

APA citation of journal article: Pupil Dilation Patterns Spontaneously Synchronize Across Individuals During Shared Attention

The Basics:

1. What was the broad question being asked by this research project? What was the specific question being asked by this research project?
 - a. Summarize the background information on the research topic in three sentences. Humans, as primarily social beings, depend heavily on the emotional meeting of minds. This synchrony allows us to communicate and share mental states. It seems as we move more in sync with each other, we grow closer.
 - b. What is the gap in the literature identified by the researchers? What question(s) are they trying to answer? What is their hypothesis and what should happen if the author's hypothesis is true? Pupils have been known to play some emotional role, but the researches will attempt to identify if pupil dilation synchronizes during shared attention between people. They hypothesize that since pupil size fluctuates with emotional states, shared emotional states between individuals should show synchronized pupil dilation patterns, revealing a new psychological dimension to the enchanting interconnectivity between humans.
 - c. What are alternative hypotheses? Two individuals interacting will show different pupil dilation patterns, and will not synchronize with each other.

2. What experiments were done to test the hypothesis or investigate the research question?
 - a. Explain the task design – what are participants instructed to do and what is being measured? Think about the independent and dependent variables. They gathered expressive speakers, and volunteering listeners. The speakers shared a story, later measured on an emotional and intensive scale by raters over time, and pupil dilation was monitored to track change in time in both the speaker and listener. Stories, and intensity was manipulated, while the change in pupil dilation was measured.

3. What evidence supports each of the conclusions?
 - a. Before you read the discussion, summarize the main findings and link each one back to the research question(s). How does each result inform the hypothesis? Speaker expressivity and Listener empathy had a significant interaction, and the

more expressive a person was, the more their pupil dilation patterns matched with the speaker.

4. What are the major conclusions?
 - a. What do the results add to the field? How do the researchers interpret their findings? Summarize any limitations identified by the researchers. The results demonstrate that when we feel more interest or empathy towards a speaker, our pupils dilate in conjunction with theirs, the more we share our attention with them. They add a new physiological dimension to the extent that humans engage in intersubjectivity. It adds a new piece of evidence to the age-old idea that the eyes are the window to the soul, and perhaps where two decide to couple together.

The Critique:

1. Is the paper well written? How do you know? For week 2 & later, use this space to practice headlines & summaries of the articles via tweets. The paper is very well written. The explanations are easy to interpret, and the sequencing of the paper follows the logic of the discoveries themselves.

SCIENCE TWEET: “New evidence suggests that as two people share attention, their pupil dilation will synchronize as well. A new approach to the outstanding human act of intersubjectivity.”

COMMON TWEET: Telling a story to a friend? Turns out that as we share with others, our pupil dilation will synchronize with theirs. A new approach to the windows of the soul.

2. Do the conclusions seem logical given the data processed? Why or why not? Another way of thinking about this: do the results adequately support the conclusions that are drawn? Are there alternative explanations for the findings? What inferences about the hypotheses and questions can be made based on these results?

3. Are the conclusions important? How do you think this relates to everyday behavior? The conclusions are important. They bring physical evidence to the mechanisms that underly

the human ability to share attention, and emotions with other people. As far as everyday behavior goes, it might be hard to observe this in real time, but it's cool to know nevertheless.

4. What were the best aspects of the research presented, and how could the research be improved? Name at least one way to improve the experiment. As far as the way pupil dilation was measured to observe for any synchrony, the study did a very good, comprehensive job. To improve the experiment, I would have also had trials between to random participants, where they take turns speaking and listening, instead of aiming for these outstandingly expressive speakers, to find if there may be synchrony even between more casual speakers.
5. How would you follow-up this experiment or study? I would have brought in people who knew each other beforehand, such as family members, friends, or spouses, and compared that against strangers, to see if there is a notable human difference in our synchrony with those we know, versus those we don't, and to what extent. I would measure heartrate as well, to see if there might also be a deeper level to which humans share experiences.

Additional Resources: What are the basic concepts that you need to know to understand the science presented in your paper? What other information or resources would help you better understand the paper? This is helpful to consider for your science communication pieces. Joint attention is an incredibly important topic here, as well as some of the underlying mechanisms that effect pupil dilation, apart from light.

Further Questions:

Write at least five comments or questions about the article to discuss with the class.

1. How might this support or challenge the idea that the eyes are the window to the soul?
2. What among participants might lead to a lack of synchrony in pupil dilation during sharing?
3. What can this reveal about human evolution?
4. How might this have looked if the participants weren't looking at each other?
5. Is this worth studying?