table, baseline levels of positive affect ranged from 0-7% with an average of 4% across sessions. During the alternating treatment phase, chocolate averaged 15% across sessions with one session reaching 28%. This indicates an average level of positive affect nearly four times higher than baseline. Data for the music intervention resembled baseline data, with a range of 2-16% and an average of 6% across sessions. This indicates levels of positive affect 2.5 times lower than chocolate. During the sessions incorporating the stuffed dog, levels of positive affect ranged from 7-15% with an average of 10% for all sessions. This indicates an increase in positive affect from baseline and better results than the music intervention. As can be seen from these results, the chocolate intervention was associated with the highest levels of positive affect.

### **Final Treatment Phase**

When utilizing an alternating treatments design, it is standard practice to continue implementing the intervention found to be most effective during the alternating treatments phase. Determining which intervention was most effective in this study proved to be challenging. When examining all distress data together, no intervention was significantly better than another in reducing levels of distress. All interventions were

near, within, or above baseline levels. The music intervention was the only one to indicate levels lower than that of baseline. As was noted earlier, however, music was not implemented as the best treatment option. This was done for several reasons. First, as was stated earlier, researchers encountered problems associated with the volume of the music. A large portion of the verbal interactions between staff and the participant were inaudible, making measurement of verbal aggression and emotional distress nearly impossible. Therefore, the accuracy of the data collected for this intervention was questionable. Second, examination of positive affect data indicated that music was associated with baseline levels of responding. Finally, staff indicated on several occasions that the participant seemed “annoyed” by the music. These pieces of information caused researchers to question the effectiveness of the intervention as indicated by the initial data.

Chocolate, on the other hand, though consistent with baseline distress levels, was associated with consistently higher levels of positive affect. This coupled with staff report that the participant enjoyed days with chocolate led to its implementation in the final phase of the study. Examination of Figure 1, however, indicates that indicators of distress were higher during this phase than previous phases. Percent of intervals containing distress ranged from 33-37% with an average of 35%. This is an increase of 15% from baseline to the end of treatment. Furthermore, instances of positive affect returned to baseline levels with an average of 5% across sessions. Data related to emotional distress and positive affect during the final phase suggest that the intervention

was not effective in reducing levels of distress or maintaining increases in positive affect.

Hypotheses as to why this may have occurred will be discussed below.

## **Chapter IV**

### **Discussion**

The current study tested three hypotheses, which were: 1) that the distraction-based intervention would result in a decrease in indicators of distress and aggression, 2) that the distraction-based intervention would result in an increase in positive affect, and 3) that items identified using a SPA would be more effective than items chosen by staff or family members in terms of producing changes in indicators of distress and positive affect. Each of these hypotheses will be discussed as they relate to the outcome of the study.

#### **Hypothesis 1**

Results suggested that, overall, there were no decreases in indicators of distress as a result of the intervention. Indicators of distress were relatively consistent with baseline during the alternating treatment phase and increased by an average of 15% during the final treatment phase. These results are not consistent with previous research findings. There are several possible explanations for this finding. While coding data, it was observed that distress-related behaviors consistently occurred during times in which the participant was being physically handled by staff to move her from one location to another (e.g., lifted from her bed, lifted from the toilet, set down in her wheel chair). During these times the participant would shout phrases that potentially indicated the presence of physical pain (e.g., “You’re killing me”, “You’re tearing me apart”). These observations prompted the researchers to meet with staff in an attempt to clarify their

understanding of the situation. Staff confirmed that the participant was, in fact, complaining of physical pain more often than in previous months and was not being allowed increased pain medication by her guardians. According to staff, other indicators of physical decline accompanied this increase in physical pain. For example, it was noted that the participant spent less time engaged in activities provided for the residents (e.g., sing-a-longs, games), was more withdrawn from social interaction, and had recently experienced increased difficulty in recognizing family visitors. Staff suggested that these changes in behavior may have been the result of a stroke or transient ischemic attack (TIA). As a result, the increases in distress-related behavior may have been due, in part, to the general physical decline of the individual, rather than the result of a failed intervention.

### **Hypothesis 2**

Consistent with this hypothesis, an increase in positive affect was noted during the alternating treatment phase of the study. This result was seen in both the chocolate and stuffed dog interventions, with levels nearly four times higher than baseline with chocolate and 2.5 times higher with the stuffed dog. However, levels of positive affect immediately returned to baseline levels of responding upon implementation of the final treatment phase. As with the previous hypothesis, the researchers were inclined to attribute these results, in part, to the participant's declining physical health. The distractors used in this study were chosen to distract from general distress related to ADLs, not from serious physical pain.

