Original Research Article

Explaining a Conceptual Model of Components Affecting Aesthetic Experience of Architecture in Cognitive Sciences

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Abstract

Problem statement: Accepting architectural aesthetics, especially people's in-depth experiences of buildings, is of considerable importance. Few attempts have been made to recognise it as scientific content. There is still some confusion about which architectural theoretical model of aesthetics is more comprehensive and complete. In fact, this concept appears to be an ambiguous quality that requires cohesive data for more accurate research. The aesthetic experience of architecture has always been a complicated topic affected by different factors; therefore, knowing the raison d'être and quality of this experience as a qualitative necessity can affect the design process and principle of architecture. Hence, what kind of quality is the aesthetic experience of architecture? What components does it depend on?

Research objective: This study aims to provide a full description and develop a cohesive framework of the aesthetic experience of architecture in a bid to perceive its innate structure by proposing a conceptual model.

Research method: This descriptive-analytical qualitative study reviewed the theoretical literature on the findings of cognitive sciences from an interpretative perspective to present the research results as a conceptual model.

Conclusion: The aesthetic experience of architecture refers to the emotional evaluation of spatial perception experience based on a direct approach through perceptive, motivational, sensorimotor, cognitive, and behavioural components emerging as a combination of different emotional imaginations (e.g., joy and pleasure). Hence, according to the theories of cognitive sciences, it can be stated that the intrusion of unclear body reactions in the architectural experience indicates that perceptive and motivational components lead to behavioural reactions. This shows the relationships between emotional dimensions and the involvement of sensorimotor components through the body with the space. In fact, interaction with an architectural space through its resultant capabilities can involve motivational components. Therefore, the perception of architectural aesthetics depends on the intrinsically stimulated activities including emotional processing and cognitive factors of an individual's background. In this regard, behavioral components can draw the individual's attention and trigger his motivation and enable him, the experiencing subject, to gain a conscious experience and also enjoy the aesthetic experience through the phenomenon of architectural work.

Keywords: *Architecture, Aesthetic experience, Cognitive sciences, Embodied perception, Embodied experience.*

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Introduction and problem statement

Different schools of thought have addressed the aesthetic experience of architecture so far. Including a general methodological context of theoretical and empirical studies, these schools of thought have pointed out human experience in the perception of aesthetics based on how to judge aesthetics within different frameworks. According to research findings, the philosophical approach (Scruton, 1989; Winters, 2007) in empirical studies and emotional (Russel, 1980), phenomenological (Böhme, 2018; Bermudez & Ro, 2013), and neurological (Vartanian et al., 2013; Vartanian et al., 2015) approaches in empirical studies placed further emphasis on experience-based architectural aesthetics. However, these studies only introduced one or several specific features to describe the nature of this phenomenon, and no accurate theoretical models have been proposed to explain the raison d'être and quality of the process of perceiving the aesthetic experience of architecture. For instance, different theoretical approaches have been proposed to address the role of emotion and visualisation in the aesthetic experience, although they have received insufficient empirical support. Nevertheless, depending on the depth and level of a person's empirical activity, a specific approach to aesthetics cannot address the open-ended field of architectural experience. In other words, a more comprehensive content approach is required to organise this concept and its perception process theoretically.

This study aims to address what actually humans face in the real experiences of architecture, for a person's successful experience of an architectural work means that he/she becomes full of himself/herself as spatial completeness. Hence, the constituent elements of an aesthetic experience are the quantitative/qualitative characteristics of an architectural work, the realisation of which leads to an aesthetic experience as well as an architectural experience. Since buildings are not self-sufficient objects but locations for human activities, this fact turns architecture from a physical-structural art into an organised empirical complex art. Therefore, it is essential to consider the nature of an aesthetic experience of architecture from an interaction-oriented perspective, for architecture is an instance of an identifiable case of inclusive human participation and human involvement with aesthetics (i.e., a case in which humans are not merely abstract spectators). Furthermore, every location can assume a different role substantively based on what empirical importance its aesthetics has in perception.

Architectural works form a sequence of aesthetic situations that are necessarily interactive. Each of them requires human participation in different ways. Hence, the problem is how this integrity turns into the base of an aesthetic experience in architecture. Concordantly, this study aims to provide a better perception of aesthetic experience in architecture by using the neurological findings of this area, for these findings analyse architectural experience through the relationship between the mind and the human's psychological experience of the world. The findings also analyse the human's feelings of the environment based on the brain response to stimuli, regard a sensory experience as a key to the perception of aesthetics, and relate the human psyche to feelings and physiological experience of the environment. Therefore, this study used these frameworks as a base for discussion about concepts and theoretical identification of the topic to perceive their underlying mechanisms.

The study also sought to be relevant to the other emerging areas of scientific and philosophical studies to think more about the subjective qualities of experience in architecture. Thus, the outcome of this viewpoint can be useful for the clarification of fundamental concepts to further rethink the theoretical topics of architectural aesthetics. In this study, the fundamental concepts were considered the research base that would form the prerequisite for the problems related to an artificial environment and its relation to the aesthetic experience. This experience has been discussed from different perspectives such as phenomenology, cognitive psychology, and neurology because it has been deemed necessary to establish a discourse between architecture and the knowledge about subjective qualities and empirical philosophy, an area

that has not yet been addressed from this perspective. In fact, this approach can enhance the ability to confirm the previously proposed theoretical/philosophical propositions. Presenting a parallel interpretation of current schools of thought and the resultant feedback in the perception process of architectural aesthetics, this study will have the potential to turn into the base of new theorisation for further studies with similar topics. In other words, an embodied structure to cognitive sciences as an instruction for the analysis of aesthetic experience can provide a higher potential than the previous schools of thought. Given the paucity of studies on human experience with the perception of architectural aesthetics, this school of thought can be used as a useful solution.

