



How do Individuals with Autism Respond to Their Own Name in a Noisy Setting?

This article is a review of the following research: Schwartz, S., Wang, L., Shinn-Cunningham, B.G., Tager-Flusberg, H.: Neural Evidence for Speech Processing Deficits During a Cocktail Party Scenario in Minimally and Low Verbal Adolescents and Young Adults with Autism. *Autism Research*. 2020 Aug 22. Epub ahead of print. PMID: 32827357.

The *Cocktail Party Effect* refers to the brain's ability to focus on one auditory stimulus while filtering out other noises and stimuli. For example, when at a party, one can focus on a single conversation in a noisy room. Related to this phenomenon is *selective auditory attention*, which occurs when people are engaged in an auditory focus (i.e., a conversation) and their attention switches when they hear an important and familiar (salient) sound, such as their name.

Research has shown that some individuals with autism spectrum disorder (ASD) often feel overwhelmed in loud, multisource settings, such as school, a birthday party or a large family gathering.¹ These challenges could be due to difficulties filtering out background noise (The Cocktail Party Effect), or to deficits in identifying important information.

It is important for professionals to understand the challenges that individuals with autism face in auditory processing, which is how sound information is received in the brain. The way people receive information will affect their ability to learn and to understand the world around them.

A team of researchers from Boston University, led by Dr. Sophie Schwartz, investigated the relationship between autism spectrum disorder, background noise, and neural response to salient sounds. They sought to answer the following questions:

1. Do individuals with ASD respond to their name (more than a stranger's name) in a quiet environment?
2. Do individuals with ASD respond to their name (more than a stranger's name) when in a noisy environment?
3. For individuals with autism, do the neural responses to their own name change if they are verbal (ASD-V) or minimally/low verbal (ASD-MLV)?

Study

- Dr. Schwartz and her team used an electroencephalogram (EEG) to test the participants. An EEG is a test that detects electrical brain activity using small electrodes attached to the scalp.
- All participants were between the ages of 13 and 22.
- Participants with autism were categorized as verbal (ASD-V) or minimally/low verbal (ASD-MLV).
- Participants listened to a recording of a female voice randomly reciting their own name and the name of two strangers. In the first experiment, only the female voice could be heard. In a second experiment, a male voice speaks in the background without saying any names in order to create the cocktail party effect.

Results

Quiet Setting

Verbal

The response time for individuals with ASD hearing their own name was delayed when compared to the control group of neurotypical individuals. The response time for hearing their own name and a stranger's name was equal.

Minimally/Low Verbal

The results were the same as for the verbal participants. The response time for individuals with ASD hearing their own name was delayed when compared to the control group of neurotypical individuals. The response time for hearing their own name and a stranger's name was equal.

Noisy Setting

Verbal

These participants showed typical automatic response to their own name in a noisy setting. They responded more quickly to their own name than to a stranger's name.

Minimally/Low Verbal

These participants did not show early, automatic response to their own name. They responded equally to their own name as to a stranger's name.

Conclusions

Past research has shown that adults whose brains have been affected by autism respond differently to hearing their names than do those of neurotypical individuals.^{2,3} This research also highlights such differences, as seen in the quiet setting results. However, this study went one step further and explored the differences between verbal and minimally verbal individuals with ASD.

The team found that minimally/low verbal individuals with autism may have difficulty detecting important words or stimuli, even their own name, in a noisy setting. They may not be able to determine the sounds on which they need to focus. It is important for parents and clinicians to understand this information. Since auditory processing may be compromised in those with autism, other means, such as visual cues, can be used to give information and focus attention.

The extent of auditory sensitivities for a child with autism spectrum disorder varies. Dr. Schwartz's future research will look at whether these over-sensitivities impede minimally verbal children from learning language, and if these children are minimally/low verbal because of their deficits in auditory processing.

Work by researchers continues to uncover many of the complexities of autism. By understanding how individuals with autism process audible information, parents and professionals can provide more appropriate and effective strategies to help a child thrive.

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References

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