



Honestly, Does Brain Training Really Work?

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Professor

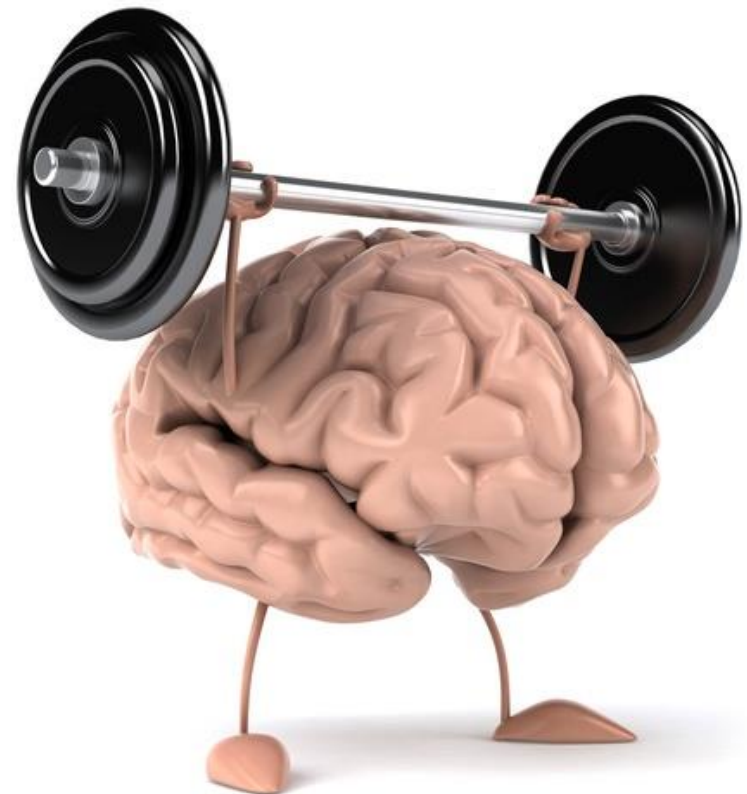
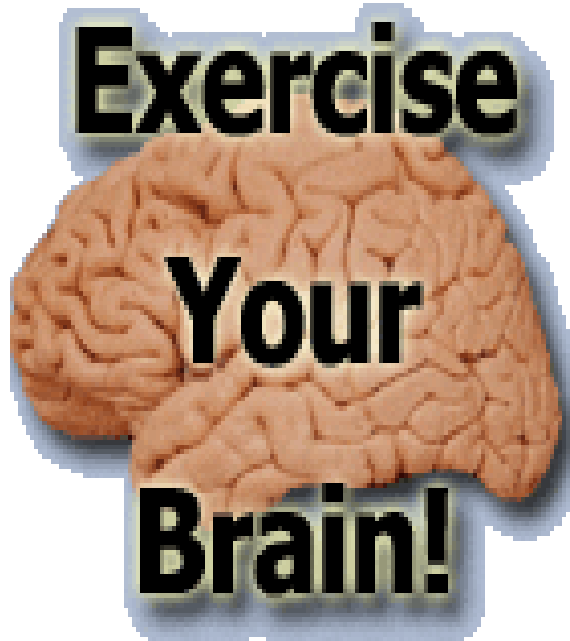
May 7, 2018



JOHNS HOPKINS
BLOOMBERG
SCHOOL of PUBLIC HEALTH



Getting Your Mental Exercise



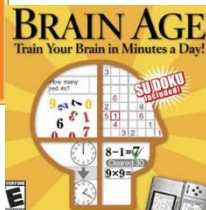
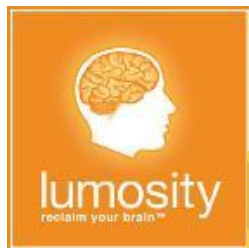
Does Brain Training Really Work?

It works! Or, at least I'll say it does as long as it makes me rich!

Seems to work, but definitely needs more investigation

Might work, just not convinced by the available evidence

No way, no how. Don't care what your study shows!



