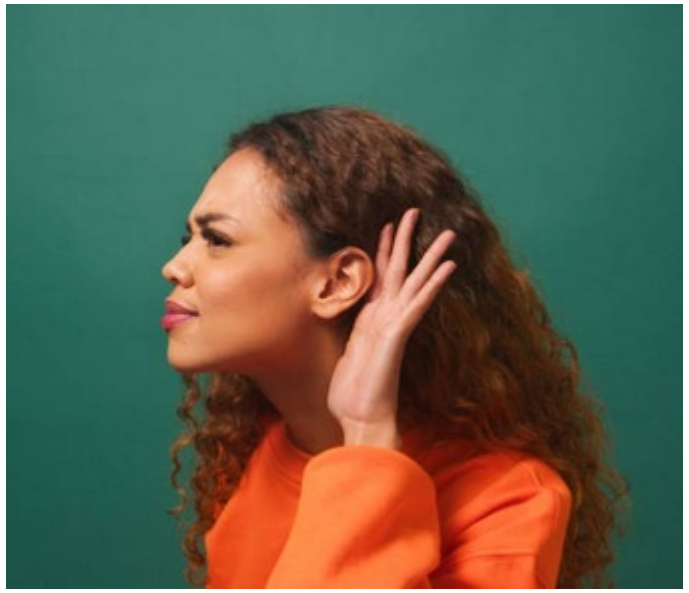
DR. PATRICK DWYER

UNDERSTANDING SOUND INTOLERANCE IN AUTISM

SENSORY ACUITY

Sensory processing – how we take in information from our environments

On average, no differences between autistic and non-autistic people's hearing acuity



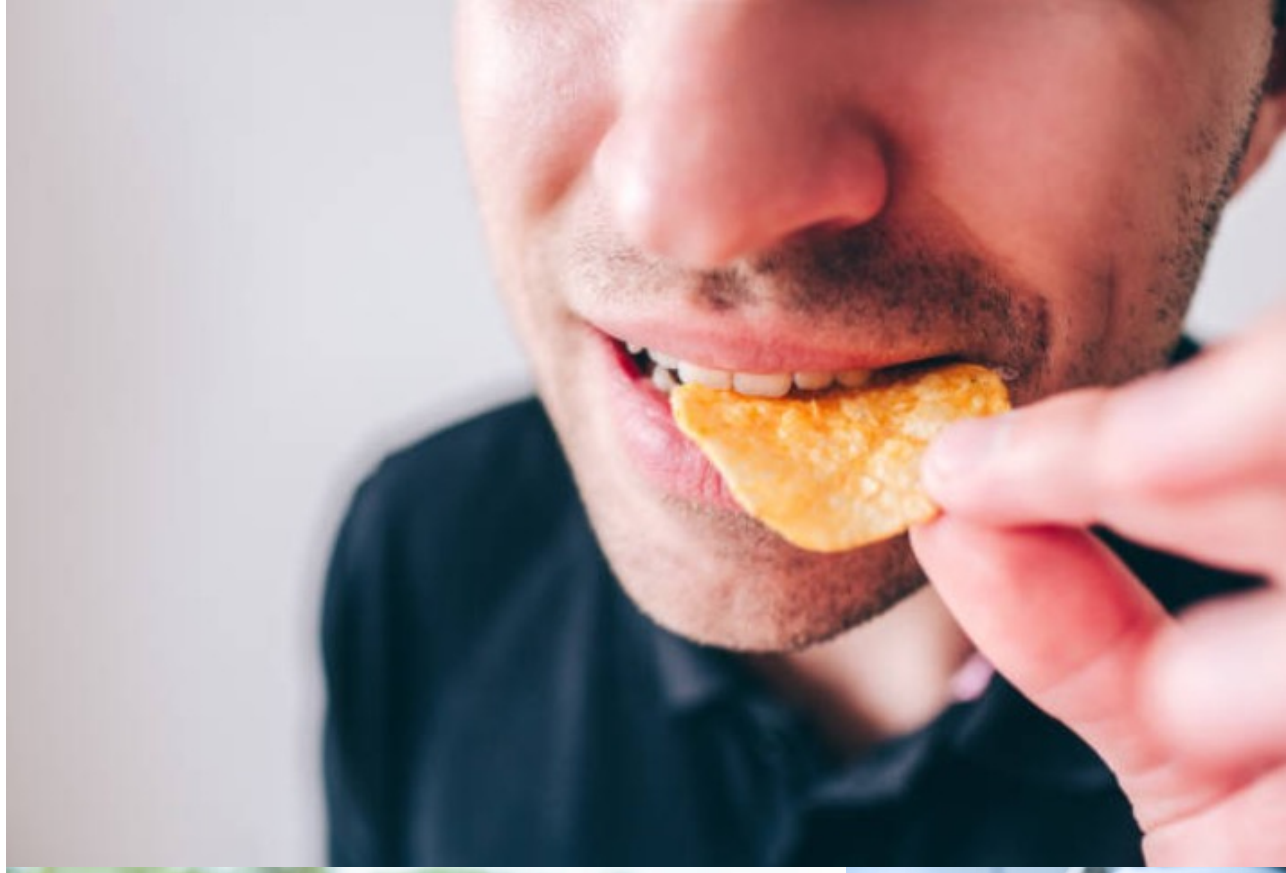
That is, no difference in ability to hear soft sounds in controlled spaces with nothing else happening

