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# Are there Auditory Hypersensitivity Subtypes Among Children with Autism Spectrum Disorders?

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**Abstract:**
**Background:**
Auditory hypersensitivity is common among children with Autism Spectral Disorders (ASD). Nevertheless, there have been inconsistent findings on its measurement and homogeneity. The negative emotions and disruptive behaviors due to this sound oversensitivity affect these children's daily lives. Previous studies in auditory hypersensitivity reported inconsistent characteristics and patterns of symptoms by questionnaires.

**Research purpose:**
This study aimed to use both self-perceived like-dislike measure and electrophysiology to characterize auditory hypersensitivity by pure tone sounds.

**Method:**
Fifty children with ASD were screened by auditory profile showing comparable positive hypersensitivity symptoms. The control group was 32 age-matched typically developed (TD) children without the symptoms. Auditory hypersensitivity assigned like-dislike ratings to 36 pure tone sounds in different magnitudes and frequencies. In the next step, the participants then passively heard the sounds, and their cortical auditory evoked potential (CAEP) was captured by electroencephalogram. Their levels of intelligence, emotion, auditory filtering ability, and autistic traits were also measured.

**Result:**
The ASD participants formed two clusters based on their like-dislike ratings, i.e., the more-disliking (ASD-MDL, n=34) versus more-liking groups (ASD-ML, n=16) by model-based cluster analyses. Significant between-group CAEP amplitude differences were found in the P1, N1, and P2, and latency differences in the P2. The CAEP differences further confirmed ASD subgroup memberships. The ASD-MDL showed significantly higher non-verbal intelligence and lower arousal level than the ASD-ML.

**Finding:**
Our findings revealed consistent and different patterns of auditory hypersensitivity among the ASD participants, suggestive of diverse underlying neural dysfunctions.
Future studies should aim to gain better understanding of the neural mechanisms behind auditory hypersensitivity and investigate differences in hearing novel versus environmental sounds in ASD individuals. Researchers should also design clinical test with a sub-type differentiation, and explore the effective interventions associated with the auditory hypersensitivity.

**Biography:**
Huan-Ling Yuan is a Ph.D. student at The Hong Kong Polytechnic University. Her research topic is "Auditory sensitivity processing in individuals with autism spectrum disorder: A psychophysiological study". My research goals are to explore the characteristics of auditory sensitivity from different perspectives, provide evidence and ideas for effective interventions that are beneficial to the development of children with autism, and stimulate the development of more equipment and instruments.

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