

What Cognitive Training Does and Does Not Improve: The Evidence on Transfer — summary

An evidence synthesis · Holistic Quality LLC

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How this was produced. AI-assisted literature review and drafting, then **human-verified** — every figure and conclusion was checked against a fetched primary or authoritative source (peer-reviewed journals via PubMed/PMC and publishers; the FTC's own records; the 2014 scientific statements) by independent per-claim verifiers that asserted nothing from memory. Where the evidence is contested, that is stated.

The bottom line

Cognitive-training games reliably make you better at **the tasks you practice**. Whether that improvement **transfers** to general, everyday cognition — memory, reasoning, "brain fitness" — is a much weaker claim, and the evidence divides sharply along that line. The distinction is between **near transfer** (gains on the trained task and close variants — reasonably supported) and **far transfer** (gains in general intelligence or real-world functioning — weak, inconsistent, and in the strongest tests absent). The largest test found trained-task gains but **no transfer** to untrained cognition; the authoritative consensus review found "little evidence" of everyday-cognition benefit; and in 2016 the U.S. Federal Trade Commission settled deceptive-advertising charges against Lumosity for exactly this overreach. The honest frame is **contested, asymmetrically**: near transfer is supported; broad far transfer is not. A faithful compression of the [full evidence review](#).

1. The question is transfer, not practice

No one disputes that practicing a task improves performance on that task. The interesting claim is **transfer** — that training on games improves *general* cognition in a way that shows up in daily life. Cognitive scientists grade transfer by distance: **near transfer** (the trained task and close variants — supported) versus **far transfer** (distant tasks, general intelligence, everyday functioning — weak). Reading the evidence without that distinction is how "you got better at the game" becomes, in marketing, "you got smarter." [2]

2. The large-scale test and the consensus reviews

The single largest test (Owen et al., *Nature*, 2010) was a six-week online randomized study: of **52,617 who registered, 11,430 completed** enough to be analyzed. Improvements on the trained tasks were **large**, but there was **"no evidence... for transfer effects to untrained tasks, even when those tasks were cognitively closely related"** — the trained groups did no better on general-cognition benchmarks than an active control that only answered trivia. [1]

The authoritative consensus review (Simons et al., *Psychological Science in the Public Interest*, 2016) examined the very studies the brain-training companies cite as their best evidence and concluded there is **"extensive evidence that brain-training interventions improve performance on the trained tasks, less evidence... on closely related tasks, and little evidence that training... improves everyday cognitive performance"** — and that many cited studies had major design flaws (missing/passive controls, no correction for expectancy). [2] Two meta-analyses of working-memory training (Melby-Lervåg and colleagues, 2013 and 2016) agree: reliable short-term gains on working-memory measures (effect size ≈ 0.28 – 0.31) but **no convincing far transfer** to intelligence, reading, or arithmetic against active controls (≈ 0.05 – 0.06), with the apparent far-transfer signal traceable to weak control designs. [3][4]

3. A contested field, and a regulatory line

The field is genuinely contested. In 2014 roughly seventy scientists (Stanford Center on Longevity + Max Planck Institute) objected that there is **"no compelling scientific evidence"** that brain games reduce or reverse cognitive decline; a larger, industry-associated group responded that evidence does show generalizable benefits and disputed the "consensus" label. [5][6] The two dueling statements establish that the science is contested — and that "scientific consensus supports brain training" is not a defensible claim.

The dispute has a legal boundary. In January 2016 the FTC settled deceptive-advertising charges against Lumosity's maker — a **\$50 million judgment, suspended after a \$2 million payment** — over claims that training improves school/work/everyday performance, delays age-related decline, and protects against dementia and Alzheimer's, "and that scientific studies proved these benefits." The company, the FTC said, "simply did not have the science to back up its ads," and the order requires **competent, reliable scientific evidence before** any such future claim. [7]

4. What genuinely works — with limits

The skeptical case is not that training does nothing; it is that the benefits are **narrower** than the marketing. Near transfer is real (practice improves the trained and near tasks). [2][4] The strongest positive RCT evidence — the ACTIVE trial ($N = 2,832$ older adults; Ball et al. 2002; Rebok et al. 2014) — found **durable but largely domain-specific** gains: each training arm

improved its own targeted ability (reasoning and speed persisting to ten years), with **no objective everyday-function benefit at two years** and only a self-reported one at ten. That is real evidence of trained-ability-specific improvement in a defined population — **not** broad far transfer. A downstream claim that speed training lowers dementia risk (Edwards et al. 2017) is **statistically fragile and contested** (borderline significance, vendor-conflicted authorship) and does not license a prevention claim. [8][9][10]

One caveat sits underneath all of it: because **simply retaking a cognitive test raises the score** (a retest gain of about $d \approx 0.26$; Hausknecht et al. 2007), an uncontrolled before/after "improvement" is not, by itself, evidence of a cognitive gain — it must be netted against a control group or alternate test forms. [11]

5. What the evidence supports — and what it does not

Supported: practice reliably improves the **trained task and near variants**; specific structured training produces **durable, domain-specific** gains in **defined populations** (ACTIVE, older adults). **Not supported:** that cognitive-training games improve **general intelligence, everyday cognition, or real-world performance** (far transfer). **Contested / not established:** that training **prevents or delays cognitive decline, dementia, or Alzheimer's** — the exact class the FTC found unsubstantiated. The defensible synthesis: cognitive training **works for what you train, in the population and ability trained, and does not reliably generalize beyond it.**

How to cite

This page is the **summary brief**. The citable version of record is the **full evidence review** — please cite that:

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The full report — with the complete reference set and disclosures — is at holisticquality.io/research/cognitive-training-efficacy-full.

References

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All citations independently verified against their published sources (fetch-no-memory, 2026-07-04). Near-transfer gains are established; far transfer to general cognition is not. Decline-prevention statements reflect the cited source's own language and, where noted, are contested.

Disclosures

Competing interests. The author is the founder and principal of Holistic Quality LLC, the commercial publisher of this brief, which develops regulator-facing safety-data and compliance products; a sibling property (the Institute for Cognitive Sovereignty) and a planned cognitive-training surface may cite this work. Because this synthesis defines the evidentiary boundary for a product line the author has an interest in, the competing interest is direct and material. To mitigate it, every claim and citation was independently source-verified fetch-no-memory, the limits of the evidence are stated throughout, the supportive evidence is bounded rather than overstated and the unsupported claims are represented as unsupported, and the author retained sole editorial control. **Funding:** none (self-funded). **Data availability:** synthesis of published and public regulatory data; no new data. **AI use:** AI-assisted review/drafting, human-verified; the named author is responsible for all content. **ORCID:** 0009-0005-6946-3569. **Peer-review status:** self-published working paper; not peer-reviewed. Full disclosures are in the [full report](#).