

## How is hypnosis experienced by the neurodivergent brain? Thinking about what we can see in EEG.

The use of EEG (electroencephalogram) in research is providing so much insight into the way our brains work from an electrical activity perspective. Using a simple EEG headset is revealing a full range of experiences from understanding how a person engages with a computer game, how we choose items in the supermarket, to how we experience therapy and even altered mind states. In this research project, I asked people to wear the headset during a pre-recorded Ericksonian style indirect trance. Some of the people declared themselves to be ‘neurotypical’ and others declared themselves to be on the autism spectrum (ASD) or to have traits of attention deficit [and hyperactivity] disorder (ADHD). The findings I present here are collected from male participants aged 40-60 years. Note that these images are snapshots of a longer period of time and that variation can and does occur both between participants with similar declarations and within the same recording for each individual. Interpretations are made in conjunction with post-session discussions with all participants.

### *A point of interest*

In this article, I will be presenting images of people experiencing trance and you will notice that I include two images from someone declaring ASD. This participant initially experienced trance in his chosen mode of eyes open, soft gaze directed out of the window. I asked if we could conduct a second recording with his eyes shut as is more commonly seen in trance. The results were fascinating. When I asked him about the different experiences, he explained that sitting with his eyes shut was “stressful”, that he “doesn’t like not knowing what is going on or who is there and what they are doing”. He chose to have his eyes open the first time he experienced trance as he picked up the message of ‘relax’ and that is how he feels most relaxed.

### The resting state of the brain

These images (figure 1) show how the participants’ brains looked at the beginning of the trance experience. At this moment, the participants are sat in the room, the purpose of the study has been explained, they’ve given consent for their brain activity to be recorded and are feeling comfortable.

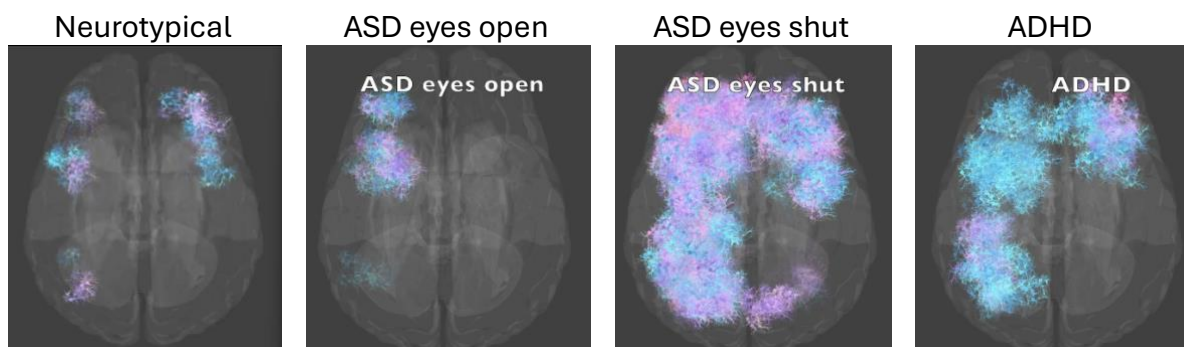


Figure 1. The resting state of the brain

Look at the very different starting points we have here. The images show four different brainwave activities: Alpha (purple), Beta (pink), Theta (blue) and Gamma (Red). Alpha is associated with visualisation and a sense of wellbeing. Beta is associated with a busy, productive, active state. Theta is associated with a meditative, hypnotic state, with creativity and problem-solving. Gamma is associated with busy connectivity and working things out, a ‘doing’ brain wave. As a rough guide, activity in the bottom left of the brain is visualisation, activity in the bottom right is emotion, activity in the top left is information gathering and activity in the top right is evaluation and sense-making.

In these images it looks as though all brains are information gathering, getting used to the experience of sitting with an EEG headset on, listening to the background noise of the room. The picture showing participant (ASD eyes open) has a lot of pink and red present which would indicate a lot of work going on, supporting the participant’s experience of eyes shut being “stressful”. The picture showing the participant (ADHD) includes a lot of blue, theta, consistently found in people with ADHD.

Response to the statement “You are in control”

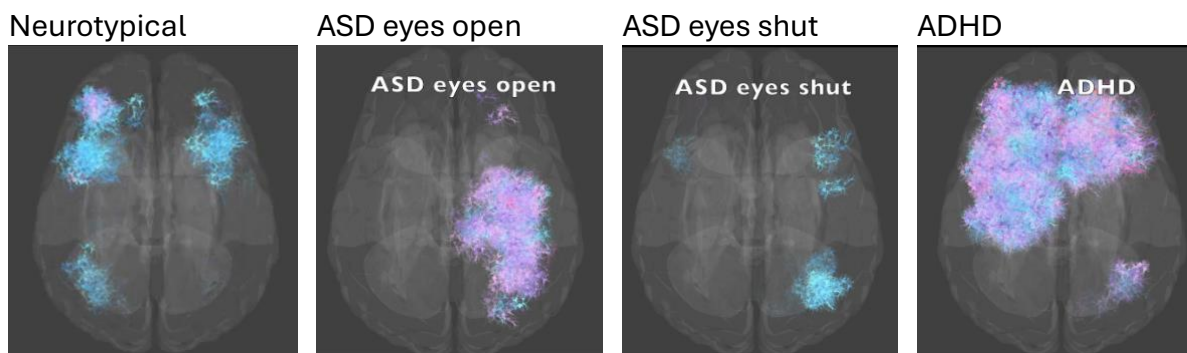


Figure 2. Response to the statement “you are in control”

