

A Comparison of the Effects of Toys versus Live Animals on the Communication of Patients with Dementia of the Alzheimer's Type

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ABSTRACT. The purpose of this study was to determine the effect of toy versus live cat stimuli on the verbal communication of elderly nursing home residents with dementia. The subjects' verbal communication was analyzed for total number of words, meaningful information units, and initiations. The measurements were recorded in three conditions: without stimuli, in the presence of two toy cats, and in the presence of two live cats. Six female nursing home residents with moderate dementia were randomly assigned into two groups to counterbalance the order of the conditions. The results indicated that live cats had the greatest influence on average subject performance across all three measurements. [Article copies available for a fee from The Haworth Document Delivery Service:

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Referring to the dangers of dementing illnesses, Schwartz (1999) asserted, "The longer we live the greater the risk" (p. xi). Indeed, ten percent of Americans age 65 and older are stricken with DAT, and half of Americans over the age of 85 are afflicted with dementia of the Alzheimer's type (DAT). Approximately 4 million people currently suffer from this disease. By the year 2050, this number is projected to increase to 14 million (Bellenir, 1999; Churchill, Safoui, McCabe, & Baun, 1999).

DAT is not a normal part of the aging process (Bellenir, 1999). It is a neurological disorder that slowly advances in stages and affects cognition in terms of memory, reasoning, abstraction, and personality (Churchill et al., 1999). This progressive deterioration of memory often negatively influences linguistic communication. Bayles and Kasniak (1987) indicated that this is a primary feature of DAT. These deficits may be represented by difficulties with retrieval and generating meaningful communication (Hopper, Bayles, & Tomoeda, 1998). McCallion (1999, as cited in Curtright & Turner, 2000) added that individuals with DAT show limited content and concept understanding in their conversations.

Intervention targeting these difficulties can be conceptually divided into internal and external methods. Internal methods focus on improving the cognitive functioning per se, whereas external methods aim at improving communication mostly by manipulating the environment, such as milieu therapy (Coons, 1981). Following the external approach rationale, previous studies have considered the effects of toys on the communication of the elderly (Francis & Baly, 1986; Hopper et al., 1998). Hopper et al. (1998) indicated that the presence of toys may result in a decreased need of free recall during conversation. In other words, toys can serve as a shared referent for meaningful communication. They found that the presence of a plush animal resulted in an increase in information units for persons with DAT. Francis and Baly (1986) found that plush animals increased the social interest and mental function of nursing home residents. In addition, plush animals produced a positive impact on self-concept and interaction and served as topics of conversation between the residents. The DAT patients studied by Bailey, Gilbert, and Herweyer

(1992) displayed increased alertness and social gestures along with diminished agitation when dolls and stuffed animals were present.

Vickery (1998) asserted that an increasing number of “long term care facilities incorporate animal-assisted therapy into their package of services” (p. 93). Animals were originally introduced into nursing homes due to evidence of animal interactions lowering blood pressure, releasing strain and tension, relieving loneliness and depression, and increasing life expectancy (Farkas, 1997). They have also been used to “reach” individuals who lack interactional skills (Churchill et al., 1999). However, the effects of animal interactions go far beyond these findings.

Several studies investigated the effects of live animals on elderly individuals (Churchill et al., 1999; Curtright & Turner, 2000; Erickson, 1985; Fick, 1993; Hopper et al., 1998; Kogan, 2000; Kongable, Buckwalter, & Stolley, 1989; Kongable, Stolley, and Buckwalter; 1990; Zisselman, Rovner, Shmueli, & Ferrie, 1996). Zisselman et al. (1996) investigated the differences between one group of elderly psychiatric patients receiving pet therapy and another receiving exercise intervention. In the group receiving pet therapy, the subjects had contact with dogs and fed them. They were also encouraged to reminisce about dogs and other animals. Measurement consisted of a 40-item scale that observed the patients’ self-care functioning, disoriented behavior, depressed or anxious mood, irritable behavior, and withdrawn behavior. Both types of intervention yielded improved scores in the areas of self-care functioning, irritability, and withdrawal.

Kongable et al. (1989) researched the effects of a pet dog on the social behaviors among DAT patients in a veterans home. The twelve subjects were observed on the social behaviors of smiles, laughs, looks, leans, touches, verbalizations, name-calling, etc. The observations took place in three conditions (i.e., absence of the dog, temporary presence of the dog, and permanent placement of the dog) both in group and individual settings. Both the temporary presence and permanent placement conditions led to an increased total number of social behaviors. Kongable et al. (1990) noted that pet therapy results in social benefits, such as stimulation of interpersonal interactions.

Churchill et al. (1999) found that the presence of a therapy dog “improved socialization and decreased agitation in persons with . . . [DAT] . . . during sundown hours” (p. 21). Specifically, this study found that subjects produced twice as many verbal initiations when the dog was present. This study is similar to Batson, McCabe, Baun, and Wilson (1998, as cited in Wilson & Turner, 1998), which showed that the presence of a therapy dog enhanced socialization behaviors of persons with DAT.

Erickson (1985) stated that pets can serve as “social ice breakers” (p. 93). Animals have been shown to enhance interaction among residents, as well as

between staff and residents (Cusak, 1988; Erickson, 1985; Fick, 1993; Twiname, 1984). Price (1996) stated, "When a dog is taken in, it not only sparks conversation between the volunteer and the patient, but also among other residents" (p. 12).

