

L. CUNNINGHAM, C. NUGENT, G. MOORE, D. FINLAY, D. CRAIG. *Detecting subtle movement difficulties present in Parkinson's disease using a computer mouse. Gerontechnology 2010;9(2):205; doi:10.4017/gt.2010.09.02.215.00* **Purpose** Parkinson's Disease (PD) presents a large number of features such as tremor, dyskinesia and rigidity with the main features being movement related¹. It can be difficult to definitively diagnose due to the differing features exhibited by each person suffering from the disease². As a result, the current methods used to diagnose and assess PD are quite subjective and are largely based on observations made by clinicians. This work aims to assist with making the diagnosis and assessment of PD more objective whilst at the same time decreasing the number of hospital/clinic visits required by those suffering from PD³. A computer based assessment tool has been created using Visual Basic NET. The tool requires the user to use a computer mouse to click on a series of images that randomly appear at different locations on a computer screen. The tool collects data relating to any accidental clicks; data on the coordinates of the cursor during the running of the tool; personal details such as the user's medication regime; time stamps displaying the times at which each icon was clicked and a visual representation of the path taken to move from icon to icon by the user. **Method** An evaluation was carried out to determine if the assessment tool could help identify the presence of certain features of PD. A group of 20 people, 10 with PD and a control group of 10 without PD took part in the evaluation. Within both the PD and control groups there were five people who were computer literate and 5 who were not. This balance of computer literacy allowed for the identification of PD related difficulties compared to those caused by a lack of computer knowledge. **Results & Discussion** Results from this evaluation showed that the tool could record a difference between people with PD and people without PD through analysing time taken, distance covered and the path taken. As anticipated the PD group took a significantly ($p=0.038$) longer time to complete the tool, with the slowest PD participant taking a mean time of 15.78 seconds, compared to 13.69 seconds for the slowest participant in the control group. Other differences, such as the number of pixels covered to traverse from image to image was significantly higher ($p=0.001$) in the PD group than in the control group. All of the control group and 5 of the PD group covered a mean distance under 1000 pixels. The path taken by most of the members of the PD group contained jagged sections which could suggest tremor. In comparison, the path taken by the control group participants show considerably smoother movements. Akinesia, bradykinesia and even dyskinesia could be detected following assessment of time metrics to complete various parts of the task. In conclusion, the evaluation showed that this tool has the potential to compliment the current methods used to diagnose/assess PD and help make the process more objective. Future work will focus on automating the analyses process of this assessment tool.

References

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