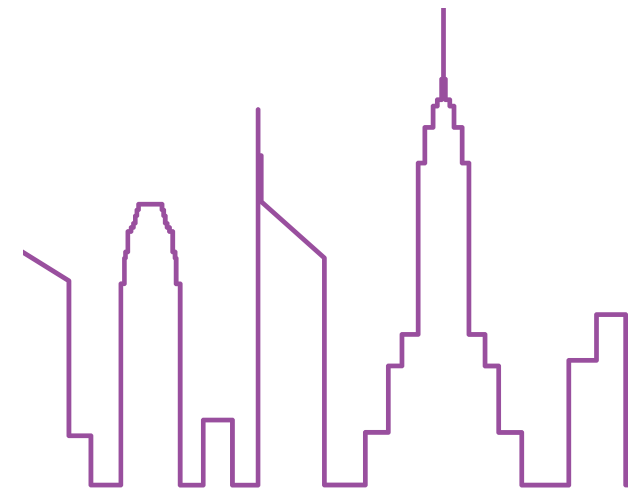


HKS

Creating a Brain Healthy Workplace
Through a Neurodiversity Lens:
An Autistic Brain



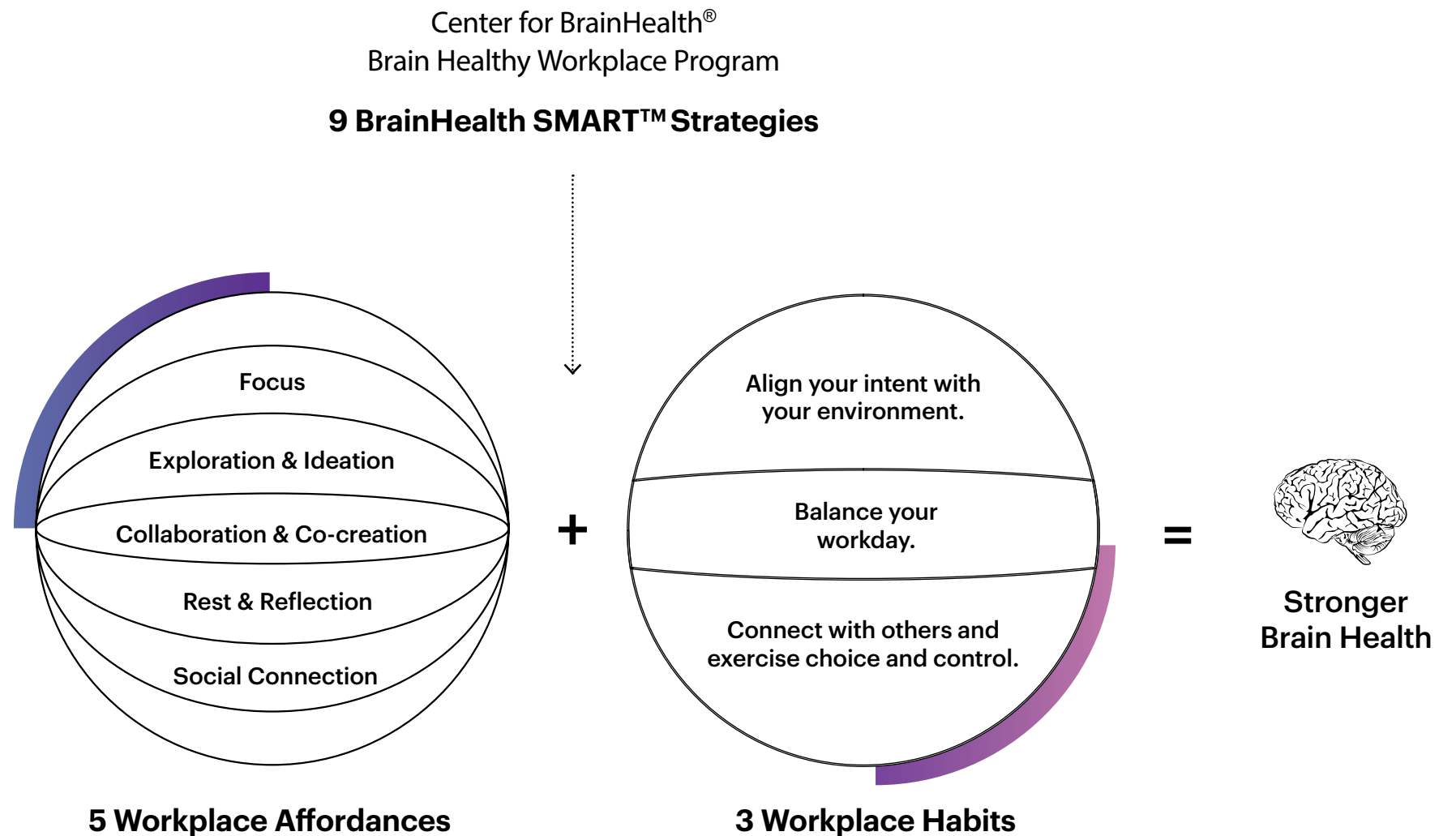
INTRODUCTION

A Neurodiversity Lens on Brain Health

This is an extension to the HKS Creating a Brain Healthy Workplace report, specifically addressing the needs of neurodivergent individuals. We reviewed the framework on getting to brain health outcomes (9 strategies, 5 affordances, and 3 habits summarized on the right) to validate its applicability and identify gaps and opportunities from a neurodiversity lens. Our approach was to review literature and reach out to volunteer HKS neurodivergent employees for their input, expertise, and stories to share here.

We acknowledge that there is a wealth of evidence in this area that should be further leveraged depending on the context. While strategies are currently tailored to neurodivergent individuals already in the workforce, our hope is that implementing these strategies will create a more inclusive environment overall.

This may eventually extend support to individuals who need more assistance and/or are not in the workforce. This work should not be considered as guidelines or a prescription for neurodiversity-friendly workplaces. Rather, it is intended as a conversation starter to help include neurodivergent people and their needs in the workplace and make space for those needs through place-making.



An Autistic Brain