THE NEW YORKER

APRIL 5, 2013

BRAIN GAMES ARE BOGUS

BY GARETH COOK

Chein (2015). Getting Smart about Getting Smarter Conference

A Consensus on the Brain Training Industry from the Scientific Community



Max-Planck-Institut für Bildungsforschung
Max Planck Institute for Human Development



October 20, 2014

In summary: We object to the claim that brain games offer consumers a scientifically grounded avenue to reduce or reverse cognitive decline when there is no compelling scientific evidence to date that they do. The promise of a magic bullet detracts from the best evidence to date, which is that cognitive health in old age reflects the long-term effects of healthy, engaged lifestyles. In the judgment of the signatories, exaggerated and misleading claims exploit the anxiety of older adults about impending cognitive decline. We encourage continued careful research and validation in this field.

Why is Cognitive Training Important?

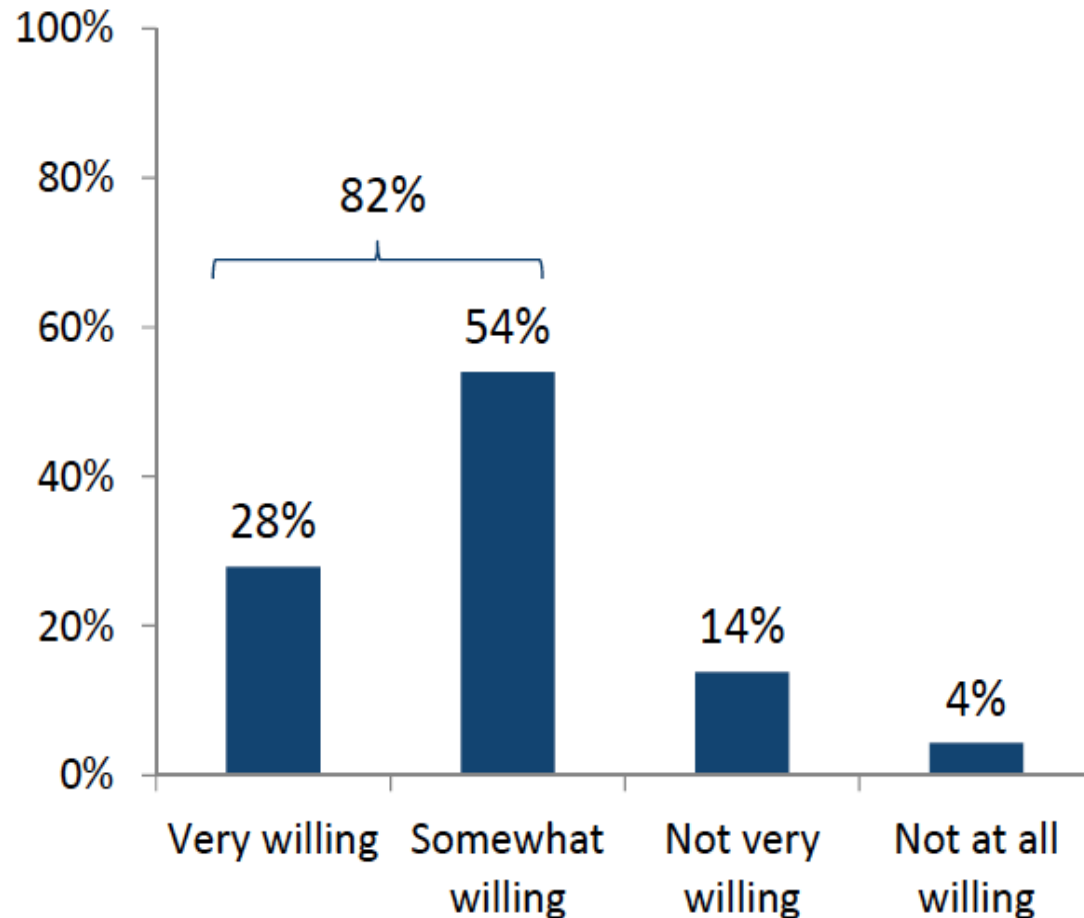


- 65+ population is growing rapidly
 - 20% of population (72 million) by 2030
- Cognitive decline is most feared aspect of growing older
- Drug trial results are disappointing
- Cognitive impairments heavily affect aging population
 - 1 in 4 adults 70 years or older have an impairment without dementia
 - About 5.3 million people in the U.S. have Alzheimer's disease

