

ROCHESTER RESEARCH ROUNDUP

AUDITORY PROCESSING OF SOUND PATTERNS IN INDIVIDUALS WITH AUTISM SPECTRUM DISORDER

WHAT did you study?

- **Neuroscientists are trying to understand how people with autism process sounds in the environment** and how this might relate to their social and repetitive behaviors.
- Many scientists have suggested that **people with autism might have different responses to unexpected sounds** than people without autism. They wonder if this is why people with autism may have more difficulty with communication and prefer predictable environments.

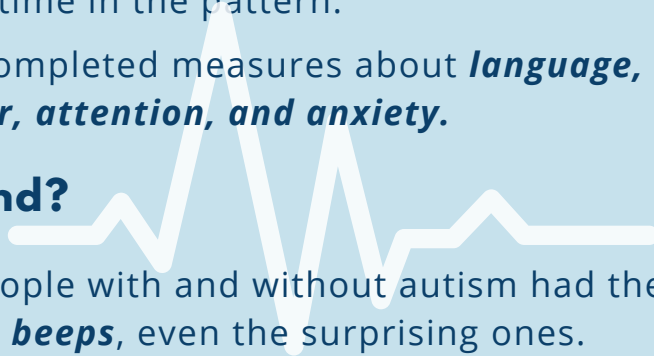


HOW did you study it?

- **Researchers used an EEG** (a test that detects activity in your brain by attaching small, metal discs to the top of the head) to **measure brain waves** while individuals with and without autism (age 6 to 21 years old) listened to patterns of beeps. Sometimes, they would “surprise” the brain by playing a beep at the wrong time in the pattern.
- Participants also completed measures about **language, communication, repetitive behavior, attention, and anxiety**.

WHAT did you find?

- In general, both people with and without autism had the **same brain responses to these beeps**, even the surprising ones.
- People with stronger brain responses to the surprising beeps tended to have **better language understanding**, but there was no relationship between a person's brain response to the beeps and their social communication, repetitive behaviors, attention, or anxiety.




Conducted by the Cognitive Neurophysiology Lab



WHY does it matter?

- This research study suggests that ***people with and without autism may show some similarities in the way they process sounds***. Brain responses to simple sounds may be able to give us some information about the ***building blocks for how people understand language***.
- By understanding how people with autism experience the world, researchers can work toward important goals like making a diagnosis earlier or designing new therapies.

What's NEXT?

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- Researchers need to continue this work with more people who have a ***wider range of intelligence and language abilities***.
 - We also want to study ***other types of sound and language processing*** to look for where there are differences, what these differences mean, and how they change with age and intervention.

THE FULL ARTICLE CAN BE FOUND THROUGH THE FOLLOWING CITATION:

Knight, E.J., Oakes, L., Hyman, S.L., Freedman, E.G. and Foxe, J.J. (2020), Individuals With Autism Have No Detectable Deficit in Neural Markers of Prediction Error When Presented With Auditory Rhythms of Varied Temporal Complexity. Autism Research. <https://doi.org/10.1002/aur.2362>

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