### **Hypothesis 3**

With regard to the utility of the SPA, there is evidence to suggest that it was useful for correctly ranking items with regard to their effectiveness as distractors. Although there were no interventions that reliably reduced levels of distress-related behaviors as compared to baseline, there was one clear difference between average levels of responding for two distractors: chocolate and the stuffed dog (music will not be included in this discussion as a result of the issues with data collection). The results illustrated by Figure 1 indicate that the chocolate intervention was associated with levels of distress similar to that of baseline, while the stuffed dog intervention was associated with responding 10% higher than baseline. This data suggests SPA results have some validity, with the dog being least preferred during the assessment and the intervention phases. This also supports previous research findings related to the utility of a SPA for identifying effective distractors.

When specifically considering the effectiveness of the SPA in choosing distractors as compared to those chosen by staff and family opinion, the results are difficult to determine. Staff chose chocolate as the most preferred distractor, which was also the highest ranked SPA item. This match prevents researchers from drawing conclusions about differences in caregiver opinion and SPA results. It should be noted, however, that this result is not consistent with previous literature (Fisher et al., 1992; Green et al., 1988; Mesman, Buchanan, Husfeldt, & Berg, 2011) in that caregiver opinion and SPA results are often conflicting. Further research is needed to better understand why this match may have occurred.



As with chocolate, the effectiveness of the music intervention when comparing family opinion and SPA results is difficult to determine. Given the issues related to music volume, the distress and aggression data collected is unreliable. Though not measured empirically, staff observation of the participant's possible annoyance with the music intervention also undermines the credibility of the data obtained. Positive affect data, on the other hand, may provide some insight into its effectiveness. The emotional distress definition consisted only of components that required one to hear what the individual said or noises she made. The definition of positive affect, on the other hand, included both verbal and physical components. These physical components (e.g., smiling, waving) may be relied upon for drawing conclusions about the effectiveness of this intervention. Positive affect data indicated that the participant was responding at levels consistent with baseline when this distractor was used, as compared to levels higher than baseline for the other distractors, suggesting relatively low preference. This would be consistent with SPA results in that it was ranked sixth out of the eight items, but inconsistent with family opinion. As a result, one may be able to tentatively conclude that the SPA was more useful than family opinion for determining the relative effectiveness of distractors, at least in terms of producing more positive affect during ADLs.

Though the intervention did not produce the hypothesized levels of change in distress, staff report made clear that the procedures were, at least, socially valid. As described by Wolfe (1978), three components are necessary for a socially valid procedure: acceptable goals, acceptable means to obtain stated goals, and acceptable

outcomes. Though the researchers did not formally measure these constructs, interactions with staff suggest that all three requirements were met. First, all targeted behaviors were chosen with the help of staff, indicating that they were acceptable goals for change. Second, staff never reported excess burden as a result of the intervention. In fact, they were cooperative and committed to the procedures. Finally, staff noted positive responses by the participant when using the chocolate intervention. Though this was not to the extent expected, it does suggest some degree of satisfaction with the outcome. As a result, researchers feel confident that an adequate level of social validity was reached with the implemented procedures. Future research related to distraction-based interventions with this population would be wise to incorporate formal measurements of social validity. An intervention with goals, processes, or outcomes that do not garner staff investment and confidence will not be implemented, regardless of the potential outcome.

### **Implications**

Though few firm conclusions can be drawn from the results of this study, it does provide tentative implications related to the use of a SPA in the caregiving setting. First, though inconsistent with previous literature, caregiver opinion matched SPA results in ranking chocolate as the most preferred item. During the initial interviews with caregivers, several indicated that they had worked with the participant for many years. Perhaps this extended history with the resident provided them with enough time to identify the participant's specific likes and dislikes, thereby increasing the likelihood of choosing the distractor indicated as most preferred by the SPA. This may suggest that

caregivers who have spent a significant amount of time with residents are more able to predict effective distractors, thereby eliminating the necessity of the time and effort required to conduct a SPA.

This level of understanding may not always be possible, however. In such cases, a SPA may be useful for identifying effective distractors. As is consistent with previous research, SPA results for the current study were useful in identifying the relative effectiveness of particular stimuli as distractors. Though none of the distractors significantly improved responding from baseline, there was a clear difference in responding when using chocolate (ranked highest in the SPA) and the stuffed dog (ranked lowest in the SPA). This suggests that a SPA may be useful for identifying a preferred distractor in the caregiving setting when several options are available, but no opinion can be offered as to which stimulus would be most effective.

