

Can you train your brain?

Melanie I Stefan, mstefan@exseed.ed.ac.uk

BMS3 Tutorial 4 (Neuro)

24 February 2016

Lumosity commercial



Lumosity commercial (quotes)



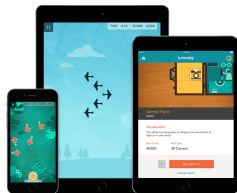
To be quicker
Just to stay sharp
To concentrate a little better
To remember people's names

It's like a personal trainer for your brain, improving your performance with the science of neuroplasticity, but in a way that just feels like games.

Can you train your brain?

Work alone or in groups (5 minutes)

- Do you think Lumosity works?
- Why or why not?
- What outcomes would you predict?
- What do they depend on?
- What else should be considered?



SHARE

REIGH LEBLANC/FICKR (CC BY-NC 2.0)



Brain game-maker fined \$2 million for Lumosity false advertising

By [Emily Underwood](#) | Jan. 5, 2016 , 5:00 PM

Lumos Labs, the company that produces the popular “brain-training” program Lumosity, **yesterday agreed to pay a \$2 million settlement** to the Federal Trade Commission (FTC) for running deceptive advertisements. Lumos had claimed that its online games can help users perform better at work and in school, and stave off cognitive deficits associated with serious diseases such as Alzheimer’s, traumatic brain injury, and post-traumatic stress.

The \$2 million settlement will be used to compensate Lumosity consumers who were misled by false advertising, says Michelle Rusk, a spokesperson with FTC in Washington, D.C. The company will also be required to provide an easy way to cancel autorenewal billing for the

What does the science say?

Questions

What does the science say?

Questions

- Does cognitive activity correlate with better cognitive outcomes?

What does the science say?

Questions

- Does cognitive activity correlate with better cognitive outcomes?
- Is there a biological mechanism for that?

What does the science say?

Questions

- Does cognitive activity correlate with better cognitive outcomes?
- Is there a biological mechanism for that?
- Do targeted brain training exercises work?

What does the science say?

Questions

- Does cognitive activity correlate with better cognitive outcomes?
- Is there a biological mechanism for that?
- Do targeted brain training exercises work?
- What aspects of brain function can be trained?

What does the science say?

Questions

- Does cognitive activity correlate with better cognitive outcomes?
- Is there a biological mechanism for that?
- Do targeted brain training exercises work?
- What aspects of brain function can be trained?
- Do the brain training exercises provided by Lumosity work?

What does the science say?

Questions

- Does cognitive activity correlate with better cognitive outcomes?
- Is there a biological mechanism for that?
- Do targeted brain training exercises work?
- What aspects of brain function can be trained?
- Do the brain training exercises provided by Lumosity work?
- Does improvement in brain training games translate to improvements in daily-life cognitive tasks?

What does the science say?

Questions

- Does cognitive activity correlate with better cognitive outcomes?
- Is there a biological mechanism for that?
- Do targeted brain training exercises work?
- What aspects of brain function can be trained?
- Do the brain training exercises provided by Lumosity work?
- Does improvement in brain training games translate to improvements in daily-life cognitive tasks?
- What else can we learn from brain training data?

Your task for Tutorial 5

- Work in groups of 2 or 3*
- Present a paper* on brain training (journal club style)
- 5 min/student in groups of 2
4 min/student in groups of 3
- See guidance notes for details



**assigned by your tutor*

What to think about when presenting a paper

What to think about when presenting a paper

- 1 The question
- 2 The background to appreciate why the question is interesting
- 3 The experimental approach to answering the question
- 4 The assays and controls
- 5 What the results were
- 6 What the results mean
- 7 Relate the results back to the original question
- 8 Your review/critique
- 9 Summary and further directions



NIH Public Access

Author Manuscript

Arch Neurol. Author manuscript; available in PMC 2013 August 20.

Published in final edited form as:

Arch Neurol. 2012 May ; 69(5): 623–629. doi:10.1001/archneurol.2011.2748.

Association of Lifetime Cognitive Engagement and Low β -Amyloid Deposition

Dr. Susan M. Landau, PhD, Mr. Shawn M. Marks, BS, Dr. Elizabeth C. Mormino, PhD, Dr. Gil D. Rabinovici, MD, Dr. Hwamee Oh, PhD, Dr. James P. O'Neil, PhD, Dr. Robert S. Wilson, PhD, and Dr. William J. Jagust, MD

Helen Wills Neuroscience Institute (Drs Landau, Mormino, Rabinovici, Oh, and Jagust and Mr Marks) and School of Public Health (Dr Jagust), University of California, Berkeley, and Life Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California (Drs Landau, Rabinovici, O'Neil, and Jagust); Memory and Aging Center and Department of Neurology, University of California, San Francisco (Dr Rabinovici); and Rush Alzheimer's Disease Center, Rush University Medical Center, Chicago, Illinois (Dr Wilson)



HHS Public Access

Author manuscript

J Am Geriatr Soc. Author manuscript; available in PMC 2014 June 12.

Published in final edited form as:

J Am Geriatr Soc. 2014 January ; 62(1): 16–24. doi:10.1111/jgs.12607.

Ten-Year Effects of the ACTIVE Cognitive Training Trial on Cognition and Everyday Functioning in Older Adults

Dr. George W. Rebok, PhD [Professor],

Department of Mental Health and Johns Hopkins Center on Aging and Health, Johns Hopkins University, Hampton House 891, 624 North Broadway, Baltimore, MD 21205

Dr. Karlene Ball, PhD [Professor] [Chair],



The largest human cognitive performance dataset reveals insights into the effects of lifestyle factors and aging

Daniel A. Sternberg^{1*}, Kacey Ballard¹, Joseph L. Hardy¹, Benjamin Katz², P. Murali Doraiswamy³ and Michael Scanlon¹

¹ Lumos Labs Inc., San Francisco, CA, USA

² Combined Program in Education and Psychology, University of Michigan, Ann Arbor, MI, USA

³ Department of Psychiatry and Duke Institute for Brain Sciences, Duke University, Durham, NC, USA

Plasticity of Attentional Functions in Older Adults after Non-Action Video Game Training: A Randomized Controlled Trial

Julia Mayas¹, Fabrice B. R. Parmentier^{2,3,4}, Pilar Andrés^{2,3}, Soledad Ballesteros^{1*}

¹ Studies on Aging and Neurodegenerative Diseases Research Group, Department of Basic Psychology II, Universidad Nacional de Educación a Distancia, Madrid, Spain,

² Neuropsychology and Cognition Group, Department of Psychology and Institute of Health Sciences (IUNICS), University of the Balearic Islands, Mallorca, Spain,

³ Instituto de Investigación Sanitaria de Palma (IdISPa), Mallorca, Spain, ⁴ School of Psychology, University of Western Australia, Perth, Australia

Journal of Experimental Psychology: General
2013, Vol. 142, No. 2, 359–379

© 2012 American Psychological Association
0096-3445/13/\$12.00 DOI: 10.1037/a0029082

No Evidence of Intelligence Improvement After Working Memory Training: A Randomized, Placebo-Controlled Study

Thomas S. Redick, Zach Shipstead,
Tyler L. Harrison, and Kenny L. Hicks
Georgia Institute of Technology

David E. Fried and David Z. Hambrick
Michigan State University

Michael J. Kane
University of North Carolina Greensboro

Randall W. Engle
Georgia Institute of Technology