

ASI – Architecture for Sensory Integration; Architectural Intervention in Occupational Therapy

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I. EXTENDED ABSTRACT

This research proposes the use of architectural intervention in Sensory-Integration (SI) clinics to facilitate the environment in which SI therapy is conducted, so that the clinics respond to the unique nature of their users and are more conducive to successful treatment. Generally speaking, SI therapy requires very controlled environments to be effective, but many clinics providing this therapy are not designed to facilitate the required treatment. This paper will discuss how architectural design can meaningfully improve treatment results, by making more careful decisions with respect to the therapy space.

Sensory Processing – In General. Sensory processing is easy to define conceptually, but hard to describe. It is often defined as the organization of sensory input (Ayres, 2005). Our senses help us differentiate between positive and negative environmental stimuli by processing sensory cues and utilizing motor skills. Some people, however, cannot accurately integrate information from their senses and are inundated by their experiences, creating sensory-processing disorders (SPD) that impact day-to-day functioning severely. These disorders can affect anyone, but most frequently affect children. Occupational therapists, physical therapists, and speech pathologists often treat SPDs in SI clinics that aim to isolate sense-specific stimuli in what is referred to as SI therapy. This therapy requires a controlled environment that can cater to each patient's individual needs.

Despite ongoing research in SI therapy, clinics continue to suffer from a lack of mindful design. One consequence is that extraneous stimuli (e.g., street noise, harsh fluorescent lights) obscure the goal of focusing on a patient's controlled senses. The most obvious solution to this problem is to eliminate excess stimuli. This may be as simple as turning off a light, or providing a "quiet" area with adequate sound insulation. But what happens when you turn off a light yet there is still a strong glare shining through a skylight window, or the "quiet" space is adjacent to a street where ambulance sirens and truck horns blare incessantly? Simple solutions become less useful if the space doesn't accommodate varying degrees of sensitivity.

Intelligent Architectural Design for SI Clinics.

Understand the Disorders and Treatment. The first step in creating a successful SI clinic is to understand the disorder, analyze the methods of therapy, and then carefully plan a space that addresses both. Since no two people exhibit sensory disorders in the same way, any clinical space must be flexible enough to cater to a spectrum of sensitivities at any given time.

The Seven Senses. SI Therapy deals with the seven major senses of the human body: auditory (hearing), visual (sight), tactile (touch), olfactory (smell), gustatory (taste), proprioceptive (muscle/joints), and vestibular (gravity/movement). The vestibular and proprioceptive senses are unique in their complexity in that they communicate with each other and involve other senses.

Over and Under-stimulation. Any disorder in the senses can usually be categorized as "hypo" or "hyper," hypo being under stimulated and hyper being overstimulated.

Children Affected. Children are most often diagnosed with SPDs because symptoms occur between the ages of 0-7. SPDs are often co-morbid and occur with other disorders such as ADHD, Asperger's, Fragile X Syndrome, and most commonly Autism. As a result, SPDs are difficult to diagnose definitively and to treat. Each child presents their own unique set of sensory input which forces therapist to be flexible in their approach to practice as they adapt to every child's specific need.

Research on Architectural Design and SI Clinics. Due to the unique nature of SI disorders and limited resources regarding SI clinics, qualitative research was used to acquire a critical mass of information to inform a basis of design for architecturally programming SI clinics. The objective was to develop an architectural guideline for SI clinics catering to children ages 0-16. The research was conducted by visiting a number of SI clinics in Los Angeles,

<p>Hypo -Proprioceptive Have a high tolerance to stimulation, have difficulty relating to space. Often seek repetitive movements, spinning, rocking, banging into things, etc.</p>	<p>Hypo -Vestibular Often thrill seekers, constantly moving, poor balance, hyperactive.</p>
<p>Hyper -Proprioceptive difficulty processing information from joints and muscles, unaware of their own strength, clumsy.</p>	<p>Hyper -Vestibular Deals primarily with balance, individual may have blurry vision, a regular feeling of vertigo, disorientation.</p>

FIGURE 1- CHARACTERISTICS OF HYPO AND HYPER PROPRIOCEPTIVE AND VESTIBULAR DISORDERS

creating observation reports, conducting interviews, and taking surveys. By applying this research to architectural design, strategic interventions can be made to a typical SI clinic to address both the needs of the patient and the therapist, while addressing the nuances of sensory stimulation.

