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# Successful Practices for Developing Cognitive Stimulation Programs

Robert G. Winingham, PhD; Cassandra J. Dinius

## ABSTRACT

Participating in cognitively stimulating activities may reduce the likelihood of developing dementia. In circumstances where older adults are beginning to experience cognitive decline, participating in a cognitive program may help rehabilitate memory ability. This article draws on the experiences of many continuing care retirement communities and other groups who have successfully instituted cognitive stimulation programs, and provides useful information on resources, group size, ratio of instructors to participants, and other factors that contribute to participation. Cognitive stimulation programs may benefit older adults who are experiencing mild to moderate cognitive impairment. Based on experiences with these programs, a multifaceted approach is recommended that includes a wide variety of activities and stimulation. Older adults may experience disruptions in their executive functions, leading to inhibition and attention problems. Empirical evidence is given to support our methodology for rehabilitating these functions. Last, suggestions are given for motivating participants and creating an environment that supports brain health. These steps may help to sustain a program and increase participation in a cognitive stimulation class.

## INTRODUCTION

If older adults can improve their cognitive ability even by a small amount, their quality of life may be enhanced (Meade & Park, 2009). Moreover, a decrease in cognitive ability is often associated with significant functional declines, skilled nursing placement, and mortality (Sands et al., 2002; Yaffe et al., 2002; Yaffe, Petersen, Lindquist, Kramer, & Miller, 2006). There is evidence that cognitive stimulation may improve memory ability in older adults who have normal age-related memory deficits (Ball et al., 2002; Smith et al., 2009; Tsai, Yang, Lan, & Chen, 2008; Willis et al., 2006) or are experiencing mild cognitive impairment (Kinsella et al., 2009; Park, Kwon, Seo, Lim, & Song, 2009). Although limited research has taken the position that the benefits of cognitive training do not always transfer to untrained tasks and may not benefit younger populations (e.g., Owen et al., 2010), numerous researchers (Ball et al., 2002; Eckroth-Butcher & Siberski, 2009; Park et al., 2009; Smith et al., 2009; Stine-Morrow, Parisi, Morrow, & Park, 2008; Willis et al., 2006) have conducted randomized controlled interventions that led to improvements in older adults' cognitive abilities relative to a control group. Information on how to establish and sustain cognitive stimulation programs may be helpful to seniors housing and assisted living providers, senior centers, and adult day care programs.

Winningham et al. (2003) conducted one such intervention study and found that older adults living in assisted living communities may, on average, improve their ability to make new memories by about 15% after doing a group-based cognitive exercise program two to three times a week for three months. Based on our experiences conducting these types of studies and input from hundreds of retirement communities, we have identified many useful strategies to maximize the effectiveness of these programs. These strategies and best practices are presented in this article and when possible they are supported by published research. We strive to

address many components of cognitive stimulation classes, including how to develop a class, various forms of mental stimulation, and social interaction. We also address managing participants and suggest ways to provide motivation to those who need it. To our knowledge, this is the first article that primarily presents suggestions about how to most effectively design and implement group-based cognitive stimulation programs.

## Different Populations

It may be that not all types of cognitive enhancement interventions work for all populations. If participants have dementia or are experiencing significant cognitive impairment, then they may not be able to do the cognitive activities. Conversely, healthy younger adults may not experience much improvement by engaging in cognitive exercises. In one widely publicized study conducted by Owen et al. (2010), computer-based cognitive training programs did not lead to improvements in cognitive abilities that were not specifically exercised. It is important to note that Owen et al. (2010) used a much younger group of participants than is usually used in adult cognitive training studies; however, if we look at older adults who are, on average, experiencing mild deficits in attention and their ability to make new memories, then we would expect very different results. In other words, we wouldn't expect people who are already performing attention and memory tasks well to significantly improve these skills with a six-week computer-based intervention. But a three-month intervention with people who are, on average, in their 80s and living in assisted living communities may benefit from such a program, especially if it was group based (e.g., Winningham et al., 2003). Many previous studies have found evidence that living a cognitively stimulating life over a long period of time can decrease one's chances of getting dementia (e.g., Paillard-Borg, Wang, Winblad, & Fratiglioni, 2009; Verghese et al., 2006).

