

Relationship between physiological and parent-observed auditory over-responsiveness in children with typical development and those with autism spectrum disorders

Hidetoshi Takahashi, Takayuki Nakahachi, Andrew Stickley, Makoto Ishitobi and Yoko Kamio

The aim of this study was to investigate relationships between sensory processing as reported by caregivers (using a questionnaire called the Sensory Profile) and sensory processing as measured using a more objective measure - 'acoustic startle response (ASR)' (which measures the activity of the muscles around the eye when blinking, in response to sounds of different degrees of loudness – between 65-105 decibels; as well as how long it takes children to respond to the sound). We explored this in children with autism spectrum disorders and in children who were typically developing. In all of the participants, scores on a particular section of the Sensory Profile questionnaire (specifically, low threshold scores on the auditory section, which measure a person's awareness, irritation, or annoyance with sounds) were related to the magnitude (size) of the ASRs at 75 and 85 decibels, but not to the lower intensity of 65 decibels. The average time that it took children to respond to the sound, as well as the magnitude of the ASRs at low intensities of 65 and 75 decibels, were significantly related to both aspects of the Sensory Profile questionnaire thought to measure an individual's tendency to avoid sensory stimuli, as well as their tendency to seek more sensory stimuli in their environment. Overall, our results suggest that using the ASR (as an objective measure of sensory processing) provides useful information regarding auditory over-responsiveness to low intensity stimuli (in this case, sounds), and is related to sensory processing in everyday situations (as reported by caregivers).