Fick (1993) examined the verbal behaviors of nursing home residents. She found that verbal interactions between subjects doubled in the presence of a dog. According to Savinsky (1985, as cited in Kogan, 2000), animals can serve as a topic of mutual interest to promote conversation. Furthermore, an animal can be used to stimulate verbalization of memories (Churchill et al., 1999).

Curtright and Turner (2000) examined the effects of the presence of stuffed and live cats on the verbal communication of an elderly individual with DAT. The authors found that average meaningful communication increased during both conditions. They concluded that the total number of utterances in both the stuffed and live cat sessions was greater than that of baseline and withdrawal sessions. Live cats resulted in more meaningful communication than stuffed cats for their subject. Curtright and Turner indicated a need for replication of this study with a greater number of participants.

Kongable et al. (1990) commented that patients with DAT are "at particular risk for social isolation and withdrawal because of their physiological and cognitive deterioration" (p. 17). Despite their deterioration, individuals with this debilitating condition continue to require, and more importantly, are able to engage in selected forms of socialization (Kongable et al., 1990). These studies support the hypothesis that animals have a positive influence on the verbal and non-verbal communication of persons with DAT.

Lubinski (1991) commented that persons with DAT do not tend to respond to direct treatment interventions for communication difficulties. More indirect treatments that are designed to facilitate automatic communication would be more beneficial. The purpose of this study was to examine the effects of toy and live cats on the verbal communication of individuals with DAT within a group setting. The present study was designed to expand on the earlier findings of Curtright and Turner (2000).

METHODOLOGY

Participants

Six females qualified for participation in this study by meeting the following criteria:

1. spoke English as a first language,
2. had no reported history of depression,
3. were classified as having a moderate level of dementia based on Mini Mental Status Examination (MMSE) (Folstein, Folstein, & McHugh,

1975) and the Functional Assessment Tool for Alzheimer's-Type Dementia (FAST) (Reisberg, Ferris, & Franssen, 1985).

The six participants were randomly assigned to one of two groups. The subjects' family members and/or legal guardians were contacted by the nursing home staff for permission to participate in this study. Informed consents were obtained for each participant.

Methods

An ABACA withdrawal design with counterbalancing across groups was implemented to assess verbal interactions of the participants. The subjects were placed in a family room, and their verbal communication was quantified in terms of total words, number of meaningful information units (MIU), and number of initiations in the presence and absence of live and toy cats.

Baseline/withdrawal phases. Each baseline and withdrawal phase consisted of three 10-minute sessions. The subjects' verbal communication was assessed in terms of total number of words, MIU, and initiations without a live or toy cat present.

The participants were positioned around a card table facing each other. The examiner sat approximately two feet away from the group and operated a video camera. In addition, an audiocassette recorder was placed in the room for back-up recording purposes.

The examiner remained a passive communicator throughout the interaction and only briefly responded when addressed during conversation. The examiner did not initiate conversation. After each session, the examiner scored the verbal communication components for each participant from the video tape recording (see sample recording form in Appendix A).

Intervention phases. In one intervention phase of the study, two toy cats were placed on the table in front of the participants. This intervention phase consisted of three ten-minute sessions. Number of total words, MIU, and initiations were measured as they were in the baseline phase. The participants were again positioned around a card table with the examiner approximately two feet away. The same recording procedures were utilized.

In the second intervention phase of the study, two live cats were placed on the table in front of the participants. This intervention phase consisted of three ten-minute sessions. Number of total words, MIU, and initiations were measured as they were in the baseline phase. The participants were again positioned around a card table with the examiner seated approximately two feet away. The same recording procedures were utilized. In addition, the examiner was responsible for keeping the cats within close proximity of the group.

The two intervention phases were counterbalanced between the groups to reduce the likelihood of sequencing effects. After initial baseline, Group 1 received the toy cat intervention phase. Group 1 then received the first withdrawal phase followed by the live cat intervention phase and a second withdrawal phase, yielding an ABACA series. The treatment phases were reversed for Group 2 (ACABA).

Stimuli

As previously stated, the stimuli consisted of two toy cats and two live cats. The toy cats were purchased from a local toy store prior to the study and were unfamiliar to the participants. The live cats were also unfamiliar to the participants.

Data Collection

The effect of the stimuli on the participants' verbal communication was documented by counting the total number of words, MIU, and verbal initiations. Total words were defined as the total number of words produced during each 10-minute session. Repetitions within an utterance, unintelligible words and neologisms were not included.

MIU were defined as words or phrases produced by the participant that had meaning, were not redundant, and were directly related to the conversation. Pronouns were not counted separately; however, specific sentence subjects, such as "farmer," were. Specific adjectives were counted separately (e.g., green, beautiful). Nonspecific adjectives, such as, "very" or "really," were not. Because negatives change the meaning of a sentence, they were also counted separately. Unintelligible utterances and neologisms were not included. By way of illustration, each of the following utterances contain three MIU:

I don't mean to be nosey.

1. do mean,
2. not,
3. nosey

Funny jokes make me laugh.

1. funny,
2. jokes,
3. make me laugh

Initiations were defined as utterances produced without a verbal model. They were counted if they introduced new information, and were directed towards another person or one of the stimuli.

