Morphosyntactic production and processing in agrammatic aphasia

Individuals with agrammatic aphasia (IwAA) often have trouble understanding grammatically complex sentences, while their production of certain morphosyntactic categories is also impaired. In particular, verb-related morphosyntactic production of IwAA has been consistently found to be selectively impaired, with subject–verb agreement being better preserved than tense/time reference (e.g., for Hebrew: Friedmann & Grodzinsky, 1997; for Greek: Fyndanis, Arcara, Christidou, & Caplan, 2018; for German: Wenzlaff & Clahsen, 2004; for Dutch: Kok, van Doorn, & Kolk, 2007). Moreover, studies on Greek agrammatic aphasia have found that aspect is equally or more impaired than tense/time reference (e.g., Fyndanis et al., 2018b; Fyndanis, Varlokosta, & Tsapkini, 2012; Nanousi, Masterson, Druks, & Atkinson, 2006; Varlokosta et al., 2006). However, the reasons why tense marking is problematic in aphasia are not yet fully understood; it is possible that fundamental linguistic processes (i.e. linguistic encoding and retrieval) are affected in different ways/extent among IwAA. Moreover, the role of temporal adverbs, and specifically how they affect temporal processing in language comprehension as regards their position (preverbal vs. postverbal) in the sentence has not been adequately studied. Thus, in order to acquire a better understanding of temporal processing and morphosyntactic abilities in aphasia, the present project will address the following research questions: **(a)** whether the two major processes (encoding/retrieval) involved in the production of tense/time reference are differentially affected in IwAA; **(b)** whether comprehension of past/future reference is modulated by the aspectual context (perfective vs. imperfective); **(c)** whether the relative position (preverbal vs. postverbal) of the temporal cue (i.e. temporal adverb) affect the processing and interpretation of temporal reference.

For the purposes of the study, a group of IwAA, and a control group of healthy speakers, matched with the IwAA on age and years of formal education, will be assessed. Three (3) experiments will be conducted to address these research questions; experiments 1 and 2 will address questions (a) and (b). Both experiments will involve sentence completion tasks tapping into time reference in production, but experiment 1 will be a transformational sentence completion task that will tap into encoding and retrieval processes alike, while experiment 2 will be a non-transformational sentence completion task that will primarily tap into retrieval processes. This way encoding and retrieval processes involved in the production of temporal/time reference will be teased apart. Experiment 3 will address question (c) and will be a self-paced reading or listening experiment with end-of-sentence grammaticality judgments. In this experiment some of the sentences will be manipulated so as to include a mismatch between a temporal adverbial and a verb form. The experimental stimuli will also vary the position of the temporal adverb/cue (i.e., in some sentences the adverb will precede the target verb form, while in others it will follow). The study aims to deepen our understanding of morphosyntactic processing in IwAA and to provide additional insights into morphosyntactic processing in the healthy brain. Investigating the underlying causes for the morphosyntactic deficits in aphasia will allow us to gain a better understanding of the surfacing problems that IwAA experience, which will in turn inform treatment programs. Thus, the results will also have clinical implications.