Although some studies have found that computerized programs lead to improvements in particular

areas (e.g., Smith et al., 2009), it may be that group-based cognitive stimulation programs provide greater long-term benefits for many older adults. Ertel et al. (2008) found that social engagement was associated with a decreased likelihood of developing memory problems. Group-based programs may provide stimulation beyond activities in that the participants get to know each other and are possibly more motivated to continue participating in the program. More research on the differences between computerized and group-based programming should be done. In addition, more research needs to be done to determine how to maximize transfer from the cognitive exercises to real-world settings. See Rebok, Carlson, and Langbaum (2007) for a review of different types of memory enhancement approaches. We will now make suggestions for group-based interventions designed for older adults.

## **Class Development**

Getting started. People working in retirement communities, assisted living, and even skilled nursing facilities are very motivated to take advantage of the recent findings on cognitive stimulation and preventing cognitive decline, but they often do not know where or how to begin. Implementing a memory enhancement program may be an effective way to help older adults maximize their memory ability and quality of life.

Screening. One of the first steps in developing a cognitive stimulation program is selecting appropriate participants who could benefit from and positively contribute to a classroom experience. Screening participants to verify that they are a good fit for the class is the first step. Some potential participants may not be a good fit if they are unable to inhibit negative emotions or are unable to stay on task. Some who might not be able to participate alone might be able to do so if a family member or caregiver can assist them. Schedule a brief meeting (e.g., 15 to 20 minutes) with participants prior to the first day. This time may be used to answer questions and address any concerns.

Consider having a trained professional administer the Mini Mental State Exam (MMSE) or a similar test to gauge each participant's level of functioning. Mitchell and Miller (2008) found that self-reported memory ability is often inaccurate, so it is helpful to have an objective assessment. If participants have more severe memory impairment (e.g., mid-stage dementia), it is very challenging to have them engage in the types of cognitive activities to improve memory ability that will be discussed in this article; however, with a smaller group or additional instructors, those with greater cognitive challenges may participate and benefit. Ideally, a cognitive exercise class should have participants with relatively similar abilities. If participants with mild cognitive impairment or early stage dementia are in the same class as those who do not have any cognitive impairment, both groups will be dissatisfied with the experience. Whenever possible, it is strongly recommended to have two class levels. Mungas (1991) noted that MMSE scores between 21 and 25 are indicative of mild impairment, whereas scores between 26 and 30 correspond with questionable impairment or intact functioning. Based on our experience, people with scores between 25 through 30 benefit from participating together in the same class, as do people with scores between 18 and 24.

If a person is close to the cut-off, use your best judgment, as scores on short memory tests are used for screening and may not always be accurate indicators of ability. Moreover, a participant's personality and social skills may influence whether he/she will benefit and positively contribute to a class environment. If necessary, participants should be able to move to a different group. Furthermore, although it is not the intent of this article to discuss evaluating such programs, for researchers seeking to study the efficacy of cognitive stimulation, it is crucial that the study participants accept the interventions.

Group size. The maximum number of people who may benefit from a group-based memory enhancement class depends on a number of factors. If the majority of participants have mild cognitive impair-

ment or early stage dementia, smaller groups will be needed in order to explain the activities and provide support. Based on our experiences, for those with MMSE scores between 17 and 24, the class should be limited to five people per instructor. If all participants have MMSE scores above 24, this number may be increased to 12 people per instructor. Students will often volunteer from psychology or health departments at local colleges and universities to assist in instructing a memory class. In addition, the student may be able to earn course credit for this type of a volunteer or internship experience.

**Attendance.** Keeping visible track of attendance allows others to see who is attending regularly. If a participant misses a class, he/she can initiate a different social encounter by talking to residents who were present last session. In addition, an attendance board may hold participants accountable for coming to class. Periodically recognize those who have perfect attendance with a certificate, a brain-healthy snack, or a book of word games.

