

Use It Or Lose It: The Survival of the Busiest Minds

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Some Facts about Aging and Memory

- Alzheimer's disease (AD) affects approximately 5 to 10 % of all adults over the age of 65. For those over the age of 85, the prevalence increases to nearly 50%.
- Nearly 1/2 of community dwelling older adults are concerned about declining memory.
- Over **five** million older adults in the U.S. suffer from AD
- Ten million older adults suffer from Mild Cognitive Impairment (MCI) or other more severe disorders affecting memory.
- 16% of people with MCI develop Alzheimer's Disease each year. 80% of people with MCI will develop AD within six years (Petersen et al., 2005).

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The Problem

- Many independent older adults are not getting enough cognitive stimulation.
- Many independent older adults, regardless of health, are forced to move to assisted living facilities when their cognitive abilities deteriorate to the point of requiring additional care.
- Many ALF residents are forced to move to nursing homes when their cognitive abilities deteriorate to the point of requiring additional care.

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The Problem

- Ironically, ALF residents are at risk *mentally* because all their *physical* needs are all met: cooking, cleaning, making appointments, shopping, and transportation.
- Regardless of living situation and health status, many older adults are not getting adequate cognitive stimulation.

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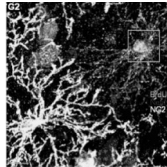
Now the Hope

- Older adults grow new brain cells or neurons, by a process known as neurogenesis.
- Neurogenesis occurs in the adult hippocampus, olfactory bulb, striatum and possibly in other parts of the brain.

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More Hope

Newborn GABA neuron in adult rat neocortex, in green box at right, appears to have arisen from precursor cell, white at left. Mature GABA neurons are red. Magnification: 650X. (Source: Heather Cameron, Ph.D., NIMH Unit on Neuroplasticity)

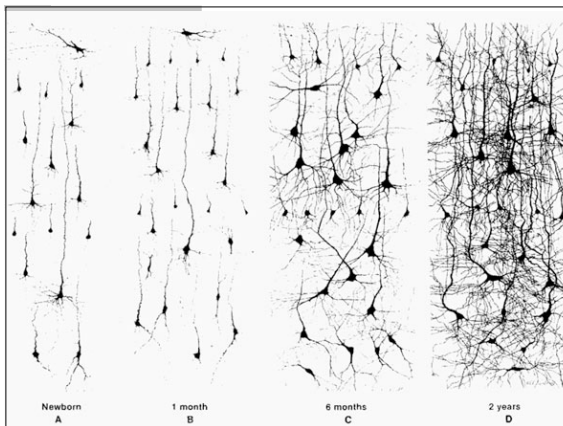


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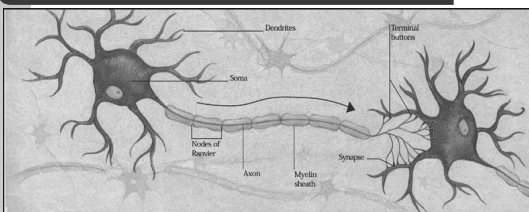
More Hope (and more importantly)

- Older adults can make new connections and rewire their brains.
- The organization and connections among neurons is more important than the number of neurons.
- What causes us to make and maintain connections among neurons?

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100 Billion Neurons with up to 20,000 Connections Each (in the cortex)



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Exercise is the Key

- Older adults can improve their memory ability with regular cognitive exercise.
- The “Use It or Lose It” theory is now widely accepted by scientists.
- The “Reserve Hypothesis” is consistent with the “Use It or Lose It” theory, in that increased neuronal connectivity will lead to better functioning.

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More Scientific Findings

- Stimulating jobs are associated with decreased likelihood of having memory problems
- Having complex and dense ideas early in life is associated with fewer memories problems later (nun study)
- Increased education is associated with a decreased likelihood of developing Alzheimer’s Disease.

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Recent Scientific Findings

- January, 2007 - People who know two or more languages develop Alzheimer’s, on average, 4.1 years later than people who only know one language. *Dr. Bialystock, York University*
- This finding provides further support for the Reserve Hypothesis.

