Final Progress Report for Research Projects Funded by Health Research Grants

Instructions: Please complete all of the items as instructed. Do not delete instructions. Do not leave any items blank; responses must be provided for all items. If your response to an item is "None", please specify "None" as your response. "Not applicable" is not an acceptable response for any of the items. There is no limit to the length of your response to any question. Responses should be single-spaced, no smaller than 12-point type. The report **must be completed using MS Word**. Submitted reports must be Word documents; they should not be converted to pdf format. Questions? Contact Health Research Program staff at 717-783-2548.

1. **Grantee Institution:** Madlyn and Leonard Abramson Center for Jewish Life

2. **Reporting Period (start and end date of grant award period):** 1/1/2011 – 6/30/2012

3. **Grant Contact Person:** Susanne R. Morganstein, MS

4. **Grant Contact Person's Telephone Number:** 215-371-1861

5. **Grant SAP Number:** 4100054858

6. **Project Number and Title of Research Project:** Examining Impact of Individualized Positive Psychosocial Interventions in Nursing Homes

7. **Start and End Date of Research Project:** 1/1/2011 – 6/30/2012

8. **Name of Principal Investigator for the Research Project:** Kimberly S. Van Haitsma, PhD

9. **Research Project Expenses**.

   9(A) Please provide the amount of health research grant funds spent on this project for the entire duration of the grant, including any interest earned that was spent:

   $17,589.60

   9(B) Provide the last names (include first initial if multiple individuals with the same last name are listed) of **all** persons who worked on this research project and were supported with health research funds. Include position titles (Principal Investigator, Graduate Assistant, Post-doctoral Fellow, etc.), percent of effort on project and total health research funds expended for the position. For multiple year projects, if percent of effort varied from year to year, report in the % of Effort column the effort by year 1, 2, 3, etc. of the project (x% Yr 1; z% Yr 2-3).

Last Name	Position Title	% of Effort on Project	Cost
VanHaitsma	Director	8.5	10,445.84
Kleban	Statistician	11.0	3,513.99

9(C) Provide the names of **all** persons who worked on this research project, but who *were not* supported with health research funds. Include position titles (Research Assistant, Administrative Assistant, etc.) and percent of effort on project. For multiple year projects, if percent of effort varied from year to year, report in the % of Effort column the effort by year 1, 2, 3, etc. of the project (x% Yr 1; z% Yr 2-3).

Last Name	Position Title	% of Effort on Project
None		

9(D) Provide a list of **all** scientific equipment purchased as part of this research grant, a short description of the value (benefit) derived by the institution from this equipment, and the cost of the equipment.

Type of Scientific Equipment	Value Derived	Cost
None		

10. Co-funding of Research Project during Health Research Grant Award Period. Did this research project receive funding from any other source during the project period when it was supported by the health research grant?

Yes_____ No____x_____

If yes, please indicate the source and amount of other funds:

11. Leveraging of Additional Funds

11(A) As a result of the health research funds provided for this research project, were you able to apply for and/or obtain funding from other sources to continue or expand the research?

Yes_____ No___x_____

If yes, please list the applications submitted (column A), the funding agency (National Institutes of Health—NIH, or other source in column B), the month and year when the application was submitted (column C), and the amount of funds requested (column D). If you have received a notice that the grant will be funded, please indicate the amount of funds to be awarded (column E). If the grant was not funded, insert "not funded" in column E.

Do not include funding from your own institution or from CURE (tobacco settlement funds). Do not include grants submitted prior to the start date of the grant as shown in Question 2. If you list grants submitted within 1-6 months of the start date of this grant, add a statement below the table indicating how the data/results from this project were used to secure that grant.

A. Title of research project on grant application	B. Funding agency (check those that apply)	C. Month and Year Submitted	D. Amount of funds requested:	E. Amount of funds to be awarded:
	☐NIH ☐ Other federal (specify:_____ _____) ☐ Nonfederal source (specify: _____)		$	$
	☐NIH ☐ Other federal (specify:_____ _____) ☐ Nonfederal source (specify: _____)		$	$

11(B) Are you planning to apply for additional funding in the future to continue or expand the research?

Yes___x_____ No_____

If yes, please describe your plans:
Results of this research project will be incorporated into future grant applications.

12. Future of Research Project. What are the future plans for this research project?

Results of this project will be utilized in two ways:
1) Results will be incorporated into a paper that will be submitted to a peer-reviewed journal
2) Results will be incorporated into a grant application designed to test a preference-based care intervention

13. New Investigator Training and Development. Did students participate in project supported internships or graduate or post-graduate training for at least one semester or one summer?

Yes_____ No_____x_____

If yes, how many students? Please specify in the tables below:

	Undergraduate	Masters	Pre-doc	Post-doc
Male				
Female				
Unknown				
Total				

	Undergraduate	Masters	Pre-doc	Post-doc
Hispanic				
Non-Hispanic				
Unknown				
Total				

	Undergraduate	Masters	Pre-doc	Post-doc
White				
Black				
Asian				
Other				
Unknown				
Total				

14. Recruitment of Out-of–State Researchers. Did you bring researchers into Pennsylvania to carry out this research project?

Yes_____ No___x_____

If yes, please list the name and degree of each researcher and his/her previous affiliation:

15. Impact on Research Capacity and Quality. Did the health research project enhance the quality and/or capacity of research at your institution?

Yes_____ No____x_____

If yes, describe how improvements in infrastructure, the addition of new investigators, and other resources have led to more and better research.

16. Collaboration, business and community involvement.

16(A) Did the health research funds lead to collaboration with research partners outside of your institution (e.g., entire university, entire hospital system)?

Yes_____ No_____x_____

If yes, please describe the collaborations:

16(B) Did the research project result in commercial development of any research products?

Yes_____ No____x_____

If yes, please describe commercial development activities that resulted from the research project:

16(C) Did the research lead to new involvement with the community?

Yes_____ No_____x____

If yes, please describe involvement with community groups that resulted from the research project:

17. Progress in Achieving Research Goals, Objectives and Aims.

List the project goals, objectives and specific aims (as contained in the grant application's strategic plan). Summarize the progress made in achieving these goals, objectives and aims for the period that the project was funded (i.e., from project start date through end date). Indicate whether or not each goal/objective/aim was achieved; if something was not achieved, note the reasons why. Describe the methods used. If changes were made to the research goals/objectives/aims, methods, design or timeline since the original grant application was submitted, please describe the changes. Provide detailed results of the project. Include evidence of the data that was generated and analyzed, and provide tables, graphs, and figures of the data. List published abstracts, poster presentations and scientific meeting presentations at the end of the summary of progress; peer-reviewed publications should be listed under item 20.

This response should be a DETAILED report of the methods and findings. It is not sufficient to state that the work was completed. Insufficient information may result in an unfavorable performance review, which may jeopardize future funding. If research findings are pending publication you must still include enough detail for the expert peer reviewers to evaluate the progress during the course of the project.

Health research grants funded under the Tobacco Settlement Act will be evaluated via a performance review by an expert panel of researchers and clinicians who will assess project work using this Final Progress Report, all project Annual Reports and the project's strategic plan. After the final performance review of each project is complete, approximately 12-16 months after the end of the grant, this Final Progress Report, as well as the Final Performance Review Report containing the comments of the expert review panel, and the grantee's written response to the Final Performance Review Report, will be posted on the CURE Web site.

There is no limit to the length of your response. Responses must be single-spaced below, no smaller than 12-point type. If you cut and paste text from a publication, be sure symbols print properly, e.g., the Greek symbol for alpha (α) and beta (ß) should not print as boxes (□) and include the appropriate citation(s). DO NOT DELETE THESE INSTRUCTIONS.

The objective of this research was to conduct analyses on an existing data set to test the following hypotheses:

> H1 Quality of Nursing Assistant Interactions Hypothesis: Nursing Assistants who engaged in prescribed Individualized Positive Psychosocial Interventions (IPPI) will exhibit more positive observed interactional behavior compared to an Attention Control Intervention (ACI) or Usual Care (UC) conditions.
>
> H2 Impact on Observed Resident Outcomes Hypothesis: Residents who engaged in prescribed Individualized Positive Psychosocial Interventions (IPPI) will overtly demonstrate more positive and less negative affect and behavior when compared to residents engaged in Attention Control Intervention (ACI) or residents who experience only Usual Care (UC) condition.
>
> H3 Impact on Staff reported Resident Outcomes Hypothesis: Staff will report that residents who engaged in prescribed Individualized Positive Psychosocial Interventions (IPPI) will be perceived as having more positive and less negative affect and behavior when compared to residents engaged in Attention Control Intervention (ACI) or residents who experience only Usual Care (UC) condition.

This data set was collected in a randomized controlled trial (RCT) investigating the effectiveness of one CMS-recommended strategy, planning individualized activities, to reduce negative affect and behavior, and increase positive states, in nursing home residents with dementia. The study used paraprofessionals as interventionists.

