

SENSORIAL INCLUSIVITY

CREATING A MORE SENSORY POSITIVE AND INCLUSIVE USER EXPERIENCE

Author: Emily Rose Fradette

Thesis Studio Advisor: Wladek Fuchs; **Thesis External Advisor:** Frederick Williams, PhD; **Thesis Director:** Claudia Bernasconi

ARCH 5100-5110-5200-5210 Thesis Studio and Thesis Research Methods Fall 2023-Winter 2024

School of Architecture and Community Development, University of Detroit Mercy

ACKNOWLEDGEMENTS

I would like to take this moment to acknowledge all the people that have helped in advising me through this thesis. My studio advisor Wladek Fuchs, who has guided me into intentional research and worldly thinking. My external advisor Frederick Williams PhD, who brought new knowledge and understanding to the autistic experience. The director of Master of Architecture, Claudia Bernasconi, without whom I would not know how to comprise, follow through with, and be intentional with the many details and research within this thesis. I would also like to acknowledge everyone on the faculty for The University of Detroit Mercy, School of Architecture and Community Development. Their knowledge and future driven mentalities have helped me stay on track through this master's program. Lastly, I would like to thank my friends and family for their unwavering support through this last year of work. Many thanks to you all.

ABSTRACT

This thesis delves into the role of the senses not only in the overall human experience but also specifically in the autistic or sensory atypical experience within the built environment. It acknowledges the five main human senses, with particular emphasis on two: hearing and vision. The research investigates sensory experiences through experiments, installations, interviews, precedent studies, and analyses of the built environment. It also examines existing inclusive and universal design approaches for the autistic experience. Additionally, the thesis uncovers insights into the broader autistic spectrum and specifically addresses non-verbal autism. In America, one in 36 people has been diagnosed with autism, with 40% of them diagnosed as nonverbal (Source needed). Non-verbal autism severely affects language comprehension and speech abilities. Furthermore, 70% of nonverbal autistic individuals exhibit sensitivity to sound (Source needed), and 40% have sensitivity to light and visuals (Source needed). The research on autism will be expanded through interviews with guardians and caretakers of non-verbal autistic individuals, various installations and experiments exploring human experience, and studies on autism and sensory design. The thesis aims to examine the current design standards available for major disabilities in America and highlight the lack of standards and limitations for individuals on the autistic spectrum or with sensory atypicality. It will investigate the sensory triggers of non-verbal autism and sensory atypical individuals, as well as identify factors contributing to overstimulation in unfamiliar spaces. Following this comprehensive research, the hospitality design sector, specifically restaurants, will be selected to test the findings, resulting in the development of new sensorial design standards.

THESIS STATEMENT

This thesis aims to investigate various aspects related to sensory perception and its impact on the human experience, particularly within the context of autism spectrum disorder (ASD) and sensory atypicality in built environments. It explores concepts such as balance, harmony, and inclusivity in sensory levels to create a pleasant perception of the built environment, while also delving into the conscious experience of interactions, perceptions, thoughts, and emotions throughout an individual's life cycle. Through a comprehensive examination of research on the quality of sensory experiences, the behavioral and sensorial experiences of non-verbal autism, and the spatial design and performance of hospitality settings, this study seeks to contribute to the development of inclusive and universally designed spaces.

Additionally, it compares and analyzes various scholarly sources, including works by Lucien Febvre, Juhani Pallasmaa, Roslinda Ghazali, and Tola Giulia, to glean insights into sensory design and its effects on individuals with autism spectrum disorder. The thesis also incorporates practical elements such as acoustic ornamentation and classroom acoustics, aiming to understand the correlation between sensory environments and academic performance.

Methodologically, the research utilizes interviews, installations, experiments, existing floor plan analysis, photo diaries, visual ethnography, and precedent studies to gather data and insights. By focusing on perceptual rather than strictly quantitative approaches, the study aims to provide valuable insights for inclusive and universal design practices. It addresses critical questions about minimizing overstimulation, identifying sensorial triggers, and utilizing sensory elements to create more inclusive environments for individuals with non-verbal autism.

Ultimately, this thesis advocates for heightened attention to the user experience within design processes and calls for the implementation of new design standards to accommodate the sensory needs of individuals with autism spectrum disorder, particularly those who are non-verbal. Through this research, architects and designers are encouraged to consider the diverse sensory experiences of all users, promoting inclusivity, and enhancing the overall quality of built environments.

RESEARCH QUESTIONS

To comprehend the interconnectedness of the senses, sensory perception, the experience of non-verbal autism, the comparison to those not on the autistic spectrum, and inclusive/universal design, a series of research questions has been formulated.

What new design standards can be implemented to minimize overstimulation of non-verbal autistic people within an interior environment?

What are the main sensorial triggers within the built environment that lead a non-verbal autistic person to overstimulation?

What kind of sensory elements can negatively and positively affect a non-verbal autistic person experiencing the built environment?

How can architects and designers use sensory elements when designing to be more inclusive to non-verbal autism?

ASSUMPTIONS

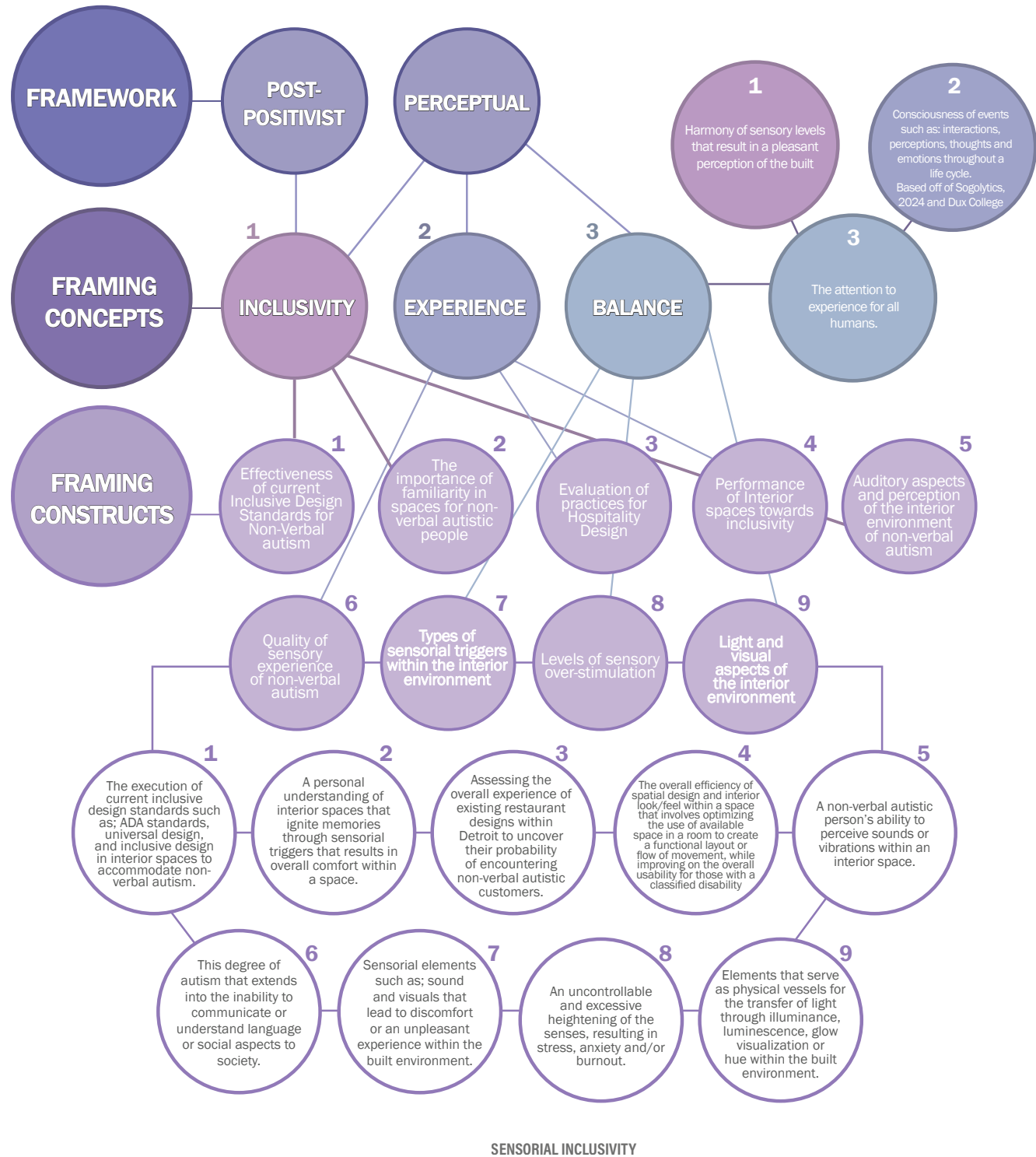
Non-Verbal Autistic people develop a higher sensitivity to the built environment than a non-autistic person.

Sound and light are two primary triggers for someone with Non-Verbal Autism when experiencing the built environment.

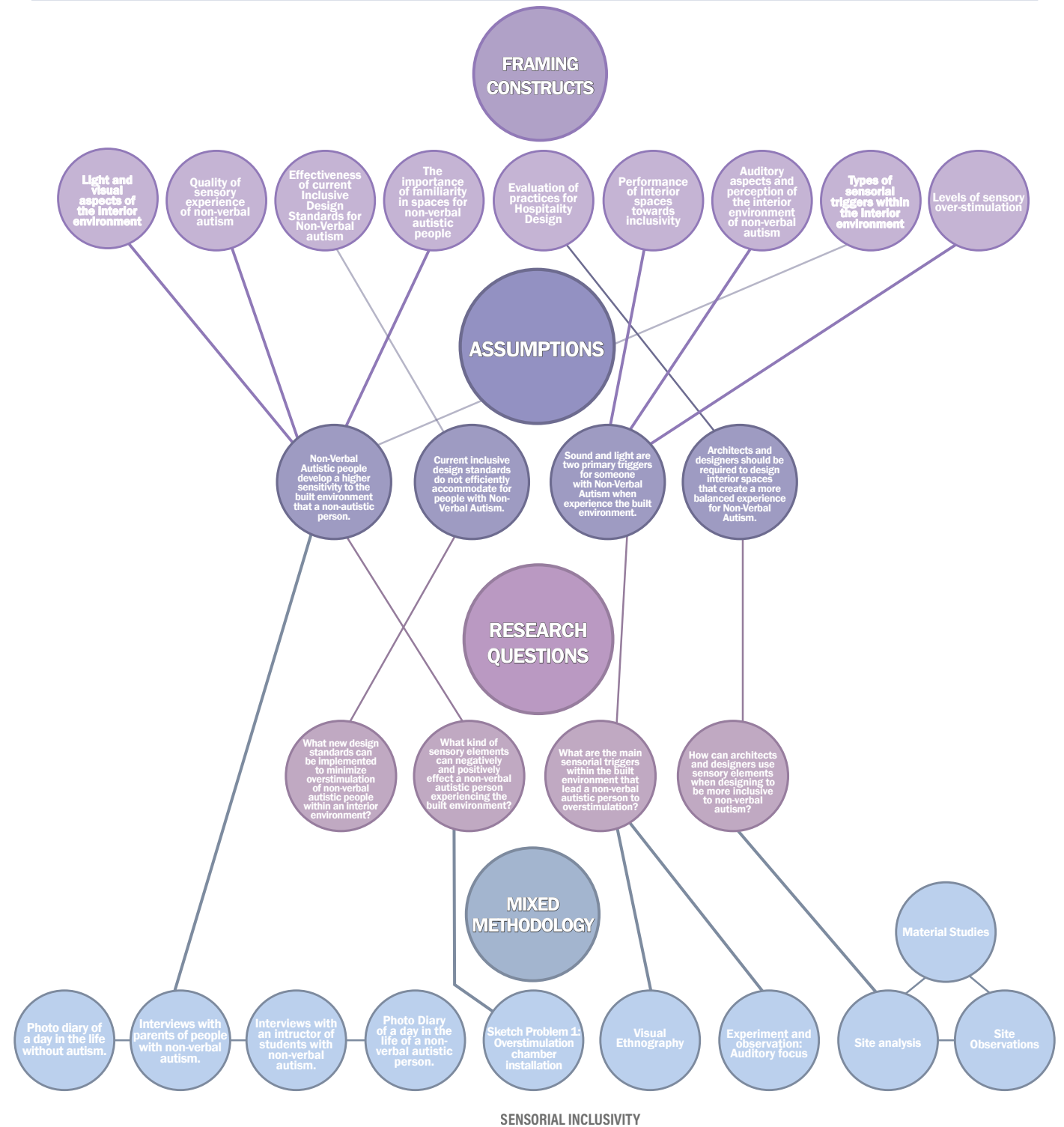
Current inclusive design standards do not efficiently accommodate for people with Non-Verbal Autism.

Architects and designers should be required to design interior spaces that create a more balanced experience for Non-Verbal Autism.

THESIS CONCEPTS



THESIS METHODOLOGY



THESIS FOUNDATION

CHAPTER I: THE SENSES & THEIR HIERACHY

CHAPTER II: THE LEVELS OF AUTISM

CHAPTER III: WHY IS THIS RELEVANT?

CHAPTER IV: MARKET SECTOR RESEARCH & ANALYSIS

CHAPTER V: A MORE INCLUSIVE DESIGN APPROACH

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BOOK CONTENTS

**This book is dedicated to my cousins,
Nicki and Alex.
I love you more than words can convey.**

CHAPTER I: THE SENSES AND THEIR HIERARCHY

This chapter covers the hierarchy of senses as well as the role they play in the human experience in relation to the built environment. Through research and experimentation it is known that the hierarchy of these senses are unique to each individual human experience. Knowing this fact, there has still been a hierarchy of the senses determined Pallasama's book, "Eyes of the Skin". After immense research into the human senses he understands the hierarchy of the senses in the order of sight, hearing, smell, taste, and touch. Understanding that there are 7 total senses a human can perceive, this thesis only researched the five major senses for the human experience. Primarily focusing on what was discovered as the two main senses that contribute to the overstimulation of non-verbal autism. Hearing and Sight and how the senses contribute to overstimulation. How can the over heightening of the senses be limited?

Webster dictionary defines senses as "the faculty of perceiving by means of sense organs or a specialized function or mechanism such as sight hearing smell taste or touch by which an animal or human receives a and response to external and internal stimuli." (Meriam Webster) Although there are five well known human senses there are additional human senses or sense systems that humans experience. Thermoception is the sense of heat which uses the skin including internal skin passages noiception which is the sense of pain. one other important sense or sense system to note that relates more importantly to architecture is equilibrioception which is a vestibular sense that senses the balance of the body over liquid in the inner ear and proprioception is a kinesthetic sense that gives a person awareness of their body and where their body parts are located. (Senses in Arch) Reference *Figure 1 and 2* for a breakdown of these sensory systems.

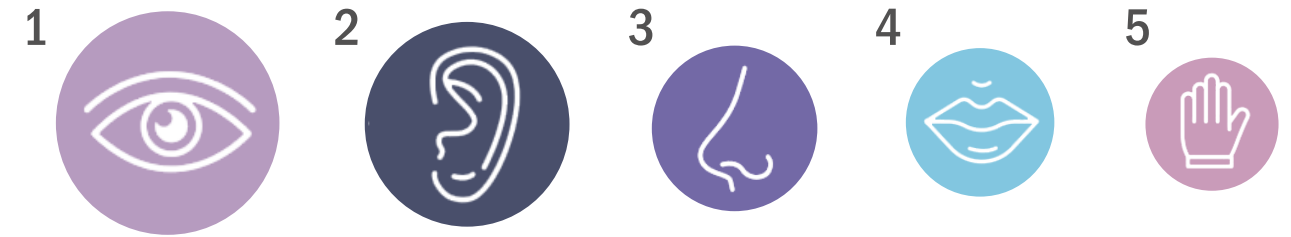


FIGURE: PALLASAMA'S HIERARCHY OF THE SENSES
SOURCE: EYES OF THE SKIN, GRAPHIC DONE BY AUTHOR

SENSE HIERARCHY

The hierarchy of sensory processing is a fundamental aspect of human perception, significantly influencing how individuals engage with their environment. In neurotypical populations, the conventional hierarchy often prioritizes visual and auditory stimuli. Vision allows for the discrimination of shapes, colors, and movements, while audition facilitates language comprehension and sound localization. These sensory modalities synergize to construct a comprehensive representation of the external world, relegating olfaction, gustation, and somatosensorial to subsidiary roles in cognitive processing and environmental interaction. Conversely, individuals diagnosed with Autism Spectrum Disorder (ASD) frequently manifest atypical sensory processing patterns, thereby exhibiting a distinct sensory hierarchy. A significant proportion of individuals with ASD exhibit sensory sensitivities or sensory seeking behaviors, indicative of aberrant processing of sensory information. Certain stimuli, such as intense lights, loud noises, or specific tactile textures, may evoke heightened aversion or discomfort, precipitating maladaptive responses. Conversely, some individuals with ASD engage in sensory seeking behaviors, manifesting repetitive actions like rocking, spinning, or hand-flapping to modulate their sensory experiences. In this alternative sensory hierarchy, senses such as tactile perception, proprioception, or vestibular sensation may assume heightened significance compared to conventional auditory or visual modalities.

