

Researchers use sensory integration model to understand unconscious priming

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Priming, an unconscious phenomenon that causes the context of information to change the way we think or behave, has frustrated scientists as they have unsuccessfully attempted to understand how it works. For example, researchers have found that hearing aging-related words causes people to walk more slowly, or holding a hot cup of coffee while talking to another person heightens feelings of interpersonal warmth. But, recent failures to replicate demonstrations of unconscious priming have resulted in a heated debate within the field of psychology.

In a breakthrough paper published in *Perspectives on Psychological Science*, Carnegie Mellon University's Roberta Klatzky and J. David Creswell use a well-established human perception theory to illustrate the mechanisms underlying [priming](#) and explain how its effects do not always act as predicted. Klatzky and Creswell describe and adapt a model of inter-sensory interaction—how multiple senses combine to form perception—that will give scientists a new and clearer avenue to investigate priming in the future.

"We began to think about social priming as just another way that our senses interact," said Klatzky, the Charles J. Queenan, Jr. Professor of Psychology who holds additional appointments in the Human-Computer Interaction Institute and the Center for the Neural Basis of Cognition (CNBC).

Klatzky and Creswell use a basic sensory integration model in which each sense gathers information about the physical world through a

channel; i.e. vision takes in photons of light, hearing takes in sound waves, etc. The information coming through these various pathways then comes together in the brain. Each input source produces a "bid" for the value of what is being experienced, and the bids are combined to create the whole perceptual result.

For example, when we stir coffee in a mug, we knock against the sides with the spoon and hear the "clink." Both senses of touch and hearing contribute to our impression that the mug is made of some hard material. The situation in social priming is that sources of information are combined in rather surprising ways. If holding that hot-coffee-filled mug in our hand signals "warmth" to us while we are introduced to someone, we might perceive that person to be socially warmer than the social interaction alone would suggest.

To apply the model to priming, Klatzky and Creswell extend it to include additional bids from indirect sources, including memory and heuristic inferences made by "rule of thumb." They explain indirect bidding as it relates to several classic priming studies, including how words unrelated to action but synonymous for elderly, such as "Florida," "old" and "lonely," might cause individuals to walk more slowly. The concept of "elderly" is aroused, and it causes a heuristic bid on a related dimension, such as self-perceived energy resources. Priming "elderly" leads to a reduced estimate of available energy, which directly affects walking speed. Variations in whether this happens may result because people interpret the prime words differently, or because some individuals' perceived energy levels are unaffected, or simply because their walking speed is determined by something like hurrying to the next appointment rather than the words they heard.

"Our approach is to understand how the basic processes work, in order to account for the inconsistencies," Klatzky said. "Because, as scientists, once you understand the underlying causes, you are gifted with control

over when effects occur and when they don't."

Creswell, associate professor of psychology and member of the CNBC, believes their inter-sensory interaction model provides a significant advance to research on social priming.

"We are constantly being primed by our environment, yet there is significant debate in the field about whether primes can influence our behavior in meaningful ways, particularly because a couple of recent studies haven't been able to replicate established priming-social behavior effects. Our model provides one of the first accounts depicting when you would expect primes to affect behavior, which directly addresses the vigorous priming debate in the field," he said.

Acclaimed science writer Wray Herbert championed Klatzky and Creswell's novel approach to priming in a recent piece in the Huffington Post, calling it an "insight into the mess."

More information: To read the full paper, "An Inter-Sensory Interaction Account of Priming Effects—and Their Absence," visit pps.sagepub.com/content/9/1/49.abstract

Provided by Carnegie Mellon University

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