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The Effects of Visual Arts on Expressive Language in Participants with Dementia

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The Effects of Visual Arts on Expressive Language in Participants with Dementia

by

Shannon Valentine Daly

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science
with a concentration in Speech Language Pathology
Department of Communication Sciences and Disorders
College of Behavioral and Community Sciences
University of South Florida

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Keywords: realistic, line, drawing, painting

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ABSTRACT

Visual aids such as memory books have been shown to help increase recall of information and facilitate improved communication in people with dementia (Bourgeois, 2014). Because of the effectiveness of visual aids for people with dementia, this study aimed to determine if the type of visual stimulus would produce differences in the quality of language expressed. It was hypothesized that a more realistic picture in full color would elicit more descriptive language than a black and white line drawing. Verbal descriptions of Norman Rockwell’s realistic painting, Coming and Going and descriptions of a black and white line drawing of the same painting were collected in a counterbalanced manner from seven participants with dementia. Transcripts were coded for expressive language variables (e.g., descriptive content, nouns, verbs, etc.). Results revealed that the descriptions of the black and white line drawing contained more irrelevant utterances including significantly more unrelated utterances (p=0.04) and significantly more self-corrected utterances (p=0.02) than the realistic picture. No statistically significant differences were found for any other variables. This suggests that while both pictures elicited descriptive language, the descriptions of the black and white line drawing contained more unrelated and self-corrected information than descriptions of the realistic painting. More research needs to be conducted using a greater number of participants to further explore the effects of different visual stimuli on expressive language of persons with dementia.
INTRODUCTION

As the cognitive challenges of persons with dementia increase, their ability to communicate decreases. Caregivers often experience stress as a result of the impaired day-to-day communication caused by changes in cognitive functioning. The use of memory books as a visual aid was the first documented method to improve communication interactions between a caregiver and an individual with dementia (Bourgeois, 2014). Visual art images as a visual aid have also been used with individuals with dementia to improve a variety of behavioral and social challenges (Cowl & Gaugler, 2014), but there are no studies that address the communicative effects of participating in an arts program. Research is needed to explore the potential benefits of visual art stimuli on the expressive language output of persons with dementia.

Dementia Incidence and Prevalence

Dementia is an acquired, major neurocognitive disorder (NCD) that causes a progressive decline in mental ability and cognitive processes (DSM-5; American Psychiatric Association, 2013). The disorder has many subtypes, the most common of which is Alzheimer’s disease (AD) (American Psychiatric Association, 2013); others include vascular NCD, NCD with Lewy bodies, NCD caused by Parkinson’s disease, Frontotemporal NCD, NCD caused by traumatic brain injuries, NCD caused by HIV infection, NCD induced by substance or medication, NCD caused by Huntington’s Disease, NCD caused by prion disease, NCD caused by other medical conditions, and unspecified NCD (American Psychiatric Association, 2013). In 2015, 5.3 million Americans were estimated to have Alzheimer’s disease with the number projected to increase to
7.1 million by the year 2025 (Alzheimer’s Association, 2015). Dementia is the sixth leading cause of death in the United States (Alzheimer’s Association, 2015).

The Food and Drug Administration of the United States has approved five drugs for treating Alzheimer’s disease (Alzheimer’s Association, 2015). These drugs serve to temporarily improve certain symptoms of Alzheimer’s by affecting the neurotransmitters in the brain. Unfortunately, none of these drugs can slow or stop the progressive nature of the disease. The drug Aricept (donepezil) is used to treat all stages, Razadyne (galantamine) treats mild to moderate stages, Namenda (memantine) treats moderate to severe stages, Exelon (rivastigmine) treats all stages, and the most recently approved drug, Namzaric (donepezil and memantine), treats moderate to severe stages of AD (Alzheimer’s Association, 2015). Because these drugs have not produced the desired changes in the cognitive and behavioral symptoms of dementia, clinicians are exploring the use of non-pharmacological interventions, such as memory books, art therapy, and music therapy, among others (Cabrera, et al., 2015; Egan, Bérubé, Racine, Leonard, & Rochon, 2010; O’Neil et al., 2011) to manage challenging symptoms of dementia.

**Communicative and Cognitive Behaviors**

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) states that a diagnosis of Neurocognitive Disorder (NCD) (formerly, dementia) requires evidence of a steadily progressive decline in three cognitive domains, two of which include memory and learning. At the mild NCD level, memory, learning, depression, apathy, and sometimes executive functioning are impaired. At the major NCD level, visuo-constructional/perceptual-motor ability, and language are also impaired. Behavioral and psychological manifestations often appear that include irritability, combativeness, and wandering. However, social cognition is usually preserved until the late stages of the disease.
Individuals demonstrate a continuum of communicative and cognitive behavior deficits and strengths over the course of the early, middle, and late stages of the disease.

**Early Stage:** During the early stages of the disease, an individual experiences memory deficits, such as word-finding problems for names and places, and impaired comprehension of abstract language and complex conversation. The individual experiences mild declarative and explicit memory retrieval deficits, inconsistent problems completing activities of daily living related to finances and shopping, lapses in divided and selective attention, and mild visuo-spatial deficits. Strengths in the early stage include intact phonology, syntax, pragmatics, oral reading, writing, comprehension of concrete language, good reading comprehension, non-declarative/implicit and sensory memory, intact awareness of language and memory lapses, and relatively good sustained attention and concentration (Bourgeois & Hickey, 2009).