Theoretical Frameworks of the Intervention

Three well-known theoretical models emphasize the importance of satisfying activities and relationships to promote personal wellbeing. The *Need-Driven Dementia-Compromised Behavior Model* (NDB) views behavioral symptoms of dementia (e.g. wandering, physical aggression) as expressions of unmet needs (Algase et al., 1996). A person's background factors (e.g., neurological changes, current cognitive abilities, general health, and psychosocial history) combine with proximal factors (e.g., physical and social environment, physiological and psychological need states) to produce need-driven behavior that cannot be expressed in words (Algase et al., 1996; Whall & Kolanowski, 2004; Kolanowski et al., 2011).

According to the NDB model, care is most effective when providers understand an individual's past identity as well as current abilities, needs and preferences, and then match the care setting and delivery to those factors as closely as possible (Penrod et al., 2007). The model emphasizes meeting needs for physical comfort, as well as meaningful activities and positive resident-caregiver relationships.

Self-Determination Theory (SDT) is a model of personality and motivation which holds that all people have three important innate needs – for autonomy, competence and relatedness -- that must be fulfilled for psychological well being across the life course (Deci & Ryan, 2000; Kasser & Ryan, 1999). Individual internal as well as environmental factors that support satisfying these

needs "maintain and enhance the self" (Kasser & Ryan, 1999). Aspects that "undermine need fulfillment result in negative functional consequences for mental health" (Deci & Ryan, 2000).

SDT-based research in nursing homes has shown that residents have greater wellbeing when their needs for autonomy, competence and relatedness are supported. One study found that residents with greater autonomy in recreational, interpersonal, religious and self-care activities reported lower depression, and better self-esteem, life satisfaction, meaning, general health and psychological adjustment (Vallerand & O'Connor, 1989). Another reported a positive correlation between psychological outcomes and satisfaction of needs for relatedness and autonomy (Kasser & Ryan, 1999).

The emerging field of *positive psychology* highlights similar elements. Keyes (2007) contends that measures of mental health and mental illness form two distinct and independent dimensions. In his view, mental health involves not just the absence of mental illness, but also the presence of positive adaptive behaviors, emotions and functioning. Keyes describes 13 aspects of mental health, divided into hedonic wellbeing (positive affect and stated quality of life) and eudaimonic wellbeing (positive psychological and social functioning). Humans flourish when they have high levels of positive affect or avowed quality of life, and at least 6 elements of eudaimonic wellbeing (e.g., sense of purpose in life, autonomy, positive relations with others, social acceptance, social contribution and social integration). While the model has not been tested explicitly in older adults, gerontologists have studied similar concepts, and found them to be important for optimizing adaptation and successful aging (Meeks et al, 2012).

Fredrickson's *Broaden-and-Build Theory* (1998, 2001) proposes that positive emotions, even if experienced briefly, can have lasting effects that lead to a broadened scope of attention, cognition and openness. In turn, these feelings can create an upward spiral of wellbeing and social connectedness (Garland et al., 2010). While these effects have a clear intrinsic value, a growing body of research suggests that individuals with higher levels of positive affect also have better health and biological regulation (Ryff & Singer, 2009; Tugade, Fredrickson & Barrett, 2004). Also, studies have found connections between positive affect and lower morbidity, decreased health symptoms and pain, increased longevity, resistance to illness, decreased stroke incidence and better glycemic control. Research on older women found that higher eudaimonic wellbeing was associated with lower cardiovascular risk and salivary cortisol as well as lower inflammatory factors (Ryff & Singer, 2009).

Lawton's *"dual-channel" effect* identifies different antecedent patterns for positive and negative affect. According to this framework, externally engaging phenomena enhance positive affect but not negative affect, while intrapersonal factors – such as health, self-esteem, and personality -- contribute to negative but not positive affect states (Lawton, Winter, Kleban & Ruckdeschel, 1999). Positive affect is directly related to the external environment, while negative affect is more internal and less susceptible to change in response to outside influences such as recreational activities.

Collectively, these theories underscore the need for nursing homes to meet residents' across dimensions. While addressing basic physical needs is crucial, the models highlight the equally

important role of providing activities and experiences that nurture feelings of pleasure, competence and connection.

Research on Individualized Activities

Over the years, numerous studies have explored whether non-pharmacological interventions, including activities, can alleviate behavioral symptoms among nursing home residents with dementia. Two recent reviews of the literature report similar findings. Kroes and colleagues (2011) found that it was difficult to determine whether a wide variety of modalities (e.g., reality orientation, light therapy, communication/interaction, music therapy, activity therapy, massage and nutrition) produced meaningful benefits because of conflicting results and low quality data. However, the review did find scientific evidence to recommend physical activity and cognitive stimulation/training programs.

O'Neil and colleagues concluded that clear and consistent evidence supporting use of the various psychosocial therapies for the treatment of behavioral symptoms for dementia is lacking, in part due to methodological problems. They cite the paucity of good quality RCTs, and limitations such as small-scale studies, often with great differences in the way behavioral symptoms are defined, the duration of interventions, and the measures used. However, they found that aromatherapy, music therapy, massage therapy and exercise may have merit in reducing dementia symptoms.

Interestingly, both reviews highlight the promise of individualized interventions. Kroes et al. note that interventions with positive outcomes are tailored to individual patient needs, while O'Neil et al. report that current research investigating systematic individualized interventions provides preliminary evidence that targeted tailored and individualized approaches may be effective in decreasing certain behavioral symptoms of dementia (add citations).

Two recent efficacy studies conducted by Kolanowski and colleagues illustrate the benefits of individualized activities. In a 2005 project (Kolanowski et al., 2005), nursing home residents (n=30) were randomly assigned to activities matched to their skill level, style of interest or a combination of the two. Research assistants (RA) implemented the activities, which were recorded on videotape. Residents in the NDB-derived and matched to interest only treatments showed significantly more time on task, greater participation, more positive affect and less passivity than other residents. Compared to baseline, agitation and negative affect improved under all treatments, but there was no change in mood.

In a 2011 randomized, double blind clinical trial, cognitively impaired residents (n=128) were assigned to activities adjusted to: functional level (FL); personality style of interest (PSI); a combination (FL1PSI); or active control (Kolanowski et al., 2011). Activities took place 2 times per day for 3 weeks. During the intervention, all treatments improved outcomes, except mood, which worsened under active control. The two groups with interest-matched activities fared best. The PSI group demonstrated greater engagement, alertness, and attention, while the FL1PSI group showed greater pleasure than other groups. Also, the two groups showed less agitation and passivity. One week after the intervention, residents' mood, anxiety, and passivity improved over baseline, but they displayed significantly less pleasure.

Kolanowski's efficacy studies, using highly trained research assistants as interventionists, found that outcomes improve when activities match individual interests. Our research builds on these findings.

Purpose

The purpose of the randomized clinical trial was to test the impact of a one-to-one social activity intervention with nursing home residents with dementia using certified nursing assistants as interventionists. CNA-led activities were designed to match residents' current preferences and abilities, and address needs for meaningful social interaction. Based on random assignment, residents received usual care, a uniform attention control activity or an individualized activity. Behavioral and affective outcomes were observed before, during and within a 30-minute period after the intervention.

An effectiveness trial of this type has not been conducted before, but is critical to moving the field of individualized activity care delivery into a translational phase.

Hypotheses

We hypothesized that introducing customized one-to-one activity interventions would reduce residents' observed negative affect (anger, anxiety, sadness) and behavior (e.g., withdrawal, agitation, null behavior), and increase instances of observed positive affect (pleasure, interest) and behavior (e.g., engagement in meaningful activity, coherent verbalizations). Furthermore, we expected to find the most benefit for residents receiving the individualized intervention, followed by those taking part in the attention control activity when compared to a usual care group of residents.

METHODS

Study Setting and Participants

The study took place within a large nonprofit Pennsylvania nursing home primarily serving Jewish older adults. The project director screened medical charts for all residents on 8 nursing home units to determine their eligibility for the study. Criteria for inclusion were: age 65 or older, lived on the unit for one month or more, had a diagnosis of Alzheimer's disease or related disorder and a Mini-Mental State Examination (MMSE) score of 0 to 24. Residents were excluded if they were actively psychotic or receiving end-of-life care.

Sample Size

A total of 180 nursing home residents participated in the study. Residents were randomly assigned to Usual Care (n=93) or one of two experimental groups, either the Attention Control intervention (AC, n=43) or Individualized Positive Psychosocial Intervention (IPPI, n=44).

Randomization

The nursing home federally assured institutional review board approved the protocol for this randomized controlled trial (RCT). Randomization occurred at three levels. First, researchers used a random numbers generator to assign all eligible residents to UC or an experimental condition. The UC group served as controls for treatment effects, while the AC group controlled for attention bias.

