Toddlers with ASD are better at visual search without trying harder: a pupillometric study

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Motivation
We found that toddlers with Autism Spectrum Disorder are better at visual search than age-matched controls. The cause is mysterious: enhanced perception? faster search? more attentional resources? Greater ‘focus’?

Task-evoked pupillometric responses

Pupillometry & Locus Coeruleus

Pupil changes due to mental activity are due to activity of the LC
Whitesell, et al., 1999

Phasic mode: focused attention on task-relevant stimuli (associated with better performance, e.g. on search tasks).

Tonic mode: diffuse attention marked by broad sampling of stimuli in the environment.

The Locus Coeruleus and ASD

Autism is thought to resemble a persistent, highly focused attentional state, with LC neurons in a persistent ‘hyperpallidic’ mode.

Febrile episodes normalize LC activity and mitigate ASD symptoms.

The LC hypothesis is supported by recent findings demonstrating that the NE reuptake inhibitor venlafaxine suppresses LC neuronal activity...

...and is also an effective treatment for attention-impairment symptoms associated with autism.

References

Apparatus

Tobi T120

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