**Middle Stage:** Persons in the middle stage of the disease experience increased deficits in expressive language consisting of difficulty in word-finding, decreased conversational content, and pragmatic difficulties such as reduced topic maintenance. Receptive language deficits include increased difficulty in comprehending complex instructions and tasks. Further deficits are seen in reading comprehension, all domains of attention, and increasing difficulties in visuo-spatial skills. Deficits increase in declarative memory retrieval, inhibition, and problems planning/set shifting. Strengths during the middle stage of the disease include intact phonology, syntax, and oral reading of familiar text. Good reading comprehension of familiar words and phrases remains intact as well as non-declarative/implicit and sensory memory (Bourgeois & Hickey, 2009).
Late Stage: The late and end stages of the disease are characterized by deficits in expressive language and the ability to express needs and wants. A person in this stage may produce inappropriate verbal or vocal productions and may become mute in the end stages. Repetitive verbal and physical behaviors are common in this stage and severe deficits are seen across auditory comprehension and all domains of memory. Attention is impaired and includes fluctuating alertness. Strengths during this stage are seen in appropriate responses such as smiles and pleasant vocalizations to sensory stimuli such as music and improved cooperation with activities of daily living when appropriate tactile and visual cues are used. The basic human needs for attention, communication, and physical contact (touch) remain intact through the end stages of life (Bourgeois & Hickey, 2009).

**Consequences of Cognitive-Communication Deficits**

As the degenerative course of the disease progresses, the daily living of an individual with AD is greatly affected. An individual with AD experiences decreased interest in activities and social interactions. They experience decreased participation in functional activities of daily living, decreased quality of life, and decreased quality of social communication (Bourgeois & Hickey, 2009). Caregivers often experience stress as a result of impaired day-to-day communication caused by changes in cognitive functioning. As the care for the individual becomes increasingly more demanding, the health and wellbeing of the caregiver can be affected as well (Schulz & Beach, 1999; Shaw et al., 1997). Zientz and colleagues (2007) recommend that caregivers be given education and training to increase understanding of communicative breakdowns and to teach them to use strategies to improve effective communication and successful interactions in order to improve the quality of life of the individual under their care and themselves (Zientz, Rackley, Chapman, Hopper, & Mahendra, 2007).
Existing Communication Treatment Approaches

There are a variety of treatment approaches that target communication for individuals with dementia ranging from studies that focus on stimulating cognition through activities (Logsdon, McCurry, & Terri, 2007) to modifications of the environment (Brush, Sanford, Fleder, Bruce, & Calkins, 2011). Interventions that specifically target improving communication such as memory books, do so by providing visual cues to improve access to memory (Bourgeois, 2014).

Visual intervention strategies such as external memory aids were designed to improve access to memory in order to allow for more satisfactory conversations. External memory aids such as a Memory Book are documented to increase the number of factual statements individuals with moderate dementia said during a 5-minute conversation, while decreasing repetitiveness and ambiguity of their utterances (Bourgeois, 1990). The effects of this study were replicated with individuals with severe dementia provided that modifications were made in font size, page size, use of plastic page protectors, or use of lamination in order to increase the ease of physically manipulating the book (Bourgeois, 1992). The use of memory books also serves to improve turn-taking, improve topic maintenance, reduce prompting, and reduce conversational dominance (Bourgeois, 1993).

Another form of visual intervention for individuals with dementia is the use of visual arts. Eekelaar, Camic, and Springham (2012) showed that structured viewing of public paintings in a museum, followed by an art-making activity, improved episodic memory (given a visual stimulus) but had ambiguous results for changing the verbal fluency of these participants. The authors used semi-structured interviews with open-ended questions to elicit descriptions and opinions of the paintings. Transcriptions of the interviews were coded according to memory, semantic clustering, disfluencies, factual observations of the painting, opinion of the painting,
emotional reaction to the painting, emotional reaction to the group art activities after the group, seeking knowledge, and requesting guidance. Caregivers reported that improvements in mood, confidence, and reduced isolation were seen in participants during the art gallery sessions. While aspects of expressive communication were explored in this study, specific communicative acts such as sentence structure and complex language features were not included.

A systematic literature review performed by Cowl and Gaugler (2014) analyzed 112 articles to determine the effectiveness of creative arts therapies. The systematic review covered 39 visual arts (utilizing painting, drawing, or sculpting), 53 music (utilizing playing and listening), 3 drama (utilizing story-telling, dance, and movement), 2 poetry, and 15 combination studies (utilizing art, music, drama, or poetry) on individuals with dementia and their caregivers (Cowl & Gaugler, 2014). Eight out of twelve of the quantitative visual arts studies reported statistically significant differences in improved apathy, quality of life, general well being, specific well being (interest, attention, pleasure, self-esteem, normalcy), sociability, and procedural skills as a result of the arts program. In addition, three of the eight studies reported improvements in mood and two of the studies reported improvements in behavior and depression. Statistically significant differences were not found for measures of engagement, agitation, cognition, vitality, activities of daily living, caregiver burden, family relationships, memory, compositional asymmetry and complexity of artwork, or functionality. Communication was not measured by any of the quantitative visual arts studies (Cowl & Gaugler, 2014).

Qualitative visual arts studies that measured some types of communication behaviors reported increased communication, socialization, sharing and listening, and reminiscence. Nine studies reported increased communication in general, four studies reported increased nonverbal communication in participants creating art, and two studies specifically reported increased verbal
expression. In one visual arts study that measured verbal expression, a participant began to sing enthusiastically when she had previously not spoken for a month (Cowl & Gaugler, 2014). Due to the non-specificity of the communication measures used during these studies, it remains unclear what specific language behaviors may have changed as a result of the programs studied.

Overall, the results of Cowl’s and Gaugler’s (2014) systematic review concluded that creative arts therapies may be effective in treating the behavioral and emotional challenges of dementia and were seen to improve agitation, apathy, depression, mood, quality of life, and well-being. Changes in communication, however, were reported but not described in sufficient detail to understand what features of art activities are important for future interventions. In addition, methodological issues such as small sample sizes and short to non-existent follow-ups constrain the analysis of the efficacy of creative arts therapies (Cowl & Gaugler, 2014).