Autism is a neurodevelopmental condition related to brain development that impacts how a person perceives and socializes with others, influencing communication, learning, behavior, and sensitivities.¹ The medical model (DSM-5) categorizes autism by severity levels based on the amount of support needed by an individual which focuses on deficits. More recently, a social model that focuses on the unique strengths of autistic people is increasingly acknowledged and accepted.²

The content included here covers some commonalities but autism experiences and strengths may differ significantly. We highlight how we can work together to create a brain healthy workplace that is neuroinclusive by incorporating more engagement, agency, and understanding.

Autism Strengths

- Higher visual capacity that may detect and identify anomalies³
- Deliberative processing that may be slower, effortful, and have a meticulous style of thinking⁴
- Higher auditory capacity to perceive sounds in the environment⁵

Autism Numbers

80 million
people worldwide are diagnosed with autism⁶

5.4 million
of the adults in the United States are diagnosed with autism⁷

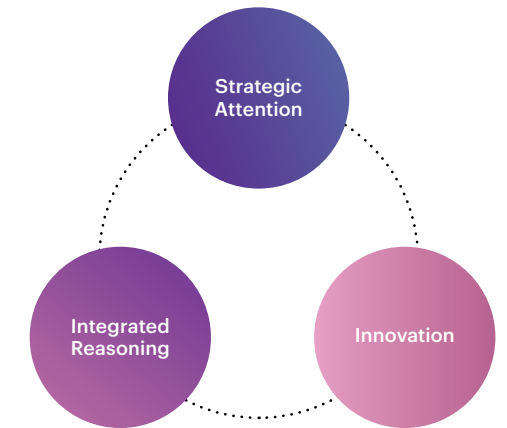
80%
of autistic people are unemployed globally⁸

55%
in the United States find themselves jobless within 6 years of graduating high school⁹

Activating Brain Health Strategies in the Workplace

We can thrive in the workplace together. Here are some conversation starters that translate research findings related to brain health strategies.* Note that there are significant individual differences amongst autistic people and not all may apply.

