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Evaluating the Influence of Time of Day on Activity Engagement in Persons with Dementia

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Evaluating the Influence of Time of Day on Activity Engagement in Persons with Dementia

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Applied Behavior Analysis
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DEDICATION

I dedicate this manuscript to my parents, Julie and Marc, my brother, Marc, and my partner, Awais. Thank you for your endless help and support. This would not have been possible without you.

ACKNOWLEDGMENTS

I would like to acknowledge my thesis advisor, Dr. Raymond Miltenberger, for his time, support, and feedback throughout the development and completion of my thesis. I would also like to acknowledge my mentor, Marissa Novotny, for her guidance, assistance, and encouragement throughout this process. Finally, I would like to acknowledge Vanessa Larson for her time, effort, and patience during this process. Thank you all for your support.

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ABSTRACT

Dementia is a serious disease affecting a growing number of people. With the onset of dementia comes a decline in social activity engagement which can negatively impact multiple aspects of a person's life. Research suggests that time of day may influence activity engagement of a person with dementia, but such research is limited. The purpose of this study was to evaluate the influence of time of day on engagement in activities in persons diagnosed with dementia. The secondary purpose of this study was to assess the validity of preference assessments in individuals diagnosed with dementia and determine if low preference is correlated with low engagement in group activities. An alternating treatments design was used with three participants to compare activity engagement during two times of day, morning and afternoon, and during two activities, a moderately preferred and a low preferred. Results showed no differentiation in engagement between morning and afternoon activities for all three participants, with high levels of engagement during both times of day. For two participants, results showed no differentiation in engagement between moderately preferred and low preferred activities. For one participant, levels of engagement were higher during moderately preferred activities than during low preferred activities.

INTRODUCTION

Approximately 5.1 million people in the United States, age 65 and older, suffer from dementias brought on by disease and that number is expected to rise as the population ages (National Institute on Aging, 2015). Dementia is a general term used to describe the continuous decline in cognitive abilities due to either disease or injury (American Psychiatric Association, 2000). In addition to a decline in cognitive abilities, dementia is characterized by a decline in memory and language along with a change in mood and behavior (American Psychiatric Association, 2000; American Psychiatric Association, 2013).

Another area of serious concern for persons with dementia is a decline in social activity engagement. Research shows that persons with dementia residing in nursing homes and assisted living facilities spend minimal time engaged in social activity and are consistently observed engaging in nonsocial behavior such as sleeping or watching television (Ice, 2002; Kuhn, Fulton, & Edelman, 2004; McClannahan & Risley, 1975; Schreiner, Yamamoto, & Shiotani, 2005; Shore, Lerman, Smith, Iwata, & DeLeon, 1995). Both Kuhn et al. (2004) and Shore et al. (1995) found that residents spent, on average, less than 20% of their time engaged in appropriate social behavior. Schreiner et al. (2005) found that during times where no group activity was provided, residents spent more than 50% of their time doing “nothing.” This is especially concerning because low levels of social activity engagement in the elderly can have negative impacts on several aspects of the person’s life. Buchanan et al. (2009) followed participants for almost 5 years and found that less participation in social activities is associated with more rapid declines

in motor functioning. McClannahan and Risley (1975) found that nursing home residents engaged in few motor movements, lacked social interaction, and rarely participated in appropriate activities. Buettner and Fitzsimmons

(2003) measured agitation, which is generally characterized by inappropriate verbal, vocal, and motor activities and is often exhibited by persons with dementia. They found that agitation peaked at times when the fewest social activities were offered. Finally, Winningham and Pike (2007) and Tsai et al. (2009) both found that a lack of social interactions is related to an increased risk of depression.

Although lack of engagement can have a negative impact on persons with dementia, research shows that an increase in activity engagement can have a positive impact. One advantage of having individuals engaged in activities is an increase in social behavior, such as communication and interactions with others (Cohen-Mansfield, Thein, Dakheel-Ali, & Marx, 2010; Quattrochi-Tubin & Jason, 1981). Several studies have also found increases in indices of happiness, such as laughing or smiling, when the person was engaged in an activity (Lancioni et al., 2015; Lancioni et al., 2017; Moore, Delaney, & Dixon, 2007; Short- DeGraff & Diamond, 1996). Furthermore, Schreiner et al. (2005) found that indices of happiness were expressed during recreational activities, but not during periods of free time. Altus, Engelman, and Mathews (2002) measured resident engagement before and after an intervention targeting staff behavior; staff interactions were recorded as a secondary measure. Altus et al. (2002) found that when resident's activity engagement increased, staff interactions with residents increased, suggesting activity engagement can benefit both caregivers and residents. Finally, research shows that an increase in stimulation from activities can lead to a decrease in inappropriate, maladaptive, and

passive behaviors, such as incorrect manipulation of items, aggression, or sitting on a couch watching television (Engstrom, Mudford, & Brand, 2015; Spira, Koven, & Edelstein, 2004).