### **Limitations and Future Research**

One limitation of the study was the overlap of caregiver opinion with SPA results. Because both identified chocolate as the most preferred item, their relative effectiveness in choosing distractors could not be compared, making it difficult to test the third hypothesis of the study. Future researchers would be wise to include only those participants whose SPA results did not match staff and family opinion. Perhaps this could be accomplished by including more participants, thereby increasing the likelihood of finding participants with no overlap, or by presenting staff and family members with a predetermined list of items to rank order and comparing those rankings to SPA results with regard to their effectiveness as distractors.

Another limitation of the study was the inconsistent implementation of the interventions. As was noted previously, the chocolate and the dog were only available when offered by caregivers. The music, however, was playing throughout the entire session, providing the participant with free access at all times. Not only did this result in differences in the participant's general access to the item, but also established the potential for a power differential between the participant and the caregivers when implementing the dog and chocolate interventions. The resident participant was dependent upon staff for receiving a preferred item, chocolate. It is possible that this limited access and increased dependence on staff may have led to increases in indicators of distress over time.

This could be corrected in future studies by delivering all interventions on a free access or limited access basis. As with the music intervention, a free access schedule would allow the participant to sample the chocolate and the stuffed dog at all times. Perhaps the dog or pieces of chocolate could be placed on a tray within reach of the participant, allowing her access whenever she desired. On the other hand, limited access to distractors could be implemented using a fixed-interval schedule. A timer could be set to go off at regular intervals (e.g., every 30 seconds), reminding caregivers to allow access to the item. With this schedule the chocolate and stuffed dog interventions would be implemented as before, but music would only be turned on after the alarm. In the interest of altering ADLs as little as possible and establishing a good working relationship with staff, it was decided to allow caregivers the freedom to implement the interventions in a flexible manner.

The issue of the participant's sudden physical decline was also a limitation of the study. Researchers questioned staff about the participant's general physical condition during the initial interviews and were assured there were no significant problems. The intervention was implemented with the understanding that problem behaviors occurred as a result of general distress related to ADLs, not as a result of serious physical pain. The information provided by staff members near the end of the study may indicate that this was no longer accurate. Given the nature of general physical decline within this population, future researchers would be wise to gather data throughout the study to identify changes related to declining participant health. Keeping this information current may allow researchers to draw better-informed conclusions about an intervention's effectiveness.

Treatment integrity should also be noted as a potential limitation in this study. Though all three requirements were met for a majority of sessions (56%), it is clear that there was room for improvement in staff's implementation of intervention procedures. The component missed most frequently was access to the item after completion of the task. One explanation for this problem may be staff fatigue both within sessions and over the course of the study. Since this component was incorporated at the end of each session it seems likely that staff may have failed to implement it for two reasons: 1) They were tired of orienting the individual to the item and simply chose not to do so or 2) due to the strain of the task or their focus on assisting the next resident, staff simply forgot. It should also be noted that staff implemented this component fewer times during the second half of the alternating and final treatment phases (4 of 9 sessions) than in the first

half (7 of 9 sessions). This would suggest that fatigue over the course of the study was also an issue affecting proper implementation of the intervention procedures. Future studies would be wise to incorporate booster training sessions and/or staff reinforcement for proper implementation of procedures.

Finally, researchers find it necessary to address a potential ethical issue found in the final treatment phase of the study. As can be noted in Figure 1, this phase ended with the participant responding with higher levels of distress than observed during baseline. Researchers made several efforts to continue working with the resident after finding that the intervention was generally ineffective, but several issues with family and staff prevented this. First, the participant's husband indicated that he was not interested in pursuing new intervention options presented by the researchers. Second, during the final week of the alternating and final treatment phases, researchers began experiencing resistance by staff. On several occasions morning ADLs would either be completed before a researcher was scheduled to be on site or he was encouraged to leave due to changes in ADL schedules. Also, staff members were no longer interested in pursuing new options for intervention. Though approached both in person and by email, neither staff participants nor their supervisors were willing to discuss further involvement. Finally, two primary staff members involved in the study were either no longer employed or unavailable for participation by the end of the final intervention phase. As a result, it was impossible for the researchers to carry out a new intervention or conduct follow-up measurements of behavior.

