New Research From Psychological Science

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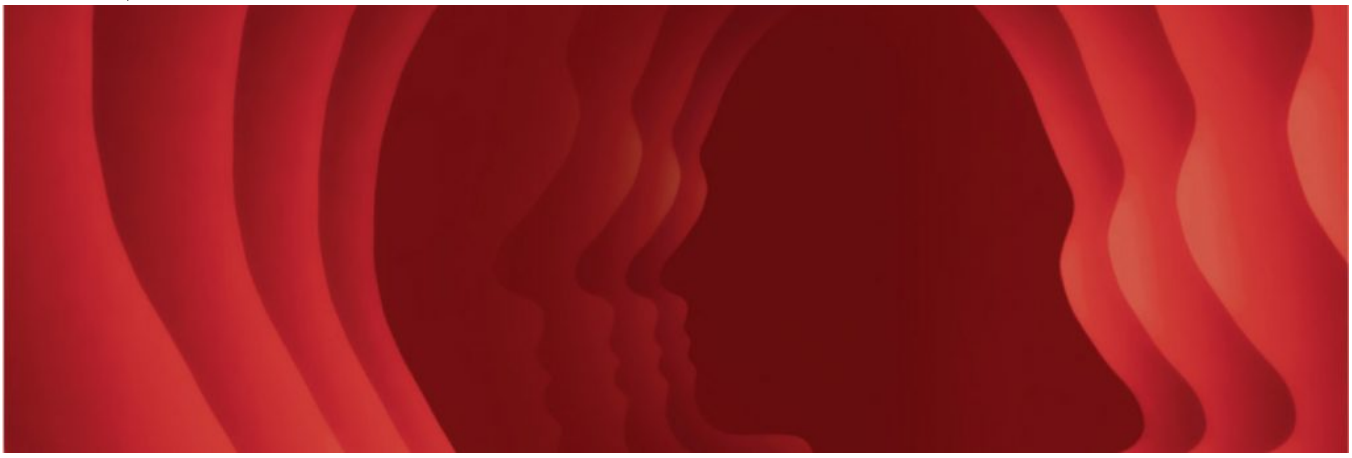

Read about the latest research published in *Psychological Science*:

Similarity Grouping as Feature-Based Selection
Dian Yu, Xiao Xiao, Douglas K. Bemis, and Steven L. Franconeri

Individuals perceive objects with similar features (i.e., color, orientation, shape) as a group even when those objects are not grouped in space. An explanation for this phenomenon — termed similarity grouping — is that features are selected one at a time, and spatial areas that contain that feature are amplified even if they are not contiguous. If features are selected one at a time, though, similarity grouping must be serial (e.g., a green group cannot be formed at the same time as a red group). Yu and colleagues offer support for this hypothesis by showing that individuals do not underestimate the number of objects in a visual display when these objects are grouped by similarity cues (e.g., same color, orientation, or shape) but do underestimate the number when the objects are grouped by spatial cues (e.g., proximity). Because the number-estimation task requires simultaneous selection of the entire display, it prevented similarity grouping, impeding the underestimate created by grouping from occurring. Participants showed the same pattern of results when they had more time to process the displays and when grouping was stronger (i.e., cued by two similar features). Hence, similarity grouping seems to produce only one group at a time, which allows individuals to choose a grouping that best serves their current goals.

As if by Magic: An Abrupt Change in Motion Direction Induces Change Blindness
Richard Yao, Katherine Wood, and Daniel J. Simons

Magicians claim they can hide their method for a trick in plain sight by using a sudden change in movement direction that attracts attention. Yao and colleagues tested this claim that a sudden directional change in movement induces change blindness (i.e., failure to notice a change in a visual stimulus). Participants saw an array of Gabor patches (circular objects that appear striped) that traveled together in a straight line before suddenly changing direction. A random Gabor patch in the array changed in orientation either when or after the array changed trajectory, and participants were asked to report which patch changed. Participants were worse at identifying the target patch when it changed during the trajectory change. This effect occurred both when the change in trajectory was curved and when it was an abrupt angle. Eye-tracker data showed that participants rarely made a saccade (a rapid eye movement) at the moment of the change, indicating that saccades were not the cause of change blindness. The sudden change in movement of the array seems to have hidden the orientation change among the Gabor patches. This change blindness occurred while the object was in full view and shows how little disturbance is needed to mask an obvious change.

Understanding Dyslexia Through Personalized Large-Scale Computational Models
Conrad Perry, Marco Zorzi, and Johannes C. Ziegler

Despite normal intelligence and schooling, many children in primary school struggle with becoming efficient readers, showing developmental dyslexia. Perry and colleagues used a computational model that learned to read the same way children do to investigate how the core deficits of dyslexia determine individual reading abilities. The model is taught grapheme-phoneme correspondences, and then it decodes words that already have a phonological representation but not an orthographic representation. Finally, in a self-taught process, the model uses orthography and phonology to strengthen letter-sound connections and improve the efficiency of decoding and, therefore, the ability to read irregular words and nonwords. The authors found that this model simulated the differences among children's reading abilities better than models that emphasize only one component of reading difficulties (e.g., deficits in perception of phonemes, deficits in letter-position coding, or general processing inefficiency). The model indicates that increasing vocabulary tends to be more beneficial for reading irregular words than for reading nonwords; whereas increasing phonological processing shows the opposite pattern, and increasing orthographic efficiency helps reading of all word types. These results suggest that the deficits that cause dyslexia are multidimensional, and the results could pave the way for developing personalized computer models to guide the design of individually tailored interventions to improve reading.