Acknowledging and accommodating the idiosyncrasies of sensory processing in ASD individuals are paramount for effective intervention and support strategies. The creation of sensory-friendly environments, characterized by reduced sensory stimuli and provision of sensory tools and techniques, represents a cornerstone in enhancing their well-being and participatory capacity. Therapeutic modalities such as sensory integration therapy, grounded in occupational therapy principles, aim to ameliorate sensory dysregulation and enhance adaptive coping mechanisms. Moreover, fostering societal acceptance and understanding of diverse sensory experiences fosters a culture of inclusivity, wherein individuals with ASD are recognized for their unique sensory profiles and afforded equitable opportunities for social participation and integration. Comprehending the intricacies of sensory processing in ASD individuals not only informs clinical practice but also underscores the imperative for societal accommodation and acceptance. Empirical investigations elucidating the neural underpinnings of sensory processing aberrations in ASD further enrich our understanding, facilitating the development of targeted interventions and support frameworks. By fostering a scholarly discourse on sensory diversity and its implications for neurodevelopmental disorders, researchers, clinicians, and stakeholders collectively contribute to the cultivation of a more equitable and inclusive society, wherein the unique sensory experiences of individuals with ASD are valued and respected.

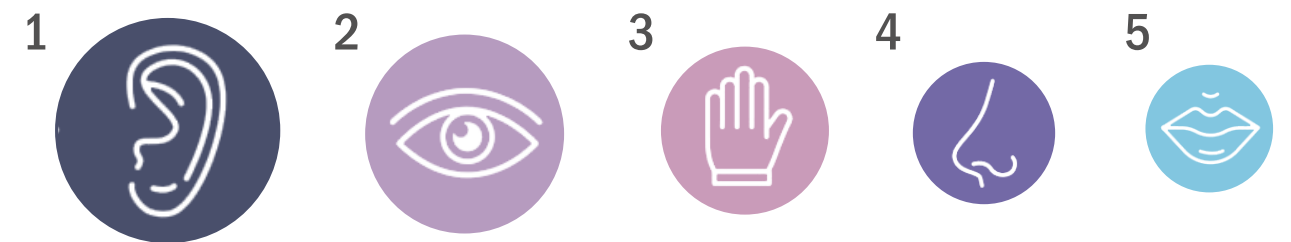


FIGURE: SENSORY ATYPICAL PERSON'S HIERARCHY OF THE SENSES
SOURCE: DETERMINATION MADE BY AUTHOR BASED OFF EXPERIMENTS, INTERVIEWS, OBSERVATIONS AND NUMEROUS SOURCES.
GRAPHICS DONE BY AUTHOR

HEARING/SOUND

When thinking of perception of space, the first sense that comes to mind is hearing. For the autistic experience, sound can be a trigger that creates overstimulation. 70% of people with ASD have a heightened sensitivity to sound, creating a unique human experience to sound and space. (Center for Disease Control) The way the spaces move through the body molds the way we experience a space. Sound is the ability to perceive sound. Sound is streamlined through the human ear. It then flows through the external auditory canal which leads to sound waves reaching tiny bones within the eardrum resulting in sound vibrations to be recognized by a living beings' nervous system. As Louis I. Kahn says, "To hear a sound is to see a space." This quote only intensifies the importance for the sense of hearing and how it gracefully translates into sound when within a space. An efficient architectural precedent that illuminates the sense of hearing with respect to nature sounds is Frank Lloyd Wright's , Falling Water. In Mill Run, Pennsylvania this structure creates a balance of sound, material, natural elements, and overall sensory design. Focusing on sound particularly, the waterfall placed under the main house creates a vibrant acoustic range from every angle of viewing the house. This creates an opportunity for a pleasant user experience with this specific detail to the sense of hearing and how natural sounds can be translated seamlessly.

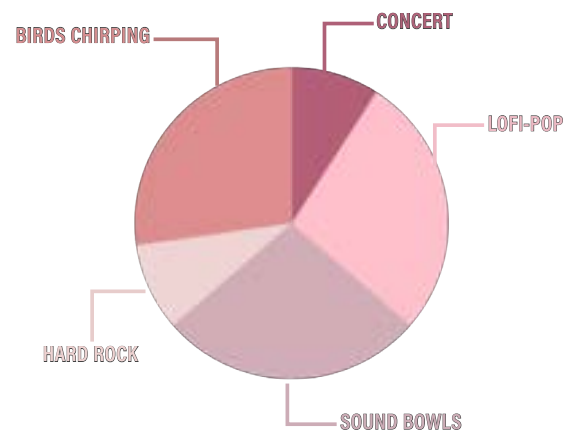
After this research into this specific sense of hearing, it is essential to test this new knowledge on a real scale. Figure 3 displays an experiment titled The Senses Part: One. This experiment is done on a non-specific range of participants, within a university environment, that agreed to submerge themselves into a unique experience catered to sound and space. The purpose is to observe the perception of space with priority to sound with absence of vision (this description will be addressed in the next section). It consists of ten sounds each with a different tone, feel, and vibration. These sounds are as follows: traffic, whale sounds, sound bath, Metallica, nails on a chalkboard, bird sounds, heavy breathing, large crowd, lo-fi music, and an airhorn.

There is a total of 13 participants and the results of this study conclude that sounds with a high frequency tend to create more discomfort than those with lower frequency. It also brings up the importance of familiarity. 9 of the 13 participants stated that a sound did not cause discomfort or overstimulation due to it sounding familiar to them. More concrete and in-depth result/ findings can be found in *Figure 3*.

Lucien Febvre states that "the 16th century did not see first: it heard and smelled it sniffed the air and caught sounds. It was only later that it seriously and actively became engaged in geometry, focusing attention on the world of forms with Kepler and Desargues of Lyon." (Eyes of the Skin)

	PRESENT	CALM	TENSE	OVER-STIMULATED
#1	✓	x	x	x
#2	x	✓	x	x
#3	x	x	✓	x
#4	x	x	✓	x
#5	✓	x	x	x
#6	✓	x	x	x
#7	✓	x	x	x
#8	x	x	x	✓
#9	x	x	x	✓
#10	x	✓	x	x
#11	x	x	x	✓

THE SENSES: PART I, SOUND AND SPACE EXPERIMENT RESULTS
CHART 1 BY AUTHOR



THE SENSES: PART I, SOUND AND SPACE EXPERIMENT RESULTS
CHART 2 BY AUTHOR

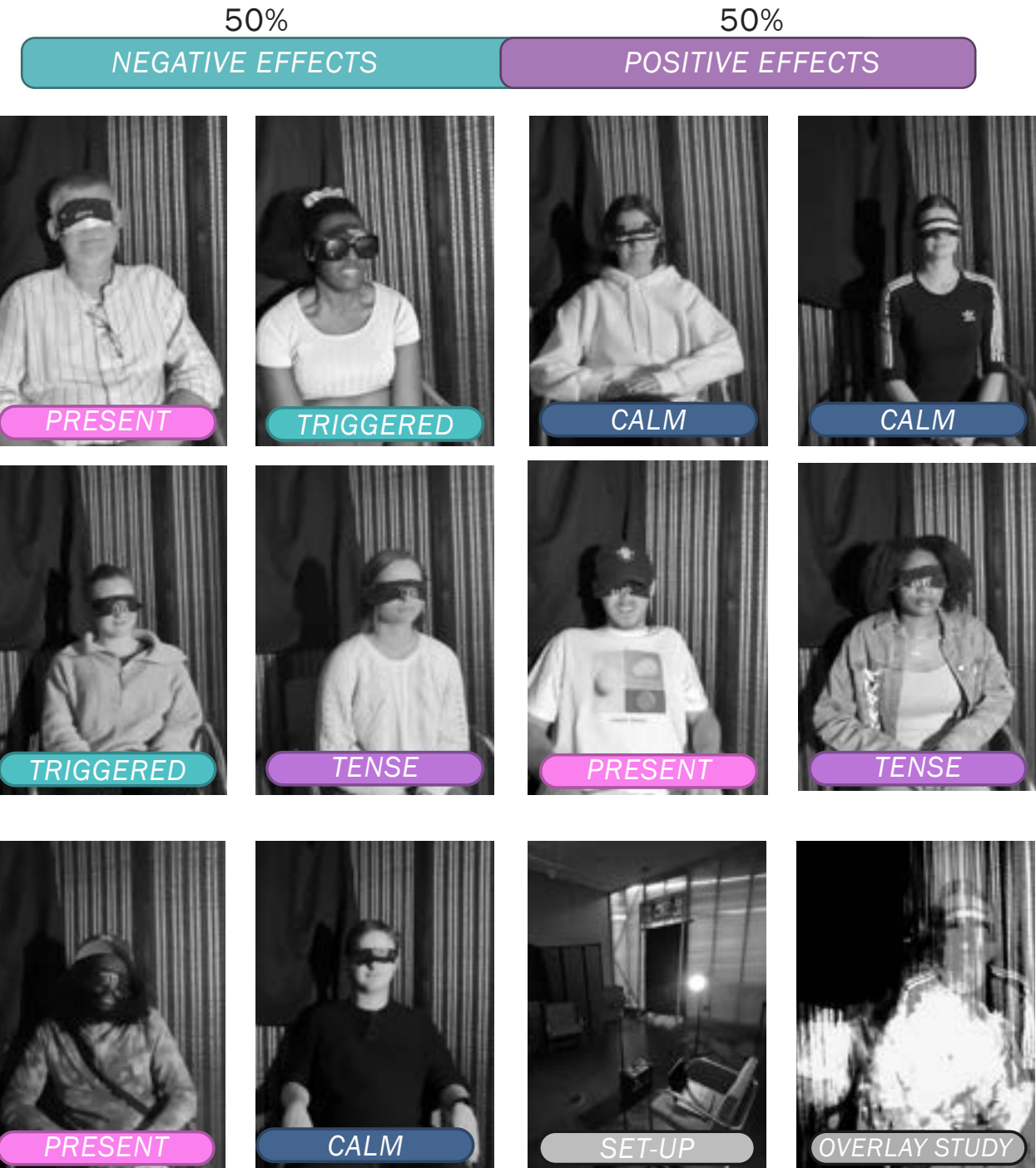


FIGURE 3: THE SENSES: PART I, SOUND AND SPACE EXPERIMENT, PARTICIPANTS AND RESULT PERCENTAGES
PHOTOS AND GRAPHICS BY AUTHOR



***“THIS
SOUND
MAKES ME
FEEL CALM”***

SIGHT/VISUALS

Sight, like hearing, holds profound significance in human perception, particularly within the context of the built environment. For individuals on the autism spectrum, sight is instrumental in shaping their experiences within different spaces. This importance is further accentuated by the fact that a significant percentage of individuals with severe autism also contend with epilepsy, which adds another layer of complexity to their sensory perception of space. This intricate interplay between sight, autism, and epilepsy underscores the multifaceted nature of human sensory experiences, a theme that will be explored more deeply in subsequent chapters.

As elucidated by Ghazali and corroborated by the National Eye Institute (NEI), sight serves as the primary conduit through which humans apprehend the world, processing visual stimuli via the intricate mechanisms of the eye. Light entering the eye is transmuted into electrical signals by photoreceptor cells in the retina, which then traverse through the brain and nervous system, ultimately coalescing into coherent images. However, Robert Mandrou’s challenge to Febvre’s historical hierarchy of the senses suggests a shifting perception of sight’s dominance. While contemporary society elevates vision as paramount, historical contexts unveil fluctuating attitudes towards sensory primacy, with sight sometimes relegated to a lesser position in eras that favored hearing and touch.

Mandrou’s perspective, juxtaposed with historical insights from “The Eyes of the Skin,” prompts reflection on the evolving significance attributed to sight throughout different epochs. Despite its contemporary preeminence, the status of sight as the dominant sense remains subject to historical variability, highlighting the dynamic nature of human sensory perception and the multidimensional relationship between sight, environment, and cognition. Understanding these historical shifts in sensory perception enriches our comprehension of the intricate interplay between human perception and the constructed environment, shedding light on the complex ways in which individuals navigate and interpret the spaces they inhabit.

Moreover, the intersectionality of sensory experiences underscores the need for holistic approaches to design and architecture, especially in accommodating diverse sensory needs. By recognizing the varied ways in which individuals perceive and interact with their surroundings, designers and architects can create more inclusive environments that cater to a spectrum of sensory preferences and sensitivities. This holistic approach not only fosters greater accessibility but also enhances the overall quality of human experiences within built environments, fostering a sense of belonging and empowerment among diverse populations.

In essence, the significance of sight in human perception extends beyond mere visual processing; it permeates every facet of our interaction with the world around us. By delving into the complexities of sensory perception and its historical underpinnings, we gain valuable insights into the intricate dynamics of human cognition and the profound influence of the built environment on our sensory experiences. These insights serve as a foundation for fostering greater inclusivity and empathy in design, ultimately enriching the lives of individuals across the neurodiversity spectrum and enhancing the overall quality of human existence.

Furthermore, the dynamic nature of sensory perception underscores the importance of considering individual differences and preferences in design and planning processes. While sight may reign supreme in certain contexts, it is essential to recognize that individuals vary in their sensory preferences and sensitivities. For some, touch or auditory stimuli may play a more prominent role in shaping their perception of space. By adopting a more nuanced understanding of sensory diversity, designers can create environments that accommodate a broader range of sensory experiences, fostering a sense of inclusion and accessibility for all individuals.

OVERSTIMULATION

Realizing the importance of the senses on the full human experience, the topic of overstimulation or sensory overload must be addressed. The gift of the senses can create both positive and negative sensations with the nervous system. Sensory processing sensitivity (SPS) is a personality trait reflecting inter-individual differences in sensitivity to negative and positive environmental information. (Source 6) Philipp Yorck Herzberg with the Journal of Clinical Medicine conducted a qualitative study on the factors and themes that can lead or contribute to overstimulation and sensory processing overload. The 2020 study consists of included adults aged 25 to 50 years who considered themselves highly sensitive. It had a total of 494 volunteers. These participants formed eight subgroups. The subgroups were created based on three variables: age, sex, and highest level of education. The registration form on the Donders Institute website remained live until data saturation. After this process 26 participants completed interviews. From this questionnaire Herzberg was able to create the levels of sensitivity for each participant. Herzberg based his questions on the following sensory themes, emotional responding; relatedness to others; thinking; overstimulation; perceiving details; and global SPS characteristics." (Source 6) The results of this study conclude that each participant of high sensory sensitivity felt more aware of their triggers and felt positively about the new understanding. The nature of conducting a qualitative study helps to understand the uniqueness of human perception and overall limits to our experience. This study could have been stronger on the qualitative side. Although Herzberg created questions catered to the participants with high sensitivity, the themes and overall factors that contribute to overstimulation were too vague for full answers.

This next section goes into an installation that focuses further on sound and visual triggers that result in overstimulation. These uncomfortable sensations are experienced by non-verbal autistic people at an alarming rate. The lack of control and unfamiliarity with the space that surrounds create a heightening of all senses. This installation focuses on the dramatic audio and visual triggers that people with non-verbal autism experience.

In this installation, the primary sense engaged is hearing, achieved through sound manipulation based on triggers commonly experienced by individuals with non-verbal autism. Research indicates that a significant portion of autistic individuals, ranging from 50% to 70%, exhibit reduced tolerance for certain sounds, leading to distress and difficulties in social engagement. The secondary sense, sight, is also intentionally stimulated, considering that 40% of individuals with moderate to severe autism have epilepsy, often triggered by erratic lighting, which can result in seizures and discomfort. The overarching purpose of this installation is to evoke discomfort, mirroring the sensory experiences of individuals living with non-verbal autism. As depicted in Figure 5, the chamber's structure facilitates user interaction, capturing their responses to the installation. Quotes atop the figure convey the visceral reactions of participants, reflecting feelings of claustrophobia, overstimulation, and even post-traumatic stress disorder (PTSD). While observing live reactions provides valuable data, these written responses offer a poignant insight into the profound impact of sensory environments on individuals' well-being and quality of life.

The installation serves as a poignant reminder of the challenges faced by individuals with non-verbal autism, highlighting the importance of creating inclusive environments that accommodate diverse sensory needs. By eliciting discomfort and eliciting visceral reactions, it prompts reflection on the pervasive nature of sensory experiences and the significance of designing spaces that promote accessibility, empathy, and understanding for all.

