

Neurophysiological Correlates of Information Systems Commonly Used Self-Reported Measures: A Multitrait Multimethod Study

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Given the importance and criticality of instrument validation in IS research, the main objective of this study is to provide a systematic assessment of IS construct validity via a multitrait multimethod (MTMM). To do so, the paper uses structurally different methods – neurophysiological and self-reported scales - to measure three commonly used IS constructs: engagement, arousal and cognitive load in two different experimental settings. The experiments involved seventeen (17) and twenty four (24) participants respectively and consisted in using different IS to execute a set of both instrumental and hedonic tasks. The neurophysiological measures were taken while participants performed their tasks, while the psychometric measures were taken immediately after the tasks were completed. The study's results generally support MTMM expectations and shed light on the complexity of detecting the nature of mono-method bias. More specifically, the study's results show that primitive perceptual IS constructs such as arousal seem to be less affected by mono-method bias, whereas more complex perceptual constructs such as engagement or cognitive load have higher within method correlations. There are two alternative explanations for the within method correlations: a) a method bias, or b) a combination between trait and method.

Finally, the study's results prompt a series of potentially important questions for our field and for the scientific research process in general: What are the implications if no correlation is found between neurophysiological and self-reported measures? Are actual methods for detecting and/or controlling for mono-method bias reliable? Are we under or over estimating the impact of mono-method bias on research results?

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