In figure 2, notice how the neurotypical participant hears the statement “you are in control”. This person is using theta (blue) to problem solve this statement. They visualise what this concept means to them (bottom left), gather information on “control” as something they have had before (top left) and evaluate the statement of “you are in control” (top right). Compare this to the participant (ASD eyes open) and see how this statement hits the emotion areas of the brain and the image is predominantly beta (pink) and gamma (red). This participant is actively exploring the idea of control, working it out (what does control mean to me, why am I being told that I am in control, would I not be in control in this situation?). Look too at the participant (ADHD), the amount of brain activity in the frontal regions as he hears the message of control and generates an intense information generation – information evaluation thinking pattern. We might propose that his brain is testing this notion hard.

Typical pattern during progressive muscle relaxation (PMR)

During the PMR, the participants showed quite different patterns of brain activity. Looking at figure 3, we can see that the neurotypical participant experienced the PMR mostly on the left-hand side of the brain. There is a lot of activity in the bottom left area as the person visualises the instruction to relax from top to toe and there is a lot of

activity top right as the person information gathers and pattern matches the instruction to relax to previous experiences of relaxation, and activity top left as the person evaluates that information and confirms that he is experiencing relaxation right now. Compare that with the participant (ADHD) where his entire brain is actively visualising relaxation, information gathering, pattern matching, confirming and feeling emotional at the suggestion that he can relax. The participant (ASD eyes open) showed very little activation during this section of trance but with eyes shut there was a little more activation based around information gathering (have I [and *how* have I] experienced relaxation before) and information evaluation (is this something I can *do* right now).