*Adapted from the Center for BrainHealth® Strategic Memory Advanced Reasoning Tactics (SMART™)¹⁰



Brainpower of Two Prioritized Tasks

Autistic individuals may struggle with prioritizing tasks and/or identifying the most pertinent information.¹¹

How can managers work with employees to effectively communicate priorities and critical information?

Brainpower of One Single Tasking

Performing one task at a time is beneficial and may be preferred for autistic individuals. Multi-tasking can be a challenge.¹²⁻¹⁴

How can we maintain focus and quality when there are frequent project shifts?

Brainpower of None Brain Breaks

Taking intentional breaks during the workday can help manage sensory overload and stress for autistic individuals.¹⁵

What spatial and policy considerations can help facilitate decompression?

Zoom In What

Focusing on key details aligns with the strength of many autistic individuals, who often pay great attentions to details.¹⁶

What strategies can help balance the team's collective ability?

Zoom Out So What

Autistic individuals might get sidetracked with smaller details and forget about the big picture or the gist of the project.¹⁷

How can the big picture (i.e. goals and objectives) be clearly communicated throughout the task duration?

Zoom Deep & Wide Now What

Holistic processing can be a challenge because of difficulties to integrate diverse information sources into coherent interpretation.¹⁸

What tools can help organize information for easier pattern recognition?

Brainpower of Unknown Curiosity

Autistic individuals successfully engage in curiosity and challenge the status quo when fostering interest-based motivation.¹⁹

What piques interest and motivates autistic people to engage in projects as needed?

Brainpower of Paradox Lessons Learned

Error-correction is effective for autistic learners when mentors model correct responses without requiring active feedback from the learner.²⁰

How can we enable learning through observation without the stress of immediate action?

Brainpower of Infinite Endless Options

Cognitive flexibility can be a challenge, which includes difficulty in shifting perspectives or adapting to new cognitive strategies.²¹

How can we improve outreach to incorporate diverse perspectives?

5 Affordances

Autistic employees may have specific needs when searching for brain healthy workplace affordances (i.e., how we perceive environments to meet our needs). We reviewed scientific literature for supporting evidence and interviewed HKS autistic employees that volunteered to share their experience.

"We need to have more options in and out of the office - understanding the best pairing of where to do different types of work will get most people to be their best selves."

Key Considerations

- Involve individuals with sensory sensitivities in the design process to ensure their needs are met.²²
- Minimize distractions.²³
- Use dimmable lights or multiple light levels to allow for customization.²⁴
- Support both structured and flexible collaboration methods.²⁵
- Offer private spaces for rest and refuge.²⁶



Exploration & Ideation

Sensory sensitivities of autistic individuals and how they process information can vary. Therefore, their needs and preferences for creative stimulation are different. Virtual spaces for exploration for autism is an emerging trend to accommodate for each individual's specific sensory needs.^{27, 28}

Social Connection

Autistic individuals may prefer more structured social interactions with respect to their need for solitude.^{29, 30} Communities and social networking opportunities for autistic individuals to express themselves can help form meaningful connections.

"Some days I can handle work challenges better than others. But having a place to regress to and decompress would be really good - places like the wellness room are great."

Collaboration & Co-creation

Social interactions can be challenging for autistic individuals. Workplaces that provide clear guidelines for collaboration and offer a variety of communication methods (including virtual, non-verbal, or asynchronous communication) can be more inclusive for autistic people.³¹

Focus

Heightened sensitivity to sensory inputs like noise, light, or movement, can challenge autistic people's ability to focus. They may seek environments that minimize distractions and allow control over sensory inputs. Diminished Reality (a computer-aided reality process that removes, conceals, or eliminates objects) spaces have also emerged to help filter out irrelevant visual information.²⁶

Autistic Employee Insight: Focus spaces that have a level of control over sensory stimulation can be helpful and reduce energy depletion.

