



Empathic response to strangers based on interoceptive experience: an fMRI study



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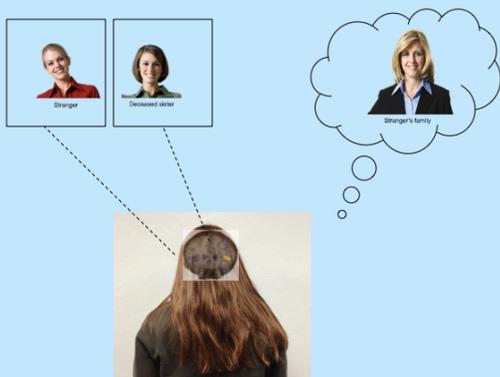
Abstract

Empathy, or experiencing the affective or sensory state of another (Batson, 2009), is usually investigated through explicit or implicit instruction. In the present study, bereaved individuals were shown photos of their deceased loved one and of a stranger (i.e., a control condition). Participants were asked to report, in an open-ended format, what they felt while looking at their loved one and at the stranger. Although no information was provided about the stranger, many participants presumed that the stranger was also deceased, like their own loved one.

Objectives

What regional brain activation is correlated with bereaved participants' empathy?

Figure 1



Methods

- Twenty-one women who had experienced the death of a mother or a sister to breast cancer were scanned with a 3T fMRI scanner.
- Participants brought in photos of the deceased, which were matched with photos of a stranger.
- Participants were asked, "What were you thinking or feeling when you were looking at the stranger?" (Figure 1)
- Responses to the open-ended question varied from "Curious, detached", to "Sorry for whoever she left behind".
- Ten clinical graduate students rated spontaneously reported feelings from the participants' open-ended responses, based on the level of empathy conveyed.
- Averaged empathy ratings were used in second level regression analysis of functional activation.

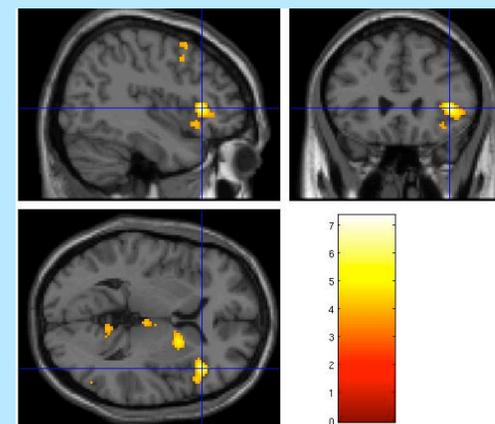
Results

Participants had an average age of 45 and were 28 months past the death event. Average education was a college degree, and 86% were white.

When looking at the stranger, the brain region with activity most strongly associated with empathy ratings was in the right anterior insula ($x = 42, y = 26, z = 4; Z = 6.83, p < .05$, corrected for multiple comparisons by family-wise error) (Figure 2).

Empathy ratings did not correlate with time since death, depressive symptoms, grief severity, positive or negative affect.

Figure 2



Conclusion

The present data fit with prior meta-analyses that have shown that right anterior insula activation occurred during passive viewing of pain or emotion in others (Fan et al, 2011). However, in the present study, reported empathy was not for the pictured stranger (who was interpreted as deceased), but for the participants' mental representation of the bereaved relatives of the pictured stranger. One interpretation is that interoceptive experience of one's own grief during the presentation of a stranger led to the conclusion that the pictured stranger must also be deceased, and therefore must have grieving relatives with whom the participant could empathize.

References

Batson, CD. (2009). "These things called empathy. In Decety & Ickes, *The Social Neuroscience of Empathy*, MIT Press, Cambridge, MA

Fan, Duncan, de Greck and Northoff (2011). *Neurosci Biobehav Rev* 35, 903-911.

This study funded California Breast Cancer Research Program Grant Number 10IB-0048, T32-MH19925, the Cousins Center for PNI and the Friends of the Semel Institute.