## Chapter V

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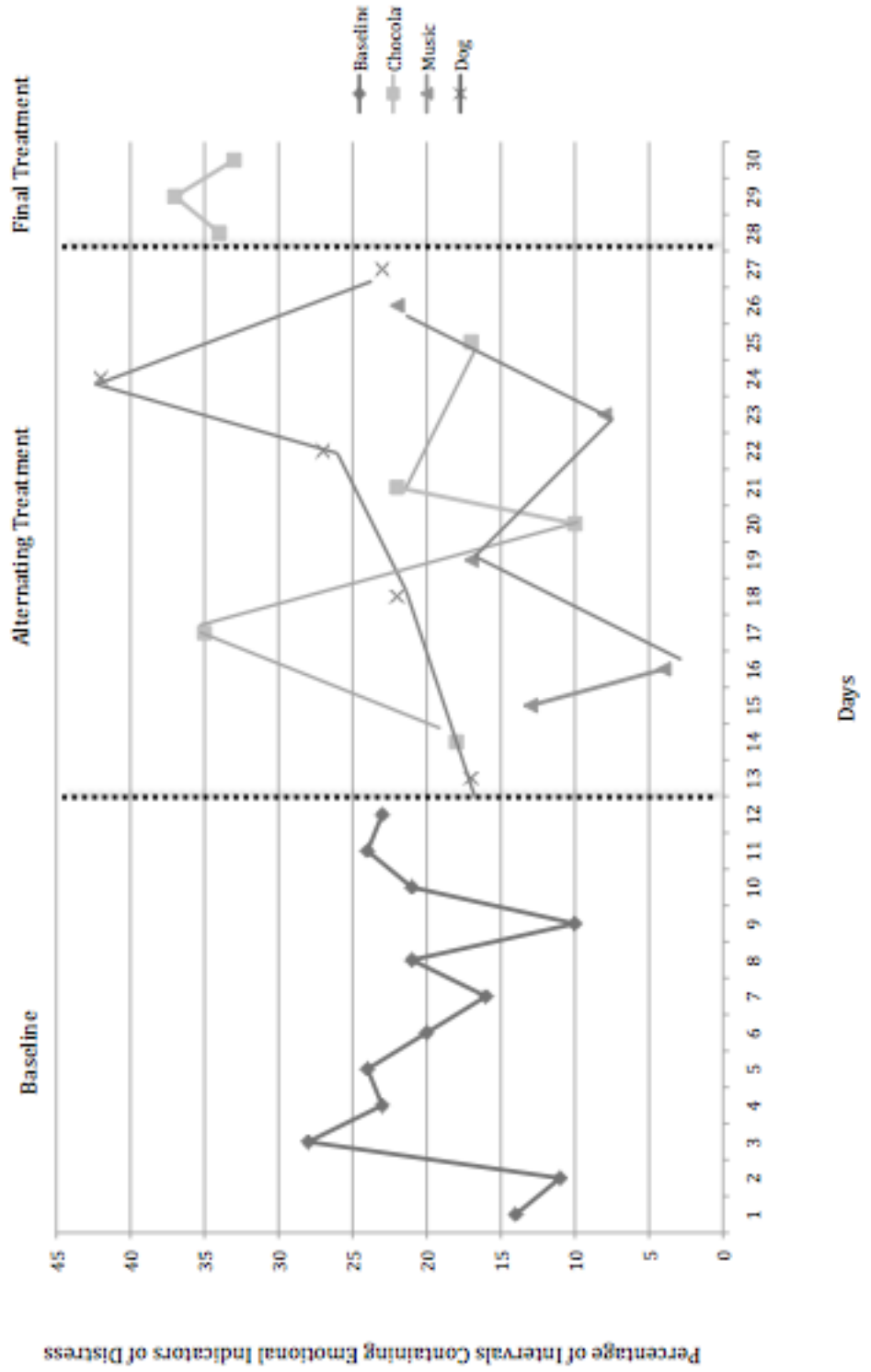
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Appendix A

Figure 1. Percentage of intervals containing emotional indicators of distress across all phases.



## Appendix B

Table 1

*Treatment Integrity*

<u>Day</u>	<u>Orient Before</u>	<u>Orient After</u>	<u>Number of Orientations</u>	<u>% of Orientations</u>
13	X	X	5	5
14	X	-	16	12
15	X	X	10	9
16	X	X	10	11
17	X	X	9	12
18	X	X	6	7
19	X	X	6	7
20	X	X	17	13
21	X	-	9	9
22	X	X	4	4
23	X	-	10	8
24	X	-	10	14
25	X	X	7	10
26	-	-	8	11
27	X	X	6	6
28	-	X	6	8
29	X	-	8	9
30	-	-	6	9
Total %: 83%		61%	Avg: 7	Avg %: 9

*Note.* Percent of orientations illustrates the percent of intervals within a session containing an orientation to the distractor. This was measured by dividing the number of orientations by the number of intervals for each session.

## Appendix C

Table 2

*Positive Affect*

<u>Phase</u>	<u>Total %</u>	<u>Range</u>
Baseline	4%	0-7%
Alt Tx: Chocolate	15%	6-28%
Alt Tx: Music	6%	2-16%
Alt Tx: Stuffed Dog	10%	7-15%
Final Treatment (Chocolate)	5%	1-7%