

EDITORIAL

A 109-Year-Old Pastime Beats a High-Tech Teenager

Patrick Merrell¹

Surprise! According to findings in the article entitled “Computerized Games versus Crosswords Training in Mild Cognitive Impairment,” now published in *NEJM Evidence*,¹ solving crosswords had a more beneficial effect on older adults with mild cognitive impairment (MCI) than training with an array of Web-based brain games. The researchers had hypothesized just the opposite outcome, in part, on the basis of the findings of a 2015 study² involving cognitively intact participants of a greater age range (18–80 years of age in the earlier study vs. 55–95 years of age in the current study). Lumosity Labs, creator of the Lumosity brain game website, funded the earlier research. It also provided the brain games and electronic crosswords for both studies.

The conclusion that crossword puzzles had a positive cognitive effect in the current report¹ is not a surprise to me. I know crosswords well. I’ve written 2000 of them over the past 22 years, the majority for the *New York Times* and *People* magazine (and one — so far — for *NEJM Evidence*) (Fig. 1). I’ve also created thousands of other word, visual, and logic puzzles, for both children and adults.

Puzzles are problems designed to be solved. They provide a bit of entertainment and make us feel smart in cracking them, although the level of challenge and engagement can vary widely. At the less taxing end are word search puzzles and mazes. Not much brainwork is needed to solve them. Crossword puzzles are at the opposite extreme.

I rate crosswords so highly because they offer such a rich experience. Vocabulary, lateral thinking, reading, spelling, recall, wordplay, humor, and a wide range of classic and current facts all come into play. Crossword solving also involves decoding skills, including being able to see word possibilities with only a few letters in place.

Lumosity’s online brain games focus on specific skills, testing and training participants to complete narrowly defined tasks. Attractive graphics appear one after the other, or in continuous motion, and must be dealt with quickly. For example, “Train of Thought” has a series of tracks and switches, the goal being to route each train into a barn of the same color. Altogether, 18 game modules were used in the study,¹ offering a variety of challenges that reward greater accuracy and faster performance with higher scores.

So, what accounts for the success of crosswords in the current study¹ and for brain games previously?² I’ll get to that in a moment but first a brief story.

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From Here to There
by Patrick Merrell

Solve the crossword as usual, using the clues below. (The extra numbers in the grid are for use in the next step.)

As you write letters in the grid, transfer them to the same-numbered blanks in the tinted box.

The filled-in blanks (an anagram of the letters in the grid) will reveal ... well, you'll see.

1	2	3		4	5	6
7	8	9		10	11	12
		13	14	15		
16	17	18		19	20	21
22	23	24		25	26	27

—		—		—			
21	24	8					
—							
17	9	26	11	5	14	22	
—							
4	27	10	6	20	13	1	
—							
—		—					
7	16						
—							
12	25	23	15	19	3	18	2

ACROSS

1 Hula loop
4 Bell ___ (container designed to hold next to nothing)
7 Possess
10 Einstein's German birthplace
13 *Star Wars* nickname hidden in the word "cranium"
16 Boggy lowland

DOWN

1 Behold! The first message to travel across ARPANET, forerunner of the internet
2 "Ick!"
3 Mindless

19 Channel whose chief medical correspondent is Dr. Sanjay Gupta
22 U.S. pres. when Sputnik was launched
25 Id's counterpart

4 Electricity, slangily
5 Chemical symbol for 96% of the metal in a soda can
6 Apt. part
16 Town org. with axes and helmets
17 Sheeran or Asner
20 *Little Fires Everywhere* author Celeste
21 Is the answer to this clue "yes"?

Figure 1. Crossword.

In 2001, I underwent intensive chemotherapy and, by the end of it, I'd developed a good case of what's called "chemo brain." I had trouble following telephone conversations, and multi-step tasks were challenging. A few months earlier, I'd been a strong crossword solver, but I found myself unable to finish anything beyond an easy puzzle.

Chemo brain is common, typically lasting 9 to 12 months, sometimes less, other times years. My approach in trying to reverse it was far from common, though. Determined to prove I still had it, I went into writing crosswords with a vengeance. Puzzle writing is a consuming mental workout, like puzzle solving on steroids — and it seemed to do the trick. Several months later, my brain fog had completely lifted and, as a bonus, I'd come up with four good crosswords, three of which I sold to the *New York Times*.

Did crosswords make a difference in my recovery or in speeding it along? Who knows, but it sure felt that way to me. And it's because of that that I'm particularly interested in what this latest research suggests.

Looking at the data from the current study,¹ crosswords had a beneficial effect by nearly every measure. And by every measure, crosswords performed better than the brain games. That's quite an outcome when you consider that crosswords were intended to be a baseline against

which the brain games would be judged. The supporting actor upstaged the star!

I kept wishing a control group had been involved, receiving neither brain games nor crosswords. As there wasn't one, we can only compare the two activities against each other, and it can be a bit misleading. For example, at the end of the 78-week study, Alzheimer's Disease Assessment Scale-Cognitive subscale scores were 0.4 point worse for brain game players compared with baseline, and 0.98 point better for crossword solvers, a difference of 1.38. But how would a control group have scored? Let's say that group's score had worsened by one point, a modest prediction. Judged against that, brain games would have helped slightly in limiting cognitive decline, improving scores by 0.6 point. Crosswords would do even better, notching a gain of 1.98 points, three times that of brain games.

Finally, let's look at that 10-week 2015 study,² the results of which were reanalyzed in a 2021 peer-reviewed publication.³ The age range was broad (participants were 18-80 years of age), and they were all cognitively intact. Either of those factors could be important, but there are two issues with the study that stand out. First is the risk of inadvertent experimenter or publication bias. Lumos Labs not only funded the project, but its stock-holding employees designed and implemented the study. Other employees offered input, including

with the published manuscript. Second, 52.5% of the original 9919 participants were not included in the final results; 49.1% of them dropped out along the way. Were those people who were lost to follow-up doing well with the brain games, or were they struggling and/or uninterested, which might have affected the results? We just don't know.

This is important work that could result in quality-of-life improvements for many people. Several intriguing questions have been raised by the current study,¹ and I wonder if additional research focusing solely on crosswords, as well as a few other types of word puzzles, might show that they can strengthen our minds.

Disclosures

Author disclosures are available at evidence.nejm.org.

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¹ Patrick Merrell is a freelance puzzle maker, graphic artist, writer, illustrator, cartoonist (including as one of MAD magazine's "Usual Gang of Idiots"), and photographer — all in about equal doses.

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