Rest & Reflection

Many aspects of the workplace can be overwhelming for autistic individuals. Spaces that autistic individuals can privately retreat to that are quiet can help regulate overstimulation.³²

Autistic Employee Insight: Access to rest (or transition) spaces are critical in restoring depleted energy depletion throughout the day.



3 Habits

Autistic employees may have workplace habits created to best support their needs. The timeline on the right illustrates an ideal brain healthy workday from one of our HKS autistic employees, tracking movements through various locations, both inside and outside the office, engaging in different activities. Below, we add an autistic lens to the brain healthy habits as supported by scientific literature for additional reference.

3 Brain Healthy Workplace Habits

Align your intent with your environment:

Autistic employees might thrive in a workplace that allows customization of their physical and digital spaces to minimize sensory overload and distractions.³³

Balance your workday:

This ideal day balances different activities over time. No empirical studies on the effect of aligning intent with your environment were found to-date for autism.

Connect with others and exercise choice and control:

Social interaction can be challenging for some autistic people, but it is also an important aspect of workplace dynamics. The emphasis on choice and control allows individuals to engage in social interactions on their own terms, which can be less overwhelming. Moreover, having the option to signal when not to be disturbed or choosing a workspace that limits distractions can be particularly beneficial for those who might struggle with sensory sensitivities or social communication.³⁴

What's your story?

Reflect on your own workday and the differing needs as you chart out your ideal day. Contact research@hksinc.com to request a template.

An Ideal Day from An HKS Autistic Employee

*Note: Images provided as examples by the HKS Autistic Employee.



11 AM
Work

My ideal day starts late morning when my brain is clear. I prefer the first hours to be quiet, focused on learning with small groups, and no large meetings. This is the time to get organized, gear up for the day, make task lists, and ask clarification questions.



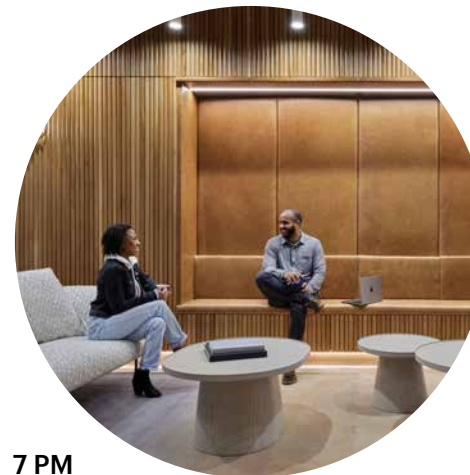
2 PM
Break

Time for lunch or time to decompress.



3 PM
Work

My brain is more active during the afternoon hours, making it best for larger meetings with more than three people.



7 PM
Break

Time for a break, exercise, eat, nap, or whatever.



8 PM
Work

My brain is at its peak hours in the evening to get heads-down focus time. I can accomplish a lot during this period.

10 PM
Wrap Up

Wrap up my day at the end.

Acknowledgements & References

This report was made possible by internal support from HKS, Inc. and the continued partnership with the Center for BrainHealth. Designing for neurodiversity in the workplace is an extremely important yet complex subject to address effectively. We truly appreciate the neurodivergent contributors for sharing their lived experiences and expert knowledge, which have been invaluable in educating us on designing for neurodiversity. We also extend our sincere gratitude to our reviewers for their careful and comprehensive feedback.

These efforts covered only Autism and ADHD due to the substantial literature and lived experiences available. While creating a brain-healthy workplace for other neurodivergent conditions is equally important, we will cover those in the future as more information becomes available.

