

Recovery after brain damage: Is there any indication for generalization between different cognitive functions?

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Abstract

Introduction: The question whether recovery in various cognitive functions is supported by one or two more fundamental functions (for instance, attentional or working memory functions) is a long-standing problem of cognitive rehabilitation. One possibility to answer this question is to analyze the recovery pattern in different cognitive domains and to see whether improvement in one domain is related to performance in another domain.

Method: Ninety-two inpatients with stroke or other brain lesions (Barthel Index >75) were included. Neuropsychological assessment was done at the beginning and the end of a rehabilitation stay. Cognitive performance was analyzed at test and at domain level using conceptually and statistically defined composite scores for attention, immediate and delayed memory, working memory, prospective memory, and word fluency. We used regression analysis to look for generalization between cognitive domains.

Results: Effect sizes of improvement varied largely (from $d = 0.18$ in attention and $d = 1.36$ in episodic memory). Age, gender, and time since injury had no impact on recovery. Impaired patients showed significantly more improvement than nonimpaired patients. Regression analysis revealed no effect of initial performance in one cognitive domain on improvements in other cognitive domains.

Conclusion: Significant recovery in impaired cognitive domains can be expected during neuropsychological rehabilitation. It depends more or less exclusively on improvement in the specific functions itself, and there was no evidence for generalization between cognitive domains.