

Strategies for Parents, Educators and Advocates: Verifying Working Memory and Brain Training Claims

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A working memory/brain training provider may say:	A parent/advocate/educator might respond:	Research Conclusions and/or Recommendations
Our program is based on the latest scientific research.	May I see a peer-reviewed study regarding the <u>results of your specific program</u> ? Has this study been replicated?	Peer Review: “Have findings supporting this method been published in recognized scientific journals that use peer review procedures? The answer to this question will almost always separate pseudoscientific claims from the real thing.... (Stanovich, p.7) “ ¹ “...providers of commercial products are not subject to peer review and can thus present results selectively, advertise through insinuation or make unsubstantiated claims.” ² (Shipstead)
In 3-6 months, “students... average more than 3.6-year gains in cognitive skills and exceed 4 years in reading”. (LearningRx) ³ Our program “has been shown to improve learning outcomes such as reading comprehension and mathematic ability.”(Cogmed, p.22) ⁵ (Cogmed) ¹²	Do you have peer-reviewed evidence of this?	“... games may yield improvements in the task being trained, but this does not transfer to skills like the ability to read or do arithmetic....or to other measures of intelligence.” (Cook) ⁴ “... there have been few studies to utilize academic outcome measures... <u>it is imperative that more data on reading and math outcomes be published before they are included in this analysis</u> ” (Cogmed, p. 35) ⁵ “CWMT (Cogmed Working Memory Training) does not appear to foster treatment generalization to other domains of functioning. As such, CWMT should not be considered a viable treatment for children with ADHD.”(Chacko) ⁶ “Reading, spelling, comprehension or mathematics scores...showed no response to training.” (Gathercole) ⁶
"Inattention is... is a cognitive skill weakness that can be identified and corrected." LearningRx) ⁷	Do you have peer-reviewed evidence of this?	“Collectively, meta-analytic results indicate that claims regarding the academic, behavioral, and cognitive benefits of cognitive training programs are unsupported in ADHD.” (Rapport) ⁸
In our 12 week brain training program, your child will make amazing gains on the posttest.	Will same test be used for pre- & post-testing? How much time between pre-test & posttest? Perhaps student gains were a result of practice effects.	“Practice effects” refer to gains in scores on cognitive tests that occur when a person is <u>retested on the same instrument</u> (rather than an alternate form)... These gains... do not reflect growth or other improvement on the skills being assessed.” (Kaufman) ⁹ “Organizations may be able to minimize practice effects due to memory by using <u>a minimum retest interval of at least one year</u> ” (not 12 weeks). ¹⁰ (Hausknech)

Our staff will evaluate your child.	What training has your staff had in administering cognitive tests?	“Graduate-level training in cognitive ability assessment and a background in diagnostic decision-making are requisite.” ¹¹
“in a one-year follow-up study, 98.7% of the skills trained were equal or greater than at the completion of the training.” (LearningRx) ³ “...working memory training makes permanent changes to the brain.” (Cogmed) ¹²	Was this a peer-reviewed study? Brain training gains are not permanent.	The FTC has charged that Focus Education and its officers violated the FTC Act by making false or unsubstantiated claims that the ifocus System permanently improves children’s focus, memory, attention, behavior, and/or school performance, including in children with ADHD. The company also allegedly falsely claimed that these benefits were scientifically proven.” ¹³
On our website, you can read many testimonials regarding the amazing results of our brain training program.	May I see a peer-reviewed study of your training results? Has it been replicated?	“...one source of evidence that should not persuade you is testimonials (anecdotal reports) – that is, first-person accounts from people who have used the product and swear that it helped.” (Willingham) ¹⁴
“...we conclude that it is possible to improve Gf (fluid intelligence)....” (Jaeggi 2008) ¹⁵ Brain training will make your child smarter. “The average gain on I.Q. is 15 points after 24 weeks of training....” (LearningRx) ¹⁸	The Jaeggi study has not been replicated. May I see peer-reviewed studies of your results? It’s my understanding that reading itself increases verbal intelligence.	“The Web site PsychFileDrawer.org , which was founded as an archive for failed replication attempts in psychological research, maintains a Top 20 list of studies that its users would like to see replicated. The Jaeggi study is currently No. 1.” ¹⁶ “...there was no positive transfer to any of the cognitive ability tests. (Redick) ¹⁷ “Those who read a lot will enhance their verbal intelligence; that is, reading will make them smarter!” (Cunningham and Stanovich) ¹⁹
Brain training games are fun!	Researchers say “Brain training is hard and really frustrating!”	“That’s the biggest challenge we have as researchers in this field - to get people engaged and motivated to play our working-memory game and to really stick with it. Some people say it’s hard and really frustrating and really challenging and tiring.” (Hurley) ²⁰
Schools should provide working memory training to students.	Schools are required by federal law to use research based interventions.	“The most accurate description of the state of WM training is that the techniques remain a work in progress.” (Shipstead) ²¹ “Congress clarified that IEPs must include research-based methodologyIDEA 2004 creates new requirements for schools to use scientific research based instructional practices and interventions that are based on accepted, peer-reviewed research....” (IDEA 2004, Section 1414(d)(1)(A) (Steedman) ²²