Second, the research team randomly assigned each nursing home unit to provide AC or IPPI as well as UC. The nursing home used a permanent assignment staff model so that CNAs cared for the same group of residents each day. During the study, some individuals on a CNA's caseload received an experimental condition while others received UC. Assigning only one experimental condition (either AC or IPPI) to each unit helped mitigate cross-contamination. Staff members were blinded to the condition of their unit.

A third level of random assignment occurred among paraprofessional staff. Half of the CNAs on each nursing home unit were randomly assigned to take communication skills training and half did not. This allowed us to control for effects of the instruction.

The mean age for the sample was 88.7 years (range 64-105). Most participants were female (82.2%), Caucasian (99.4%), and Jewish (97.2%). Approximately two-thirds were widows (66%), and had a high school education or less (64%).

Procedures

During the study, residents in the UC group followed their normal routine, while those in the experimental groups took part in a special one-to-one activity with their CNA. The AC activity was a standard social interaction in which residents discussed a popular magazine with their CNA. The IPPI activity was tailored to each resident's interests, and aimed to promote positive affect and behavior while diminishing negative affect and behavior symptoms of dementia.

Each resident in the AC and IPPI groups participated in the activity for 10 minutes up to 3 days per week for 3 weeks. Nurse managers posted schedules at the unit desk to assure that the interventions took place at the assigned times. Each resident's interdisciplinary care team selected the time of the intervention, either during the day (7 a.m. to 3 p.m.) or evening (3 p.m. to 11 p.m.) shift, based on when the individual might be most alert or in need of stimulation or comfort. The time remained consistent throughout the study. Interventions were not scheduled during morning care, meals, shift changes or other hectic periods.

CNA Training. During the two-weeks before the study began, all CNAs received two "in vivo" coaching sessions with an activities therapist (AT). The goal was to teach CNAs how to successfully carry out their assigned AC or IPPI activities. Each session had the same format: 1) the CNA observed while the AT demonstrated the activity with a resident; 2) AT reviewed the steps involved; 3) CNA practiced the activity with the resident while the AT observed; and 4) AT offered feedback. Most CNAs quickly learned to implement assigned activities, complete a scale measuring the observed affect of the resident, and report completion of the activity completion to the nurse manager.

Half of the CNAs received an additional three hours of didactic communication skills training. The sessions focused on strategies to promote positive interaction and engagement during the intervention. (A future article will describe the outcomes of the CNA training.)

The IPPI intervention. IPPI was a one-to-one program featuring activities selected to match the individual interests of each resident. The study offered 5 basic types of activities: physical

exercise, music, activities of daily living (ADLs), and sensory stimulation. Within each general category, two or more specific options were possible. For example, exercise could involve an outdoor walk or working with clay, while music might mean singing or listening to a favorite artist.

Researchers and clinicians collaborated to identify appealing activities for each resident. Since customization is at the essence of the IPPI, we considered the selection process as part of the intervention. The research team used the PGC Preferences Questionnaire (date) to collect information about each resident's leisure interests. Modeled after Teri's Pleasant Events Scale, the tool can be used to gather data from older adults, family members and formal caregivers. Whenever possible, the team interviewed residents in the IPPI group directly. If a cognitive or communication problem precluded this, researchers spoke with the family member listed in facility records as the responsible relative. If relatives were unavailable, the team consulted an AT or other direct care staff member who knew the resident well but would not be part of the experimental intervention.

Our experience shows that residents usually are more comfortable talking about past preferences. Many deflect questions about the present by indicating, "they don't offer that activity here," or that they can no longer participate as they once did ("I can't see the needlepoint anymore"). Typically, relatives are best informed about a resident's past preferences, while formal caregivers may be more attuned to current likes and dislikes.

After gathering responses to the questionnaire, researchers reviewed the results with each resident's interdisciplinary care team. The group identified three activities best matched to the resident's current interests and abilities, and from this list, the CNA chose the one activity s/he would most enjoy leading. This activity became the focus of the resident's IPPI throughout the study.

Activity protocols. The research team developed protocols for the 30 activities used as IPPIs in the study (manual available upon request). Each protocol required only basic materials and a small block of time (approximately 15 minutes). The protocols' common format covered: starting the activity (materials to have on hand, introductions), steps and discussion prompts for the specific activity (in the case of reminiscing about the beach, ask the resident if s/he would like to touch the sand provided in the activity kit), and ending the activity. CNAs were welcome to improvise but the protocol provided a basis for interaction that many found reassuring, particularly at the outset.

Fidelity Monitoring**.** Throughout the project, the research team assessed CNA adherence to project protocols. During randomly selected sessions, researchers observed CNAs providing the experimental conditions and evaluated their compliance with study procedures.

Major Outcome Measures

This study used direct observation to measure nursing home residents' affect and behavior as described in Table 1. All measures represent the amount of time an RA directly observed the affect or behavior.

Table 1
Description of Observed Outcome variables of Affect, Verbal Behavior and Non-Verbal Behaviors of Nursing Home Residents.

Outcome	**Behavior**
Affect	
Pleasure	Smiling, laughing, singing, nodding
Sadness	Crying, tears, moan, sigh, mouth turned down at corners
Anger	Clenched teeth, grimace, pursed lips, eyes narrowed
Anxiety	Furrowed brow, motoric restlessness, repeated or agitated motion, hand wringing, leg jiggling
Alertness	Eyes following object, intent fixation on object or person, visual scanning, eye contact maintained
Verbal behavior	
Very negative	Swearing, screaming, mocking
Negative	Incoherent, repetitious statements, muttering
Positive	Coherent conversation, responding to questions
Very positive	Complimenting, joking
No verbal	
Non verbal behavior	
Psychosocial task	Manipulates or gestures toward an object, engages in conversation
Restlessness	Pacing, fidgeting, disrobing
Null behavior	Stares with fixed gaze, eyes unfocused
Eyes closed	Sits or lies with eyes closed
Aggression	Hitting, kicking, pushing, scratching, spitting
ADL	
Uncooperative	Pulling away, saying “no”, turning head or body away
Positive touch	Appropriate touching, hugging, kissing, hand holding
Gesture	

During the three-week study period, trained (RAs) conducted behavioral observations for all residents in the sample. Non-intervention participants were observed on 700 occasions, while AC and IPPI participants had a combined total of 516 observations. The average participant received 6 interventions, with a range from 5 to 9. Observations were postponed if the resident or CNA were sick or had a schedule conflict.

At assigned times; RAs observed CNA-resident dyads and recorded the nature and duration of the pair’s emotional, verbal and non-verbal behavior. RAs used a handheld computer, the Psion Organizer (Noldus, 1991), equipped with Observer 3.0 software. The device allowed RAs to enter codes simultaneously for behavioral and emotional events exhibited by multiple actors. It can handle up to 5 categories for coding and a total of 52 variables (see Van Haitsma, Lawton,

Kleban, Klapper, & Corn, 1997 for a full methodology description). RAs could track real time changes resulting from the intervention with this highly sensitive technology.

RAs were trained to situate themselves unobtrusively and avoid eye contact or interaction with the individuals being observed. For each session, they observed residents and entered data over a one-hour period. Five minutes before the CNA initiated the intervention, RAs made baseline entries describing the resident's actions. Next, the RA made dyadic observations during the 10 to 15 minutes while the intervention took place (as well as 5 minutes after it ended. Thirty minutes later, the RA made a final set of observations for 5 minutes.

RAs began practicing their observations during the CNA training process. This "washout period" gave residents and staff time to adjust to the RA's presence, and helped to minimize subject reactivity.

Coding Scheme. The project used codes drawn primarily from two existing observational protocols: Van Haitsma, Lawton, Kleban, Klapper, & Corn, 1997, as well as Burgio's research (1993-1997) on behavior problems in nursing homes. As needed, researchers and clinicians worked together to devise new codes by developing definitions, generating examples, clarifying distinctions, and pre-testing.

Codes fell into categories of emotional states and behavioral states and events (see Table 1) During observations, RAs could enter a single code in each of the three categories simultaneously; for example, anxiety, psychosocial task engagement, and a positive remark could be noted at the same time. Coding could capture the duration of each behavioral or affect state, as well as the frequency of fleeting behavioral events, such as reaching to hit someone.

Codes were mutually exclusive within each major category (affect, verbal behavior and non-verbal behavior). Thus, if a resident displayed the affect states of anxiety and pleasure simultaneously, the RA could code only one. The decision was made to code the more positive state since these instances were less frequent. It is important to keep this in mind when group comparisons are conducted on more than one variable at a time, as in a multivariate analysis of variance (MANOVA). When codes are mutually exclusive, a high frequency of one code necessarily implies a lower frequency of another in the same category. Residents demonstrated considerable variability in their display of each emotion. Most behavior codes were well represented.

