

# NEUROSCIENCE WITH DR VALERIA GAZZOLA AND PROFESSOR CHRISTIAN KEYSERS

## TALKING POINTS

### KNOWLEDGE

1. What is empathy?
2. What are mirror neurons?

### COMPREHENSION

3. How does modern-day understanding of the neuroscience behind empathy differ to that from several decades ago?
4. What new discoveries did the Social Brain Lab make about psychopathic individuals' capacity for empathy, and how did they reach these conclusions?

### APPLICATION

5. Valeria says you can train yourself to become more empathic. Can you think of some ways this might be achieved?

### ANALYSIS

6. What are the limitations of fMRI within neuroscience?
7. Can you think of any possible caveats in the experiments on rats mentioned? Are there reasons that observer rats might experience fear other than empathy?

### SYNTHESIS

8. How would you design an experiment to test and understand differences in levels of empathy of human individuals? What variables would you need to control for?

### EVALUATION

9. Experiments involving animals, such as the experiments using lab rats to understand the neural basis of empathy, can provide useful scientific insights, but do they come at an ethical cost? Thinking about the pros and cons of experimenting on animals, how do you think researchers and lawmakers should decide whether any particular experiment is justified?
10. How do you think the Social Brain Lab's work could benefit society? Do you think their findings could lead to a more empathic population?

## ACTIVITIES YOU CAN DO AT HOME OR IN THE CLASSROOM

Create a poster or presentation that explains the work of the Social Brain Lab and its findings on empathy. Do further research online to supplement what you have learned from the article. Make sure to include:

- A definition of neuroscience and how it differs from other sciences such as psychology.
- The changing scientific consensus on how empathy works.
- Experimental techniques used to find out more about empathy.
- What factors lead to different levels of empathy.
- Next steps for research and for society.

When complete, present your work to your peers. What feedback do they offer?

## MORE RESOURCES

- The website for Christian Keyzers' research group contains several videos on how the lab uncovered new information about empathy, including one narrated by Morgan Freeman: [nin.nl/research/researchgroups/keyzers-group/](http://nin.nl/research/researchgroups/keyzers-group/)
- Find out more about Christian's book, *The Empathic Brain*: [nin.nl/research/researchgroups/keyzers-group/empathic-brain/](http://nin.nl/research/researchgroups/keyzers-group/empathic-brain/)
- The webpage for Valeria Gazzola's research group delves deeper into her work with links to research and explanatory videos: [nin.nl/research/researchgroups/gazzola-group/](http://nin.nl/research/researchgroups/gazzola-group/)
- This episode of *Citizen Brain* explains the 'empathy circuit', and what it means for society: [www.youtube.com/watch?v=a\\_732-H1CUY](http://www.youtube.com/watch?v=a_732-H1CUY)
- This Wikipedia page provides a brief overview of the history of neuroscience: [en.wikipedia.org/wiki/History\\_of\\_neuroscience#:~:text=From%20the%20ancient%20Egyptian%20mummifications,knowledge%20about%20the%20human%20brain.](http://en.wikipedia.org/wiki/History_of_neuroscience#:~:text=From%20the%20ancient%20Egyptian%20mummifications,knowledge%20about%20the%20human%20brain.)