Interscorer Reliability

One session from each baseline, treatment and withdrawal phase was randomly selected for measuring reliability. An examiner who was not present for that particular session scored the verbal communication components. The number of point-to-point agreements was counted and divided by the total number of possible agreements (Hopper et al., 1998). Interscorer reliability was .88 for MIU, .97 for total words, and .99 for initiations.

RESULTS

Subject demographics and assessment results are listed in Table 1. The original methodology called for ten-minute sessions; however, not all subjects remained for the entire length of every session. Therefore, data were calculated per minute rather than per session and are reflected as such. Graphs charting individual performance for each session can be found in Appendix B. The pre-test baseline phase data were gathered over five sessions instead of three in an attempt to stabilize performance. However, lack of cooperation led to four baseline sessions for Group 1 and three baseline sessions for Group 2. The remaining treatment and withdrawal phases consisted of three sessions each for both groups.

Total Words

In the toy cat condition, average subject performance for total words gradually decreased across baseline (21.1/min), toy cat intervention (19.3/min), and subsequent withdrawal (16.4/min). When the live cats were present, average total words (24.8/min) increased from baseline (21.1/min), and continued to increase upon withdrawal (28.2/min) (see Figure 1). Average total words were greater during the live cat intervention than in the toy cat intervention.

TABLE 1. Subjects' Demographics and Assessment Results

	Subject	Age	MMSE	FAST
Group 1	DF	90	15	6d
	HR	88	19	4
	CM	87	7	6c
Group 2	AW	89	16	6d
	BH	89	21	5
	EC	84	12	6d

Analysis of individual groups showed that Group 1 reverted to baseline after an increase in the presence of toy cats. This group showed a continual increase in the presence and withdrawal of live cats (see Figure 2). Conversely, Group 2 showed a slight increase upon withdrawal of toy cats. These scores reverted to baseline after an increase in the presence of live cats (see Figure 3).

Meaningful Information Units

In the toy cat condition, average subject performance for MIU was relatively stable during baseline (5/min), toy cat intervention (4.7/min), and subsequent withdrawal (4.8/min) (see Figure 4). In the presence of live cats, average MIU (6.2/min) increased from baseline (5/min) and showed a slight decrease upon withdrawal (5.8/min). Overall subject performance showed greater number of MIU when the live cats were present.

Analysis of individual groups revealed that Group 1 increased production of MIU in the presence of toy cats and reverted to baseline upon withdrawal. In the presence of live cats, Group 1 increased from baseline and continued to increase when the cats were removed (see Figure 5). Group 2's production of MIU decreased when the toy cats were introduced and increased upon withdrawal. In the live cat condition, Group 2 demonstrated an increase in MIU and a decrease upon stimuli withdrawal (see Figure 6).

Initiations

In the toy cat condition, average subject performance for initiations increased slightly (from 1.8/min to 2.1/min) and remained stable following with-

FIGURE 1. Average Total Words Across Both Groups

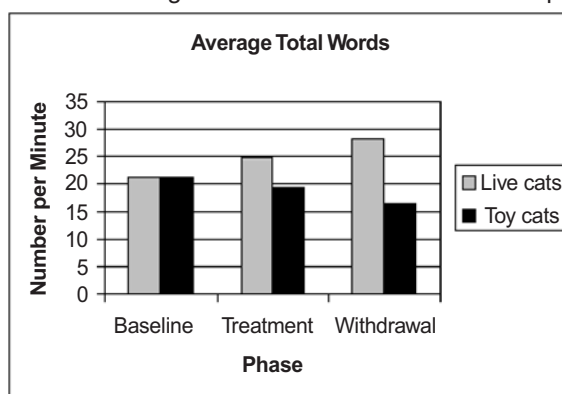


FIGURE 2. Average Total Words for Group 1

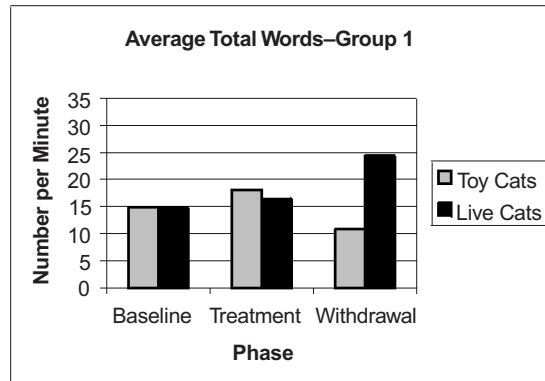
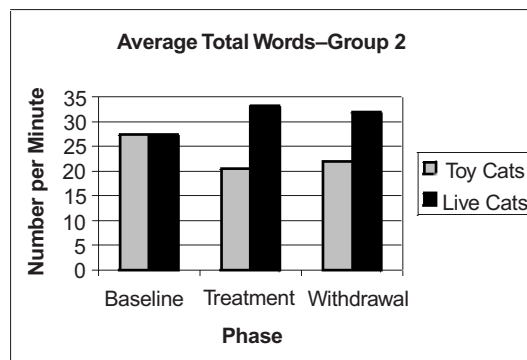


FIGURE 3. Average Total Words for Group 2



drawal (2.1/min) (see Figure 7). On the other hand, in the presence of live cats, average initiations (2.5/min) increased from baseline (1.8/min) and decreased during withdrawal (1.7/min). Average initiations were greater during the live cat intervention than in the toy cat intervention.

