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The Effects of Sustainability as a Positive Attribute on Equine Therapy Design: An Interdisciplinary Study.

Abstract Submitted to The University of Akron Honors College.

By Andria Sinclair.

Interdisciplinary studies have brought benefits to introducing new solutions to the traditional environment and traditional therapies. Sustainability in relation to design has been suggested in 2006, by the Center for Building Performance and Diagnostic (CBPD) at Carnegie Mellon University to incorporate daylight, solar, heat and ventilation of the natural environment combined with the innovations of current technologies (Whitmore, 2011). This paper will look at how sustainability plays a key role of benefits including those that are health associated with equine therapy design and its relationship to the patient, or end user. Interdisciplinary research in the therapeutic value of equine-human bonding in recovery from trauma, self-concept of adolescents with special needs such as autism as well as intervention with dementia patients.

Keywords: Sustainability, Equine Therapy, Interior Design, Trauma, P.T.S.D., Dementia, Hippotherapy, Autism, A.D., L.E.E.D., U.S.G.B.C., I.E.Q.,

Introduction

The obstacles presented in maturing an interconnection with a substantial, virtuous and efficacious animal such as a horse and attaining additional knowledge to accommodate and ride parallels with possible life obstacles such as P.T.S.D. (post traumatic stress disorder), dementia, as well as autism and emotional disorders of adolescents. It is no wonder why treatment such as hippotherapy, the use of horses for therapeutic purposes, and the importance of equine therapy design has become increasingly more substantial (Strauss, 1991; Engel 1997; Bizub, Joy and Davidson 2003; Haylock and Cantril 2006; Kaiser et al.2006).

The results from equine therapeutic studies have yielded consistently positive results. Riders develop reliance, mutual trust, intimacy, self-satisfaction through

collaboration, adventurousness, proficiency and self-acceptance through equine therapy sessions. The purpose of this paper is to reframe the equine therapy discussion to include the positive attributes of sustainability as yet another facet to be considered for the ultimate therapy session for the end user.

Therapeutic Value

To understand how sustainability fits into the mix, one must first understand the therapeutic value of hippotherapy. Horses in therapy are sanctioned as imperturbable, synergetic and recipient to people, and therapeutic riding sessions have established a positive impact on quality of life for those with disabilities (Garrity and Stallones 1998). The therapeutic process consists of both an emotional and task dimension. These categories represent the four equine human bond themes of intimacy bond, identity bond, partnership bond and utility bond all with their end result of central healing. Hippotherapy is able to accommodate the therapeutic process with exceptional results.

The horse has been believed to be a remedial or medicinal ambassador since early Greek mythology (Butt, 1981). Since then, many therapeutic authors have perpetuated that riding may not only be therapeutic, but also may assist in the remedy of numerous medical ailments. Riding as therapy acquired exclusive consideration in 1952, when Liz Hartel of Denmark triumphed at the Grand Prix Dressage engagement in the 1952 Olympics (Butt, 1981). Hartel contracted polio in 1943, but had since been a lifelong horse enthusiast and rider. The disease left her incapable of employing her lower extremities for mobility. As a form of rehabilitation, she decided to return to her

former love of riding. Later this was proven to be a positive occurrence in her life when she was able to revisit the show ring and Olympics.

Introspective analysis by Henrickson (1971), discovered palpable and physiological augmentation in children with physical impairment who had cooperated in a therapeutic riding program at the nationally known Cheff Center in Augusta, Michigan. She hypothesized that the preeminent psychological sanction of riding for the disabled is the sensation experienced by replacing one's non-functioning legs by the workable legs of the horse.

The statistic of individuals with Alzheimer's disease (A.D.) has heightened notably over the previous decade, and this statistic will most conceivably increase as baby boomers age. Presently, there are 5.4 million individuals with A.D. in the United States, and by 2050, this statistic is predicted to increase to 16 million (National Alzheimer's Association 2012). A.D. is delineated by progressive cognitive and behavioral decline, conclusively resulting in death. However, for those with dementia, aftermath from medication can depreciate their quality of life. Although pharmacological therapy is the backbone of treatment, non-pharmacological interventions often are recommended for physiological and behavioral hurdles associated with AD. Behavior management therapies, cognitive stimulation, caregiver reinforcement, and staff education show the most promise of impacting mood, thought, and behavior of persons with dementia (Livingston et al. 2005).