2017 AARP Cognitive Health and Brain Activity Survey

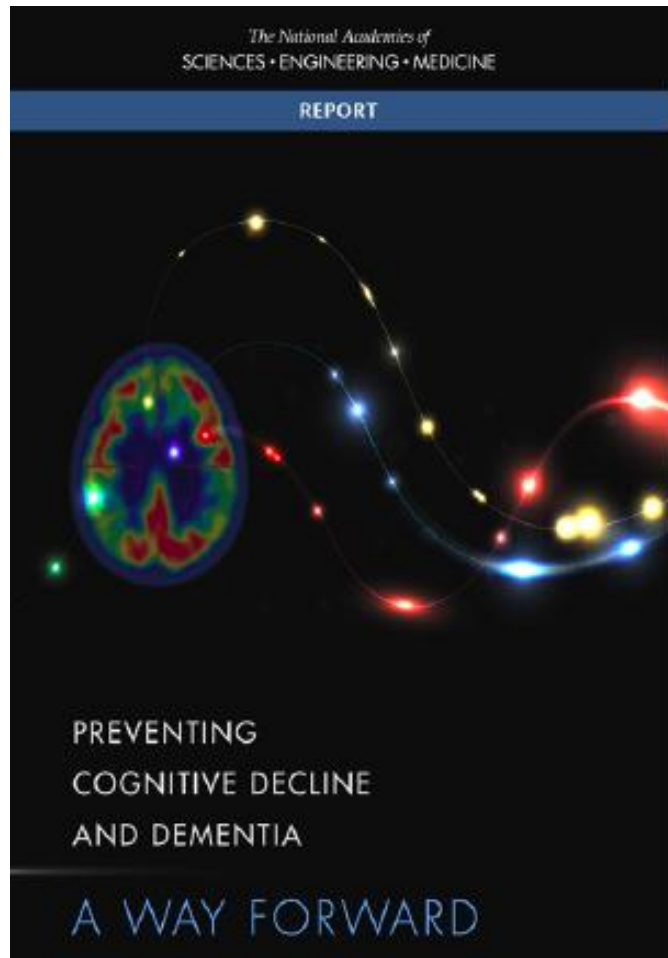


Willingness to engage in cognitive training	
Characteristic	% Willing
Women	85%
Men	78%
Age 40-49	85%
Age 50-59	84%
Age 60-69	80%
Age 70+	78%
Working	84%
Retired	78%



If you wanted to improve in a specific area related to your cognitive ability, how willing would you be to participate in cognitive training?

Evidence for Cognitive Training Benefits



Beneficial effects of three classes of interventions:

1. Cognitive Training
2. Blood Pressure Management
3. Increasing physical activity

Conclusion: Moderate strength evidence for cognitive training based largely on the ACTIVE Study

Evidence from the ACTIVE JOHNS HOPKINS MEDICINE

Trial

- ACTIVE - Advanced Cognitive Training for Independent and Vital Elderly
- Funded by the National Institute on Aging and National Institute of Nursing Research
- Over 2,800 adults aged 65+ recruited from 6 sites: Johns Hopkins, Penn State, Indiana University School of Medicine, Hebrew Senior Life/Harvard; Wayne State, University of Alabama, Birmingham

Exemplar: Memory Training

1 Lesson 2: Four Basic Principles of Memory – MOVA

Instruction #1:

Here are 12 words for finding meaningful categories.

Identify in your mind three categories under which all of these 12 words might fit.

Type the title of each category into the space provided.

Type each of the 12 words underneath the category title you think they belong to.

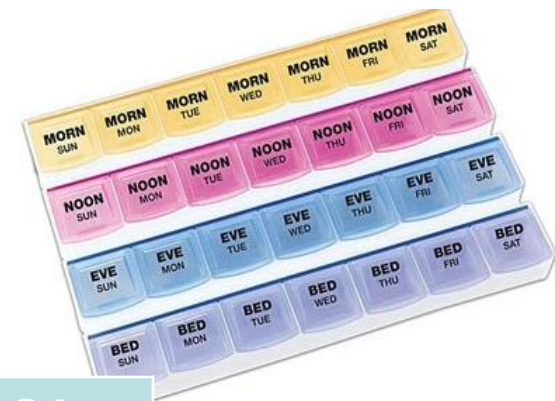
Remaining: 3:29

tennis copper melon pear			iron basketball bronze banana			bowling aluminum golf apple		
Category 1			Category 2			Category 3		
metal			sports			fruit		
Word List 1			Word List 2			Word List 3		
copper			tennis			apple		
iron			basketball			banana		
aluminum			golf					
bronze								
						I'm Done!		

