

11-2007

A Cognitive Intervention to Enhance Institutionalized Older Adults' Social Support Networks and Decrease Loneliness

Robert G. Winningham
Western Oregon University, winninr@wou.edu

Naomi L. Pike
Western Oregon University

Follow this and additional works at: http://digitalcommons.wou.edu/fac_pubs



Part of the [Psychology Commons](#)

Recommended Citation

Winningham, R. G., & Pike, N. L. (2007, November). A cognitive intervention to enhance institutionalized older adults' social support networks and decrease loneliness. *Aging and Mental Health*, 11(6), 716-721. doi:10.1080/13607860701366228

This Article is brought to you for free and open access by the Faculty Research at Digital Commons@WOU. It has been accepted for inclusion in Faculty Research Publications (All Departments) by an authorized administrator of Digital Commons@WOU. For more information, please contact digitalcommons@wou.edu.

A Cognitive Intervention to Enhance Institutionalized Older Adults'

Social Support Networks and Decrease Loneliness

Robert G. Winningham and Naomi L. Pike

Western Oregon University

Direct correspondence to:
Robert G. Winningham, Ph.D.
Western Oregon University
Department of Psychology
345 N. Monmouth Ave.
Monmouth, OR 97361
Phone: (503) 838-8297
Fax: (503) 838-8618
winninr@wou.edu

Abstract

Nearly all older adults experience social losses, which can disrupt their social support networks and impair their quality of life. Events such as retirement, an inability to drive, death of a spouse and/or close life-long friends, or moving to an elder care facility may negatively affect the quality of older adults' social support networks. Low levels of perceived social support are associated with increased depression, impaired immune functioning, and reduced life expectancy. Moreover, social interactions can be cognitively stimulating and may help older adults preserve their cognitive abilities. In the present study, institutionalized older adults were exposed to either a cognitive enhancement program designed to enhance social networks or a control group. Measures of perceived social support and loneliness were administered before and after a 3-month, group-based intervention. There was a significant interaction between group and time. Those who did not participate in the intervention experienced a decrease in perceived social support and an increase in perceived loneliness. Participants in the intervention group stayed the same on the above measures. Helping older adults increase or maintain the quality of their social networks may lead to enhanced cognitive functioning, decreased depression, and improved quality of life. Recommendations to help ALFs, nursing homes, retirement communities, and senior centers develop social and cognitive interventions are provided.

A Cognitive Intervention to Enhance Institutionalized Older Adults'

Social Support Networks and Decrease Loneliness

Nearly all older adults, but especially those who are institutionalized, experience a myriad of social losses and disruptions to their social support networks. Social support networks may change when people retire and have less social contact through work. This is often followed by losing the ability to drive, further limiting opportunities for socialization. Disruptions to social networks often continue due to the death of a spouse and close life-long friends. Finally, many older adults need to move to assisted living facilities (ALFs) in order to accommodate physical limitations; this may alienate from family and friends (see Winningham, 2005 for a discussion of ALFs from a psychological perspective). Thus, such disruptions to social support networks may negatively affect physical, cognitive, and mental well-being.

Low levels of social support are related to a number of negative physical health outcomes, such as an increased likelihood of having a second myocardial infarction (Pedersen, Van Domburg, & Larsen, 2004), poorer prognosis for cancer patients (Garssen, 2004), and higher mortality risks (Berkman, 1995). In addition, the quality of social support networks has profound effects on mental health variables. For example, poor social and emotional support is associated with an increased likelihood of experiencing depression (Cuijpers & Van Lammeren, 1999; Cummings, 2002; Cummings & Cockerham, 2004; Gurung, Taylor, & Seeman, 2003). An increase in depressive symptoms is likely to further erode social support, integration, and interaction. The downward cycle continues since depression, especially persistent depression, is associated with cognitive decline in non-demented older adults (Paterniti, Verdier-Taillefer, Dufouil, & Alperovitch, 2002). Paterniti et al. identified depressed and non-depressed

individuals and tracked their cognitive ability over time and concluded that depression was associated with decreased cognitive ability after two years.