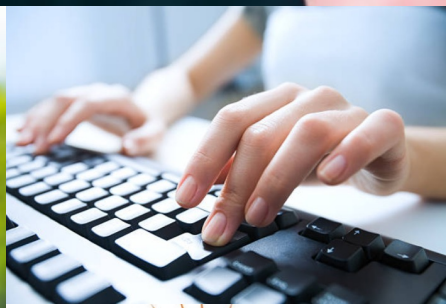
So where does the sound intolerance come from?

MISOPHONIA

Emotional reactions (like anger, rage, disgust) towards often-repetitive, obnoxious trigger sounds

Not about volume: reaction happens if you can identify the sound, even if soft!





PHONOPHOBIA

Phobia of specific sounds

Should **not** be confused with anxiety/avoidance due to sensory distress itself

HYPERACUSIS

Multiple definitions, but often thought of as aversion to sound volume

Sometimes (but not always) accompanied by physical symptoms: pain, fluttering ears

Various hypothesized mechanisms/processes as to what could be happening with hyperacusis **in autism**:

- Greater neural response to loudness due to processing differences in the brain or brainstem
- Tensor tympani muscle – contraction can offer some protection against loud noise

SENSORY OVERWHELM

Less concretely defined – being overwhelmed by:

- Intensity of stimuli (like hyperacusis)
- Number of stimuli
- Pattern of stimuli

(not auditory-specific)

Image: Interacting with Autism

WHAT KIND OF SOUND INTOLERANCE?

