

Relationship Between Instrumental Activities of Daily Living and Naturalistic Driving Performance: Indications for Detection of Mild Cognitive Impairment

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PURPOSE: Ethically, OT practitioners must address the valued task of driving, especially for individuals with cognitive impairment. The AMPS, as a valid/reliable indicator of cognitive decline, has been shown to correlate with on-road driving performance [1,2] but has yet to be tested against naturalistic driving data. Individuals with deficits in IADL performance will likely have difficulty with judgment, wayfinding, and processing speed. Standard on-road evaluation (SODE) has shown some correlation with the development of cognitive decline in older adults suggesting naturalistic driving data may detect early Alzheimer's disease [3]. This ongoing study is examining the nature and strength of the relationship between complex IADL performance with the AMPS, the SODE, and naturalistic driving behaviors in older adults by examining their performance outcomes. Specifically, the study will examine if there is a statistically significant difference in AMPS scores between participants with greater or fewer driving errors on the SODE and/or naturalistic driving, therefore, offering an evidence-based occupational therapy tool that can be used to identify driving risk and/or early detection of cognitive impairment, as demonstrated by driving.

DESIGN: A cross-sectional design was used to compare the AMPS's process skills with naturalistic driving behaviors in older drivers and the outcomes of the SODE. Participants were older adult drivers recruited from the community. The 41 adults are active drivers over 65 years of age (M = 73 yrs) with a range of 65 to 87 yrs.

METHOD: Participants agreed to drive with a computer chip in their vehicle for 20 weeks. The chip collects data similar to GPS as well as driving performance including sudden stops, hard cornering, and number of trips. Each participant completed the AMPS assessment and a comprehensive driving evaluation (clinical assessment and on-road).

DATA ANALYSIS: The P-Drive [4] is an observational tool that is scored on the quality of driving performance. While the mean score was 89.36/100, indicating normal performance, the scores were categorized by performance between those who did poorly (<80), passed (80-89), and did very well (>90). A one-way ANOVA found no significant differences in AMPS process scores based on the performance of the P-drive groups ($F(23) = 1.19, p < 0.324$). Using the same performance grouping, an ANOVA found a significant difference ($F(24) = 3.864, p < 0.036$) between MoCA scores and P-drive outcomes.

RESULTS: Non-significance in the AMPS scores and SODE is not surprising, as these were community-living and active drivers. However, the individual with the lowest AMPS process score (0.9) had the lowest P-Drive score (73). Interestingly, the MoCA mean score for the same group was 24.95, indicating sub-normal cognition amongst the sample. Also, a significant difference existed between P-Drive score groups. While one might argue that the MoCA is more sensitive to cognitive change, it is not clear that those changes interfere with functional performance. In fact, we argue that the non-significant difference in AMPS and P-Drive is due to being based on functional performance or functional cognition, which may be a more relevant measure. The most important comparison will be the naturalistic driving outcomes, which are yet to be analyzed but will be completed by March 2022.

IMPACT: This study will contribute to the evidence that occupational therapists must use functional performance to evaluate complex IADLs and take the lead especially when addressing the critical IADL of driving and community living.

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