Many ALF residents possess risk factors for poorer social support networks (see Table 1 to view a list of possible risk factors for poor social support in older adult populations). For example, many of the reasons that cause older adults to move to an ALF can also disrupt social networks (e.g., impaired mobility and illness). In addition, cognitively impaired older adults have poorer social support networks (Gurung et al., 2003), and many ALF residents suffer from declining cognitive abilities. Depressed older adults also have poorer networks (Burt et al., 1995), and studies suggest that nearly 52% of ALF residents are depressed, which is much higher than same-age independent older adults (Cuijpers & Van Lammeren, 1999; Cummings & Cockerham, 2004).

Carstensen (1991, 1992) postulated a socioemotional selectivity theory, as adults get older they voluntarily choose to reduce the size of their social networks by selecting social partners who maximize emotional gains. Thus the size of the social networks decrease, while the quality of the networks increase through a process of selective pruning. Previous research has also shown that older adults' emotional support comes more from friends than family members (Crohan & Antonucci, 1989; Pinquart & Sorensen, 2001). However, ALF residents have often outlived close friends or have been forced to move away from them. Therefore, many ALF residents may not be receiving enough social support. Moreover, it is often difficult for ALF residents with normal cognitive functioning to make new social contacts within the ALF environment because many residents and potentially new friends are suffering from mild cognitive impairment or hearing problems. Many ALF residents may be at risk of experiencing a significant reduction in quality of life because they lack social support and interaction.

Loneliness is another potential problem that can negatively affect older adults. Pinquart and Sorensen (2001)¹ conducted a meta-analysis and reported that loneliness and age are positively correlated in people 80 years of age and older. They also reported that when older adults' social support networks decrease in quality, loneliness often increases. In addition, they reported people living in nursing homes experienced higher rates of loneliness than people living independently.

Institutionalized older adults may benefit from participating in programs designed to increase the level of social support and the frequency of meaningful social interactions. Since, social support is associated with better cognitive functioning (Barnes, Mendes de Leon, Wilson, Bienias, & Evans, 2004; Bassuk et al., 1999), fewer depressive symptoms, and higher self-efficacy, there may be a number of benefits to increasing the quality of social support networks. Moreover, social interactions may be cognitively stimulating and, according to the use it or lose it theory, may help preserve cognitive abilities (Barnes et al., 2004; Zunzunegui, Alvarado, Del Ser, & Otero, 2003). Clearly many potential benefits are associated with having good social support networks and opportunities to socialize; this is especially true for women (e.g., Gurung et al., 2003). However, to our knowledge, researchers have never assessed the effectiveness of a social and cognitive program on ALF residents' levels of social support and loneliness.

We conducted a 3-month intervention in ALFs. Before the intervention, social support and loneliness were assessed in an experimental group and a control group. After 3 months, all participants were reassessed with the same measures. We predicted that a group-based intervention would lead to better social support networks and decreased loneliness. The intervention program was similar to one described by Winningham, Anunsen, Hanson, Laux,

Kaus, and Reifers (2004), which led to increased ability to make new memories among ALF residents.

Method

Participants

Participants from 6 ALFs were assigned to either a Cognitive Enhancement Program (CEP) intervention or the control group. All participants in a given facility were assigned to either the CEP intervention or the control group. Participants within a given facility were all assigned to the same condition, because we have previously observed that non-participating residents in the same facility may be exposed to some aspects of the program by hearing participants discuss ways to improve memory, facts learned about other residents that were discussed and memorized during the sessions, and helping work on challenging “homework” assignments. Facilities were assigned to be a part of the cognitive enhancement or control groups simply based on location to the researchers and the availability of a large room at certain times to conduct classes. The ALFs, however, were very similar in size (approximately 40-65 residents in each) and offered very similar services (e.g., part-time skilled nursing), amenities (e.g., laundry service and housekeeping service), and activity programs. Each facility employed a full-time activity director that organized events and drove residents to the grocery store or medical appointments. Between 5 and 16 participants at each facility that were included in the analyses. According to a series of one-way ANOVAs, the participants at the 6 facilities did not differ, at Time 1, in terms of age, Mini-Mental State Exams (MMSE) scores, number of depressive symptoms, Social Support Appraisal (SS-A), Social Support Behaviors (SS-B), or loneliness ($p > .05$).

In order to be included in the study, participants were required to complete the pre-test and post-test measures. Residents who had severe uncorrected sensory problems or scored 10 or less on the MMSE were not included in the study. In addition, the CEP group had to attend at least 50% of the sessions, during the three-month intervention.

