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Learning tactility from Bauhaus: Educational pedagogy of Lasyo Moholy-Nagy

Elif Aktaş Yanaş
Ozyegin University Faculty of Architecture and Design, Istanbul, Turkey
* elif.aktas@ozyegin.edu.tr

In design, sensual experience, where the sense of touch is coupled with vision, plays an important role in building designers' internal knowledge. Therefore, many design schools put emphasis on perceptually grounded experience, especially in the first year curriculum. Foundation of perceptually ground experience as formal educational concept goes back to Bauhaus, which is one of the most important teachings of Bauhaus that still influences today's design education. However, in contemporary practice, especially with the use of the computers, perceptual grounded experience in design studios highly decimated and mostly limited with visual experience. Moreover, tactile experience has often been neglected in comparison to visual experience both in design practice and research. With this regard, this study analyses tactile experience in design based on the teachings of Moholy-Nagy. Educational approach of Moholy-Nagy on tactility will be elaborated within the perspective of grounded and embodied cognition. This paper aims to contribute to the understanding of tactile experience in design within the frame of embodied perspective.

Keywords: embodied cognition, tactile experience, design education, Bauhaus, Moholy-Nagy

1 Introduction

Sensual experience, where the sense of touch is coupled with vision, is encouraged in design education with regards to its contribution to various aspects including perception and crafting skills. Although architects emphasize hands on experience, cognitive aspect of the sensual experience have been merely investigated. Tactile experience in design has been studied in research that are related to crafting skills, sketching, drawing, physical model making and various hands-on activities. Nonetheless, this study focuses on the cognitive aspects of tactile experience in design, which supports internal knowledge production and the intuitive behaviour. The example of this notion can be found in the educational pedagogy of Moholy-Nagy, who was the head of metal workshop in Bauhaus Dessau between 1923-1928 and founder of the New Bauhaus in Chicago in 1937. Nagy was an artist and he considered design as an intuitive practice. More than any other professors in Bauhaus, Moholy-Nagy specifically emphasized the role of tactile sense and systematically proceeded it in his workshops with various tactile exercises.

Recent studies in cognition suggest that our body and environment are integral parts of our cognitive system. Understanding these theories is important in order to examine the role of

hands-on experience in design. Therefore, in this study firstly, cognitive theories that acknowledge bodily experience will be briefly explained with related empirical studies in different fields. Further, design studies with similar cognitive approaches will be referred. Eventually, an educational design pedagogy that emphasizes the tactile experience will be analysed within this approach.

2 Embodied and Grounded Cognition

One of the contemporary theories that appreciate the sensual experience as a part of the cognitive system is grounded cognition. Perceptually grounded cognition theories assert that simulation, situation and bodily states are the central actors of the cognition. Studies demonstrate that perceptually grounded experience plays a significant role in learning and problem solving (Clement 1994 Stephen and Clement 2007, Barsalou 2008, Black 2010). Clément's (1994) study indicates that expert scientists rely on their physical intuition rather than abstract equations while solving a physic problem. He describes the term "imagistic simulation", which refers to a dynamic temporal mental simulation of an event that subjects create based on their physical intuitions during problem-solving activity. Stephen and Clement (2007) also found out that imagistic simulation plays an important role in the novice problem-solving process as well as experts. Similarly, Black (2010) implies the importance of perceptually grounded experience in learning. He (2010) states three steps to learn something, (1) a perceptually grounded experience (2) learning to imagine the perceptually grounded experience (3) Imagining the experience when learning from symbolic materials. According to him for a complete understanding of something, it is necessary to build a mental perceptual simulation of it (Black, 2010). Simulation is one of the central accounts of grounded cognition research. Briefly stated, simulation is the revitalization of perceptual, motor and introspective states obtained during our interaction with the mind, body, and environment through experiences (Barsalou,2008).