18 autistic and 22 non-autistic adolescents

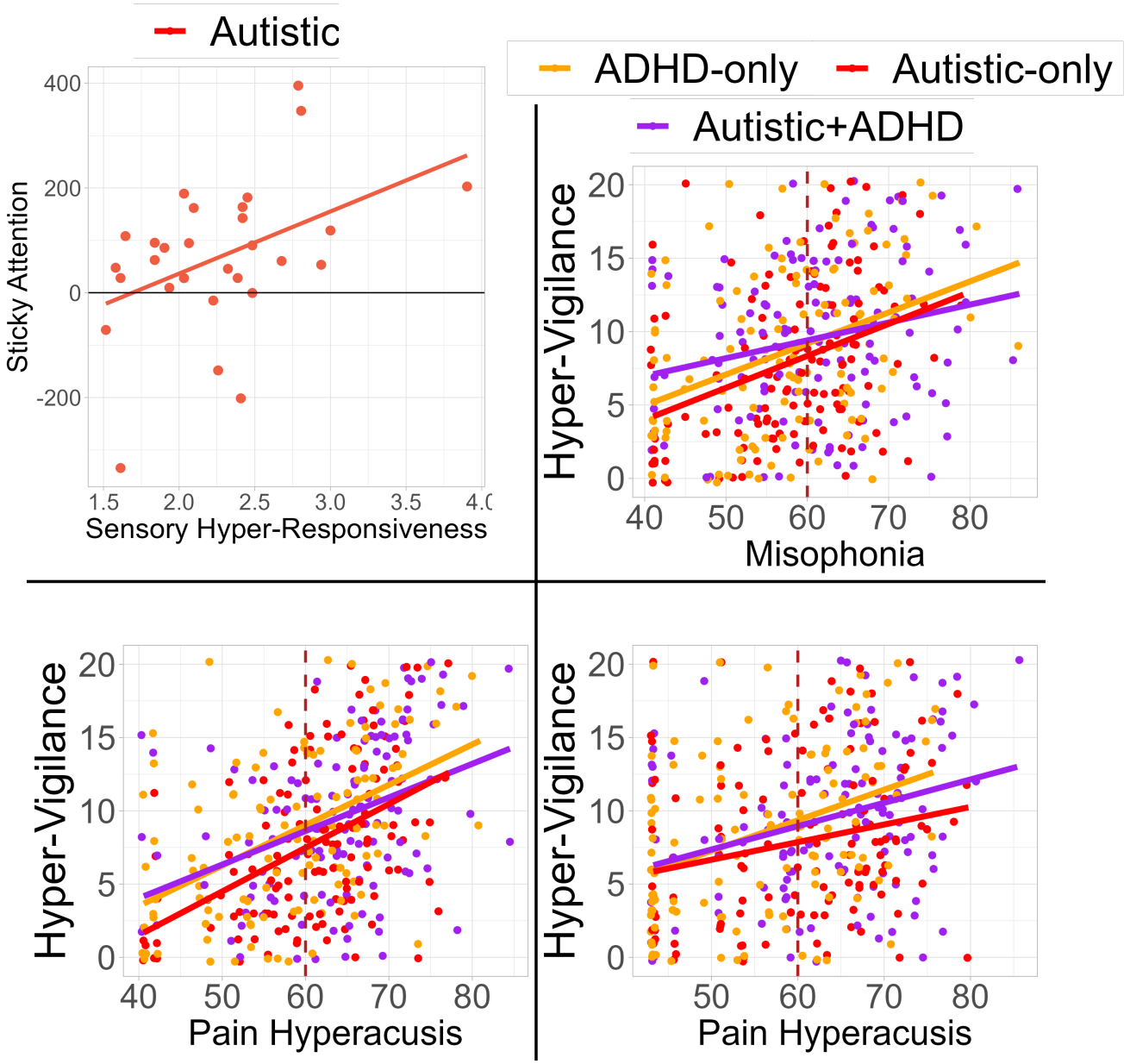
Listened to sounds at different volumes, including:

- Misophonic trigger sounds (e.g., chewing sounds) and conventionally-unpleasant sounds (e.g., fingernails on chalkboard) – everybody disliked them
- Conventionally-pleasant sounds (e.g., birds chirping, water flowing, music) – **autistic people disliked these more than non-autistic people**
  - This pattern is usually considered to reflect **hyperacusis**
  - But we also saw that autistic people reported **unusual misophonia triggers**, like “R2D2 sounds” or “my mother talking”
  - Also, what about individual differences?