While evidence exists that supports the use of visual arts for improving the behavioral and social challenges seen in individuals with Dementia, there is not supportive evidence of the communicative effects of visual arts. Currently, there are no studies that analyze the quantifiable aspects of what is communicated when using visual arts as an intervention or when using different types of visual stimuli. Research is needed to explore the effects of visual arts on expressive language output. It would be important to know how different types of visual art stimuli affect the expressive language output of individuals with dementia so that clinicians and families could use effective stimuli to create positive communicative interactions.

In the field of Speech-Language Pathology, clinicians often use picture stimuli to elicit language behaviors from clients in order to describe their language impairments. The “Cookie Theft” picture from the Boston Diagnostic Aphasia Examination (BDAE-Third Edition; Goodglass, Kaplan, & Barresi, 2001) has been used extensively to elicit a discourse sample from
persons with a variety of neurologically-based language deficits, including persons with aphasia, TBI, and dementia (Bourgeois & Hickey, 2009). The “Cookie Theft” picture is a black and white line drawing depicting a common household scene with several actors engaged in specific actions with common objects. The semantic content of the elicited discourse is described and analyzed. According to Yorkston and Beukelman (1980) and Lezak (1987), this discourse analysis helps clinicians determine the participant’s awareness of causal relationships, use of situational cues, interpretation and integration of visual information, word retrieval in connected speech, and efficiency of content production.

Yorkston and Beukelman (1980) used the Cookie Theft picture to analyze the speech of participants with aphasia. The researchers used the following three parameters to measure speech: (1) content units (amount of information), (2) syllables per minute, and (3) content units per minute. Using these measures, the researchers were able to differentiate groups of mild and high-moderate speakers from normal speakers and low-moderate from moderate speakers (Yorkston & Beukelman, 1980).

Tomoeda and Bayles (1993) found that the most sensitive measures of discourse changes exhibited by persons with dementia during the Cookie Theft picture description task were found when examining the participant’s efficiency and conciseness of provided information. This is achieved by measuring the (1) elapsed time in seconds, (2) syllable count, and (3) total number of Information Units (IU). Giles, Patterson, and Hodges (1996) used this method to analyze Cookie Theft picture descriptions produced by 66 participants with minimal dementia severity, mild dementia severity, moderate dementia severity, and a control group. They discovered that discourse impairments can be present as early as the minimal impairment level and as dementia severity increased, the participants produced significantly fewer content units but no significant
differences across groups for syllable per second or total discourse time.

Currently, there are no studies that report the effects of alternate forms of picture stimuli for eliciting language in people with dementia. Using works of art as a novel, visual stimuli may be an effective way to elicit language. What is not known is whether artworks have the potential to elicit more or better language from the person. In a related study of the effects of different visual stimuli, Kerr and Bourgeois (2009) studied the ability of participants with dementia to identify emotions depicted in both photographs and line drawings. The results suggested that emotions were easier to identify in photographs than in line drawings, but the differences did not attain statistical significance due to the fact that the study was underpowered (i.e., involved too few participants). These results suggest the potential for realistic artwork to have greater effects on expressive language than line drawings.

The purpose of this study was to investigate the differences in language features elicited from realistic artwork in comparison to artwork that is created with line drawings. The research questions were: What are the differences in language features used to describe a full-color, realistic picture and a line drawing of the same picture? What are the differences in language features used to describe pictures as a function of dementia severity? It was hypothesized that realistic artwork would be more visually stimulating, eliciting more related utterances, nouns, verbs, and adjectives than line drawings. It was also hypothesized that as the severity of dementia increased, the frequency of related utterances, nouns, verbs, and adjectives would decrease.
METHOD

Participants

Staff from the Arden Courts Memory Care Community in Tampa, Florida, identified participants and provided consent forms to family members or their power of attorney. The Institutional Review Board (IRB) of the University of South Florida approved this study; the informed consent document is included as Appendix A and the IRB study approval form is included as Appendix B. After establishing consent, participant demographics and caregiver information were collected according to the study protocol (Appendix B) adapted from the *Memory Book Study Protocol* (Bourgeois, 1992a). Functional vision, hearing, and communication screening measures (Bourgeois et al., 2001) and *The Montreal Cognitive Assessment* (MoCA) (Nasreddine et al., 2005) were used in order to document the participant’s severity of dementia. Inclusionary criteria included: that the participant had a documented diagnosis of dementia, Alzheimer’s Disease, or memory loss; was able to hear the experimenter; was able to see the art materials; received a score higher than 3 out of 30 on the MoCA; and was willing to participate in a conversation and visual arts activity with the researcher. Exclusionary criteria included: the patient did not exhibit functional hearing, vision, or communication; received a score of 3 or lower on the MoCA; or did not want to participate in a conversation and visual arts activity.

Ten participants were recruited from Arden Courts Memory Care Community in Tampa, Florida. Seven participants met the inclusionary criteria and were included in the study. Table 1 displays participant demographics including age, MoCA score, gender, and race. Table 1 also
includes means and standard deviations of ages and MoCA assessment scores. The mean age of all participants was 81.43 years (standard deviation = 6.85, range = 73-92 years). Participants’ mean MoCA score was 10 (out of 30) (standard deviation = 5.13, range = 4-17). Two participants were male and seven participants were female. Six participants were Caucasian and one participant was Hispanic.

Table 1. Participant Demographics.