## **Multifaceted Cognitive Stimulation**

**Class materials.** A high-quality cognitive stimulation program will offer a variety of ways to receive stimulation. Diversifying activities should help the brain exercises generalize to other settings as well as keep the participants from becoming bored. Many researchers have found that exercising a specific ability will only lead to improvements in that area (e.g., Li et al., 2008; Owen et al., 2010). A multifaceted memory enhancement program may include teaching compensatory strategies and mnemonics. Mnemonics may be useful, but they are often not appropriate for those with greater cognitive impairment, as they require significant cognitive resources. Brehmer et al. (2008) found that many older adults do not use mnemonic strategies unless prompted. Baltes and Kliegl (1992) reported that older adults did not benefit from mnemonic training as much as younger adults, even if the older adults received more training. Unfortunately, people who could benefit the most from using mnemonics are often the least

able to use them.

Beginning a cognitive stimulation course with a discussion about memory may reduce anxiety. Reese et al. (1999) found that older adults often become sensitive about the topic of Alzheimer's and other forms of dementia. Reviewing research about the effects of cognitive stimulation and providing information about how memory works also may motivate participants.

**Activity variety.** Offering a wide variety of activities is crucial to a good cognitive enhancement program. It is likely that a varied curriculum will lead to better improvement in myriad real-world tasks (Zelinski, 2009). Begin class with the "fact of the day," which allows people to practice making new memories. Present the fact and prompt recall after increasing intervals (e.g., two-minute interval, then four, then eight, etc.). Cavallini, Pagnin, and Vecchi (2002) found that memory problems, including those experienced by older adults, could often be traced back to how well people monitor their own memory. Older adults need to know when they have and when they have not made a new memory. This allows them to gauge how much time and effort goes into successfully making new memories.

Ensure a wide variety of activities by incorporating activities that exercise the main types of cognition and abilities that are most vulnerable to the aging process; for example, participants should practice activities requiring a high level of sustained attention, given that impaired attention often contributes to poorer encoding abilities in older adults (Buckner, 2004). Solving anagrams, doing word searches, completing Sudoku puzzles, and circling as many m's and n's in a newspaper story (while counting the number that have been circled) are all examples of activities that exercise attention. Additionally, participants may brainstorm many possible uses for common objects (e.g., old tires, used milk cartons, dimes). Providing opportunities for people to work on word fluency and generating names also is recommended; for example, ask participants to generate a first or last name for each letter of the alphabet. Have

participants exercise verb-generation abilities by asking them to think of things that children, teachers, mechanics, or athletes do. Note that an inability to generate verbs is a symptom that appears to be unique to Alzheimer's disease (Tippett, Gendall, Farah, & Thompson-Schill, 2004). Participants may create touch memories by learning an object they are feeling inside a paper bag and cannot see. New smell memories can be made by learning the names of less common aromatherapy oils. Exercise spatial abilities by doing activities that require mental rotation and reproducing images using small puzzle pieces (e.g., tangrams).

The ability to understand how one person's behavior will be perceived by others is known as theory of mind and is often associated with cognitive impairment (Modinos, Oblols, Pousa, & Vicens, 2009; Snowden et al., 2003). This ability can be exercised by participating in a play (Noice, Noice, & Staines, 2004) and possibly by doing a cartoon caption activity. Begin developing the cartoon caption activity by acquiring single-picture cartoons that have a caption on the bottom. Cut the caption off the cartoon and retype it in large font. Then place three to six cartoons and their corresponding captions in an envelope for each participant (more options increase difficulty). Encourage them to match the caption with the correct cartoon. The overarching goal is to develop a curriculum with as many different types of activities as possible.

### **Dose-Dependent Benefits**

Cognitive benefits associated with memory enhancement programs are dose dependent (Paillard-Borg, Wang, Winblad, & Fratiglioni, 2009); the more one does, the greater the benefit. The community may create a culture of cognitive stimulation; for example, cognitively stimulating materials can be placed on tables before mealtime. Community newsletters should include puzzles and games, and newspapers and magazines should be widely available. Provide take-home activities during each session, particularly if the class only meets once or

twice a week. In addition, develop novel activity programs such as book clubs, foreign vocabulary classes, or computer skills classes. Encourage the highest functioning residents to take ownership of some of the activity programming.