Several interventions have been used to increase activity engagement. Extensive research has established the efficacy of delivering prompts and praise to increase activity engagement in persons with dementia (e.g., Brenske, Rudrud, Schulze, & Rapp, 2008; Cohen-Mansfield, Thein, et al., 2010; Engelman, Altus, & Mathews, 1999; Engestrom, Mudford, & Brand, 2015; Lancioni et al., 2015; McClannahan & Risley, 1975). Research has successfully focused on the incorporation of staff training and feedback, such as training staff in reinforcement procedures and providing a training on depression in dementia residents, to increase engagement (Altus et al., 2002; Brenske, et al., 2008; Meeks & Looney, 2011). Another area of focus is on the assessment of preference and its influence on activity engagement (Cohen-Mansfield, Marx, Thein, & Dakheel-Ali, 2010; LeBlanc, Cherup, Feliciano, & Sidener, 2006; LeBlanc, Raetz, Baker, Strobel, & Feeney, 2008; Ortega, Iwata, & Nogales-Gonzalez, 2010; Raetz, LeBlanc, Baker, & Hilton, 2013). LeBlanc et al. (2008) conducted two preference assessments: an oral and a pictorial version. They found that items selected as highest preferred on the picture assessment resulted in high engagement while those selected as highest preferred on the verbal assessment resulted in low engagement. This study provides valuable information into more valid approaches to obtaining preference in persons with dementia. Research has also evaluated the use of intergenerational activities, music therapy, horticulture, and technology to increase activity engagement (Boyd, Evans, Orpwood, & Harris, 2017; Camp et al., 1997; Clair, 2002; Galbraith, Larkin, Moorhouse, & Oomen, 2015; Jarrott & Gigliotti, 2010; Lancioni et al., 2012,

Short De-Graff & Diamond, 1996). These diverse interventions appear to be effective and are consistently being evaluated.

In addition to research on behavioral interventions to increase activity engagement, research suggests that time of day may influence the behaviors of individuals with dementia. Research has found that there may be a temporal pattern in the occurrence of appropriate and inappropriate behavior (Beutter & Fitzsimmons, 2003; Burgio, Scilley, Hardin, & Hsu, 2001; McCann, Gilley, Bienias, Beckett, & Evans, 2004; Paillard, Noe, Bru, Couderc, & Debove, 2016; Wood, Harris, Snider, & Patchel, 2005). Research has shown that during the late afternoon to early evening, balance and gait control worsens (Paillard et al., 2016) and agitation (including physical and verbal aggression) increases (McCann et al., 2004; Cohen-Mansfield, 2007; Beuttner & Fitzsimmons, 2003, Kovach & Schlidt, 2001). Additionally, during the later hours, disruptive vocalizations (Burgio et al., 2001; McCann et al., 2004), and passive behavior, such as sleeping or watching television increase (Beutter & Fitzsimmons, 2003). These increases in disruptive behaviors later in the evening is often referred to as “sundowning” (Bliwise, Carroll, Lee, Nekich, & Dement, 1993; McCann et al., 2004). Although the effect did not reach statistical significance, Madhusoodanan et al. (2010) found that cognitive impairment is marginally worse in the afternoon for women compared to men.

Research also shows there are positive changes in behavior of individuals with dementia during the afternoon. Abbott, Sefcik, and Van Haitsma (2015) found an increase in duration and frequency of social interactions in the afternoon in a dementia care unit but not in a traditional assisted living facility (ALF). However, it is unclear if participants from the ALF were diagnosed with dementia. Cohen-Mansfield (2007) and Cohen-Mansfield, Thein, et al. (2010) found

increases in perceived interest and attention, respectively during the afternoon. However, both measures were determined by a subjective rating-scale, thus the implications of the results are unclear. Cohen-Mansfield, Thein, et al. (2010), the only published study to have objectively evaluated the influence of time of day on active engagement, also found higher levels in active engagement in the afternoon and evening.

Cohen-Mansfield, Thein, et al. (2010) evaluated the effects of modeling, presentation order, time of day, and setting characteristics on engagement in activities, but the study had limitations. First, attention and attitude toward an item or activity were scored on a 4-point and 7-point rating scale, respectively. These were based on subjective definitions, such as “not attentive,” “somewhat attentive,” or “very attentive.” The subjectivity of the rating scale is problematic and a clear set of operational definitions would strengthen the results. Additionally, engagement was a duration measure obtained through direct observation, but was loosely defined as “motor or verbal behavior in response to the activity.” Based on the definition, both positive and negative engagement could be included in the measure. Observations were conducted with individual participants and lasted no longer than 15 min, but could end after only 3 min. These observations are likely not representative of what typically occurs during a group activity, considering the activities generally exceed 15 min, and there was no clear definition of when the observation periods should end.

The implications of differentiation in engagement between morning and afternoon activities could benefit ALFs and nursing homes. The information obtained could allow facilities to better allocate their resources and potentially save money. If one time of day yields more engagement, resources can be focused on that time of day as opposed to scheduling an activity at

a time where engagement is lower. In turn, this will improve quality of life for residents because preferred activities can be structured around times when they are most likely to be engaged.

However, more research is needed to determine if time of day does influence engagement, so the purpose of this study is to objectively and systematically evaluate the influence of time of day on engagement in activities in persons diagnosed with dementia. The secondary purpose of this study is to assess the validity of preference assessments in individuals diagnosed with dementia and determine if low preference is correlated with low engagement in group activities.

METHOD

Participants and Setting

The study was conducted in an assisted living facility. The facility had an activities director that coordinates activities for residents to participate in throughout the day. Prior to starting the activity, an announcement was made over a loud speaker; this announcement could be heard throughout most of the facility. During activities, approximately five to seven residents, including the participant, attended. Three adults participated in the study: Gill, Peggy, and Judy. Inclusion criteria for the study required individuals to be age 55 and older, diagnosed with dementia, and have Mini-Mental State Examination (MMSE) scores ranging from 11 to 20, indicating moderate impairment (see Burns, Brayne, & Folstein, 1998 for a description of the MMSE). Gill was an 86-year-old man with an MMSE score of 16 and used a walker for mobility. Peggy was a 92-year-old woman with an MMSE score of 11 and used a walker for mobility. Judy was an 82-year-old woman with an MMSE score of 15 and used an electric wheelchair for mobility. The activities director leading the group activities at the facility carried out the activities as she normally would during the course of the study. Participants were physically capable of engaging in the designated group activity. Participants were selected based on staff report of low to moderate engagement in facility-administered group activities. Staff referred these three individuals when they were asked to identify individuals that willingly attend

group activities but do not participate in them or participate at low levels, or commonly engage in behavior that results in escape from the activity.

