

S. HINDIN, E. ZELINSKI. *Computerized training cognitive transfer effects for healthy older adults*. *Gerontechnology* 2010;9(2):288; doi:10.4017/gt.2010.09.02.206.00 **Purpose** Whether cognitive training produces transfer in older adults is of primary concern to the brain-training industry, cognitive psychologists, and aging individuals¹⁻². Cognitive transfer is improvement on tasks not trained, practiced or learned²⁻⁴. For example, training to update four- word sets transfers to free recall of longer word lists. Extended practice whereby one practices updating of information is likely to transfer because it encourages plasticity through repetition. Repetition in training appears to be important for transfer in older adults² though this is controversial. We conducted a quantitative meta-analysis of studies that specifically train working memory of older adults in computerized tasks and test transfer to other cognitive tasks. Additionally studies with more rigorous methods are expected to produce larger transfer effect sizes. **Method** A search in PsycInfo retrieved 223 articles with an additional four from references. Fourteen studies met the criteria of involving computer training of updating skills. They were rated separately by both authors with the Scale to Assess Scientific Quality of Investigations (SASQI) modified for basic research⁵⁻⁶. Inter-rater agreement was 92% and all disagreements were resolved by discussion. Both training and transfer effect sizes for each study were computed. Control group effect sizes were subtracted from the experimental group to account for practice effects of training. Average effect sizes and 95 percent confidence intervals for training and transfer are reported. Studies with a higher SASQI rating are compared to those with a lower rating. **Results & Discussion** SASQI ratings ranged from 3-7 with a cutoff of 5. Trained effect sizes for the higher rated studies were very large, $d=3.3$, 95% CI(1.9-5.2) and lower but still large for studies with lower ratings, $d=1.2$, 95% CI(0.54-1.87). Within-experimental group transfer effects sizes were .67 and .35 respectively. Higher rated studies had a higher mean between-group transfer effect size ($n=24$ $d=0.16(0.2)$) compared to lower ($N=27$ $d=0.11(0.25)$). In conclusion, training effect sizes are very large in comparison to transfer effect sizes. Yet extended computerized updating training in older adults produces transfer effects significantly greater than zero after accounting for practice. Commercial products that use principles of cognitive training like those of the studies reviewed should be evaluated for transfer effects compared to a control group to take practice effects into account.

References

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