**Lectures.** Teaching older adults about the risk and protective factors related to developing dementia provides an opportunity to share the benefits of a holistic approach. Bring health-related newspaper articles or new brain games to class. Nutrition, physical exercise, sleep, and social engagement are all related to the likelihood of maintaining memory ability or developing dementia (see Winningham, 2010, for more information about factors). Develop short presentations on these subjects or invite local experts from colleges, universities, or hospitals to present one or more of the topics. Lectures provide a new kind of cognitive stimulation and promote good brain health. If people outside of the cognitive stimulation class attend the lectures, advertise the availability of memory classes during the lecture.

**Social connection and engagement.** Older adults who are the most socially engaged have a reduced likelihood of developing memory problems, whereas the least integrated decline much more rapidly (Ertel, Glymour, & Berkman, 2008). Wilson et al. (2007) found that loneliness is a risk factor for developing dementia. Moreover, people who perceive their social support networks as being better are less likely to develop depression (Cuijpers & Van Lammeren, 1999).

The first few weeks of class should focus on building a social network. Include one social activity each day, perhaps as a mental break following a challenging activity. Social interaction can be worked into the curriculum by having participants share answers with a neighbor, find another person with at least two of the same brainstorming ideas, or work together on activities. On the first day of class, consider having participants interview each other and develop biographies about one another.

As we age, our social support networks tend to become smaller through natural life events

(Carstensen, 1991, 1992). Experiences such as retirement and an inability to drive can impact social groups, making it increasingly difficult to maintain social support networks. Friends and peers may be suffering from cognitive impairment, hearing impairment, or vision problems. Cognitive exercise groups provide opportunities to expand social networks by increasing meaningful social interactions. Group-based classes allow older adults to meet and socialize with others who are working toward a similar goal. A recent study found that older adults with cognitive impairment experienced significant improvements in their mood when they took part in a socially focused group activity (Haslam et al., 2010). These improvements can provide protection against depression and other mood disorders, which may further decrease cognitive functioning. Alexopoulos (2005) suggested that older adults without dementia who are experiencing depression often have problems with attention, concentration, and slower mental processing speeds.

Winningham and Pike (2007) found that a three-month, group-based cognitive enhancement program increased perceived social support and decreased self-reported loneliness in older adults. Older adults who are socially invested with a group may become more cognitively engaged in activities (Haslam et al., 2010). Having social connections might increase program compliance and attendance by creating an environment in which older adults enjoy coming to class. By incorporating group-based activities into cognitive enhancement programs, older adults are provided an opportunity to enhance their social engagement and networks. In addition, social engagement can be cognitively stimulating (Ertel et al., 2008).

Facilitate social engagement outside of memory classes as well. Many retirement communities provide nametags for residents, and anecdotal evidence suggests this has a very positive effect on the social environment. Another effective strategy for retirement communities and assisted living facilities is to develop new neighbor “notes” in which new residents

are interviewed and a very short biography is written about them. This information, and perhaps a photograph, is given to the neighbors that live closest to the new resident. Take photographs of memory class participants, put them on the wall in the activity room, put the name under the photograph, and cover the name with a piece of paper that is hinged at the top with tape. It is likely that participants and residents will study the photos and names outside of class time. Consider developing a resident directory using photographs. Strategies that facilitate social engagement and support can have far-reaching effects on residents’ quality of life (Winningham & Pike, 2007).

## Participant Management

Some participants in cognitive exercise programs have a difficult time inhibiting negative emotions and inappropriate behaviors, particularly if they have cognitive impairment (Andres, Guerrini, Phillips, & Perfect, 2008). The effects of inhibitory deficits lead to impaired memory ability as well as behaviors such as getting started on an activity before all the instructions have been given, saying inappropriate things to others, or the inability to stop working on a previous task.

In order to limit the negative effects of inhibition problems, refrain from distributing handouts until the activity is introduced. Consider using a whiteboard or chalkboard to demonstrate new activities. Prepare participants to raise their hand when recalling a “fact of the day” or other information. Practicing inhibiting behaviors should strengthen that ability and enhance executive functioning, enhance attention, and assist in making new memories.

