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Response to Dr. Edward Ratner et al.

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Drs. Ratner and Atkinson provide a thoughtful critique of popular claims about commercial “brain games” but miss some important points.

There are more than 51 CCT RCTs, yet undue emphasis is placed on one trial. ACTIVE is presented to illustrate that single-domain training tends not to transfer to other domains. Fortunately, multiple clinical-grade CCT programs offer dozens of exercises that cover all the cognitive domains affected in aging and can customize training to suit individual performance. We have recently shown that such a multidomain approach is effective for global cognition.¹ ACTIVE demonstrated that training supports daily function over the long term in healthy elderly adults,² this result is not cited in their discussion of limited transfer to function. Two major criticisms of CCT, that effects wane after stopping intervention and lack of functional effects due to the current inability to measure improved function in nonimpaired individuals, equally apply to other medical interventions.

The idea that CCT should somehow modify Alzheimer’s pathology is a red herring. This is not the mechanism of scientific interest because there is no consistent postmortem evidence that an active cognitive, physical, or social lifestyle is linked to amyloid plaques or neurofibrillary tangles.³ Rather, research suggests that patterns of mental activity have a fundamental influence on the relationship between Alzheimer’s pathology and clinical dementia.³ Furthermore, the therapeutic value should not be reduced to merely biomarkers of Alzheimer’s pathology, because many different classes of pathology can lead to dementia.

It is likely that neural compensation is a more-salient mechanism. Compensatory neural networks can substan-

tially influence cognitive function in late life and may mask clinical manifestation of neurodegenerative disease.⁴ It is therefore encouraging that task-dependent brain activation, resting-state networks, and fluorodeoxyglucose uptake are responsive to cognitive training.⁵ Although nascent, this evidence clearly shows that cognitive training can lead to detectable brain changes, in some cases with therapeutic benefits for cognition.

Finally, appealing to the wisdom of a scientific “consensus statement” is superfluous when an even larger group of scientists have signed an opposing view (cognitivetrainingdata.org). We reiterate that the area deserves better regulation under federal law to prevent financial exploitation of health concerns, but irresponsible marketing practices should not cloud what is a clear evidence base for efficacy of CCT.

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