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Recent Scientific Findings

- July, 2003 - "More education provides older adults with a reserve that allows them to function normally in the presence of a brain disease like Alzheimer's....However, because education is a lifelong process, it is possible that elderly people can delay or even prevent the onset of dementia by keeping their brains active." *Dr. Mortimer, Director of USF Institute of Aging*

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Recent Scientific Findings

- March, 2005 - Higher levels of education are associated with different cognitive courses in AD patients. More education is associated with a relative preservation of attention and verbal processes. *Le Carret et al., Universite Victor Segalen*

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Recent Scientific Findings

- January 2006 -- Reduced volume, or atrophy, in parts of the brain known as the amygdala and hippocampus may predict which cognitively healthy elderly people will develop dementia over a six-year period, according to a study in the January issue of *Archives of General Psychiatry* by Tom den Heijer et al.

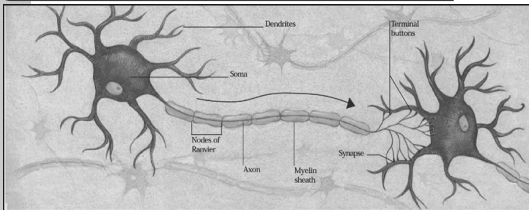
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Recent Scientific Findings

- March 2006 -- Stimulating experiences may be responsible for increasing the thickness of the myelin on neurons. Alexander et al., reported that electrical stimulation caused a cascade of events that led to the development of myelin around neurons.
- Why is this important?

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Myelin Increase the Speed and Efficiency of Neuronal Transmission



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4.5 Year Longitudinal Study Reported in JAMA 2002

- Wilson et al. (2002) collected baseline measures of cognitive activity on approximately 800 older adults, then they were retested after 4.5 years to see who developed AD. 111 were classified as probable or possible AD.

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4.5 Year Longitudinal Study Reported in JAMA 2002

- Wilson et al. (2002) ranked participants as a function of the number and frequency of cognitively stimulating activities at baseline.
- They reported that people at the 50-percentile range were 28% less likely to develop dementia than people at the 10-percentile range.
- People at the 90-percentile range were 47% less likely to develop dementia than people at the 10-percentile range.

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New England Journal of Medicine June, 2003

- Dr. Verghese and his colleagues at the Albert Einstein School of Medicine followed older adults for 21 years! The researchers measured the number of cognitively stimulating activities the participants did and whether or not they developed dementia.

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New England Journal of Medicine (June, 2003) Results

- The participants who did the most activities were 63% less likely to develop dementia, as compared to those who did the least.
- For every additional activity someone did on a weekly basis, there was a 7% reduction in the likelihood of developing dementia.

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Journal of Mental Health and Aging (2004)

- The results of the New England of Journal of Medicine article are consistent with the study we conducted at Western Oregon University. We assessed the effectiveness of a comprehensive group based memory enhancement program relative to a control group. This study didn't rely on previous cognitive ability because it was essentially an intervention.

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Participants:

- Attended 3 sessions per week in their community.
- Learned about the brain and memory.
- Engaged in challenging and fun activities.
- Exercised many different parts of their brain.
- Develop better social support networks.

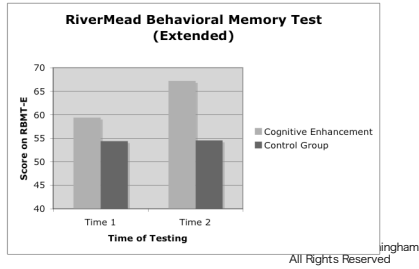
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Clinical Research

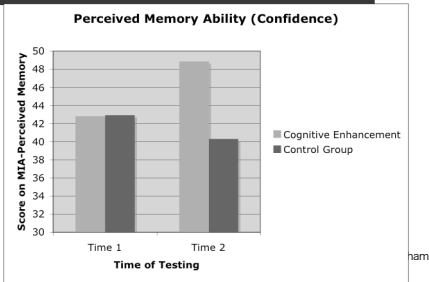
- Participants in 7 different facilities were tested on many different memory and mental tests. Then 1/2 of the participants engaged in the cognitive enhancement program and the other 1/2 (the control group) did not. Three months later all participants were retested on the same tests. Changes over the three months were analyzed.

