

Developing a Sensory Resources Guide for Visitors Sensitive to Sensory Overstimulation at Museums and Historic Sites

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ABSTRACT

Exhibit spaces in Museums and Historic Sites (MHS) can be inaccessible or uncomfortable for visitors who are overstimulated by external sensory environments and museum technology. While some strategies exist to make these spaces accessible to these visitors, they are rarely employed by museum specialists and technologists. In this poster, we summarize our work understanding the current practice of supporting the needs of individuals who are overstimulated in MHS. We visited four New York City MHS, and surveyed online content from 23 MHS websites. Our findings reveal that many MHS do not offer comprehensive sensory resources to sufficiently support visitors with sensory sensitivities. To address this challenge, we developed a sensory resources guide which includes detailed content recommendations and templates to implement support for visitors who may be overstimulated in MHS. Using our guide, we worked with a historic site to produce sensory resources and evaluated them with two disability advocates with museum accessibility experience and one MHS staff member. Our guide allows MHS professionals, accessibility staff, and technology developers to design more inclusive environments.

CCS CONCEPTS

• Human-centered computing • Accessibility • Accessibility systems and tools

KEYWORDS

Sensory resources, Sensory kit, Sensory guide, Social narrative, Accessibility, Museum experience, Sensory overstimulation

1 Introduction

With more than 35,000 Museums and Historic Sites (MHS) in the United States [10], these public spaces have legal obligations to continually improve their accessibility to make their spaces more inclusive [11]. MHS can be overstimulating due to crowded exhibits, unfamiliar spaces, or technologies that are used in MHS with bright, flashing lights, and sudden loud noises [9]. As a result, overstimulating environments

in MHS may present sensory challenges for individuals sensitive to these sounds and visuals. Providing visitors with the resources they need to understand their surroundings before and during a visit may affect their overall experience [4,7]. While schools and home settings routinely use sensory resources, MHS should adopt sensory supports including sensory kits, sensory guides, and social narratives [4]. A *sensory kit* is a collection of items (e.g. noise reduction headphones, sunglasses, visual timers, and fidget toys) that may help reduce stimulation. A *sensory guide* is a document used to provide insight on an unfamiliar environment before a visit and includes an overview of senses in the environment. A *social narrative* is a document that describes a social situation to support visitors with autism [8,9] and is intended to be used before a visit. However, creating and implementing these resources requires time, budget, and knowledge that not all MHS staff have. Additionally, implementation in MHS is difficult as there are currently no templates that advise exactly what to include to guide the design of a sensory guide or social narrative.

We present our work understanding the discrepancies and assessing existing sensory resources through visiting and surveying existing materials at four NYC MHS, interviewing their staff, and surveying content from 23 MHS websites. We used this data to inform the design of templates that describe the sensory experiences visitors would experience at a specific museum by consulting one MHS professional and two disability advocates. These digital templates were designed to help museum staff identify what information is needed to help visitors with sensory sensitivities feel more in control of their sensory experiences.

2 Related Work

Some MHS have implemented program-based accessibility features. This includes “early openings” (programs that provide a quiet environment with less visitors present) or “sensory friendly tours” (programs that remove/ turn off bright lights, loud sounds, large crowds). Both are useful as they can reduce the amount of sensory challenges presented [12]. However, these programs require sufficient pre-planning to attend those set times and do not allow for spontaneous visitation [4]. Some MHS have changed their physical space by adding low sensory spaces and clear signage throughout the museum but this may not always be possible, especially at historic sites. Sensory resources such as social narratives [8], sensory guides [2] and sensory kits [4] are found to be effective in home and school settings, but these tools are not currently widely used as museum specific resources [6]. While some MHS have been implementing sensory resources on an individual basis [1,3,4,5], others may need more support. There is no known summarized information on MHS-specific sensory resources and a scalable means to produce them.

