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## Automation Reliability and Performance Detection Using Two Systems of the Multi-Attribute Task Battery

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# **Automation Reliability and Performance Detection Using Two Systems of the Multi-Attribute Task Battery**

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With the advancements of new and emerging technology in the modern cockpit, it is important to understand the effect of these enhancements on performance. Our research seeks to examine both the effect of display type and reliability level on an operator's performance. The goals of this research are to evaluate and compare the new MATB-II to the original MATB, as well as to further investigate the effect of reliability level in a automated aviation environment.

In the current study, we empirically test the impact of a specified reliability level on performance for a controlled and modernistic automated aviation task. Previous data from participant's performance on the original system, the MATB, determined that there was a relationship between increased levels of automation reliability and a decreased level of correct error detection (Oakley, Mouloua, & Hancock, 2003). When the newer system was introduced, the MATB-II, Stader et al. (2012) divulged a difference between the two present systems of the Multi-Attribute Task Battery (MATB; Comstock & Arnegard, 2002; & MATB-II, NASA LRC, 2011). The current study seeks to determine if the data from an original MAT study, in relation to reliability, could be recreated by using the MATB and the MATB-II; all the while trying to find a difference in performance between the two systems. A 2 (system; MATB vs MATB-II) X 3 (reliability; 50%, 70%, 90%) mixed model ANOVA was conducted based on the data from 84 participants. Results showed that there was a main effect for system, that participants performed significantly better on the MATB-II ( $M = 74.26$ ,  $SD = 26.92$ ) than on the original MATB ( $M =$

53.097,  $SD = 27.507$ ),  $F(1,81) = 48.68$ ,  $p < .001$ ,  $partial\ eta^2 = .375$ . Also, data show that participants did significantly better in 50% reliability condition ( $M = 70.59$ ) and the 70% reliability condition ( $M = 67.58$ ) than the 90% reliability condition ( $M = 52.86$ ). There was no significant interaction found. Theoretical and practical implications will be discussed.