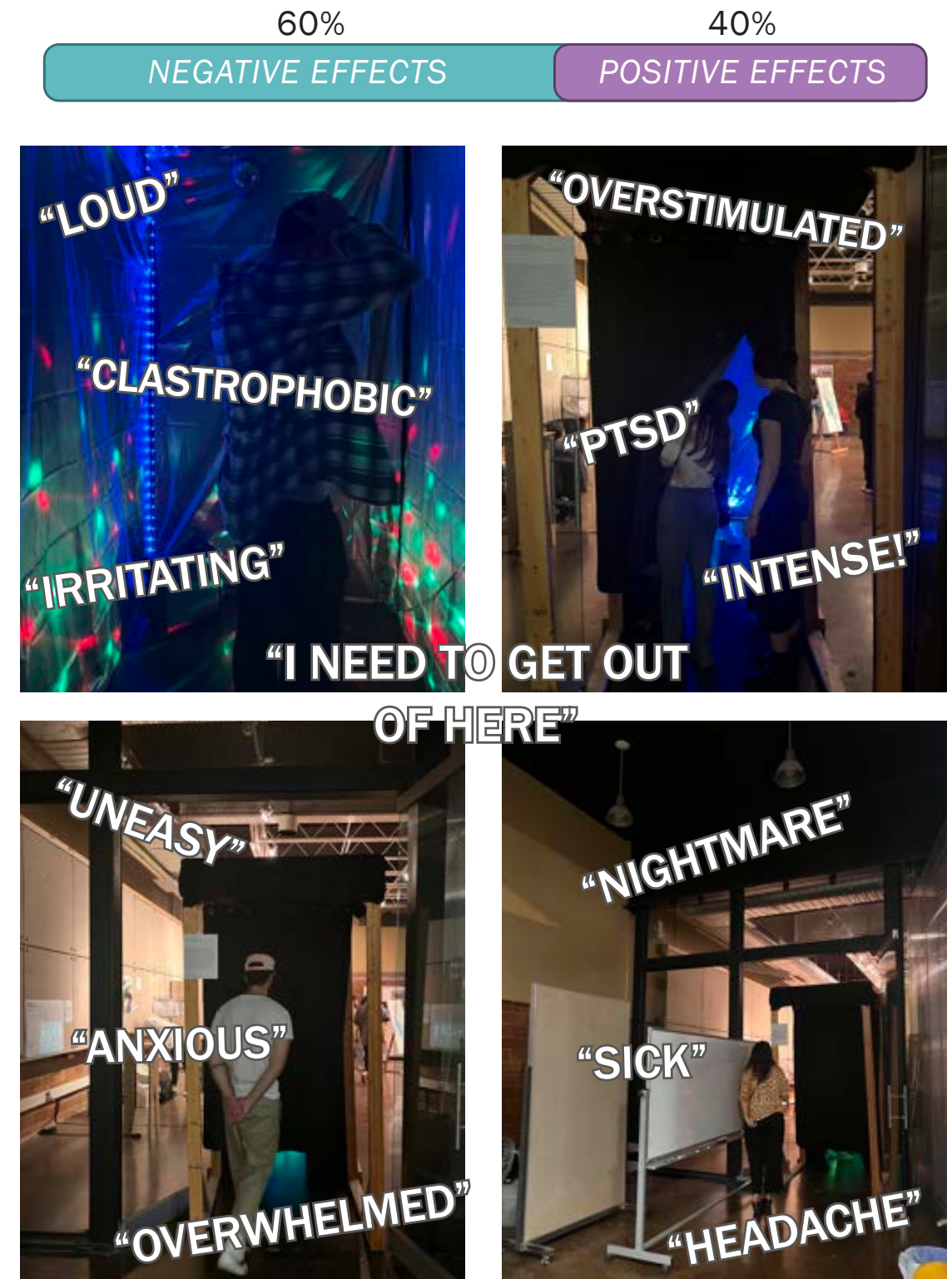


FIGURE: SKETCH PROBLEM 1: OVERSTIMULATION CHAMBER, PARTIAL PARTICIPANTS AND OVERALL RESULT PERCENTAGES
GRAPHICS AND PHOTOS BY AUTHOR

CHAPTER II: THE LEVELS OF AUTISM

Autism spectrum disorder (ASD) refers to a neurodevelopmental disorder for children and adults that have difficulties in social interaction and communication with limited control over their behavior patterns and cognitive skills. (Ghazali) According to the Center of Disease Control and Prevention (CDC) , autism can be identified among children over 4 that have social communication and speech difficulties. This also applies to those with repetitive and limited behavioral patterns and interests. When focusing on those diagnosed with ASD, we must also pay attention to their relationship with the built environment and how their sensory levels respond to it. Individuals with autism and their understanding of the senses can be classified into two types of sensitivities. The first is hypersensitivity or overdeveloped sense recognition. This is the ability to be able to hear conversations in the distance, have an inability to cut out sounds such as background noise which leads to difficulties concentrating, and sound can become distorted overtime due to the inability to translate sound waves efficiently within the eardrum. The second is hyposensitivity or underdeveloped sense recognition. Autistic people with this form of sensitivity only hear sounds in one ear with the other you're having partial hearing or even none, might enjoy crowded and noisy places, and like to bang doors or objects together or even speak in loud tones to seek the sensation. (Ghazali)

**"I FEEL
OVERSTIMU-
LATED"**

NON-VERBAL AUTISM

Although this thesis covers autism, it will be taking priority to severe autism with specificity to non-verbal autism. Non-verbal autism is defined as “a degree of autism that creates major difficulties using words to express needs or desires and impedes the ability to understand language.” (CDC) According to the CDC, autism cases in the United States of America have steadily been increasing in the twenty years. In 2006 1 in 110 people were diagnosed on the autistic spectrum. This number jumped to 1 in 59 in 2018. In the most recent study in 2022, 1 in 36 people have been diagnosed on the autistic spectrum. (CDC) This clearly shows the growing prevalence of autistic cases in America and creates valid reasons to research their experiences deeper to create environments for the full human experience.

Daily routine and regularity are two key factors to sensory levels remaining balanced for someone with non-verbal autism. Familiarity of the space, where everything is placed, the interior finishes, the sounds encompassing the space, who is there, etc. are just a few of the many elements to keep in mind when working to understand how to keep sensory levels balanced. (Ghazali) In a study done by Roslinda Ghazali, she addressed the elements to avoid, how they autistic person is impacted and suggestions to create more pleasant learning environment for those with ASD. Some elements to a space said to avoid are, complicated planning, crowded space, spaces with many points of egress, moments of physical hazards (such as, loose flooring, toxic paints, open stairways, etc.), over-stimulation environment, noisy spaces, disturbing lights, strong smells, direct sunlight, and flickering lights. (Source 3 – Ghazali) Although this study uncovers quite a few unknowns on autism design and educates on how to design a learning environment for the autistic experience; it is displayed rather vague in its nomenclature and suggestions column. To strengthen this understanding, another study done by Tola Giulia specifies the more specific preferences necessary when designing a sensory space specific to autism.

She creates detailed columns dedicated to each sense that goes into depth on these unique preferences. Some of these preferences with priority to light and sound are, “ensuring a good level of sound insulation between the different rooms; installing higher efficiency fans with quieter performance with switches operated manually to avoid sudden activation; reducing the openings in number as well as in size in areas requiring high acoustical quality such as a bedroom or speech therapy room; double or triple glazed windows and heavy curtains can also be used; avoiding the “greenhouse” effect and providing a graduated series of acoustically modified rooms (depending on activities) to help children generalize skills and not to become dependent upon an optimum acoustical quality; preferring natural lighting (avoiding direct sunlight) and ventilation; avoiding fluorescent lighting because of the visual issue of flickering and the auditory issue of the low humming sound it emits, preferring LED lights instead; using adjustable intensity lighting systems with diffuse light source to avoid glare; providing

In addition to the installation, detailed columns are created to delve into the unique sensory preferences of individuals with Non-Verbal Autism. These columns provide comprehensive guidance on accommodating these preferences, particularly focusing on aspects such as light and sound. Recommendations include ensuring effective sound insulation between rooms, installing quieter fans operated manually to prevent sudden activation, and minimizing openings in areas requiring high acoustical quality. Moreover, emphasis is placed on natural lighting over fluorescent lighting to mitigate visual and auditory sensitivities, alongside adjustable intensity lighting systems to reduce glare. These meticulous considerations underscore the commitment to fostering environments that prioritize the comfort and well-being of individuals with diverse sensory needs.

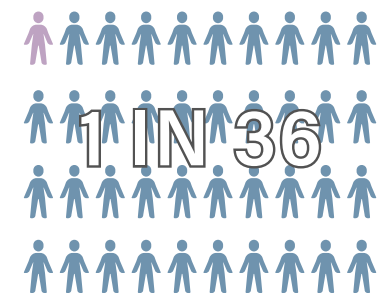
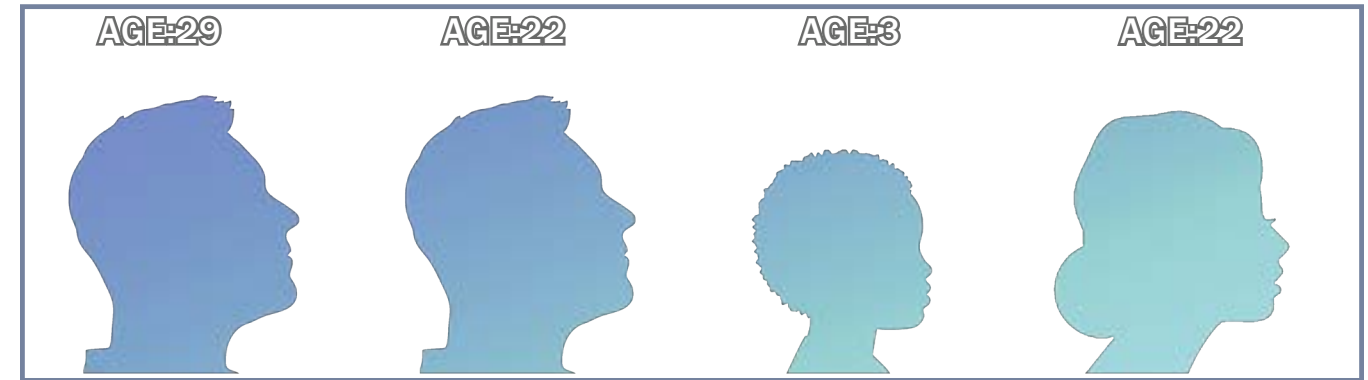


FIGURE: AUTISM STATISTICS, SOURCE: CENTER FOR DISEASE CONTROL



SEVERE AUTISM

MILD AUTISM

FIGURE: LEVELS OF AUTISM STUDIED, GRAPHIC BY AUTHOR

LEVELS OF AUTISM RESEARCHED

This thesis researches the different levels of autism. Although Non-Verbal Autism is the chosen level for sensory engagement, understanding other levels to autism is imperative to overall autism knowledge.

Mild and severe autism represent two ends of the spectrum in terms of symptom severity and functional impairment. Individuals with mild autism typically exhibit fewer and milder symptoms compared to those with severe autism. While there is no strict delineation between the two categories, mild autism is generally characterized by relatively mild challenges in social communication, restricted interests, and repetitive behaviors. These individuals may be able to function relatively independently in certain areas of life, such as academic or occupational settings, with varying levels of support.

In contrast, severe autism is marked by significant impairments in social communication skills, restrictive interests, and repetitive behaviors that profoundly impact daily functioning. Individuals with severe autism often require substantial support and intervention to navigate social interactions, communicate

effectively, and engage in activities of daily living. Their challenges may be so pronounced that they struggle to live independently or participate fully in academic, occupational, or social activities without ongoing assistance and supervision.

Despite the differences in symptom severity, both mild and severe autism present unique challenges and strengths. Individuals with mild autism may benefit from targeted interventions aimed at addressing specific areas of difficulty while leveraging their strengths to foster independence and success. Conversely, individuals with severe autism may require comprehensive, multifaceted support tailored to their individual needs to maximize their quality of life and enhance their ability to participate meaningfully in society. Ultimately, recognizing the diverse presentations of autism spectrum disorder and providing appropriate support and resources is crucial for promoting the well-being and success of individuals across the spectrum.

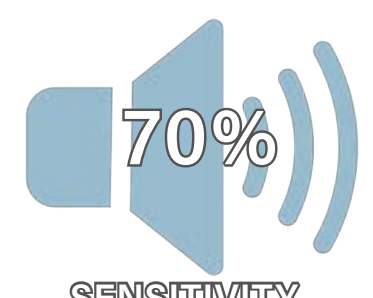
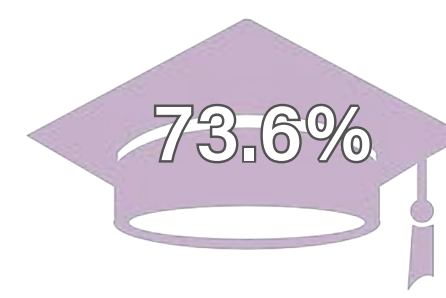


FIGURE: AUTISM STATISTICS, SOURCE: CENTER FOR DISEASE CONTROL

"THEY LIKE TO BE OUT IN PUBLIC TOO!"

QUALITATIVE STUDIES

When researching Non-Verbal Autism and what people with this diagnosis deal with on a day-to-day basis, qualitative research is essential in understanding their lifestyle deeper. This thesis gathered interviews, photo diaries, and series of observations to strengthen this understanding. The following are a series of responses from caretakers and teachers for nonverbal autistic people. Caretaker Interview takeaways: Interviewer, "[Please] explain where your children classify within the autistic spectrum?" Caretaker, "I have two children with a form of moderate to severe autism. The first was diagnosed at the age of 3 with moderate to severe Non-Verbal Autism and PDDNOS. The second was diagnosed at 2 with moderate to severe Non-Verbal Autism." Interviewer, "what are some methods to keeping a familiar schedule and environment with your children and how do you combat triggers that may lead to over stimulation?" Caretaker, "when in the home room layout is extremely important. It reads as familiar to them and makes them feel safe."

When leaving the house, my wife and I over-explain where we are going who will be there what we might experience as far as sounds and visuals and smells. This method is necessary because we are leaving this familiar space for an unfamiliar space. Getting them acquainted with a new space so it feels a bit familiar or prepares them more is super important. Also, the music that we play on the ride there plays a key role with a new space so it feels a bit familiar or prepares them more is super important. Also, the music that we play on the ride there plays a key role in their overall anxiety levels." Interviewer, "what do you wish architects did differently to improve a space for your children?" Caretaker, "I wish they were more aware of autism in general. To be more specific sound absorbing materials help diminish triggers with sound and space, audio is usually the biggest issue when we go to an unfamiliar space, also easy access for all entrances and exit emergencies in case of a seizure or episode..."

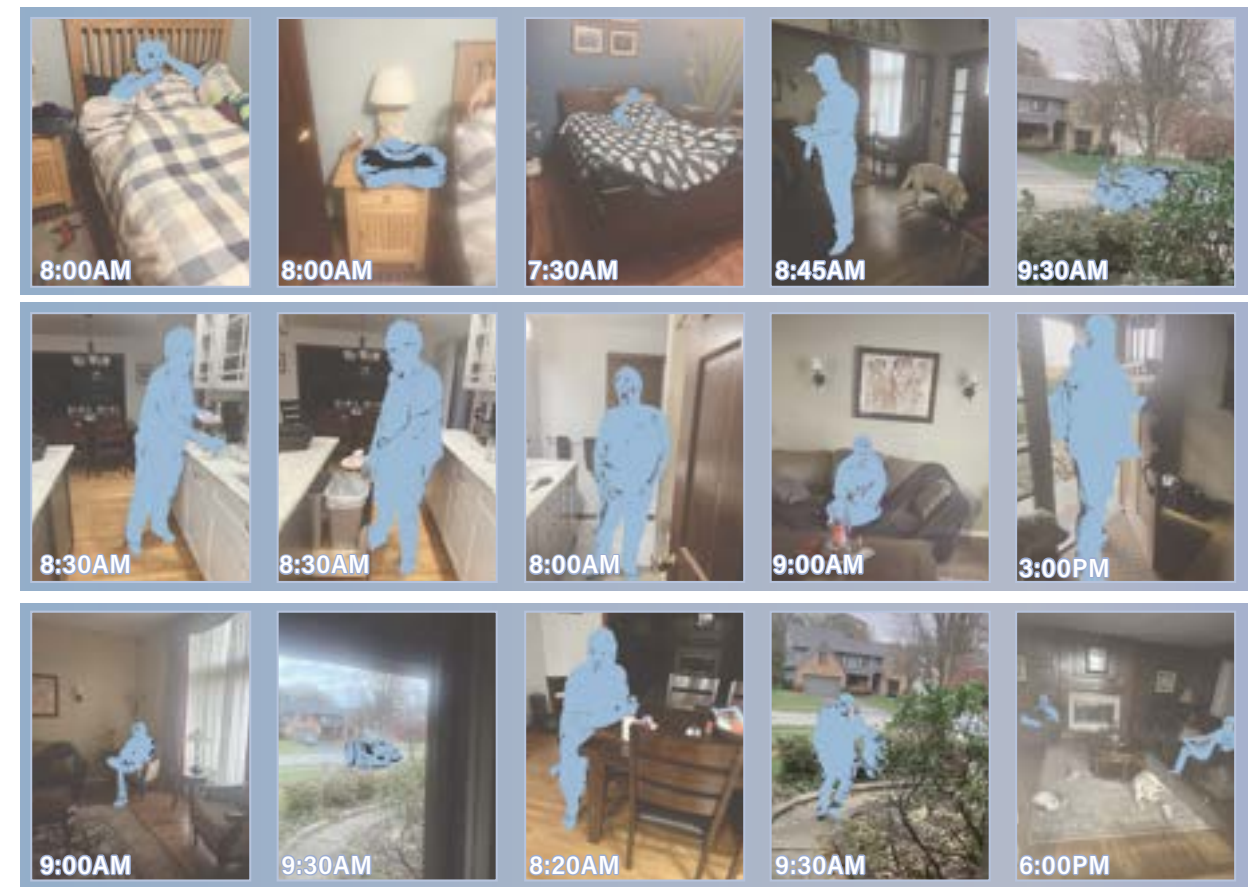


FIGURE 7: PHOTO DIARY BY FREDERICK WILLIAMS, A DAY IN THE LIFE AUTISTIC. GRAPHICS BY AUTHOR

Better access to family restrooms is necessary. Also, I will state the idea of crying rooms and quiet rooms are interesting in theory but generally dreary and has been unsuccessful in calming my children. All it does is separate them from the overall space and make them look like aliens. They are real people you don't have to be afraid of them." Interviewer, "What are some things you wish more people would know about autism?" Caretaker, "they like to be out in public too. If you [want] to see a kids face light up take my son to a baseball game. He loves baseball. Lastly, when you meet one kid with autism you meet one kid with autism. Each unique in their own way." This interview gives direct and qualitative data to what is like to care for and experience a Non-Verbal Autistic person.