On the other hand, another cognitive theory that links perception with direct sensual experience is embodied cognition. In embodied cognition theory, simulation plays a significant role in social cognition and aesthetic experience. Especially, studies in the field of neuroimaging and neuropsychology link embodied experience and aesthetic experience (Freedberg and Gallese 2007, Jola et. al 2012, Umilta et. al 2012, Kirsch et al. 2013, 2016). In both dance and related performative art, simulation of observed moments is generally linked to the part of aesthetic experience (Kirsch et. al. 2015). Freedberg and Gallese (2007) claims that the reason we appreciate art is partly due to the embodied experience that we simulate in the brain. Empirical evidence from studies indicate that aesthetic appraisal of static figurative visual art (Freedberg and Gallese, 2007) and abstract art (Umilta et. al. 2012) might be related to embodied simulation. Umilta et.al (2012) demonstrates that observation of a static abstract art activates the relevant motor areas in the observers' brain. According to Umilta et. al (2012), the visible trace of cutting action in original painting helps participants to simulate an embodied experience, which representational lines do not afford the same experience. Additionally, these studies indicate that embodied simulation is related to physical abilities and can be enhanced by training and experience. Cross et. al (2011) demonstrates that observers' aesthetics evaluation of dance moments is related to their physical ability to produce movements. Participants like the movements more, which they considered to perform more difficult. Jola et.al (2012) demonstrate that observers' visual experience related to aesthetic appreciation of dance movements as well as a physical

experience. Kirsch and Cross (2015) show that with certain physical training, apprehension of a dance performance of the participants has increased due to the fact that they can imagine themselves doing certain dance figures.

Existing literature points out that perceptually grounded experience plays an essential role in the development of cognitive, spatial, motor, social and aesthetic skills. Nevertheless, there are a few studies that investigate the design cognition within the frame of embodied perspective. Groth (2016) emphasizes the importance of haptic and tactile experience in decision making during design and craft making. She found out that emotions are key to the decision-making process and they are linked to haptic and tactile experience (Groth, 2016). Moreover, Groth and Mäkelä (2016) suggest that students' previous material experiences gathered through the body, guided them in material explorations even before the actual physical manipulation of the materials began. Gursoy and Ozkar (2015) encourage the making as an integral part of the thinking process in design, in contrast to the general distinction between thinking and making. Thinking through the material also has been granted in craft practices' research (Mäkelä 2007; Nimkulrat, 2009). Still, those realms are merely investigated in design practice, especially within the perspective of embodied cognition. The main motivation of this study is to contribute to filling this gap by investigating tactile experience within the perspective of embodied and grounded cognition.

3 Learning from Bauhaus

3.1 Sensory experience in Bauhaus

The foundation manifesto of Bauhaus was to create a unique mode of production by combining arts and crafts instead of industrial production (Denel, 1979). The school aimed to gather all the creative workers such as architects, sculptors, painters, and raise them as craftsmen at the same level. Accordingly, the educational program of the school had various workshops, where students were able to directly test tools, materials and production techniques. This working environment provides students to experiment with visual and spatial outcomes of their ideas continuously (Ozkar, 2007). Above all, what makes Bauhaus still unique was to teach a design approach instead of how to design. This learning style does not focus on how a particular object is done in a certain way; in a much broader sense, it focuses on the act of making as an integral part of the design process (Ozkar, 2007). This approach, which was founded and developed in Bauhaus was continued by former employees who went to the US, Britain, and Russia after the Bauhaus was closed. Lasyo Moholy- Nagy was one of these educators, who lead the preliminary courses and various workshops in Bauhaus Dessau between 1923-1928. Later, he founded the New Bauhaus in Chicago in 1937, which was named as "Institute of Design" in 1938, and directed it until his death in 1948. He was also an artist and known as her activities in a range of fields such as painting, film, typography, sculpture, graphic design, stage design, and photography.