3 Methods

Our methods consist of three steps: 1) understanding current MHS resources and practices in overstimulating environments; 2) creating a sensory resources guide; and 3) evaluating this resource guide with one MHS and two disability advocates. This work was conducted as part of an active Institute of Museum and Library Services (IMLS) grant that focuses on interpretation accessibility in MHS and has partnered with nine historic sites across the United States and eight disability advocates. We refer to historic sites participating in this grant as *MHS partners*.

To understand current practices around sensory resources visited four MHS of varying sizes in New York City including: two historic sites (one MHS partner), one art museum, and one science museum. After each visit we interviewed administrators at these sites about their accessibility support. We then surveyed the online offerings of 9 MHS partners and 14 other MHS from the United States and Europe: six history museums, four art museums, three science museums, one children’s museum and one zoo which offer some sensory resources selected by searching museum accessibility related keywords on a web search engine. We published our sensory resources guide to a website [13] which we iteratively refined using feedback from MHS partners. One MHS partner created their own sensory guide and social narrative using our templates, and we evaluated these materials remotely with them and two disability advocates with expertise in the impact of overstimulating environments. In our evaluations, we discussed the feasibility of using these guidelines and templates with the MHS staff, and asked disability advocates about any missing information and requirements from the visitor's perspective.

4 Findings

4.1 Understanding Current Practices

We identified three common sensory resources in MHS from our museum visits and interviews with museum professionals: sensory kits, sensory guides, and social narratives. One of the four MHS we interviewed started addressing sensory challenges in 2012 with the help of a grant. They said it was beneficial to have these three resources to address sensory overstimulation and, although it was difficult to begin development, it got easier to implement with experience. However, two out of the four MHS stated they had limited support to make those resources. While they knew these resources would be useful to visitors, they felt it was difficult to start developing them because of limited time, budget, and knowledge. One of them had completed their first social narrative about six months before the interview. They said it took several months to create because the staff were busy and relied on an intern with limited experience.

To get a better sense of sensory resource adoption, we looked at MHS online resources. We first looked at the offerings from nine MHS partners and were surprised that only one offered sensory resources (they provided all three sensory resources) so we searched online to find museums that offered these resources. Our search yielded 14 museums and we found 12 offered social narratives, eight offered sensory guides, and four offered sensory kits. Only two offered all three sensory resources.

4.2 Sensory Resources Guide Design

Our sensory resources guide is a website that provides summarized information and specific guidelines about three sensory resources: sensory kits, sensory guides, and social narratives. To address the challenge that not all staff members are familiar with these resources, we aimed our guide to be useful in staff education. Our guide also includes templates of a sensory guide and social narrative to help museum professionals develop their own. These templates are easily customizable with specific instructions on what to include and exclude, following the feedback from MHS and disability advocates. To ensure compatibility with existing MHS software, our templates are available in both Google Slides and Microsoft Power Point. Our website provides examples of other museums' sensory resources and additional related information.

Sensory kits are a collection of items to calm overstimulating situations. We suggested a list of items to include in a sensory kit with usage, such as noise reduction headphones and sunglasses used to calm high ambient sound and light. Our recommendations also included items that should be avoided due to cleaning difficulties, such as weighted blankets. We included recommendations for how to integrate kits into MHS, since we found that some visitors feel uncomfortable or stigmatized to checkout this equipment at the reception desk because they felt they were forced to self-disclose. To avoid this, we suggested a strategy to keep sensory kits in the exhibit space for a visitor's self-checkout.

Sensory guides identify sensory stimuli that visitors should be aware of during their visit (Figure 1). Common overstimulating stimuli that reduce their ability to engage with museum exhibits include high ambient sound and light, sudden noises, flashing lights, ambient odors, and exhibit-specific smells (animal, natural, or chemical). These are missing from current sensory guides, and our templates include describing these external stimuli along with the exhibit space. We designed our templates by using both icons and words to express the level of stimulation, making the information easily understandable to a broader audience, including visitors with cognitive disabilities or non-native English speakers. We followed universal design principles and WCAG 2.1, addressing font style and size and color contrast, 21:1 on white background and 18.26:1 on gray background, for visitors who have low vision [14,15].

