

# Effects of Temporal Pressure on Episodic Memory

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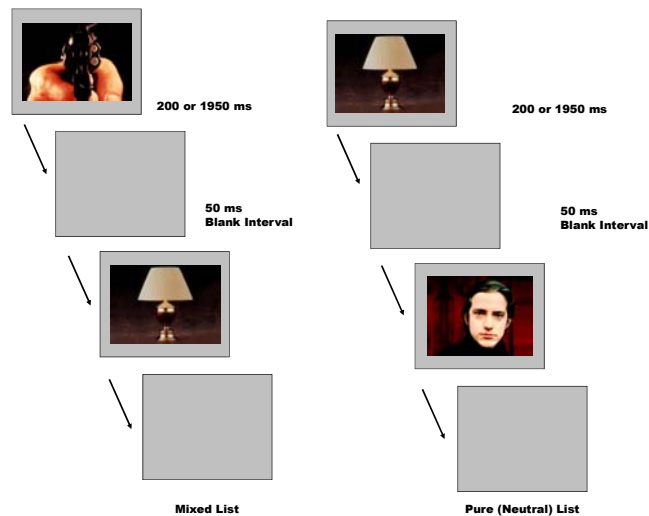
## BACKGROUND & RATIONALE

Priority Binding theory (MacKay et al., 2004) proposes that under temporal pressure arousing negative stimuli delay binding of neutral items presented in close temporal proximity (as in lists with mixed neutral and negative stimuli). With fast presentation rates, a subsequent negative item may interrupt the binding process for the preceding neutral stimulus. This results in more accurate memory for negative images presented in mixed lists. However, in slow presentation rates, binding occurs equally for all items. Therefore, no such advantage is predicted comparing images presented in lists of the same valence.

This study examined the predictions of Priority Binding theory by manipulating temporal pressure across lists of emotional visual images.

## METHOD

Participants (N = 42, recruited from subject pools at two private Southern California universities) were shown eight lists of 14 images selected from the International Affective Picture System. One pure negative, one pure neutral, and two mixed valence lists were presented at 0.5 Hz and at 4 Hz, using E-Prime 2.0 Professional to randomize this list order and list composition. Following each list, participants completed old-new recognition tests and rated their confidence using a remember/know paradigm.



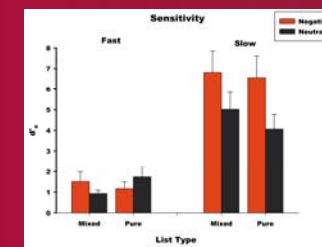
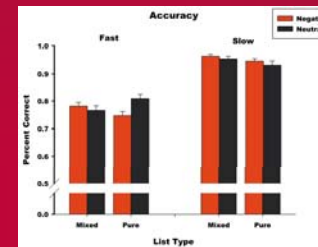
## Acknowledgments

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## RESULTS

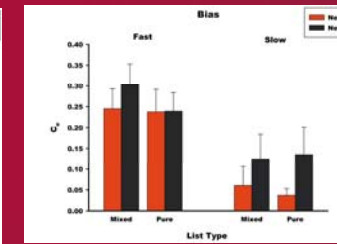
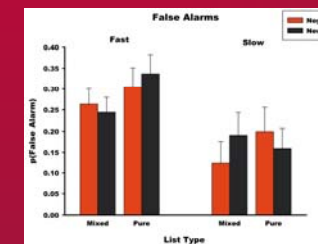
**Accuracy:** A three way interaction resulted from performance differences between rates, and among lists at the fast rate,  $p = .006$ . In fast, pure lists, neutral valence images displayed an accuracy advantage over negative,  $p < .001$ , while in fast, mixed lists the difference was non-significant,  $p = x$ . Participants performed more Accuracy was better for slow than fast lists suggesting that processing benefited from the extra encoding time,  $p < .001$ . No differences among lists were observed at the slow rate.

**Sensitivity:** Sensitivity ( $d'$ ) paralleled accuracy; however the differences among lists were greater.  $d'$  was better at slow than fast presentation rates,  $p < .001$ , and for negative images at slow rates,  $p < .03$ . A two-way Rate X List Type interaction,  $p < .03$ , resulted from a non-significant trend for better sensitivity for negative images in fast mixed lists, but neutral images in fast pure lists.



**False Alarms:** There were more FAs in fast than slow lists,  $p = .001$ . No other differences were observed, although the three-way interaction hinted at a trend among list types,  $p = .09$ .

**Bias:** Following the FAs, participants displayed a more conservative response bias with fast than slow presentation rates,  $p < .001$ ; however, despite the appearances, bias was not significantly more liberal for negative images,  $p > .10$ .



## CONCLUSION

The present study examined the effects of temporal pressure on recognition of emotional pictures. Manipulating presentation rate produced the largest effect and strongly influenced recognition accuracy sensitivity and bias. The predictions of binding theory were partially supported with a trend for negative images to exhibit a memory advantage over neutral images in the mixed, fast lists; there was also an unexpected memory advantage for neutral images in pure lists. A ceiling effect was found for recognition memory of lists at the slow rate, suggesting that extra viewing time allowed participants to better process and encode images. Inspection of the graphs suggests slow-rate negative images produced higher  $d'$ , and more liberal bias than neutral. Though image recognition appears to be influenced by emotional valence and arousal, it is still possible that image stimuli are differentially processed and remembered than word stimuli.