

Contagious yawning in chimpanzees

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A yawning chimpanzee.

Image courtesy of AfrikaForce; image source: Flickr

In 2009, a US research group published a study entitled *Computer animations stimulate contagious yawning in chimpanzees* (Campbell et al., 2009). This article is a good example of a research paper that is accessible to secondary-school students, because it is relatively short, the experiment is simple and the topic is engaging. The researchers found that chimpanzees yawn in response to yawning animations, suggesting that they identify and empathise with them.

This paper and subsequent studies also gathered a lot of media attention, so an Internet search will provide interesting supporting materials such as video summaries and clips of humans and animals yawning.

The *motive* of the study was to obtain a ‘flexible tool in the study of animal behaviour’ (p 4255). The *objective* is presented twice: once as a question, ‘Will non-human animals identify or empathize with animations?’ (p 4255); and once as a goal, to ‘determine whether chimpanzees identify with animations’ (p 4256). This is not exceptional; authors often present their objective in different styles several times.

To illustrate the experimental *method*, show figure 1 of the research article (a sample animation of a yawning chimpanzee) to the students, who will probably have their own empathic reaction: yawning in response to the animation.

The main *conclusion* is the answer to the objective. In this article, it is presented in the discussion section: in the first sentence, ‘Chimpanzees showed contagious yawning...as demonstrated by...’ (p 4257); and at the end, ‘the results... strongly

Supporting material for:

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suggest... that chimpanzees... empathize with [animations].’ (p 4259). The *implication*, stated in the final paragraph of the discussion, is the possibility to exploit animations for chimpanzee behaviour research (p 4259).

The supports may be a bit harder to find. We highlighted three supports (all on p 4257): one in the *results* section (‘The chimpanzees yawned more frequently in response to the yawn video than the control video...’) and two in the *discussion* section (‘as demonstrated by a significant population-level effect’ and ‘the results of Anderson et al. (2004) are representative’). The other data presented in the *results* section are control experiments.

A support can also consist of a counter-argument that is refuted by data. This article contains three counter-arguments that are refuted by data (refutations), all in the *discussion* section:

1. The counter-argument ‘Because we tested our subjects in pairs, we cannot be certain in all cases whether an individual yawned in response to the yawn animations or a partner’s yawn’ (p 4257) is refuted by: ‘However, the large difference in yawning to the yawn versus control animations, using either the individual or the pair as the unit of analysis, demonstrates that the yawn animations did stimulate contagious yawning.’
2. The refutation ‘the chimpanzees attended similarly to the yawn and the control videos’ is used to dismiss the counter-argument ‘the control video inhibited yawning because it was more interesting’ (p 4257). A further refutation is added: ‘If yawning was induced by boredom, we would expect the rate of yawning to have increased over time.... This was the case for the control video, but not the yawn video....’
3. The third counter-argument was ‘Our measures of attention did not correlate with the rate of yawning’ (p 4258). This was counteracted by three refutations:
 - a) ‘It is possible that our sampling method was not precise enough.’
 - b) ‘... there may not be much of a relationship between total attention and the amount of contagious yawning. A small amount of attention could stimulate multiple yawns by a highly susceptible individual, and a large amount of attention by an individual less susceptible to contagious yawning could produce few or no yawns.’
 - c) ‘Approximately half of human subjects show contagious yawning under experimental conditions (Provine 1986; Platek et al. 2003). All of the human subjects watched numerous yawns but around half showed no yawn response (Provine 1986; Platek et al. 2003), so there appears to be no correlation between attention and contagious yawning in humans either.’

Reference

Campbell MW et al. (2009) Computer animations stimulate contagious yawning in chimpanzees. *Proceedings of Royal Society B*. **276**: 4255–4259. doi: 10.1098/rspb.2009.1087

The article is freely available via the journal website
(<http://rspb.royalsocietypublishing.org>)

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