Differences in participants who completed the study. Seventy-three participants began the study but sixteen dropped out for reasons, including moving out of the ALF, suffering from an illness, or not attending at least 50% of the sessions. A series of analyses were performed to assess whether participants who dropped out differed from those who completed the study. A t-test, $t(72) = 2.65, p = .010$, indicated that participants who completed the study ($M = 82.00, SD = 7.11$) were younger than those who did not complete the study ($M = 87.19, SD = 6.19$). Further analyses indicated that, at Time 1, a trend existed, such that participants who completed the study had somewhat higher scores on the SS-A test ($M = 74.84, SD = 9.62$) as compared to participants who dropped out ($M = 71.33, SD = 6.81$), $t(70) = 1.32, p = .19$. MMSE, SS-B; and UCLA Loneliness scores did not differ as a function of whether or not participants completed the study ($p > .05$).

Differences in participants as a function of group. Fifty-eight participants were included in most of the following analyses: 29 from the CEP Condition and 29 from the control group (one participant did not complete an SS-A test, two participants did not give their age, and 8 participants did not provide information about their education level). The participants ranged in age from 61-98 years ($M = 82.11, SD = 7.19$) and MMSE scores ranged from 11 to 30 ($M = 23.18, SD = 4.24$).

There was not a significant difference in the age of participants in the control and experimental conditions, $t(54) = 1.14, p = .27$, nor was there a significant difference in

participants' education levels as a function of condition, $t(48) = 0.92, p = .36$. In addition, the groups did not differ on the MMSE at Time 1, $t(56) = 0.65, p = .52$.

Materials

All participants completed the MMSE; this test was designed to quickly assess for possible dementia. MMSE scores can range from 0-30, and scores of 10 or less are indicative of severe cognitive impairment (Folstein, Folstein, McHugh, & Fanjiang, 2001). We assessed participants' depression level using the Geriatric Depression Scale (Yesavage et al., 1982/1983).

Previous research indicated that the quality of social interactions (i.e., quality of interactions and perceived social support) is the most important factor in terms of having good mental and physical health. Therefore, we used social support measures that were designed to measure the above constructs. The SS-A test was designed to assess participants' appraisals regarding their social relationships (Vaux, 1986). Participants rate their agreement to 23 statements on the SS-A using a 4-point Likert Scale. Examples of statements on the SS-A include "I can rely on my friends" and "My family cares for me very much." The SS-B was designed to assess participants' beliefs regarding whether or not friends and family members would do certain behaviors for them (Vaux, Riedel, & Stewart, 1987). The SS-B includes 36 behaviors, which participants respond to using a 4-point Likert Scale. To simplify the test and reduce the time needed to administer it, we collapsed separate family and friends categories into one category. The UCLA Loneliness Scale (Russell, 1996; Russell, Peplau, & Ferguson, 1978) was designed to assess participants' subjective feelings of loneliness or social isolation. The UCLA Loneliness Scale contains 20 questions that are answered on a 4-point Likert Scale.

Procedures

Trained technicians administered the above tests in one-on-one interviews. All participants completed the tests at two different times, which were separated by three months. Most participants completed the tests in approximately 45 minutes. During the three-month interval between testing periods, the participants were either exposed to the CEP intervention or not. The control group wasn't deliberately exposed to anything different. The CEP groups attended three sessions per week in their assisted living community. The sessions were designed to educate participants about the brain and memory, stimulate memory and cognitive activity, and focus on making new memories and doing activities that required relatively high levels of attention (see Winningham et al., 2004 for more information about the cognitive and social enhancement activities). In addition, the activities were designed and conducted in order to facilitate social interactions and the development of social support networks. Participants worked cooperatively in a collaborative and supportive environment as they learned each other's names and memorized novel and interesting information about each other (e.g., state of birth, nicknames, favorite vacation, favorite food item, etc.), learned to associate childhood photos with participants, were encouraged to work together and share insights on homework assignments.

Results

Our main hypotheses were generally supported by the data. There were significant interactions between time of testing and group on the SS-A, SS-B, and the UCLA Loneliness Scale. We found that participating in the cognitive enhancement program led to stable scores on the social support appraisals, perceptions of social support behaviors participants thought others would do for them, and reported feelings loneliness. Participants in the control group had lower

scores on both the social support scales and higher scores on the loneliness scales at Time 2 relative to Time 1.

