Autism Skill Tutor

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# Introduction

Two of the greatest challenges people with high-functioning autism have are (1) social and communication skills and (2) sensory processing/sensory sensitivity problems. (1) and (2) are highly individualized and nuanced problems that take years of trial-and-error to learn to live with. As a result of this process, it is not uncommon for people with high-functioning autism to develop unhealthy coping mechanisms. This content theory proposes a computer program made up of three sections that will give people with high-functioning autism skills and techniques that can be used in day-to-day life to make living with autism easier. Section one will focus on social development, two on coping strategy development, and three will be a resource that uses personalized data to find the best possible alternatives to foods and everyday items for users.

# Terms

**Asperger’s Syndrome**

A form of functional ASD, typical traits include impaired social skills, obsessive interest(s), impaired motor development, and a strict adherence to routine.

**Autism Spectrum Disorder (ASD) / Autism Disorder**

A developmental disorder that has a large range of intensity that can impair communication, social development, motor skills, and mental development.

**Functioning Autism / High-Functioning Autism (HFA)**

Autism that does not exhibit an intellectual disability, allowing for the person to function and live independently.

**Hyperfocus**

The process of being so intensely focused that they are unable to process anything outside of the area of focus. This can include both physical and emotional feelings and the world around them.

**Masking / Camouflaging**

The practice of a person with autism suppressing behaviors identified as “autistic” and performing behaviors to attempt to present as neurotypical.

**Neurodivergant**

Someone who has a mental disorder or mental illness.

**Neurotypical**

Someone who does not have a mental disorder or a mental illness, the ‘typical’ brain.

**Non-Functioning Autism / Low-Functioning Autism (LFA)**

Unable to live independently, autism has had a highly debilitating effect on the person and needs assistance.

**Pervasive Developmental Disorder - Not Otherwise Specified (PDD-NOS)**

Mild symptoms/traits of autism or may not have all signs of autism and includes the subtypes of autism that do not fall under Asperger’s Syndrome or Autistic Disorder.

**Sensory Sensitivity / Sensory Processing Sensitivity**

Some sensory stimuli have heightened processing. This can affect any of the five senses and can be overwhelming and painful, leading to sensory overload.

**Special Interest/Fixation**

The area of interest of a person with autism in which they are fixated on. It is usually a hobby in which the person has a very deep focus on, to the point that it may appear obsessive.

**Treatment**

Treatment, in the context of this content theory, is the development of skills or practices that make living with a disability easier. Is not an indicator that this content theory proposes a cure or way to get rid of the symptoms/traits of ASD.

# Scope

This paper proposes a downloadable computer program with the intended users are American children between the ages of 7 and 12, with some consideration for those above the age of 12, that have HFA.

# Autism Traits

The symptoms/traits of autism are diverse and varying levels of intensity.

David Rowland, in “Redefining Autism”, presents a table of fifty autistic traits (below), which Rowland claims are caused by hyperfocus.

Below are the traits from the table that will be addressed from “Redefining Autism” and the section they are to be addressed in.

| **Social Development** | **Coping Strategy Development** |
| --- | --- |
| Intense Single-Mindedness | Mind always busy, tendency to overthink |
| Self-awareness but no social awareness | Interruption trigger agitation, confusion, or anxiety |
| Unaware of feeling, needs, and interests of others | Hypersensitive to loud noises and bright lights |
| Unaware of socially appropriate responses | Experiences anxiety from being mentally trapped in a sensory assault |
| Unable to read body language | Overwhelmed from hearing unwanted conversations |
|  | Overwhelmed by too much information |
|  | Sensory overload makes it impossible to think or focus |
|  | Cannot nature self psychologically |
|  | Unable to defend against emotional attacks |

# Problems with Current Models

Development of robots such as (Palestra, De Carolis and Esposito 2017),(Scassellati, et al. 2018)

How this technology and the traditional methods of treatment can be inaccessible to low-income families. (Scassellati, et al. 2018), (Zaidman-Zait, et al. 2018)

How some models of treatment can encourage masking and why masking is bad. (Lawson 2020)

# Contents

## Home Screen

## Social Development

### Social Questions

### Social Development Games

### Talk to AI

## Coping Strategy Development

### Grounding and Mindfulness Games

### Understanding Sensory Sensitivity

## Alternatives Finder

### Profiles

### Search

## Character Model and Design Choices

Display some concept character models and explain the ideal character model.

