

Interactive Displays, Eureka Stockade.

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A young boy with dark hair, wearing a dark blue polo shirt, is leaning over a large, multi-panel interactive digital display. He is using his hands to interact with the screen, which shows a historical map or architectural drawing. The display is composed of several panels, some of which show text in Cyrillic script. The background shows other museum exhibits, including a large handprint graphic and a display with the number '30'.

NEURODIVERSITY AND PLACEMAKING IN EXHIBITION DESIGN

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Fig. 1.

Art Gallery,
Nottingham Castle, UK.

PLACEMAKING, INCLUSIVITY, AND ASD

As modern temples to the contemplation of the place of art and culture in society, museums claim to have something for everyone (**fig. 1**). But, in reality, contemporary exhibition design is for a small percentage of the neurotypical population. Many visitors, especially the 10 to 15 percent of the global population who are neurodiverse, find contemporary exhibitions discomfiting – from how subjects and themes are displayed, to the lack of inclusive design in environments.¹ To ensure the exhibition-development process results in an experience that is safe, comfortable, and relevant for a neurodiverse audience, specific placemaking considerations need to be deliberately incorporated.

With the growing understanding of mental health and the need for resources to support neurodiversity challenges, museums have a unique opportunity to create emotional safe spaces that promote self-recognition and self-regulation. By building on the principles of placemaking, which aims to transform public spaces to promote individual emotional health and well-being, museums can play a crucial role in supporting the mental health of their communities. To achieve visitor-centered design and create

emotional safe spaces for individuals with Autism Spectrum Disorder (ASD), museums must consider sensory-processing mindfulness, clear wayfinding, and strategic regulation spaces as part of their placemaking strategies. These placemaking considerations can enhance the museum experience for individuals with ASD, promoting engagement and learning while reducing stress and discomfort.

A 2020 study commissioned by the American Alliance of Museums (AAM) closely examined the current landscape of inclusivity initiatives within cultural institutions. The research also surveyed the attitudes of museum visitors and the general public toward these efforts.² AAM responded to the need for enhanced diversity, equity, accessibility, and inclusion (DEAI) in museums by developing resourceful strategies and primers for professionals in the field. However, these initiatives, while gradually receiving more acknowledgment in the museum industry, still largely overlook a key segment of society – the neurodiverse population, which is conspicuously absent from AAM's primers.

Among the neurodiverse population, a particular group which requires specific attention is those diagnosed with ASD. Our focus on this group is motivated by multiple



factors: the unique needs arising from the ASD condition, the increasing prevalence of ASD diagnoses in the population, and the potential benefits that museum visits can bring to individuals with ASD. ASD, a neurodevelopmental disorder, often presents co-occurring diagnoses such as ADHD, dyspraxia, dyslexia, dyscalculia, dysgraphia, and Tourette's syndrome. This population demonstrates a broad spectrum of intellectual and social abilities, hence the term "spectrum disabilities" is used to describe the diagnosis.³ Before designing exhibitions that can effectively cater to this group, it is crucial for professionals to understand the characteristics and symptoms of ASD. This understanding will inform more inclusive and responsive design strategies.⁴

When designing exhibitions or experiences, there are physiological considerations for individuals with ASD, such as sensory sensitivities to lighting, audio, and crowded or confusing environments.⁵ Destigmatizing the need for regulation spaces and time

away from increased stimuli should be a key goal for designers, as the same considerations affect other members of the population, like those with post-traumatic stress disorder (PTSD).⁶ These sensitivities discourage not only neurodiverse and other sensory-averse individuals from visiting museums but also their families due to their desire to avoid the resulting physiological discomfort and social behaviors that may arise from overstimulation. Recent studies have shown that 44 to 52 percent of individuals with ASD have learning difficulties, and understanding the information presented in museums is an additional challenge once they have adapted to their environment.⁷ In order to best serve individuals with ASD and their families and caregivers, museums need to devote resources to making all aspects of a museum visit sensory friendly. In what follows, we will assess strategies and best practices for museum placemaking to show the progress that has been made and to suggest pathways for increased inclusivity for the neurodiverse population.