<table>
<thead>
<tr>
<th>Code</th>
<th>Age</th>
<th>MoCA</th>
<th>Gender</th>
<th>Race</th>
</tr>
</thead>
<tbody>
<tr>
<td>6364</td>
<td>82</td>
<td>14</td>
<td>M</td>
<td>Caucasian</td>
</tr>
<tr>
<td>6566</td>
<td>89</td>
<td>14</td>
<td>F</td>
<td>Caucasian</td>
</tr>
<tr>
<td>6970</td>
<td>79</td>
<td>9</td>
<td>M</td>
<td>Caucasian</td>
</tr>
<tr>
<td>7172</td>
<td>79</td>
<td>8</td>
<td>F</td>
<td>Caucasian</td>
</tr>
<tr>
<td>7374</td>
<td>92</td>
<td>4</td>
<td>F</td>
<td>Caucasian</td>
</tr>
<tr>
<td>7576</td>
<td>76</td>
<td>17</td>
<td>F</td>
<td>Caucasian</td>
</tr>
<tr>
<td>7778</td>
<td>73</td>
<td>4</td>
<td>F</td>
<td>Hispanic</td>
</tr>
<tr>
<td>Mean</td>
<td>81.43</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>6.85</td>
<td>5.13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Procedures

Participants were invited to participate in one session, lasting no longer than 30 minutes and conducted in a quiet and well-lit room within the nursing facility. The experimenter sat beside the participant and first conducted the screening assessment (as described above). If the individual met the inclusionary criteria, then the person was presented each of the two artworks (Norman Rockwell’s painting, *Going and Coming*, and Figure 2) in a counterbalanced manner across participants. Artwork by Norman Rockwell was chosen to elicit descriptive language samples from the geriatric population because the pictures depict potentially familiar scenes from their early adulthood years (Ulatowska & Chapman, 1989). The researcher said, “Tell me everything you see that is going on in this picture,” while pointing to each quadrant of the artwork and starting the stopwatch. When the participant stopped talking or indicated they were done, the researcher used one additional prompt to encourage added content to the stimulus.
description. The participant’s responses were audio-recorded using Olympus digital voice recording software and transcribed offline. If the participant did not meet the inclusionary criteria, they were thanked for their participation and walked back to their room.

Figure 1. *Going and Coming*, black and white line drawing by Shannon Valentine Daly.

**Design**

Expressive language output was evaluated using a within subjects design comparing two visual conditions (realistic painting versus a line drawing). Presentation of the two pictures was counterbalanced across participants to prevent order effects.

**Transcription and Coding**

Each session was audio-recorded using Olympus Digital Voice Recorder WS-801, downloaded to Mac OS X computer and transcribed offline by the experimenter. The utterances were numbered and coded according to definitions adapted from Bourgeois (1992). The definitions of each dependent variable are shown in Table 2, and include descriptive language codes as well as total time from each participant’s transcript. Data-coding sheets (Appendix E)
were used to summarize the codes. The dependent variables were counted, tallied, and
transferred into an Excel Spreadsheet where they were analyzed for means, standard deviations,
and $T$-tests.

**Table 2. Dependent Variables.**

<table>
<thead>
<tr>
<th>Participant Codes</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>RU Related Utterance: An utterance that is intelligible and relevant to the visual stimulus.</td>
<td>I see an automobile.</td>
</tr>
<tr>
<td>UU Unrelated Utterance: An utterance that is intelligible but irrelevant to the visual stimulus.</td>
<td>What else you want?</td>
</tr>
<tr>
<td>N Noun: A noun used by the participant that is specific to the stimulus material.</td>
<td>Automobile.</td>
</tr>
<tr>
<td>V Action Verb: An action verb (excluding auxiliary verbs) used by the participant that is specific to actions performed by stimulus material.</td>
<td>Riding.</td>
</tr>
<tr>
<td>A Adjective: An adjective used by the participant to describe stimulus material.</td>
<td>Ugly.</td>
</tr>
<tr>
<td>PU Perseverative Utterance: An utterance that is intelligible but is a repetition of a previously stated utterance.</td>
<td>They’re riding a bus. They’re riding a bus.</td>
</tr>
<tr>
<td>O Other Speech Acts: Speech acts that are unintelligible or ambiguous. Includes answers to yes/no questions.</td>
<td>Uhm.</td>
</tr>
<tr>
<td>SC Self-Correction: An utterance that has been self corrected with only corrected utterance used for coding purposes.</td>
<td>Kids running, or kids um, going out a school bus window.</td>
</tr>
<tr>
<td>IC Incorrect Information: Content that is relevant but incorrectly identified by participant.</td>
<td>It looks like a donut.</td>
</tr>
</tbody>
</table>

**Partner Codes**

| P1 Partner Prompt #1: Initial prompt. | Tell me everything you see that is going on in this picture. |
| P2 Partner Prompt #2: Facilitating prompt used to encourage additional content to the stimulus description. | What else can you tell me about this picture? |
| PO Partner Other: Any other speech act that does not serve to add content to the discussion but includes acknowledgements, reassurances, and possible statements from others in the environment. | If you would like. |

**Transcript Code**

| TT Total Time: Total time of stimulus description. | 3:00 |
Reliability

Reliability of the coded data was established by recruiting and training a secondary coder until at least 80% agreement or higher was achieved on all codes. Training involved a review of all coding definitions with practice on randomly selected transcripts. The secondary coder coded 28.57% of the data collected (4 out of 14 transcripts) and achieved an overall inter-rater reliability of 93.2% agreement, ranging from 87.5% to 97% agreement.

Data Analysis

Excel spreadsheets were used to summarize the data including the number of related utterances, nonrelated utterances, nouns, verbs, adjectives, perseverative utterances, other statements, incorrect utterances, self corrections, and total talking time demonstrated during participant descriptions of two pictures. The Excel program for MacBook Air was used to determine means and standard deviations of each data set. $T$-tests with statistical significance set at $p < .05$ were conducted to determine if significant differences existed between descriptions of the realistic painting versus descriptions of the black and white line drawing.
RESULTS