Materials

The materials for this study included a data collection sheet, pens, and a timer that vibrated on a pre-determined schedule. Materials also included any items needed for the activities in which participants were engaged, such as paint and paint brushes, dominoes, balloons, and coloring sheets.

Target Behavior and Data Collection

Similar to Brenske et al. (2008), the dependent variable was percentage of intervals with participant engagement during group activities. Engagement was defined individually per participant and based on behaviors in their repertoire. For example, engagement for one participant was defined as communicating with another person in the room (resident or caregiver) in an appropriate conversation either relevant to the game or conversations other residents were engaged in, manipulating an activity item related to the available activity in a manner consistent with the item's intended use, or waiting for a turn in the activity. Waiting for a turn in the activity required the participant to be within 1 m of the activity and visually oriented toward the activity. Examples of group activities included painting and coloring, playing dominoes, and physical motor movements such as exercising in a game called "noodle ball." During noodle ball, participants sat in chairs in a circle and used a pool noodle to hit a balloon around; the objective of the game was to prevent the balloon from hitting the ground.

The target behavior was measured using 10-s momentary time sampling and recorded with paper and pencil during the observation session. A vibrating timer set to the interval length

was used to indicate the end of each interval, thus prompting the data collector to score the target behaviors. Additionally, the nature of the activity and the specific activity (e.g., exercise and noodle ball), time of day, and staff member leading the activity were recorded at the beginning of each observation. If the participant chose not to attend the designated activity, this was directly observed and recorded. A subsequent offer to attend the activity occurred 15 min after the start of the activity; the participant's response was recorded. Observations occurred at the beginning of the designated group activity and lasted approximately 30 min to 1 hr. During the observation, frequency of staff and other residents' delivery of prompts to engage in the activity and praise for engagement were collected to determine if a similar rate of prompts (e.g. "It's your turn, Peggy") and praise (e.g. "Way to go, Gill") were delivered during both times of day. Observations ended when the staff member indicated that the group activity time had concluded, the resident asked to leave, or the observation lasted approximately 30 min. During the first two phases (three phases for Peggy), the activities remained constant, but the time of day the activity was offered alternated between morning and afternoon. During the last phase, time of day remained constant, but the type of activity, moderately or low preferred, alternated.

Interobserver Agreement

Point-by-point interobserver agreement (IOA) data were collected for 33% of sessions. IOA was calculated for 33% of Gill's sessions, 25% of Peggy's sessions, and 60% of Judy's sessions. The occurrence and nonoccurrence of engagement was compared within each interval. To calculate the IOA percentage, first each interval was scored as an agreement or disagreement between the two observers for each target behavior. An agreement was scored if both observers agreed that the target behavior did or did not occur during the interval. A disagreement was

scored if there was a discrepancy in the occurrence of the target behaviors between the observers within the interval. Next, the number of intervals with agreements and disagreements was counted and summed to determine a total number of intervals. Then, the number of intervals with agreements was divided by the total number of intervals and multiplied by 100, resulting in an IOA percentage for each session. The overall IOA for the study was 97%, with IOA collected during each phase of the study for each participant. The overall IOA for Gill was 98%, ranging from 95% to 100%. The overall IOA for Peggy was 96%, ranging from 85% to 100%. The overall IOA for Judy was 97%, ranging from 93% to 100%.

Social Validity

A 4-item questionnaire measuring social validity was distributed to the individual affiliated with the study. Each item was rated on a 5-point rating scale, ranging from strongly disagree to strongly agree. The rating scale was given to the activities director who implemented or participated in the procedures and worked with the researcher to arrange the activity schedule (See Appendix A). The rating scale assessed the acceptability, feasibility, and predicted future use of the procedures. The activities director reported “strongly agree” for three of the social validity questions (including: “It was not a problem to have the activity schedule rearranged,” “If rearranging the activities schedule improved resident’s participation, I would be okay with changing the schedule,” and “The time of day the activity occurred influenced the amount of participation from the resident”). For the item “When the residents participated in activities more often, I was more engaged with the residents,” the director reported “agree.” Finally, the activities director commented that the researchers were “very professional,” she “felt the

residents were more engaged and very happy,” and “the residents had a fun time” during the study.

Treatment Fidelity

Treatment fidelity was assessed during the morning activity and afternoon activity conditions (See Appendix B). Treatment fidelity was calculated to confirm that similar prompts were provided throughout each condition and activities occurred during the scheduled time of day. This ensured that interactions with participants remained consistent throughout the study. Treatment fidelity was 100% across all observations, demonstrating adherence to procedures.

Experimental Design

An alternating treatments design was used to evaluate if there was a difference in the percentage of engagement during morning and afternoon activity sessions and to evaluate if there was a difference in the percentage of engagement during moderately and low preferred activities.

Procedure

First, a preference assessment was conducted with participants to determine which available activities were moderately and low preferred. Then, two conditions were alternated: morning activity and afternoon activity, each consisting of the same moderately preferred activity. Finally, time of day remained constant (morning or afternoon) and two conditions were alternated: moderately preferred activity and low preferred activity.

Preference assessment. A preference assessment was conducted with each participant to determine what group activities were used as the morning and afternoon activities. Group activities included in the assessment were dependent on activities offered at the facility. A paired stimulus preference assessment was conducted with pictures and vocal descriptions

representative of the group activities. During each trial, two pictures of activities were presented and the client was asked to choose which one she preferred. All activity pictures were paired seven times and the percentage of times the activity was chosen when it was presented was reported. A hierarchy of high to low preferred activities was established and moderately preferred activities (defined as those chosen 43-57% of times) were chosen for observation. After observations during moderately preferred activities concluded, a subsequent paired stimulus preference assessment was conducted without the previously identified moderately preferred activity; this was to determine a low preferred activity. A low preferred activity was defined as one chosen less than 25% of the time when the item was presented. Activities included in the assessment were dependent on availability and accessibility. A hierarchy of high to low preferred materials was established and low preferred activities were selected for observation.