From this, more qualitative research was established. In Figure 7, this research in making study is titled *A Day in The Life... Autistic*. This consists of a photo diary taken from the care takers of Non-Verbal Autistic people. The purpose of this study was to create a frame to frame look at what a day looks like for someone with Non-Verbal ASD. When looking at these photos' colors, routine, and familiarity are important. Colors that are shown here are neutral. Staying in the realm of blues, greys, and wood tones. Natural colors are suggested when designing an interior for non-verbal ASD. Whites, off-whites, and pale pink tones are among the most popular choices. Also, using plants to separate environments devoted to different functions characterized also by different sensory stimulation levels. (Tola Giulia) Another detail to note within these photos is routine. Notice the clothes folded and ready by the bed, the same balanced breakfast each day, and the same van picking them up for school each day with their dedicated nurse. The necessity of order within the life of a non-verbal autistic is quite apparent.

Further qualitative studies include a trigger path map and the process to keep familiarity path map [See Figure 8 and figure 9]. The trigger path map breaks down triggers that lead a non-verbal autistic person to overstimulation/sensory overload or imbalance. It gives a deeper understanding of how simple changes to the order of a day can shift the sensory levels of Non-Verbal ASD.

The process to keep familiarity path map shows the step-by-step approach to keeping someone with Non-Verbal Autism whelmed when leaving a familiar space. This data from both these paths come from care takers and registered medical professionals for Non-Verbal Autistic children and adults that have been gathered through interviews.

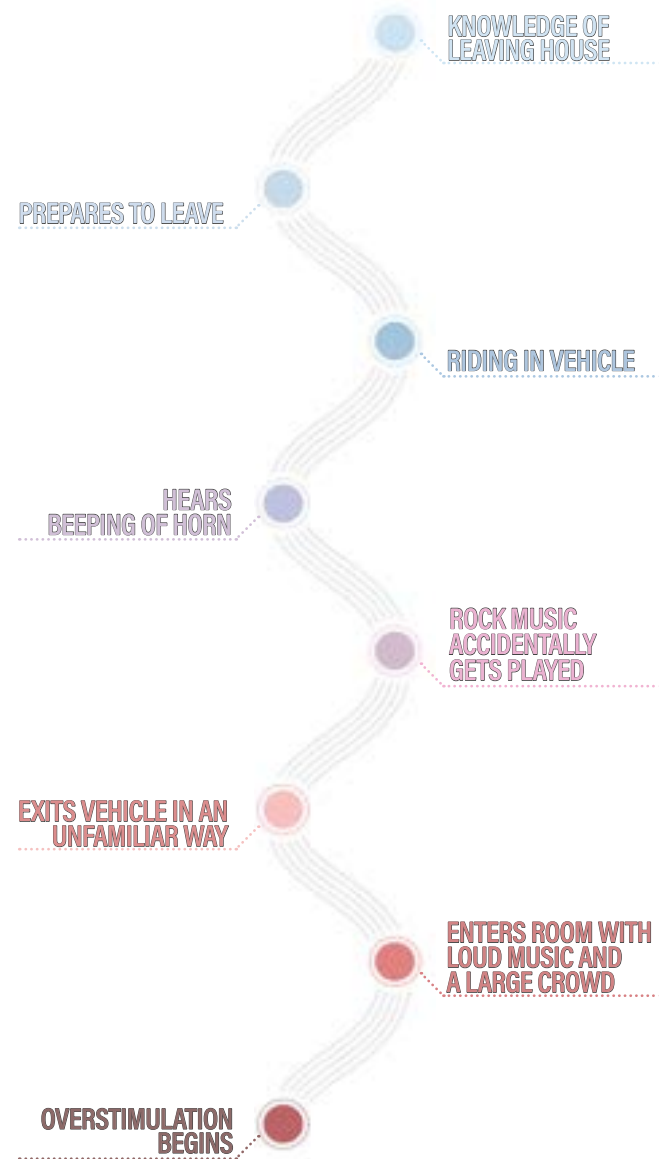


FIGURE 8: TRIGGERS LEADING TO OVERSTIMULATION MAP, AUTISTIC
SOURCE: FREDERICK WILLIAMS AND GABRIELLE CUFFIE, GRAPHICS BY AUTHOR



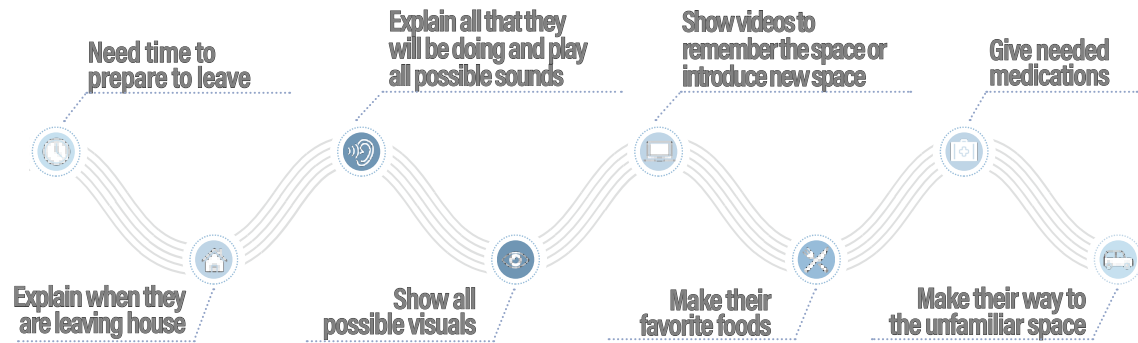


FIGURE 9: SENSORY BALANCE PATH
SOURCE: PARENT INTERVIEW WITH FREDERICK WILLIAMS, GRAPHICS BY AUTHOR

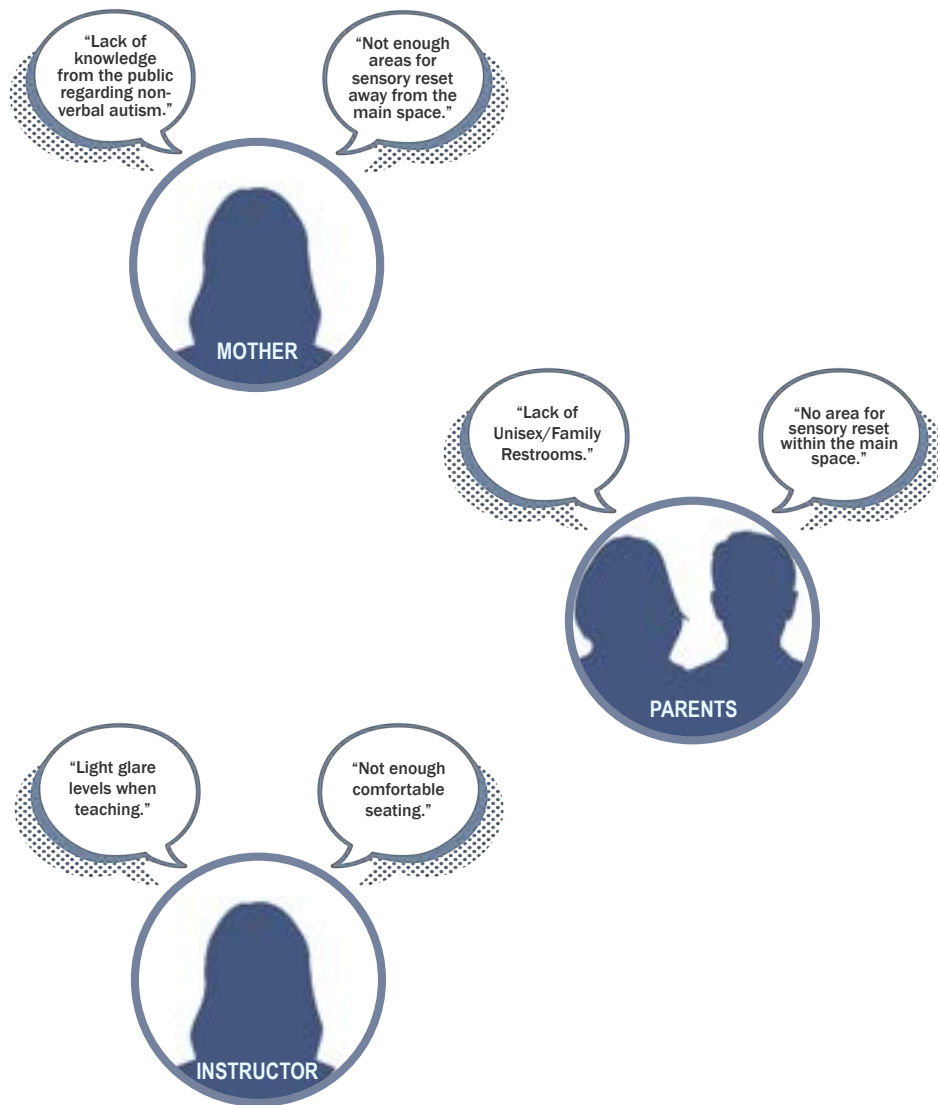


FIGURE 10: INTERVIEW KEY TAKEAWAYS
SOURCE: PARENT INTERVIEW WITH FREDERICK WILLIAMS, GABRIELLE CUFFIE, AND INSTRUCTOR AT AN UNDISCLOSED SCHOOL, GRAPHICS BY AUTHOR

SENSORIAL TRIGGERS AND PREVENTION OPTIONS

Through qualitative research involving interviews with guardians and instructors, photo diaries, observations of my cousins with Non-Verbal Autism, and studies conducted by Ghazali, a series of main sensorial triggers for individuals with Non-verbal Autism within the built environment have been identified. As depicted in *Figure 11*, triggers such as loud speakers/music, large crowds, dishes breaking, heavy contrast color palettes, and busy lighting fixture layouts with tight seating emerge as prominent factors contributing to sensory overload in these individuals.

Following the recognition of these sensorial triggers within the built environment, a range of prevention options are devised to efficiently enhance the sensory performance of interior spaces and improve the experience for individuals with Non-Verbal Autism. Some materials identified as prevention options include sound absorption materials, natural elements, low ceilings with diffused lighting layouts, wood elements, and diffused glazing (as illustrated in *Figure 10*).

By implementing these prevention strategies, interior spaces can be tailored to mitigate sensory overload and create environments that are more conducive to the comfort and well-being of individuals with Non-Verbal Autism. Sound absorption materials help dampen noise levels, while natural elements such as plants can provide a calming effect. Additionally, the use of low ceilings with diffused lighting layouts and wood elements can contribute to a more soothing atmosphere, reducing the likelihood of sensory triggers and promoting a sense of security and tranquility for individuals with Non-Verbal Autism.

Furthermore, the incorporation of diffused glazing into interior design serves multifaceted purposes in creating sensory-friendly environments for individuals with Non-Verbal Autism. Beyond its functional role in allowing the penetration of natural light, which is often preferred over harsh fluorescent lighting due to its softer, more soothing quality, diffused glazing contributes to a holistic sensory experience. By diffusing light evenly throughout a space, glare and visual distractions are minimized, creating a visually calming atmosphere conducive to relaxation and sensory regulation. This gentle illumination not only alleviates potential triggers for sensory overload but also fosters a sense of comfort and security within the interior environment, promoting a greater sense of well-being for individuals with Non-Verbal Autism.

Moreover, the use of diffused glazing strategically integrates individuals with Non-Verbal Autism into their surroundings while maintaining a sense of privacy and safety. Through the softened diffusion of light, individuals can experience a subtle connection to the outside world without feeling overwhelmed by external stimuli. This balance between transparency and privacy is crucial in fostering a sense of belonging and empowerment within the interior space. Additionally, diffused glazing allows for a sense of openness and expansiveness, which can help alleviate feelings of confinement or claustrophobia that individuals with Non-Verbal Autism may experience in enclosed spaces. By providing a visual link to the external environment while ensuring a comfortable, controlled atmosphere within, diffused glazing plays a pivotal role in enhancing the sensory experience and overall quality of life for individuals with Non-Verbal Autism.

CHAPTER III: WHY IS THIS RELEVANT?



FIGURE 10: TRIGGERS PREVENTION OPTIONS
SOURCE: FREDERICK WILLIAMS AND GABRIELLE CUFFIE, GRAPHICS BY AUTHOR



FIGURE 11: TRIGGERS WITHIN THE BUILT ENVIRONMENT FOR NVA
SOURCE: INTERVIEWS, GHAZALI, PHOTO DIARY RESULTS, THE SENSES:PART 1, GRAPHICS BY AUTHOR

In America, individuals with autism and other disabilities often face significant challenges due to the lack of specific design standards tailored to their needs. While current design standards, such as the Americans with Disabilities Act (ADA), universal design, and inclusive design principles, aim to promote accessibility and inclusivity, they may not adequately address the unique sensory sensitivities and requirements of individuals with autism. Design for Autism and sensory design principles underscore the importance of creating environments that mitigate sensory overload and support sensory regulation. However, the absence of comprehensive design guidelines specifically tailored to autism limits the ability to create truly inclusive spaces that cater to the diverse needs of this population (Smith, 2020).

In the realm of architectural and interior design, there is a growing recognition of the need for specialized guidelines and standards that address the sensory needs of individuals with autism. Research efforts are underway to develop comprehensive design principles that prioritize sensory performance enhancements and promote the creation of environments that are truly inclusive and supportive for individuals on the autism spectrum. This chapter will highlight these issues while addressing the differences and similarities between non-autistic and autistic people.

COMPARISON TO A NON-AUTISTIC LIFE

Individuals with autism and those without autism exhibit both similarities and differences in various aspects of cognition, behavior, and social interaction. One prominent area of contrast lies in social communication skills. Research indicates that individuals with autism often experience challenges in understanding and interpreting social cues, maintaining eye contact, and engaging in reciprocal conversation compared to neurotypical individuals (Happé & Frith, 2014). Conversely, individuals without autism typically demonstrate more fluidity and ease in social interactions, displaying a greater understanding of nonverbal communication cues and the ability to navigate complex social dynamics.

Moreover, individuals with autism may demonstrate differences in sensory processing and perception compared to those without autism. Sensory sensitivities, such as heightened sensitivity to light, sound, touch, or texture, are common among individuals with autism and can significantly impact their daily functioning and quality of life (Leekam, Nieto, Libby, Wing, & Gould, 2007). In contrast, individuals without autism may exhibit a more typical range of sensory responses and may not experience

the same level of sensory discomfort or overload in certain environments.

Despite these differences, it is essential to recognize the shared humanity and individuality of both groups. While individuals with autism may face unique challenges in certain areas, they also possess strengths and abilities that contribute to their diverse experiences and perspectives. By fostering understanding, empathy, and inclusivity, society can create environments and opportunities that support the well-being and success of individuals both with and without autism. Understanding the similarities and differences between individuals with autism and those without autism is crucial for promoting inclusivity and providing appropriate support and accommodations. By recognizing and embracing neurodiversity, society can cultivate environments that celebrate the strengths and contributions of all individuals, regardless of their neurodevelopmental profile.

