Being anxious could be good for you—in a crisis

December 29 2015

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New findings by French researchers show that the brain devotes more processing resources to social situations that signal threat than those that are benign.

The results in the journal *eLife* may help explain the apparent "sixth sense" we have for danger. This is the first time that specific regions of the brain have been identified to be involved in the phenomenon. The human brain is able to detect social threats in these regions in a fast,

automatic fashion, within just 200 milliseconds.

Even more surprising for the scientists was the discovery that anxious individuals detect threat in a different region of the brain from people who are more laid-back. It was previously thought that anxiety could lead to oversensitivity to threat signals. However, the new study shows that the difference has a useful purpose. Anxious people process threats using regions of the brain responsible for action. Meanwhile, 'low anxious' people process them in sensory circuits, responsible for face recognition.

Facial displays of emotion can be ambiguous but the researchers managed to identify what it is that makes a person particularly threatening. They found that the direction a person is looking in is key to enhancing our sensitivity to their emotions. Anger paired with a direct gaze produces a response in the brain in only 200 milliseconds, faster than if the angry person is looking elsewhere.

"In a crowd, you will be most sensitive to an angry face looking towards you, and will be less alert to an angry person looking somewhere else," says lead author Marwa El Zein from the French Institute of Health and Medical Research (INSERM) and the Ecole Normale Supérieurein Paris.

Similarly, if a person displays fear and looks in a particular direction you will detect this more rapidly than positive emotions. Such quick reactions could have served an adaptive purpose for survival. For example, we evolved alongside predators that can attack, bite or sting. A rapid reaction to someone experiencing fear can help us avoid danger.

"In contrast to previous work, our findings demonstrate that the brain devotes more processing resources to negative emotions that signal threat, rather than to any display of negative emotion," says El Zein.

Electrical signals measuredin the brains of 24 volunteers were analysed while they were asked to decide whether digitally altered faces expressed anger or fear. Some faces displayed exactly the same expression, but the direction of their gaze was altered. A total of 1080 trials were carried out.

It has often been theorized that elevated anxiety, even in a non-clinical range, could impair the brain's processing of threats. However, El Zein and her co-authors instead found that non-clinical anxiety shifts the neural 'coding' of threat to motor circuits, which produce action, from sensory circuits, which help us to recognise faces. The researchers note that it would be interesting to determine whether the same is true for people with anxiety scores in the clinical range.

More information: Marwa El Zein et al. Anxiety dissociates the adaptive functions of sensory and motor response enhancements to social threats, *eLife* (2015). DOI: 10.7554/eLife.10274

Provided by eLife

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