

Tips for reading Rosenberg et al., 2016

SimpleWriter Abstract.

Even though attention is important for everything to do with sensing and thinking, we don't have a good way of telling how good a person is at paying attention over all. There are too many different ways of trying to look at attention by looking at what people do, so instead we wanted to look at what happened in the brains of people who are good and bad at keeping attention on one thing for a long time. We saw groups of brain parts that were stronger in working together when people were good at paying attention for a long time and not so strong working together when they were not so good at it. We could also use information from one group of peoples' groups of brain parts to look at other peoples' brains and tell if they were good at paying attention -- even if they were only resting and not trying to pay attention when their brains were looked at. We could also use the same information to tell the problems of people who have seen a doctor because they have a very hard time paying attention just from looking at their brains when they were resting and not trying to pay attention. This shows that looking at how groups of brain parts all over the whole brain can give us a brain sign of how good you are at paying attention.

Fasten your seatbelts. This one is methodologically fancy.

In general:

As usual, don't get too caught up in the details of the methods and don't fear Google when you don't understand terminology or jargon. As always, it can be helpful to make yourself a little glossary or dictionary of unfamiliar terms as you go along, so you can use it as a key while you read.

In this paper the methods/details of results are very complex but the driving questions and implications of the findings are very clearly summarized in the **Intro** and **Discussion**, so for this paper focus mostly on those sections. Key results are summarized in the last paragraph of the Introduction as well as the first paragraph of the Discussion — as is typical in *Nature Neuroscience* papers. **Focus on Figures 1 and 3.** In this paper the **Discussion** is worth a careful read as it raises a number of meaty points about the implications of the findings. There are specific questions about some of these at the end of the questions below.

Here is a Glossary of some of the Key Terms.

Data-driven Unlike *hypothesis-driven* approaches, where you test your hypothesis against the null hypothesis or an alternative hypothesis, *data-driven* approaches to data analysis let the data tell *you* what patterns it contains. It's a useful approach for large data sets containing complex patterns and exploratory research questions. That is, when you don't know exactly what you're looking for.

For **this paper specifically** try to answer these questions:

- What three specific attentional functions are encompassed by the construct of *sustained attention*? What might be a) a neural and b) a behavioural example of each?
- What is the SAN model and how do they derive it?
- What is the relation between the SAN network and the ADHD network?

Also try to answer these standard questions, which are a good way to study for the exams.

NOTE: Because the Methods are only available online I will NOT ask questions about those.

- **Context.** What is the “big picture” context of the present research? That is, what is it about the brain/mind that compelled these researchers to carry out the present study?
- **Specific Question.** What was/were the specific question(s) addressed in the research?
- **Question in Context.** Based on what is already known from past empirical research, how does that leave an open question that is addressed in this study? What is the main
- What are the independent (IV) and dependent (DV) variables?

Note: ***In this paper the Methods are all online and they don’t even report the behavioural task manipulation in the main paper. So figuring out the CPT task manipulation will require either google or the online Methods. Again, I will NOT ask exam questions on this.

- What are the operational definitions of variables of interest?
- What is the deductive logic outlining how different experimental outcomes will relate to the main hypothesis?
- Who were the subjects
- What were the stimuli? *****Note** They don’t report the stimuli used in CPT in the body of the paper
- What was the connection between stimuli and each experimental condition?
*****Not reported in main paper.**
 - Procedure: *****Not reported in main paper.**
 - Instructions for participants:
 - Stimulus presentation: What they see, when, for how long, and in what order
 - Data Collection (e.g., length of experimental procedure)
 - What are results in order of importance and relevance to initial question(s)?
- What is the connection between the results and the hypotheses?

- What are the conclusions **that the authors claim are** most directly implied by the results and most relevant to the questions at hand, in order of importance. *****For this paper specifically see below:**
 - In the 2nd paragraph of the Discussion, what do they emphasize that their results do **NOT** demonstrate?
 - In the 3rd paragraph of the Discussion, what do they emphasize about the novelty of the study?
 - In the 4th paragraph of the Discussion, what is the primary advantage of the SAN model as a neuromarker? What is the advantage of using resting state data?
 - In the 5th paragraph of the Discussion, what 2 points do the authors make about the implications of their findings for understanding of neural underpinnings of sustained attention?
 - In the 6th paragraph of the discussion, what implications do the authors suggest for our understanding of ADHD.