Quick to smile: Study shows speed of expression offers vital visual cues

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The speed at which we produce facial expressions plays an important role in our ability to recognize emotions in others, according to new research at the University of Birmingham.

A team in the University's School of Psychology carried out research which showed that people tend to produce happy and angry expressions more rapidly, while sad expressions are produced more slowly.

The team found that our ability to form judgements about people's facial expressions has close links with the speeds at which those expressions are produced and is also closely related to the ways in which we would produce those expressions ourselves. The study is published in *Emotion*.

"Being able to recognize and interpret facial expressions is a vital part of social interaction," explained lead author Dr. Sophie Sowden. "While we understand the spatial characteristics of an expression—the way the mouth moves in a smile, for example—the speeds at which expressions are produced are often overlooked. The ability to pick up on and rapidly interpret these cues could also help people to judge facial expressions even when mask-wearing might limit other visual cues."

Dr. Sowden added: "Better understanding how people interpret this important visual cue, could give us new insights into the diagnosis of conditions such as Autism Spectrum Disorder or Parkinson's Disease. This is because patients with these conditions often recognize facial expressions differently, or exhibit expressions differently."

In the study, the team asked people to create facial expressions directed at a camera, and used an opensource software program called OpenFace to track their facial movement. They measured the speed of movement in regions of the face known to be important in producing expression, including around the eyebrows, the nose and the mouth, as well as across the face as a whole.

In the first part of the experiment, the researchers investigated the average speed at which participants produced different expressions. They were asked to produce 'posed expressions', as well as expressions during speech, and spontaneous expressions were recorded in response to emotion-inducing videos. Interestingly, they showed differences in speed across emotions depends on the region of the face and the 'type' of expression being considered.

In a second phase of the study, the team investigated what would happen if they captured schematic versions of facial expressions being produced, and manipulated the speeds involved. In this experiment, the researchers found that as the act of expression was speeded up, people would get better at recognizing it as happy or angry, whereas if it was slowed down, people would more accurately identify it as sad.

As well as being important for early diagnosis of autism and Parkinson's disease, the researchers

believe the work could also be useful in a range of artificial intelligence applications such as facial recognition software.

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Provided by University of Birmingham

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