

The Ties That Bind Us: Social Neuroscience Provides Cerebral Answers to Life's Social Problems

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Social neuroscience assumes that the essential mechanisms of mind and behavior can only be explained by a partnership between biological and social approaches. Researchers in social neuroscience use various methodologies and levels of analysis in their pursuit of ever more broader, more comprehensive, theories of social processes and behavior. Like the proverbial overnight sensation, social neuroscience seems to have burst on the scene rather suddenly. But in fact, this is a well-established field with rich albeit short history.

Current topics in social neuroscience and future directions for this field were the topic of a symposium introduced by Thomas Insel, director of the National Institute for Mental Health, during the APS Annual Convention in Atlanta.

The Social Neuroscience Symposium included presentations by APS Board Member John Cacioppo, University of Chicago; Nathan Fox, University of Maryland; Heather Henderson, University of Miami; Matthew Lieberman, University of California, Los Angeles; and Liz Phelps, New York University. The National Institute of Mental Health and the National Science Foundation sponsored this symposium.

Cacioppo, an APS Fellow and Charter Member, began the symposium with “How Does the Social World Get Under Your Skin? Social Isolation and Health,” a presentation of research into the mediating and transduction pathways connecting stress to poor physical and emotional health. According to Cacioppo, social isolation can be a significant, even traumatic, stressor. Mediating pathways between social isolation and other stressors, real or perceived, and poor health include more traditional psychological factors, such as personality traits, whereas transduction pathways include physical factors such as catabolic and anabolic processes. Cacioppo said that social isolation can have a significant detrimental effect on both one’s mental and physical health. He cited research showing that self-reported lonely people’s sleep quality appears to be better than non-lonely people, indicating that lonely people are in REM sleep a greater amount of the time relative to their more socially-adept counterparts. REM sleep has been shown to be a time of processing emotional trauma and repair and growth of neuronal circuitry. This may indicate that social isolation may be emotionally and neurologically traumatic.

In “Temperament Influences Automatic and Control Processes Underlying Social Development,” Fox and Henderson examined the influence of temperament on automatic and control processes underlying social development. In particular, they discussed the influential role of the brain’s frontal lobes in shaping a child’s emerging personality. According to Fox and Henderson, the maturation of the prefrontal cortex heavily influences a child’s developmental timeline. The fact that relatively stable differences in behavior exist throughout infancy and childhood may point to the relative stability of cerebral development. Their work illustrates the influence of brain processes on temperament and the sway of temperament on social cognition, providing further evidence for the integration of social

psychology and neuroscience.

“Developmental psychology provides a ‘moving window’ on brain-behavior relationships that emerge over infancy and childhood,” Fox said.

In a series of three fMRI investigations, Lieberman revealed that the neurological experience of pain stimulation, social rejection, and the presentation of African-American faces produced relatively similar neuroanatomical activity in the brain. During his presentation, “The Common Neural Bases of the Experience and Self-Regulation of Physical Pain, Social Threat Cues and Interpersonal Rejection: A Social Cognitive Neuroscience Approach,” Lieberman said these neural pathways seem to very similar. All three activities were shown to produce emotional reactions in the amygdala and anterior cingulate cortex regions of the brain. Linking to Cacioppo’s earlier presentation on the detrimental neurological effects of social isolation, Lieberman concluded by presenting preliminary results from the “first neuroimaging study on social exclusion,” in which he has found a significant correlation between social exclusion and select brain activity, further implying a strong social-neuroanatomical connection.

Phelps discussed the role of affective neuroscience in her talk, “The Amygdala and Race: Linking Affective Neuroscience and Social Evaluation.”

“Both amygdala and behavioral responses to race evaluation may represent indications of social learning, as controlled to a large extent by the amygdala,” Phelps said.

Working with an animal model of research, her findings lend credence to the role that animal models can provide for understanding neural systems and human social behavior.