Social narratives are stories with photos and text that describes what visitors may experience while visiting a MHS (Figure 2). For MHS professionals' ease of use, we added precise instructions and suggestions on the templates. For example, we specified what kind of images to put on each page, such as *"a photo of the entrance or a photo of the security person looking friendly"*, instead of just writing *"add a photo"*. We also included instructive information based on the feedback from our disability advocates such as, instead of simply saying there is an exit, we instructed how to leave the building and locate a safe space.

4.3 Sensory Resources Guide Evaluation

We tested our templates with one MHS partner, who created a sensory guide (Figure 1) and social narrative (Figure 2) about their site using our template. We then evaluated these resources with the same MHS partner and two disability advocates. The MHS partner found the templates were very helpful in creating these sensory resources. One of our advocates told us that she wished there had been a resource guide like ours when she was a child. The other advocate said our sensory resources guide would be useful for smaller MHS that tend to have limited resources to improve accessibility.

SENSORY GUIDE:					
PHOTO OF EXHIBITION(AREA)	DESCRIPTION OF AREA (General physical information about exhibition space)	PRESENCE OF SUDDEN LOUD NOISES OR FLASHING LIGHTS	SOUND LEVEL (Amount of noise or sound to hear)	SIGHT (Amount and type of lights and sights to see)	SMELL
			Loud	Bright	Add description of smell (what kind of smell is it, how strong is it?)
			Moderate	Moderate	
			Quiet	Dark	

SENSORY GUIDE:					
PHOTO OF EXHIBITION(AREA)	DESCRIPTION OF AREA (General physical information about exhibition space)	PRESENCE OF SUDDEN LOUD NOISES OR FLASHING LIGHTS	SOUND LEVEL (Amount of noise or sound to hear)	SIGHT (Amount and type of lights and sights to see)	SMELL
	Visitor Center-Front Desk	No - sudden loud noise / flashlights	Loud	Bright	Indoor- No particular smell.
	Visitor Center-Exhibit	No - sudden loud noise / flashlights	Quiet	Bright	Indoor- No particular smell.
	Garden	Yes - sometimes sudden loud noise / No flashlights	Moderate	Bright	Strong, rotting smell of compost

Figure 1: (left) Our sensory guide template. (right) A sensory guide created by the MHS partner using our template.

Photo Ideas
Entrance to the museum Walkway or path leading to the entrance of the museum

When I arrive, I will walk a few steps to the entrance. I can also use the accessible entrance nearby.



When I arrive, I will walk a few steps to the entrance. The entrance is flat and paved.

Figure 2: (left) Our social narrative template. (right) A social narrative created by the MHS partner using our template.

5 Limitations and Future Work

We plan to continue evaluating our resources and encourage other MHS to adopt these templates. We believe there are technology opportunities to automatically support the needs of individuals sensitive to sensory overstimulation. We recommend future work identifying techniques to measure crowd levels and identify crowd-related stimulation and solutions. Finally, there is remaining work to understand the effects of the COVID-19 pandemic on sensory resources and how to sufficiently disinfect sensory objects.

6 Conclusion

In this paper, we presented our work creating a sensory resources guide to help MHS implement three sensory resources: sensory kit, sensory guide, and social narrative. We identified that, while they are helpful for visitors who are sensitive to sensory overstimulation, many MHS have not implemented them. Our sensory resources guide provided summarized information on sensory resources specifically designed for MHS and a scalable way to produce them with our templates. Our research seeks to make MHS more sensory accessible to a wider range of people.

