Size of personal space is affected by anxiety

August 27 2013

The space surrounding the body (known by scientists as 'peripersonal space'), which has previously been thought of as having a gradual boundary, has been given physical limits by new research into the relationship between anxiety and personal space.

New findings have allowed scientists to define the limit of the 'peripersonal space' surrounding the face as 20-40cm away. The study is published today in *The Journal of Neuroscience*.

As well as having numerical limits the specific distance was found to vary between individuals. Those with anxiety traits were found to have larger peripersonal space.

In an experiment, Dr Chiara Sambo and Dr Giandomenico Iannetti from UCL recorded the blink reflex - a defensive response to potentially dangerous stimuli at varying distances from subject's face. They then compared the reflex data to the results of an anxiety test where subjects rated their levels of anxiety in various situations.

Those who scored highly on the anxiety test tended to react more strongly to stimuli 20cm from their face than subjects who got low scores on the anxiety test. Researchers classified those who reacted more strongly to further away stimuli as having a large 'defensive peripersonal space' (DPPS).

A larger DPPS means that those with high anxiety scores perceive threats as closer than non-anxious individuals when the stimulus is the

same distance away. The research has led scientists to think that the brain controls the strength of defensive reflexes even though it cannot initiate them.

Dr Giandomenico Iannetti (UCL Neuroscience, Physiology and Pharmacology), lead author of the study, said: "This finding is the first objective measure of the size of the area surrounding the face that each individual considers at high-risk, and thus wants to protect through the most effective defensive motor responses."

In the experiment, a group of 15 people aged 20 to 37 were chosen for study. Researchers applied an intense electrical stimulus to a specific nerve in the hand which causes the subject to blink. This is called the hand-blink reflex (HBR) which is not under conscious control of the brain.

This reflex was monitored with the subject holding their own hand at 4, 20, 40 and 60 cm away from the face. The magnitude of the reflex was used to determine how dangerous each stimulus was considered, and a larger response for stimuli further from the body indicated a larger DPPS.

Subjects also completed an anxiety test in which they self-scored their predicted level of anxiety in different situations. The results of this test were used to classify individuals as more or less anxious, and were compared to the data from the reflex experiment to determine if there was a link between the two tests.

Scientists hope that the findings can be used as a test to link defensive behaviours to levels of anxiety. This could be particularly useful determining risk assessment ability in those with jobs that encounter dangerous situations such as fire, police and military officers.

More information: 'Better safe than sorry? The safety margin surrounding the body is increased by anxiety' is published online today in the journal The *Journal of Neuroscience*.

Provided by University College London