Moholy-Nagy's educational pedagogy aimed to support internal knowledge production and intuitive behaviour. According to Nagy, design education should deal with internal conditions, not external ones. He believes in a process-oriented education model, in which students can communicate their inner transformations (Findelli, 1990). Nagy states that "Basic sensory experiences - gained by these exercises - undergo development and intellectual transformation, and later are brought into relation to other experiences. It is not possible to skip any stage inexperience, though it may sometime appear desirable. From the first

inarticulate experience, the whole life is constant growth. Therefore, it is indispensable, in human development, to pass through all the stages of elementary experience in every field of sensory activity. Little by little man find his way of expression and find his form" (Lasyo-Moholy-Nagy, The New Vision, 1947, p.23). Therefore, the sensory experience was an essential part of his courses. More than any other professor in Bauhaus, Moholy-Nagy specifically emphasized the role of sensory experience and systematically proceed it in his workshops with various exercises. Figure 1 shows one of the sensory exercises "Smell-o-Meter" by his student Charles Niedringhaus. In these exercises, six tubes are used to mix six different odors, and an electric fan blows the odor towards the nose opening.

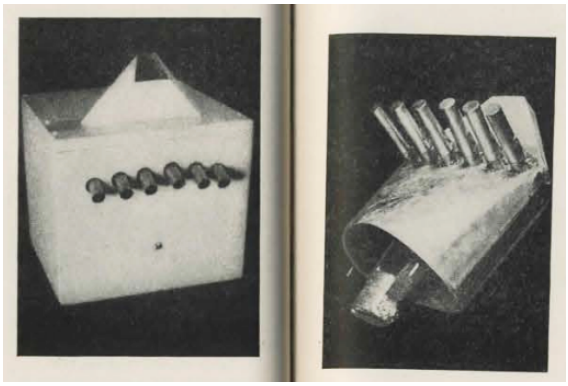

Figure 1. Charles Niedringhaus,-Smell-o-Meter (The Second Semester New Bauhaus, from The New Vision 1938, p.34.)

3.2 Moholy-Nagy pedagogy on Tactility

Nagy focused on sensory experiences, enrichment of emotional values and development of thought in the preliminary courses. Nevertheless, he puts specific emphasis to the sense of touch in his book New Vision, where he explains his educational pedagogy in Bauhaus and Institute of Design. According to him sense of touch more than any other can be divided into number of separately sensed qualities, such as pressure, pricking, rubbing, pain, temperature and vibration (Moholy-Nagy,1947). Nagy gave students different tactile exercises in his studio. In these exercises, students used to gather various materials, so that they could experience different senses with them as much as possible. Some of these senses were related while some of them had contrasting sensations. After this experience with the materials, the students created their own tactile charts. Figure 2, shows the tactile chart developed by Nagy's student Willy Zierath in Bauhaus 1927 fall semester (Smith, 2006).

