

# **Autistic functioning at rest:**

## A collation of existing literature.

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## 1 Findings

In this short report, I set out to find evidence for differences in brain activity at rest, in autistic and non-autistic individuals. In total, I found two articles with consumable<sup>1</sup> content covering this area; in the following sections, I summarise the important information in these articles.

To summarise, evidence suggests that autistic individuals produce more information than their counterparts while at rest. The reasons for this are speculative but could be any of the following.

1. Autistic people experiencing more of an “inner world”.
2. Autistic participants taking the instruction to “be at rest” as more of a task than truly being at rest.
3. Autistic people being more sensitive to external stimuli and/or being unable to “ignore” certain stimuli.

## 2 “Information gain in the brain’s resting state”

In their study<sup>2</sup>, Velázquez, Luis, and Galán state the following, referring to their Figure 4B (see Figure 1; p. 5).

[The] information gain in the ASD group is 42% larger [than the control] on average, indicating that ASD brains produce more information from the stochastic inputs driving them.<sup>3</sup>

In their discussion, they also state:

[The] brains of individuals with ASD, Asperger syndrome in this case, produce more information than the age-matched participants with a 42% increase on average.<sup>4</sup>

Further, in discussing activity in certain brain areas, they conclude:

[The] higher information gain in the ASD group could therefore be related to the more intense “inner world” that autistic individuals normally have.

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<sup>1</sup>As in, understandable by someone from a non-medical background

<sup>2</sup>Pérez Velázquez, José Luis, and Roberto Galán, “Information gain in the brain’s resting state: A new perspective on autism”, *Frontiers in Neuroinformatics*, 7 (2013). doi: [10.3389/fninf.2013.00037](https://doi.org/10.3389/fninf.2013.00037).

<sup>3</sup>*Ibid.*, p. 6.

<sup>4</sup>*Ibid.*, p. 7.

### 3 “Resting state EEG in youth with ASD: age, sex, and relation to phenotype”

Neuhaus et al., in their study<sup>5</sup>, conclude:

Youth with ASD displayed decreased alpha power relative to peers without ASD, suggesting increased neural activation during rest.

From their research, Neuhaus et al. found “decreased alpha power in [their] ASD group compared to [their] NT group”<sup>6</sup>; they go on to explain how this is important:

Because alpha power is inversely related to neural activation, this suggests greater activation in the ASD group than in the NT group during a condition designed and assumed to capture a “resting” or baseline brain state.

This finding could suggest that youth with ASD experience the experiment as an explicit task (e.g., complying with instructions to limit physical movements and attending to the screen) rather than as “rest” in an experimental sense.<sup>7</sup>

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<sup>5</sup>Emily Neuhaus et al., “Resting state EEG in youth with ASD: age, sex, and relation to phenotype”, *Journal of Neurodevelopmental Disorders*, 13/1 (Sept. 2021), 33. doi: [10.1186/s11689-021-09390-1](https://doi.org/10.1186/s11689-021-09390-1).

<sup>6</sup>*Ibid.*, p. 9.

<sup>7</sup>*Ibid.*, pp. 9, 11.

## References

- Neuhaus, Emily et al., "Resting state EEG in youth with ASD: age, sex, and relation to phenotype", *Journal of Neurodevelopmental Disorders*, 13/1 (Sept. 2021), 33. doi: [10.1186/s11689-021-09390-1](https://doi.org/10.1186/s11689-021-09390-1) (cit. on p. 3).
- Velázquez, Pérez, Luis, José, and Galán, Roberto, "Information gain in the brain's resting state: A new perspective on autism", *Frontiers in Neuroinformatics*, 7 (2013). doi: [10.3389/fninf.2013.00037](https://doi.org/10.3389/fninf.2013.00037) (cit. on pp. 2, 5).

## A Appendix

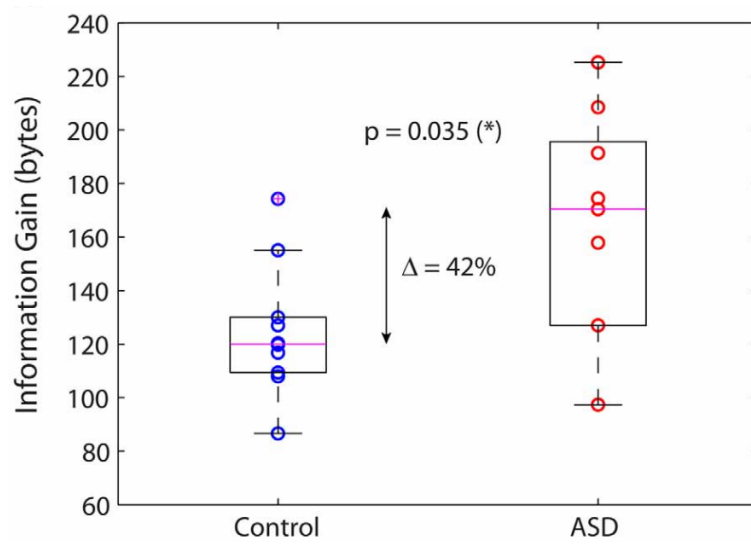


Figure 1: Information gain in the brain's resting state.<sup>8</sup>

<sup>8</sup>Velázquez, Luis, and Galán, "Information gain in the brain's resting state", Figure 4B.