**Motivation.** Many people who could benefit from participating in a cognitive stimulation program are not motivated to do so. Motivation and willingness to engage in health-promoting behavior are primarily affected by individual beliefs. Two of the most important beliefs are self-efficacy and beliefs about the outcome of doing a certain behavior. Research has repeatedly shown that these factors predict

whether or not someone will engage in behaviors that improve his/her health. After briefly reviewing the topics of self-efficacy and outcome expectations, we present ways to use these principles to help motivate participants.

Self-efficacy. Self-efficacy refers to the individual's belief that he/she is capable of doing a behavior or achieving an outcome (Bandura, 1997). Although related, self-efficacy is different from self-esteem. Self-esteem refers to someone's general perceptions of his/her self-worth, whereas self-efficacy refers to the belief that one can successfully achieve some outcome. One could have a healthy self-esteem but have very low self-efficacy for flying a plane, rebuilding a car engine, or eating a healthier diet. Research has shown that people's self-efficacy for health-promoting behaviors predicts their overall physical activity, nutrition, stress management, and interpersonal relations (Kwong & Kwan, 2007; Morowatisharifabad, Ghofranipour, Heidarnia, Ruchi, & Ehrampoush 2006; Sohng, Sohng, & Yeom, 2002). Fortunately, it is possible to increase some people's self-efficacy, which is one of the best ways to improve their motivation.

Outcome expectations. The other belief is often referred to as outcome expectations. Outcome expectations are beliefs people have about what the potential outcomes will be if they perform a certain behavior; for example, people who are more aware of the health benefits associated with physical exercise might actually be more likely to exercise. If our goal is to help people increase their behaviors that are likely to lead to better health and cognitive ability, then we need to make sure they are fully aware of the associated benefits.

Applying motivational principles. To motivate someone to engage in behaviors such as increasing cognitive and physical exercise, it is important to help increase self-efficacy for those behaviors and his/her awareness of the benefits. Participants should be provided opportunities to have successful experiences; for example, successfully completing a simple Sudoku puzzle (e.g., a mini Sudoku) will

increase a person's belief that he/she can complete a more challenging version of the puzzle. When trying to motivate someone, look for opportunities to facilitate successful experiences. When asking someone to report a previously learned item, phrase the question in a way that they can recognize the correct answer; for example, you could phrase a question about the "fact of the day" this way: "The fact of the day refers to the number of neurons in the average human brain. Is that number one billion, 10 billion, 100 billion, or one trillion?" Research shows that older adults with beginning stages of memory problems are not impaired in their ability to recognize the correct answer if it was previously learned (e.g., Grönholm-Nyman, Rinne, & Laine, 2010). These strategies may increase successful memory experiences and presumably-increase self-efficacy for memory-related activities.

Alternatively, self-efficacy may be increased by observing someone similar to oneself successfully doing a behavior. There are many ways to employ this self-efficacy-enhancing strategy to increase people's motivation. In a facility-based residential setting, new residents can be invited to observe part of a memory class. One particularly effective technique to motivate new residents to join a memory class is to have them fill out a short questionnaire. The form can contain questions such as "What was your childhood nickname?" and "Where were you born?" and "What is your all-time favorite movie?" Inform the new resident that the memory class participants would like to memorize information about him/her and ask if he/she would like to observe. If the new resident is willing to come, he/she will see participants successfully doing various memory and attention exercises. Witnessing his/her peers succeed could have a dramatic effect on the new resident's belief that he/she can successfully participate in the class.

It is important that people know the benefits associated with doing cognitively stimulating activities. The potential positive outcomes should be specific to the individual. Some people may be concerned about

declining memory ability, so knowing that cognitive exercises have been shown to improve attention and memory ability may be very motivating. Another individual may want to stay in an independent living environment, so if the ability to remember his/her medications may be a particularly motivating outcome of participating in a memory enhancement class.

## CONCLUSION

It is vital that cognitive stimulation be incorporated into the daily life of older adults. Creating an atmosphere and culture of cognitive stimulation helps to maximize older adults' level of cognitive stimulation, particularly in retirement and assisted living communities. Properly screening participants and maintaining appropriate group size will provide the necessary support to successfully address individual needs. Informing people about the plethora of research that has identified risk and protective factors for dementia should maximize and encourage long-term lifestyle changes. In order to maximize transfer to other tasks, use a wide variety of cognitive activities that exercise different abilities. Executive functions, such as attention and inhibition, are particularly affected by the aging process. These abilities should be targeted in an attempt to help older adults maintain or improve their cognitive functioning. Finally, it is important to use all available techniques to motivate participants to participate fully in a cognitive stimulation program. Participants need to be aware of the benefits of engaging in cognitively stimulating activities and that some of the benefits might be unique to certain participants (e.g., able to live independently and take care of a pet). In addition, participants need to have adequate self-efficacy and believe they are capable of engaging successfully in a cognitive enhancement program.