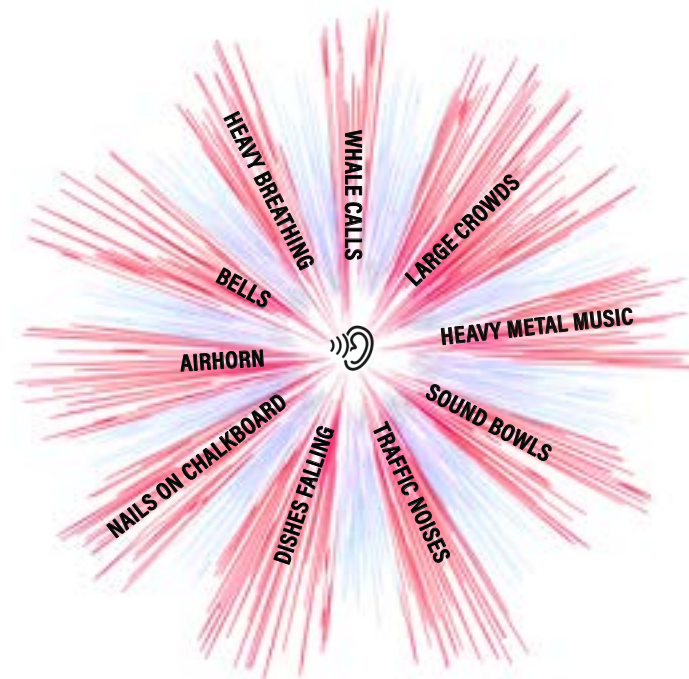


FIGURE 12: ALIKE SOUND WAVE TRIGGERS GRAPH
SOURCE: PARENT INTERVIEWS AND THE SENSES: PART 1 RESULTS
GRAPHICS BY AUTHOR

In Figure 12, ten sounds from The Senses: Part 1 results are displayed, indicating triggering sounds. This is relevant because these sound triggers for Non-Autistic individuals are also triggers for Non-Verbal Autism (NVA) according to interviews with guardians. Another comparison to Non-Verbal Autism triggers can be found in Figure 13. This overstimulation map provides a comparative look at what triggers a person not living with autism deals with daily. Although these triggers create discomfort, they do not result in overstimulation, unlike in Figure 8, where the multitude of triggers leads to overstimulation for someone with NVA. These findings shed light on the unique sensory experiences of individuals with NVA and underscore the importance of understanding and accommodating their needs in various environments.

Understanding the overlap in triggering stimuli between individuals without autism and those with Non-Verbal Autism (NVA) is crucial for creating inclusive environments. Figure 13 further elucidates this comparison by providing insights into the daily triggers experienced by individuals without autism. While these triggers may cause discomfort, they do not typically result in overstimulation. In contrast, Figure 8 highlights the overwhelming number of triggers that can lead to overstimulation for individuals with NVA. These comparisons underscore the need for tailored interventions and accommodations to support individuals with NVA in navigating sensory-rich environments without becoming overwhelmed. By recognizing and addressing these triggers, designers, caregivers, and educators can foster environments that promote comfort, well-being, and participation for individuals with diverse sensory needs.

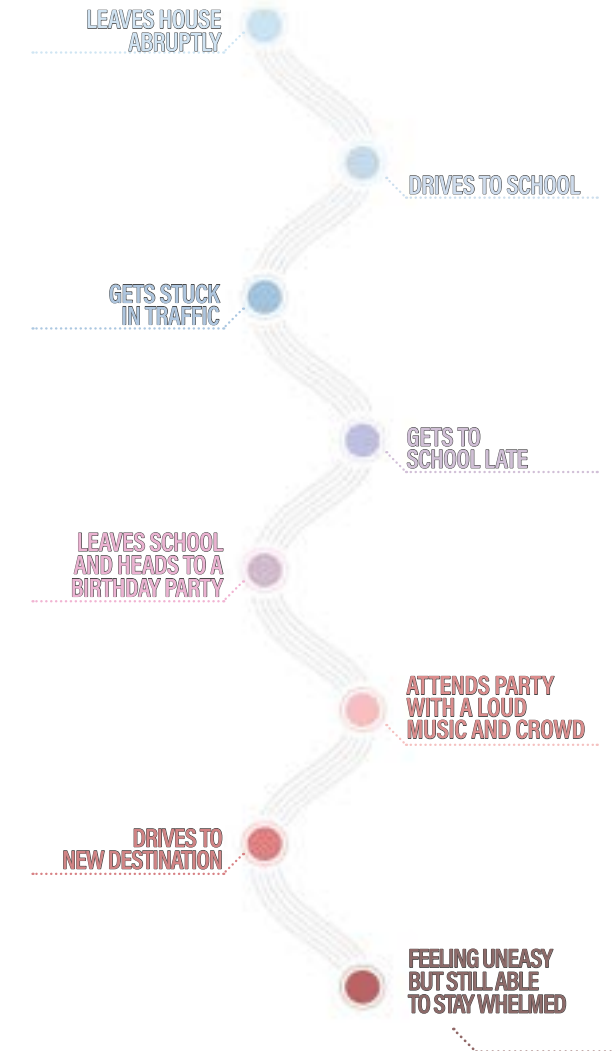


FIGURE 13: TRIGGERS LEADING TO OVERSTIMULATION MAP, NON-AUTISTIC EXPERIMENT AND GRAPHICS BY AUTHOR



FIGURE: PHOTO DIARY, DAY IN THE LIFE NON-AUTISTIC
PHOTOS AND GRAPHICS BY AUTHOR

DESIGN FOR AUTISM

The design of spaces for individuals with autism requires careful consideration of sensory sensitivities, functional needs, and opportunities for engagement. Precedents such as the Special Needs Education Center in Egypt, designed by Magda Mostafa, showcase innovative approaches to creating supportive environments for individuals with autism. Mostafa's design prioritizes sensory-friendly elements such as calming color palettes, natural lighting, and flexible spaces that cater to individual needs. By integrating sensory design principles into the architectural framework, the center provides a nurturing and inclusive environment that promotes learning and development.

Similarly, the "Stretch and Color" initiative at the University of Michigan's Taubman College exemplifies the integration of sensory design into educational settings for individuals with autism. This project explores the use of color and spatial flexibility to create dynamic learning environments that accommodate diverse sensory needs. By incorporating elements such as adjustable furniture, varied textures, and interactive sensory installations, the initiative aims to enhance engagement and facilitate learning for individuals with autism.

Additionally, the Eden Institute in New Jersey, designed by KSS Architects, offers valuable insights into the design of therapeutic environments for individuals with autism. The institute features purpose-built spaces that support a range of therapeutic activities, from sensory integration therapy to social skills development. By incorporating elements such as sensory rooms, quiet spaces, and outdoor play areas, the design promotes sensory regulation, social interaction, and overall well-being for individuals with autism.

These precedents demonstrate the importance of integrating sensory design principles into the planning and design of spaces for individuals with autism. By prioritizing sensory comfort, flexibility, and engagement, architects and designers can create environments that foster learning, development, and inclusion for individuals with diverse sensory needs.



FIGURE: SPECIAL NEEDS EDUCATION CENTER, EGYPT
SOURCE: MAGDA MOSTAFA



FIGURE: STRETCH AND COLOR, MI
SOURCE: UNIVERSITY OF MICHIGAN, TAUBAN COLLEGE



FIGURE: THE EDEN INSTITUTE, NEW JERSEY
SOURCE: KSS ARCHITECTS

SENSORY DESIGN

Sensory design is a holistic approach to creating environments that cater to the diverse sensory needs and experiences of individuals. Precedents such as the Hazelwood School for the Blind in Scotland exemplify the integration of sensory design principles into educational settings. Designed to accommodate students with visual impairments, the school features tactile pathways, auditory cues, and accessible materials that facilitate navigation and learning. By prioritizing sensory engagement and accessibility, the design fosters independence, confidence, and inclusion for students with visual impairments.

Similarly, the Fireplace for Norway Children project demonstrates the transformative potential of sensory design in outdoor spaces. This initiative, which involves the creation of interactive fireplaces in public parks, aims to provide sensory-rich experiences for children with autism and other sensory processing disorders. By incorporating elements such as tactile

surfaces, soothing sounds, and warm lighting, the fireplaces offer opportunities for sensory exploration, relaxation, and social interaction in natural settings. This innovative approach to sensory design promotes sensory regulation, social engagement, and well-being for children with diverse sensory needs.

Furthermore, the Egaligilo Pavilion in Mexico showcases the integration of sensory design principles into architectural interventions. Designed as a sensory garden pavilion, the structure features a variety of sensory elements, including textured surfaces, aromatic plants, and water features. These sensory-rich experiences stimulate the senses, promote relaxation, and encourage mindfulness for visitors of all ages and abilities. By creating immersive environments that engage multiple senses, the pavilion fosters a deeper connection to nature and enhances the overall well-being of individuals within the built environment.



FIGURE: HAZELWOOD SCHOOL FOR THE BLIND, SCOTLAND
SOURCE: ARCH DAILY



FIGURE: FIREPLACE FOR NORWAY CHILDREN
SOURCE: ARCH DAILY



FIGURE: EGALIGILO PAVILION, MEXICO
SOURCE: ARCH DAILY

DISABILITIES IN AMERICA

Disabilities in America encompass a wide range of conditions that impact individuals' mobility, hearing, vision, and neurodevelopmental functions such as autism. In terms of mobility disabilities, approximately 13.7% of Americans report having a mobility disability, according to the Centers for Disease Control and Prevention (CDC). These disabilities can range from difficulty walking to complete paralysis and significantly impact individuals' ability to navigate their environment independently. Access to wheelchair-accessible infrastructure, such as ramps, elevators, and curb cuts, is crucial for promoting mobility and ensuring equal access to public spaces and facilities for individuals with mobility impairments.

Hearing disabilities affect approximately 15% of American adults, according to the National Institute on Deafness and Other Communication Disorders (NIDCD). Individuals with hearing impairments may experience varying degrees of hearing loss, ranging from mild to profound, which can impact their ability to communicate effectively and participate fully in social, educational, and professional activities. Access to assistive technologies, such as hearing aids and cochlear implants, as well as captioning services and sign language interpreters, is essential for facilitating communication and promoting inclusion for individuals with hearing disabilities.

Vision disabilities affect an estimated 12 million Americans aged 40 and older, according to the CDC. These disabilities encompass a range of conditions, including low vision and blindness, which can significantly impact individuals' ability to perform daily tasks, such as reading, driving, and navigating their surroundings. Access to accommodations such as Braille signage, magnification devices, and screen readers is crucial for promoting independence and ensuring equal access to information and services for individuals with vision disabilities.

Autistic disabilities, which fall under the umbrella of neurodevelopmental disorders, affect an estimated 1 in 54 children in the United States, according to the CDC. Autism spectrum disorder (ASD) is characterized by challenges in social communication, sensory processing, and repetitive behaviors, which can vary widely in severity and impact. Access to early intervention services, behavioral therapy, and educational accommodations is essential for supporting individuals with autism and promoting their social, emotional, and cognitive development.

57 MILLION
People in the U.S. have a disability.

DISABILITIES IN AMERICA

HEARING

15%

MOBILITY

13.7%

VISION

4.8%

AUTISM

2.2%

FIGURE: DISABILITIES IN AMERICA PERCENTAGES GRAPHIC
SOURCE: CENTER FOR DISEASE CONTROL

ADA DESIGN STANDARDS

The Americans with Disabilities Act (ADA) design standards play a pivotal role in ensuring equal access and inclusion for individuals with disabilities in various aspects of daily life. Enacted in 1990, the ADA prohibits discrimination against individuals with disabilities and mandates accessibility requirements for public accommodations, commercial facilities, transportation, and state and local government facilities. These standards aim to eliminate barriers to accessibility and promote full participation and equal opportunity for individuals with disabilities.

One key aspect of ADA design standards is the requirement for accessible building entrances and routes. This includes features such as ramps with specific slope requirements, handrails for support, and clear pathways free from obstacles. Additionally, accessible entrances must have doorways wide enough to accommodate wheelchairs and other mobility devices, as well as automatic door openers to facilitate independent entry for individuals with mobility impairments.

Another critical component of ADA design standards is the provision of accessible parking spaces. These spaces must be located close to building entrances and equipped with appropriate signage and markings to ensure visibility and ease of use. Accessible parking spaces also require adjacent access aisles to accommodate wheelchair lifts and ramps, as well as curb cuts or ramps to provide access to pedestrian walkways.

Interior spaces subject to ADA design standards must also adhere to specific accessibility requirements. This includes features such as accessible routes throughout buildings, accessible restroom facilities with appropriate grab bars and clear floor space, and accessible telecommunication devices for individuals with hearing impairments. Additionally, public spaces such as assembly areas, dining facilities, and recreational areas must be designed to accommodate individuals with disabilities and ensure equal access to amenities and services.

Overall, ADA design standards serve as a cornerstone of accessibility and inclusivity, promoting equal rights and opportunities for individuals with disabilities. By incorporating these standards into architectural and design practices, we can create environments that are welcoming, functional, and accessible to all members of society, regardless of their abilities or mobility impairments.

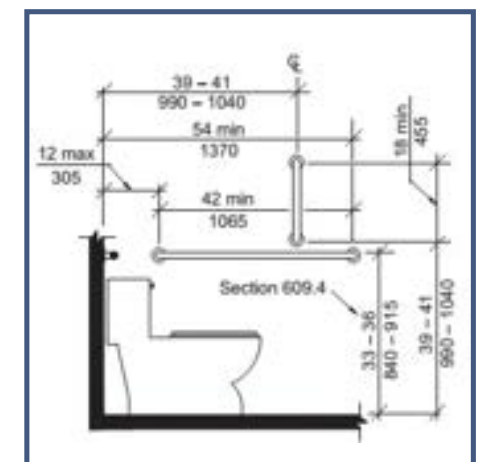
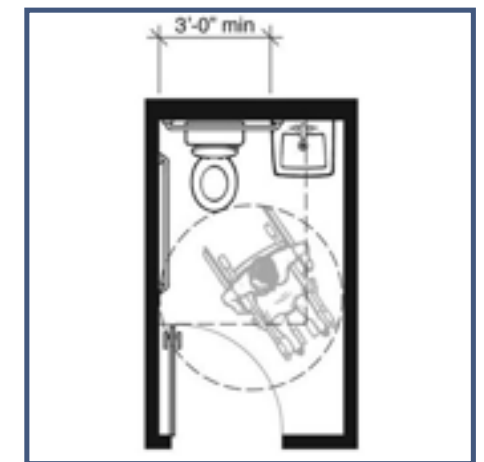


FIGURE: ADA BATHROOM STANDARDS EXAMPLES
SOURCE: ADA COMPLIANCE & STANDARDS MANUAL

INCLUSIVE AND UNIVERSAL DESIGN

Inclusive and universal design principles aim to create environments that are accessible and usable by people of all ages, abilities, and backgrounds. Unlike traditional design approaches that may cater to a specific demographic, inclusive design considers the diverse needs and preferences of all users, including those with disabilities. By prioritizing accessibility and inclusivity from the outset, inclusive design seeks to minimize barriers and maximize usability for everyone.

One fundamental aspect of inclusive design is the concept of flexibility and adaptability. Spaces and products designed with flexibility in mind can accommodate a wide range of users and adapt to their changing needs over time. For example, adjustable-height countertops in kitchen spaces can be easily accessed by individuals using wheelchairs or those who prefer to stand while preparing meals. Similarly, modular furniture arrangements in public seating areas can be reconfigured to accommodate larger groups or individuals requiring additional space.

Another key principle of inclusive design is the emphasis on user-centeredness and participatory design processes. By involving end-users, including individuals with disabilities, in the design process, designers can gain valuable insights into their unique needs and preferences. This collaborative approach ensures that solutions are tailored to the specific requirements of diverse user groups and reflect their lived experiences.

Additionally, engaging with users throughout the design process fosters a sense of ownership and empowerment, promoting greater acceptance and usability of the final design outcomes.

Universal design takes inclusivity a step further by advocating for environments and products that are usable by the widest range of people possible, without the need for adaptation or specialized design features. Universal design principles emphasize simplicity, intuitiveness, and flexibility, ensuring that spaces and products are accessible to individuals with varying levels of ability and familiarity. For example, curb cuts at sidewalk intersections not only benefit individuals using wheelchairs but also parents pushing strollers, travelers pulling suitcases, and cyclists maneuvering through the city.

Overall, inclusive and universal design principles promote accessibility, usability, and inclusion for all individuals, regardless of their abilities or backgrounds. By embracing these principles in architectural, product, and graphic design, we can create environments that are welcoming, functional, and equitable for everyone. From public spaces and transportation systems to digital interfaces and consumer products, inclusive and universal design has the power to transform the way we live, work, and interact with the world around us.