Exemplar: Reasoning Training



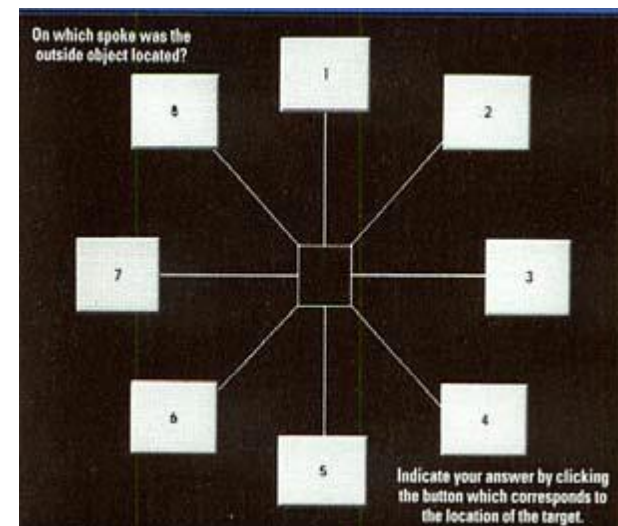
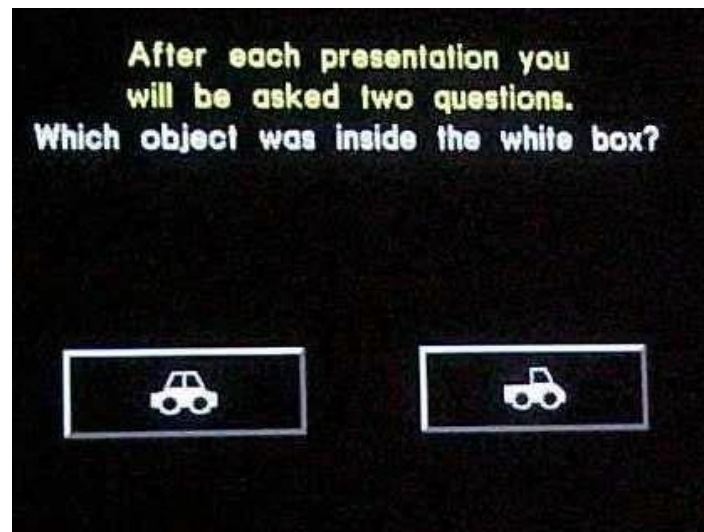
#8702451	Dr. Smith, R. S.
Jones, Bob	
Take 2 pills at bedtime	Refills: 1
Dekin - 20 mg (HOECHST)	15 Tablets



Time	SU	MO	TU	WE	TH	FR	SA
MORN	AA B	AAB	AAB	AAB	AAB	AAB	AAB
NOON							
EVE	AA	AA	AA	AA	AA	AA	AA
BED	CC	CC	CC	CC	CC	CC	CC