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1. American Psychiatric Association (2013). Diagnostic and statistical manual of mental disorders, 5th Edn. Washington, DC: American Psychiatric Association Publishing.
2. Olkin, R. (2022, March 28). Conceptualizing disability: Three models of disability. American Psychological Association. <https://www.apa.org/ed/precollege/psychology-teacher-network/introductory-psychology/disability-models>
3. Swettenham, J., Remington, A., Murphy, P., Feuerstein, M., Grim, K., & Lavie, N. (2014). Seeing the unseen: autism involves reduced susceptibility to inattention blindness. *Neuropsychology*, 28(4), 563.
4. Brosnan, M., & Ashwin, C. (2023). Thinking, fast and slow on the autism spectrum. *Autism*, 27(5), 1245-1255.
5. Remington, A., & Fairnie, J. (2017). A sound advantage: Increased auditory capacity in autism. *Cognition*, 166, 459-465.
6. World Health Organization. (2023, November 15). Autism. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders>
7. Dietz, P. M., Rose, C. E., McArthur, D., & Maenner, M. (2020). National and state estimates of adults with autism spectrum disorder. *Journal of autism and developmental disorders*, 50, 4258-4266.
8. Roux, A. M., Rast, J. E., Anderson, K. A., & Shattuck, P. T. (2017). National autism indicators report: Developmental disability services and outcomes in adulthood. Life Course Outcomes Program, AJ Drexel Autism Institute, Drexel University.
9. Shattuck, P. T., Narendorf, S. C., Cooper, B., Sterzing, P. R., Wagner, M., & Taylor, J. L. (2012). Postsecondary education and employment among youth with an autism spectrum disorder. *Pediatrics*, 129(6), 1042-1049.
10. Center for BrainHealth. <https://centerforbrainhealth.org/>
11. Lattimore, L. P., Parsons, M. B., & Reid, D. H. (2003). Assessing preferred work among adults with autism beginning supported jobs: Identification of constant and alternating task preferences. *Behavioral Interventions: Theory & Practice in Residential & Community Based Clinical Programs*, 18(3), 161-177
12. García-Villamizar, D., & Sala, S. D. (2002). Dual-task performance in adults with autism. *Cognitive neuropsychiatry*, 7(1), 63-74.
13. Dodwell, A., & Trick, L. M. (2020). The effects of secondary tasks that involve listening and speaking on young adult drivers with traits associated with autism spectrum disorders: A pilot study with driving simulation. *Transportation research part F: traffic psychology and behaviour*, 69, 120-134.
14. Rajendran, G., Law, A. S., Logie, R. H., Van Der Meulen, M., Fraser, D., & Corley, M. (2011). Investigating multitasking in high-functioning adolescents with autism spectrum disorders using the Virtual Errands Task. *Journal of Autism and Developmental Disorders*, 41, 1445-1454.
15. Marwati, A., Dewi, O. C., & Wiguna, T. (2021, January). Visual-sensory-based quiet room for reducing maladaptive behavior and emotion in autistic individuals: A review. In *International Conference on Health and Medical Sciences (AHMS 2020)* (pp. 265-269). Atlantis Press.
16. Alink, A., & Charest, I. (2020). Clinically relevant autistic traits predict greater reliance on detail for image recognition. *Scientific Reports*, 10(1), 14239.
17. Barnes, J. L., & Baron-Cohen, S. (2012). The big picture: Storytelling ability in adults with autism spectrum conditions. *Journal of autism and developmental disorders*, 42, 1557-1565.
18. López, B., Donnelly, N., Hadwin, J., & Leekam, S. (2004). Face processing in high functioning adolescents with autism: Evidence for weak central coherence. *Visual Cognition*, 11(6), 673-688.
19. Kozunova, G. L., Sayfulina, K. E., Prokofyev, A. O., Medvedev, V. A., Rytikova, A. M., Stroganova, T. A., & Chernyshev, B. V. (2022). Pupil dilation and response slowing distinguish deliberate explorative choices in the probabilistic learning task. *Cognitive, Affective, & Behavioral Neuroscience*, 22(5), 1108-1129.
20. McGhan, A. C., & Lerman, D. C. (2013). An assessment of error correction procedures for learners with autism. *Journal of applied behavior analysis*, 46(3), 626-639.
21. Gould, E., Tarbox, J., O'Hara, D., Noone, S., & Bergstrom, R. (2011). Teaching children with autism a basic component skill of perspective taking. *Behavioral Interventions*, 26(1), 50-66.
22. Gaudion, K., Hall, A., Myerson, J., & Pellicano, L. (2015). A designer's approach: how can autistic adults with learning disabilities be involved in the design process?. *CoDesign*, 11(1), 49-69.
23. Sánchez, P. A., Vázquez, F. S., & Serrano, L. A. (2011). Autism and the built environment. *Autism spectrum disorders-From genes to environment*, 19, 363-380.
24. Interview with autistic employee. February 15th, 2024
25. Harnett, T. (2019). Issues in employment for autistic adults: open plan offices. *Good Autism Practice*, 20(2).
26. Focus group with autistic employees. February 13th, 2024.
27. Ringland, K. E., Boyd, L., Faucett, H., Cullen, A. L., & Hayes, G. R. (2017, June). Making in Minecraft: A means of self-expression for youth with autism. In *Proceedings of the 2017 conference on interaction design and children* (pp. 340-345).
28. Ringland, K. E. (2019, May). A place to play: the (dis) abled embodied experience for autistic children in online spaces. In *Proceedings of the 2019 CHI conference on human factors in computing systems* (pp. 1-14).
29. Castro, T., & Lucke, U. (2016). Socialization of people with autism through social networks. In *Universal Access in Human-Computer Interaction. Users and Context Diversity: 10th International Conference, UAHCI 2016, Held as Part of HCI International 2016, Toronto, ON, Canada, July 17-22, 2016, Proceedings, Part III 10* (pp. 193-202). Springer International Publishing.
30. Brownlow, C., Bertilsdotter Rosqvist, H., & O'Dell, L. (2015). Exploring the potential for social networking among people with autism: Challenging dominant ideas of 'friendship'. *Scandinavian Journal of Disability Research*, 17(2), 188-193.
31. Tomczak, M. T. (2022). How can the work environment be redesigned to enhance the well-being of individuals with autism?. *Employee Relations: The International Journal*, 44(6), 1467-1484.
32. Donarski K, Wood-Nartker J (2020) Calm in Chaos: Creating Refuge Spaces in the Theme Park Setting for People with Autism Spectrum Disorder and Post-Traumatic Stress Disorder. *J Phys Med Rehabil Disabil* 6: 046.
33. Palmer, C. J., Lawson, R. P., & Hohwy, J. (2017). Bayesian approaches to autism: Towards volatility, action, and behavior. *Psychological bulletin*, 143(5), 521.
34. Lindsay, S., Osten, V., Rezai, M., & Bui, S. (2021). Disclosure and workplace accommodations for people with autism: A systematic review. *Disability and rehabilitation*, 43(5), 597-610.