CHAPTER IV: MARKET SECTOR RESEARCH AND ANALYSIS

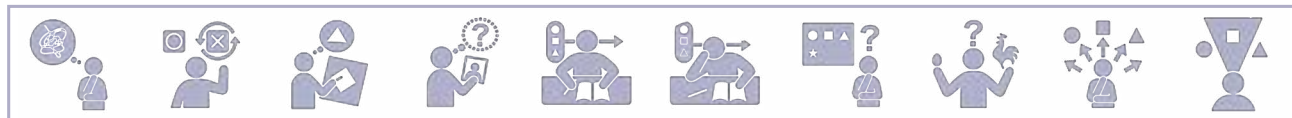
In exploring market sectors with autism-friendly elements, it becomes evident that certain industries have made significant strides in incorporating inclusive design practices. For instance, the hospitality sector has increasingly recognized the importance of creating sensory-friendly environments to cater to the needs of individuals with autism and sensory sensitivities. Hotels and resorts are implementing measures such as quiet rooms, sensory-friendly amenities, and staff training programs to ensure a comfortable and welcoming experience for guests on the autism spectrum. Similarly, the education sector has been exploring innovative approaches to accommodate students with autism, including the development of sensory-friendly classrooms and curriculum adaptations to support diverse learning styles.

However, despite progress in some sectors, there are still areas where inclusive design practices are lacking. For example, the retail industry has been slow to adopt autism-friendly initiatives, with many stores and shopping centers lacking accommodations such as quiet spaces, sensory-friendly lighting, and accessible signage. Similarly, public transportation systems often fall short in providing adequate support for individuals with autism, with limited accessibility features and sensory-friendly amenities. Identifying these gaps in inclusive design highlights opportunities for improvement and underscores the importance of advocating for greater accessibility and inclusivity across all market sectors. In the forthcoming chapters, we will delve deeper into the specific strategies and interventions employed in various market sectors to enhance sensory performance and promote inclusivity for individuals with autism. By examining case studies and best practices, we aim to provide insights and inspiration for creating more inclusive environments across diverse industries.

The Body and Movement



Sight and Hearing



Cognition



Emotion



FIGURE: UNIVERSAL DESIGN GUIDE COMPILATION, SOURCE: CANON GLOBAL

MARKET SECTORS AUTISTIC HIERARCHY

When addressing autism-friendly elements within market sectors, it's crucial to understand the hierarchy of industries based on their level of inclusivity and accommodation for individuals with autism. At the forefront of this hierarchy are sectors that have demonstrated a strong commitment to incorporating autism-friendly practices, such as healthcare and education. In healthcare, facilities are increasingly adopting sensory-friendly design features, training staff in autism awareness, and implementing strategies to support individuals with autism during medical appointments and procedures. Similarly, educational institutions are embracing sensory-friendly classrooms, personalized learning plans, and specialized support services to meet the diverse needs of students on the autism spectrum.

Following closely behind are sectors such as hospitality and entertainment, which have made significant strides in creating autism-friendly environments. However, within the hospitality sector, there are still notable gaps in accessibility and accommodation for individuals with autism. While some hotels and resorts have implemented sensory-friendly amenities and staff training programs, many still lack comprehensive strategies to support guests on the autism spectrum. Similarly, in the entertainment industry, although theme parks and recreational facilities have introduced sensory-friendly accommodations, there remains room for improvement in terms of inclusivity and accessibility.

Office design is another sector that often lags behind in addressing autism-friendly elements. While some companies have taken steps to create more inclusive work environments, such as providing quiet spaces and flexible work arrangements, many office designs still overlook the sensory needs of individuals with autism. Open-plan layouts, bright lighting, and noisy environments can be overwhelming for individuals on the autism spectrum, making it challenging for them to focus and thrive in the workplace.

In contrast, sectors such as retail and transportation occupy a middle ground in the hierarchy, with varying degrees of inclusivity and accommodation for individuals with autism. While some retailers have begun to introduce autism-friendly initiatives, such as sensory-friendly shopping hours and

accessible signage, many stores and shopping centers still lack adequate accommodations for individuals with autism. Similarly, public transportation systems often fall short in providing comprehensive support for individuals with autism, with limited accessibility features and sensory-friendly amenities.

At the bottom of the hierarchy are sectors that have yet to prioritize autism-friendly practices, such as construction and technology. However, by raising awareness and advocating for greater accessibility and inclusivity, there is potential for these sectors to become more autism-friendly in the future. Overall, understanding the market sector hierarchy in addressing autism-friendly elements highlights areas of progress and areas for improvement, guiding efforts to create more inclusive environments across diverse industries.

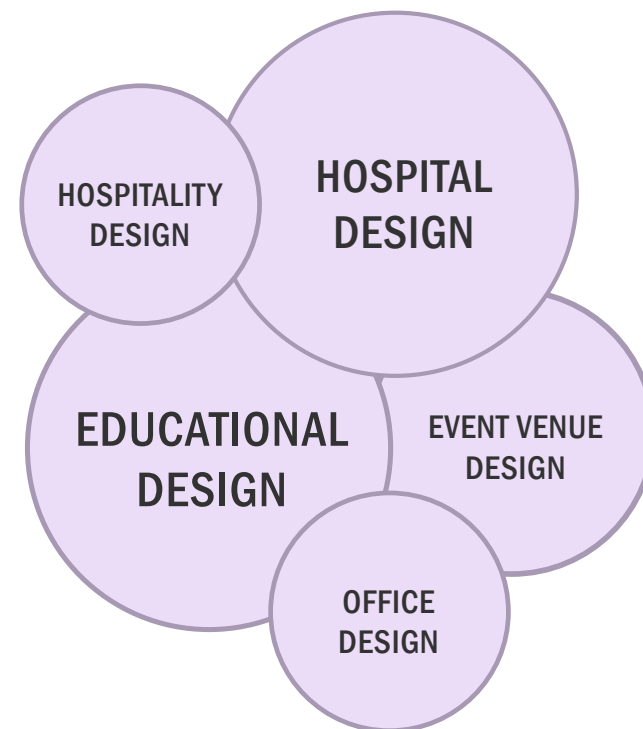


FIGURE: MARKET SECTOR MATRIX
GRAPHICS BY AUTHOR

HOSPITALITY DESIGN

In hospitality design, particularly within the realm of restaurant design, there remains a noticeable lack of autism-friendly elements despite the growing awareness of sensory needs among patrons. Restaurants often prioritize aesthetics, ambiance, and efficiency in their designs, overlooking the sensory sensitivities of individuals with autism. As a result, many dining establishments fail to provide a comfortable and inclusive experience for guests on the autism spectrum.

One of the primary challenges in restaurant design is the prevalence of sensory stimuli that can be overwhelming for individuals with autism. Bright lighting, loud music, crowded spaces, and strong smells are common features of many restaurants, but they can be distressing for individuals with sensory sensitivities. Moreover, the fast-paced and unpredictable nature of restaurant environments can exacerbate anxiety and sensory overload for guests on the autism spectrum, making it difficult for them to enjoy their dining experience.

Another issue in restaurant design is the lack of consideration for spatial layout and seating arrangements. Many restaurants feature tightly packed tables, narrow aisles, and communal seating areas, which can be uncomfortable and restrictive for individuals with autism who may prefer more space and privacy. Additionally, the absence of designated quiet areas or sensory-friendly zones further limits options for guests seeking a calmer dining environment.

Moreover, menu presentation and ordering processes can pose challenges for individuals with autism. Complex menus with extensive descriptions and unfamiliar terminology can be overwhelming and confusing, making it difficult for guests to make decisions. Similarly, ordering at the counter or interacting with servers may be stressful for individuals with autism who struggle with social communication and sensory processing. Providing clear and concise menu options, as well as alternative ordering methods such as mobile apps or visual aids, can improve accessibility and inclusivity for guests with autism.

Despite these challenges, there is growing recognition within the hospitality industry of the importance of creating autism-friendly dining experiences. Some restaurants are beginning to implement sensory-friendly design elements, such as adjustable lighting, sound-absorbing materials, and flexible seating arrangements, to accommodate the diverse needs of their guests. Additionally, staff training programs in autism awareness and sensitivity are becoming more prevalent, empowering restaurant employees to better understand and support guests with autism.

However, there is still much work to be done to make restaurant design truly inclusive for individuals with autism. Collaborating with autism advocacy organizations and seeking input from individuals with autism and their families can provide valuable insights and guidance for designing more welcoming and accommodating dining spaces. By prioritizing sensory-friendly design elements, clear communication, and staff training, restaurants can create a more inclusive dining experience that celebrates diversity and ensures equal access for all patrons, including those with autism.



FIGURE: BOFIA, SAUDI ARABIA
SOURCE: ARCH DAILY



FIGURE: PRIME SEAFOOD PALACE, TORONTO
SOURCE: ARCH DAILY

RESTAURANT SENSORY PERFORMANCE ANALYSIS

While Olin Detroit provides a unique approach to restaurant aesthetic, culture and community engagement, but it also faces challenges in addressing sensory performance negatives within its urban spaces. Despite its commitment to accessibility and inclusivity, the project may encounter barriers that impact individuals with sensory sensitivities, including those on the autism spectrum. The bustling urban environment of Detroit, characterized by noise, traffic, and crowded spaces, can be overwhelming and distressing for individuals with sensory processing difficulties, leading to sensory overload and discomfort.

One of the key sensory performance negatives of Olin Detroit is the prevalence of sensory stimuli that can trigger anxiety and sensory overload for individuals with autism and other sensory sensitivities. The city's vibrant atmosphere, with its bustling streets, honking horns, and bustling crowds, may pose challenges for individuals who are hypersensitive to noise and auditory stimuli. Similarly, the visual clutter of urban landscapes, with its bright lights, flashing signs, and colorful advertisements, can be overwhelming for individuals with sensory sensitivities, contributing to sensory overload and anxiety.

Moreover, the lack of designated quiet spaces or sensory-friendly zones within Olin Detroit's restaurant space further exacerbates challenges for individuals with sensory sensitivities. In such tight square footage availability, there may be limited opportunities for individuals to find respite from sensory stimuli and recharge in a calm and soothing environment. The absence of sensory-friendly amenities, such as noise-reducing barriers, shaded areas, and quiet seating areas, can further contribute to feelings of discomfort and exclusion for individuals with sensory sensitivities.

Additionally, Olin Detroit's materiality, light fixture selections and spatial arrangements throughout may inadvertently overlook the diverse needs and preferences of individuals with sensory sensitivities. While the project aims to create vibrant and inclusive environments that celebrate diversity, it is essential to ensure that these spaces are accessible and accommodating for individuals with sensory processing difficulties. By prioritizing sensory-friendly design elements, such as calming colors, natural materials, and quiet areas, Olin Detroit can enhance the overall inclusivity and accessibility of its urban spaces for individuals with autism and sensory sensitivities.



FIGURE: OLIN DETROIT
SOURCE: MCINTOSH PORIS ARCHITECTS, HOUR DETROIT, & AUTHOR

SENSORY FRIENDLY RE-DESIGN APPROACHES

Re-designing Olin Detroit's materials and spatial floor plan to address sensory performance negatives requires a thoughtful approach that prioritizes accessibility, inclusivity, and user experience. One key aspect of this redesign involves revising seating arrangements to create more comfortable and accommodating spaces for individuals with sensory sensitivities. By incorporating flexible seating options, such as movable furniture and modular seating arrangements, Olin Detroit can provide individuals with the freedom to customize their environment based on their sensory needs and preferences. Additionally, creating designated quiet zones or sensory-friendly areas within public spaces can offer individuals a reprieve from sensory stimuli and promote relaxation and well-being.

Light diffusion plays a critical role in mitigating sensory overload and creating a more calming and soothing environment within Olin Detroit's urban spaces. By implementing strategies to diffuse harsh lighting and minimize glare, such as using diffused lighting fixtures, frosted glass, and adjustable window treatments, Olin Detroit can create a more visually comfortable environment for individuals with sensory sensitivities. Additionally, incorporating natural elements such as plants and greenery can help soften the visual landscape and promote a sense of connection to nature, further enhancing the overall sensory experience.

Material palette changes are another important aspect of re-designing Olin Detroit's urban spaces to address sensory performance negatives. By selecting materials that are soft, tactile, and non-intrusive, Olin Detroit can create a more inviting and sensory-friendly environment for individuals with autism and sensory sensitivities. Using natural materials such as wood, stone, and fabric can evoke a sense of warmth and comfort while minimizing sensory triggers such as harsh textures or loud patterns. Additionally, incorporating sound-absorbing materials such as acoustic panels and carpeting can help reduce noise levels and create a more tranquil and serene atmosphere.

Threshold sensory enhancements are crucial for ensuring a seamless and inclusive experience for individuals with sensory sensitivities as they navigate Olin Detroit's urban spaces. By eliminating physical barriers such as uneven surfaces, abrupt transitions, and narrow passageways, Olin Detroit can create a more accessible and welcoming environment for individuals

with sensory sensitivities as they navigate Olin Detroit's urban spaces. By eliminating physical barriers such as uneven surfaces, abrupt transitions, and narrow passageways, Olin Detroit can create a more accessible and welcoming environment for individuals with mobility impairments and sensory sensitivities. Additionally, providing clear signage, wayfinding cues, and sensory-friendly markers can help individuals navigate their surroundings more easily and confidently, reducing feelings of anxiety and uncertainty.



FIGURE: SKETCH PROBLEM 2, OLIN FLOOR PLAN RE-DESIGN, NEW FINISH PALETTE STUDY
SOURCE: MATERIALS BY MATERIAL BANK, MATERIAL PROCUREMENT BY AUTHOR



FIGURE: SKETCH PROBLEM 2, OLIN FLOOR PLAN RE-DESIGN, THRESHOLD STUDY
MODEL BY AUTHOR

EXISTING CONDITIONS

Mad Nice Detroit's calming material palette reflects its creative spirit. From exposed brick walls and industrial steel beams to colorful murals and eclectic artwork, the interior design of Mad Nice Detroit is a celebration of creativity, culture, and community. However, while these design elements contribute to the project's dynamic and visually striking atmosphere, they may also contribute to sensory overload and imbalance within the space.

The existing floor plans and sections of Mad Nice Detroit are characterized by open layouts, expansive areas, and diverse zones dedicated to various activities and functions. While this layout promotes flexibility, collaboration, and engagement, it may also present challenges in achieving sensory balance and accommodating individuals with sensory sensitivities. The lack of designated quiet spaces or sensory-friendly zones within the interior environment limits options for individuals seeking respite from sensory stimuli and may contribute to feelings of discomfort and overload.

Moreover, the abundance of visual and auditory stimuli within Mad Nice Detroit's interior spaces can be overwhelming for individuals with sensory sensitivities, leading to sensory overload and anxiety. The eclectic mix of colors, patterns, and textures, combined with the bustling atmosphere of the space, may create a chaotic and overstimulating environment that challenges individuals' ability to focus and engage. Additionally, the lack of acoustic treatments and sound-absorbing materials may exacerbate noise levels and contribute to auditory overload, further impacting individuals' sensory experiences.

To address the lack of sensory balance within the space, Mad Nice Detroit may consider implementing design strategies aimed at creating a more calming and harmonious environment. This could include incorporating soft, muted colors, natural materials, and diffused lighting to reduce visual clutter and create a more soothing atmosphere. Additionally, creating designated quiet zones or sensory-friendly areas within the interior environment can provide individuals with a retreat from sensory stimuli and promote relaxation and well-being.

By re-evaluating the existing material palette, floor plans, and sections of Mad Nice Detroit with a focus on sensory balance and inclusivity, the project can create a more welcoming and accommodating environment for all individuals,

including those with sensory sensitivities. By prioritizing sensory-friendly elements and incorporating feedback from individuals with diverse sensory needs, Mad Nice Detroit can foster a more inclusive and accessible space that celebrates creativity, culture, and community.