Analysis of individual groups revealed that Group 1 showed an increase from baseline in the presence of toy cats and reversed to baseline following withdrawal. Group 1 showed an increase in the presence of live cats and decreased upon the stimuli withdrawal (see Figure 8). Group 2 demonstrated an increase in initiations when the toy cats were present and continued to increase upon their withdrawal. In the presence of live cats, Group 2 showed a similar performance to that of Group 1 (see Figure 9).

FIGURE 4. Average Meaningful Information Units Across Both Groups

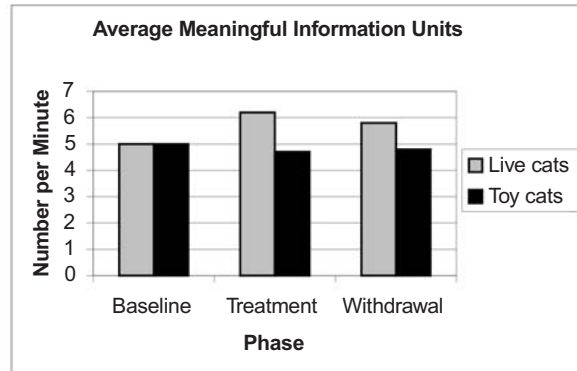
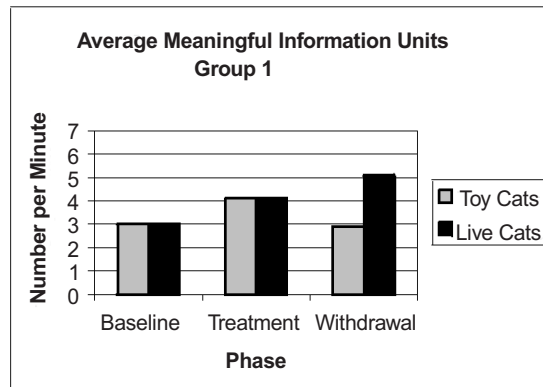


FIGURE 5. Average Meaningful Information Units for Group 1



DISCUSSION

The results indicated that live cats had the greatest influence on overall average subject performance across all three measurements. Closer inspection of individual group performance showed that the live cats had a stronger effect on Group 2 than on Group 1. This is likely due to the fact that live cats were the first intervention for Group 2 and the second intervention for Group 1. This may be due to the subjects' progressive loss of interest as the study went on. Several subjects voiced their refusal to come to or remain in the sessions during the later weeks of the study.

FIGURE 6. Average Meaningful Information Units for Group 2

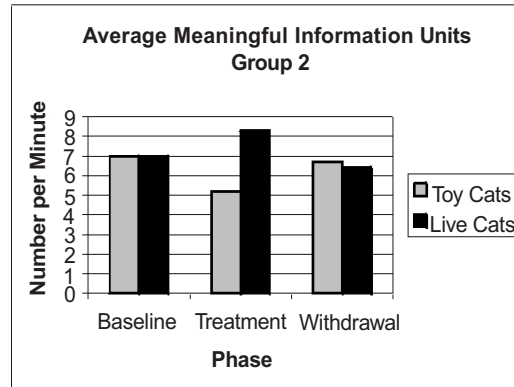
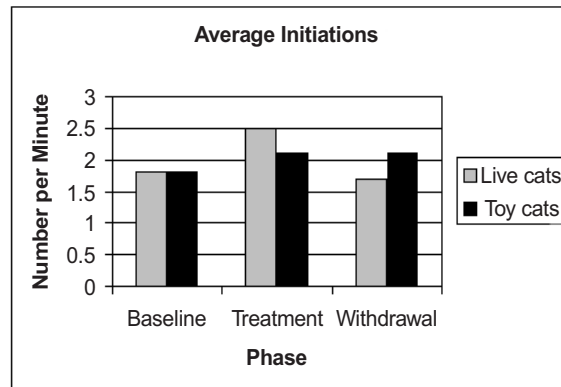


FIGURE 7. Average Initiations Across Both Groups



In the toy cat condition, the average performance of total words, MIU, and initiations was relatively stable across phases (baseline, treatment, and withdrawal). These findings are similar to those of Hopper et al. (1998), who found that the presence of toy stimuli did not influence the number of total words or verbal initiations for three of their four subjects. However, Hopper et al. also found that the presence of toy stimuli resulted in a greater number of meaningful statements from all of their subjects. Differences in the results between the

FIGURE 8. Average Initiations for Group 1

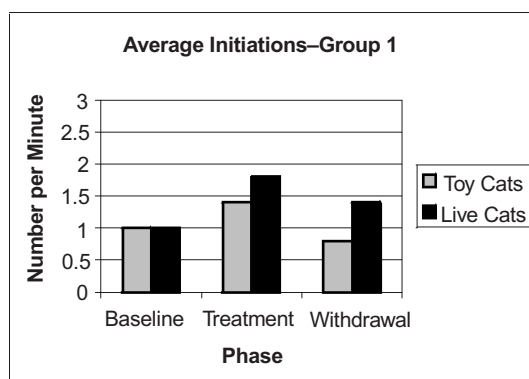
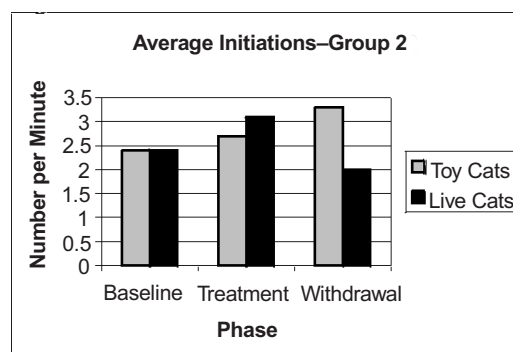


FIGURE 9. Average Initiations for Group 2



two studies may be due to variations in methodology (e.g., Hopper et al. allowed examiner initiations and one-on-one sessions).