# Potential Problems

User frustration - (Palestra, De Carolis and Esposito 2017)

Affordability.

# Conclusion

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# References

Abdel Hameed, Mohamed, M. Hassaballah, Mosa E. Hosney, and Abdullah Alqahtani. 2022. "An AI-Enabled Internet of Things Based Autism Care System for Improving Cognitive Ability of Children with Autism Spectrum Disorders." *Computational Intelligence and Neuroscience* (Hindawi) 2022.

Bottema-Beutel, Kristen, and Shannon Crowley. 2021. "Pervasive undisclosed conflicts of interest in applied behavior analysis autism literature." *Frontiers in Psychology* (Frontiers) 1631.

Cook, Julia, Laura Hull, Laura Crane, and William Mandy. 2021. "Camouflaging in autism: A systematic review." *Clinical psychology review* (Elsevier) 89: 102080.

Grandgeorge, Marine, and Nobuo Masataka. 2016. "Atypical color preference in children with autism spectrum disorder." *Frontiers in psychology* (Frontiers) 7: 1976.

Hall, Geoffrey B. C., C. Dianne West, and Peter Szatmari. 2007. "Backward masking: Evidence of reduced subcortical amygdala engagement in autism." *Brain and cognition* (Elsevier) 65: 100–106.

Kupferstein, Henny. 2018. "Evidence of increased PTSD symptoms in autistics exposed to applied behavior analysis." *Advances in Autism* (Emerald Publishing Limited).

Lawson, Wenn B. 2020. "Adaptive morphing and coping with social threat in autism: An autistic perspective." *Journal of Intellectual Disability-Diagnosis and Treatment* 8: 519–526.

O'Neill, Meena, and Robert S. P. Jones. 1997. "Sensory-perceptual abnormalities in autism: a case for more research?" *Journal of autism and developmental disorders* (Springer) 27: 283–293.

Palestra, Giuseppe, Berardina De Carolis, and Floriana Esposito. 2017. "Artificial Intelligence for Robot-Assisted Treatment of Autism." *Waiah@ ai\* ia.* 17–24.

Pellicano, Elizabeth. 2013. "Sensory symptoms in autism: a blooming, buzzing confusion?" *Child Development Perspectives* (Wiley Online Library) 7: 143–148.

Rowland, David. 2020. "Redefining autism." *Journal of Neurology, Psychiatry and Brain Research* 2020.

Russell, Ailsa J., David Mataix-Cols, Martin Anson, and Declan G. M. Murphy. 2005. "Obsessions and compulsions in Asperger syndrome and high-functioning autism." *The British Journal of Psychiatry* (Cambridge University Press) 186: 525–528.

Scassellati, Brian, Laura Boccanfuso, Chien-Ming Huang, Marilena Mademtzi, Meiying Qin, Nicole Salomons, Pamela Ventola, and Frederick Shic. 2018. "Improving social skills in children with ASD using a long-term, in-home social robot." *Science Robotics* (American Association for the Advancement of Science) 3: eaat7544.

Smith, Kathryn A., Jean-G. Gehricke, Suzannah Iadarola, Audrey Wolfe, and Karen A. Kuhlthau. 2020. "Disparities in service use among children with autism: A systematic review." *Pediatrics* (American Academy of Pediatrics) 145: S35–S46.

Zaidman-Zait, Anat, Pat Mirenda, Peter Szatmari, Eric Duku, Isabel M. Smith, Tracy Vaillancourt, Joanne Volden, et al. 2018. "Profiles of social and coping resources in families of children with autism spectrum disorder: Relations to parent and child outcomes." *Journal of autism and developmental disorders* (Springer) 48: 2064–2076.