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Lexical decision and semantic categorization: age of acquisition effects with students and elderly participants

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Introduction

Age of acquisition (AoA) effects have often been found in a large variety of tasks involving word processing. One of the ongoing discussions remains the confounding of AoA effects with word frequency (e.g. Morrison & Ellis, 1995). In this study we removed possible frequency confounds by comparing AoA and word familiarity differences with young and older participants. A lexical decision experiment was conducted to test if reaction time (RT) differences of both age groups might be explained by differences in AoA of the words.

Previous research (Brysbaert, Van Wijnendaele, & De Deyne, 2000) has shown that AoA effects might also have a semantic origin, apart from proposed origins at the word output or word form access level. To further test this hypothesis we adapted the lexical decision procedure to become a semantic categorization task.

Method

Norms

Subjective ratings of AoA and word familiarity ratings were gathered for 309 Dutch words from students (18 to 23 years old) and older persons (52 to 56 years old). The rated stimuli consisted of early acquired nouns (e.g. apple) and late acquired nouns (e.g. radar), of which some are acquired only recently by the older participants (e.g. modem) and were used for selecting stimuli for the RT experiments. Results showed that not only AoA differed significantly, but also familiarity differed between both age samples.

Lexical Decision

A lexical decision experiment with 108 Dutch words was conducted with young ($n = 22$, 18 to 23 years old) and older participants ($n = 20$, 52 to 56 years old). Due to the significant differences between the rated familiarity of words for both groups a factorial design was undesirable and correlational designs were used.

Semantic Categorization

Subjects from both age groups were required to make a categorization between manmade concepts and natural concepts for 160 Dutch words. Ages varied in the young group ($n = 21$) from 18 to 23 years and from 52 to 56 years in the older group ($n = 21$).

Results and Conclusions

Results from the lexical decision experiment showed that there was an effect of difference in AoA but not familiarity when predicting RT differences for the young and older participants. The results were complete analogues in the semantic categorization experiment. In both experiments no effects were found for AoA and familiarity when predicting error rates.

The main conclusions of this study are threefold. First, the data show that the normation of words depends on age, both for AoA and familiarity. In this respect it is the first study where age-specific norms are used. Second, our study clearly demonstrates, by only manipulating the age between subjects, that AoA is an important factor in lexical decision. Third, we provide further evidence for an interpretation of the AoA effect as a general effect of learning systems. More specifically, besides the proposed effects on word output or word form access level, AoA plays a significant role in processing the meaning of words.

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