A 2 X 2 mixed design ANOVA indicated that there was a significant interaction between time of testing and experimental condition on SS-A, $F(1, 55) = 11.33, p = .001$. Follow-up tests revealed that the CEP group's SS-A scores did not change over time, $t(28) = 1.34, p = .19$; however, the control group had a significant decrease in SS-A scores from Time 1 to Time 2, $t(27) = 3.46, p < .002$. See Table 2 to view means and standard deviations.

A 2 X 2 mixed design ANOVA indicated that there was a reliable interaction between time of testing and experimental condition on SS-B scores, $F(1, 56) = 5.68, p = .02$. Follow-up tests revealed that the CEP group's SS-B scores did not change over time, $t(28) = 0.15, p = .88$; however, the control group had a significant decrease in SS-B scores from Time 1 to Time 2, $t(28) = 3.57, p = .001$. See Table 2 to view means and standard deviations.

A 2 X 2 mixed design ANOVA indicated that there was a significant interaction between time of testing and experimental condition on UCLA Loneliness Scores, $F(1, 56) = 1.55, p = .22$. Follow-up tests revealed that the CEP group's loneliness scores did not change over time, $t(28) = 1.35, p = .19$; however, the control group had a significant increase in loneliness scores from Time 1 to Time 2, $t(28) = 1.96, p = .06$. See Table 2 to view means and standard deviations.

Discussion

The results of this study indicate that older adults can benefit from a group-based program designed to facilitate social support and improve cognitive abilities. We found that after a three-month intervention, control participants reported lower levels of social support and greater levels of loneliness. However, ALF residents who participated in the intervention did not

experience decreases in perceived social support nor an increase in loneliness. These findings are important because lower levels of social support may lead to reduced physical and mental well-being.

Many ALF residents have poor social support networks, possibly because they have outlived friends and family members, needed to move away from their home, and are less able to travel and maintain relationships. Poor social support networks may lead to depression, which may further impair their social interactions and exacerbate cognitive difficulties. Based on the results of the present study, it appears that ALFs can provide enhanced programs, which may lead to improvements in perceived social support, decreased loneliness, and would presumably lead to improvements in residents' quality of life. Table 3 contains a list of activities and suggestions that can be used to facilitate social interaction and cognitive stimulation in ALFs, retirement communities, and senior centers. Most of the activities can be implemented for minimal cost. We had a high participation rates among ALF residents, possibly because the classes were explicitly held in order to help residents improve their memory ability, rather than just making new friends.

Not all older adults are equally willing or able to meaningfully participate in cognitive or social enhancement programs. We found that the oldest adults in our sample were less likely to complete the study. Several reasons may exist for the higher attrition rates among the oldest participants, including physical and cognitive impairments. In addition, a trend was found, such that participants with lower social support appraisal scores were less likely to complete the study.

We suggest that retirement facility staff encourage older residents or those who feel they have a poor social support network to participate in programs like the one we have described and also provide those residents with more reinforcement during the activities. One technique that

was successful in our pilot program was to invite new residents and others who had not previously participated in the class to one session and tell them they could sit on the periphery and simply listen; ultimately, most wanted to participate after observing. We also suggest that ALFs hire qualified activity directors because they would be the staff members most likely to implement social or cognitive enhancement programs. The activity directors need to be optimistic, positive, and possess excellent social skills. In addition, ALF staff (e.g., caregivers, activity directors, and administrators) could benefit from receiving more training about psychological aspects of well-being (e.g., memory, cognitive exercise, mood, and social support) and how they can help residents maintain or even improve their overall quality of life.

Future research should continue to refine our understanding of how social support and cognitive activity are related to various health outcomes. In addition, relatively little psychological and medical research has been conducted in ALFs. Future research should also examine the long-term effects of living in ALFs on individuals' social support, memory ability, depression, and overall physical health. Data from the present study and Winningham et al.'s (2004) suggest that without interventions, residents' mental abilities and the quality of their social support networks decrease rapidly over time, while loneliness increases. A longitudinal study may help identify the most vulnerable times for residents (e.g., when they initially move into a facility) and suggest opportune times for and types of interventions. While ALFs provide a valuable service, they can be improved and thereby increase the residents' quality of life.

