

# The time-course of negative priming: Implications for models of selective attention

Andrew R.A. Conway

University of Illinois at Chicago  
Department of Psychology (M/C 285)  
1007 West Harrison Street  
Chicago, IL 60607-7137  
aconway@uic.edu

Models of selective attention often include an inhibitory mechanism, which acts to suppress irrelevant information, preventing distraction. Support for the existence of an inhibitory mechanism comes from the demonstration of negative priming, which refers to the finding that responses are slowed to stimuli that have recently been ignored. However, Neill and his colleagues (Neill & Valdes, 1992; Neill, Valdes, Terry, & Gorfien, 1992) have proposed an alternative account of negative priming, the episodic retrieval theory, which if correct, calls into question the need for an inhibitory mechanism in selective attention.

The experiments reported here were designed to test competing predictions of the episodic retrieval theory and an inhibition account of negative priming. Episodic retrieval theory and an inhibition account differ on three predictions. First, episodic retrieval predicts that negative priming depends on the delay between the prime and probe (the RSI) (Neill et al., 1992). In contrast, a persisting inhibition view predicts that negative priming will be as robust after a long RSI as it is after a short RSI (Hasher, Zacks, Stoltzfus, Kane, & Connelly, 1996). Second, episodic retrieval predicts that negative priming depends on the delay before the prime display (the previous RSI or PRSI) (Neill et al. 1992). An inhibition account predicts that PRSI should not affect negative priming (Hasher et al. 1996). Third, episodic retrieval predicts that the predictability of the timing of each trial in the experiment will not affect negative priming (Neill & Valdes, 1992). In contrast, an inhibition account predicts that negative priming will be stronger when the timing of trials is predictable than when the timing is unpredictable. This follows from the notion that inhibition is a controlled process, thus, if the subject is able to predict the timing of each subsequent display, then they will be able to exert

greater attentional control over what information is selected and how information is selected-against, or inhibited.

These predictions were tested in two experiments. Experiment 1 was the same procedure used by Neill et al. (1992). Experiment 2 differed from Experiment 1 in that RSI was manipulated randomly within groups in E1 and RSI was manipulated consistently within groups in E2. Thus, in E1 timing was not predictable but in E2 timing was predictable. Both experiments were localization tasks, in which four location markers were presented on the screen. On each trial, a target 'O' and a distractor 'X' each appeared at one of the four locations. The subject responded to the location of the target by pressing a corresponding key on the computer keyboard.

There are three main findings. First, negative priming was not a function of RSI. Second, negative priming was not a function of PRSI. Third, negative priming was more reliable when RSI was manipulated consistently within groups than when it was manipulated randomly within groups. All of these results support an inhibition-based view of negative priming.

## References

- Hasher, L., Zacks, R. T., Stoltzfus, E. R., Kane, M. J., & Connelly, S.L. (1996). On the time course of negative priming: Another look. *Psychonomic Bulletin and Review*, 3, 231-237.
- Neill, W. T. & Valdes, L. A. (1992). Persistence of negative priming: Steady state or decay? *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 18, 565-576.
- Neill, W. T., Valdes, L. A., Terry, K. M., & Gorfien, D. S. (1992). Persistence of negative priming: II. Evidence for episodic trace retrieval. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 18, 993-1000.