E. Zelinski, P. Housen, K. Yaffe, R. Ruff, R. Kennison, H.E. Mahncke, G.E. Smith. Who benefits from computer training of cognitive abilities? Gerontechnology 2008; 7(2):250. A clinical trial of a commercially available computer program involving training of speeded auditory discrimination and recognition abilities improved not only the tasks trained, but also auditory recall and working memory tasks in older adults (IMPACT study[1,2]). The program uses an intensive series of adaptive computerized exercises targeting the speed/accuracy of auditory and language processes, and neuromodulatory systems associated with learning and memory throughout the 40 one-hour training sessions. Although there were gains on average, it is important to know whether individual differences characteristics affect relative improvements in performance. Predictions about differential gain have been controversial: some suggest that those with poorer baseline performance have the most to gain[3], whereas others have suggested that plasticity is limited in poor performers, including the very elderly[4]. **Methods** The IMPACT Study was a multi-site double-blind randomized trial evaluating the efficacy of a brain-plasticity-based cognitive training program in adults aged 65-93 years with normal cognition (MMSE≥26). Of the 468 individuals randomized, 232 were assigned to the experimental treatment and 236 to a structured computer-based learning program matched for novelty and intensity. Predefined endpoints included standardized neuropsychological assessments of memory. The present analysis examined performance on the endpoints as a function of main effects of age, gender, education, pretraining memory score, estimated intelligence, audiometric function, presence of tinnitus, vision correction, and the interaction of these covariates with the training effect using linear modeling. **Results and discussion** There were main effects of age, with older adults and those with worse auditory memory gaining less ($p<0.01$), but none of the interactions of these covariates with the training effect were significant (all $p>0.23$). That is, none of the factors that could be associated with poorer performance at the outset were associated with reduced training gains. Thus, the brain plasticity program appears to be useful for individuals with a wide range of characteristics, including age, intelligence, and sensory function. However, a limitation of this study is that individuals were selected for normal mental status (MMSE>26) and it is possible that those with pre-existing cognitive declines may benefit differentially. Another limitation is that the subjects reported being committed to the training despite its difficulty, and individuals who end training prematurely may have ranges of scores on characteristics that were not assessed in the present study. The conclusion is that of those who participated in the IMPACT study, only age and initial memory score were associated with reduced gains in general, regardless of the intervention; age, education, ability, and sensory function covariates were not associated with differential training effects.

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