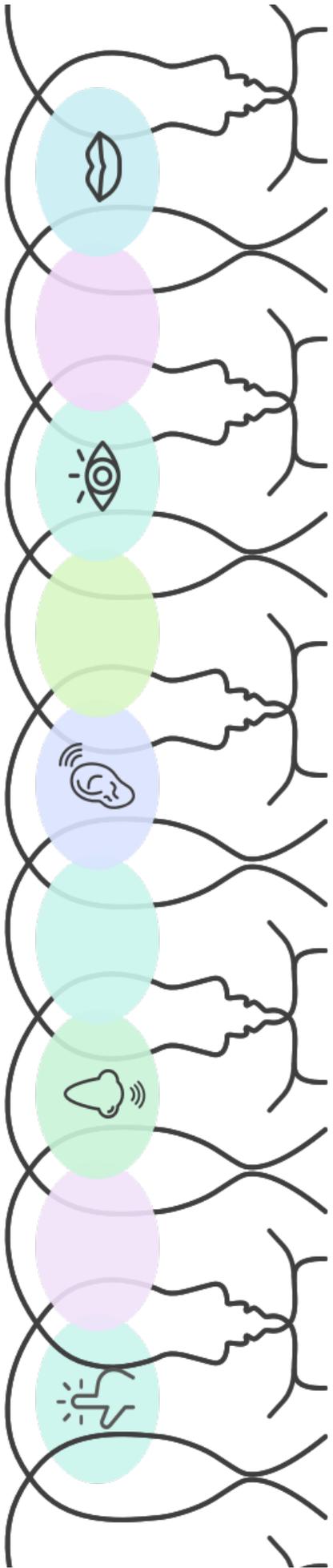


# RESEARCH PLAN & STUDY GUIDE

Opportunities towards a better experience for  
neurodivergent children with sensory integration needs.

Alea Abrams Amberly Riegler Tiffanie Horne



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# RESEARCH PLAN

## Introduction

**Neurodiversity** refers a spectrum of neurological differences, which result from a normal, expected range of variation in the human genome and accounts for **20% of the global population** (1).

**Neurodiversity** is used to represent a group of people with varied neurocognitive configuration and includes Dyslexia, Autistic Spectrum Disorder (ASD), Tourette's syndrome, Attention Deficit Hyperactivity Disorder (ADHD), and others(1). Due to these differences in configuration, neurodivergence can be viewed as a detriment, but these individuals have strengths and talents that are often overlooked by society. By supporting the unique needs of neurodivergents from an **early age**, we can further empower their success (2).

One way to provide support is to focus on experience. All humans experience the world directly through their physical sensations, however, individuals with greater neurodiversity process these experiences differently. The challenge to perform **sensory integration** (SI), which is the neurological organization and interpretation of sensory input, impacts approximately 75% of people with autism (3).

Addressing the need for SI is critical to the development of complex social and communication skills necessary for high quality of life (4).

So much so that SI is often the focus of early interventions from occupational therapists, developmental specialists, psychologists, and other healthcare professionals (5). Interventions tend to focus on interventions that involve using sensory and motor treatment activities and equipment. These include adaptations to overstimulation, sensory diet programs that help to manage sensory modulation, and environmental modifications like sensory rooms (6).

Despite the variety of options available, the barriers to receiving SI support come in many forms. Current interventions can require frequent and recurring visits to professionals, costly equipment, physical proximity, and intense commitment multiple individuals (7). **Many families lack the time, resources, and access to these vital services** and often manage these needs at home (8).

The team plans to investigate **how technology can assist** providing more accessibility to children with sensory integration needs in their homes. This research plan outlines our inquiry into sensory integration from the professional, parental, and personal perspective with the goal of identifying possible areas for design intervention.

## Insights & Questions

### INSIGHTS

- ✎ Differences in sensory integration is widespread in the neurodiverse community and comes in many shapes and sizes.
- ✎ Addressing sensory integration needs at an early age improves communication and behavioral outcomes for neurodivergent individuals.
- ✎ The barriers to existing interventions can be overwhelming for families who need them the most.

### RESEARCH QUESTIONS

- 1 What types of resources currently exist for neurodivergent individuals with sensory integration needs?
- 2 What potential barriers exist for practicing sensory integration?
- 3 How might we better facilitate sensory integration for neurodivergent individuals?