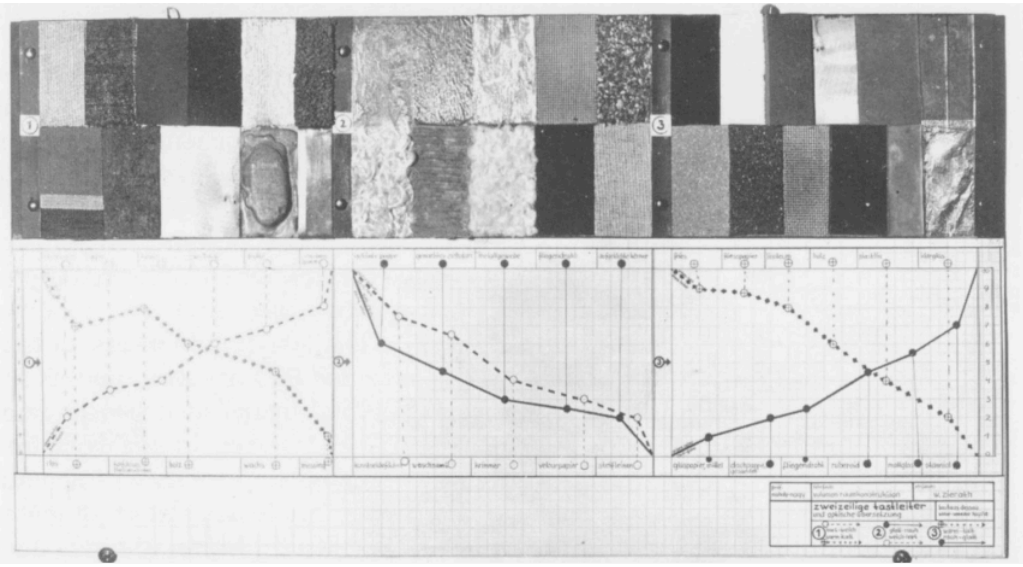

Figure 2. Willy Ziereth. "Zweizeilige Tastleiter Preliminary Course, winter semester 1927-1928. Courtesy Bauhaus-Archive Berlin. Smith, 2006, p.14).

Zierath chart on a flat surface uses three set of columns which two of the row in each column consists of materials with different tactile properties and below in the last row there are graphs showing tactile values on grid paper. Zierath called these chats “optical translation”, which he translates the “tactile values” of the materials above into a visual language, which exhibits the sense of touched materials (Smith 2006). The compositional grid examines the tactile values such as hardness/ softness, smoothness/roughness, dryness/wetness by means of systematically combined materials for example man-made and natural, raw and fabricated ones. Furthermore, tactile values translate to subjectively recorded reactions into a “touch diagrams” these could be referred to again later on.

In the same preliminary course, Otti Berger, who was later graduated from Bauhaus as textile designer, created a textile chart that consists of thread triangles made of silk, rayon, velvet, wool, organic and chemically treated cotton that diagonally replaced on a metal strip and coloured papers (Figure-3). This chart shows early interest of Berger in the role of touch, who later developed theoretical writings about the primary role of tactility in cloth (Smith, 2006). Berger’s tactile chart examines visual and tactile values in one piece. Therefore, it may be differentiated from Zierath pure touch diagram. However, both studies aimed to build a systematic tactile experience and examine the different properties of tactility. These exercises were subjective test as Moholy-Nagy states and did not have a scientific aim, but they all enabled the emergence of useful results in the field of technology or art and rehabilitation of visually handicapped people later (Moholy-Nagy, 1947). As other sensory experiences, the purpose of the tactile exercises was to contribute to designers’ inner knowledge transformation.

Figure 3. Otti Berger, Moholy-Nagy's preliminary course, Touching board with threads, 1928 (from Bauhaus Women: Art, Handicraft, Design, p.63).

Nagy had pursued the same pedagogy in Bauhaus Chicago and Design Institute. In the preliminary course, Nagy used to introduce students with basic components of design to prepare them for following workshops. After successfully completing preliminary course, students were used to attend five workshops in Institute of Design, including object design, textile, colour, light and modelling workshops (Figure 4). The first exercises start with sensory experiences with fingers the tactile tables. After that students combine different textures among tactile charts. The form of the tactile charts was not defined for any specific problem. The only criteria were that the surfaces to be tested were sensible to the minimum stimulus. Therefore, the form of the tactile charts was unique to every individual and each of them was reflecting an original idea. Some of these charts not only stimulated fingertips but also muscles and joints. For example, student work developed on twisted plastic in (Figure 5) was designed to allow for different circulation, such as the ascending and descending finger movements (Moholy-Nagy, 1947).

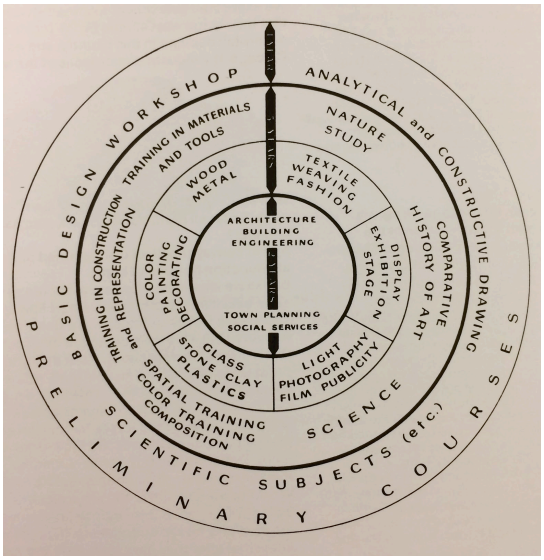

Figure 4. The New Bauhaus Educational Programme (The Bauhaus: Weimar, Dessau, Berlin, Chicago, p.194).

