Inhibitory Effects of Aging on Category Learning

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While there exists an abundant amount of literature on the effects of aging on memory, priming, and classical conditioning, very little has been said about the effects of aging on category learning. Age-related declines in performance have been consistently found in tasks involving explicit memory, but normal aging has little to no effect on implicit memory operations (e.g. Light & Albertson, 1989). It is easy to assume, then, that category tasks that require the use of explicit memory will take longer for the elderly to learn than implicit memory categorization tasks.

A general decrease in neural plasticity as a result of normal aging has been well documented (Woodruff-Pak, 1997). Most neural communication is inhibitory (Kandel et al., 2000), and it has been proposed that this prevalence of inhibition allows necessary functions to be performed without interference. If this were true, it would be likely that the decline of plasticity may have the greatest effect on inhibitory communication, which would lead to difficulties in learning and memory tasks as a result of unnecessary brain activity. Maddox et al. (1998) demonstrated that deficits in inhibitory processes affect attentional capacities of older adults during category learning tasks. In particular, older adults showed poorer performance in selectively attending to single dimensions of integral-dimension stimuli. These results can be attributed to a lack of inhibition, which results in high interference during the learning of the category structures.

Instead of focusing on the idea that the elderly are unable to learn as quickly as younger participants, the current study looked at how well elderly participants were able to inhibit their learning. We propose that not only do the attentional processes decline with age, but the inhibition of inappropriate learning declines as well. This lack of negative feedback in the categorization process results in slower learning of an explicit category structure. It is also possible that age-related declines in implicit category learning will be demonstrated due to decreased ability to ignore irrelevant dimensions

Using a category learning paradigm, the current study compared elderly participants' ability to learn explicit category structures to their ability to learn implicit category structures, both of which require attention to more than one dimension. We compared the results of the older adults to those of younger adults who performed the same categorization tasks. A categorization model was created incorporating the decline of attentional processes and the reduction of the influence of negative feedback due to aging. This model was then used to simulate the participants' responses. Post hoc analysis was performed based on Ashby et al.'s (1998) COVIS model that postulates two modules responsible for category learning, explicit and implicit, where the module predicting the most accurate responses becomes responsible for a person's output. Modeling techniques were employed to examine the decision bounds used by each participant during categorization. Due to the lesser effect of aging on the implicit module, we expect older adults to use an implicit decision bound on both implicit and explicit tasks more often than younger adults.

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