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### ■ TOWERS OF HANOI AND LONDON ON A TABLET-PC: STANDARDIZATION AND CORRELATION WITH OTHER EXECUTIVE TESTS

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#### Abstract

The Towers of Hanoi (ToH) and London (ToL) are popular tests to assess executive functions and are widely used. Standardization is, however, difficult as are proper comparisons. We developed tablet PC versions for use with a touch pen that simulate the original wooden games in a realistic manner. In addition to timing the moves taken, the programs visualize them in problem space. 62 healthy control subjects (44 female; age groups: 20-45, mean 29.1 years and 46-70, mean 57.8 years) solved a fixed series of 20 ToH and 20 ToL tasks of graded difficulty, with 2 to 7 moves minimally. The tasks were chosen according to graphical similarity of corresponding solution pathways. Times taken for solution, initiation and completion and the number of

moves were analysed for each task. ToH and ToL performance was compared and correlations with performance on other executive tests were sought. We found significant age group differences in solution and completion time for most tower tasks. Further, solution and completion times correlated with the Trail Making Test B, the WAIS Matrices Subtest and the 5-Point-Test. Initiation times for some ToH tasks correlated with TMT-B and digit span backwards. Absence of such correlation for ToL tasks is a further indicator for the assumption that the two towers, ToH and ToL, tap different executive function aspects.

We suggest that our versions of the Tower of Hanoi and London are promising research tools to further define the position of these problem solving tasks among the host of executive function tests.