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Do attentional abilities measured by the Test of Attentional Performance–Mobility, predict auditory Go/NoGo accuracy in a real-world dual-task walking scenario?

Attention is a cognitive ability supported by multiple executive functions working together. During dual-tasking (DT), attentional resources are taxed more extensively, resulting in slower, less accurate and more variable performance. Participants completed an auditory Go/NoGo task while sitting, while walking on a treadmill and while freely walking outdoors. They also completed four TAP-M subtests, targeting core attentional operations relevant to cognitive-motor DT. Using reaction time data from four subtests of the Test of Attentional Performance – Mobility (TAP-M), we examined whether they could serve as predictors of accuracy (d') in the cognitive-motor DT paradigm. Walking outdoors resulted in a larger change in accuracy, when compared to treadmill walking. However, accuracy was not significantly reduced during treadmill walking when compared to the single-task condition. Furthermore, the overall TAP-M reaction time data did not significantly predict any DT costs. However, specifically within the Divided Attention subtest, reaction time significantly correlated with auditory Go/NoGo accuracy, both during treadmill ($p = -0.51$, $p = 0.003$) and outdoor walking ($p = -0.63$, $p < 0.001$). Several TAP-M subtests also showed significant intracorrelations, indicating overlap between attentional aspects, yet not such an extensive overlap as to claim redundancy of the subtests. These correlations point to both expected and surprising relationships between computer-based cognitive testing and cognitive-motor DT scenarios. The findings start to pave the way in showing how psychometric measures can relate to DT performance in ecologically valid settings, thus helping future understanding of differences between laboratory and everyday-life scenarios. The eventual applications may prove relevant especially for individuals with attentional challenges or age-related attentive decline.