This exploratory study developed and tested the impact of equine-assisted therapy for individuals with AD. Participants were able to positively engage in activities

such as grooming, painting, and leading the horses. Findings suggest engagement in equine-assisted therapy may reduce problematic behaviors that can be exhibited by individuals with AD attending ADS centers. Problematic behaviors such as wandering and resisting care exhibited by individuals with AD can be very stressful for formal and informal caregivers. In fact, individuals who are caring for persons with AD experience the highest levels of strain and mental and physical health complications compared with caregivers of individuals without dementia (Oryet al. 1999). Enrollment of an individual with AD in an equine-assisted therapy may offer an opportunity to temporarily relieve caregivers from problematic behaviors in formal care environments and at home.

The Measurement of Sustainability

According to L.E.E.D., or Leadership in Energy and Environmental Design, prerequisites and credits in the LEED building system address seven highlighted areas: Sustainable Sites (S.S.), Water Efficiency (W.E.), Energy and Atmosphere (E.A.), Materials and Resources (M.R.), Indoor Environmental Quality (I.E.Q.), Innovation in Design (I.D.) and Regional Priority (R.P.).

The Sustainable Sites (S.S.) category focuses on the environment surrounding the building. Sustainable sites introduces relationships between buildings, ecosystems, and ecosystem services. Areas of focus within this category include: Construction Activity Pollution Prevention, Site Assessment, Site development, Open Space, Rainwater Management, Heat Island Reduction and Light Pollution Reduction.

The intent behind Construction Activity Pollution Prevention is to reduce pollution from construction activities by limiting soil erosion, waterway sedimentation, and airborne dust by utilizing and implementing a sedimentation and erosion control plan. The plan must conform to the U.S. Environmental Protection Agency (E.P.A.) and Construction General Permit (C.G.P.). Selection rests with whichever is more stringent.

Water efficiency (W.E.) is readily achievable in sustainable design. Of the 69 possible points for new construction under L.E.E.D., only 5 of those points are directly associated with water efficiency. The five points are apportioned accordingly: Landscaping, Innovative Waste Technologies and Water Use Reduction. Greening the supply can be achieved by tapping alternative water sources: rainwater collection and wastewater recovery. Rainwater collection can be used to supplement the irrigation system during dry periods. When discussing wastewater recovery, one method is gray water systems which can also be used to supplement irrigation systems. Adaptable technologies to improve waste water consumption include reducing potable water use for sewage conveyance. Composting toilets and waterless urinals are two technologies that can eliminate a facility's use of potable water for sewage conveyance.

Energy and Atmosphere (E.A.) represents a holistic approach to reducing energy consumption. Categories include optimizing energy performance, renewable energy production and green power and carbon offsets. To complete the optimization of energy performance, the target must be established no later than the schematic design phase. The target must be established as kBtu per square foot of source energy use.

Materials and Resources (M.R.) focuses on embodied impact reduction. The subcategories associated with Materials and Resources fit into a larger context of a life-cycle approach. Subcategories include Storage and Collection of Recyclables, Construction and Demolition Waste Management Planning and Building Life Cycle Impact Reduction.

Indoor Environmental Quality (I.E.Q.) encompasses the air quality, lighting, thermal conditions, ergonomics and acoustics and can have a substantial impact on its occupants. The results of effective Indoor Environmental Quality can impact health, stress, quality of life and potential injuries.

Innovation in Design (I.D.) is the ability for design teams to be awarded for exceptional performance above and beyond L.E.E.D. standards or exceptional innovativeness, addressing green building categories not specifically categorized or required by L.E.E.D. Regional Priority (R.P.) credit is based upon the application for which the user is applying and location of project. Categories can include On-Site Renewable Energy and Stormwater Design.