FIGURE: EXISTING FINISH PALETTE
SOURCE: PARINI DESIGN STUDIO



FIGURE: EXISTING MATERIALITY PHOTOS
SOURCE: PARINI DESIGN STUDIO

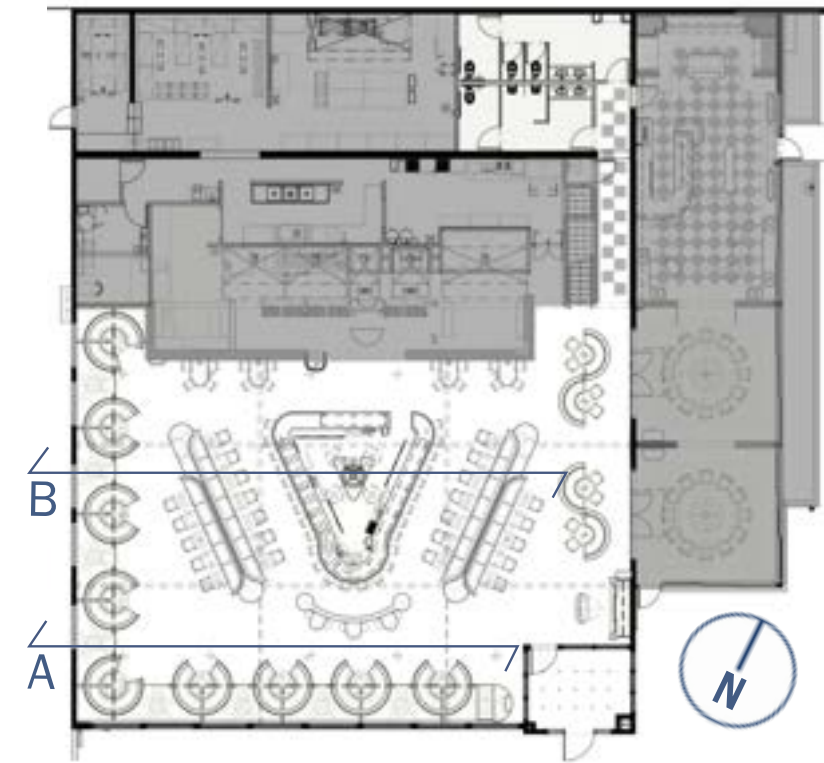
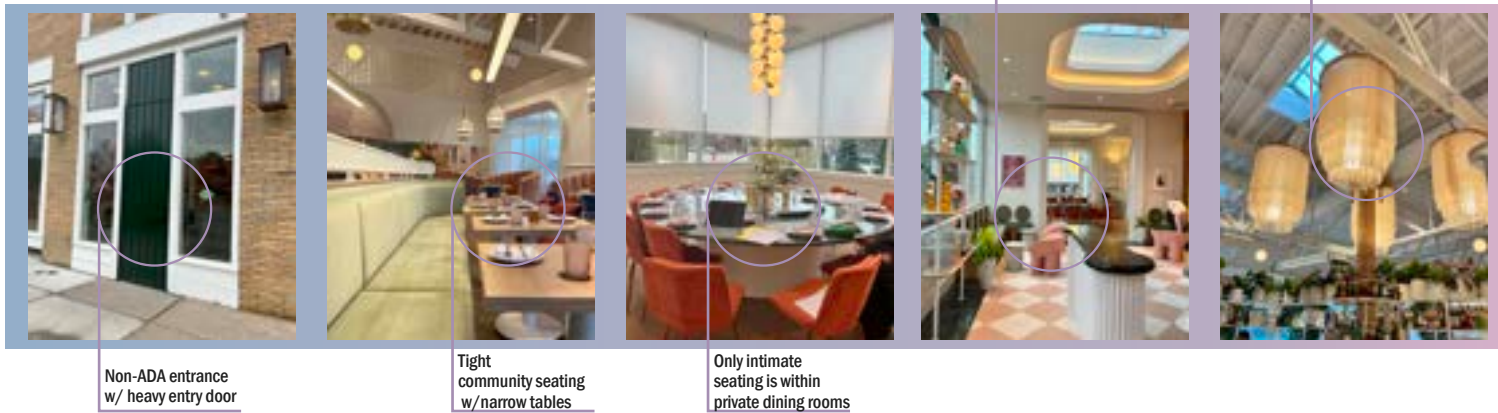


FIGURE: MAD NICE EXISTING FLOOR PLAN
SOURCE: PARINI DESIGN STUDIO



FIGURE: MAD NICE EXISTING SECTIONS
SOURCE: PARINI DESIGN STUDIO



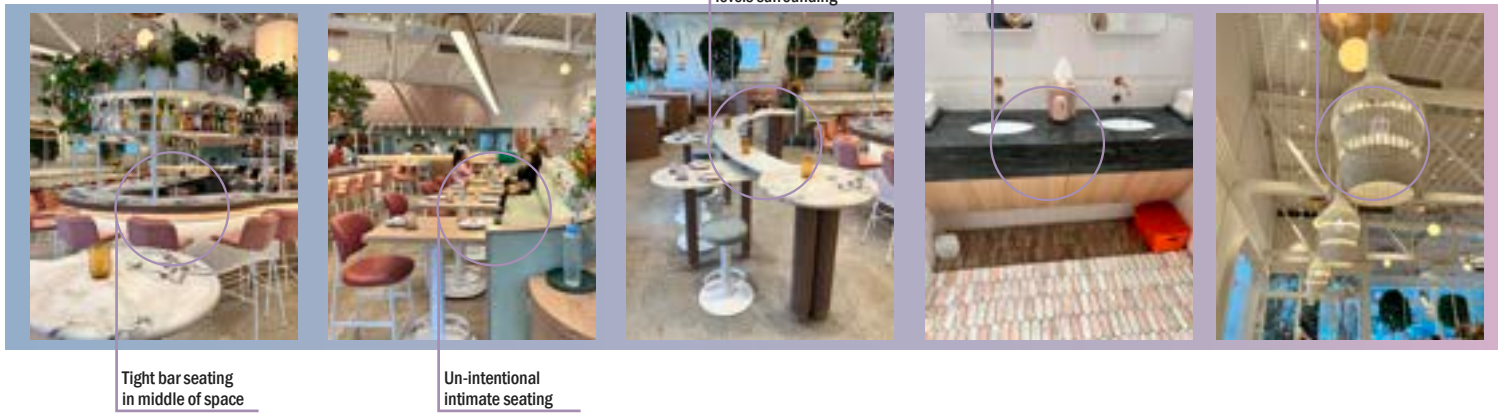
Non-ADA entrance w/ heavy entry door

Tight community seating w/narrow tables

Only intimate seating is within private dining rooms

Chaotic and uncomfortable seating

Over-powering light fixture in focal point of space



Tight bar seating in middle of space

Un-intentional intimate seating

Small and uncomfortable seating w/ high sound levels surrounding

Possible wheelchair accessibility disruption

Distracting light fixture w/ little diffusion



Lack of light fixture cohesion through space

Tactile friendly intimate seating

Tight seating

Excessive amount of down lights at tables

Lack of sound barrier at seating arrangement transitions



Distracting dinner time lighting

Efficient amount of circulation between seating arrangements

Tight circulation for wait staff

Distracting amount of different light fixtures

Crowded seating

FIGURE: MAD NICE SITE OBSERVATION AT 8:30PM ON A SATURDAY
PHOTOS BY AUTHOR

SITE OBSERVATIONS

Observing Mad Nice Detroit on a Thursday afternoon and Saturday night reveals stark differences in sensory balance and overall ambiance within the space. On a Thursday afternoon, the atmosphere is relatively calm and subdued, with muted lighting, moderate noise levels, and ample seating available. The seating arrangements are spaced out, allowing for a sense of openness and comfort, and the crowd is sparse, creating a relaxed and leisurely environment. However, despite the relatively quiet and uncrowded conditions, there is a noticeable lack of energy and vibrancy in the space, contributing to a somewhat hibernating atmosphere.

In contrast, visiting Mad Nice Detroit on a Saturday night presents a starkly different sensory experience. The lighting is brighter and more dynamic, with colorful neon signs, flashing lights, and vibrant projections illuminating the space. The noise level is significantly higher, with music playing loudly, conversations overlapping, and the sounds of clinking glasses and laughter filling the air. The seating arrangements are closer together, and the space feels more crowded and chaotic, with patrons jostling for space and competing for attention. However, despite the lively and energetic atmosphere, the sensory overload can be overwhelming for individuals with sensory sensitivities, leading to feelings of discomfort and anxiety.

The differences in sensory balance between Thursday afternoon and Saturday night highlight the challenges of achieving a harmonious and inclusive environment within Mad Nice Detroit's interior space. While the subdued lighting and moderate noise

levels on Thursday afternoon create a more comfortable and relaxing atmosphere, they also contribute to a lack of energy and excitement, detracting from the overall experience. Conversely, while the bright lights and lively music on Saturday night create a vibrant and dynamic atmosphere, they can also be overwhelming and overstimulating for individuals with sensory sensitivities, detracting from the overall accessibility and inclusivity of the space.

Moreover, the crowded seating arrangements on Saturday night exacerbate feelings of sensory overload and discomfort, making it difficult for individuals to find respite from sensory stimuli and navigate the space comfortably. The lack of designated quiet zones or sensory-friendly areas further limits options for individuals seeking relief from sensory overload, contributing to feelings of exclusion and isolation. Additionally, the lack of consideration for diverse sensory needs and preferences within Mad Nice Detroit's interior design undermines its potential as a welcoming and inclusive space for all individuals, regardless of their sensory abilities.

Overall, the site observations of Mad Nice Detroit on a Thursday afternoon and Saturday night underscore the importance of achieving a balanced and inclusive sensory environment within the space. By addressing the differences in lighting, sound, seating arrangements, and crowded seating between different times of day, Mad Nice Detroit can create a more accessible and accommodating environment that celebrates diversity and promotes equal access for all patrons, including those with sensory sensitivities.

FIGURE: MAD NICE SITE OBSERVATION AT 3:30PM ON A THURSDAY
PHOTOS BY AUTHOR

AREAS OF SENSORIAL TRIGGERS

For a non-verbal autistic person, the sensory experience within Mad Nice Detroit may be overwhelming and challenging due to a variety of sensory triggers present in the environment. One potential trigger is the lighting, which can be bright, dynamic, and constantly changing, with colorful neon signs, flashing lights, and vibrant projections illuminating the space. These intense visual stimuli may be disorienting and distressing for individuals with sensory sensitivities, leading to feelings of discomfort and anxiety.

Another sensory trigger within Mad Nice Detroit is the noise level, which can be significantly higher during peak hours, such as Saturday night. Loud music, conversations overlapping, and the sounds of clinking glasses and laughter can create a cacophony of auditory stimuli that is difficult for non-verbal autistic individuals to process. The constant background noise and lack of auditory breaks may contribute to sensory overload and make it challenging for individuals to focus and engage in the environment.

Moreover, the crowded and chaotic nature of Mad Nice Detroit's interior spaces can be overwhelming for non-verbal autistic individuals, who may struggle with sensory processing and spatial awareness. The close proximity of seating arrangements, the bustling atmosphere, and the constant movement of people can create a sense of claustrophobia and discomfort, exacerbating feelings of sensory overload and anxiety. Additionally, the lack of clear pathways and designated quiet zones further limits options for individuals seeking respite from sensory stimuli and navigating the space comfortably.

Furthermore, the eclectic mix of colors, patterns, and textures within Mad Nice Detroit's interior design may be overwhelming for non-verbal autistic individuals, who may be hypersensitive to visual stimuli. The visual clutter and sensory overload can be disorienting and distracting, making it difficult for individuals to focus and engage in the environment. Additionally, the lack of predictability and routine within Mad Nice Detroit's interior spaces may contribute to feelings of anxiety and uncertainty for non-verbal autistic individuals, who may rely on familiar environments and routines to feel comfortable and secure.

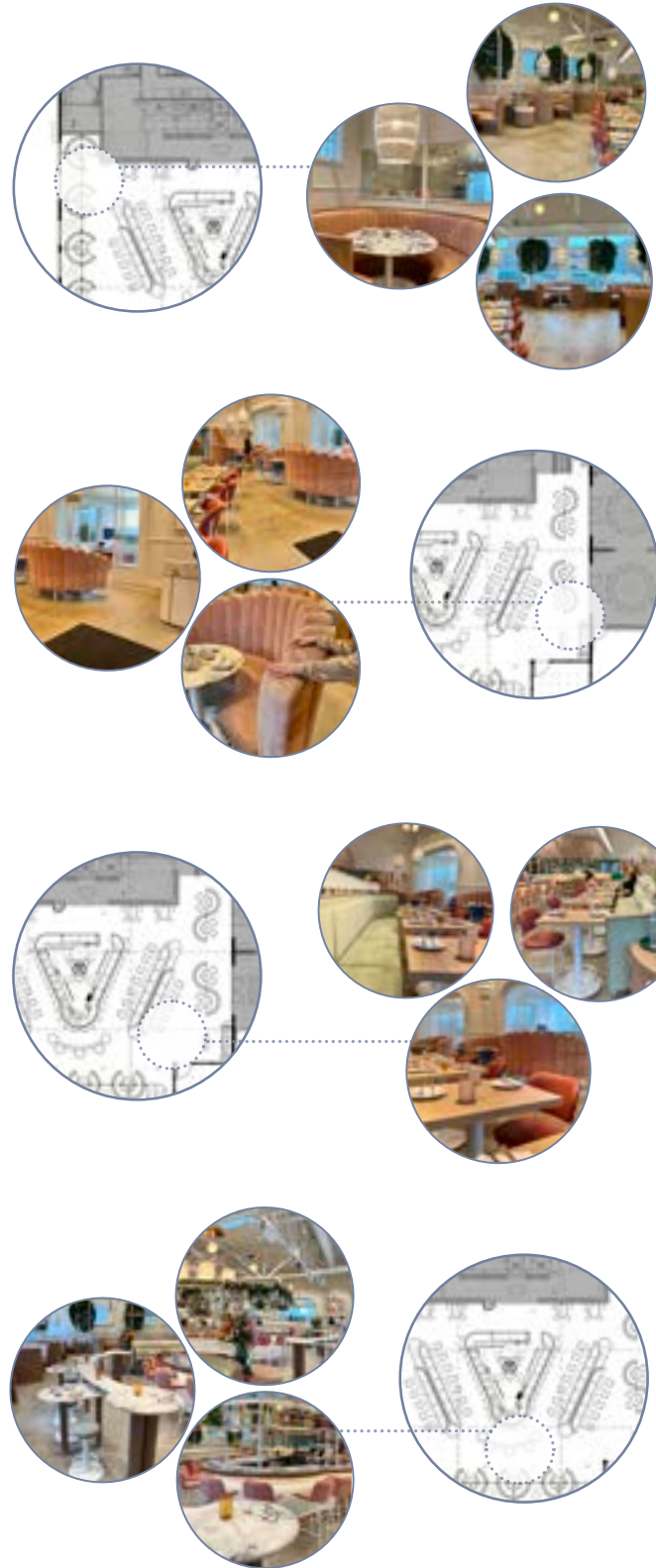


FIGURE: MAD NICE AREAS OF SENSORIAL TRIGGERS ANALYSIS
SOURCE: BACKGROUNDS BY PARINI DESIGN STUDIO, PHOTOS BY AUTHOR

CHAPTER V: A MORE INCLUSIVE DESIGN APPROACH

Through this chapter, two approaches to improving the sensory performance of Mad Nice Detroit will be introduced. These approaches will offer diverse strategies to enhance the overall experience for all patrons, including those with autism and sensory sensitivities. The first approach adopts a less invasive strategy, focusing on optimizing the existing interior space to create a more comfortable and accommodating environment. This approach aims to maintain the majority of the existing elements within Mad Nice Detroit while implementing targeted interventions to improve the sensory experience.

In the less invasive approach, one key focus is on increasing the amount of intimate seating within the space to provide individuals with autism and sensory sensitivities with a sense of comfort and security. This may involve reconfiguring existing seating arrangements to create smaller, more secluded seating areas that offer privacy and relaxation. By providing intimate seating options, Mad Nice Detroit can offer individuals with autism a retreat from sensory stimuli and promote a sense of calm and well-being. Additionally, the less invasive approach seeks to enhance egress and circulation through the space to improve accessibility and ease of movement for individuals with autism and sensory sensitivities. This may involve widening aisles, creating clear pathways, and reducing congestion in high-traffic areas to minimize sensory overload and promote a more comfortable and inclusive environment.

Next, the second approach takes a more invasive approach to enhancing the sensory performance of Mad Nice Detroit, focusing on comprehensive materiality revisions and seating arrangements revamping. This approach involves eliminating a majority of the existing elements within the space and reimagining the interior design to create a more sensory-friendly environment. By completely revamping the material palette and seating arrangements, Mad Nice Detroit aims to create a more harmonious and inclusive atmosphere that celebrates diversity and promotes equal access for all patrons, including those with autism and sensory sensitivities.



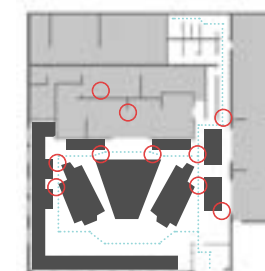
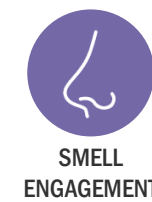
FIGURE: MAD NICE AREAS CUSTOMER EXPERIENCE
SOURCE: INTERVIEWS WITH CUSTOMERS HELD BY AUTHOR

EXISTING SENSORY ENGAGEMENT

Inside Mad Nice Detroit, sensory engagement can be overwhelming and disorienting, with the cacophony of colors, textures, and patterns assaulting patrons' senses. The mishmash of vibrant murals, eclectic artwork, and chaotic decor creates a visually chaotic environment that may leave patrons feeling visually overwhelmed and overstimulated. Rather than inviting exploration and discovery, the sensory overload within Mad Nice Detroit can lead to a sense of sensory fatigue and discomfort for individuals seeking respite from the visual onslaught.