Morning vs afternoon activity. The morning activity took place around 10:00 a.m. and lasted approximately 30 min to 1 hr. The afternoon activity took place around 2:00 p.m. and lasted approximately 30 min to 1 hr. During the morning and afternoon activity sessions, data were collected on the participant's engagement in activities and frequency of prompts and praise delivered to the resident. The type of activity (e.g., games, physical motor movements, or crafts) remained consistent and the person(s) leading the activity varied across observations. The staff member leading the activity conducted the group as he or she typically would with no programmed changes from the researchers. If the participant chose to refrain from the group activity, the refusal or inability to attend was directly observed and recorded. Once the participant was absent from the activity for 15 min, an additional statement regarding attending the activity was provided to the participant.

Moderately and low preferred activities. Given no differentiation in engagement between morning and afternoon sessions and high engagement across time of day, moderately and low preferred activities were alternated. Data were collected on participants' engagement in activities and frequency of prompts and praise delivered to the resident. The activity took place between 9:00 a.m. and 11:00 a.m. or 1:00 p.m. and 4:00 p.m. The time of day remained constant for each participant and the activity (moderately or low preferred) alternated. As with morning and afternoon activity conditions, if the participant chose to refrain from the group activity, the refusal or inability to attend was directly observed and recorded. Once the participant was absent from the activity for 15 min, an additional statement regarding attending the activity was provided to the participant.

RESULTS

All three participants were engaged at high, undifferentiated levels during moderately preferred activities in both the morning and afternoon. Two of the three participants were engaged at high, undifferentiated levels of activity during both moderately and low preferred activities. One participant had higher levels of engagement during the moderately preferred activity than during the low preferred activities. The rate of prompts and praise remained consistent across all sessions and phases.

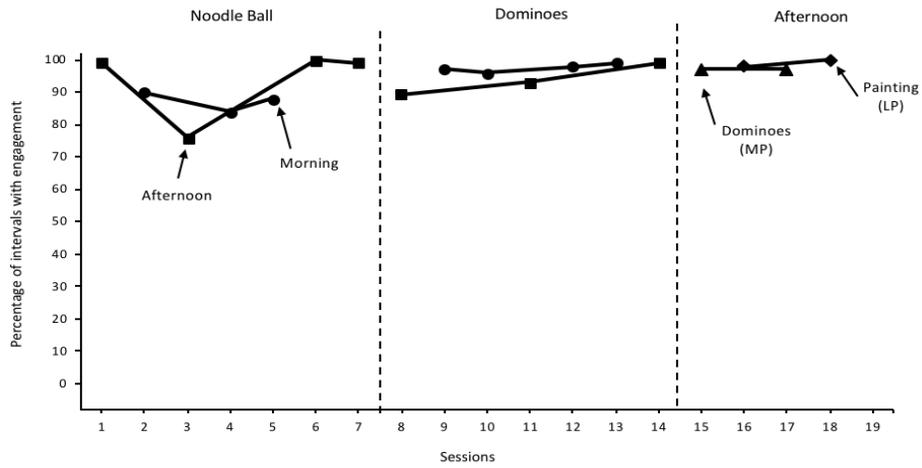
Gill's preference assessment determined that noodle ball, a game where residents sit in a chair in a circle and use a pool noodle to hit a balloon around, and dominoes were moderately preferred. A subsequent preference assessment showed that painting was a low preferred activity. Figure 1 shows percentage of engagement, rate of prompts, and rate of praise for Gill. During morning and afternoon sessions of noodle ball, Gill was engaged during an average of 87% and 94% of intervals respectively. During morning and afternoon observation of dominoes, Gill was engaged during an average of 98% and 94% of intervals respectively. During assessment of engagement during moderately preferred and low preferred activities (dominoes and painting, respectively) in afternoon observations, Gill was engaged during an average of 97% and 99% of intervals respectively. During morning observations of noodle ball, rate of prompts and praise averaged .05 and .02 responses per min respectively. During afternoon observations of noodle ball, rate of prompts and praise averaged .04 and .09 responses per min respectively. During

morning observations of dominoes, rate of prompts and rate of praise averaged .04 responses per min. During afternoon observations of dominoes, rate of prompts and praise averaged .03 and 0 responses per min respectively. During the third phase of dominoes and painting in the afternoon, rate of prompts and praise during dominoes averaged 0 responses per min; rate of prompts and praise during painting averaged .02 and .08 responses per min respectively.