L.E.E.D. criteria provides a foundation for Equine Design Therapy research. Green building categories that L.E.E.D. addresses can significantly impact the end-user. Equine Design Therapy will specifically look out the impact of the Indoor Environmental Quality (I.E.Q.), Materials and Resources (M.R.) and Water Efficiency (W.E.).

Design with Sustainability

Therapy is not the only consideration to take place for the health of the end user. A good design can go a long way. Through the conservation of water, energy and materials the health and well being of the occupants is also positively impacted. This is especially true in equine therapy design. Our physical environment will represent both short and long term consequences for the end user by the choices we make in the sustainability realm. These sustainability choices affect the indoor environmental quality (I.E.Q.) which can be interrupted in ways like the usage of V.O.C.'s (volatile organic compounds) in material finishes such as paints, coatings, sealants and adhesives as well as furniture. There is an off-gassing of pollutants that can take place, and these toxins inhibit potential cancer-causing abilities (Loftness, 2007). Specifying materials that have low V.O.C.'s or ideally zero V.O.C.'s can aid in ensuring the quality of air for not only the application process but for the off-gassing period as well.

Ventilation is a notable design consideration when designing a barn that is healthy for not only the horse but also the end user. The U.S. Green Building Council (U.S.G.B.C.) recognized the value of indoor environment quality through L.E.E.D (Leadership in Energy and Environmental Design) (Whitmore, 2011). Ventilation is essential in every barn, regardless of whether it is located in a hot or cold climate. The goal for a healthy stable lies within passive solar design and vertical ventilation. Upward, vertical ventilation reduces the risk of disease for horses by minimizing the amount of damp, stale, contaminated air in their stables. Designs that create this

ventilation harness natural solar and wind power to effortlessly provide a strong interior current and upward movement of air in the barn. In turn this promotes the theory of healthy indoor air quality and the benefits of it by the end user.

Maximizing natural light is also an integral part of our sustainable design efforts in horse stables. Natural light is linked to the needs of human biology specifically affecting the body between the nervous system and the endocrine system. The importance of how lighting can affect the body is accentuated by human biorhythms and the discovery of how non-visual receptors in our retina emplane our circadian rhythms and balance basic physiological processes that occur within the human body (Whitmore, 2011). Natural light fosters a healthy environment for both the end users and their horses. In addition, fewer electric lights reduce fire hazards. The result is a healthy equine facility for both the horses that is friendly to the environment and efficient for the end user.

By specifying materials that are recyclable and reclaimed there are benefits on our natural resources. These materials are also healthier for the end user. The concept of Cradle to Cradle will aid to ensure the health of the end user for centuries to come. Acknowledging that the positive advancements of hippotherapy and the positive advancements in sustainable design can only result in positive health benefits for the end user in Equine Design Therapy can be presumed from this article. The research completed in Indoor Environmental Quality (I.E.Q.) can possibly even further advance the therapy that is given to these patients in hippotherapy resulting in even greater successes in a shorter amount of time. These proposed results could even be further

looked at within the horse itself and then circled again back to the patient. If the horse has positive health benefits due to sustainable efforts implemented in the design process would that then further reinforce the positive health benefits implemented onto the patient?

Conclusion

Although this article suggests and promotes the positive attributes of equine-human psychotherapeutic purposes and bonding, caution must always be executed. This article also suggests the direct relationship between the health benefits of implementation of sustainable measures and equine therapy on the end user. Larger studies are necessary to establish the effectiveness of the equine-human relationship as well as the role and linking of sustainability measures to equine therapy and hippotherapy.

Sustainable measures considered include natural ventilation and the positive effects of natural lighting along with selecting materials and specifications that would promote a reduction in the amount of volatile organic compounds and off-gassing released into the air. Reducing water consumption and specifying materials that are renewable will have lasting positive impacts and ripples to affect generations to follow. Reducing energy consumption would in turn reduce costs and reduce stress of the patients if therapy reflected the reduction efforts. By implementing sustainability with hippotherapy, the results are perceived to be positive and perhaps even greater

success with therapy at accelerated rates. Both short term and long term health benefits should be considered and further research should consider the effects of both.

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