# Brain takes just 200 milliseconds to interpret facial expressions

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(PhysOrg.com) -- Researchers at the University of Glasgow have discovered that it takes the brain just 200 milliseconds to gather most of the information it needs from a facial expression to determine a person's emotional state.

The study, led by Prof Phillipe Schyns, Director of the Centre for Cognitive Neuroimaging within the Department of Psychology, showed that the brain starts by looking at the eyes then zooming out to process the whole face before zooming back in to examine specific diagnostic features - such as eyes open wide in fear, or a smiling mouth.

The researchers believe the results show that facial expressions and the ability to decipher them co-evolved in the brain.

Prof Schyns said: "Facial expressions and the interpretation of them are a fundamental part of human communication and our study has revealed

how the brain uses facial details in order to make crucial social judgements.

“Our study suggests that facial expressions co-evolved with the brain - the former to be deciphered, the latter to decipher. With time-resolved brain data, we reveal both how the brain uses different expressive features and how long it takes to process enough information for the critical social judgements we take for granted.”

There are six basic facial expressions: happy, fear, surprise, disgust, anger and sadness. All of these expressions have distinctive characteristics that the brain can easily distinguish between.

Volunteers in the study were shown each expression on 10 different faces, five male, five female, while brain-imaging equipment monitored how quickly different parts of the brain interpreted them.

The results showed that between 140-200ms of the picture being shown, an information processing mechanism starts independently in both left and right brain hemispheres, looking first at the eyes, then the rest of the face before zooming back in on specific features associated with the basic emotions.

By the end of this process, the brain has enough information to accurately predict the emotional state of the person displaying the facial expression.

The paper: ‘Transmission of facial expressions of emotion co-evolved with their efficient decoding in the brain: behavioural and brain evidence’ is published online at *PLoS ONE*.

Provided by University of Glasgow