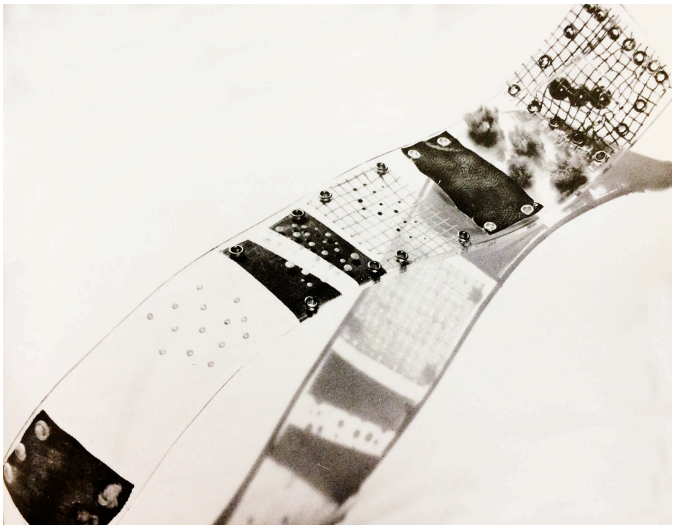

Figure 5. Tactile chart by O Robert Brownjohn, Institute of Design 1944, Bend plastic (from Vision in Motion, p.77)

After completing their tactile charts and segregate the different qualities of touch sensation with their fingertips, students were obliged to make a hand sculpture. By means of this, they were able to register the function of hands that is to catch, to press, to twist, to feel thickness, to weigh, to go through holes, etc. All these exercises in the first part of the training was integrated with the following workshops and classroom, which was another unique aspects of Design Institute curriculum.

Long before the theorization of “perceptual learning” theorizes in cognition studies, Nagy applied a perceptually grounded learning pedagogy in Bauhaus and Design Institute. Especially James and Eleanor Gibson's ecological perspective of perception, which is assumed as an important pillar in the theorization of embodied cognition, suits very well to Nagy’s educational system. According to Gibson, perception improves discovering new information about an object rather than building up new definitions (E. J. Gibson, 1978; E. J. Gibson & Spelke, 1983; Adolph and Kretch 2015). In the Design Institute, students did not add new descriptions but they seek for the new possibilities of the materials, mediums and their bodies. His education was focused on all the sensory experience without prioritizing the visual sense. He investigated the potential of the tactile experience in whole haptic system as an integral part of our cognition. As Gibson (1979) claims perception of an object involves not only perception of the visual characteristics of that object, but also involves what the object affords (Gibson, 1979; Goldstein 1981). Similarly, Nagy’s exercises intuitively help students to be aware of the affordances of the entities that will guide them for their following practices.

4 Conclusion

For Moholy-Nagy, primary aim of the sensory experiments was to develop a unique way of expression for each individual. He considers all stages of sensory experience as the ground for personal development. Nagy intuitively knows that sensory experience does not only contribute to crafting skills but also skills associated with thinking, perception and intuition. Nagy was aware of the technological means of his age. According to him, the key of the era was to "seeing everything in relation" (Moholy Nagy, 1947, p68). At present new digital tools,

which are introduced by rapidly developing technology, have affected intuitive practices such as design as well. The problem is; how design education adopted and reflected these changes. In this context, I believe that some of Nagy's teachings, who interpreted his age very well, are still valid despite changing technology and will guide us in shaping the future of design education.

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About the Author:

Elif Aktaş Yanaş: She received her bachelor's degree in Interior Architecture in 2011 from ITU, Department of Interior Architecture. She is currently a PhD candidate at ITU Architectural Design Computing and a research assistant at Özyeğin University, Faculty of Architecture and Design.

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