RA Training. Senior researchers provided RAs with extensive training in coding definitions and processes. Within 1 to 2 months, all trainees showed adequate reliability (75% agreement or better), and could code interventions independently. The team checked reliability data in weekly meetings, looking for "window matches" (when staff observe the same intervention and enter the same code within 10 seconds of each other) as well as errors. As needed, staff clarified coding criteria or recommended RAs take additional rapid coding practice.

Statistical Analysis

Three sets of behavioral observations (emotional, verbal and non-verbal behaviors) were analyzed individually using the SPSS GLM multivariate program. Three covariates (ADL,

MMSE and Withdrawal) were employed to control or remove shared influences from the observational variables. Tables present SPSS output, including indices (means and standard deviations) for the original and the MANOVA adjusted outputs.

Table 2 present the important MANOVA results, including measures of the Wilks' Lambda, the multivariate F, degrees of freedom, significance levels and multivariate effect size for the differences among groups (UC, AC and IPPI) and for the covariates (ADL, MMSE and Withdrawal). The effect sizes, f, were calculated from the SPSS partial eta-squared (eta2); the f was derived from the relationship, sqrt (eta2 / (1 – eta2)). Cohen (1988) categorizes f as low (.15), medium (.25) and large (.40). Table 3 displays the univariate adjusted p-values (.05, Bonferroni adjusted) from independent t-tests between groups. The adjusted means, p and effect size, d are listed for the UC vs. AC, UC vs. IPPI and AC vs. IPPI comparisons. The effect size was generated from the SPSS GLM, univariate program. The univariate GLM was conducted separately for each behavioral observation on each of the UC-AC, UC-IPPI and AC-IPPI group contrasts. The covariates likewise were included in these analyses. The aim was to obtain the partial eta-squared from the program so that the effect size, d could be calculated, 2*sqrt (eta2 / (1 – eta2)). Cohen's categorization of d is: low (.20), medium (.50) and large (.80)

RESULTS

Inter-Rater Reliability

Inter-rater reliability between RAs was averaging 74.5% agreement across all coded categories. More specifically, kappas were calculated for each variable category separately for a subsample of 169 interventions coded by two RAs, resulting in acceptable values.

For CNA codes, kappa = .73; for "combine verbal and nonverbal into resident behaviors"; Resident Verbal codes, kappa = .69; Resident Non-Verbal codes, Kappa = .73; Resident Emotion codes, kappa = .64. This level of agreement is considered to be in the "substantial agreement" range for the kappa statistic (Landis & Koch, 1977).

Descriptive Statistics (Means and Standard Deviations)

Table 2 contains the observational means and standard deviations for the original data as well as for the MANOVA mean and sigma adjustments based on the controls afforded by the ADL, MMSE and Withdrawal covariates. The table lists these indices for the set of observations based on affect, verbal and nonverbal variables; they are recorded with respect to the three comparison groups (UC, AC and IPPI).

Table 2
Means, SD and SE for Observations for Comparison Groups of Usual Care (UC), Attention Control (AC) and IPPI (a)

		Descriptive Statistics			MANOVA Adjusted Statistics (b)		
Variables	Group	Mean	SD	SE	Mean	SD(c)	SE
Emotions							
Pleasure	UC	1.50	0.62	0.06	1.53	0.85	0.09
	AC	2.93	1.16	0.18	2.91	0.81	0.13
	IPPI	3.31	1.23	0.19	3.25	0.76	0.12
Sadness	UC	1.23	0.42	0.04	1.24	0.47	0.05
	AC	1.43	0.74	0.11	1.43	0.50	0.08
	IPPI	1.22	0.43	0.06	1.21	0.51	0.08
Anger	UC	1.16	0.31	0.03	1.17	0.47	0.05
	AC	1.45	0.64	0.10	1.46	0.44	0.07
	IPPI	1.23	0.46	0.07	1.22	0.44	0.07
Anxiety	UC	1.86	0.86	0.09	1.84	0.94	0.10
	AC	2.07	1.24	0.19	2.13	0.87	0.14
	IPPI	2.04	1.00	0.15	2.03	0.89	0.14
Alertness	UC	3.90	1.08	0.11	3.91	0.75	0.08
	AC	4.79	0.56	0.09	4.77	0.75	0.12
	IPPI	4.85	0.42	0.06	4.85	0.76	0.12
Verbal Behaviors							
Very negative	UC	4.61	14.14	1.47	4.18	44.53	4.72
	AC	32.32	87.10	13.28	33.92	43.47	6.96
	IPPI	10.95	35.38	5.33	10.30	43.89	6.94
Negative	UC	32.95	73.83	7.66	31.38	74.15	7.86
	AC	46.23	61.37	9.36	52.82	72.38	11.59
	IPPI	59.66	99.17	14.95	57.47	73.11	11.56
Positive	UC	40.89	64.52	6.69	43.81	117.26	12.43
	AC	385.86	195.17	29.76	378.00	114.47	18.33
	IPPI	285.06	175.05	14.95	286.50	115.61	18.28
Very Positive	UC	5.54	15.78	1.64	7.19	47.92	5.08
	AC	21.35	23.97	3.66	20.41	46.78	7.49
	IPPI	77.14	101.88	15.36	74.57	47.24	7.47
No Verbal	UC	504.86	101.09	10.48	502.40	121.69	12.90
	AC	109.49	133.64	30.28	110.80	118.78	19.20
	IPPI	165.40	195.02	29.40	169.30	119.98	18.97

Table 2 (continued)
Means, SD and SE for Observations for Comparison Groups of Usual Care (UC), Attention Control (AC) and IPPI (a)

Variables	Group	Descriptive Statistics Mean	SD	SE	MANOVA Adjusted Statistics (b) Mean	SD(c)	SE
Non-verbal behavior							
Psychosocial task	UC	58.40	165.60	17.17	59.40	175.47	18.60
	AC	468.65	201.81	30.78	464.10	171.36	27.44
	IPPI	446.33	192.16	28.97	448.70	173.10	27.37
Restlessness	UC	22.97	47.19	4.89	22.85	34.15	3.62
	AC	3.75	13.68	2.08	5.97	33.35	5.34
	IPPI	4.40	17.81	2.69	2.52	33.71	5.33
Null behavior	UC	22.93	50.63	5.25	23.05	51.98	5.51
	AC	19.84	57.89	8.83	20.50	50.77	8.13
	IPPI	14.37	57.53	8.67	13.50	51.23	8.10
Eyes closed	UC	198.17	167.02	17.32	195.70	119.43	12.66
	AC	27.75	78.55	11.98	30.54	116.59	18.67
	IPPI	18.47	45.43	6.84	20.87	117.76	18.62
Oppositional	UC	0.01	0.05	0.01	0.01	0.38	0.04
	AC	0.29	0.75	0.12	0.29	0.37	0.06
	IPPI	0.08	0.34	0.05	0.07	0.38	0.06
Positive touch	UC	0.06	0.17	0.02	0.08	1.03	0.11
	AC	0.77	1.09	0.17	0.74	1.00	0.16
	IPPI	0.96	1.82	0.27	0.95	1.01	0.16

[a]Number of subjects in each group: UC = 93; AC = 43 and IPPI = 44.

[b] Mean, SD and SE adjustments based on means of covariates: ADL = 26.52; MBTOTAL = 8.91 and PRWITHDR = 21.27.

[c] MANOVA standard deviation calculated by SE*sqrt(n(group) – 4); the loss in degrees of freedom resulting from n – 1 plus 1 degree of freedom for each covariate.

Observations of Emotional Responses

Several emotional responses (Pleasure, Alertness, Anger, Anxiety and Sadness) were observed simultaneously. These multiple dependent variables were regressed upon treatments (UC, N = 93; AC, N = 43 and IPPI, N = 44), three covariates (centered measures of ADL, MMSE and

Withdrawal), and three interactions of the centered covariates by treatments to estimate the assumption of parallel slopes within treatments. Both the centered covariates of ADL (Wilks' lambda (W) = .88 (1 df), F = 4.48 (5, 164), p = .0008) and withdrawal (W = .90 (1), F = 3.69 (5, 164), p = .0035) and only the treatment-centered ADL interaction (W = .88 (2), F = 2.18 (10, 328), p = .0188) were significant. The covariates of ADL and Withdrawal were significantly related to the emotions of pleasure, anger, anxiety and alertness. Higher withdrawal and ADL impairment scores were related to less pleasure, more anger, more anxiety and less alertness. However, these covariate and interaction influences were partialled from the dependent variables by the MANCOVA and did not prevent the treatment effect from being highly significant (W = .44 (2), F = 16.60 (10, 328), p = .0000). The partialled effect size for the treatment condition was f-squared = .51 which, based on Cohen's (1988) categorization, is a high effect size.

