



UNIVERSITY OF AMSTERDAM

BACHELOR THESIS IN BRAIN & COGNITION

**Parkinson's disease and the Medial Geniculate Nucleus:
A 7-Tesla MRI comparison of structural volume between patients and healthy
controls**

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Abstract

Parkinson's is a degenerative neurological disorder, affecting a considerable amount of the elderly and involving the impairment of several brain structures. However, the subcortical structures involved have not been thoroughly investigated, even though they play a major role in normal functioning, like hearing. This study examined whether Parkinson's disease is related to a decrease of structural volume in the medial geniculate nucleus (MGN), the thalamic relay of audition. Participants included 11 patients with Parkinson's and 11 healthy controls. Their brain scans had already been collected at the Spinoza center for Neuroimaging in Amsterdam, using a 7-Tesla MRI scanner. Structural volume, measured in cubic millimeters, was calculated for every subject by manually delineating the MGN in each hemisphere of the scan. For each group, the data were collapsed by taking the mean of the two hemispheres, and they were analyzed with a Bayesian Mann-Whitney U test. Results showed that the data are equally likely under both competing hypotheses, that of a decreased MGN volume in Parkinson's patients compared to healthy controls, and that of no difference between the two groups, $BF10 = 1.22$. This suggests that it is not yet clear whether Parkinson's is related to a decrease of structural volume in the MGN, highlighting the need for further research on the topic. Elucidating the involvement of the MGN in Parkinson's is important for the prognosis of the disease since it could help doctors alleviate symptoms related to audition.

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