New research reveals more about how the brain processes facial expressions and emotions

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Research released today helps reveal how human and primate brains process and interpret facial expressions, and the role of facial mimicry in everything from deciphering an unclear smile to establishing relationships of power and status. The findings were presented at Neuroscience 2012, the annual meeting of the Society for Neuroscience and the world's largest source of emerging news about brain science and health.

Facial mimicry—a social behavior in which the observer automatically activates the same facial muscles as the person she is imitating—plays a role in learning, understanding, and rapport. Mimicry can activate muscles that control both smiles and frowns, and evoke their corresponding emotions, positive and negative. The studies reveal new roles of facial mimicry and some of its underlying brain circuitry.

Today's new findings show that:

- Special brains cells dubbed "eye cells" activate in the amygdala of a monkey looking into the eyes of another monkey, even as the monkey mimics the expressions of its counterpart (Katalin Gothard, MD, PhD, abstract 402.02, see attached summary).
- Social status and self-perceptions of power affect facial mimicry, such that powerful individuals suppress their smile mimicry

towards other high-status people, while powerless individuals mimic everyone's smile (Evan Carr, BS, abstract 402.11, see attached summary).
- Brain imaging studies in monkeys have revealed the specific roles of different regions of the brain in understanding facial identity and emotional expression, including one brain region previously identified for its role in vocal processing (Shih-pi Ku, PhD, abstract 263.22, see attached summary).
- Subconscious facial mimicry plays a strong role in interpreting the meaning of ambiguous smiles (Sebastian Korb, PhD, abstract 402.23, see attached summary).

Another recent finding discussed shows that:

- Early difficulties in interactions between parents and infants with cleft lip appear to have a neurological basis, as change in a baby's facial structure can disrupt the way adult brains react to a child (Christine Parsons, PhD, see attached speaker's summary).

"Today's findings highlight the role of facial expressions in communication and social behavior," said press conference moderator Ruben Gur, PhD, of the University of Pennsylvania, an expert on behavior and brain function. "Brain circuits that interpret the face appear ever more specialized, from primate 'eye cells,' to brain feedback that enables us to discern meaning through facial mimicry." This research was supported by national funding agencies, such as the National Institutes of Health, as well as private and philanthropic organizations.

More information: www.sfn.org/am2012/pdf/press/Faces.pdf