Curtright and Turner (2000) also studied the influence of a toy cat on the verbal communication of an elderly individual with DAT. They found that the presence of a toy cat increased the number of complete information units and total number of utterances. The results of the present study are not equivalent to those of Curtright and Turner. The present study found that toy cats led to a slight decrease in total words and meaningful information units. This may be due to the inclusion of six subjects in the present study compared to only one subject in that of Curtright and Turner. In addition, Curtright and Turner allowed examiner initiation whereas the current study did not. However, inspec-

tion of individual performances in the present study showed that toy cats appear to have positively influenced CM's production of total words and MIU (see Appendix B). That particular subject's performance is comparable to the findings of Curtright and Turner.

In the live cat condition, the average production of total words, MIU, and initiations increased compared to baseline. Upon withdrawal of the live cats, overall average total words continued to increase, overall average MIU slightly decreased, and overall average initiations decreased to baseline levels. The findings for the initiation variable are similar to those of Fick (1993), who found that the presence of a dog resulted in an increase in verbal interactions between subjects. Temporary placement of live animals produces a novel situation that may elicit more verbal communication.

The findings for the total words and MIU variables are comparable to those of Curtright and Turner (2000) who also studied the influence of a live cat on the verbal communication of a single elderly individual with DAT. They found that the presence of a live cat increased meaningful communication as well as total number of utterances. Upon analysis of individual performance in the present study, EC demonstrated the greatest benefit from the live cat intervention across total words and MIU (see Appendix B). EC and the subject examined by Curtright and Turner were similar in MMSE score with 12 and 14, respectively.

An interesting finding upon individual analysis was that CM and EC demonstrated a favorable response to the toy cats and the live cats, respectively. These two subjects had the lowest MMSE scores and two of the most severe FAST scores (see Table 1). Hopper et al. (1998) found increased verbal communication in patients with MMSE scores ranging from 8 to 12 in response to toy stimuli. CM, whose MMSE was 7, showed greater verbal communication in the presence of toy cats. Curtright and Turner's (2000) subject, who responded more favorably to a live cat, scored a 14 on the MMSE. EC, whose MMSE was 12, performed similarly. These results may indicate that therapy involving toy and live cats would be most effective for more severely impaired individuals with DAT. This indicates they may need more external stimuli to promote conversation. Future research may want to consider focusing on more severe individuals. Still, this individual variability in the results point to the need for future research to focus on more precise candidacy issues for these types of therapeutic approaches.

The findings of the present study demonstrate that the live cats, overall, resulted in greater number of total words, MIU, and initiations than the toy cats. Curtright and Turner (2000) found that the live cat resulted in more meaningful communication than the toy cat, but no difference was found in the measure of total number of utterances. The results of the present study showed that the

live cats encouraged interaction between the subjects and the stimuli. That is, the subjects talked to and touched the live cats more than they did the toy cats. This is similar to the performance of the subject examined by Curtright and Turner. Live cats initiate by approaching and touching people.

It was noted that the subjects often communicated to the examiners and the stimuli. Although the examiners remained passive communicators and sat apart from the group, subjects would often initiate communication with them rather than with the other subjects. The subjects also spoke directly to and touched the live cats, which is similar to that found in Curtright and Turner (2000). However, unlike Curtright and Turner, the subjects occasionally spoke to and touched the toy cats. Additionally, their number of initiations was significantly greater than their number of responses, which indicates that the subjects were not talking to each other. However, the subjects initiated and responded during conversations with the examiners outside of the assessment room. Their utterances tended to be appropriate, meaningful, and social. It appears that when examiners directly addressed the subjects, they tended to participate in conversation. This was not evident during the formal testing sessions, due to the subjects' tendency not to address each other. In contradistinction, Hopper et al. (1998) found that their subjects interacted more effectively. However, the more encouraging results in their study could be attributed to the use of examiner initiations in conjunction with their toy stimuli. These findings suggest that subjects may perform better when topics are initiated by a communicative partner. To examine the more social aspects of communication, researchers should consider focusing their measurement on the quality of communicative exchanges between subjects rather than isolated measures of quantity, such as number of initiations.

Other characteristics may have affected the subjects' performance. For example, EC's harsh voice quality made her unintelligible at times and BH demonstrated a difficulty hearing as she frequently asked for clarification and responded inappropriately. These variables could be included within the exclusion criteria of future studies. Furthermore, DF and BH both exhibited confusion during sessions. A better screening for research subjects could also minimize this confounding variable. Finally, subjects would lose interest and even doze off during recorded sessions. This could be prevented by a more active participation of the investigator. Future research should take these factors into consideration as well as incorporating both genders and more subjects.