Table 3 displays the means and standard deviations for each dependent measure of participant descriptions of both the realistic painting (Picture 1) and the black and white line drawing (Picture 2), and the p-values for differences between the two picture condition variables. Participants took a mean (SD) of 1.32 (0.04) minutes and 1.33 (0.02) minutes to describe Picture 1 and Picture 2, respectively. There were no significant differences in the total amount of time participants took to describe each picture (p = .046). Participants described Picture 1 with a mean of 6.43 (4.43) Related utterances and Picture 2 with a mean of 7.57 (4.86) Related utterances; there were no significant differences between conditions on this variable (p = 0.25). In contrast, participants used a mean of 2.0 (0.82) Unrelated utterances to describe Picture 1, and a mean of 4.0 (2.08) to describe Picture 2, resulting in a significant difference (p = .037) between conditions. Participants used a mean of 12.14 (7.56) nouns to describe Picture 1 and a mean of 11.43 (6.95) to describe Picture 2 with no significant differences between conditions on this variable (p = 0.35). Participants described picture 1 with a mean of 3.71 (3.5) verbs and Picture 2 with a mean of 4 (2.52) verbs, resulting in no significant differences between these variables (p = 0.42). Participants used a mean of 5.57 (6.29) adjectives to describe Picture 1 and a mean of 4.14 (3.93) to describe Picture 2 with no significant differences between conditions on this variable (p = 0.15). Participants used a mean of 2.14 (2.61) Perseverative utterances to describe Picture 1 and a mean of 0.71 (0.76) to describe Picture 2; there were no significant differences between these variables (p = 0.12). Participants described Picture 1 with a mean of 1.57 (2.44) Incorrect utterances and Picture 2 with a mean of 3.29 (4.92), with no significant differences
between variables (p = 0.07) on this condition. However, participants used a mean of 0 (0) Self-Corrected utterances to describe Picture 1 and mean of 0.71 (0.76) to describe Picture 2, resulting in a significant difference (p = 0.02) between variables on this condition.

The effects of dementia severity on performance were then analyzed by creating three groups of participants according to MoCA scores. Two participants with MoCA scores of 4 were included in the Lo group. Two participants with scores ranging from 8-9 were included in the Lo-Mid group and three participants with scores ranging from 14-17 were included in the Mid group. Figure 2 shows the effects of dementia severity on performance during descriptions of Picture 1 and Figure 3 shows performance during Picture 2. Figure 2 (realistic painting) shows that as the participant’s severity increased, the frequency decreased for related utterances, nouns, verbs, and adjectives. Interestingly, Perseverative utterances and Incorrect utterances increased as the severity decreased. Unrelated Utterances were highest in the Mid range and lowest in the Lo-Mid range. Figure 3 (line drawing) shows that as the participant’s severity increased, the frequency decreased for nouns, verbs, adjectives, and total talking time. Related utterances and Self-Corrected utterances were highest in the Mid range and identical in the Lo and Lo-Mid range. Unrelated utterances were highest in the Lo-Mid range and lowest in the Mid range. Figure 3 also shows that perseverative utterances were highest in the Mid range and nonexistent in the Lo range.
Table 3. Means (SD) and T-test results of language variables for two picture conditions.

<table>
<thead>
<tr>
<th>Code</th>
<th>Related Utterances</th>
<th>Unrelated Utterances</th>
<th>Nouns</th>
<th>Verbs</th>
<th>Adjectives</th>
<th>Perseverative Utterances</th>
<th>Incorrect Utterances</th>
<th>Self-Corrected Utterances</th>
<th>Total Talking Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>6364</td>
<td>11</td>
<td>3</td>
<td>20</td>
<td>4</td>
<td>18</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>1:31</td>
</tr>
<tr>
<td>6566</td>
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<td>15</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1:38</td>
</tr>
<tr>
<td>6970</td>
<td>2</td>
<td>1</td>
<td>6</td>
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T-test.

| p-value | 0.25 | 0.04* | 0.35 | 0.42 | 0.15 | 0.12 | 0.07 | 0.02* | 0.46 |

*p < 0.05
Figure 2. Effects of dementia severity on performance during descriptions of Picture 1.

Figure 3. Effects of dementia severity on performance during descriptions of Picture 2.
DISCUSSION

This study aimed to investigate the differences in language features elicited from realistic artwork in comparison with a line drawing. It was hypothesized that a realistic painting would elicit more qualitative expressive language with more related utterances, nouns, verbs, and adjectives than descriptions of a black and white line drawing. The frequency of each dependent variable was quantified and analyzed to determine the quality of language used to describe both pictures. Participants in this study performed similarly to participants in past research on memory books in that they were able to describe a picture stimulus with increased expressive content language (Bourgeois, 1990). Participants all described visual stimuli using related utterances and there were differences in unrelated utterances (Bourgeois, 1990). The participants in this study also responded similarly to the participants in the visual arts studies in that they engaged with the visuals and communicated using increased verbal expression (Caul & Gaugler, 2014).

While there were no significant differences in related utterances, nouns, verbs, adjectives, perseverative utterances, incorrect utterances, or total talking time across picture conditions, there were statistically significant differences in unrelated utterances and self-corrected utterances. These findings are consistent with Bourgeois’ (1990) study in that participants who talked about memory books demonstrated reductions in unrelated utterances, ambiguous statements, and error statements. Descriptions of the black and white line drawing contained significantly more unrelated utterances and significantly more self-corrected utterances than descriptions of the realistic painting, making said descriptions contain higher amounts of off-topic information and disfluencies, thereby decreasing the quality of the description. Although
participants demonstrated a greater number of perseverative utterances in descriptions of the realistic painting, their related utterances included more nouns and adjectives than the related utterances describing the black and white line drawing. While the black and white line drawing had a higher mean of verbs, it also had a mean of more than twice as many incorrect utterances. Three of the seven participants directly identified emotions during their descriptions using adjectives and verbs. Three participants correctly identified emotions in Picture 1 and incorrectly identified emotions in Picture 2. For example, participant 7172 correctly identified an emotion with the statement, “The little girl looks bored,” in response to a person in Picture 1 with a neutral expression. In contrast, participant 6364 incorrectly identified an emotion with the statement, “And I see a young lady smiling,” in response to a person in Picture 2 who was blowing a bubble. These results suggest that emotions are easier to depict in a realistic visual, similar to the results presented by Kerr and Bourgeois (2009) whose research suggested that emotions were easier to identify in photographs than in line drawings.