1. Stanovich & Stanovich (2003) Using Research and Reason in Education: How Teachers Can Use Scientifically Based Research to Make Curricular and Instructional Decisions http://lincs.ed.gov/publications/pdf/Stanovich_Color.pdf
2. Shipstead (Sept 2012) Working Memory Remains a Work in Progress. *Journal of Applied Research in Memory and Cognition*, 1 (3) (p .217) <http://www.sciencedirect.com/science/article/pii/S2211368112000757>
3. LearningRx. How does LearningRx rate on the seven questions? <http://www.learningrx.com/child-learning-centers-faq.htm>
4. Cook G. (2013) Brain Games are Bogus <http://www.newyorker.com/online/blogs/elements/2013/04/brain-games-are-bogus.html>
5. Ralph, K. COGMED RESEARCH CLAIMS & EVIDENCE: Cogmed Working Memory Training (Version 2.0, page 35) <http://www.cogmed.com/research>
6. Chacko A., et.al. (2014) A randomized clinical trial of Cogmed Working Memory Training in school-age children with ADHD: a replication in a diverse sample using a control condition. <http://www.ncbi.nlm.nih.gov/pubmed/24117656>
Gathercole, S. (2014) Commentary: Working memory training nd ADHD – where does its potential lie? Reflections on Chacko et. Al. (2014) <http://www.ncbi.nlm.nih.gov/pubmed/24438534>
7. Attention Issues in Children <http://www.learningrx.com/attention-issues-in-children.htm>
8. Rapport, M (2014) Do programs designed to train working memory, other executive functions, and attention benefit children with ADHD? A meta-analytic review of cognitive, academic, and behavioral outcomes <http://www.gwern.net/docs/dnb/2013-rapport.pdf>
9. Kaufman, A.S. (2003) Practice Effects <http://www.speechandlanguage.com/clinical-cafe/practice-effects>
10. Hausknech, J.P.(2006) Retesting in Selection: A Meta-Analysis of Practice Effects for Tests of Cognitive Ability <http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1012&context=articles> (p.29)
11. Woodcock-Johnson® III Tests of Cognitive Abilities. Examiner Qualifications <http://www.riversidepublishing.com/products/wjIII Achievement/pdf/CogQuals.pdf>

12. Programming Children for Success – Computerized Training Can Improve Brain Function
<http://www.cogmed.com/programming-children-for-success-%E2%80%93-computerized-training-can-improve-brain-function-2>
13. The Federal Trade Commission orders Focus Education to stop making unsubstantiated brain training claims
<http://sharpbrains.com/blog/2015/01/22/the-federal-trade-commission-orders-focus-education-to-stop-making-unsubstantiated-brain-training-claims/>
14. Willingham, D.T. (2012) *When Can You Trust the Experts: How to Tell Good Science from Bad in Education*. San Francisco: Jossey-Bass. (p. 194)
15. Jaeggi, S.M., Buschkuhl, M., Jonies, J., & Perrig, W.J. (2008). Improving fluid intelligence with training on working memory. *Proceedings of the National Academy of Sciences of the United States of America* 105 (19), 6829–6833. doi: 10.1073/pnas.08012810.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2383929/>
16. PsychFileDrawer. Top 20 List of Studies Users Would Like to See Replicated <http://www.psychfiledrawer.org/top-20/>
17. Redick, et.al. (June 2012) No Evidence of Intelligence Improvement After Working Memory Training: A Randomized, Placebo-Controlled Study
<http://psycnet.apa.org/index.cfm?fa=buy.optionToBuy&id=2012-16236-001>
18. Hurley, D, (2012, October 31). The Brain Trainers. *The New York Times*.
<http://www.nytimes.com/2012/11/04/education/edlife/a-new-kind-of-tutoring-aims-to-make-students-smarter.html?pagewanted=all>
19. Cunningham and Stanovich (2001) What Reading Does for the Mind. *Journal of Direct Instruction*
http://www.csun.edu/~krowlands/Content/Academic_Resources/Reading/Useful%20Articles/Cunningham-What%20Reading%20Does%20for%20the%20Mind.pdf
20. Hurley D. Can You Make Yourself Smarter? <http://www.nytimes.com/2012/04/22/magazine/can-you-make-yourself-smarter.html?pagewanted=all>
21. Shipstead, Z. et.al. (2012) Working memory training remains a work in progress. *Journal of Applied Research in Memory and Cognition*, 1 (3)
<http://www.sciencedirect.com/science/article/pii/S2211368112000757>
22. Steedman, W. (2008). 10 Tips: How to Use IDEA 2004 to Improve Your Child's Special Education
<http://www.wrightslaw.com/idea/art/10.tips.steedman.htm#3>