CONCLUSION

This study proposed to look at the effects of toy cats versus live cats on the verbal communication of elderly females with DAT. Overall, live cats were

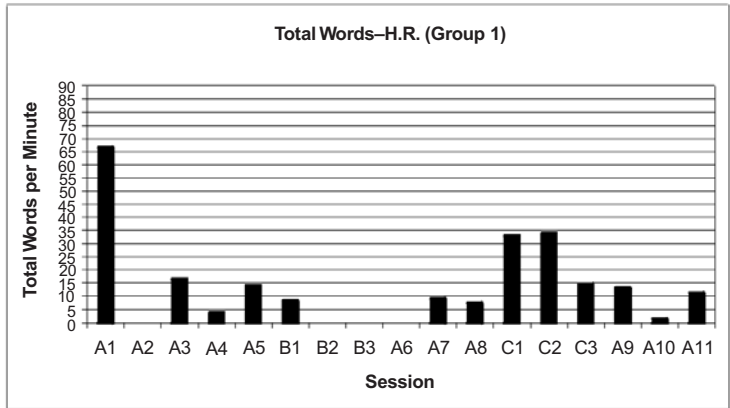
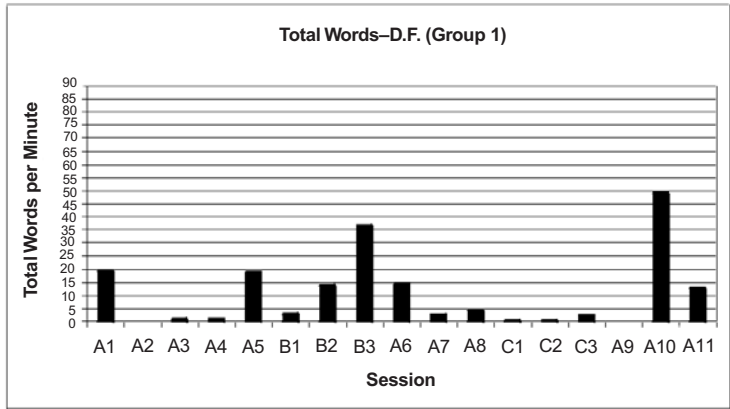
found to have a greater influence on subject performance than toy cats, due to their active nature, which could be interpreted as communicative initiations. Analysis of individual group performance showed that each group responded more favorably to their first intervention phase. Observations of communication outside the study, as well as findings from the literature, suggest that individuals with DAT may increase meaningful communication when active communicative partners are present.

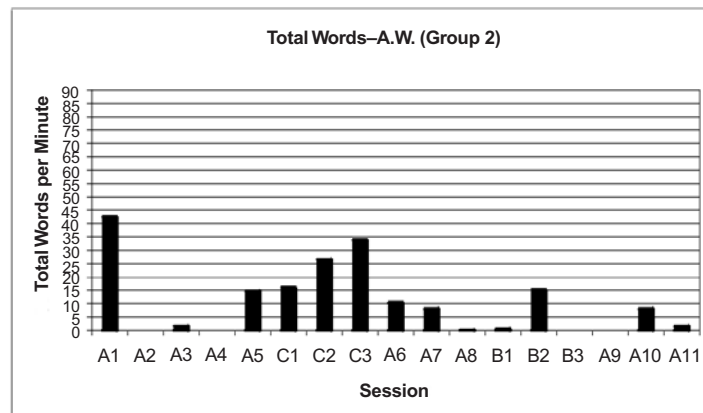
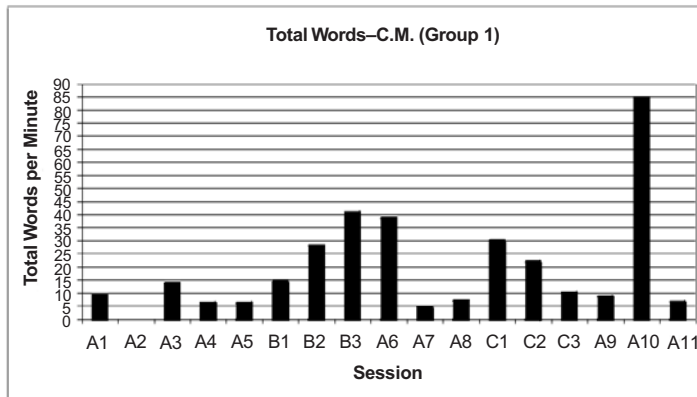
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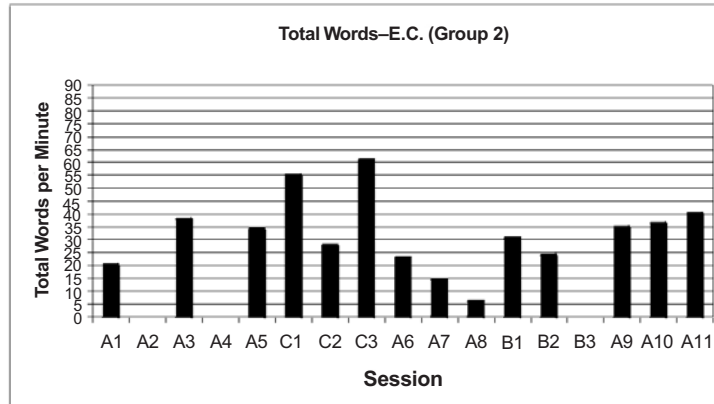
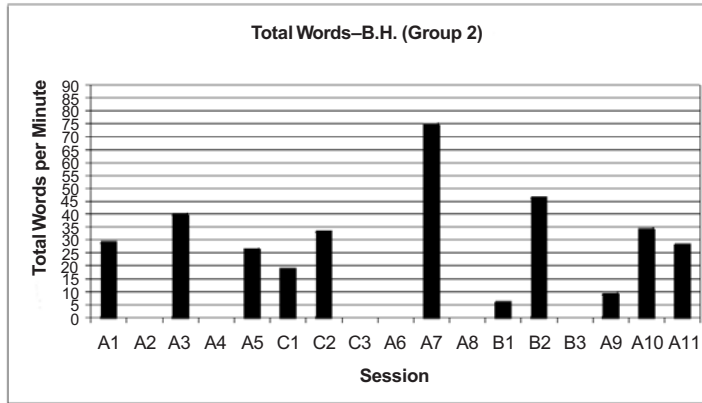
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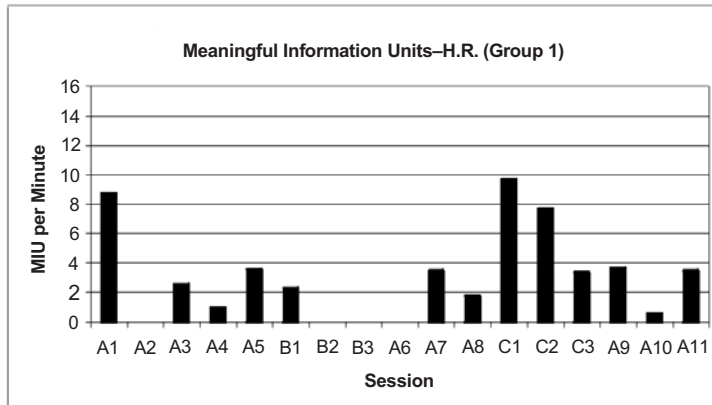
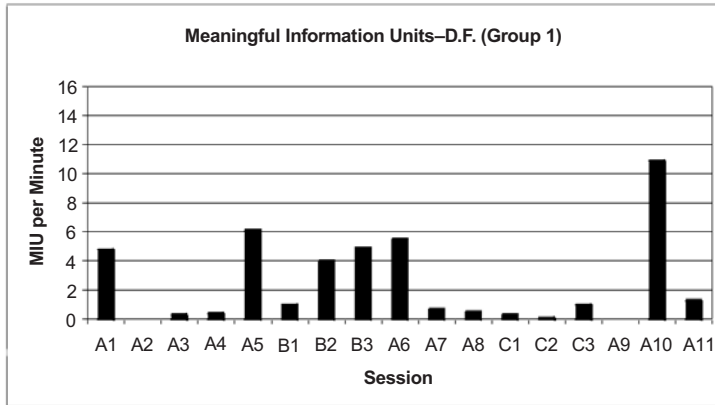
APPENDIX B