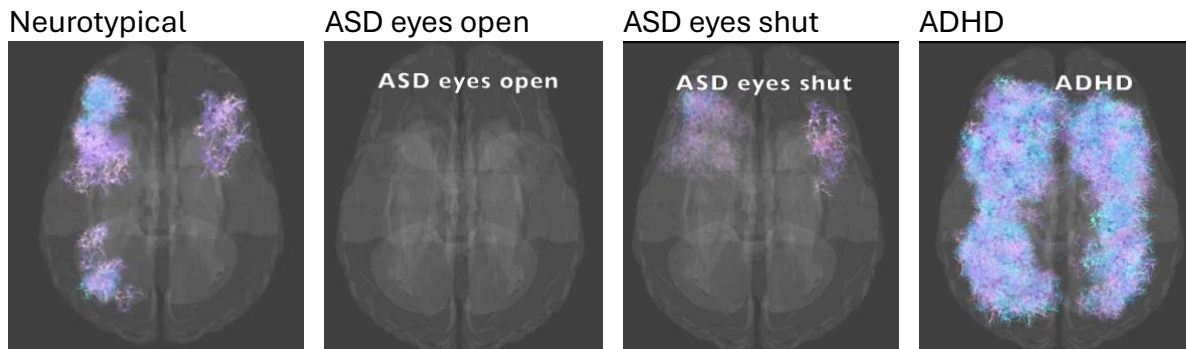


Figure 3. Typical experience during PMR

Typical pattern during a guided image

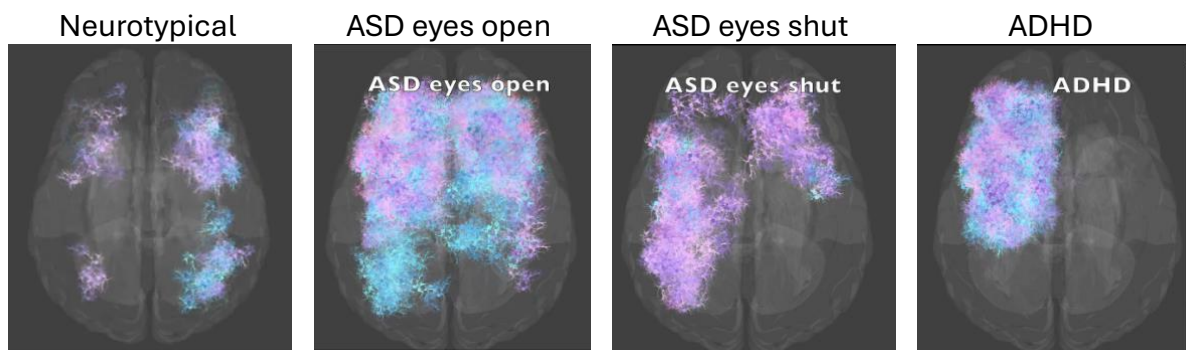


Figure 4. Typical experience of a guided image

In the research study, all the participants heard the same recording using a walk in the woods as the context for the hypnotic suggestions. Participant (ADHD) spent a lot of time in the information gathering and pattern matching part of the brain during this part of the trance experience (what does walking in the woods look like to me). Compare that to the participant (neurotypical) who showed activation in waves all around the brain as he engaged in the emotional experience of walking in the woods, evaluating the pattern match as a positive experience for him. The participant (ASD) exhibited a lot of busy processing information gathering, pattern matching and evaluation during this part of the trance. Both times the guided image generated a lot of visualisation for this participant and notice that when he had his eyes open, there was more theta (blue), it was therefore a more calming experience for him with his eyes open but when his eyes were closed, processing the guided image was a much more stressful experience.

### Typical response to the hypnotic suggestion that you can choose your thoughts

A number of suggestions were made during the pre-recording and one in particular raised the notion that we all have a range of thoughts that come to mind during the day, but we can choose which thoughts we give weight and time to and which we can let go. During this suggestion there was an interesting range of responses by the participants and figure 5 provides a snapshot of how the participants reacted to this suggestion. Participant (neurotypical) responded to this suggestion with a lot of beta in all areas of his brain suggesting that he was working through this suggestion, visualising what it might mean, information gathering (have I made choices like this before?) information evaluating (could I make choices right now?) and feeling the emotion of being offered a choice in how he thinks about things. Notice how the participant (ASD eyes open) is doing a lot of this same activity too but is showing a lot of theta activity whilst doing so which suggests that he *is* finding the answer to this suggestion, he *is* finding out that he can choose his thoughts. This is quite a different response to when he had his eyes shut where visualising the notion that he can choose his thoughts brought an emotional response. It is interesting to see that the brain activity of participant (ADHD) was solely focused on information gathering which makes me think was he engaged in questioning this notion that he can choose the thoughts he wants to hold and that he can let go of the thoughts that are not helpful, something that he declared he finds difficult to do on a daily basis.

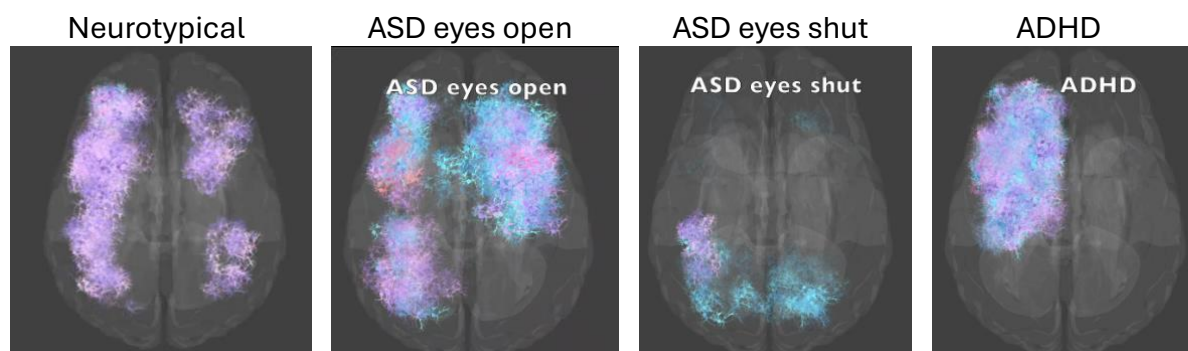


Figure 5. Typical response that you can choose your thoughts

### Summary

This is a brief overview of my research findings exploring how hypnosis is experienced by the neurodivergent brain. There is a lot of work to do with regards to interpreting what we can see here and what the implications are for our practice which I hope to bring to the UKHC conference in November!

Dr Rachel Gillibrand

Dr Rachel Gillibrand is a Chartered Psychologist registered with the Health and Care Professions Council, and an Associate Fellow of the British Psychological Society, specialising in the application of psychology to our health and well-being. With a doctorate in philosophy from University of Southampton, Rachel has 20 years' experience as a Senior Lecturer at the University of the West of England, training psychologists through Masters and Doctoral level qualifications. Rachel is now in private practice at Seaview Therapies based in North Somerset, UK. She is also the

Director of Research at the Centre for Solution Focused Research and Director of the Clinical Hypnotherapy School, running regular CPD and training events in Hypnotherapy and Solution Focused Brief Therapy.



[www.clinicalhypnotherapyschool.com](http://www.clinicalhypnotherapyschool.com)

[www.seaviewtherapies.com](http://www.seaviewtherapies.com)

Email: [rachel@seaviewtherapies.com](mailto:rachel@seaviewtherapies.com)