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REFERENCES

- [1] Tina Fletcher, Jon Eckberg, and Amanda B Blake. 2018. Fine arts museums and occupational therapy collaborations promote inclusion for children with autism spectrum disorder. Vol. 22, No. 2., (May 2018). Retrieved from <https://twu-ir.tdl.org/handle/11274/11183>
- [2] Tina S. Fletcher, Amanda B. Blake, and Kathleen E. Shelffo. 2018. Can Sensory Gallery Guides for Children with Sensory Processing Challenges Improve Their Museum Experience? *J. Mus. Educ.* 43, 1 (January 2018), 66–77. DOI:<https://doi.org/10.1080/10598650.2017.1407915>
- [3] Paige Harpenau. 2020. An Organization-Level Occupational Therapy Consultation Approach: Increasing Art Museum Access for Visitors with Autism Spectrum and Sensory Processing Disorders. *Occup. Ther. Capstone Present.* (May 2020). Retrieved from <https://red.library.usd.edu/ot-capstone/13>
- [4] Elizabeth Hoskin, Aditi Singh, Nicola Oddy, Adrian L. Jessup Schneider, Gabrielle Trepanier, Chantal Trudel, and Audrey Girouard. 2020. Assessing the Experience of People with Autism at the Canada Science and Technology Museum. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (CHI EA '20)*, Association for Computing Machinery, Honolulu, HI, USA, 1–7. DOI:<https://doi.org/10.1145/3334480.3382834>
- [5] Jil Kennedy. 2006. Inclusion in the Museum: A Toolkit Prototype for People with Autism Spectrum Disorder. Thesis. University of Oregon, Arts and Administration Program. Retrieved May 16, 2020 from <https://scholarsbank.uoregon.edu/xmlui/handle/1794/2577>
- [6] Taylor Kelsey Kulik and Tina Sue Fletcher. 2016. Considering the Museum Experience of Children with Autism. *Curator Mus. J.* 59, 1 (2016), 27–38. DOI:<https://doi.org/10.1111/cura.12143>
- [7] Lesley A. Langa, Pino Monaco, Mega Subramaniam, Paul T. Jaeger, Katie Shanahan, and Beth Ziebarth. 2013. Improving the Museum Experiences of Children with Autism Spectrum Disorders and Their Families: An Exploratory Examination of Their Motivations and Needs and Using Web-based Resources to Meet Them. *Curator Mus. J.* 56, 3 (2013), 323–335. DOI:<https://doi.org/10.1111/cura.12031>
- [8] Christine Rhodes. 2014. Do Social Stories help to decrease disruptive behaviour in children with autistic spectrum disorders? A review of the published literature. *J. Intellect. Disabil.* 18, 1 (March 2014), 35–50. DOI:<https://doi.org/10.1177/1744629514521066>
- [9] Sam Theriault and Beth Redmond Jones. 2018. Constructing Knowledge Together: Collaborating with and Understanding Young Adults with Autism. *J. Mus. Educ.* 43, 4 (October 2018), 365–374. DOI:<https://doi.org/10.1080/10598650.2018.1525657>
- [10] Institute of Museum and Library Services. Retrieved June 30, 2020 from <https://www.imls.gov/>
- [11] Expanding Your Market: Maintaining Accessibility in Museums. Retrieved June 30, 2020 from https://www.ada.gov/business/museum_access.htm
- [12] How Museums Are Becoming More Sensory-Friendly For Those With Autism. *Smithsonian Magazine*. Retrieved May 18, 2020 from <https://www.smithsonianmag.com/innovation/how-museums-are-becoming-more-sensory-friendly-for-those-with-autism-180967740/>
- [13] Sensory Resources Guide For Museums. Retrieved July 2, 2020 from https://wp.nyu.edu/sensory_resources_guide_for_museums/
- [14] How to Meet WCAG (Quickref Reference). Retrieved June 23, 2020 from <https://www.w3.org/WAI/WCAG21/quickref/>
- [15] The 7 Principles | Centre for Excellence in Universal Design. Retrieved June 30, 2020 from <http://universaldesign.ie/What-is-Universal-Design/The-7-Principles/>