

The Incidental Linguistic Information Processing and Its Relation to General Intellectual Abilities

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Abstract : The present study was aimed at clarifying the relationship between general intellectual abilities and efficiency in free recall and rhymed words generation task after incidental exposure to linguistic stimuli. The theoretical frameworks stress that general intellectual abilities are based on intentional mental strategies. In this context, it seems to be crucial to examine the efficiency of incidentally presented information processing in cognitive task and its relation to general intellectual abilities. The sample consisted of 32 Russian students. Participants were exposed to pairs of words. Each pair consisted of two common nouns or two city names. Participants had to decide whether a city name was presented in each pair. Thus words' semantics was processed intentionally. The city names were considered to be focal stimuli, whereas common nouns were considered to be peripheral stimuli. Along with that each pair of words could be rhymed or not be rhymed, but this phonemic aspect of stimuli's characteristic (rhymed and non-rhymed words) was processed incidentally. Then participants were asked to produce as many rhymes as they could to new words. The stimuli presented earlier could be used as well. After that, participants had to retrieve all words presented earlier. In the end, verbal and non-verbal abilities were measured with number of special psychometric tests. As for free recall task intentionally processed focal stimuli had an advantage in recall compared to peripheral stimuli. In addition all the rhymed stimuli were recalled more effectively than non-rhymed ones. The inverse effect was found in words generation task where participants tended to use mainly peripheral stimuli compared to focal ones. Furthermore peripheral rhymed stimuli were most popular target category of stimuli that was used in this task. Thus the information that was processed incidentally had a supplemental influence on efficiency of stimuli processing as well in free recall as in word generation task. Different patterns of correlations between intellectual abilities and efficiency in different stimuli processing in both tasks were revealed. Non-verbal reasoning ability correlated positively with free recall of peripheral rhymed stimuli, but it was not related to performance on rhymed words' generation task. Verbal reasoning ability correlated positively with free recall of focal stimuli. As for rhymed words generation task, verbal intelligence correlated negatively with generation of focal stimuli and correlated positively with generation of all peripheral stimuli. The present findings lead to two key conclusions. First, incidentally processed stimuli had an advantage in free recall and word generation task. Thus incidental information processing appeared to be crucial for subsequent cognitive performance. Secondly, it was demonstrated that incidentally processed stimuli were recalled more frequently by participants with high nonverbal reasoning ability and were more effectively used by participants with high verbal reasoning ability in subsequent cognitive tasks. That implies that general intellectual abilities could benefit from operating by different levels of information processing while cognitive problem solving. This research was supported by the "Grant of President of RF for young PhD scientists" (contract № is 14.Z56.17.2980- MK) and the Grant № 15-36-01348a2 of Russian Foundation for Humanities.

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