

The Disruptiveness of Interruptions

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We have been examining the disruptiveness of interruptions for the last several years (e.g., Trafton, Altmann, Brock, & Mintz, 2003). The goal activation theory (Altmann & Trafton, 2002) suggests that three aspects of cognition are key to resuming after an interruption: decay (based on the ACT-R decay equation), rehearsal (which slows down decay), and environmental cues (facilitating prospective and retrospective memory). Our theory predicts qualitative and quantitative effects of rehearsal, decay, and environmental cues on the first action after trying to resume a task after an interruption (which we call the resumption lag). We have gathered support for our theory in several experiments (Trafton et al., 2003; Monk, Boehm-Davis, & Trafton, 2002; under review).

Most task analyses, problem solving theories, and cognitive architectures suggest that there will be no residual effects of an interruption after the user is "back on track." In general, task effects, goal and subgoal relationships, and planning are the biggest determinant of reaction time in simple and complex tasks (Altmann & Trafton, 2002). However, we examined the residual effects (the first 10 actions) after an interruption and found a strong linear trend: participants became faster within those 10 actions.

We will present a simple mathematical model (based on ACT-R equations) that shows an excellent qualitative and quantitative fit of the data to attempt to account for this finding.

References

- Altmann, E. M., & Trafton, J. G. (2002). Memory for goals: An activation-based model. *Cognitive Science*, 26(1), 39-83.
- Monk, C., Boehm-Davis, D., & Trafton, J. G. (2002). The attentional costs of interrupting task performance at various stages. Paper presented at the Human Factors.
- Monk, C., Boehm-Davis, D., & Trafton, J. G. (under review). Recovering from Interruptions: Implications for Driver Distraction Research. *Human Factors*.
- Trafton, J. G., Altmann, E. M., Brock, D. P., & Mintz, F. E. (2003). Preparing to resume an interrupted task: Effects of prospective goal encoding and retrospective rehearsal. *International Journal of Human Computer Studies*, 58(5), 583-603.