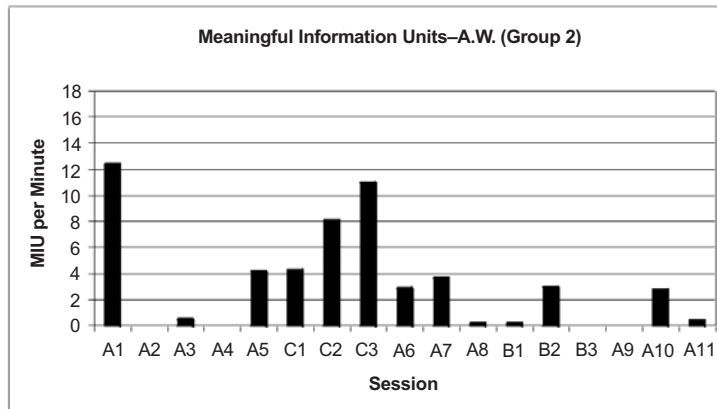
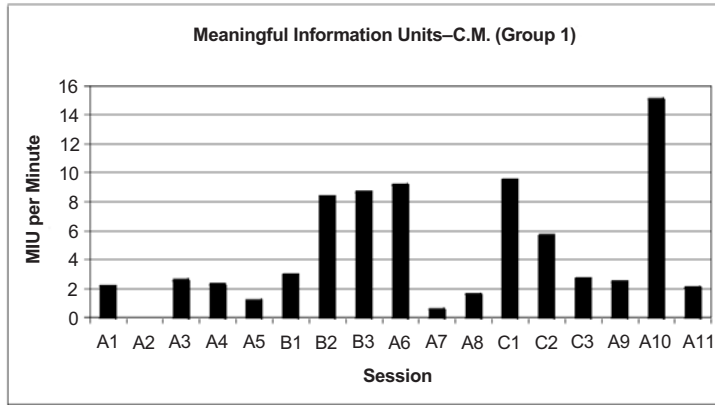