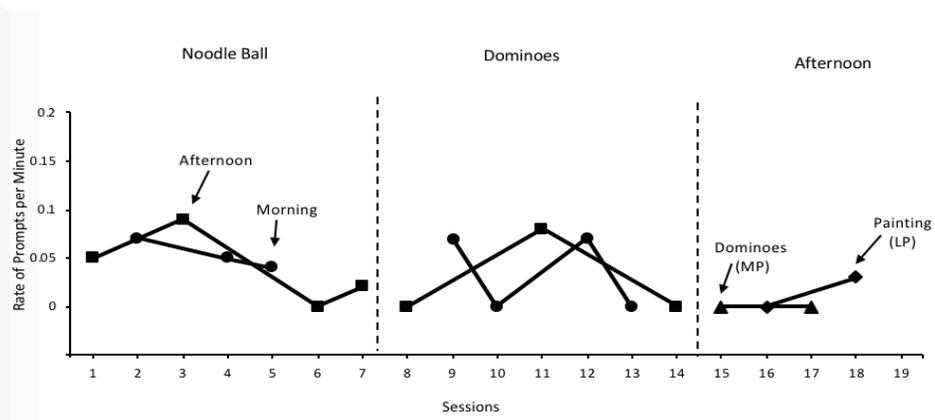
Peggy's preference assessment determined that noodle ball and dominoes were moderately preferred. Due to a change in activities director, Family Feud, another moderately preferred activity had to be removed. A subsequent preference assessment confirmed that noodle ball was moderately preferred and showed that coloring was a low preferred activity. Figure 2 shows the percentage of engagement, rate of prompts, and rate of praise for Peggy. During morning and afternoon sessions of dominoes, Peggy was engaged during an average 87% and 77% of intervals respectively. During the afternoon observation of Family Feud, Peggy was engaged 85% of intervals. During morning and afternoon observation of noodle ball, Peggy was engaged during an average of 86% and 96% of intervals respectively. During assessment of engagement during moderately preferred and low preferred activities (dominoes and coloring) in morning observations, Peggy was engaged during an average of 82% and 76% of intervals respectively. During morning observations of dominoes, rate of prompts and praise averaged .05 and .04 responses per min respectively. During morning observations of noodle ball, rate of prompts and praise averaged .01 and .03 responses per min respectively. During afternoon observations of dominoes, rate of prompts and praise averaged .06 and .03 responses per min respectively. During afternoon observations of Family Feud, rate of prompts and praise was 0 and .06 responses per min respectively. During afternoon noodle ball, rate of prompts and praise

averaged 0 and .2 responses per min respectively. During the fourth phase of dominoes and coloring in the morning, rate of prompts and praise during dominoes averaged .22 and .12 responses per min respectively; rate of prompts and praise during coloring averaged .01 and .12 responses per min respectively.

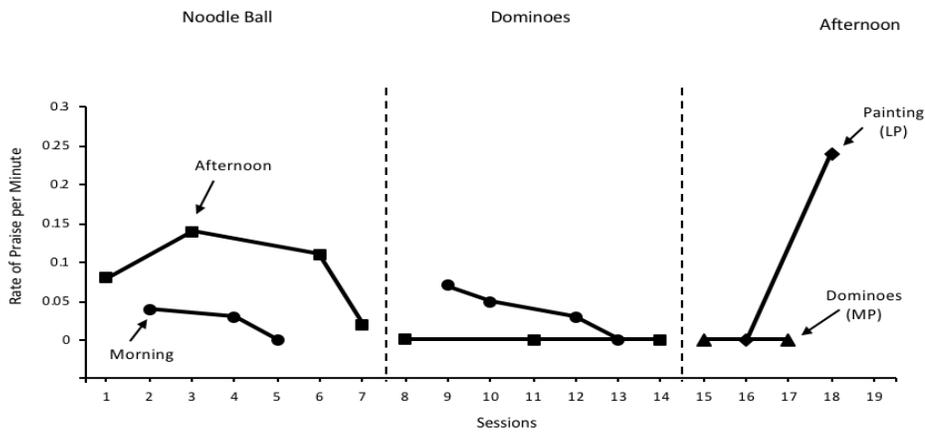
Judy's preference assessment determined that dominoes and noodle ball were moderately preferred. A subsequent preference assessment determined that coloring was low preferred. Figure 3 shows percentage of engagement, rate of prompts, and rate of praise for Judy. During morning and afternoon sessions of dominoes, Judy was engaged during an average of 93% and 97% of intervals respectively. During morning and afternoon observation of noodle ball, Judy was engaged during an average of 94% and 96% of intervals respectively. During assessment of engagement during moderately preferred and low preferred activities (dominoes and coloring) in afternoon observations, Judy was engaged during an average of 91% and 42% of intervals respectively. During morning observations of dominoes, rate of prompts and praise averaged .01 and .05 responses per min respectively. During morning observations of noodle ball, rate of prompts and praise averaged 0 and .07 responses per min respectively. During afternoon observations of dominoes, rate of prompts and praise averaged .06 and .01 responses per min respectively. During afternoon noodle ball, rate of prompts and praise averaged 0 and .04 responses per min respectively. During the third phase of dominoes and coloring in the afternoon, rate of prompts and praise during dominoes averaged .05 and .02 responses per min respectively; rate of prompts and praise during coloring averaged 0 and .04 responses per min respectively.



Gill



Gill



Gill

Figure 1. Percentage of intervals with engagement and rate of prompts and praise for Gill. The circular markers indicate a morning activity session and the square markers indicate an afternoon

activity session. The triangular markers indicate a moderately preferred activity and a diamond marker indicates a low preferred activity.