Individual ANOVAs were run on each of the dependent variables to determine which emotions were responsible for the MANCOVA effects. The same independent variables used in the MANCOVA were employed in these univariate analyses. For pleasure, the partialled treatment effect was highly significant with a strong effect size (F = 76.39 (2,168), p =.0000, effect size (f) = .95). Although the centered covariates of ADL (F = 15.66 (1, 168), p = .0001) and Withdrawal (F = 10.91 (1, 168), p = .0012) were highly related to pleasure, the treatment effect seemed unaffected by their influences.

With respect to anger, the partialled treatment effect was significant (F = 5.08 (2, 168), p = .0072, f = .25 (medium ES)). Anger was related to the centered ADL (F = 8.33 (1, 168), p = .0044) and the treatment-centered ADL (F = 6.62 (2, 168), p = .0017). As seen above, these additional significant sources of relationships with anger did not obviate the treatment effect relationship with anger. The emotion of anxiety was not significantly related to the treatment effect (F = 1.52 (2, 168), p = .2209, f = .14 (low ES)). Anxiety had borderline significant relationships with the centered covariates of MMSE (F = 4.86 (1, 168), p = .0288) and Withdrawal (F = 4.60 (1, 168), p = .0333). The emotion of depression was not significantly related to the treatment effects (F = 2.27 (2, 168), p = .1062, f =.16 (low ES)) or the covariate and interaction terms. On the other hand, alertness was strongly related to the partial treatment effect (F = 25.44 (2, 168), p = .0000, f = .55 (high ES)). None of the centered covariates or interaction terms was significantly related to alertness.

Table 3 contains the margins, delta method standard errors, F-ratio and ES, d contrasts between treatments for each of the emotions, nonverbal behaviors and verbal behaviors. The table presents three pairwise comparisons for each outcome variable. Each of the three rows contains a pairwise contrast, that is, UC vs. AC, UC vs. IPPI, and AC vs. IPPI. With respect to pleasure, both AC and IPPI have highly significant F-ratios and very high d measures compared to UC. AC and IPPI are non-significantly related. For anger, AC is significantly higher than UC and IPPI. The effect size, d is within the medium category. Both anxiety and depression have no significant F-ratio contrasts, and the d values range below the low medium to low values. For alertness, strong F-ratios exist for the UC vs. AC and UC vs. IPPI contrasts. Both of their d values are very high ES scores. The ES and F-ratio are both very low for the AC vs. IPPI contrast. Based upon an alpha = .05, beta = .20 (80% power), the effect size, d column provides an index of which contrasts were under or over powered with respect to the treatment sample sizes.

Table 3

*Adjusted Means, Standard Errors, F-Ratios and Effect Sizes, **d** Among Residents*

Emotion Outcomes

	Treatment	Mean	SE	Treatment	Mean	SE	F(1, 168)	p	**d**
Pleasure									
	UC	1.52	0.08	AC	2.93	0.13	82.88	0.0000	1.72
	UC	1.52	0.08	IPPI	3.19	0.13	113.52	0.0000	2.00
	AC	2.93	0.13	IPPI	3.19	0.13	1.97	0.1622	0.24
Sadness									
	UC	1.24	0.05	AC	1.44	0.08	4.15	0.0433	0.38
	UC	1.24	0.05	IPPI	1.23	0.09	0.00	0.9923	0.00
	AC	1.44	0.08	IPPI	1.23	0.09	2.92	0.0839	0.37
Anger									
	UC	1.17	0.04	AC	1.42	0.07	9.69	0.0022	0.58
	UC	1.17	0.04	IPPI	1.19	0.07	0.07	0.7975	0.05
	AC	1.42	0.07	IPPI	1.19	0.07	5.68	0.0183	0.51
Anxiety									
	UC	1.85	0.04	AC	2.15	0.15	2.69	0.1031	0.30
	UC	1.85	0.04	IPPI	2.04	0.15	1.11	0.2933	0.20
	AC	2.15	0.07	IPPI	2.04	0.15	0.23	0.6336	0.10
Alertness									
	UC	3.92	0.08	AC	4.78	0.13	30.68	0.0000	1.03
	UC	3.92	0.08	IPPI	4.85	0.13	35.00	0.0000	1.10
	AC	4.78	0.13	IPPI	4.85	0.13	0.14	0.7080	0.08

Non-Verbal Behavior Outcomes

IPPI and psychosocial tasks								
UC	58.80	18.83	AC	476.31	29.05	145.44	0.000	2.24
UC	58.80	18.83	IPPI	441.29	29.56	119.14	0.000	2.02
AC	476.31	29.05	IPPI	441.29	29.56	0.71	0.3993	0.18
General restlessness								
UC	23.47	3.60	AC	5.28	5.56	7.54	0.0067	0.51
UC	23.47	3.60	IPPI	6.50	5.66	6.40	0.0123	0.47
AC	5.28	5.56	IPPI	6.50	5.66	0.02	0.8780	0.03
Null behaviors								
UC	23.13	5.60	AC	20.69	8.64	0.06	0.8131	0.04
UC	23.13	5.60	IPPI	13.41	8.79	0.87	0.3523	0.17
AC	20.69	8.64	IPPI	13.41	8.79	0.35	0.5554	0.13

Table 3 (continued)
*Adjusted Means, Standard Errors, F-Ratios and Effect Sizes, **d** Among Residents*

Non-Verbal Behavior Outcomes (continued)

Eyes closed								
UC	193.26	12.63	AC	25.88	19.49	51.96	0.000	1.34
UC	193.26	12.63	IPPI	19.41	19.82	54.71	0.000	1.37
AC	25.88	19.49	IPPI	19.41	19.82	0.05	0.8163	0.05
Aggression								
UC	0.000	0.02	AC	0.117	0.04	7.08	0.0086	0.5
UC	0.000	0.02	IPPI	0.061	0.04	1.85	0.1753	0.25
AC	0.117	0.04	IPPI	0.061	0.04	1.15	0.2855	0.23
Uncooperative								
UC	0.006	0.03	AC	0.149	0.04	9.65	0.0022	0.57
UC	0.006	0.02	IPPI	0.016	0.04	0.04	0.8333	0.04
AC	0.149	0.04	IPPI	0.016	0.04	5.84	0.0167	0.51
Positive touch								
UC	0.059	0.10	AC	0.741	0.16	13.26	0.0004	0.68
UC	0.059	0.10	IPPI	1.173	0.16	34.53	0.0000	1.09
AC	0.741	0.16	IPPI	1.173	0.16	3.71	0.0557	0.41

Verbal Behavior Outcomes

Very negative verbal behavior								
UC	4.74	4.42	AC	41.82	6.82	20.82	0.0000	0.85
UC	4.74	4.42	IPPI	12.49	6.94	0.89	0.3472	0.17
AC	41.82	6.82	IPPI	12.49	6.49	9.09	0.0030	0.65
Negative verbal behavior								
UC	30.83	7.94	AC	49.44	12.26	1.62	0.204	0.24
UC	30.83	7.49	IPPI	52.51	12.47	2.15	0.144	0.27
AC	49.44	12.26	IPPI	52.51	12.47	0.03	0.8607	0.04
Positive verbal behavior								
UC	44.94	11.70	AC	368.39	18.06	225.79	0.0000	2.8
UC	44.94	11.70	IPPI	300.16	18.38	137.21	0.0000	2.17
AC	368.39	18.06	IPPI	300.16	18.38	7.01	0.0089	0.57
Very positive verbal behavior								
UC	5.950	4.73	AC	20.85	7.29	2.94	0.0882	0.32
UC	5.950	4.73	IPPI	68.86	7.42	51.16	0.0000	1.33
AC	20.850	7.29	IPPI	69.86	7.42	21.3	0.0000	1.00
No verbal behavior								
UC	502.660	12.73	AC	114.23	19.65	275.33	0.0000	3.09
UC	502.660	12.73	IPPI	164.93	19.99	203.16	0.0000	2.65
AC	114.230	19.65	IPPI	164.93	19.99	3.27	0.0722	0.39

Note: UC - usual control; AC - attention control and IPPI treatment

Observations of Non-Verbal Behaviors

The same MANCOVA model was used to analyze the observations of non-verbal behaviors. The 8 dependent variables of the non-verbal behavior set were: 1) IPPI and psychosocial tasks, 2) general restlessness, 3) gazing with interest, 4) null behaviors, 5) eyes closed, 6) uncooperativeness, 7) aggression and 8) positive touching. Only the centered-ADL covariate was significant (W = .87 (1), F = 2.95 (8, 161), p = .0042). Subjects with higher ADL impairments tended to show more incidences of null behaviors, eyes being closed, uncooperativeness and aggression. Significant heterogeneity of treatment slopes were evident in the treatment-centered-ADL (W = .84 (2), F = 1.86 (16, 322), p = .0233) and the treatment-centered-MMSE (W = .83 (2), F = 1.99 (16, 322), p = .0134) interactions. Despite these potentially interfering influences, the treatment effect was highly significant (W = .26 (2), F = 19.00 (16, 322), p = .0000, f-squared = .95 (very high ES)).