### PARTICIPANT PROFILE

Our participant population will be made of two groups: professionals who work with sensory integrating neurodivergent children and families that include a pre-K to elementary school age neurodivergent child with sensory integration needs. These two groups will allow us understand sensory integration on a spectrum of ad hoc to professional in order to identify gaps and pain points.

**Professionals** can include occupational therapists, psychologists, child behaviorists, and educators. These individuals will provide information about standard practices and tools for sensory integrations as well as insight into alternative approaches to this space.

**Family**, with a focus on parents, will help us to better understand the challenges, needs, and current ways of addressing the sensory needs of their neurodivergent children at home.

### RECRUITMENT

Recruitment will take place in multiple forms. We plan to recruit up to 5 professionals through contact with research faculty at the University of Washington, inquiring into institutional resources on campus (UW Autism Center), the DUB community, and personal connections. Efforts to recruit up to 4 families will occur through involvement with neurodiversity events in the greater Seattle area, online communities, service organizations, and professional or personal connections.

### ACTIVITIES

In order to gain a breadth of understanding, we want to conduct the following research activities:

- 1 Contextual Inquiry
- 2 Artifact Analysis
- 3 Directed Storytelling
- 4 Creative Toolkit

These activities will allow us to assess the current state of sensory integration on a professional and personal level in order to better understand its role in the community and fully inform future design direction.

### ACTIVITY DESCRIPTIONS

**Contextual Inquiry** with parents and professionals to understand context of use, the sequence of events, and environment surrounding implementation of sensory integration.

**Artifact Analysis** with parents and children to identify construction and adaptation of tools and techniques in order to uncover design opportunities.

**Directed Storytelling** with family members and professionals to learn more about an experience of sensory integration, it's success, and it's overall impact on the child.

**Creative Toolkit** containing materials that activate a variety of senses in order to explore the sensory interests of neurodivergent children with sensory integration needs.

# STUDY GUIDE

# Facilitation Guide

## Professional Session

### SESSION OVERVIEW

Introduction .....	5 minutes
Interview .....	20 minutes
Directed Storytelling .....	15 minutes
Artifact Analysis .....	15 minutes
Closure .....	5 minutes
Total .....	60 minutes

### INTRODUCTION

Hello! I'm [interviewer] and this is [note-taker] and [photographer]. We are graduate students studying Human-Computer Interaction and Design at UW. Thank you so much for meeting with us to discuss your experience around kids with sensory needs. We are excited to learn from you. We expect this conversation should take no longer than an hour.

For our first phase of the project, we are researching this space to get a clear understanding of sensory needs in neurodivergent children and how they are addressed.

Today, I'll be talking with you, [note-taker] will be taking notes, and [photographer] will be taking some photos and additional notes to help us remember what you've told us. We'll let you review these photos at the end. We'd like to record this interview, is that still alright with you?

Please read this consent form <hand consent form>. If you agree to the terms outlined, please sign the form and let us know if you have any questions.

Additionally, I just want to reiterate that you may refuse to answer any question or end the interview at any time. If you agreed to an audio or video recording, you may ask that we stop recording at any time. Also, all personal information will be kept anonymous.

Do you have any questions? Would you like to use the restroom or get a drink/snack before we start?

### ROLES

Facilitator  
Note taker  
Photographer

### INTERVIEW

#### Can you tell us a little bit about yourself?

- How long have you worked in this area?
- Why did you want to enter this area?
- How specifically do you interact with individuals with sensory integration needs?
- What is your role in helping individuals manage sensory needs?

#### What types of sensory needs do you see most frequently?

- Do you notice any trends? Have these trends changed? (for example, with the use of technology)?
- Can you make generalizations regarding this topic and the population?

#### Can you tell us more specifically about intervention?

- Can you walk us through a typical session, once the need has been recognized?
- What sort of techniques or tools do you use in sessions?
- How has this changed over time?
- Are there any things you've found ineffective?
- How does this differ from what's being done in the home? How is it similar?

# Facilitation Guide

## Professional Session (continued)

### ARTIFACT ANALYSIS

**Introduction:** For this activity, we wish to understand the objects and items you use as they are within their current context.

**Question:** Would you be willing to show us these tools or techniques? Is it ok if we photograph them?

Do you see any barriers that exist for children with sensory needs?

