

Published online: 21 March 2007; | doi:10.1038/news070319-9

## To kill one, or watch many die?

### Brain damage takes the emotion out of decisions.

Kerri Smith

A runaway train is speeding down the tracks towards five workmen. You and a stranger are standing on a bridge over the track. The only way to save the five is to push the stranger in front of the train to his death, and his body will stop it from reaching them.

Do you push him?

Most people answer that they could not personally push a stranger to his death, even though more lives would be saved than lost. But a new study published online in *Nature* finds that people with damage to a particular part of the frontal lobe reach the opposite — alarmingly utilitarian — conclusion<sup>1</sup>.

Antonio Damasio at the University of Southern California in Los Angeles and his colleagues used a battery of dilemmas like this one to explore the role of emotion in moral decisions. Healthy subjects rejected most of the solutions that involved harming one person to save many lives, but the team found that people with damage to the ventromedial prefrontal cortex (VMPC), a brain area just behind the forehead, endorsed such decisions.

These patients, whose brain damage resulted from stroke or the removal of a brain tumour, made perfectly normal decisions when the scenarios didn't have a moral component (is it all right to change a cake recipe if you don't like it?) or were asked to make less personal decisions (is it all right to push a heavy sculpture off a bridge to save the five workmen?). But when patients responded to more personal moral dilemmas, they were more than twice as likely as both normal controls and patients with brain damage that didn't include the VMPC to decide to harm one person — even their own child — to save more lives in the future.

"There is a natural emotional revulsion over harming someone else, combined with sympathy for that person. This seems to be lacking in these patients," says Damasio. "They don't bring to the table the emotional component that the others are bringing."

### Moral maze

This fits with what scientists already know about the VMPC - it is responsible for taking account of social emotions such as pride, embarrassment, guilt and shame, and connects to other brain regions that are responsible for physiological signs of emotion.

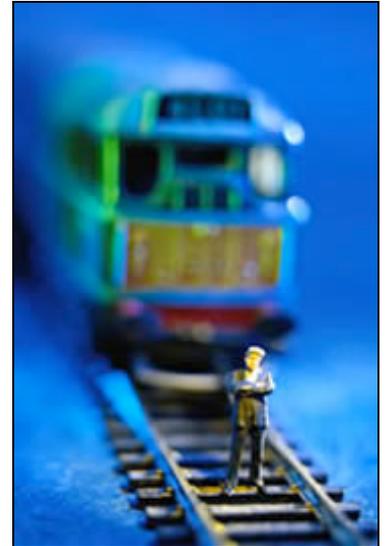
Other groups have used brain scanning to look at how people make moral decisions, and have shown that the VMPC is activated in such dilemmas. But scanning cannot tell you if the emotional reaction is caused by making the judgement, or arose before it, and therefore may have influenced the decision. Damasio's team have demonstrated that the VMPC is indeed involved in the decision-making process.

"It's a really striking result," says Joshua Greene, a neuroscientist at Harvard University who has carried out studies of moral judgement using brain scanning. The new study shows, he says, that activation in this one particular area is necessary for producing the normal pattern of judgements. "The effect is really strong," Greene says.

Damasio thinks the finding may also shed light on how humans became moral creatures in the first place.

"Social emotions were really the scaffolding for what we came to construct as ethics," he says. How those social emotions are taken into account in the process of decision-making seems to be very biological. "When things get complicated, we engage an emotional system — it's not reason alone," Damasio says.

Visit our [newsblog](#) to read and post comments about this story.



What would you do? Find a full list of questions used in this [experiment](#) here.

*Photodisc*

[▲ Top](#)

---

## References

1. Koenigs M., *et al.* *Nature*, DOI: 10.1038/nature05631 (2007).

[▲ Top](#)

---

Story from news@nature.com:  
<http://news.nature.com/news/2007/070319/070319-9.html>



© 2006 Nature Publishing Group | [Privacy policy](#)