

## South Carolina Researchers Examine Language Impairments in Patients with Parkinson's Disease

Researchers from the [Arnold School of Public Health](#)'s department of [Communication Sciences and Disorders](#) at the University of South Carolina have partnered with collaborators from Northwestern University, Georgetown University, Shahid Beheshti University of Medical Sciences, Westfälische Wilhelms-Universität Münster, and the University of Social Welfare and Rehabilitation Sciences to examine the syntactic and lexical processing in patients with Parkinson's disease. Their paper was published in the [Journal of Neurolinguistics](#) with doctoral candidate [Karim Johari](#) serving as lead author.

Parkinson's disease, which involves the degeneration of dopaminergic neurons in the basal ganglia, has long been associated with motor deficits. Increasing evidence suggests that language can also be impaired, including aspects of syntactic and lexical processing. However, the exact pattern of these impairments remains somewhat unclear, for several reasons.

Few studies have examined and compared syntactic and lexical processing within subjects, so their relative deficits remain to be elucidated. Studies have focused on earlier stages of Parkinson's disease, so syntactic and lexical processing in later stages are less well understood. Research has largely probed English and a handful of other European languages, and it is unclear whether findings generalize more broadly. Finally, few studies have examined links between syntactic/lexical impairments and their neurocognitive substrates, such as measures of basal ganglia degeneration or dopaminergic processes.

The researchers addressed these gaps by investigating multiple aspects of Farsi syntactic and lexical processing in 40 Farsi native-speaking moderate-to-severe non-demented Parkinson's patients, and 40 healthy controls. Their analyses revealed equivalent impairments of syntactic comprehension and syntactic judgment, across different syntactic structures.

Lexical processing was impaired only for motor function-related objects (e.g., naming 'hammer', but not 'mountain'), in line with findings of Parkinson's deficits at naming action verbs as compared to objects, without the verb/noun confound. In direct comparisons between lexical and syntactic tasks, patients were better at naming words like 'mountain' (but not words like 'hammer') than at syntactic comprehension and syntactic judgment. Performance at syntactic comprehension correlated with the last levodopa equivalent dose.

The authors found no other correlations between syntactic/lexical processing measures and either levodopa equivalent dose or hypokinesia, which reflects degeneration of basal ganglia motor-related circuits. All critical significant main effects, interactions, and correlations yielded large effect sizes. These findings elucidate the nature of syntactic and lexical processing impairments in Parkinson's disease.