Atten Percept Psychophys (2016) 78:1219–1220
DOI 10.3758/s13414-016-1166-8

News from the field

Published online: 17 June 2016

ATTENTIONAL CONTROL

Flanker Congruency Effects

Avital-Cohen, R., & Tsal, J. (2016). Top-down processes override bottom-up interference in the flanker task. *Psychological Science, 27(5)*, 651–658. doi: 10.1177/0956797616631737

Flanker congruency effects reflect the involuntary processing of distractor letters that surround a central target letter. The typical finding is that RTs are slowed when the distractors are incongruent with the target (requiring a different response) than when the distractors are congruent with the target (requiring the same response), or neutral (requiring no response).

It has long-been thought that congruency effects reflect bottom-up processing of the distractors; however, more recently, congruency effects have been thought to reflect involuntary processing of the distractors due to incomplete top-down attentional control. Avital-Cohan and Tsal examined whether top-down processing is applied to the distractors by manipulating the category of the distractors so they were either relevant (letters) or irrelevant (digits) to the target category (letters). Critically, certain distractors were made to be ambiguous and would be perceived as letters or digits depending on which category they appeared. Subjects identified a target letter that appeared in Times New Roman font (S or O) that was flanked by letters or digits (distractor category was blocked). Distractors appeared in a font (e.g., Digital-Mono 7) that made two distractors ambiguous (S and 0)—they could be perceived as S/5 or as O/0. Other distractors were neutral to the target (letters: A F L; digits: 3 4 6). Avital-Cohan and Tsal hypothesized that if the distractors received top-down processing, congruency effects would occur for the ambiguous distractors (S and 0) in the letter distractor condition, because they would be perceived as response-incongruent letters, but not the digit distractor condition, because they would be perceived as digits. Indeed, Avital-Cohan and Tsal found an interaction between distractor category and distractor congruency, with a large congruency effect from the ambiguous distractors in the letters condition and no congruency effect in the digits condition. Their second experiment used unambiguous distractor letters (S, D) in Calibri or Nyala font, so they could only be perceived as letters, and found equivalent congruency effects in the digit and letter distractor conditions.

The results suggest that subjects applied top-down processing to the flanking distractors, leading to their involuntary processing and response interference on the central target. Additionally, the results suggest that congruency effects are not due to only bottom-up processing of the distractors, but also to incomplete top-down attentional control.-Bryan R Burnham.

VISUAL PERCEPTUAL LOAD

Inattentional Numbness

Murphy, S. & Dalton, P. (2016) Out of touch? Visual load induces inattentional numbness. Journal of Experimental Psychology: Human Perception and Performance, 42(6), 761–765.

It is well established that individuals can miss both visual and auditory changes in their environment when they are not attending to the location of change, or when there is insufficient cognitive capacity available to adequately process a change. Far fewer studies, however, have attempted to determine whether similar effects can be observed with tactile stimuli. In a new study by Murphy and Dalton (2016), the researchers introduce a novel paradigm to determine whether visual perceptual load can impact tactile awareness.

Participants were engaged in a visual search task in which perceptual load was varied (low vs. high) and, on half of all trials, a brief vibration was administered to one of the participants' hands 50 ms after the onset of the search display. The search task required participants to indicate which of two letters appeared in the display and following each response, they were then asked to indicate whether a tactile stimulus had been presented during the trial. Critically, participants were less likely to notice the tactile stimulus when under a high visual perceptual load relative to a low visual perceptual load. This study adds to the existing literature on change/inattentional blindness, while also serving as a unique demonstration of "inattentional numbness" given that tactile awareness was impacted by a visual perceptual load. -Michael Dodd.

LEARNING AND ATTENTIONAL DIFFERENCES

Why is spaced practice superior to massed practice for inductive learning?

Metcalfe, J. & Xu. J. (2016). People mind wander more during massed than spaced inductive learning. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 42*(6). 978–984. http://dx.doi.org/10.1037/xlm0000216

Inductive learning is the ability to learn a category or concept by studying exemplars that belong to that category or concept. For example, studying a few works of art by a particular artist should help one subsequently identify novel works of art by that artist. A classic finding in the learning literature is that spaced practice results in better learning than massed practice. This general phenomenon was believed to apply to inductive learning. Indeed, several studies show that spaced practice, where exemplars from one category (e.g., works of art by a single artist) are interleaved with exemplars from another category (e.g., works of art from a different artist), improves inductive learning relative to massed study (e.g., all works of art by a single artist studied before moving on to the next artist).

Metcalfe & Xu (2016) examined whether spaced practice is superior to massed practiced due to attentional differences. Specifically, the authors asked whether mind wandering occurred less during spaced practice, contributing to superior inductive reasoning, relative to massed practice. The authors asked participants to report whether they were mind wandering while participants studied works of art from various artists during either a massed block, where all works of art by one artist were grouped together during the study phase, or a spaced block, where works of art by different artists were spaced apart because they were interleaved with other artists' work. The final test phase involved showing participants novel works of art from the studied artists and asking participants to identify the likely artist. Success in this generalization task was interpreted as successful inductive learning. The authors hypothesized that mind wandering was more likely to occur during the massed block relative to the spaced block. The results replicated previous work showing better performance on the inductive reasoning task in the spaced condition relative to the massed condition. Additionally, the authors found that mind wandering occurred more frequently in the massed condition relative to the spaced condition, driven by significantly more mind wandering in the fourth quartile of the experiment. A negative correlation between participants mind wandering and inductive learning on the final test showed that people who mind wandered more, learned less.

In Metcalfe & Xu (2016), the term spaced is used to refer to interleaving items between one single artist's work, such that each trial may contain a different artist's work. This definition of spacing, in which trials are consecutive, is then used to examine inductive learning. As the authors pointed out in their introduction, another arena in which spacing effects have been examined is in memory for specific items rather than inductive learning. In those studies, spacing often refers to a measurable time lag separating episodes of study. Given that the present study showed an effect of time on mind wandering (that is, mind wandering was only significantly greater in the massed condition during the fourth quartile of the experiment) it would be interesting to determine the role of spacing on mind wandering according to the definition of spacing where there are measurable time lapses between study trials. This is a particularly interesting topic for us as educators because hopefully taking breaks during long lectures (spacing according to the second definition above) helps both memory for specific items and inductive learning.-Ashleigh M. Maxcey