### DIRECTED STORYTELLING

**Introduction:** For this activity, we would like for you to elaborate on one experience. This activity will take about 10 minutes.

**Question:** Tell me about a time when [*child's name*] needed sensory integration that left an impression on you? What happened?

**Prompts:** Who, what, where, when, why

Thank you for sharing that story.

Do you have any questions for us? Are there any questions you wish we would have asked?

# Facilitation Guide

## Parent Session

### SESSION OVERVIEW

Introduction .....	5 minutes
Interview .....	20 minutes
Directed Storytelling .....	15 minutes
Artifact Analysis .....	15 minutes
Closure .....	5 minutes
Total .....	60 minutes

### INTRODUCTION

Hello! I'm [interviewer] and this is [note-taker] and [photographer]. We are graduate students studying Human-Computer Interaction and Design at UW. Thank you so much for meeting with us to discuss your family's experience with sensory needs. We are excited to learn from you. We expect this conversation should take less than an hour.

For our first phase of the project, we are researching to get a clear understanding of your experience with managing sensory needs. We believe the respectful way to refer to people is the way each individual chooses for themselves, so please correct us if we use uncomfortable terminology.

Today, I'll be talking with you, [note-taker] will be taking notes, and [photographer] will be taking some photos and additional notes to help us remember what you've told us. We'll let you review these photos at the end. We'd like to record this interview, is that still alright with you?

Please read this consent form <hand consent form>. If you agree to the terms outlined, please sign the form and let us know if you have any questions.

Additionally, I just want to reiterate that you may refuse to answer any question or end the interview at any time. If you agreed to an audio or video recording, you may ask that we stop recording at any time. Also, all personal information will be kept anonymous.

### ROLES

Facilitator  
Note taker  
Photographer

Do you have any questions? Would you like to use the restroom or get a drink/snack before we start?

### INTERVIEW

#### Can you tell us a little about yourself? Your family?

- What is a typical day like?
- What are some of the day highlights you experience? Challenges?

#### Can you tell us a little about your child's sensory needs?

- What are their typical behaviors?
- How do you identify when they have sensory needs? Are there specific triggers?
- Has this changed over time? If so, how?

#### Does your child have specific items that help them address this need?

- What types of things do you use at home to assist them?
- When do you use them most frequently?

# Facilitation Guide

## Parent Session

### INTERVIEW (continued)

**Does your child see/has seen a professional (OT, behaviorist, in school) to address sensory needs?**

- Have they provided tools or guidance for how to manage these things at home?
- What has helped your child with their sensory needs?  
What hasn't helped?

**What's the overall outcome of using sensory integration techniques?**

- Have you seen benefits?
- Are you skeptical about them?

**What is your family's relationship with technology?**

- What types of technology do you use most often? Why?
- What types of technology does your child engage with?  
What bores them?
- What kinds of technology do you wish would be created for your child? Why?
- Do you ever use technology in the context of sensory integration?

**What's the most important thing to know about kids with sensory needs?**

**Are there any questions you wish we would have asked?**

**Do you have any questions for us?**

### ARTIFACT ANALYSIS

**Introduction:** For this activity, we wish to understand the objects and items you use as they are within their current context

**Question:** Would you be willing to show us these tools or techniques? Would it be possible to photograph them?

What types of things do you wish you had at home?  
What prevents you from obtaining those things?

### DIRECTED STORYTELLING

**Introduction:** For this activity, we would like for you to elaborate on one experience. This activity will take about 10 minutes.

**Question:** Tell me about a time when [child's name] needed sensory integration that left an impression on you? What happened?

**Prompts:** Who, what, where, when, why

Thank you for sharing that story.

Do you have any questions for us? Are there any questions you wish we would have asked?

# Facilitation Guide

## Parent & Child Session

### SESSION OVERVIEW

Introduction .....	5 minutes
Interview .....	15 minutes
Directed Storytelling .....	15 minutes
Creative Toolkit with Children .....	20 minutes
Artifact Analysis .....	10 minutes
Closure .....	5 minutes
Total .....	70 minutes

### INTRODUCTION

Hello! I'm [interviewer] and this is [note-taker] and [photographer]. We are graduate students studying Human-Computer Interaction and Design at UW. Thank you so much for meeting with us to discuss your family's experience with sensory needs. We are excited to learn from you. We expect this conversation should take about an hour.