It was also hypothesized that as the severity of dementia increased, the frequency of related utterances, nouns, verbs, and adjectives would decrease. The effects of dementia severity on performance were analyzed to reveal a typical decrease in frequency as severity increased for nouns, verbs, and adjectives in both Picture 1 and Picture 2, with no significant differences in total discourse time. This is similar to the results achieved by Giles et al (1996) who showed that as dementia severity increased, content units decreased. Related utterances were highest in the Mid range for both Picture 1 and Picture 2. Picture 1 shows a decrease in frequency of related utterances as severity increased. There was no change in frequency of related utterances across the Lo and Lo-Mid groups in Picture 2. The Mid range demonstrated the highest number of Self-Corrected utterances in descriptions of Picture 2 with no Self-Corrected utterances during
descriptions of Picture 1. Overall, data suggests that use of the realistic painting (Picture 1) as a visual stimulus elicits more relevant information with fewer unrelated utterances and more precise information with fewer self-corrected utterances than descriptions of a black and white line drawing (Picture 2) in individuals with dementia. However, due to the study limitations, more research is required to further explore these results.

**Limitations**

The ability to generalize the findings of this study to the wider population of persons with dementia is limited by the small number of participants in this pilot study. This study included only 7 participants with a limited range in MoCA scores (4-17 out of 30). More participants across each dementia severity level would be necessary to better understand language performance differences for the two pictures as a function of dementia severity. Additionally, this study only used one realistic painting and one black and white line drawing as picture stimuli. A range of picture stimuli would better identify visuals that elicit more qualitative language and the associating impact on language performance differences as a function of dementia severity.

**Future Studies**

It is recommended that future studies include a greater number of participants with focus on mild, moderate, and severe groups of participants. Analyzing the data within each group will provide greater information as to the differences in expressive language output as dementia progresses and allow for identification of the visual stimulus that most effectively elicits meaningful expressive language, helping clinicians provide better treatment programs for improved communication.
REFERENCES


APPENDICES

Appendix A. Informed Consent

Informed Consent of Legally Authorized Representative for an Individual to Participate in Research and Authorization to Collect, Use and Share Your Health Information

Pro # Pro00025561

You are being asked to enroll an individual in a research study. Research studies include only people who choose to take part. This document is called an informed consent form. Please read this information carefully and take your time making your decision. Ask the researcher or study staff to discuss this consent form with you. Please ask her to explain any words or information you do not clearly understand. We encourage you to talk with your family and friends before you decide to enroll your loved one in this research study. The nature of the study, risks, inconveniences, discomforts, and other important information about the study are listed below.

We are asking you to take part in a research study called: Visual Arts and Dementia

The person who is in charge of this research study is Shannon Valentine Daly, B.A. This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge. She is being guided in this research by Michelle Bourgeois, PhD., CCC-SLP.

The research will be conducted at your facility.

Under certain circumstances, an individual can give consent for another person to take part in research. This person is the Legally Authorized Representative (LAR). The LAR can make choices for the participant, if the participant is not able to make choices for him or herself.

Purpose of the Study
Speech-Language Pathologists (SLPs) often ask clients to describe visual stimuli (such as pictures or forms of artwork) during therapy. This activity gives the SLP information on the client’s expressive language abilities that can be used to determine therapeutic goals. The type of
visual stimuli that helps produce the best results in expressive language production is not currently known. This study aims to determine if individuals with dementia show differences in expressive language when describing two different forms of artwork.

Should the person for whom you are signing consent take part in this study?
This form tells you about this research study. After reading this form and having someone explain the research to you, you can decide if you think the person for whom you are consenting to take part would want to take part in the study.

This form is written as if you, the LAR, were taking part in the research. This helps you think in terms of what the person for whom you are consenting would do or what is best for him/her. After reading this form, you can choose if you want to agree to allow this individual to take part.

You may have questions this form does not answer. If you do have questions, ask the study doctor or the person explaining the study as you go along. Take your time to think about the information that has been given to you.

This form explains:
- Why this study is being done.
- What will happen during this study and what you will need to do.
- Whether there is any chance of benefits from being in this study.
- The risks involved in this study.
- How the information collected about you during this study will be used and with whom it may be shared.

Taking part in this research study is up to you. If you choose to be in the study, then you should sign this informed consent form. If you do not want to take part in this study, you should not sign this form.

Why are you being asked to take part?
We are asking you to take part in this research study because you have dementia. We want to find out if different forms of artwork can help your language expression. You will be asked to

Study Procedures:
If you take part in this study, you will be asked to:
- Participate in a one-time meeting where you will be given a brief cognitive screen lasting about 15-30 minutes. You will then be asked to participate in two 3 min sessions conducted in a quiet and well-lit room within the nursing facility. The experimenter will sit beside you and show each of the two artworks, one at a time. The researcher will say, “Tell me everything you see that is going on in this picture,” while pointing to each quadrant of the painting and starting the stopwatch. When you stop talking, the researcher will use one prompt of, “What more can you tell me?” After 3 minutes have elapsed, the
researcher will show you the second picture and invite you to talk about this picture. When 3 minutes have passed, the researcher will thank you for your time.

- It will take about 30-45 minutes to complete this procedure.
- The research will take place at your facility on a day that is convenient.
- Sessions will be audio-recorded for analysis. A client code will be assigned to the audio file. All data collected during the session will be referred to this client code. The audio recordings will be stored in a locked room, without direct identifiers. All data will be destroyed within 6 months after the study results have been compiled and submitted for publication.

**Total Number of Participants**

A total of 20 individuals will take part in the study at all sites.

**Alternatives/Voluntary Participation / Withdrawal**

You do not have to take part in this research. You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study. If you decide you want to stop taking part in the study, tell the study staff as soon as you can.

