

The Form, Senses And Dynamics: A Literature Review On The Philosophical And Technical Coherency For The Development Of The Floor-Sitting Furniture Design

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Abstract. This paper presents the literature review of the philosophical and technical coherency on the postural behavior for the development of the floor-sitting furniture design. The review encompasses the discussion of space-form, human senses and postural dynamics, and ergonomics relationships to the subject of floor-sitting by citing significant works of scholars among the architects, psychologists and ergonomists that are related to the postural behavior subject. The elaboration of literature contents consists of existing information from cross-disciplinary studies that consequently forms the foundation to the acceleration of research activities, steering for the study of sitting behavior and the development of design within the perimeters of a home environment. The explanations given provide a larger spectrum to the body of knowledge, and lead to further investigations based on the integration of cross-disciplinary studies into other cultural behavior related studies that conceivably contribute to the benefit of researchers and educators at the academia level.

Keywords: Literature Review · Floor-Sitting · Postural Behavior · Cross-Disciplinary Studies · Furniture Design

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1 Introduction

Without a doubt, the floor-sitting behaviors are finely connected to cultural significations. In relation to the development of floor-sitting furniture design, the coherency of philosophical and technical context to the body kinesthesia is immanent as foundation in idea design. This paper explicates the coherency of the integrated context extruded

* Please note that the LNCS Editorial assumes that all authors have used the western naming convention, with given names preceding surnames (first name then last name). This determines the structure of the names in the running heads and the author index. No academic titles or descriptions of academic positions should be included in the addresses. The affiliations should consist of the author's institution, town, and country.

from the key documented works related to the studies of human behavior, which significantly coherent to seating design research. The integration of cross-disciplinary studies is seen necessary when wanting to explore the cultural related studies to uncover new knowledge.

2 Literature Review

Forms and behavior have an intricate relationship. The form of an organism or city affects its behavior in the environment, and a particular behavior will produce different results in different environments, or if performed by different forms in the same environment. [1]

[2] in his research outlined 6 contributing fundamental factors that in general affected the body posture/behavior and the architectural experience. Those factors are comprised of the element of scale, texture/materiality, climate/temperature, people/society, weight/resistance, and the configuration of those five elements in the environment. In association to this researcher's design research, these elements manifest according to [3], as the catalysts of memory as well as functioning as encounters, and confrontations to the body which articulate the sensory aspects towards the whole body kinaesthe. In his book *The Eyes of The Skin: Architecture and the Senses* he adds:

We feel pleasure and protection when the body discovers resonance of space. When experiencing a structure, we unconsciously mimic its configuration with our bones and muscles: The pleasurable animated flow of a piece of music is subconsciously transformed into bodily sensations, the composition of an abstract painting is experienced as tensions in the muscular systems, and the structures of a building are unconsciously imitated and comprehended through the skeletal system. Unknowingly, we perform the task of the column or of the vault with our body.

The sensory experience denoted the body-image theory, which distinguishes the notion of body kinaesthe to the sense of dwelling. [4] in his writing extending [5] propagation on the architectural experience, body and memory integrations, stresses that our body and the movement through the psychoanalytic thought, manifests the haptic and orienting experiences that subsequently fluctuates the feeling of dwelling. It synchronizes the body-image concept through the propagation of the body kinaesthe when confronting the elements of architecture within the dwelling space. He subsequently adds:

All experiences in life, especially experiences of movement and settlement in three-dimensional space, are dependent on the unique form of the ever-present body. It appears that individuals possess an unconscious and changing image of their bodies which is quite separate from what they know objectively and quantifiably about their physicality.

[6] in *The Poetics of Reverie*, vindicates these relationships through the *polyphony of the senses*. He distinguishes the connection of sight and its complementary effects with other perceptual systems harmonizes the body kinaesthe and added, “every touching experience in architecture is multi-sensory”. Earlier, the psychologist [5] in *The Senses Considered as Perceptual System*, asserted this relevancy by propagating the body behavior’s articulation through sensory systems when reacted to the types of environment. He added that in order to understand the sensory systems operation one needs to dwell within the particular space, and thus would inspire the engagement of the kinaesthete’s experience. Elaborating this concept, and synchronizing this significance is [7] in the paper presented at the Regional Studies Association Annual Conference in Belgium which stated that the dynamics caused by the kinaesthete’s experience will consequently leave traces behind, and transform into a *locus*; a place marked by [personal] history and such body dynamics would repeat concomitantly. This can be seen when one refuge perched at the same spot, or similar section at the space where they occupied for comfort.