Auditorily, Mad Nice Detroit bombards patrons with a barrage of sounds, from the pounding beats of music to the cacophonous chatter and laughter of patrons. The relentless audio assault contributes to the chaotic and frenetic atmosphere of the space, making it difficult for individuals to focus and

engage in meaningful conversation. For individuals with sensory sensitivities, the overwhelming noise levels may be intolerable, exacerbating feelings of anxiety and discomfort and detracting from the overall experience. Inside Mad Nice Detroit, sensory engagement can be overwhelming and disorienting, with the cacophony of colors, textures, and patterns assaulting patrons' senses. The relentless audio assault contributes to the chaotic and frenetic atmosphere of the space, making it difficult for individuals to focus and engage in meaningful conversation. For individuals with sensory sensitivities, the overwhelming noise levels may be intolerable, exacerbating feelings of anxiety and discomfort and detracting from the overall experience.



MAJOR
TROUBLE AREAS

FIGURE: MAD NICE EXISTING SENSORY ENGAGEMENT DIAGRAMS
SOURCE: BACKGROUNDS, PARINI DESIGN STUDIO, ANALYSIS AND GRAPHICS BY AUTHOR

MATERIAL STUDIES

Creating two new material palettes for Mad Nice Detroit presents an opportunity to enhance sensory engagement, particularly for individuals with non-verbal autism. The first palette, centered on natural tones, prioritizes earthy colors such as warm browns, soft greens, and gentle blues. These colors evoke a sense of tranquility and harmony, creating a calming and soothing atmosphere within the space. By incorporating natural materials such as wood, stone, and woven fabrics, this palette promotes tactile stimulation and connection to the natural world, fostering a sense of comfort and well-being for individuals with non-verbal autism.

In contrast, the second material palette focuses on low-saturated colors with efficient tactile performance, aiming to minimize sensory overload and create a more balanced and inclusive environment. This palette features muted hues such as soft grays, pale blues, and subtle pastels, which provide visual interest without overwhelming the senses. Additionally, the materials selected offer efficient tactile performance, with smooth surfaces and soft textures that are gentle to the touch. By prioritizing low-saturated colors and tactile comfort, this palette creates a more sensory-friendly environment that promotes relaxation and engagement for individuals with non-verbal autism.

Both material palettes for Mad Nice Detroit aim to improve sensory engagement for individuals with non-verbal autism by creating environments that are calming, comfortable, and inclusive. By incorporating natural tones and textures or low-saturated colors with efficient tactile performance, these palettes offer diverse sensory experiences that cater to the unique needs and preferences of individuals with non-verbal autism. Through thoughtful material selection and design, Mad Nice Detroit can create environments that promote well-being, enhance sensory engagement, and foster a sense of belonging for all patrons, regardless of their sensory abilities.



FIGURE: MAD NICE MATERIAL PALETTE RE-DESIGN OPTIONS
SOURCE: MATERIALS BY MATERIAL BANK, MATERIAL PROCUREMENT BY AUTHOR



FIGURE: MAD NICE FLOOR PLAN RE-DESIGN, APPROACH 1
GRAPHICS BY AUTHOR

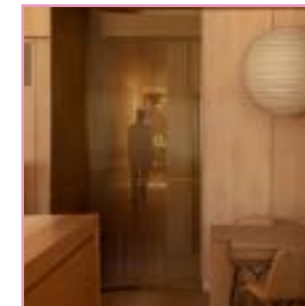


FIGURE: RE-DESIGN ELEMENTS COMPILATION
SOURCES: ARCH DAILY, MATERIAL BANK, LIGHTOLOGY, JUNIPER LIGHTING

APPROACH 1: LESS INVASIVE

The Less Invasive Approach to enhancing the sensory performance of Mad Nice Detroit involves a comprehensive strategy to improve various aspects of the interior environment while minimizing disruption to its existing layout and elements. One key intervention is the installation of a ceiling at 10 feet above the finish floor. This addition helps define the spatial volume of the space, creating a more contained atmosphere that can help reduce sensory overload by minimizing visual clutter and providing a sense of enclosure. By maintaining the existing architectural framework, this intervention seamlessly integrates with the space's design while enhancing its sensory experience.

Additionally, the renovation of the private dining room contribute to better egress and circulation within Mad Nice Detroit. This reconfiguration opens up the space, allowing for smoother flow of traffic and easier navigation for patrons. By optimizing the layout, congestion is reduced, promoting a more comfortable and inclusive environment for all visitors, including those with sensory sensitivities.

Improvements to the bathroom hallway egress further enhance the functionality and comfort of Mad Nice Detroit. By optimizing this area, patrons can access restroom facilities more easily, reducing wait times and minimizing feelings of frustration or discomfort. This simple yet effective intervention enhances the overall experience for all patrons, contributing to a more welcoming and inclusive atmosphere.

The installation of wood flooring adds a tactile element to Mad Nice Detroit's interior, enhancing sensory engagement and comfort. Wood flooring provides a warmer and more inviting surface for patrons to walk on, promoting a sense of grounding and connection to the space. This subtle yet impactful change enhances the overall sensory experience, contributing to a more pleasant and enjoyable atmosphere for all visitors.

Moreover, replacing the chandelier at the bar area with a diffused lighting fixture helps to improve the lighting elements within Mad Nice Detroit. The diffused lighting creates a softer and more ambient atmosphere, reducing glare and creating a more comfortable environment for patrons. This adjustment enhances visual comfort and promotes relaxation, contributing to a more positive sensory experience for individuals with sensory sensitivities.

In addition to these interventions, the incorporation of CNC routed wood sensory walls and re-imagined booth seating offers opportunities for intimate and secluded seating arrangements within Mad Nice Detroit. These sensory walls create designated quiet zones where patrons can relax and recharge away from the hustle and bustle of the main areas. By strategically placing these elements throughout the space, Mad Nice Detroit can create a more inclusive and accommodating environment for individuals with sensory sensitivities.

Overall, the Less Invasive Approach to enhancing the sensory performance of Mad Nice Detroit achieves significant improvements in egress, circulation, intimate seating arrangements, sound levels, lighting elements, and reverb levels while preserving the majority of the existing elements within the space. By prioritizing thoughtful interventions and strategic design solutions, Mad Nice Detroit can create a more inclusive and welcoming environment that celebrates diversity and promotes equal access for all patrons, regardless of their sensory abilities.



FIGURE: MAD NICE FLOOR PLAN RE-DESIGN, APPROACH 2
GRAPHICS BY AUTHOR



FIGURE: RE-DESIGN ELEMENTS COMPILATION
SOURCES: ARCH DAILY, MATERIAL BANK, LIGHTOLOGY, JUNIPER LIGHTING

APPROACH 2: MORE INVASIVE

The More Invasive Approach to enhancing the sensory performance of Mad Nice Detroit involves a comprehensive overhaul of the interior space, prioritizing improvements to egress, circulation, intimate seating arrangements, sound levels, lighting elements, and reverb levels. Unlike the Less Invasive Approach, this strategy does not focus on preserving the existing elements within the space but instead seeks to create a completely reimagined environment that prioritizes the sensory experience, particularly for individuals with non-verbal autism. While striving to maintain the overall Mad Nice aesthetic, this approach involves significant changes to the layout, design, and functionality of the space to achieve its sensory enhancement goals.

One of the key interventions in the More Invasive Approach is the installation of a ceiling at 10 feet above the finish floor. This addition helps define the spatial volume of the space, creating a more enclosed and contained atmosphere that can help reduce sensory overload by minimizing visual clutter and providing a sense of enclosure. Additionally, the removal of existing elements such as partial bar and booth seating allows for greater flexibility in reimagining the layout to better accommodate the needs of individuals with sensory sensitivities.

The removal and renovation of the private dining room contribute to better egress and circulation within Mad Nice Detroit. By reconfiguring this area and potentially repurposing it for other uses, such as a sensory-friendly lounge or relaxation area, the space can be better utilized to provide patrons with a more inclusive and accommodating environment.

Moreover, the incorporation of more greenery within the interior space can help create a calming and soothing atmosphere, promoting a connection to nature and providing visual interest. By strategically placing plants throughout the space, Mad Nice Detroit can create designated areas of respite and relaxation, where patrons can escape from the hustle and bustle of the main areas and enjoy a moment of tranquility.

Similar to Approach 1, installation of wood flooring adds a tactile element to Mad Nice Detroit's interior, enhancing sensory engagement and comfort. This subtle yet impactful change enhances the overall sensory experience, contributing to a more pleasant and enjoyable atmosphere for all visitors.

Furthermore, replacing the chandelier at the bar area with a diffused lighting fixture helps to improve the lighting elements within Mad Nice Detroit. The diffused lighting creates a softer and more ambient atmosphere, reducing glare and creating a more comfortable environment for patrons. This adjustment enhances visual comfort and promotes relaxation, contributing to a more positive sensory experience for individuals with sensory sensitivities.

In addition to these interventions, the incorporation of CNC routed wood sensory walls and reimagined booth seating offers opportunities for intimate and secluded seating arrangements within Mad Nice Detroit. These sensory walls create designated quiet zones where patrons can relax and recharge away from the hustle and bustle of the main areas. By strategically placing these elements throughout the space, Mad Nice Detroit can create a more inclusive and accommodating environment for individuals with sensory sensitivities.

Overall, the More Invasive Approach to enhancing the sensory performance of Mad Nice Detroit involves significant changes to the layout, design, and functionality of the space to achieve its sensory enhancement goals. By prioritizing improvements to egress, circulation, intimate seating arrangements, sound levels, lighting elements, and reverb levels, this approach aims to create a more inclusive and accommodating environment that celebrates diversity and promotes equal access for all patrons, regardless of their sensory abilities.

CHAPTER VI: A NEW NORMAL

The third approach is an inclusive design theory to enhancing the sensory performance of Mad Nice Detroit and by incorporating considerations for various disabilities into the overall redesign of the space. In addition to addressing the needs of individuals with non-verbal autism, this approach recognizes the importance of creating an inclusive environment that accommodates a range of sensory, mobility, and cognitive abilities. By integrating features and design elements that cater to diverse needs, Mad Nice Detroit can become a truly accessible and welcoming destination for all patrons.

One aspect of this approach involves optimizing the layout and design of the space to improve accessibility for individuals with mobility impairments. This may include widening doorways, installing ramps or lifts for wheelchair access, and ensuring that pathways are clear and obstacle-free. By removing barriers to entry and navigation, Mad Nice Detroit can ensure that all patrons can move through the space comfortably and independently, regardless of their mobility limitations.

Furthermore, the third approach to enhancing sensory performance may incorporate features specifically designed to address the needs of individuals with visual or hearing impairments. This could involve implementing signage and wayfinding systems that are accessible to individuals with low vision or blindness, such as Braille signage and tactile maps. Additionally, the space may be equipped with assistive listening devices and captioning services to ensure that individuals with hearing impairments can fully engage with the audio elements of the environment. By considering the needs of individuals with visual and hearing disabilities, Mad Nice Detroit can create a more inclusive and welcoming environment that promotes equal access and participation for all patrons.

APPROACH 3: MOST INVASIVE

In integrating considerations for mobility and hearing disabilities into the redesign of Mad Nice Detroit, the focus shifts towards creating a new standard of architectural design that prioritizes universal accessibility and inclusivity. One aspect of this approach involves implementing features that cater to individuals with mobility impairments, such as wider doorways, accessible seating options, and strategically placed handrails. By ensuring that the space is navigable and usable for individuals with mobility limitations, Mad Nice Detroit can set a precedent for other establishments to follow suit, promoting a more inclusive built environment.

Furthermore, the inclusion of features specifically designed to address the needs of individuals with hearing impairments can significantly enhance the overall accessibility of Mad Nice Detroit. This may include the installation of hearing loop systems that transmit audio directly to hearing aids or cochlear implants, as well as the provision of captioning services for patrons who are deaf or hard of hearing. By making these accommodations standard practice, Mad Nice Detroit can demonstrate a commitment to accessibility and equality, setting a new standard for architectural design that prioritizes the needs of all individuals.

Moreover, the consideration of the elderly population in the redesign of Mad Nice Detroit can further enhance its accessibility and inclusivity. This may involve incorporating features such as slip-resistant flooring, comfortable seating with adequate support, and easily accessible restrooms equipped with grab bars and other safety features. By creating a space that caters to the needs of older adults, Mad Nice Detroit can create a welcoming and accommodating environment for individuals of all ages, promoting social inclusion and engagement.

Additionally, the incorporation of universal design principles into the architectural standards of Mad Nice Detroit can benefit individuals with a wide range of abilities and disabilities. Universal design focuses on creating environments that are usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. By adopting universal design principles, Mad Nice Detroit can create a space that is inherently accessible and inclusive, accommodating the needs of individuals with disabilities as well as those without.

Furthermore, the integration of sensory-friendly design elements can benefit individuals with a range of sensory sensitivities and preferences, including those with autism, sensory processing disorders, and anxiety. This could involve implementing features such as adjustable lighting systems, sound-absorbing materials, and designated quiet zones where patrons can retreat from sensory overload. By creating a more comfortable and adaptable sensory environment, Mad Nice Detroit can cater to the diverse needs of its patrons, promoting a more inclusive and welcoming atmosphere for all.

In conclusion, the third approach to enhancing the sensory performance of Mad Nice Detroit by overlaying considerations for mobility, hearing disabilities, and the elderly population represents a significant step towards creating a new normal in architectural design standards. By prioritizing universal accessibility and inclusivity, Mad Nice Detroit can set a precedent for other establishments to follow, promoting social inclusion and equal access for individuals of all abilities. Through thoughtful design and consideration of diverse needs, Mad Nice Detroit can create a space that celebrates inclusivity, diversity, and equality, serving as a model for future architectural projects.



FIGURE: APPROACH 3, DISABILITIES CHOSEN
GRAPHICS BY AUTHOR

CHAPTER VII: CLOSING

In conclusion, the exploration of sensory engagement within the built environment reveals a complex interplay between sensory stimuli, individual experiences, and architectural design. Throughout this journey, we have delved into the concept of sensory balance and its crucial role in promoting comfort, well-being, and inclusivity for all individuals. We have examined the myriad triggers that can lead to sensory overload and overstimulation, particularly for those living with autism or non-verbal autism, shedding light on the challenges they face in navigating and experiencing the world around them.

Central to our discussion has been the recognition of the profound impact that architectural design can have on sensory experiences. Despite this, there remains a significant lack of knowledge and awareness regarding autism within the architectural world, resulting in a dearth of sensory-positive design standards. This deficiency perpetuates environments that are often overwhelming, disorienting, and inaccessible for individuals with sensory sensitivities, exacerbating feelings of isolation and exclusion.

Nevertheless, our exploration has also uncovered glimpses of hope and potential avenues for change. By acknowledging the unique needs and preferences of individuals with autism and non-verbal autism, architects and designers can begin to pave the way towards a more inclusive and accommodating built environment. Through thoughtful consideration of sensory triggers and the implementation of sensory-friendly design principles, spaces can be transformed into havens of comfort and tranquility, where individuals of all abilities can thrive and flourish.

Moving forward, it is imperative that the architectural community prioritizes education and awareness surrounding autism and sensory sensitivities. By fostering interdisciplinary collaboration and dialogue between architects, researchers, healthcare professionals, and individuals with lived experience, we can collectively work towards developing evidence-based design guidelines and standards that prioritize sensory well-being and accessibility.

Moreover, architects must embrace a paradigm shift towards a more human-centric approach to design, one that places the needs and experiences of individuals at the forefront of the creative process. By actively involving end-users in the design process and soliciting their feedback and insights, architects can gain invaluable perspectives that inform more empathetic and responsive design solutions.

Ultimately, the journey towards creating sensory-positive built environments is one of continuous learning, adaptation, and advocacy. It is a journey that demands openness, humility, and a commitment to fostering environments that celebrate diversity, promote inclusivity, and empower individuals to fully engage with the world around them. As we embark on this journey together, let us strive towards a future where every space is a sanctuary of sensory balance, where every individual feels seen, heard, and valued, and where the built environment becomes a catalyst for positive social change.

Thank you.

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CDC	CENTER FOR DISEASE CONTROL AND PREVENTION
NVA	NON-VERBAL AUTISM
ASD	AUTISM SPECTRUM DISORDER
NEI	NATIONAL EYE INSTITUTE
PPDNOS	PERVASIVE DEVELOPMENTAL DISORDER-NOT OTHERWISE SPECIFIED
W/	WITH

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