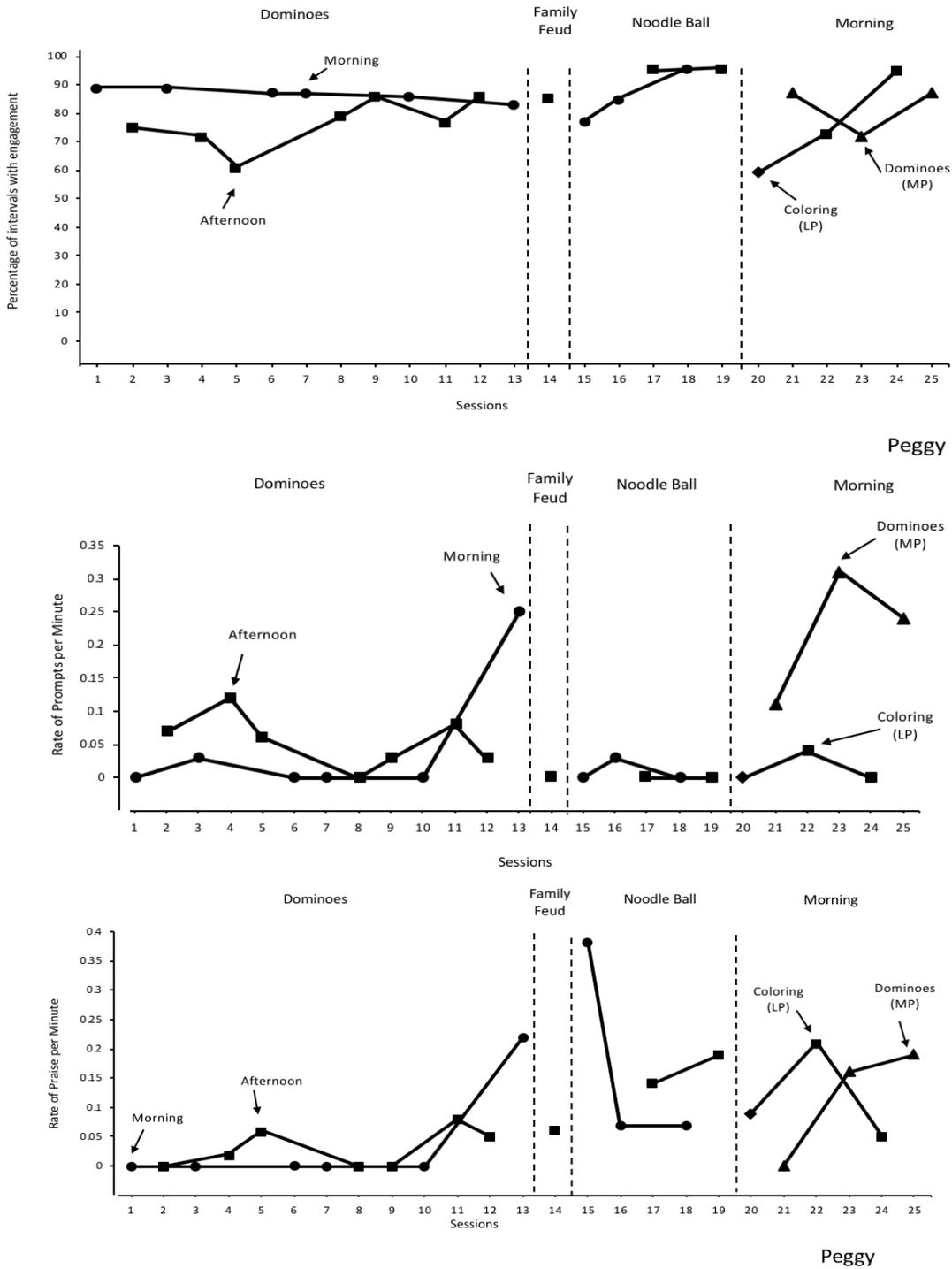
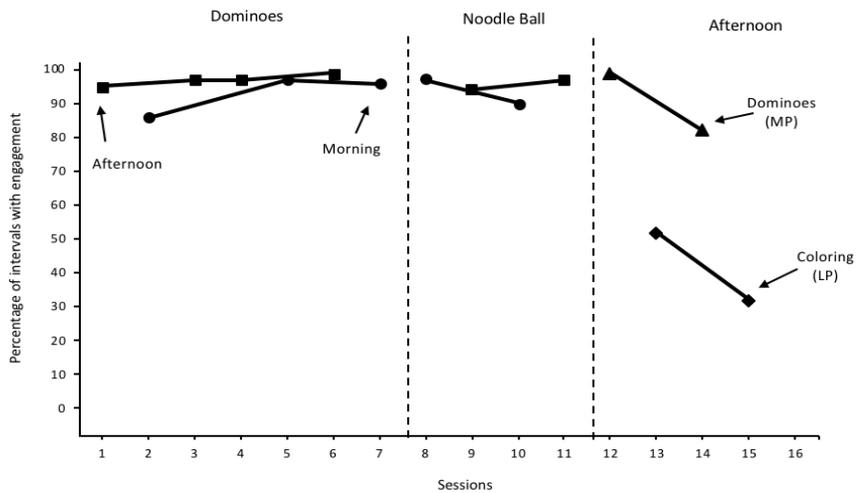


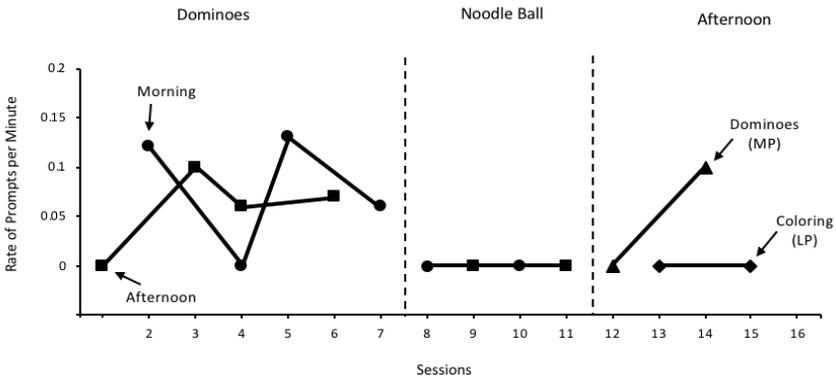
Figure 2. Percentage of intervals with engagement and rate of prompts and praise for Peggy.