Significant ANOVAs based on the same predictive model were found for IPPI and psychosocial tasks (F = 102.59 (2, 168), p = .0000, f = 1.11 (very high ES)), general restlessness (F = 5.40 (2, 168), p = .0053, f = .25 (medium ES)), gazing with interest (F = 23.83 (2, 168), p = .0000, f = .53 (high ES)), eyes closed (F = 41.28 (2, 168), p = .0000, f = .70 (high ES)), uncooperativeness (F = 5.09 (2, 168), p = .0071, f = .25 (medium ES)), aggression (F = 3.73 (2, 168), p = .0261, f = .21 (medium ES)) and positive touching (F = 19.29 (2, 168), p = .0000, f = .48 (high ES)). Only observations of null behaviors were non-significant (F = .44 (2, 168), p = .6476, f = .07 (low ES)).

Both the AC and IPPI groups had significantly greater IPPI and psychosocial tasks than the UC group. There was no significant difference between the AC and IPPI groups. The UC group showed more general restlessness, gazing with interest and eyes closed than the AC or IPPI groups; there was no significant difference between the AC and IPPI groups on these observations. There were no significant differences among the treatments with respect to null behaviors. The AC group showed more uncooperativeness than the UC or IPPI groups; the UC and IPPI groups showed no significant differences on uncooperativeness. The AC group had more incidences of aggression than the UC group. With respect to aggression, no significant differences were found between the UC and IPPI groups or AC and IPPI groups. Both AC and IPPI groups had more observations of positive touch behavior than the UC group. The AC and IPPI groups showed a non-significant difference on positive touching.

Observations of Verbal Behaviors

The same MANCOVA model was used to analyze the observations of verbal behaviors. The dependent variables were five different observations of very negative, negative, positive, very positive and no verbal behaviors. Based upon their Wilks' lambdas, all three centered covariates ADL (W = .91 (1), F = 3.07 (5, 164), p = .0133)), MMSE (W = .86 (1), F = 5.54 (5, 164), p = .0001) and withdrawal (W = .90 (1), F = 3.75 (5, 164), p = .003) were statistically significant. Very negative verbal and negative verbal behaviors were found in subjects who had high ADL levels of impairment, low MMSE scores, and high measures of withdrawal. Participants with both positive and very positive verbal behaviors tended to have low levels of ADL impairments, high MMSE scores and low scores on withdrawal. Participants who tended not to make verbal responses had high scores on ADL impairment, low MMSE scores and high scores on

withdrawal. On the test of slopes within treatments, heterogeneity of slopes were found in the treatment-centered-MMSE (W = .83 (2), F = 3.10 (10, 328), p = .0009) and treatment-centered withdrawal (W = .89 (2), F =2.00 (10, 328), p =.0323) terms. These covariate and interaction variances were partialled within the MANCOVA so that the treatment effect was free of their influences. The treatment effect was highly significant, with a Wilks' lambda = .2147 (2) and its F = 37.99 (10, 328) with a p = .0000; its ES was very strong, f-squared = 1.16.

With respect to the individual ANOVAs, based on the same covariate and interaction model, only the observations on negative verbal behavior had a non-significant treatment effect (F = 1.47 (2, 168), p = .2335, f = .13 (low ES)). The other ANOVAs had highly significant treatment effects: very negative verbal behaviors (F = 10.49 (2, 168), p = .0001, f = .35 (close to a high ES)), positive verbal behaviors (F = 142.22 (2, 168), p = .0000, f = 1.30 (very high ES), very positive verbal behavior (F = 25.66 (2, 168), p = .0000, f = .55 (high ES)), and no verbal behavior (F = 186.03 (2, 168), p =.0000, f = 1.49 (very high ES)).

The contrasts showed more very negative verbal behaviors for the AC vs. UC and the AC vs. IPPI groups. There were no significant differences among the treatments with respect to negative verbal behaviors. Both the AC and IPPI groups showed more positive behaviors compared to the usual control group; and the AC participants showed more positive verbal behaviors than their IPPI counterparts. With respect to very positive verbal behaviors there appeared to be no significant difference between the UC and AC groups. The IPPI participants, however, showed much more very positive responses than either the UC or AC participants. The UC group had many more no verbal responses than either the AC or IPPI groups, and there was no significant difference between the AC and IPPI groups.

DISCUSSION

This study tested the effectiveness of a CNA-led individualized activity intervention in increasing positive affect and behavior, and reducing negative affect and behavior, among nursing home residents with dementia. The findings support the hypothesis that activities customized to the individual (IPPI) improve outcomes as compared to a standardized attention control activity and usual care.

Nursing home residents in both experimental groups (IPPI and AC) displayed more pleasure, alertness, positive engagement, and positive verbal behavior, as well as less restlessness and inattention, than those in the usual care group. However, those in the individualized group benefited most; they experienced only positive effects, while those in the AC group exhibited more anger and uncooperative behavior than the IPPI residents, as well as more aggression and sadness than the UC group.

Several factors may account for greater negativity during a generic as compared to an individualized activity. Anger often was present during the AC condition when residents perceived the CNA's overture as an intrusion, but it was less evident during IPPIs, when the so-called "intrusion" was revealed to be something the resident truly enjoyed. CNAs' greater warmth during the IPPI activity may have kept sadness at bay among residents in that group.

These findings provide strong evidence for the value of customizing as compared to offering a generic one-to-one activity. While a standardized intervention, such as our attention control activity, would seem to be a neutral experience, our study shows this was not the case. While AC residents showed greater pleasure and alertness, they also experienced greater distress. Our results seem to show that well-crafted, individualized activities yield positive effects and do no harm, but that an apparently benign standardized intervention can actually have adverse effects (albeit mild) for a highly vulnerable population. The gerontological literature supports this with evidence showing that social interactions can be a double-edged sword

Findings from positive psychology and neuroscience research indicate that when an intervention produces a positive emotional response, we can expect a cascade of beneficial physiological and psychological effects. Recent brain research with animals suggests that positive social interaction is a key factor associated with better cognitive and cardiovascular health. With their signature memory impairment, persons with dementia are tied to the moment such that even brief improvements can take on great significance. In addition, as shown by the work of Fredrickson and others, these positive experiences can lead to an upward spiral of beneficial effects. Emotions are indicators of quality of life; the increased pleasure experienced by residents with dementia shows the value of individualized interventions. Thus, not only is the positive emotional experience in the moment of value, but it may have longer lasting benefits that can help to strengthen a resident's resilience and sense of wellbeing.

Residents' anxiety was not affected by the type of intervention, possibly because anxiety is a more intransigent emotion. Anxiety may require more targeted therapeutic intervention than a leisure activity can provide, or social interaction itself simply may be anxiety provoking for these residents, and this dynamic may be more powerful than the subtle differences between activity types.

Furthermore, the study demonstrates the feasibility of incorporating brief individualized activities 2 to 3 times per week as part of the normal nursing home routine. Nurse managers were receptive to the concept and organized staff schedules accordingly. Ideally, CNAs would have the flexibility to offer an individualized activity whenever a resident had the greatest need, and s/he had the chance, but for research purposes, we directed the timing.

Perhaps most importantly, our findings support the use of paraprofessionals as one-to-one activity leaders. With only a modest investment in training and materials, and specific protocols, CNAs in our study were well equipped to carry out the role. Each CNA was armed with a plan for an activity the resident was likely to enjoy, and this led to a virtuous circle. When CNAs introduced an appealing activity, residents responded positively, which in turned reinforced the CNA and led to further beneficial interaction. The study shows that CNAs are highly capable of guiding individualized activities, and forging a warm, human connection within an institutional context that is often relationally depriving for residents. An upcoming article will detail the CNA aspect of the intervention and outcomes.

Study Limitations

This study focused on a sample of Caucasian, Jewish seniors living in a large nonprofit Pennsylvania nursing home. While the sample was homogeneous, it allowed us to meet our

objective of ascertaining whether the intervention would have an effect. Now that we see that it does, we plan to test the intervention with more diverse older adults living in institutional and community settings.

The live-observation coding system had the benefit of allowing RAs to observe residents and CNAs wherever they chose to go for an activity, and did not limit them to the artificial setting of a video-recording room. However, this choice meant that we would sacrifice some coding nuance. Most notably, with live-observation coding, our RAs could only enter one affect or behavior state at a time, not multiple simultaneous states within a category. Attempting to document more than one state at a time would be beyond the ability of a human observer to record in real time. For this test of clinical effectiveness, we opted for in vivo coding in a natural nursing home setting even though we may have sacrificed some specificity.

A final consideration was that, although research assistants positioned themselves to be as unobtrusive as possible during interventions, it is likely that nursing home residents and CNAs had some reactivity to being observed.