EARLY EFFORTS

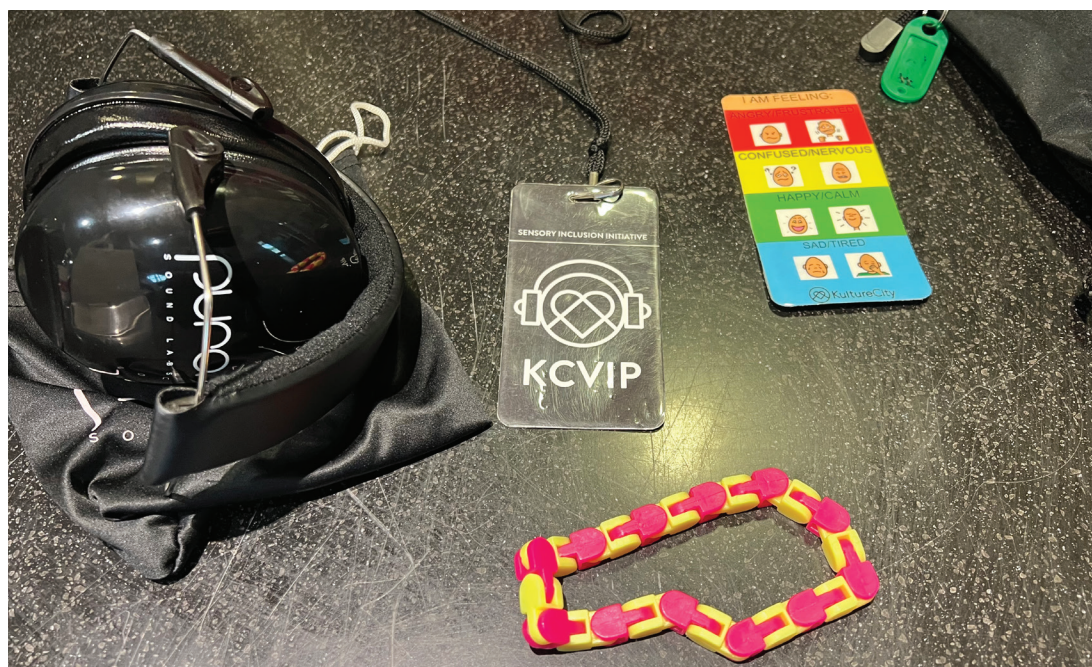
Early efforts to support individuals with ASD focused on children, with children's museums being studied as ideal informal-learning environments for those under 10 years of age. These museums offer an open setting for children to interact with one another and with a wide variety of learning materials and subjects, which supports hands-on, open-ended, and sensory-rich activities and learning – all of which are relevant to placemaking ([intro image](#)).⁸ Despite the potential benefits, sensory processing disorder (SPD) considerations such as large crowds, unfamiliar lights, sounds, and smells, along with untrained staff, may prevent children with ASD from visiting such museums.⁹ As awareness of the needs of this population grew in the early 2000s,

institutions began developing strategies to improve the museum experience, including offering special hours, sensory kits, accessibility events, and staff disability awareness training ([fig. 2](#)).¹⁰

Thanks to popular culture, ASD is more visible now than ever. However, iconic representations dating back to the 1988 film *Rain Man* have contributed to a biased and stereotyped association of autism with white males who are socially awkward or inept but demonstrate genius-level abilities. This continued focus limits the understanding of the broad range of experiences that an ASD diagnosis can entail for individuals of all ages, genders, and ethnicities. While narrowly framed and pigeonholing, such portrayals have increased awareness of the prevalence of neurodiversity in the adult population,

Fig. 2.

Sensory Inclusive Bag contents: noise-cancelling headphones, KultureCity VIP tag, fidget toy, and verbal cue card.



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though programming for ASD remains primarily focused on children, whereas most adult programs are for those with dementia.¹¹

REGULATION SPACES AND MINDFULNESS

While a general awareness of placemaking and sensory-processing considerations supports a holistic view of inclusive exhibition design, the inclusion of specifically designated regulation spaces requires considerations of the specific space in question to host visitors with SPD. Incorporating these dedicated quiet spaces or sensory rooms into museum design is an essential placemaking consideration as the areas provide an environment of calm and quiet, reducing unnecessary visual or auditory distractions and creating a more inviting learning environment. Such areas are valuable not only for reducing anxiety in children with ASD and their caregivers but also for adults who have sensory issues (including PTSD) but do not self-identify as being on the spectrum.¹² Research has shown that the improvement of general psychopathology and other mental-health psychosocial functioning improvements resulted from modulation of neurochemical interactions, improved brain function, and enhanced neural plasticity.¹³ One way in which regulation spaces support mental health for those with ASD is by providing a designated areas to self-regulate emotions and behaviors through activities such as stimming. These rooms integrate many forms of regulation assistance, including items that provide compression or weight, dog therapy, rocking chairs, seat swings, zero-gravity chairs, anti-fatigue floor mats, and hammocks fastened to the ceiling for vestibular sensory seekers. Other items such as electric heating pads or cooling pads can also be included.¹⁴

These integrated spaces allow visitors to engage with exhibitions and programming at their own pace, and reduce stress and discomfort, enhancing the museum experience for all involved, and have even led to the establishment of sensory-sensitive programs to cater to those with SPD.