The circular markers indicate a morning activity session and the square markers indicate an

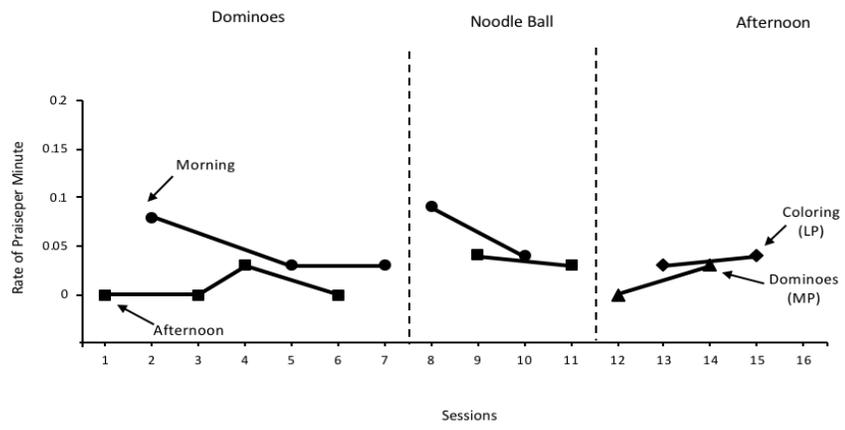
afternoon activity session. The triangular markers indicate a moderately preferred activity and a diamond marker indicates a low preferred activity.



Judy



Judy



Judy

Figure 3. Percentage of intervals with engagement and rate of prompts and praise for Judy. The circular markers indicate a morning activity session and the square markers indicate an afternoon

activity session. The triangular markers indicate a moderately preferred activity and a diamond marker indicates a low preferred activity.

DISCUSSION

Based on the results of this study, time of day did not influence engagement in group activities for persons diagnosed with moderate dementia. One moderately preferred physical activity (noodle ball) and one moderately preferred stationary activity (dominoes) were selected and observed for each participant. Results showed no differentiation in engagement during morning and afternoon for these two different types of activities. This finding is at odds with research suggesting that engagement increases in the afternoon for individuals with dementia (Abbott, Sefcik, and Van Haitsma, 2015; Cohen-Mansfield, Thein, et al., 2010). Although it is not clear why the results of this study are not consistent with reports from other researchers, one explanation might be the nature of data collection across studies. In this study, we collected engagement data through direct observation whereas in other studies engagement levels were assessed through verbal reports (Cohen-Mansfield, 2007; Cohen-Mansfield, Thein, et al., 2010). Additionally, in this study, the definition of engagement was precisely described, and observations were conducted in a group setting, designed to match group activities already occurring at the facility. In Cohen-Mansfield et. al (2010), engagement was loosely defined, and observations were conducted in an individual setting for no longer than 15 min. Based on these discrepant findings, more research using direct observation of activity levels across morning and afternoon sessions is needed to see if time of day does influence activity levels, and if so, for whom.

This study also evaluated the level of engagement in activities identified as moderately or low preferred. The researchers used the information from the preference assessment to select low preferred activities and moderately preferred activities and compared engagement between the two types of activities. The goal was to assess the validity of preference assessments with individuals with dementia and determine if low preference was correlated with low engagement. Both Gill and Peggy said they did not like the low preferred activity, however, engagement was equally high in both their moderately and low preferred activities. Interestingly, after Gill's first low preference activity (painting), he thanked the researchers for having the activity and said that he thought he "hated painting" but was proven wrong and that he was "grateful" for the opportunity to learn that. At the start of the second painting session, he said he did not like to paint one time, but began painting with the materials in front of him and did not make any additional comments. During Peggy's initial low preference activity (coloring), she said coloring was not something she enjoyed and that she could not color because she was left-handed. Although she did color for more than half of the observation, she reported stomach issues and light-headedness and the session was terminated. The researchers suspect that Peggy might not have had an appropriate way to communicate that she wanted to be finished with coloring and engaged in these behaviors to escape the activity; these behaviors had been observed before in different settings. These results indicate that some individuals with dementia will engage in activities that are not preferred at similar levels to activities that are preferred if they are simply presented with the activity. Similarly, Judy said that she did not enjoy coloring and that "coloring is not my thing." However, unlike Peggy and Gill who had similar levels of engagement with moderately and low preferred activities, Judy had less engagement with the low preferred

activity than with the moderately preferred activity. The results of this phase collectively suggest that preference assessments may be a valid indication of preference for individuals with dementia, but not necessarily indicative of engagement; just because an activity is low preferred, does not mean they will not engage in it in the absence of other activities. More research is needed to establish the value of preference assessments for predicting engagement in leisure activities.

Additionally, the rate of prompts during the activity is overall higher during dominoes for all three participants. This is likely due to the nature of the activity; participation in the game is contingent on each person playing when it is their turn. If the participant was not engaged in the activity when it was their turn, a prompt from another resident was common. This differs from solitary activities, such as coloring or painting, where the continuation of the activity is not dependent on the participation of other residents. Further, sessions with the highest rate of prompts correspond with sessions with the lowest percentage of intervals with engagement, indicating that others present for the activity were aware of the participant's lack of engagement and thus provided prompts to participate. Finally, sessions with low engagement and a high rate of prompts generally correspond with a higher rate of praise; this indicates that not only did other residents or staff members prompt the participant to engage, but also provided praise contingent on that engagement.

Next, rate of praise during activities was variable due the variety of residents that attended the activities. For example, during noodle ball, one resident who was not a participant in the study intermittently attended this activity. While playing, she frequently told all residents who were engaged that they were doing a "great job" or that they had a "great hit." When she did

not participate in the activity, there was generally less praise provided. Additionally, there was generally a higher rate of praise during all three participant's low preferred activity. This was likely due to other residents attending the activity and providing praise for engagement in an activity they were aware the participant did not like. For example, one resident told Peggy, "Wow, you say you hate coloring, but it is beautiful." The variability in residents who attended activities likely influenced the variability in the rate of praise statements provided contingent on engagement. However, there was minimal variability in the rate of praise delivered to participants from staff members. When staff were present, they rarely provided praise, as demonstrated by sessions with zero instances of praise. Intermittently, if a participant made a more impressive hit with the noodle or played a piece correctly, staff would recognize this, however, this was not consistent.

