

# Using game authoring platforms to develop screen-based simulated functional assessments in persons with executive dysfunction following traumatic brain injury

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## Abstract

The assessment of functional status is a critical component of clinical neuropsychological evaluations used for both diagnostic and therapeutic purposes in patients with cognitive brain disorders. There are, however, no widely adopted neuropsychological tests that are both ecologically valid and easily administered in daily clinical practice. This discrepancy is a roadblock to the widespread adoption of functional assessments. In this paper, we propose a novel approach using a serious game authoring platform (eAdventure) for creating screen-based simulated functional assessments. We created a naturalistic functional task that consisted of preparing a cup of tea (SBS-COT) and applied the assessment in a convenience sample of eight dyads of therapists/patients with mild executive dysfunction after traumatic brain injury. We had three main aims. First, we performed a comprehensive review of executive function assessment in activities of daily living. Second, we were interested in measuring the feasibility of this technology with respect to staffing, economic and technical requirements. Third, a serious game was administered to patients to study the feasibility of this technology in the clinical context (pre-screening test). In addition, quantitative (Technology Acceptance Model (TAM) questionnaires) and qualitative (semistructured interviews) evaluations were applied to obtain user input. Our results suggest that the staffing, economic and technical requirements of the SBS-COT are feasible. The outcomes of the pre-screening test provide evidence that this technology is useful in the functional assessment of patients with executive dysfunction. In relation to subjective data, the TAM questionnaire showed good user acceptability from a professional perspective. Interview analyses with professionals and

patients showed positive experiences related to the use of the SBS-COT. Our work indicates that the use of these types of authoring platforms could have positive long-term implications for neuropsychological research, opening the door to more reproducible, cooperative and efficient research by allowing the facilitated production, reuse and sharing of neuropsychological assessment tools. (C) 2017 Elsevier Inc. All rights reserved.

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