Design Criteria and Proposed Solutions

SI therapy focuses primarily on motor skills, which requires specialized gross and fine motor gyms and unique learning environments. Most SI clinics were found to only have one or two standalone gyms. However based on observations, the clinical setting benefited most from flexibility and variety which was difficult to achieve in limited space. The proposed alternative is to design a clinic that has a multiple number of gyms varying in size and function. These gyms should be interconnected as opposed to independent of each other to maximize flexibility while providing a multitude of environments that can be easily traversed or isolated. In this case, gyms should be programmed according to the hypo and hyper sensitive child, and provide a variety of small pocket sensory spaces that can facilitate these users in addition to the larger gym spaces. With the gym as the primary space of the clinic it provides the foundation for which the remaining program can support, such as offices, waiting rooms, observations spaces, etc. In doing so, the hierarchy of programming is established to delineate the circulation of the occupants within the facility and ease wayfinding. Once these basic parameters are set, a more acute analysis can be applied to the materials, lighting, acoustics, olfactory sensations, etc. of these specialized spaces. However, without creating a symbiotic relationship between designated sensory zones one space can easily negate the other by causing sensory disruptions.

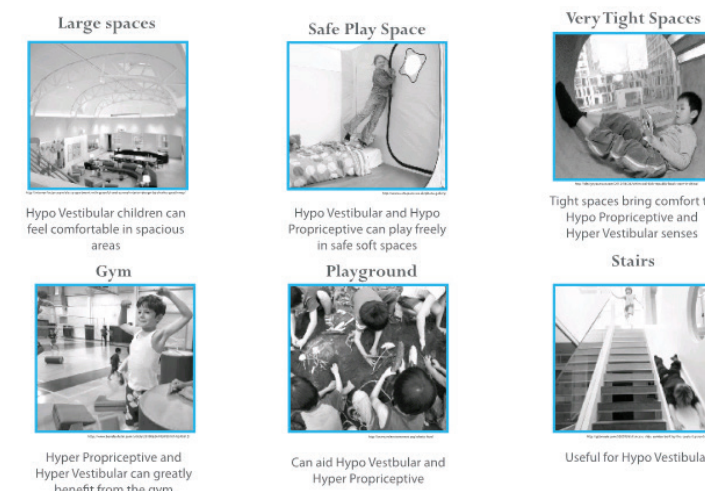


FIGURE 2- EXAMPLES OF SPACE TYPES FOR PROPRIOCEPTIVE AND VESTIBULAR THERAPY

Conclusion.

Since SI therapy relies on controlling environmental stimuli to isolate specific senses, architecture and interior design can have a direct impact on success during treatment. Architects, researchers, and physicians must work together closely in planning these environmentally-sensitive clinics. By implementing these basic parameters we can further discover the impact of architectural design and the relationship to sensory processing therapy.

2. REFERENCES

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3. AUTHOR BIOS

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Fallon currently works at CO Architects as a project coordinator for the design and construction of the new Outpatient Pavilion at the Health Sciences Campus at UCSD. She continues to pursue her passion for clinical design and hopes to further the link between architecture and sensory processing with evidence based research.

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Gina Chang is an associate principal with CO Architects, where she has served as project manager, healthcare architect and medical planner on complex projects with ambitious goals. With over 15 years of experience, she has planned and managed projects for UC San Diego Health, Kaiser Permanente, Palomar Health and St. Joseph Health in California. Gina is a strong advocate for evidencebased design and sees the opportunity to create a unique environment for healing and wellness in each project.