- We will tell you how to stop safely. We will tell you if there are any dangers if you stop suddenly.
- If you decide to stop, you can continue getting care from your regular doctor.
- To stop, contact the primary investigatory, Shannon Valentine Daly, at 813-857-1699.
- Even if you want to stay in the study, there may be reasons we will need to withdraw you from the study. You may be taken out of this study if we find out it is not safe for you to stay in the study or if you are not coming for the study visits when scheduled. We will let you know the reason for withdrawing you from this study.

**Benefits**

The potential benefits of participating in this research study include conversing with the researcher about an interesting topic – art works. The results of this study may help researchers to find effective activities for persons with dementia and to better understand the language abilities of persons with dementia.

**Risks or Discomfort**

This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study.
Compensation
You will receive no payment or other compensation for taking part in this study.

Costs
It will not cost you anything to take part in the study.

Compensation for Research Related Injuries
If you are experiencing an emergency, call 911. If you believe you have been harmed as a result of participating in this study, you should call Shannon Valentine Daly at 813-857-1699 as soon as possible. The University of South Florida has not set aside money to pay for illness or injury that may result from your participation in research. The cost of such care will be billed to your insurance company or to you in the event you do not have medical insurance. Before you agree to take part in this study, you may want to find out whether your insurance will cover injuries that result from taking part in research. You may be responsible for any deductible, co-insurance, or co-payments that result from such care. If you are injured, the University of South Florida has also not set aside money for lost wages, discomfort or disability you may experience as a result of a research related injury. You do not give up your legal rights by signing this form. In addition to contacting the study investigator, you should also contact the USF Institutional Review Board (IRB) at 813-974-5638 if you believe you have been injured as a result of taking part in this study.

Conflict of Interest Statement
There are no conflicts of interest.

Privacy and Confidentiality
We will keep your study records private and confidential. Certain people may need to see your study records. Anyone who looks at your records must keep them completely confidential. These individuals include:

- The research team, including the Principal Investigator, study coordinator, and all other research staff.
- Certain government and university people who need to know more about the study, and individuals who provide oversight to ensure that we are doing the study in the right way.
- Any agency of the federal, state, or local government that regulates this research. This includes the Food and Drug Administration (FDA) and the Office for Human Research Protection (OHRP).
- The USF Institutional Review Board (IRB) and its related staff who have oversight responsibilities for this study, staff in USF Research Integrity and Compliance.

We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are.
You can get the answers to your questions, concerns, or complaints

If you have any questions, concerns or complaints about this study, or experience an adverse event or unanticipated problem, call Shannon Valentine Daly at 813-857-1699.

If you have questions about your rights as a participant in this study, or have complaints, concerns or issues you want to discuss with someone outside the research, call the USF IRB at (813) 974-5638.

Authorization to Use and Disclose Protected Health Information (HIPAA Language)

The federal privacy regulations of the Health Insurance Portability & Accountability Act (HIPAA) protect your identifiable health information. By signing this form, you are permitting the University of South Florida to use your health information for research purposes. You are also allowing us to share your health information with individuals or organizations other than USF who are also involved in the research and listed below.

The following groups of people may also be able to see your health information and may use that information to conduct this research:

- The medical staff that takes care of you and those who are part of this research study;
- The USF Institutional Review Board (IRB) and its related staff who have oversight responsibilities for this study, including staff in USF Research Integrity and Compliance and the USF Health Office of Clinical Research.
- Data Safety Monitoring Boards or others who monitor the data and safety of the study.

Anyone listed above may use consultants in this research study, and may share your information with them. If you have questions about who they are, you should ask the study team. Individuals who receive your health information for this research study may not be required by the HIPAA Privacy Rule to protect it and may share your information with others without your permission. They can only do so if permitted by law. If your information is shared, it may no longer be protected by the HIPAA Privacy Rule.

By signing this form, you are giving your permission to use and/or share your health information as described in this document. As part of this research, USF may collect, use, and share the following information:

- Your research record
- All of your past, current or future medical and other health records, other health care providers or any other site affiliated with this study as they relate to this research project. This includes, but is not limited to records related to HIV/AIDS, mental health, substance abuse, and/or genetic information.
You can refuse to sign this form. If you do not sign this form you will not be able to take part in this research study. However, your care outside of this study and benefits will not change. Your authorization to use your health information will not expire unless you revoke (withdraw) it in writing. You can revoke this form at any time by sending a letter clearly stating that you wish to withdraw your authorization to use your health information in the research. If you revoke your permission:

- You will no longer be a participant in this research study;
- We will stop collecting new information about you;
- We will use the information collected prior to the revocation of your authorization. This information may already have been used or shared with others, or we may need it to complete and protect the validity of the research; and
- Staff may need to follow-up with you if there is a medical reason to do so.

To revoke this form, please write to:

Shannon Valentine Daly
For IRB Study # Pro00025561
3551 Palm Crossing Dr. Unit 204
Tampa, Fl 33613

While we are conducting the research study, we cannot let you see or copy the research information we have about you. After the research is completed, you have a right to see the information about you, as allowed by USF policies. You will receive a signed copy of this form.

**Consent of Legally Authorized Representative (LAR)**

**And Authorization for the Collection, Use and Disclosure of Health Information**

I give consent to have ___________________________ take part in this study and authorize that his/her health information be disclosed/collection as outlined above. I have received a copy of this form to take with me.

I understand that I am being asked to serve as the LAR and give permission for the individual outlined above to participate in this research study. My signature on this form also gives authorization for the collection, use and sharing of private health information. My decision is based on what I believe this individual would choose for him/her and what I believe is now best for him/her, based on the information I have been provided.

