

News from the field

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SYNESTHESIA

The mechanisms of synesthesia

Hamada, D., Yamamoto, H., & Saiki, J. (2016). Database of synesthetic color associations for Japanese kanji. *Behavior Research Methods*. doi:10.3758/s13428-015-0691-z

How does synesthesia operate across individuals? Are there overall patterns in how colors are evoked, or does the condition develop in entirely idiosyncratic ways based on personal experience? To compile data that can begin to answer such questions, Hamada et al. collected more than 5,000 color associations from eight grapheme–color synesthetes looking at Japanese kanji and hiragana and Western letters and numbers. Then they used this database to look for patterns in how the visual stimuli evoked sensations and in the distributions of colors. They found that both entire stimuli and different levels of components within complex stimuli can evoke colors, and that the colors are not uniformly distributed, but clearly cluster. Two general principles seem to govern grapheme–color synesthesia: *shape similarity* and *synesthetic color clustering*—so that similar shapes tend to evoke similar colors, which cluster in distinct areas of color space. Using these findings, Hamada et al. even propose a theory for how synesthesia develops: Early-acquired forms evoke colors, which then attract new associations based on similarity as new characters are acquired. In a field where individual differences have been much more striking than overall patterns, these results provide suggestive evidence for the processes that may underlie synesthesia as a phenomenon.—Emilio Englade

MULTI-TASKING

Bad strategies

Clark, A.D. & Hunt, A.R. (2016). Failure of intuition when choosing whether to invest in a single goal or split resources

between two goals. *Psychological Science*. doi: 10.1177/0956797615611933.

People can monitor two task goals pretty well if the goals and associated strategies are easy to concurrently maintain and the tasks remain easy to perform. But when each task becomes more difficult, eventually a point is reached where it becomes inefficient to maintain both goals. That is, people should dedicate all potential resources to one task to ensure that at least one goal can be accomplished, accepting that the other task might be poorly completed. This approach leads to better performance than dealing badly with two tasks concurrently.

Clark and Hunt show that people are not very good at changing meta-strategies in this way: they do not make sensible adjustments with increasing task demands. This was demonstrated in three experiments. In each one, participants had to monitor two goals while task difficulty was manipulated. In Experiment 1 eye movements were measured in a target detection experiment, in Experiment 2 participants were required to throw bean-bags in hoops, and in Experiment 3 participants completed a memory test. As each task became more difficult, optimal performance required participants to modify position and dedicate their potential resources to one goal. For example, in the bean-bag tossing experiment, rather than maintaining position between two distant hoops, participants would have been best served by abandoning one hoop and moving closer to the other. However, in all experiments, participants almost never made this kind of adjustment.

The authors propose a couple of reasons why people are bad at optimizing performance in such seemingly simple situations. One hypothesis is that because deciding between multiple goals requires division of resources and tends to be complex, people are unable to see the simple solution. By habit, they adopt a more complicated approach to the task than is necessary. There is thus clear potential for future research

investigating our ability to ‘fix’ this kind of inefficient behaviour.—Dr. Wieske van Zoest.

THREAT DETECTION

Threat and attention

Azarian, B., Esser, E.G., & Peterson, M.S. (2016). Evidence from the eyes: Threatening postures hold attention. *Psychonomic Bulletin & Review* doi: [10.3758/s13423-015-0942-0](https://doi.org/10.3758/s13423-015-0942-0).

The detection of threat in the immediate environment is important for both the safety and survival of any organism. Unsurprisingly, therefore, there is mounting evidence that attention is fine-tuned to identify threatening stimuli—such as angry faces or spiders—both quickly and efficiently. A recent study by Azarian, Esser, and Peterson, appearing in *Psychonomic Bulletin & Review*, has provided the first evidence that threatening postures also impact

attention, specifically in high-anxious individuals. Participants were presented with an irrelevant body cue at fixation adopting either a fearful, happy, angry, or neutral pose (the face was occluded to ensure that emotional content could not be derived from facial expression). Following a brief exposure to the body (100 or 500 ms), a target appeared in the periphery and individuals were required to saccade to the target as quickly and accurately as possible. At the briefest SOA, high-anxious participants exhibited increased saccade latencies in response to threatening relative to non-threatening body postures. This effect was not observed in low-anxious participants, or at longer cue-target SOAs. These results are indicative of threatening postures impacting attentional disengagement in highly anxious individuals, and add to a growing literature demonstrating that attention is sensitive to a wide variety of threatening stimuli, including social threat.—Dr. Michael Dodd