Key References

- BH addendum: Nanda, U., Chung, S., Guo, X., Lindberg, C., Sellers, K., Fallon, E., Zientz, J., & Chapman, S. B. (2023, February 23). Creating a Brain Healthy Workplace. HKS, Inc. Retrieved from <https://www.hksinc.com/how-we-think/>
- Gaines, K., Bourne, A., Pearson, M., & Kleibrink, M. (2016). *Designing for autism spectrum disorders*. Routledge.
- Mostafa, M. (2021, May 9). Retrieved May 28, 2024. https://issuu.com/magdamostafa/docs/the_autism_friendly_design_guide
- Neurodiversity: The new inclusivity. HOK Forward. (2023, July 17). <https://www.hokforward.com/read/inclusive-design-for-complex-buildings/neurodiversity-the-new-inclusivity/>
- Park, G., Nanda, U., Adams, L., Essary, J., & Hoelting, M. (2020). Creating and Testing a Sensory Well-Being Hub for Adolescents with Developmental Disabilities. *Journal of Interior Design*, 45(1), 13-32.
- Peditto, K. (2024, May 7). *Blueprint for the Mind: Creating Neuroinclusive Architectural Space*. Retrieved May 28, 2024. https://issuu.com/perkinswill/docs/neuroinclusion_guide