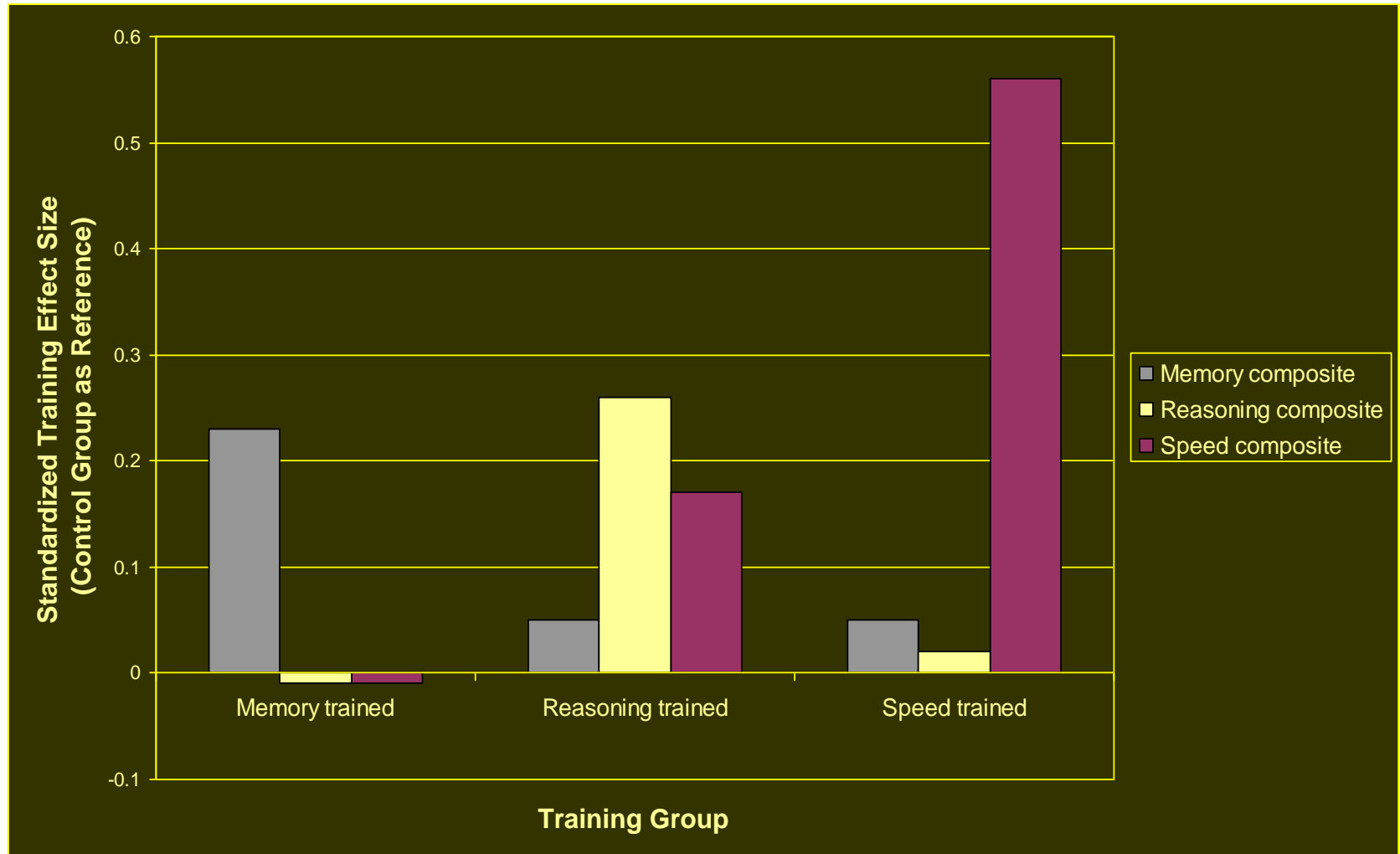
Exemplar: Speed of Processing Training

Welcome to UFOV® subtest 3
This test measures how fast you can divide your attention between two objects when the outside object is surrounded by clutter



Training Effects at 5 Years

JAMA, 2006



Why Did the ACTIVE Cognitive Training Work?

- In-person training with a certified instructor
- Group-based (3-5 persons/group)
- Active involvement in learning exercises
- Focus on real-life examples
- Emphasis on using trained strategies to solve everyday life problems
- Additional booster sessions beyond initial training
- Multiple practice opportunities

Many Unknowns

- No agreed-upon protocol for cognitive training, cf., physical exercise
 - How much training should be given?
 - How long should the training last?
 - How frequently should we train?
 - For whom does the training work best?
- Are we targeting the right cognitive abilities?
- Why so little generalization to everyday function?

So, Does Brain Training Work?



- Simple answer: YES. Numerous research trials show immediate benefit
- BUT questions remain about practical impact of benefits on everyday life tasks (such as medication management; health and financial decision making) and how long effects last
- Other questions: Does it have potential to “cure” or prevent Alzheimer’s disease or help dementia patients?