

Shrinking waistline is all in the mind

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Researchers have identified the area of the brain which controls perception of our body image by using an illusion that made people think their waists were shrinking.

Picture: A woman's waist. Volunteers in the study experienced the illusion that their waists were shrinking.

Placing a vibrating device on the tendons of the wrist creates the sensation that the joint is flexing, even though it remains stationary. Volunteers in the collaborative study, which involved Dr Dick Passingham of Oxford's Department of Experimental Psychology, had their wrists vibrated while their hands were touching their waists. This made them feel their wrists bending into their body, creating the illusion that their waists were shrinking.

Whilst the volunteers experienced the eerie sensation, their brains were scanned using functional magnetic resonance imaging. All 17 participants felt that their waist had shrunk by up to 28 per cent. The researchers found high levels of activity in the posterior parietal cortex, an area of the brain that integrates sensory information from different parts of the body. Volunteers who reported the strongest shrinking sensation also showed the strongest activity in this area of the brain.

The brain must process information about body size every day, for example when we walk through a narrow doorway, look at a pair of trousers and decide whether they would fit, or duck under a low ceiling. However, unlike more elementary bodily senses such as limb movement, touch and pain, there are no specialized receptors in the body that send information to the brain about the size and shape of body parts. Instead, the brain appears to create a map of the body by integrating signals from the relevant body parts such as skin, joints and muscles, along with visual cues.

Dr Passingham said: ‘The study suggested that the integration of information about the relative size of our body parts that gives us our body image goes on in the parietal cortex. The findings fit well with the fact that patients with injuries in the parietal cortex area of the brain can experience changes in their body image.’

The results of the study are published in the journal *Public Library of Science Biology*.

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