__________________________________________  
Signature of Legally Authorized Representative  

__________________  
Date

__________________  
Printed Name Legally Authorized Representative
Determination of the Person’s Ability to Give Consent

A. I am study participant _______________________’s clinician. I have examined this individual by the Montreal Cognitive Assessment and have found that he/she has limited/diminished capacity and therefore is unable to give informed consent to take part in the research study and the legally authorized representative signing above is an appropriate LAR.

______________________________________________________________
Signature of Person Attesting to Limited/Diminished Autonomy of Participant

Date

Printed Name of Person Attesting to Limited/Diminished Autonomy of Participant

-OR-

B. I am a physician licensed in the State of Florida. I agree that this person has limited/diminished capacity and therefore is unable to give consent.

______________________________________________________________
Signature of Physician

Date

Printed Name of Physician

Statement of Person Obtaining Informed Consent / Research Authorization

I have carefully explained to the LAR of the person taking part in the study what he or she can expect from participation. I confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in their primary language. This research subject has provided legally effective informed consent.

______________________________________________________________
Signature of Person Obtaining Informed Consent

Date

Printed Name of Person Obtaining Informed Consent
Appendix B. IRB Study Approval Form

April 5, 2016

Shannon Valentine Daly
Communication Sciences and Disorders
Tampa, FL 33613

RE: Expedited Approval for Initial Review
IRB#: Pro00025561
Title: The Effects of Visual Arts on Expressive Language in Participants with Dementia

Study Approval Period: 4/5/2016 to 4/5/2017

Dear Ms. Valentine Daly:

On 4/5/2016, 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):
Version #1 03_04_16.docx

Consent/Assent Document(s)*:
SB LAR.docx.pdf
Verbal Assent Ages 18 and older.docx

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s). Coversheets are not stamped and verbal assents.

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 45 CFR 46.110. The research proposed in this study is categorized under the following expedited review category:
(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(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,

John Schinka, Ph.D., Chairperson
USF Institutional Review Board
Appendix C. Study Protocol

Subject Name: ____________________________
Address: ________________________________
Caregiver Name: _________________________
Relationship ____________________________
Caregiver Address: _______________________
Caregiver Phone: _________________________

Subject Demographic Information:
Date of Birth: ___________________________
Race: _________________________________
Gender: ________________________________
Diagnosis: ______________________________

Appendix D: Screening Measures

1. Functional vision, hearing, and communication screening measures (Bourgeois et al., 2001)
   
   **Vision (from Minimal Data Set 2.0)** - ability to see in adequate light with glasses if used
   
   0. ADEQUATE- sees fine detail, including regular print in newspapers/books.
   1. IMPAIRED- sees large print, but not regular print in newspapers/books.
   2. MODERATELY IMPAIRED- limited vision; not able to see newspaper headlines, but can identify objects.
   3. HIGHLY IMPAIRED- object identification in question, but eyes appear to follow objects.
   4. SEVERELY IMPAIRED- no vision or sees only light, colors, or shapes; eyes do not appear to follow objects

   **Vision Limitations/Difficulties**
   a. Side vision problems- decreased peripheral vision (e.g. leaves food on side of tray, difficulty traveling, bumps into people and objects, misjudges placement of chair when seating self.)
   b. Experiences any of the following: sees halos or rings around lights; sees flashes of light; sees curtain over eyes.
   c. NONE OF ABOVE.

   **Visual Appliances**
   Glasses; contact lenses; magnifying glass
   0. No  1. Yes

   **Hearing (with hearing appliances is necessary)**
   0. Hears adequately- normal talk, TV, phone
   1. Minimal difficulty- when not in quiet setting
2. Hears in special situations only- speaker has to adjust tonal quality and speak distinctly
3. Highly impaired- absence of useful hearing

Communication Devices/Techniques (check all that apply during last seven days)
   a. Hearing aid present and used
   b. Hearing aid present and not used regularly
   c. Other receptive communication techniques used (e.g. lip reading)

Communication (5 minute conversation)
Set stopwatch for 5 minutes. Prompt at 3.5 and 2.0 minutes approximately. If necessary, use other general prompts (“Tell me more,” or “What else can you tell me about your life, family, etc?”).

1. Tell me about your family.________________________________________
2. Tell me about your life.__________________________________________
3. Tell me about your day.__________________________________________

Rating of responses
   1. No verbal or vocal responses to interviewer.
   2. Unintelligible verbal responses or vocalizing only.
   3. Single word responses, includes yes/no responses.
   4. Phrases, multiword only.
   5. Single sentences only.
   6. Elaborated conversation; multiple sentence responses; appropriate, normal conversation.

Montreal Cognitive Assessment
Appendix E: Transcription Form

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**Participant Codes (C)**

- **RU**: Related Utterance: An utterance that is intelligible and relevant to the visual stimulus.
- **UU**: Unrelated Utterance: An utterance that is intelligible but irrelevant to the visual stimulus.
- **N**: Noun: A noun used by the participant that is specific to the stimulus material.
- **V**: Action Verb: An action verb (excluding auxiliary verbs) used by the participant that is specific to actions performed by stimulus material.
- **Ad**: Adjective: An adjective used by the participant to describe stimulus material.
- **PU**: Perseverative Utterance: An utterance that is intelligible but is a repetition of a previously stated utterance.
- **O**: Other Speech Acts: Speech acts that are unintelligible or ambiguous. Includes answers to yes/no questions.
- **SC**: Self-Correction: An utterance that has been self corrected with only corrected utterance used for coding purposes.
- **IC**: Incorrect Information: Content that is relevant but incorrectly identified by participant.

**Partner Codes (P)**

- **P1**: Partner Prompt #1: Initial prompt.
- **P2**: Partner Prompt #2: Facilitating prompt used to encourage additional content to the stimulus description.
- **PO**: Partner Other: Any other speech act that does not serve to add content to the discussion but includes acknowledgements, reassurances, and possible statements from others in the environment.

**Transcription Codes**

- **TT**: Total Time: Total time of stimulus description.