Evidence for a slowing of the selection in semantic processing With a Polysemic and Monosemic Words priming paradigm: A comparison through the ages

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1. Aims: Semantic priming of polysemic words, when used on a lexical decision task (LDT), measures two components in the semantic retrieval process. Response time (RT) depends on whether the dominant (BANK-MONEY) or the subordinated (BANK-RIVER) meaning is used for the semantic priming effect (SPE). With the dominant meaning, RT are shorter reflecting the automatic spreading of semantic activation. When the subordinated meaning is used, RT are longer indicating a phase of selection. Balota et al. (1999) found equivalent SPE for younger and older participants while Copland et al. (2007) found differential SPE (dominant>subordinated) in young adults.
2. Method: We proposed a LDT with unmasked priming (SOA: 1000ms), 32 polysemic words were followed by a target word semantically related to either their dominant (PD) or subordinated (PS) meaning, while 64 monosemic words were followed by a semantic associate (M). 75 young (age: 26.6±5.9) and 120 old (67±4.8) adults participated. Mixed linear regression (MLR) was performed on the reaction time (RT) of correct answers (97.4%).
3. Results: The MLR showed a main effect of the PD condition (p=.002) and of the group (p<.0001). Younger participants answered with an mean RT of 775ms, with a significant (p<.0001) facilitation effect of the priming in the PD (-37.4ms), M (-23.5ms) and PS (-9.2ms) conditions. Older participants answered with a mean RT of 934.4ms and a significant facilitation effect of the PD (-38.5ms), M (-13.29ms), and PS (-13.3ms) conditions. When we compared the SPE between them, PD facilitation was significantly higher than PS for both groups, while M facilitation was significantly higher than PS only for the older participants.
4. Discussion: All participants benefit from facilitation when a polysemic was followed by a word related to its dominant meaning. This facilitation was higher than the one obtained when a monosemic word as prime. This difference is in line with the idea that polysemic words are semantically richer. On the contrary, younger and older adults reacted differently with the polysemic-subordinated condition compared to monosemic priming. For younger adults, SPE was equal in both cases while the monosemic was more beneficial for the older adults.
5. Conclusion: The selection process measured in the polysemic-subordinated condition is more resourceful for older adults. Since the selection process is viewed as inhibitory, this result is coherent with the fact that executive functions can decline with aging.

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Copland, D.A., de Zubicaray, G.I., McMahon, K., & Eastburn, M. (2007). Neural correlates of semantic priming for ambiguous words: an event-related fMRI study. *Brain Res*, *1131*(1), 163-172.