

DISSERTATION ABSTRACT

Name: Dmytro Khanzhyn

Title: “Przetwarzanie semantyczne w języku rodzimym i obcym: Rola pamięci roboczej oraz rodzaju powiązań semantycznych”

Translation: “Semantic processing in the native and non-native language: The role of working memory and the type of semantic relations”

Abstract

Words are basic meaningful elements of every language, and how their meanings are processed and retrieved from memory has been a subject of extensive psycholinguistic and cognitive research for the last several decades. The evolution of theoretical accounts of semantic memory (Smith et al. 1974; Collins and Loftus 1975; Tversky 1977; Lund and Burgess 1996; Landauer and Dumais 1997; McRae 2004; De Deyne and Storms 2008; Vigliocco et al. 2009; Mikolov et al. 2013; De Deyne et al. 2016; Kumar 2021) and a large body of empirical evidence have advanced our understanding of relations between language and cognition. However, there are gaps in lexical semantics research related to the role of working memory and different types of semantic relations in semantic processing in the native and non-native language. This thesis encompasses three experimental studies aiming to address these gaps.

In Study 1, associative norms were established for a set of Polish words (Rataj et al. 2023) in a free word association experiment involving 484 native Polish speakers. These words had previously been tested for semantic but not associative relatedness. The key research question of Study 1 was whether semantically related words from a semantic priming dataset were also related associatively. Importantly, the results demonstrated that semantically related word pairs from the tested dataset are minimally associated. This provided crucial evidence that the tested dataset can be used to investigate the influence of various factors specifically on the processing of semantic relations. The practical value of Study 1 was that association norms were developed and for the first time compared against vector-based similarity measures (Mykowiecka et al. 2017; Rataj et al. 2023) for a relatively large set of words in the Polish language, which is often underrepresented in psycholinguistic studies.

The dataset tested in Study 1 was further used in Study 2, which aimed to investigate whether high and low working memory load in the verbal and spatial domain would impact the processing of word pairs with different degrees of semantic relatedness. Previous studies

focused either on relatedness judgements (Kuperberg et al. 2008; Ortu et al. 2013) or on the impact of working memory load on semantic processing (Heyman et al. 2015, 2017), but the differences in the influence of verbal and spatial working memory load on relatedness judgements were investigated for the first time in Study 2. A series of experiments with the semantic relatedness task provided evidence that semantic relatedness judgements were faster when target words were preceded by strongly related words but slower when preceded by weakly related words relative to unrelated words. These effects were modulated by the type and extent of working memory load, with additional verbal working memory demands having a stronger influence on relatedness judgements as compared to spatial working memory. This indicates that semantic processing of words in the semantic relatedness task can be affected by the availability of verbal working memory resources and by the degree of semantic relatedness between words.

Further evidence for the role of different types of relations in semantic processing was presented in Study 3 that explored for the first time semantic relatedness judgements of word pairs with asymmetric and symmetric association in the native and non-native language. The results of this study revealed significant facilitation effects of related pairs for both native and proficient non-native speakers of English indicating that similar spreading activation mechanisms may be in place in the first and second language. It was also found that semantic processing in a non-native language may involve different strategic processes as compared to the native language.

In conclusion, the findings reported in this thesis contribute to our understanding of semantic memory and the role of different types of semantic relations and different strategic mechanisms in semantic processing in the native and non-native language. Furthermore, they have important methodological and empirical implications for future research into the role of working memory and different types of semantic relations in semantic processing.