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PRESENTER ABSTRACTS

ACADEMY OF NEUROSCIENCE FOR ARCHITECTURE

Posttraumatic Understanding: The Connections Between Posttraumatic Stress and Environmental Design

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Memories of a traumatic event are processed and stored uniquely in the mind, disassociated from all other memories. Stimuli reminiscent of a person's trauma can trigger a unique response in a person suffering from PTSD, however, psychotherapeutic treatments can facilitate restoring the mind to health. This research hypothesizes a correlation between principles of sensory processing and principles of environmental design to improve efficacy of cognitive-behavioral treatment for veterans with PTSD.

1. ABSTRACT

Veterans of the U.S. Armed Forces are ethnoculturally, socioeconomically, and geographically diverse, but unified by the military's standardized training, which affects perception as well as emotional reactions. Posttraumatic stress disorder (PTSD) can be caused by any trauma, but is particularly acute in military veterans. PTSD causes semi-permanent changes in perception and memory recall resulting in altered reactions to environmental stimuli. Design of the built environment has the potential to support comprehensive rehabilitation by being both sympathetic to this altered state and conducive to healing.

In the broadest sense, a trauma is a learning event that affects one's perception of the world and their perceived ability to function within it. When a person is experiencing PTSD symptoms, their brain is over interpreting real-time stimuli and associating it with the context of their trauma, which only exists as a memory (Schiraldi, 2009).

PTSD is a psychological disorder for which the primary treatment for permanent resolution is psychotherapy. The objective of treatment is to change the patient's reaction to the trigger of their symptoms and/or memory of their trauma. The two most widely-accepted therapies are Prolonged Exposure Therapy (PET) and Cognitive Processing Therapy (CPT). Both involve cognitive-behavioral restructuring and controlled exposures to one's trigger and/or traumatic memory. Treatment can be very taxing on the mind and body, but ongoing practice reduces the anxiety reaction over time. Furthermore, Vega (2013) argues the built environment has potential to aid the caregiver in administering treatment by helping focus the patient's efforts in the right areas, with less wasted effort.

Existing related theories include human-centered design, which Greenhouse (2012) defines not as a style, but a process for designing based on the physical and psychological needs of the human user, enabling the user to function at the highest level possible. Furthermore, considering the pursuit for higher return on physical and mental efforts, Kirsh (1996) theorizes we have only three options: adapt ourselves to the environment, migrate to a new environment, or adapt the environment.

This research hypothesizes a correlation between principles of sensory processing and principles of environmental design to improve efficacy of cognitive-behavioral treatment for veterans with PTSD.

Research Methods

1. Review of existing literature on related design theories, PTSD, PTSD treatments, and cognitive processes of perception, processing, and reactions to environmental stimuli.
2. Collaboration with experts in the fields of psychology and human factors engineering.
3. Hands-on review of United States Marine Corps (USMC) observational techniques for identifying and prioritizing threats in indoor and urban environments.

To adapt the environment for improving outcomes of PTSD treatments, we must start by acknowledging that PTSD is highly complex and multifactorial, involving many psychological and physiological processes. Further still, all of the body's systems require appropriate amounts of energy to function efficiently; to attain balance, we want to reduce the amount of energy consumed by processes that are unnecessarily overactive. Efforts made to facilitate recovery should make efficient use of the patient's energy and be considered part of a comprehensive treatment plan. With this in mind, we can explore how to facilitate healing by reducing the energy required to process and navigate the therapeutic environment, allowing

more resources to be available for undergoing psychotherapy.

USMC observational techniques provide a highly refined, thorough, and systematic approach to how a person's natural abilities can be utilized to gather information about their surroundings. These are most likely the same behaviors exhibited by a person experiencing hypervigilance from PTSD and should be considered during the design process.

The built environment can't solve PTSD on its own, but it can help. A reduction in the cognitive load of an environment moderates the energy required to process, orient and navigate within a space. Reducing environmental complexity may help prevent the patient from becoming easily distracted and reduces the probability of being unnecessarily exposed to one's trigger, as this would ideally occur initially in a controlled, deliberate, and constructive manner. The cumulative effect of these design decisions stands to help the patient achieve their best mental state for psychotherapeutic healing.

This research represents the first step of a larger investigation into the connections between posttraumatic stress and environmental design. Because this topic is highly complex, this study primarily focuses on visual contributing factors. Non-visual cues, such as olfactory, tactile, and acoustical sensations, must be incorporated to make this study comprehensive. Future development of this research must also incorporate further collaboration with experts in the fields of psychology, neuroscience, and human factors.

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3. AUTHOR BIO

Matthew Finn is a licensed architect and recipient of Perkins+Will's competitive research grant program Innovation Incubator. Matthew is professionally driven to pursue his passion for design and research to facilitate socially responsible works for the welfare of society and the environment. Matthew is an active member of the Atlanta architectural community, volunteering regularly with his alma mater and serves on the Board of Directors of the Architecture Foundation of Georgia. Outside of work Matthew enjoys spending time with his wife, Stephanie; personal interests include living a fulfilling and balanced life, soccer and photography.