For our first phase of the project, we are researching to get a clear understanding of your experience with managing sensory needs. We believe the respectful way to refer to people is the way each individual chooses for themselves, so please correct us if we use uncomfortable terminology.

At the end of the session today, we'd like to ask your child questions about different sensory items we have assembled. If you have feedback about when we should conduct this activity, please let us know. Additionally, if there are things your child is particularly sensitive to, please feel free to remove any items before we get started.

Today, I'll be talking with you, [note-taker] will be taking notes, and [photographer] will be taking some photos and additional notes to help us remember what you've told us. We'll let you review these photos at the end. We'd like to record this interview, is that still alright with you?

Please read this consent form <hand consent form>.

### ROLES

Facilitator  
Note taker  
Photographer

If you agree to the terms outlined, please sign the form and let us know if you have any questions.

Additionally, I just want to reiterate that you may refuse to answer any question or end the interview at any time. If you agreed to an audio or video recording, you may ask that we stop recording at any time. Also, all personal information will be kept anonymous.

Do you have any questions? Would you like to use the restroom or get a drink/snack before we start?

### INTERVIEW

#### Can you tell us a little about yourself? Your family?

- What is a typical day like?
- What are some of the day highlights you experience? Challenges?

#### Can you tell us a little about your child's sensory needs?

- What are their typical behaviors?
- How do you identify when they have sensory needs? Are there specific triggers?
- Has this changed over time? If so, how?

# Facilitation Guide

## Parent & Child Session (continued)

### INTERVIEW (continued)

#### Does your child have specific items that help them address this need?

- What types of things do you use at home to assist them?
- When do you use them most frequently?

#### Does your child see/has seen a professional (OT, behaviorist, in school) to address sensory needs?

- Have they provided tools or guidance for how to manage these things at home?
- What has helped your child with their sensory needs? What hasn't helped?

#### What's the overall outcome of using sensory integration techniques?

- Have you seen benefits?
- Are you skeptical about them?

#### What is your family's relationship with technology?

- What types of technology do you use most often? Why?
- What types of technology does your child engage with? What bores them?
- What kinds of technology do you wish would be created for your child? Why?
- Do you ever use technology in the context of sensory integration?

#### What's the most important thing to know about kids with sensory needs?

#### Are there any questions you wish we would have asked?

#### Do you have any questions for us?

### DIRECTED STORYTELLING

**Introduction:** For this activity, we would like for you to elaborate on one experience. This activity will take about 10 minutes.

**Question:** Tell me about a time when [child's name] needed sensory integration that left an impression on you? What happened?

**Prompts:** Who, what, where, when, why

Thank you for sharing that story.

Do you have any questions for us? Are there any questions you wish we would have asked?

### CREATIVE TOOLKIT

**Introduction:** For this activity, we have brought a with us a bin containing items meant to stimulate or eliminate senses. (textured toys, masks, noise makers, etc.)

**Prompt:** Pick your favorite thing from the box. What is it? Why do you like it?

- Which one feels the best?
- Put your favorite in a group.
- What's your favorite color?

### ARTIFACT ANALYSIS

**Introduction:** For this activity, we wish to understand the objects and items you use as they are within their current context.

**Question:** Would you be willing to take photos and send them to us?

If you are willing, please follow the instructions on this hand out.

# Facilitation Guide

## Relative/Friend Session

### SESSION OVERVIEW

Introduction .....	5 minutes
Interview .....	20 minutes
Directed Storytelling .....	15 minutes
Artifact Analysis .....	15 minutes
Closure .....	5 minutes
Total .....	60 minutes

### INTRODUCTION

Hello! I'm [interviewer] and this is [note-taker] and [photographer]. We are graduate students studying Human-Computer Interaction and Design at UW. Thank you so much for meeting with us to discuss your family's experience with sensory needs. We are excited to learn from you. We expect this conversation should take less than an hour.

For our first phase of the project, we are researching to get a clear understanding of your experience with managing sensory needs. We believe the respectful way to refer to people is the way each individual chooses for themselves, so please correct us if we use uncomfortable terminology.

Today, I'll be talking with you, [note-taker] will be taking notes, and [photographer] will be taking some photos and additional notes to help us remember what you've told us. We'll let you review these photos at the end. We'd like to record this interview, is that still alright with you?

