Sensory, attention, and mental health interventions for autism: A technological patient and public involvement (PPI) study

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Background…

Autistic people have sensory issues

These issues are prevalent at school and work

These lead to anxiety and distractibility

Technology may help, but…

Current tech is aimed at children and diagnosis—not accommodations for adults

We Aimed To…

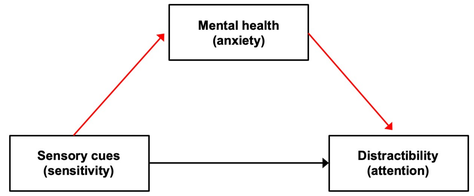
- Understand sensory sensitivity in autistic adults' lives
- Evaluate how sensitivity impacts attention & mental health
- Explore autistic desire and tolerance of technological aids

We Predicted That…

H1: Autistic adults have sensory, distraction & anxiety concerns
H2: Anxiety connects sensitivity to attention for autistic adults
H3: Autistic adults would welcome technological aids

Theory supports that…

- In non-autistic adults, sensory sensitivity leads to distractibility only when anxiety is high
- We tested this in highly educated autistic adults



Experiments and Participants…

Focus Groups

- 5 autistic adult groups co-produced an autistic-voiced questionnaire
- Crafted a word cloud to describe autistic sensory sensitivities
- Re-voiced meaningful autistic language was created

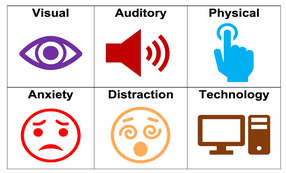
Autistic = 14

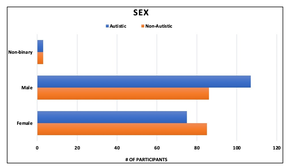
Online Questionnaire

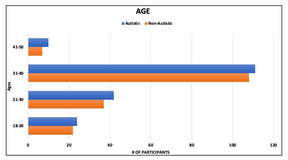
- 103-items across 6 sensitivity themes
- Example: I find humming lights, noisy ceiling fans, or clocks ticking as distracting

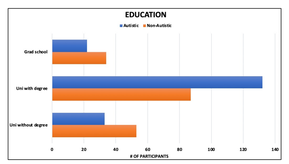
Autistic = 187

Non-autistic = 174





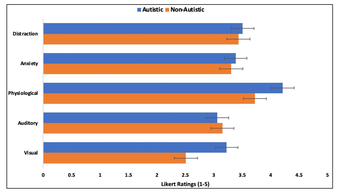




Results

Group Differences

- Autistic adults reported higher visual & physical sensitivity
- No difference in anxiety or distractibility
- Possible reasons—autistic adults:
  - ✓ have developed coping strategies?
  - ✓ are used to higher anxiety levels?



Correlations

- Nearly every variable related so that…
- Being more sensitive in one mode means you're likely to:
  - ✓ be more sensitive in other modes
  - ✓ face more anxiety & distractibility

Spearman's Rank Correlation:
Sensory sensitivity & outcome variables

	Measure	Visual	Auditory	Physiological	Anxiety
Autistic	Auditory	0.12			
	Psychology	0.35**	0.22*		
	Anxiety	0.78**	0.35**	0.46**	
	Distractibility	0.54**	0.33**	0.52**	0.70**
Non-Autistic	Auditory	0.57**			
	Psychology	0.50**	0.43**		
	Anxiety	0.65**	0.55**	0.63**	
	Distractibility	0.47**	0.37**	0.47**	0.54**

Regression

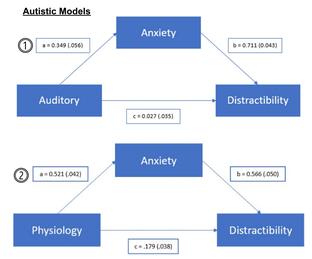
- Modelled predictors of distraction & anxiety
  - ✓ visual, auditory & physiological
- Controlled for age, gender & education
- All sensory modalities contribute to distraction & anxiety in autism group

Linear Regression:
Modeling sensory cues to distractibility and anxiety

Measure	Group	Auditory	Visual	Physiology
Distraction	Autistic	◉	◉	◉
	Non-autistic		◉	◉
Anxiety	Autistic	◉	◉	◉
	Non-autistic		◉	◉

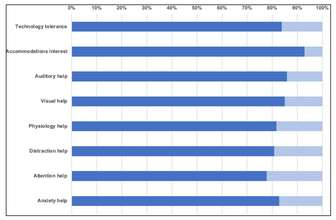
Mediation Models

- Tested if anxiety mediates relationship between sensory and distraction
- Full mediation: auditory for autistic and visual for non-autistic
- Partial mediation: physiological for both groups
- sensory → anxiety → distraction



Technology Takeaway

- Already a big part of autistic adults' lives
- Majority welcome personalized smart devices
- Desired accommodations like alerts, filters and guidance that may reduce anxiety and distraction in high sensory environments



Toward the Future

Study, select, and test sensors that:

- ✓ support autistic adults' personalized aims
- ✓ offer user-selectable reductions in sensitivity and anxiety
- ✓ use customised filters to increase attention if desired
- ✓ adapt tech to environmental and personal variability

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