Regulation spaces have also been shown to have a significant impact on the reduction of stigma around trauma. By their very existence, they normalize occurrences of overstimulation, which can lead to an increase in resiliency when supported in a healthy manner.¹⁵ Examples of regulation spaces in museums include the Smithsonian’s “take-a-break” spaces, the Brooklyn Children’s Museum’s Sensory Room, the Dallas Museum of Art’s Pop-Up Art Spot, and the National Gallery of Singapore’s Calm Room, which is a prime example of a regulation space that caters to the needs of individuals with sensory-processing issues. The Calm Room includes a weighted blanket, plushies, two private seating pods with chairs in gray or cream with adjustable arm heights, modular seats that can be rearranged in a common area, plants, a looping soundtrack of calming music, adjustable lighting and volume, and an induction loop sensor that sends vibrations to hearing aids.¹⁶

The importance of mindfulness and self-care in ASD populations is increasingly being recognized by museums. Breathing exercises and slow-looking exercises have become popular practices to support self-care in museum settings. For instance, the Calm Room provides breathing exercise instructions on its walls and offers mindful art moments workshops, which use visual-thinking strategies to create a reflective relationship with the art, and mindfulness exercises to

bring greater awareness and presence to the body. Similarly, the Museum of Modern Art offers slow-looking sessions that create moments of pause to reflect on internal feelings and thoughts, creating a flow state of mindfulness, a form of meditation.¹⁷ Finally, the North Carolina Museum of Art provides self-guided audio tours for visitors, including sensory thought prompts to help visitors ground themselves in mindfulness.¹⁸ As research continues to demonstrate that observing artworks can activate the same part of the brain as meditative practices, more museums have begun to integrate this knowledge into their programming. By promoting mindfulness and self-care in their programming, museums can support individuals with ASD in improving their mental health, physical proprioception, and overall well-being.

WAYFINDING TOOLS AND EMPATHETIC DESIGN

In supporting visitors with ASD, self-care and mindfulness exercises are commonly used alongside the creation and dissemination of wayfinding tools prior to visiting. Visual stories or sensory maps, which refer to the overarching “descriptions of a particular situation, event or activity, which include specific information about what to expect in that situation and why,” are effective tools in placemaking design.¹⁹ These wayfinding tools enable individuals to preemptively seek comprehensive pre-planning aids to reduce anxiety by removing the unknowns of a new place, which benefits not only the individual but also reduces stress for the entire visiting group. For example, sensory maps, such as the Metropolitan Museum of Art’s Sensory Friendly Map, may be downloaded onto devices or printed prior to a visit (fig. 3).

These maps highlight possible crowded areas and/or identify more congested times, galleries which are particularly bright or dim, or instances where there is a dramatic shift in lighting. Additionally, short videos showing the space or a visual story that illustrates important information such as the location of stairs, lifts, bathrooms, parking, and exits are also valuable tools. The use of such resources is supported by studies that have found that 95 percent of respondents sought disabled access information prior to visiting a venue for the first time, with 85 percent of this research done through the venue’s website.²⁰ By being conscious of this demand and providing detailed information, museums can provide valuable peace of mind for those affected and increase the likelihood of successful visits for both individuals and their families.

Once visitors are onsite, their focus shifts toward engaging with the exhibits themselves. In this phase, exhibition designers should seek guidance from industry experts to develop principles of “empathetic design” that can enhance the visitor experience within the physical space of the museum.

Four key principles can guide exhibition designers in their quest for empathetic design:

1. *Empower visitors by offering them a sense of control over their museum experience.* Allowing visitors to choose their own path, interact with exhibits at their own pace, and providing opportunities for personalization fosters a deeper connection and a more meaningful experience.
2. *Prioritize intuitive interactions to ensure that exhibits and interactive elements are easy to understand and navigate.*

Spaces that tend to be crowded

1st floor



Fig. 3. Spaces that tend to be crowded, 1st floor. Sensory Friendly Map of The Metropolitan Museum of Art for Visitors on the Autism Spectrum, 2015.

Clear instructions, user-friendly interfaces, and intuitive gestures can enhance accessibility for visitors, regardless of their level of familiarity with technology.

3. *Address points of visitor agitation by providing visibility and support.* Clear signage, guidance on where to find assistance, and readily available support staff can alleviate stress and anxiety, ensuring a more positive experience for all visitors.
4. *Adopt a holistic philosophy in organizing exhibitions to help create a cohesive and immersive museum experience.* Exhibits should be thoughtfully connected and integrated, forming a narrative or thematic journey that engages and captivates visitors.