Conclusion

Nursing home residents with dementia deserve high quality, person-centered care. As the federal government steps up efforts to promote a culture of PCC in nursing homes, providers will need evidenced-based tools and approaches to care for residents with dementia. This study shows that individualized one-to-one activities led by certified nursing assistants are a feasible, effective non-pharmacological approach to reduce behavioral symptoms and improve the quality of daily life for residents.

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Tugade, M., Fredrickson, B. & Barrett, L. (2004). Psychological resilience and positive emotional granularity: Examining the benefits of positive emotions on coping and health, *Journal of Personality*, 72 (6): 1161-1190. doi: 10.1111/j.1467-6494.2004.00294.x

Vallerand, R. & O'Connor, B. (1989). Motivation in the elderly: A theoretical framework and some promising findings. *Canadian Psychology*, 30:3, 538-549. doi: 10.1037/h0079828

Lawton, M.P., Van Haitsma, K., Klapper, J., Kleban, M., Katz, I., & Corn, J. (1998). A stimulation-retreat special care unit for elders with dementing illness. International Psychogeriatrics, 10(4), 379-395.

Whall, A. & Kolanowski, A. (2004). Editorial: The need-driven dementia-compromised model – a framework for understanding the symptoms of dementia. *Aging and Mental Health*, 8 (2), 106-108. doi: 10.1080/13607860410001649590

18. Extent of Clinical Activities Initiated and Completed. Items 18(A) and 18(B) should be completed for all research projects. If the project was restricted to secondary analysis of clinical data or data analysis of clinical research, then responses to 18(A) and 18(B) should be "No."

18(A) Did you initiate a study that involved the testing of treatment, prevention or diagnostic procedures on human subjects?

_____Yes
____x__No

18(B) Did you complete a study that involved the testing of treatment, prevention or diagnostic procedures on human subjects?

_____Yes
___x___No

If "Yes" to either 18(A) or 18(B), items 18(C) – (F) must also be completed. (Do NOT complete 18(C-F) if 18(A) and 18(B) are both "No.")

18(C) How many hospital and health care professionals were involved in the research project?

_____Number of hospital and health care professionals involved in the research project

18(D) How many subjects were included in the study compared to targeted goals?

_____Number of subjects originally targeted to be included in the study
_____Number of subjects enrolled in the study

Note: Studies that fall dramatically short on recruitment are encouraged to provide the details of their recruitment efforts in Item 17, Progress in Achieving Research Goals, Objectives and Aims. For example, the number of eligible subjects approached, the number that refused to participate and the reasons for refusal. Without this information it is difficult to discern whether eligibility criteria were too restrictive or the study simply did not appeal to subjects.

18(E) How many subjects were enrolled in the study by gender, ethnicity and race?

Gender:
_____Males
_____Females
_____Unknown

Ethnicity:
_____Latinos or Hispanics
_____Not Latinos or Hispanics

_____Unknown

Race:
_____American Indian or Alaska Native
_____Asian
_____Blacks or African American
_____Native Hawaiian or Other Pacific Islander
_____White
_____Other, specify:_____
_____Unknown

18(F) Where was the research study conducted? (List the county where the research study was conducted. If the treatment, prevention and diagnostic tests were offered in more than one county, list all of the counties where the research study was conducted.)

19. Human Embryonic Stem Cell Research. Item 19(A) should be completed for all research projects. If the research project involved human embryonic stem cells, items 19(B) and 19(C) must also be completed.

19(A) Did this project involve, in any capacity, human embryonic stem cells?
_____Yes
__x____ No

19(B) Were these stem cell lines NIH-approved lines that were derived outside of Pennsylvania?
_____Yes
___x___ No

19(C) Please describe how this project involved human embryonic stem cells:

20. Articles Submitted to Peer-Reviewed Publications.

20(A) Identify all publications that resulted from the research performed during the funding period and that have been submitted to peer-reviewed publications. Do not list journal abstracts or presentations at professional meetings; abstract and meeting presentations should be listed at the end of item 17. **Include only those publications that acknowledge the Pennsylvania Department of Health as a funding source** (as required in the grant agreement). List the title of the journal article, the authors, the name of the peer-reviewed publication, the month and year when it was submitted, and the status of publication (submitted for publication, accepted for publication or published.). Submit an electronic copy of each publication or paper submitted for publication, listed in the table, in a PDF version 5.0.5 (or greater) format, 1,200 dpi. Filenames for each publication should include the number of the research project, the last name of the PI, the number of the publication and

an abbreviated research project title. For example, if you submit two publications for PI Smith for the "Cognition and MRI in Older Adults" research project (Project 1), and two publications for PI Zhang for the "Lung Cancer" research project (Project 3), the filenames should be:

Project 1 – Smith – Publication 1 – Cognition and MRI
Project 1 – Smith – Publication 2 – Cognition and MRI
Project 3 – Zhang – Publication 1 – Lung Cancer
Project 3 – Zhang – Publication 2 – Lung Cancer

If the publication is not available electronically, provide 5 paper copies of the publication.

Note: The grant agreement requires that recipients acknowledge the Pennsylvania Department of Health funding in all publications. Please ensure that all publications listed acknowledge the Department of Health funding. If a publication does not acknowledge the funding from the Commonwealth, do not list the publication.

Title of Journal Article:	Authors:	Name of Peer-reviewed Publication:	Month and Year Submitted:	Publication Status (check appropriate box below):
1.NA				☐Submitted ☐Accepted ☐Published
2.				☐Submitted ☐Accepted ☐Published
3.				☐Submitted ☐Accepted ☐Published

20(B) Based on this project, are you planning to submit articles to peer-reviewed publications in the future?

Yes____x_____ No_____

If yes, please describe your plans:

A paper will be submitted to the Journal of the American Geriatrics Society summarizing the results of this project.

21. Changes in Outcome, Impact and Effectiveness Attributable to the Research Project. Describe the outcome, impact, and effectiveness of the research project by summarizing its impact on the incidence of disease, death from disease, stage of disease at time of diagnosis, or other relevant measures of outcome, impact or effectiveness of the research project. If there were no changes, insert "None"; do not use "Not applicable." Responses must be

single-spaced below, and no smaller than 12-point type. DO NOT DELETE THESE INSTRUCTIONS. There is no limit to the length of your response.

None.

22. Major Discoveries, New Drugs, and New Approaches for Prevention Diagnosis and Treatment. Describe major discoveries, new drugs, and new approaches for prevention, diagnosis and treatment that are attributable to the completed research project. If there were no major discoveries, drugs or approaches, insert "None"; do not use "Not applicable." Responses must be single-spaced below, and no smaller than 12-point type. DO NOT DELETE THESE INSTRUCTIONS. There is no limit to the length of your response.
None.

23. Inventions, Patents and Commercial Development Opportunities.

23(A) Were any inventions, which may be patentable or otherwise protectable under Title 35 of the United States Code, conceived or first actually reduced to practice in the performance of work under this health research grant? Yes_____ No___x_____

If "Yes" to 23(A), complete items a – g below for each invention. (Do NOT complete items a - g if 23(A) is "No.")

a. Title of Invention:

b. Name of Inventor(s):

c. Technical Description of Invention (describe nature, purpose, operation and physical, chemical, biological or electrical characteristics of the invention):

d. Was a patent filed for the invention conceived or first actually reduced to practice in the performance of work under this health research grant?
Yes_____ No___

If yes, indicate date patent was filed:

e. Was a patent issued for the invention conceived or first actually reduced to practice in the performance of work under this health research grant?
Yes_____ No___
If yes, indicate number of patent, title and date issued:
Patent number:
Title of patent:
Date issued:

f. Were any licenses granted for the patent obtained as a result of work performed under this health research grant? Yes_____ No___x

If yes, how many licenses were granted?_____

g. Were any commercial development activities taken to develop the invention into a commercial product or service for manufacture or sale? Yes___ No___x

If yes, describe the commercial development activities:

23(B) Based on the results of this project, are you planning to file for any licenses or patents, or undertake any commercial development opportunities in the future?

Yes_____ No_____x_____

If yes, please describe your plans:

24. Key Investigator Qualifications. Briefly describe the education, research interests and experience and professional commitments of the Principal Investigator and all other key investigators. In place of narrative you may insert the NIH biosketch form here; however, please limit each biosketch to 1-2 pages. *For Nonformula grants only – include information for only those key investigators whose biosketches were not included in the original grant application.*

BIOGRAPHICAL SKETCH

NAME Kimberly S. Van Haitsma, Ph.D.
POSITION TITLE Director of Research

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
Calvin College, Grand Rapids, MI	B.A.	1985	Psychology
Bowling Green State University, Bowling Green, OH	M.A.	1988	Clinical Psychology
Bowling Green State University, Bowling Green, OH	Ph.D.	1994	Clinical Psychology

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A. Personal Statement

I have been working as a clinical geropsychologist in nursing homes since 1988 and as an applied researcher in these settings since 1991. My particular area of research focuses on questions seeking to understand the impact of contextual issues (e.g., physical environment, culture of care, staff interactions, interdisciplinary team processes, and psychotherapeutic approaches) on quality of life and quality of care delivery for frail seniors residing in long term care settings. Recently, much of my research has focused on developing and evaluating individualized interventions designed to ameliorate affective or behavioral symptoms in frail elders with and without dementia. In addition, I have had extensive experience in the development of standardized behavioral protocols, and outcome measures specific to a cognitively impaired population and focused on person-centered care delivery.