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Memory Ability Increased after Three Months of Cognitive Enhancement Training



Cognitive Enhancement Training Led to an Increase in Perceived Memory Ability



Journal of Mental Health and Aging Conclusions

- Fall, 2003 -- "If older adults can maintain their cognitive ability, they will require less care and possibly delay or even eliminate the need to go to a nursing home. Cognitively stimulating activities may also postpone symptoms of dementia, which could also delay the need for more intensive care."

Dr. Winningham, Journal of Mental Health and Aging

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Cognitive Stimulation

- 1. Read a book
- 2. Order a subscription to a newspaper
- 3. Do crossword puzzles
- 4. Take a class at a senior center
- 5. Join a club or other organization
- 6. Visit with friends
- 7. Take a class at a community college

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Cognitive Stimulation

- 8. Go to a sporting event
- 9. Try to develop a new hobby
- 10. Take different routes to frequent destinations
- 11. Go to a different grocery store
- 12. Take a trip to a new place
- 13. Go dancing or take a dance class
- 14. Begin using email

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Cognitive Stimulation

- 15. Volunteer
- 16. Write a letter
- 17. Join a book club
- 18. Try learning a foreign language
- 19. Part time job
- 20. Gardening - consider becoming a master gardener
- 21. Read new magazines

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Cognitive Stimulation

- 22. Listen to the radio
- 23. Play (new?) board games
- 24. Visit museums
- 25. ElderHostel
- 26. Willamette University's Institute for Continued Learning
- 27. Oregon State University Academy Life Long Learners
- 28. Try using the bus
- 29. Cook new recipes
- 30. Sewing
- 31. Join a chorus or local orchestra

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Cognitive Stimulation

- 32. Buy furniture that needs assembly
- 33. Get involved in politics
- 34. Program your VCR and other electronic devices
- 35. Learn to juggle
- 36. Begin journaling
- 37. Complete Puzzles
- 38. Toastmasters

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Cognitive Stimulation

- 39. Attend medical lectures at hospitals
- 40. Knitting
- 41. Counted cross stitch embroidery
- 42. Try using the self-scan checkout at the grocery store
- 43. Participate in a play
- 44. Jigsaw puzzles
- 45. Volunteer at a church (e.g., teach Sunday school classes or organize volunteer efforts)

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Cognitive Stimulation

- 46. Thinking cards, mental fitness cards
800-327-4269
- 47. Daily Emails
 - Spanish Word of the Day <http://www.studyspanish.com/dailyword/>
 - Investors Terms of the Day <http://www.investorlossary.com/>
 - Health Tip of the Day http://www.realeye.com/news_features/tip.aspx
 - Health Tip of the Day/Dr. Weil <http://www.drweil.com/u/Home/index.html>
 - Jig saw puzzle http://daily.webshots.com/html/saw_jigsaw.html
 - Jig saw puzzle <http://www.jigsaw.com/>
 - Cross word puzzles
 - <http://www.bestcrosswords.com/bestcrosswords/Home.aspx>
 - Wordsmith - English Word of the Day
 - <http://www.wordsmith.org/>
 - Dictionary.com Word of the Day
 - <http://www.dictionary.com/wordoftheday/>

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Cognitive Stimulation

- 48. Sudoku

	2	3	
1			4
3			2
	1	4	

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Sudoku

1	6			5		
			9	1	4	
		4	5	7	3	
			8	7	3	
2	5			9	7	
	8	9	5			
9	4	5	8			
5	7	1				
	2			8	6	

© PUZZLES BY PARPOOM

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Cognitive Stimulation

- 49. Word Finds

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Constellations

Name _____

How many constellations can you find in the puzzle?