In relevance to the technical perspectives, [8] in her review on the ergonomic seating movement adds that one who sits freely tends to cycle their postures over the day [9, 10, 11]. She quotes [12, 13] by stating that fixed postures promote more discomfort and chronic disorders and “movement reduces these risks” [14, 15]. When we move or sit freely, “people are usually in constant motion” [16, 10, 17], and “tend to develop unique patterns of seated movements [11, 18]. Linking this, as [19] signified, quoted by [20] the author of the *Introduction to Ergonomics*, intergrades to the *body-link* concept aiming to stabilize the open-chain system. For example, while sitting, behaviors such as folding arms, crossing, or flexing the legs can be seen as postural strategies to turn closed chains into approximate open chains that are stabilized by friction for comfort. He adds that a comfort sitting position in a dynamic sense, permits muscular relaxation while stabilizing the open-chain system of body-links. Strengthening that significance to this research concept is ergonomists [21] views on the floor-sitting effects to the body in *The Chair: Rethinking Culture, Body, and Design*; where according to [22] citing her, such exercise allows “better alignment of the spine than Western-style furniture.” He added that when sitting on the floor our body is free to express the body image with movement and variety of positions to cushion for support (see Fig. 1).

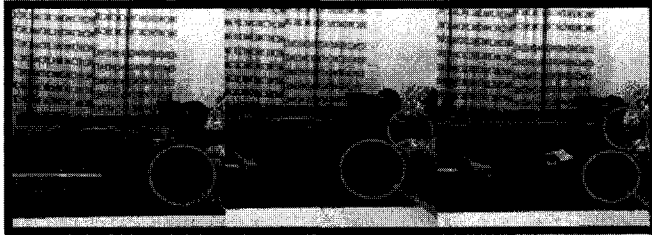


Fig. 1. The utilization of the architecture elements to achieve individual's sitting comfort through various expression of floor-sitting postures, towards the stabilization of the lumbar, thoracic and cervical muscle activity to support the natural *S-curve* [lumbar lordosis and thoracic kyphosis] when perching on the floor.

3 Results

A floor-sitting furniture prototype based on the floor-sitting behavior was constructed that embodies the connections of the human behavior concept relevancies. The design is based on the signification of the reviewed literatures.

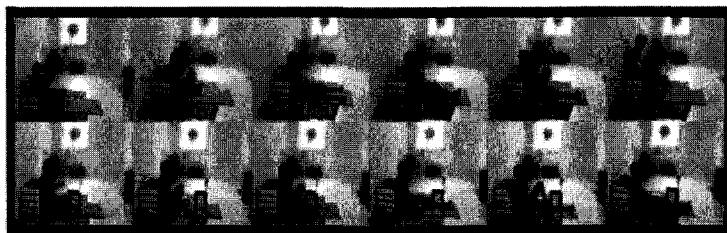
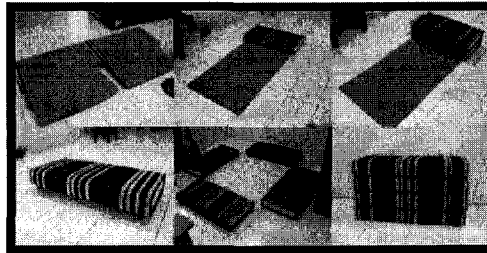


Fig. 2. The design of the floor-sitting furniture and its utilization within the home environment.

4 Conclusions

As shown in the literatures, it is important through the incorporation of philosophical and technical signification of human behavior that: (1) Generates the understanding of the phenomenology of the human (floor-sitting) behavior through the articulation of theories propagated by [5], [3], and [1] that relevantly indicated a framework of a scholar-triangle for investigating the phenomenon (see Fig. 3). (2) The integration of technical signification established a coherent foundation in diversifying design context. (3) Contribute to the diversity of scholarly knowledge through the demonstration of theories amalgamation in association to the educational research.

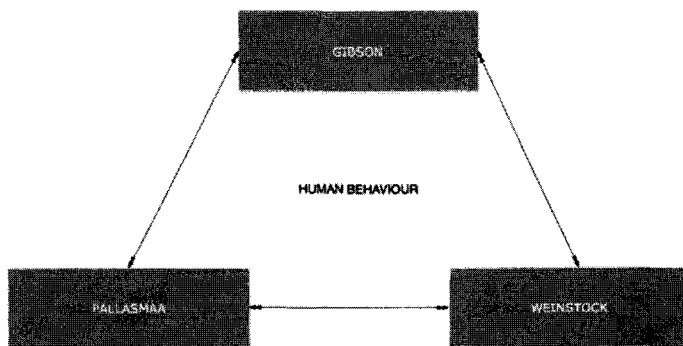


Fig. 3. The scholar-triangle framework for observing human behavior.

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