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Psychophysiological response and perceived workload when working with adaptive automation.

Adaptive automation has been defined as the automation design where an endeavor is allocated between the human operator and computer system. Within the research of adaptive automation, psychophysiology has two corresponding roles. The first role, is to produce data about the effects of different classification of automation, thus furthering the development of effective adaptive logic. The second role, psychophysiology could give information about the operator that can be assimilated with performance measurement and operator modeling to assist the managing of automation. In this study, we are examining the psychophysiological responses (heart rate) of participants faced with various amounts of workload and perceived workload when interacting with adaptive automation. The goals of this study are to (i) measure the participants' perceived workload when interacting with the adaptive automated system (ii) measure the participants' heart rate change when there is a latency/malfunction in the adaptive automation. Data will be collected from participants at a Florida university, in a flight simulator. Participants will perform various tasks with an adaptive automated system while being connected to a heart rate monitoring device. Once the experiment is complete, the participants will then take a brief survey rating their perceived workload and the workload of the adaptive automation. Expected results for this study are (i) participants will perceive they have a heavier workload than the adaptive automation if their tasks seem difficult or use more cognitive resources (ii) participants will have a negative psychophysiological heart rate response when there is a latency/malfunction with the adaptive automation. However, a limitation in this study is that some participants may experience some nausea while performing tasks in the simulator that could affect the participants' perceived workload. Another limitation, there could be

participants with pre-existing heart condition that could provide false data when connected to the heart rate moderating device.

Keywords: Adaptive automation, Automation, Experimental psychology, Human factors psychology, Psychophysiology, Workload