Please read this consent form <hand consent form>. If you agree to the terms outlined, please sign the form and let us know if you have any questions.

Additionally, I just want to reiterate that you may refuse to answer any question or end the interview at any time. If you agreed to an audio or video recording, you may ask that we stop recording at any time. Also, all personal information will be kept anonymous.

Do you have any questions? Would you like to use the restroom or get a drink/snack before we start?

### ROLES

Facilitator  
Note taker  
Photographer

### INTERVIEW

#### Can you tell us a little about yourself? Your family?

- What is a typical day like?
- What is your relationship with [child's name]?
- What are some of the day highlights you experience? Challenges?

#### Can you tell us a little about [child's name] sensory needs?

- What are their typical behaviors?
- How do you identify when they have sensory needs? Are there specific triggers?
- Has this changed over time? If so, how?

#### Do you know if [child's name] sees a professional (OT, behaviorist, etc.) to address sensory needs?

- Have they provided tools or guidance for how to manage these things at home?
- What has helped your child with their sensory needs? What hasn't helped?

#### What's the overall outcome of using sensory integration techniques?

- Have you seen benefits?
- Are you skeptical about them?

# Facilitation Guide

## Relative/Friend Session (continued)

### INTERVIEW (continued)

#### What is your family's relationship with technology?

- What types of technology do you use most often? Why?
- What types of technology does [child's name] engage with? What bores them?
- What kinds of technology do you wish would be created for your child? Why?
- Do you ever use technology in the context of sensory integration?

#### What's the most important thing to know about kids with sensory needs?

#### Are there any questions you wish we would have asked?

#### Do you have any questions for us?

### ARTIFACT ANALYSIS

**Introduction:** For this activity, we wish to understand the objects and items you use as they are within their current context.

**Question:** Would you be willing to show us these tools or techniques? Would it be possible to photograph them?

What types of things do you wish you had at home? What prevents you from obtaining those thing?

### DIRECTED STORYTELLING

**Introduction:** For this activity, we would like for you to elaborate on one experience. This activity will take about 10 minutes.

**Question:** Tell me about a time when [child's name] needed sensory integration that left an impression on you? What happened?

**Prompts:** Who, what, where, when, why

Thank you for sharing that story.

Do you have any questions for us? Are there any questions you wish we would have asked?

# Artifact Analysis Handout

## INSTRUCTIONS

For this activity, we are interested in seeing the tools or techniques your child uses during sensory integration. The purpose of this analysis is understand the objects you use within their context.

Please take photos of anything that you are currently using as a form of sensory integration. Whatever you would like to share with us to help us better understand your experience on a day-to-day basis.

Send us your pictures through email or text!

**Amberly Riegler**  
(859) 391-0312  
asrieg01@uw.edu

# Checklist

## Professional Session

### MATERIALS

- Notebook
- Pens
- Cellphone (for recording and documentation)
- Camera
- Tripod
- Facilitation Guide - Professional Session
- Consent Form
- Amazon Gift card
- Gratuity Release Form

### DOCUMENTATION

- Audio recording
- Notes
- Completed consent form
- Completed gratuity release form

### SHOT LIST

- Headshot (adult)
- Images from artifact analysis
- Images of office/surroundings

# Checklist

## Family Session

### MATERIALS

- Notebook
- Pens
- Cellphone (for recording and documentation)
- Camera
- Tripod
- Facilitation Guide - Family Session
- Consent Form
- Assent Form
- Amazon Gift card
- Gratuity Release Form
- Creative Toolkit (28 pack sensory kit)

### DOCUMENTATION

- Audio recording
- Notes
- Completed consent form
- Completed assent form
- Completed gratuity release form

### SHOT LIST

- Headshot (adult)
- Headshot (child) - if parent allows
- Images from artifact analysis
- Images of home/surroundings
- Images of creative toolkit play

# Consent Form

This study focuses on identifying and building ways we can support sensory integration in neurodivergent children.

Your participation in this study is voluntary. You can choose not to answer any question at any time. You understand that you will be compensated with a \$20 Amazon gift card for my participation. You may withdraw and discontinue participation at any time without penalty or loss of compensation.

