

When the animal destroys the beach, the beach destroys the animal: Mutually assured destruction in gist processing

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Abstract

Observers can report some semantic content of scenes when those scenes are presented for 20 msec, flanked in time by masks. It is likely that only a single object could be selected for attentional processing in this time so this gist processing would seem to involve non-selective processing of the entire image. Similarly, we find that expert observers (radiologists and cytopathologists) can detect subtle signs of cancer at above chance levels in 250 msec exposures of mammograms and Pap-smears. These exposures are unmasked but still preclude normal extended attentional scrutiny. Can multiple gist's be computed concurrently? Last year, we demonstrated limits on this ability. We cued observers with one of nine target categories (e.g. beach, animal, bridge) before presenting a masked scene for 20 msec. Targets were present on 50% of trials. Critically, on half of target present trials, an un-cued target category was also present. That is, "beach" would be cued but the scene might include both beach and animal – a "trial-irrelevant", but "task-relevant" target category. Observers were 76% correct when trials contained only cued targets but only 52% correct when trial-irrelevant targets were also present. Critically, animal would not interfere with beach if it were not a target on other trials in the same block. This year, we show that interference is mutual. On each trial, observers reported on the presence of the target and were also asked if any other categories were present. If observers missed the task-relevant "animal", they were actually LESS likely to be able to report a task-irrelevant beach. Of course, in real life, if you were looking for your fork and now for your glass, you are not blinded by the presence of both items in the visual field. We find that "mutually assured destruction" occurs for exposures shorter than 200 msec.