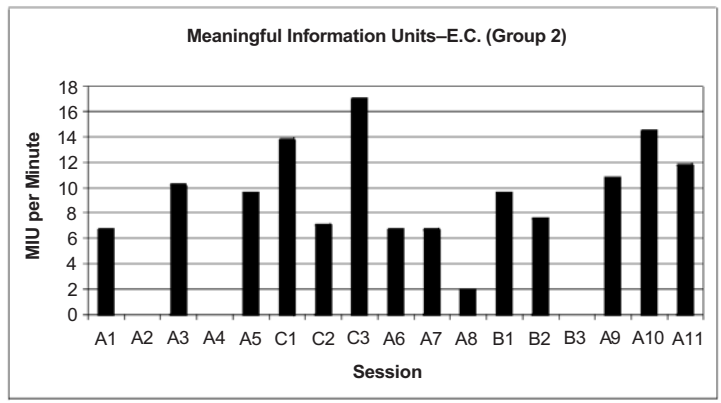
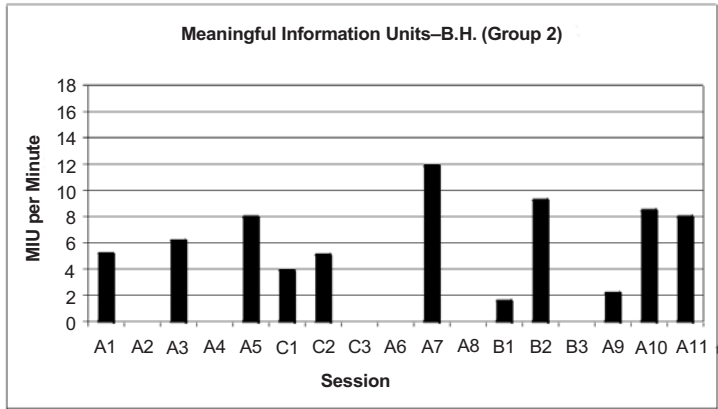
APPENDIX B (continued)



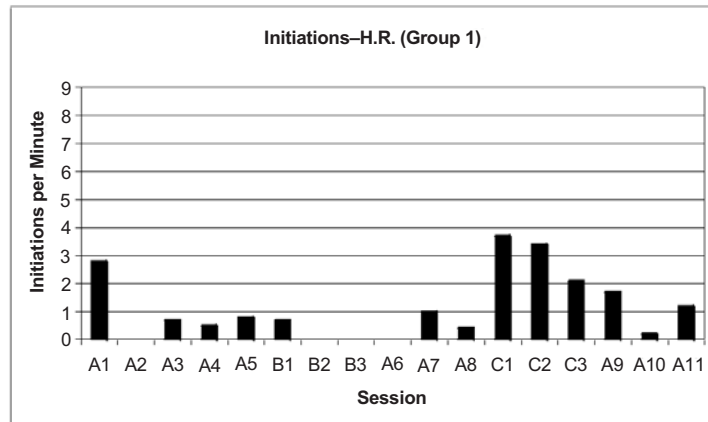
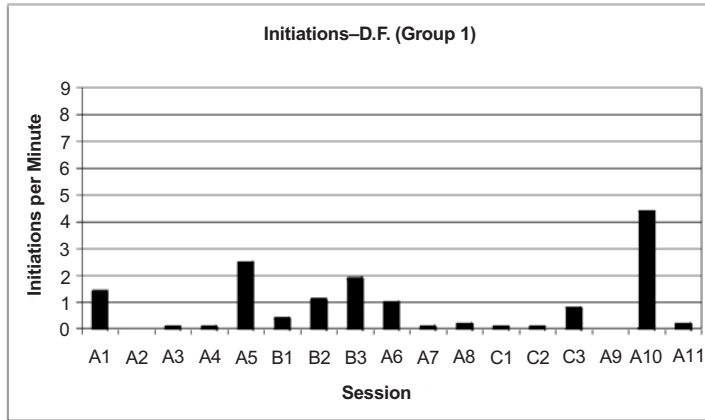


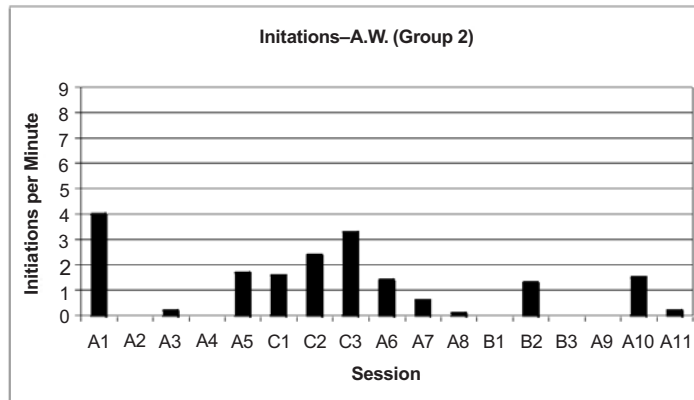
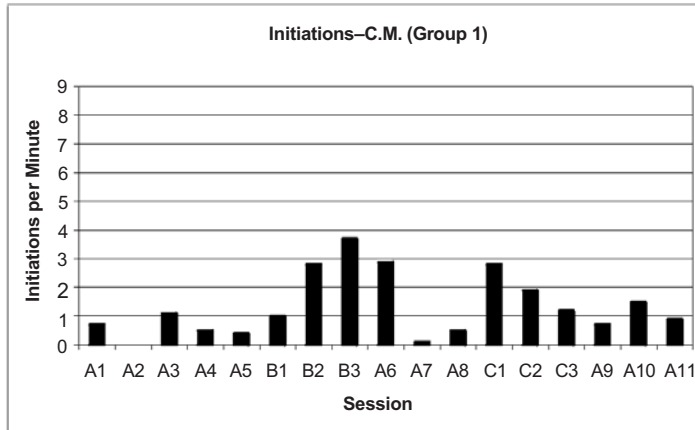
APPENDIX B (continued)





APPENDIX B (continued)





APPENDIX B (continued)