References

- Barnes, L. L., de Leon, C. F. M., Wilson, R. S., & Evans, D. A. (2004). Social resources and cognitive decline in a population of older African Americans and whites. *Neurology, 63*, 2322-2326.
- Bassuk, S. S., Glass, T. A., & Berkman, L. F. (1999). Social disengagement and incident cognitive decline in community-dwelling elderly persons. *Annals of Internal Medicine, 131*, 165-172.
- Berkman, L. F. (1995). The role of social relations in health promotion. *Psychosomatic Medicine, 57*, 245-254.
- Burt, D. B., Zembar, M. J., & Niederehe, G. (1995). Depression and memory impairment: A meta-analysis of the association, its pattern, and specificity. *Psychological Bulletin, 117*, 285-305.
- Carstensen, L. L. (1991). Socioemotional selectivity theory: Social activity in life-span context. *Annual Review of Gerontology and Geriatrics, 11*, 195-217.
- Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. *Psychology and Aging, 7*, 331-338.
- Crohan, S. E., & Antonucci, T. C. (1989). Friends as a source of social support in old age. In R. G. Adams, R. Blienszner (Eds.), *Older adult friendship: Structure and process* (pp. 129-146). Thousand Oaks, CA: Sage Publications, Inc.
- Cuijpers, P., & Van Lammeren, P. (1999). Depressive symptoms in chronically ill elderly people in residential homes. *Aging & Mental Health, 3*, 221-226.
- Cummings, S. M., & Cockerham, C. (2004). Depression and life satisfaction in assisted living residents: Impact of health and social support. *Clinical Gerontologist, 27*, 25-42.

- Cummings, S. M. (2002). Predictors of psychological well-being among assisted living residents. *National Association of Social Workers, 27*, 293-302.
- Folstein, M.F., Folstein, S. E., McHugh, P. R., & Fanjiang, G. (2001). Mini Mental State Examination User's Guide. Odessa, FL: Psychological Assessment Resources, Inc.
- Gurung, R. A., Taylor, S. E., & Seeman, T. E. (2003). Accounting for changes in social support among married older adults: Insights from the MacArthur studies of successful aging. *Psychology and Aging, 18*, 487-496.
- Garssen, B. (2004). Psychological factors and cancer development: Evidence after 30 years. *Clinical Psychology Review, 24*, 315-338.
- Kaye, L.W., & Monk, A. (1991). Social relations in enriched housing for the aged: A case study. *Journal of Housing for the Elderly, 9*, 111-126.
- Krause, N., Liang, J., & Keith, V. (1990). Personality, social support, and psychological distress in later life. *Psychology and Aging, 5*, 315-326.
- Paterninti, S., Verdier-Taillefer, M., Dufouil, C., & Alperovitch, A. (2002). Depressive symptoms and cognitive decline in elderly people. *British Journal of Psychiatry, 181*, 406-410.
- Pedersen, S. S., Van Domburg, R. T., & Larsen, M. L. (2004). The effect of low social support on short-term prognosis in patients following a first myocardial infarction. *Scandinavian Journal of Psychology, 45*, 313-318.
- Pinquart, M., & Sorensen, S. (2001). Influences on loneliness in older adults: A meta-analysis. *Basic and Applied Social Psychology, 23*, 245-266.
- Russell, D. (1996). The UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment, 66*, 20-40.

Russell, D., Peplau, L.A., & Ferguson, M.L. (1978). Developing a measure of loneliness.

Journal of Personality Assessment, 42, 290-294.

Seeman, T. E., Lusignolo, T. M., Albert, M., & Berkman, L. (2001). Social relationships, social support and patterns of cognitive aging in healthy, high functioning older adults:

Macarthur studies of successful aging. *Health Psychology*, 20, 243-255.

Vaux, A. (1986). The social support appraisals (SS-A) scale: Studies of reliability and validity.

American Journal of Community Psychology, 14, 195-219.

Vaux, A., Riedel, S., & Stewart, D. (1987). Modes of social support: The Social Support

Behaviors (SS-B) Scale. *American Journal of Community Psychology*, 15, 209-237.

Winningham, R. G. (2005). Assisted living. In N. J. Salkind (Ed.), *The encyclopedia of human*

development. Thousand Oaks, CA: Sage Publications.