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H7DRAXKQMAWSQSPRSMFEB
LEDSAMPKXUQEQOUVUWQEI
NPTTQMEFTTBJJHNSHPSQCS
GLUVUTUNASUSIQUOUITIUQ
PDKNSQUCUCUUMURNTHTTP
UOLOAEEERTAIUNTRAAHAI
GCBUNPHIRSHAAAMANDOPU
UUCQMPHAAHPTTSTETTRTPS
GSRREBUONRITBVLNIAEIJ
HAKCQACCTNTASTETGCSLL
UECFANMCSAGMEBMECRLIB
SAZACACXGACONCELIBRANVZ
VUDSAAABSCAGACRHOVHTI
LUREASNPOCBPURNZVGBGAP
EELSNITTRRESEETZCOJATI
PREPAPOOSTIERCRSGOVRAJ
UFWZEMHRPMAIOSEAROIRQ
SWZORCATTEAOLDEUSNHE
HYLEKJUNMJJRJAUPRUBS
GEPPIPLLOCEANSTSEIOB
GLCVTRAGARSDWRUAUUCNGV
ZADFKKXTAURISAHDSQSVISA
    
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Andromeda	Coma	Crux	Pisces
Aquarius	Cygnus	Heracles	Puppis
Arcturus	Canis	Hydra	Sagittarius
Aries	Canis	Leo	Serpens
Auriga	Coma Berenices	Leo	Serpens
Bow	Coma Berenices	Libra	Taurus
Cancer	Corvus	Libra	Taugethus
Canis Minor	Cygnus	Oppidum	Ursa Major
Canis Major	Delphinus	Orion	Ursa Minor
Canis Minor	Draconis	Pegasus	Vela
Capricornus	Eridanus	Perseus	Virgo
Cassiopeia	Genius	Phoenix	Vulpecula

F. Zingales 2003 <http://www.cognet.net>

Winningham
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Cognitive Stimulation

"The enemy of mental vitality isn't growing older. The real enemy is the passivity that tends to creep up on us as we age. The fight is not with age--it is with boredom, with routine, with humdrum." (Chernow, 1997, p. 202)

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Exercise and Cognition

- Researchers have found a relationship between physical activity and cognitive ability.
- However, it should be noted that the literature is inconsistent on this issue.



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Exercise and Cognition

- Colcombe and Kramer (2003) reported the results of an 18-study meta-analysis on the effects of exercise on cognition.
- They found that, on average, exercise programs lead to a .5 standard deviation increase in cognitive abilities (e.g., I.Q. of 100 versus 108).

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Exercise and Cognition

- Colcombe and Kramer (2003) found that a number of variables are related to the amount of improvement associated with exercise, including
- Age [Older (66-70 or 71-80) > Younger (55-65)]
- Gender (F > M)
- Type of exercise (Aerobic + Strength > Aerobic)
- Length (6+ months > 5 or less months)

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Exercise and Cognition

- Kramer et al. (2001) found that participating in a six month walking program led to increased attention in 60-75 year old adults.
- Colcombe & Kramer (2003) found that executive functioning improved more than straight memory functioning.
- The ability to pay attention to relevant stimuli is correlated with cognitive ability in older adults. It appears that exercise affects this ability.

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Exercise and Cognition

- "One of the mechanisms by which physical activity may be beneficial for cognition is that physical activity stimulates trophic factors and neuronal growth, possibly providing reserve against later cognitive decline and dementia."
(Dik et al., 2003, p. 643)
- Physical exercise may also increase cerebral blood flow.

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Other Factors That May Negatively Affect Memory Ability

- Diet
 - Omega 3 fatty acids (myelin hypothesis, depression link)
 - Antioxidants (let's prevent neurons from being damaged)
- Stress
 - Telomere data
- Sleep Deprivation
- Minor Ischemic Strokes

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Other Factors That May Negatively Affect Memory Ability

- Anxiety
- Low Self Efficacy
- Obesity
- Diabetes
- Medications

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Summary

- Participation in cognitively stimulating activities is associated with decreased likelihood of developing dementia.
- Cognitively stimulating activities may delay the need for more intensive care (e.g., ALF, skilled nursing or nursing home).
- Proper food and exercise is good for the brain and memory.
- It is possible for ALFs, retirement communities, senior centers, home health care companies, and others to implement high quality cognitive enhancement programs.

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