ATTENTION

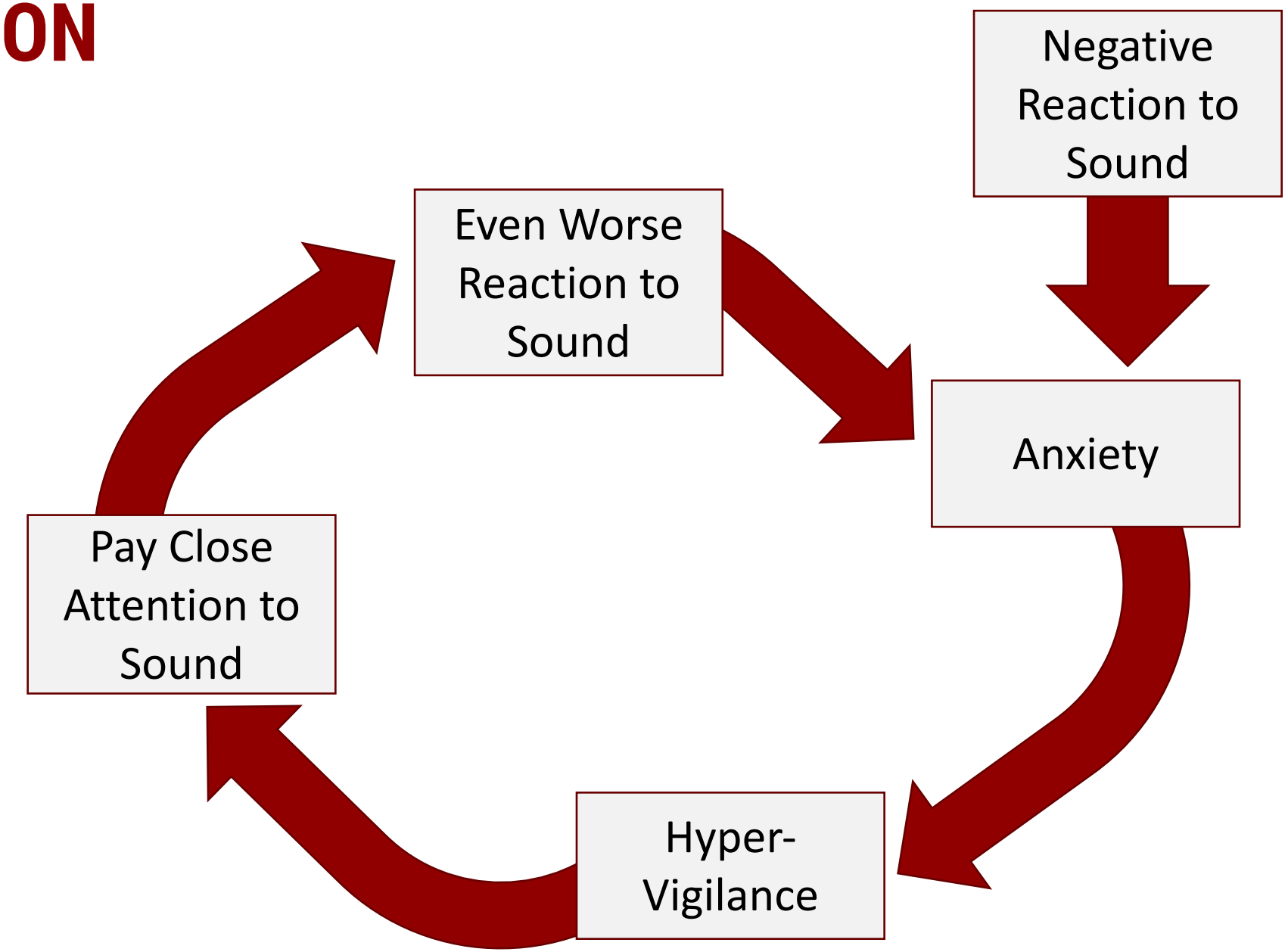
Our research shows:

- In young autistic children, sensory hyper-reactivity (not sound-specific) is related to "**sticky attention**" measured by eye tracker
- In neurodivergent adults, self-reported **hyper-focus, inattention,** and **hyper-vigilance,** as well as **anxiety**, were all related to multiple different kinds of sound intolerance (unpublished data)



Dwyer, P., Sillas, A., Prieto, M., Camp, E., Nordahl, C. W., & Rivera, S. M. (2024). Hyper-focus, sticky attention, and springy attention in young autistic children: Associations with sensory behaviors and cognitive ability. *Autism Research*, *17*(8), 1677–1695. https://doi.org/10.1002/aur.3174

ATTENTION


Negative Reaction to Sound
Anxiety
Hyper-Vigilance
Pay Close Attention to Sound
Even Worse Reaction to Sound

NEED TO UNDERSTAND THE SOUND INTOLERANCE TO RESPOND TO IT

For effective advocacy

For effective support

For effective coping

For self-efficacy

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