Winningham, R. G., Anunsen, R. A., Hanson, L., Laux, L., Kaus, K., & Reifers, A. (2004).

MemAerobics: A cognitive intervention to improve memory ability and reduce depression in older adults. *Journal of Mental Health and Aging*, 9, 183-192.

Wister, A. (1990). Living arrangements and informal social support among the elderly. *Journal*

of Housing for the Elderly, 6, 1-2.

Yesavage, J. A. et al., (1982/1983). Development and validation of a geriatric depression

screening scale: A preliminary report. *Journal of Psychiatric Research*, 1, 37-49.

Zunzunegui, M. V., Alvarado, B. E., Del Ser, T., & Otero, A. (2003). Social networks, social

integration, and social engagement determine cognitive decline in community-dwelling

Spanish older adults. *Journals of gerontology: Series B: Psychological Sciences & Social Sciences*, 58B, S93-S100.

Table 1

Risk Factors for Poor Social Support in Older Adult Populations

Risk Factors	References
Depression	(Burt, Zembar, & Niederehe 1995; Cuijpers, & Van Lemmeren, 1999; Cummings & Cockerham, 2004; Cummings, 2002; Gurung et al., 2003)
Low self-efficacy	(Gurung et al., 2003)
Low cognitive functioning	(Bassuk, Glass, & Berkman, 1999; Gurung et al., 2003; Seeman, Lusignolo, Albert, & Berkman, 2001)
Gender	(Cummings, 2002; Kaye & Monk, 1991; Gurung et al., 2003)
Marriage status	(Gurung et al., 2003; Wister, 1990)
Number of visits	(Gurung et al., 2003; Pinguart & Sorensen, 2001)
Extraversion	(Krause, Liang, & Keith, 1990)
Physical health	(Bassuk et al., 1999; Berkman, 1995; Garssen, 2004; Pedersen et al., 2004; Seeman et al., 2001)

Table 2

Mean and Standard Deviations as a Function of Group (Cognitive Enhancement or Control) and Time

	Time 1	Time 2
Cognitive Enhancement Group		
Social Support Appraisals	73.55 (9.44)	75.72 (8.73)
Social Support Behaviors	126.00 (17.55)	128.00 (15.58)
UCLA Loneliness Scale	32.79 (10.71)	31.07 (9.61)
Control Group		
Social Support Appraisals	76.18 (9.80)	70.75 (9.62)
Social Support Behaviors	130.14 (18.51)	119.41 (22.33)
UCLA Loneliness Scale	30.48 (10.11)	34.24 (10.85)

Table 3

Activities to Facilitate Social Support Networks

- Use standardized questions that each resident can answer and other residents can learn in a group setting. This activity can be modified for different levels of cognitive functioning by using recognition (easiest; “Which of these states is Helen’s place of birth), cued recall (moderate; “In what state was Helen born?”), or free recall (difficult; What do you know about Helen’s childhood?). This activity could be called the “memory game.” The questions can be put on one sheet of paper and include additional items such as the following:
 1. name
 2. childhood nickname
 3. state or city of birth
 4. favorite vacation
 5. most embarrassing moment
 6. favorite musical artist
 7. favorite color
 8. favorite season
 9. favorite recreational activity
 10. favorite movie
 11. favorite pet
 12. favorite food item
 13. favorite dessert
 14. favorite book
 15. favorite play
 16. how many grand or great-grandchildren
- Pair residents with similar interests and cognitive functioning
- Family days can bring together residents and facilitate new connections
- Name tags can help people remember names
- Resident Ambassador Program – Willing and high functioning residents can be given part time jobs or volunteer positions to greet visitors, help residents, and help facilitate social activities.

- Resident Council Program – A resident council program can serve in an advisory capacity for the facility.
- Working on word puzzles together
- Book club
- Offer trips to senior centers
- Make a display of all residents with recent pictures and names
- Memory game with residents old photographs
- The Silly Game (<http://www.agelessdesign.com/Silly%20Things.htm>)

Footnote

¹It is difficult to determine causality when looking at correlations between cognitive ability and social support. A lack of social support or interaction may lead to cognitive impairment. Alternatively, cognitively impaired individuals may socially withdraw and engage in fewer social interactions. Similar difficulties exist in using correlations between the number of cognitively stimulating activities and cognitive ability.