B. Positions and Honors

Positions and Employment

1989-1990 Health Psychology Intern, Rush Presbyterian St. Luke Medical Center, Chicago, IL
1990-1991 Clinical Geropsychology Fellow, Philadelphia Geriatric Center, Philadelphia, PA
1991-2001 Staff Geropsychologist, Philadelphia Geriatric Center
1995-2001 Senior Research Scientist, Philadelphia Geriatric Center
2001-2010 Associate Director, Polisher Research Institute, Abramson Center for Jewish Life
2002-present Adjunct Assistant Professor, Hartford Center of Geriatric Nursing Excellence, School of Nursing, University of Pennsylvania, Philadelphia, PA
1998-present Director, The Harry Stern Family Center for Innovations in Alzheimer's Care, Abramson Center for Jewish Life, Philadelphia, PA
2010-present Director, Polisher Research Institute, Abramson Center for Jewish Life, Philadelphia, PA

Professional Activities

Organizational Memberships

1986-present Member, American Psychological Association
1990-present Member, Gerontological Society of America
1995-present Member, Psychologists in Long Term Care

Review Activities

2011-2013	Editor, Practice Concepts Section, The Gerontologist
1994-present	Peer reviewer, The Gerontologist
1997-present	Peer reviewer, Journal of Gerontology: Psychological Sciences
2000-present	Peer reviewer, Journal of Alzheimer's Care
2000-present	Peer reviewer, Alzheimer's Care Quarterly
2005-present	Peer reviewer, Journal of Geriatric Psychiatry
2001	Grant reviewer, National Institute on Aging, Small Grant Review in Sociology & Psychology
1996-present	Grant reviewer, Alzheimer's Association

C. Selected peer-reviewed publications

Meeks, S., Van Haitsma, K., Kostiwa, I., & Murrell, S.A. (2012). Positivity and well-being among community-residing elders and nursing home residents: what is the optimal affect balance?. The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 10.1093/geronb/gbr135

Van Haitsma, K., Williamson, J. & Pruchno, R. (2011). Practice Concepts and Policy Studies: The New Divide, The Gerontologist, 51(6), 731-733.

Pillemer, K., Chen, E. , Van Haitsma, K., Teresi, J., Ramirez, M., Silver, S., Sukha, G. & Lachs, M. (2011) Resident-to-Resident Aggression in Nursing Homes: Results from a Qualitative Event Reconstruction Study. The Gerontologist. November.

Crespy, S., VanHaitsma, K., Payne, D., Alizzi, K., & Seddiki, S. (2009). Managing Depression in the Nursing Home: Early detection methods and individualized interventions. Provider, Sept., 51-54.

Meeks, S, Teri, L., Van Haitsma, K. & Looney, S (2006). Increasing pleasant events in the nursing home: Collaborative behavioral treatment for depression. Clinical Case Studies, 5(4), 287-304.

Freedman, V., Calkins, M., & VanHaitsma, K. (2005). An exploratory study of barriers to implementing technology in residential long-term care settings. Gerontechnology, 4(2), 86-100.

Ruckdeschel K. & Van Haitsma K. (2004). A workshop for nursing home staff: recognizing and responding to their own and resident's emotions. Gerontol Geriatr Educ, 24(3), 39-51. PMID: 15871936.

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME	POSITION TITLE
Morton Kleban	Statistician
eRA COMMONS USER NAME	
MKLEBAN	

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
City College of New York	B.B.A.	1953	Psychology
State University of Iowa	M.A.	1955	Psychology
University of North Dakota	Ph.D.	1960	Psychology

A. Personal Statement

I have had extensive experience (40+yrs) in providing methodological and statistical support to behavioral and social science researchers. In particular, my area of expertise lies in research design, univariate and multivariate statistics, and structural equation modeling.

B. Positions and Honors

Positions and Employment

1966-present Director of Psychometrics, Polisher Research Institute, Abramson Center for Jewish Life
1990-present Senior Statistician, Norristown State Hospital, Norristown, PA
1966-1999 Medical Research Scientist, Norristown State Hospital, Norristown, PA

Other Experience and Professional Memberships

1965-1969 Member of editorial staff of Pennsylvania Psychiatric Quarterly
1966-1967 Chairman, Membership Committee, Pennsylvania. Psychological Association
1967-1969 Chairman, Public Affairs Committee, Pennsylvania Psychological Association
1979-1984 Consulting Editor, Journal of Gerontology
1985-1988 Editorial Board, Journal of Gerontology
1980-1986 Editorial Board, Experimental Aging Research
1985-1995 Research Assistant Professor of Psychiatry in the Department of Psychiatry, The Medical College of Pennsylvania and Hahnemann University
1995-2000 Adjunct Professor in the Department of Psychiatry and Behavioral Science, Temple University
Member, American Statistical Association
Fellow, American Psychological Society
1990-present Member, American Statistical Association
1961-2003 Member, American Psychological Association
1995-2000 Adjunct Professor, Department of Psychiatry and Behavioral Science, Temple University
1985-1995 Research Assistant Professor of Psychiatry , Department of Psychiatry, Medical College of Pennsylvania and Hahnemann University

1961-1993 Member, Pennsylvania Psychological Association
1961-1993 Member, Pennsylvania Psychological Association
1985-1988 Editorial Board, Journal of Gerontology
1980-1986 Editorial Board, Experimental Aging Research
1979-1984 Consulting Editor, Journal of Gerontology
1965-1969 Member of editorial staff of Pennsylvania Psychiatric Quarterly
1967-1969 Chairman, Public Affairs Committee, PA Psychological Assn
1966-1967 Chairman, Membership Committee, PA Psychological Assn.

Honors

Fellow, Gerontological Society
Fellow, American Psychological Association
Fellow, American Psychological Society

C. Selected peer-reviewed publications (in chronological order).

1. Richards KC, Lambert C, Beck C, Bliwise D, Evans W, Kalra GK, Kleban MH, Lorenz R, Rose K, Gooneartne G, Sullivan D. Strength Training, Walking, and Social Activity Improve Sleep in Nursing Home and Assisted Living Residents: Randomized Controlled Trial. J Am Geriatr Soc; 2011;59:214-223. PMID: 21314643

2. Nancy Hodgson, Lisa Landsberg, Amanda Lehning, Mort Kleban. Palliative Care Services in Pennsylvania Nursing Homes. Journal of Palliative Medicine. 2006 Oct 13;9(5):1054-1058.

3. Lawton MP, Moss M, Hoffman C, Kleban MH, Ruckdeschel K, Winter L. Valuation of life: a concept and a scale. J Ag Health 2001; 13(1):3-31.

4. Van Haitsma K, Lawton MP, Kleban MH. Does segregation help or hinder? Examining the role of homogeneity in behavioral and emotional aspects of quality of life for persons with cognitive impairment in the nursing home. RADA 2000; 4: special care units.

5. Lawton MP, Moss M, Hoffman C, Grant R, Ten Have T, Kleban MH. Health valuation of life, and the wish to live. Gerontologist 1999; 39(4):406-416.

6. Lawton MP, Ruckdeschel K, Winter L, Kleban MH. Affect-experiential personality types in middle and late adulthood. J Ment Health Aging 1999; 5(3):223-349.

7. Lawton MP, Winter L, Kleban MH, Ruckdeschel K. Affect and Quality of Life. J Aging Ment Health 1999; 11(2):169-198.

8. Lawton MP, Van Haitsma K, Klapper J, Kleban MH, Katz IR, Corn J. A simulation-retreat special care unit for elders with dementing illness. Int Psychogeriatr 1998; 10(4):379-395.

9. Wang R, Mysore M, Denman S, Kleban MH. Mortality of the institutionalized old-old hospitalized with congestive heart failure. Arch Intern Med 1998; 158:2464-2468.

10. Lawton MP, Casten R, Parmelee PA, Van Haitsma K, Corn J, Kleban MH. Psychometric characteristics of the minimum data set II. Validity. J Am Geriatr Soc 1998; 14:136-744.

11. Casten RO, Lawton MP, Winter L, Kleban MH, Sando R. The relationship of health to affect in both state and trait form. J Aging Ment Health, 1997; 1:230-237.

12. Parmelee PA, Kleban MH, Katz IR. Pain, depression and anxiety among frail older persons: The role of somatic symptoms. Adv Med Psychotherapy and Psychodiagnostics 1997; 9:33-53.