Participation involves answering questions asked by the researchers, and discussing your personal experiences addressing the sensory needs of neurodivergent child(ren). You will also be asked to share a personal story surrounding this experience.

Photos and recordings will be taken during the study. You understand that the researchers will do their best to safeguard any sensitive information they receive as part of the study. Please indicate that you agree to the following:

- I consent to photos being taken of me
- I consent to my audio being recorded

If you do not agree to these recordings, please let us know.

Notes will be written about our discussion during the interview. You understand that the researcher will not identify you by name in any reports using information obtained from this study, and that your confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions.

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

# Assent Form

We are doing a design project about your senses. Design is the creation of new and exciting things. Our team wants to make things that solve a problem, are easy to use, and are enjoyable for people. If you want to help with this project, you will be asked to make or draw things.

Not everyone who takes part in this study will benefit. A benefit means that something good happens to you. We think your help might create something that will help people.

When we are finished with this project we will write a report about what we learned and created with your help! This report will not include your name or that you were in the study.

You do not have to be in this study if you do not want to be. If you decide to stop after we start, that is okay. Your parents know about the study.

If you decide you want to be in this study, please write your name/say out loud:

I, \_\_\_\_\_, want to help with this project.

# Gratuity Release Form

## Gratuity Release

I acknowledge that I have received a \$20 Amazon gift card for my participation in the University of Washington's Master of Human-Computer Interaction (MHCI+D) study on the date written below.

I acknowledge that I have been given the appropriate contact information should I have any concerns about the study and/or the gratuity.

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

# RECRUITING MATERIALS

# Recruiting Materials

## EMAIL

Hello [...],

My name is [...] and I am a Master's student in the Human-Computer Interaction and Design program at the University of Washington. My team and I are in the formative stages of research for a capstone project with a focus on autistic children with sensory processing needs. Would you be willing to participate in a 60 minute interview discussing your thoughts and experience in this area? Participants will receive a \$20 Amazon gift card for their time.

If you are interested, please complete this screener: \_\_\_\_\_

We look forward to hearing from you.

Kind regards,  
[...]

## ONLINE POST

Hi everyone! Is anyone here a parent of an autistic child with sensory needs (or know anyone who might be)? I'm a Master's student at UW doing research about sensory integration and we are looking for people to participate in our study. Qualified participants will receive Amazon gift cards. The study will not involve any treatment. If interested, sign up here, and feel free to message me with any questions!

## ONLINE FORUM MESSAGE

Hi [*name of potential recruit*]! I found you on the [Online Group Name] Group. I'm a Master's student at the University of Washington and I am part of team doing some research on sensory integration and what we might be able to do to better support families like yours. We'd love to hear from you. We are offering Amazon gift cards for your time.

# Recruiting Materials

FLYER (QUARTER SHEET)



## **Does your child have difficulty processing sensory information?**

A team of researchers at The University of Washington are studying **sensory experiences** of **neurodivergent children**.

**You might be eligible to participate in a research study.**

We are interested in talking **parents and/or children**, whatever you are most comfortable with.

The study will not involve any treatment.  
Qualified participants can receive Amazon gift cards.

**WEBSITE**

## FLYER (TEAR-OFF SHEET)

**UNIVERSITY of WASHINGTON**

**MHCI +D**  
human-computer  
interaction + design

# Does your child have difficulty processing sensory information?

A team of researchers at University of Washington are studying **sensory experiences** of **neurodivergent children**.

