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Evaluating Mechanisms of Fatigue Using a Digit Symbol Substitution Task

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Abstract: The effects of sleep deprivation on human performance can be as impactful as a military operation and as broad reaching as the daily commute. With the ACT-R architecture, we have already demonstrated how simple fatigue mechanisms can influence cognition to produce performance comparable to human subjects. This research has led to the new ?micro lapse? theory of fatigue, and paves the way for a priori predictions of human performance under fatigued conditions. This poster describes recent updates in the mechanisms that implement the theory and latest progress in evaluating the generalizability of the theory, this time in the context of the Digit Symbol Substitution Task. In this scenario, subjects must correlate a random symbol with a paired digit presented in a list. Fatigue mechanisms for procedural memory (for scanning and responding) and declarative memory (for remembering digit-symbol pairings) will be tested in the same model.