## AUTHORS

Robert G. Winningham, PhD  
Professor and Chair of the Psychology Division  
Western Oregon University  
345 N. Monmouth Ave.  
Monmouth, OR 97361  
Phone: (503) 838-8297  
Fax: (503) 838-8618  
E-mail: [rwinninr@wou.edu](mailto:rwinninr@wou.edu)  
Web site: [www.wou.edu/las/psychology/winningham](http://www.wou.edu/las/psychology/winningham)

Cassandra J. Dinius  
Western Oregon University  
345 N. Monmouth Ave.  
Monmouth, OR 97361

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## REFERENCES

- Alexopoulos, G. S. (2005). Depression in the elderly. *Lancet*, 365, 1961-1970.
- Andres, P., Guerrini, C., Phillips, L. H., & Perfect, T. (2008). Differential effects of aging on executive and automatic inhibition. *Developmental Neuropsychology*, 33(2), 101-123.
- Ball, K., Berch, D. B., Helmers, K. F., Jobe, J. B., Leveck, M. D., Mariske, M., et al. (2002). Effects of cognitive training interventions with older adults: A randomized controlled trial. *JAMA: Journal of the American Medical Association*, 288, 2271-2281.
- Baltes, P. B., & Kliegl, R. (1992). Further testing of limits of cognitive plasticity: Negative age differences in a mnemonic skill are robust. *Developmental Psychology*, 28, 121-125.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman/Times Books/Henry Holt & Co.
- Brehmer, Y., Li, S., Straube, B., Stoll, G., von Oertzen, T., Müller, V., et al. (2008). Comparing memory skill maintenance across the life span: Preservation in adults, increase in children. *Psychology and Aging*, 23, 227-238.
- Buckner, R. L. (2004). Memory and executive function in aging and AD: Multiple factors that cause decline and reserve factors that compensate. *Neuron*, 44(1), 195-208.
- 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.
- Cavallini, E., Pagnin, A., & Vecchi, T. (2002). The reha-