In addition to research that suggests that engagement is lower in the afternoon, research also suggests that agitation (including physical and verbal aggression) increases in the afternoon (McCann et al., 2004; Cohen-Mansfield, 2007; Beuttner & Fitzsimmons, 2003, Kovach & Schlidt, 2001). Anecdotally, the researcher found that participants in this study engaged in more verbally aggressive comments in the afternoon sessions and appeared to engage in property destruction, such as throwing game pieces or pushing chairs, in the afternoon. Although the researcher did not collect data on verbal or physical aggression, the anecdotal findings of this study match what research has found regarding inappropriate behavior being more likely to occur in the afternoon and evening. More research should investigate this phenomenon.

One limitation of this study is that roughly halfway through the study, the activities director left and a new one was promoted. The staff members remained consistent, however, the

same director was not able to continue to lead the activity. Although prompts and praise remained relatively similar across all conditions, the change in person and potential change in quality of the prompts and praise could have been a confounding variable. Additionally, after the director left, the researchers typically arranged the activity and gathered the residents, meaning that some of the time a researcher asked the participant to attend the activity and some of the time a staff member or the director asked the participant. Although this did not appear to influence attendance, the novel person could have influenced attendance and engagement in the activity. Another important limitation of this study is that although the participants were referred for low engagement in activities, none of the participants actually had low engagement in any of the activities, including activities selected less than 25% of opportunities on a preference assessment. This finding speaks to the lack of accuracy and validity of verbal report from care providers as a predictor of actual engagement. Finally, the scoring of engagement during dominoes and noodle ball differed from that of coloring and painting. For example, during noodle ball, if the participant was waiting for a turn by remaining in the vicinity and visually oriented toward the activity, engagement was scored. However, during coloring or painting, if the participant was sitting at the table with no materials in hand, but was visually oriented, engagement was not scored. This difference in scoring of engagement could have resulted in an inflated percentage of intervals with engagement during the moderately preferred activity relative to the low preferred activity. Future research should investigate this and determine if this small variation in definition influences overall percentage of engagement during the session.

Future research should continue to evaluate the use of prompts to get residents to attend leisure activities. The results of this study suggest that simply getting residents out of their

bedroom and into the activity room might be all that is needed to promote engagement in both moderately and low preferred activities. Additionally, although engagement was not influenced by time of day in this study, research should continue to objectively evaluate if indices of happiness or aggressive behavior are influenced by time of day. Anecdotally, the participants typically appeared “happier” in the morning and “angrier” in the afternoon, but these noticeable changes in temperament did not influence engagement. Additionally, future studies may explore different prompts to attend activities, as the participants appeared to be more receptive to prompts delivered in a softer, nicer tone of voice. Additionally, the residents made many comments about the “young” researchers; therefore, the person making the request could also influence willingness to attend and participate in activities. Next, future studies should evaluate the influence of time of day on engagement in people who actually have low engagement determined by direct observation, as opposed to verbal report from staff. Finally, low engagement could be correlated with a lower MMSE score so future research should evaluate if there is a decrease in engagement as MMSE scores decrease.

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APPENDICES

Appendix A: Social Validity Questionnaire for Administration

Please select your answer to each statement by putting a checkmark in the corresponding box.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I would be willing to make activities available at the time of day when engagement is highest.					
Arranging the activity calendar based on resident preference was easy for me.					
The information obtained from participating in this study was useful for the facility.					
I would encourage my caregivers to consider time of day when trying to improve activity engagement in residents.					
When the residents participated in activities more often, the staff was more engaged with the residents.					

Additional comments: _____

Appendix B: Assessment of Treatment Fidelity: Morning and Afternoon Activity- No

Reinforcement

Mark your selection by circling the appropriate corresponding answer.

The activity occurred during the designated activity observation time (<i>morning: 9:00am-12:00pm or afternoon: 12:00pm-4:00pm</i>).	YES	NO	
The activity observed was the scheduled activity.	YES	NO	
There were no observable changes made by the researcher to the provided activity.	AGREE	DISAGREE	
If a prompt to attend the activity was delivered to the participant, it was stated in a pleasant and welcoming tone of voice.	YES	NO	N/A
If the participant chose not to or was unable to attend the activity, the researcher directly observed the interaction.	YES	NO	N/A
If the participant chose not to or was unable to attend the activity, the researcher or staff member waited 15 min and represented a statement about the activity to the participant.	YES	NO	N/A

Appendix C: IRB Approval Letter



RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX(813)974-7091

October 16, 2017

Darienne Boyden
College of Behavioral and Community Sciences
Tampa, FL 33612

RE: **Expedited Approval for Initial Review**

IRB#: Pro00032087

Title: Evaluating the Influence of Time of Day on Engagement in Persons with Dementia

Study Approval Period: 10/16/2017 to 10/16/2018

Dear Ms. Boyden:

On 10/16/2017, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents contained within, including those outlined below.

Approved Item(s):

Protocol Document(s):

[Protocol, Version #1, 10/11/17](#)

Consent/Assent Document(s)*:

[Adult Assent, Version #1.pdf](#)

[Adult Consent, Version #1.pdf](#)

[LAR Consent, Version #1.pdf](#)

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent documents are valid until the consent document is amended and approved.

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110. The research

proposed in this study is categorized under the following expedited review category:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval via an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) calendar days.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kristen Salomon', followed by a horizontal line.

Kristen Salomon, Ph.D., Vice Chairperson
USF Institutional Review Board