

# Cognitive neuroscience

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## Talking points

### Knowledge

1. What were participants asked to draw in the team's study?
2. What was the main conclusion of the team's study?

### Comprehension

3. What is the team's assumption for why guesses as to the intended emotion from colour drawings by STEM students were more accurate than those by art students? Can you think of any possible alternative explanations?
4. What are examples of biological and cultural associations between emotions and visual cues?

### Application

5. Advertisers and architects use shapes and colours to convey specific emotions. Can you think of some notable examples, for example from famous logos or public buildings? Which emotions do you think your examples are conveying?

### Analysis

6. Why do you think that both the computer and people were less able to accurately guess the intended emotion of line drawings than that of the colour drawings?
7. The brain is often described as a 'biological computer'. To what extent do you think the team's results support or weaken this claim?

### Synthesis

8. The study recruited STEM and arts students from Canada to draw images, and psychology students from Belgium to interpret them. Based on the article's overview of biological and cultural influences, to what extent do you think that using students from two different nations could have led to a different outcome than if all students had been from the same nation?

### Evaluation

9. Historically, many cognitive and behavioural experiments have used only psychology students as participants, largely due to convenience. To what extent do you think the conclusions from these studies are applicable to the general population, and why?
10. Why do you think that the arts and sciences are traditionally considered distinct? Do you think this separation has helped or hindered societal progress? Give some examples to illustrate your opinion.

## Activity

You can perform an experiment very similar to that described in the article within the classroom, using classmates as participants.

Collectively, split the class or a group of students into two subgroups based on a particular category that you think might affect how people convey emotions through art. This could be whether they prefer:

- studying art or science subjects
- making art or viewing it
- creating/performing music or listening/watching it being performed
- acting/directing or watching films/TV/theatre
- writing or reading fiction

Now, design your experiment, considering the following points:

- Ask participants from the two groups to make abstract artworks based on emotions (using pencils/pastels/other media – your choice).
- Make sure the artworks have a note of which emotion they are conveying, and from which group they originate – but that this note can be hidden for the next part.
- Ask participants to guess which intended emotion relates to each artwork. For this part, you might want a new set of participants (e.g., a new group or a neighbouring class).
- Record all guesses and score them for accuracy.
- Analyse and write up your findings. What did you discover? How did your study differ from the one in the article? Were there any flaws in your experimental design? Did your participants' preferences relate to how they recognised emotions? To what extent do you think your findings are applicable for society at large?

## More resources

- This article from BlueThumb gives a background to the emergence of abstract art and its relation to other art forms. [bluethumb.com.au/blog/art-styles/abstract-art-the-visual-language-of-emotion](https://bluethumb.com.au/blog/art-styles/abstract-art-the-visual-language-of-emotion)
- *Nature* is the home of some of the most high-profile discoveries from across the sciences. Find articles on the latest cognitive neuroscience findings here: [www.nature.com/subjects/cognitive-neuroscience](https://www.nature.com/subjects/cognitive-neuroscience)