While these principles may have originated with digital design, their application to the physical environment is equally important, if not more so, in creating a truly inclusive and engaging museum experience.²¹

By embracing these principles, exhibition designers can create inclusive, intuitive, and enjoyable spaces that cater to the diverse needs and expectations of museum visitors. When applied to creating a more accessible exhibition experience for those with ASD, a number of these principles can be applied. For instance, while color contrast is a fundamental principle of design, high contrast can lead to cognitive fatigue, particularly for individuals with an oversensitive visual cortex, visual-perceptual disorder, and learners with dyslexia-related difficulties, such as Irlen Syndrome. To mitigate these stressors, be mindful of sharp contrast between wall color and text panels.

When considering virtual application adoption, providing the option to switch the visual appearance of the interface to a specific hue and saturation from a wide selection of colors ensures that everyone's needs are met, which can help improve information retention and reduce anxiety-related fatigue.²²

Given that wall text is the predominant method used to convey information about an exhibit, typeface and font size are important design considerations. When it comes to font selection, a legible sans-serif humanist typeface is recommended. While serif fonts tend to evoke emotions of authority, higher learning, and maturity, sans-serif fonts do not harbor a defined emotional response but are generally more legible and readable than their more ornate counterparts.²³ Humanist typefaces tend to be more open and to have unique character widths, which make them more legible at varying sizes and provides accurate letter recognition at speed. Selecting a font with unique shapes for each character can help learners with executive functioning issues who may struggle with flipped letters and learners with dyslexia, who experience reading difficulties such as the river effect and swirl effect, where words become combined and distorted due to alignment issues and overcrowding.²⁴

To create a welcoming environment for visitors with ASD, museums should aim to create exhibitions that are easy to navigate and incorporate minimally invasive interactive experiences. Providing clear directions with visual cues such as arrows or stop-and-go signs can help visitors easily navigate through exhibitions. Lighting should be placed directly on items and changes in intensity should be minimized to avoid overwhelming visitors. Proper

ventilation to minimize smells and the use of calming music at an appropriate volume are also important considerations for ASD inclusivity.²⁵ To accommodate visitors who may have difficulty concentrating for long periods of time, it is helpful to limit the use of verbose, indirect, or academic language, and to minimize extended written blocks. Finally, offering fidget and sensory toys can also help neurodiverse individuals stay grounded and focused during their visit, but it is important for visitors to be informed about their availability and for staff to be trained on their importance.²⁶

IMPLEMENTING INCLUSIVE PLACEMAKING

Understanding the unique needs of visitors with ASD in the context of exhibition design requires a consideration of the visitor's journey from the initial planning stages to the culmination of their museum experience.

Our visitor's journey starts at home, as they explore the museum's website. Here, they are provided with pre-visit tools such as sensory maps and informative guides, enabling them to prepare for and anticipate the various sensory experiences they may encounter.

Upon arrival at the museum, their visit is facilitated by well-designed wayfinding tools, including clear signage and tactile maps. These features aid them in navigating the potentially overwhelming space of the museum and offer them a sense of confidence and control.

During their visit, additional tools are at their disposal to enhance their engagement with and enjoyment of the exhibits. Sensory kits, fidget spinners, and other tactile tools

offer moments of calm and focus amidst the sensory stimulation of a museum visit. The staff they encounter are knowledgeable and trained to assist them.

It is only by considering the visitor's journey in this holistic way that museums can create a more inclusive and engaging experience, not only for individuals with ASD but for all visitors.

Our visitor is also able to access a designated regulation space, which offers a calm and quiet environment amidst the sensory stimulation of the museum. This space reduces unnecessary visual or auditory distractions and invites our visitor to engage with the exhibits at their own pace. In addition, they see that mindfulness exercises and self-care spaces in these areas promote mental health and well-being.

It is only by considering the visitor's journey in this holistic way that museums can create a more inclusive and engaging experience, not only for individuals with ASD but for all visitors. The integration of these various elements, from pre-visit planning to exhibition design, serves to create a more welcoming and engaging museum environment, where all visitors can explore, learn, and enjoy.

To promote inclusivity, museums must actively engage as cultural hubs and community builders, becoming active participants in conversations about the potential inherent in human difference.

This article is a call to action for exhibition designers and museum professionals to prioritize the needs of ASD audiences and their caregivers by incorporating these key tools and features into their designs, programs, and institutions:

1. Heightened awareness of sensory needs
2. Emphasis on breathing practices and regulation areas
3. Opportunities for health-awareness exhibits
4. Destigmatization of the need for regulation
5. Integration of art therapy practices and PTSD programs
6. Engagement with local community groups
7. Creation of safe centers of belonging and healing

The positive impacts of alterations made for one community often extend beyond their intended scope and benefit a wider range of people than originally envisioned. As museums strive for inclusivity and diversity, they are transforming the perception of disability from something to be fixed to a unique perspective to be shared. By creating exhibition spaces that encourage visitors to slow down, pause, and reflect, museums can foster inclusive and enriching experiences that celebrate human diversity and create a sense of belonging for all. ■

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