- bilitation of memory in old age: Effects of mnemonics and metacognition in strategic training. *Clinical Gerontologist*, 26(1-2), 125-141.
- Cuijpers, P., & Van Lammeren, P. (1999). Depressive symptoms in chronically ill elderly people in residential homes. *Aging & Mental Health*, 3(3), 221-226.
- Eckroth-Butcher, M., & Siberski, J. (2009). Preserving cognition through an integrated cognitive stimulation and training program. *American Journal of Alzheimer's Disease and Other Dementias*, 24, 234-245.
- Ertel, K. A., Glymour, M. M., & Berkman, L. F. (2008). Effects of social integration on preserving memory function in a nationally representative US elderly population. *American Journal of Public Health*, 98, 1215-1220.
- Grönholm-Nyman, P., Rinne, J. O., & Laine, M. (2010). Learning and forgetting new names and objects in MCI and AD. *Neuropsychologia*, 48, 1079-1088.
- Haslam, C., Haslam, S., Jetten, J., Bevins, A., Ravenscroft, S., & Tonks, J. (2010). The social treatment: The benefits of group interventions in residential care settings. *Psychology and Aging*, 25(1), 157-167.
- Kinsella, G. J., Mullaly, E., Rand, E., Ong, B., Burton, C., Price, S., Phillips, M., & Storey, E. (2009). Early intervention for mild cognitive impairment: A randomized controlled trial. *Journal of Neurology, Neurosurgery, & Psychiatry*, 80, 730-736.
- Kwong, E. W., & Kwan, A. Y. (2007). Participation in health-promoting behaviour: Influences on community-dwelling older Chinese people. *Journal of Advanced Nursing*, 57, 522-534.
- Li, S., Schmiedek, F., Huxhold, O., Röcke, C., Smith, J., & Lindenberger, U. (2008). Working memory plasticity in old age: Practice gain, transfer, and maintenance. *Psychology and Aging*, 23, 731-742.
- Meade, M., & Park, D. (2009). Enhancing cognitive function in older adults. *Enhancing cognitive functioning and brain plasticity* (pp. 35-47). Champaign, IL US: Human Kinetics.
- Mitchell, M. & Miller, S. L. (2008). Executive functioning and observed versus self-reported measures of functional ability. *The Clinical Neuropsychologist*, 22, 471-479.
- Modinos, G., Obliols, J. E., Pousa, E., & Vicens, J. (2009). Theory of mind in different dementia profiles. *The Journal of Neuropsychiatry and Clinical Neurosciences*, 21(3), 100-101.
- Morowatisharifabad, M. A., Ghofranipour, F., Heidarnia, A., Ruchi, G. B., & Ehrampoush, M. H. (2006). Self-efficacy and health promotion behaviors of older adults in Iran. *Social Behavior and Personality*, 34, 759-768.
- Mungas, D. (1991). In-office mental status testing: A practical guide. *Geriatrics*, 46 (7), 54-58.
- Noice, H., Noice, T., & Staines, G. (2004). A short-term intervention to enhance cognitive and affective functioning in older adults. *Journal of Aging and Mental Health*, 16, 562-585.
- Owen, A. M., Hampshire, A., Grahn, J. A., Stenton, R., Danjai, S., Burns, A. S., Howard, R. J., & Ballard, C. G. (2010). Putting brain training to the test. *Nature*, 465, 775-778.
- Paillard-Borg, S., Wang, H., Winblad, B., & Fratiglioni, L. (2009). Pattern of participation in leisure activities among older people in relation to their health conditions and contextual factors: A survey in a Swedish urban area. *Ageing & Society*, 29(5), 803-821. doi:10.1017/S0144686X08008337.
- Park, M. H., Kwon, D. Y., Seo, W. K., Lim, K. S., & Song, M. S. (2009). The effects of cognitive training on community-dwelling elderly Koreans. *Journal of Psychiatric and Mental Health Nursing*, 16, 904-909.
- Rebok, G. W., Carlson, M. C., & Langbaum, J. B. (2007). Training and maintaining memory abilities in healthy older adults: Traditional and novel approaches. *Journal of Gerontology: Series B*, 62B (1), 53-61.
- Reese, C. M., Cherry, K. E., & Norris, L. E. (1999). Practical memory concerns of older adults. *Journal of Clinical Geropsychology*, 5(4), 231-244.
- Sands, L., Yaffe, K., Lui, L., Stewart, A., Eng, C., & Covinsky, K. (2002). The effects of acute illness on ADL decline over one year in frail older adults with and without cognitive impairment. *The Journals of Gerontology: Series A: Biological Sciences and Medical Sciences*, 57A(7), 449-454.
- Smith, G. E., Housen, P., Yaffe, K., Ruff, R., Kennison, R. F., Mahncke, H. W., & Zelinski, E. M. (2009). A cognitive training program based on principles of brain plasticity: Results from the Improvement in Memory with Plasticity-based Adaptive Cognitive Training (IMPACT) study. *Journal of the American Geriatric Society*, 57, 594-603.
- Sohng, K., Sohng, S., & Yeom, H. (2002). Health promoting behaviors of elderly Korean immigrants in the United States. *Public Health Nursing*, 19, 294-300.
- Snowden, J. S., Gibbons, Z. C., Blackshaw, A., Doubleday, E., Thompson, J., Craufurd, D., Foster, J., Happé, F., & Neary, D. (2003). Social cognition in frontotemporal dementia and Huntington's disease. *Neuropsychologia*, 41, 688-701.
- Stine-Morrow, E. A. L., Parisi, J. M., Morrow, D. G., & Park, D. C. (2008). The effects of an engaged lifestyle on cognitive vitality: A field experiment. *Psychology and Aging*, 23, 778-786.
- Tippett, L. J., Gendall, A., Farah, M. J., & Thompson-Schill, S.