**You might be eligible to participate in a research study.**

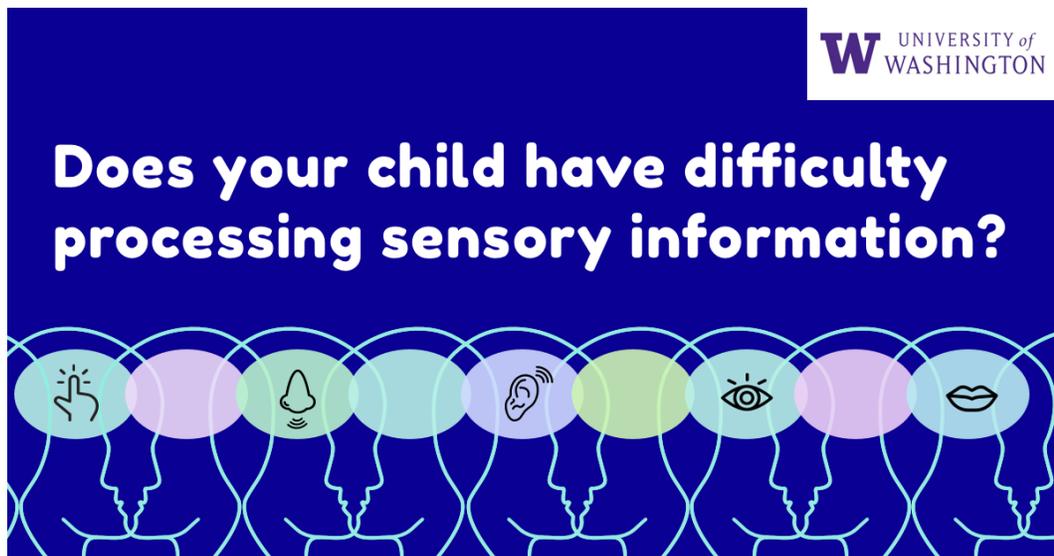
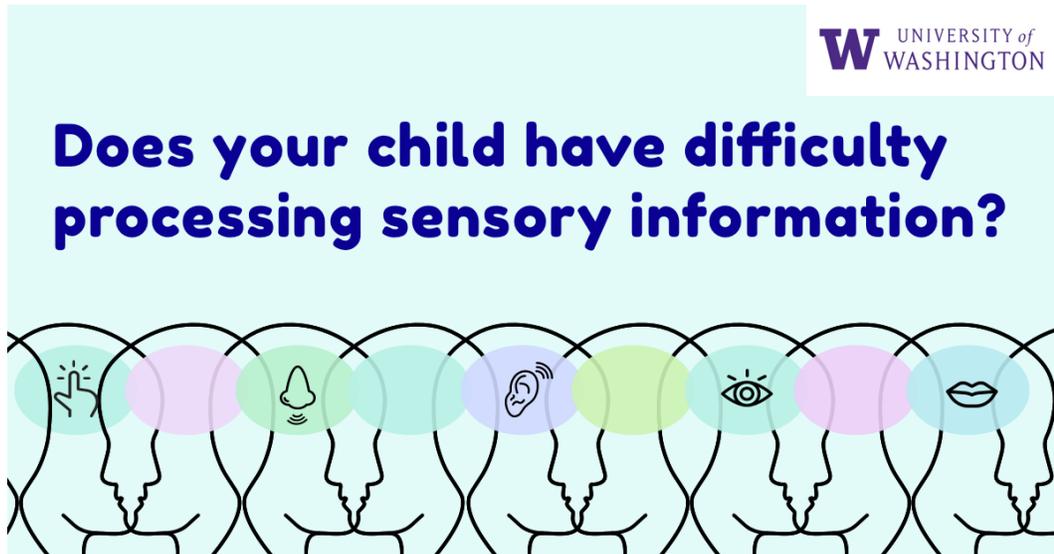
We are interested in talking to **parents and/or children** about your thoughts and experiences.

- The study will not involve any treatment.
- It will take approximately 1 hour.
- Qualified participants can receive Amazon gift cards.

Sensory Perception Study Website

# Recruiting Materials

## ONLINE AD IMAGES



## References

- 1 [https://alliance-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=TN\\_a cm3176410&context=PC&vid=UW&search\\_scope=all&tab=default\\_tab&lang=en\\_US](https://alliance-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=TN_a cm3176410&context=PC&vid=UW&search_scope=all&tab=default_tab&lang=en_US)
- 2 <https://doi.org/10.1007/s10803-013-1983-8>
- 3 What You Need to Know About Sensory Issues and Autism
- 4 <https://harkla.co/blogs/special-needs/autism-sensory-issues>
- 5 <https://www.nimh.nih.gov/health/publications/autism-spectrum-disorder/index.shtml>
- 6 <https://www.asha.org/public/speech/disorders/autism/>
- 7 <https://www.aota.org/About-Occupational-Therapy/Professionals/HW/Using-Sensory-Integration-Based-Approach-With-Adult-Populations.aspx>
- 5 <https://www.iidc.indiana.edu/pages/sensory-integration-tips-to-consider>
- 6 <https://www.especialneeds.com/blog/budget-sensory-room-building/>