

## Assessing the Structure of Non-Verbal Semantic Knowledge: The Evaluation and First Results of the Hungarian Semantic Association Test

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**Abstract :** Supported by neuroscientific findings, the so-called Hub-and-Spoke model of the human semantic system is based on two subcomponents of semantic cognition, namely the semantic control process and semantic representation. Our semantic knowledge is multimodal in nature, as the knowledge system stored in relation to a conception is extensive and broad, while different aspects of the conception may be relevant depending on the purpose. The motivation of our research is to develop a new diagnostic measurement procedure based on the preservation of semantic representation, which is appropriate to the specificities of the Hungarian language and which can be used to compare the non-verbal semantic knowledge of healthy and aphasic persons. The development of the test will broaden the Hungarian clinical diagnostic toolkit, which will allow for more specific therapy planning. The sample of healthy persons (n=480) was determined by the last census data for the representativeness of the sample. Based on the concept of the Pyramids and Palm Tree Test, and according to the characteristics of the Hungarian language, we have elaborated a test based on different types of semantic information, in which the subjects are presented with three pictures: they have to choose the one that best fits the target word above from the two lower options, based on the semantic relation defined. We have measured 5 types of semantic knowledge representations: associative relations, taxonomy, motional representations, concrete as well as abstract verbs. As the first step in our data analysis, we examined the normal distribution of our results, and since it was not normally distributed ( $p < 0.05$ ), we used nonparametric statistics further into the analysis. Using descriptive statistics, we could determine the frequency of the correct and incorrect responses, and with this knowledge, we could later adjust and remove the items of questionable reliability. The reliability was tested using Cronbach's  $\alpha$ , and it can be safely said that all the results were in an acceptable range of reliability ( $\alpha = 0.6-0.8$ ). We then tested for the potential gender differences using the Mann Whitney-U test, however, we found no difference between the two ( $p < 0.05$ ). Likewise, we didn't see that the age had any effect on the results using one-way ANOVA ( $p < 0.05$ ), however, the level of education did influence the results ( $p > 0.05$ ). The relationships between the subtests were observed by the nonparametric Spearman's rho correlation matrix, showing statistically significant correlation between the subtests ( $p > 0.05$ ), signifying a linear relationship between the measured semantic functions. A margin of error of 5% was used in all cases. The research will contribute to the expansion of the clinical diagnostic toolkit and will be relevant for the individualised therapeutic design of treatment procedures. The use of a non-verbal test procedure will allow an early assessment of the most severe language conditions, which is a priority in the differential diagnosis. The measurement of reaction time is expected to advance prodrome research, as the tests can be easily conducted in the subclinical phase.

**Keywords :** communication disorders, diagnostic toolkit, neurorehabilitation, semantic knowledge

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