L. (2004). Selection ability in Alzheimer's disease: Investigation of a component of semantic processing. *Neuropsychology*, 18(1), 163-173.

Tsai, A. Y., Yang, M., Lan, C., & Chen, C. (2008). Evaluation of effect of cognitive intervention programs for the community-dwelling elderly with subjective memory complaints. *International Journal of Geriatric Psychiatry*, 23, 1172-1174.

Verghese, J., LaValley, A., Derby, C. Kuslansky, G., Katz, M., Hall, C., Buschke, H., & Lipton, R. B. (2006). Leisure activities and the risk of amnesic mild cognitive impairment in the elderly. *Neurology* 66, 821-827.

Willis, S. L., Tennstedt, S. L., Mariske, M., Ball, K., Elias, J., Koepke, K. M., et al. (2006). Long-term effects of cognitive training on everyday functional outcomes in older adults. *Journal of the American Medical Association*, 296, 2805-2814.

Wilson, R. S., Krueger, K. R., Arnold, S. E., Schneider, J. A., Kelly, J. F., Barnes, L. L., et al. (2007). Loneliness and risk of Alzheimer disease. *Archives of General Psychiatry*, 64, 234-240.

Winningham, R. G. (2010). *Brain training: How to maximize memory ability in older adulthood*. New York, NY: Baywood Publishing Company.

Winningham, R. G., Anunsen, R. A., Hanson, L., Laux, L., Kaus, K., & Reifers, A. (2003). MemAerobics: A cognitive intervention to improve memory ability and reduce depression in older adults. *Journal of Mental Health and Aging*, 9(3), 183-192.

Winningham, R. G., & Pike, NB. L. (2007). A cognitive intervention to enhance institutionalized older adults' social support networks and decrease loneliness. *Aging and Mental Health*, 11, 716-721.

Yaffe, K., Fox, P., Newcomer, R., Sands, L., Lindquist, K., Dane, K., et al. (2002). Patient and caregiver characteristics and nursing home placement in patients with dementia. *JAMA: Journal of the American Medical Association*, 287, 2090-2097. doi:10.1001/jama.287.16.2090.

Yaffe, K., Petersen, R., Lindquist, K., Kramer, J., & Miller, B. (2006). Subtype of mild cognitive impairment and progression to dementia and death. *Dementia and Geriatric Cognitive Disorders*, 22, 312-319. doi:10.1159/000095427.

Zelinski, E. M. (2009). Far transfer in cognitive training of older adults. *Restorative neurology and neuroscience*, 27, 455-471.

## APPENDIX

Resources for starting a cognitive stimulation program:

### Crossword Puzzles

You can develop customized crossword puzzles

for your classes. Try to use information from the previous "fact of the day" or information about participants for the crossword puzzles. There are a number of software programs available; one can be found at: <http://www.qualint.com/wsdownload.html>.

### Word Searches

You can develop customized word searches for your classes. Based them on holidays, local traditions, events, and participants' interests. There are a number of software programs available; one can be found at: <http://www.puzzles.ca/wordsearch.html>.

### Sudoku

Sudoku is a fabulous activity for exercising cognitive abilities, especially attention. Full-size puzzles are available at <http://www.krazydad.com/sudoku>.

It is often helpful to start with smaller Sudoku puzzles until participants are familiar and confident in their abilities to complete them. Smaller puzzles can be found at <http://www.sudokuassistant.com/en/dailykid>.

### Alzheimer's Association

The Alzheimer's Association is a rich resource for older adults and loved ones who are concerned about memory impairment. Visit [http://www.alz.org/we\\_can\\_help\\_stay\\_mentally\\_active.asp](http://www.alz.org/we_can_help_stay_mentally_active.asp).

### Books

1. *Brain Games #1: Lower Your Brain Age in Minutes a Day* (2007) ISBN: 1412714508

2. *Brain Training: Boost memory, maximize mental agility, & awaken your inner genius* (2010) ISBN: 075665730X

3. *Mind Your Mind: A Whole Brain Workout for Older Adults* (2005) ISBN: 1578615402

4. *Train Your Brain: How to Maximize Memory Ability in Older Adults* (2010) ISBN: 0895033496