Hence, this study aims to present a comprehensive description and a cohesive framework of aesthetic experience in architecture to perceive its innate structure and components through a conceptual model. Relying on the findings of cognitive sciences based on the perception models of aesthetic experience in the psychology of art, this study proposes a theoretical model to describe and explain a process that introduces how to evaluate and represent emotions regarding this experience with a focus on an interactive model. Based on the concept of embodied perception, this model results from different angles of its point of view to allow for an understanding of the appropriateness of the experienced phenomenon. Therefore, this study seeks to address the following questions: If humans expand their scope of experience to be able to perceive aesthetics in a place, what features can result in this kind of aesthetic experience? What components does this aesthetic nature depend on empirically?

Research methodology

In this descriptive-analytical qualitative study, an interpretative approach was employed to present the findings as a conceptual model framework by explaining the theoretical literature from the perspective of cognitive science findings. For this purpose, the findings of cognitive sciences were used through the models of aesthetic experience in the psychology of art

to propose a theoretical model to describe and explain a process introducing how to evaluate and represent emotions regarding aesthetic experience by focusing on an interactive model.

Research background

The early studies of architectural aesthetics were based on the historical analysis of Western architecture theorisation addressing the practical problems of design and construction. This goes back to "Ten Books on Architecture" by Marcus Vitruvius Pollio, "On the Art of Building" by Leon Battista Alberti, and other writings by Andrea Palladio and Thomas Aquinas, who discussed the importance of discipline and proportions by using a metaphysical and objectivistic approach as the aesthetic standpoint. However, with the advent of Kant's philosophical aesthetics in the 18th century, such discussions passed the limits. As the normality topics started, aesthetics, known as an independent branch of academic philosophy, provided comprehensive explanations about architecture. For the first time, Roger Scruton established these discussions in "The Aesthetics of Architecture" (1989). In fact, his book was a work of research into architectural aesthetics mainly from Kant's perspective (Scruton, 1989). Following Scruton's opinions, Edward Winters (2007) analysed the perception of architectural aesthetics from Kant's perspective in "Aesthetics and Architecture". In a paper entitled Architecture in the book Aesthetics of Arts from the proceedings or aesthetics papers at Oxford University (2003), G. Graham analysed the architectural aesthetics in terms of classical, modern, and postmodern schools of thought from an interpretative perspective (Levinson, 2013).

However, most of the theories of aesthetic experience are particularly related to the philosophy of art, which includes a wide range of theories. For instance, "Aesthetic Experience" by Collinson (2009) covers a series of aesthetic theories, each of which introduced a criterion as the characteristic of an aesthetic experience. "Phenomenology of Aesthetic Experience" by Michael Dufrenne (1973) is a citable reference that addressed the aesthetic experience of works of art through the

object of aesthetics with a phenomenological approach. Later studies are classified under the psychology of art and define it as hierarchical models by analysing the perceptibility of aesthetic experience (Chatterjee & Vartanian, 2014; Leder, & Nadal, 2014 ;Silvia,2005 Cupchik & Gignac, 2007; Locher, Overbeeke & Wensveen, 2010; Pelowski & Akabia., 2011). Overall, these studies have not pointed out architectural aesthetics in particular from their perceptive perspective.

The studies of environmental design and architecture with an aesthetic approach are those which reveal the common foundation of human perception or the structure of the mind. An instance is "Creating Architectural Theory" by John Lang (2009), who introduced empirical aesthetics as sensory, formic, and symbolic categories by using Santayana's aesthetic theories. Based on the general foundations of perception, "Aesthetics in Architecture" by Grütter (2004) introduced aesthetic features and characteristics in architecture. None of the later studies of architecture addressed the theories and paradigms of contemporary architectural aesthetics, whereas most of the existing studies interpreted the difficulties of aesthetics in architecture (Roeser, 2013) or analysed aesthetic criteria in different architectural campaigns and styles from descriptive or critical perspectives (Bhatt, 2000; Moon, 2013; Kido & Cywin´ ski, 2013, Thomas, 2015).

As discussed earlier, despite the ever-increasing scientific attention to the dimensions of architectural aesthetics, there are only a few studies that have directly addressed human experience. Moreover, the majority of aesthetics theories have merely focused on "aesthetic campaigns" in the history of architecture or "cultural-biological" foundations of aesthetic behaviour. Recently, some theories have focused on aesthetic neurology in the architectural space on a limited scale; therefore, such neurological studies of empirical aesthetics are mainly about visual perception with a focus on visual characteristics or architectural stimuli. Although these studies have developed the early theories of methodology, they are not still

considered an organised approach to the measurement of human experiences with architectural aesthetics.

Different research areas have analysed the general nature and raison d'être of architectural experience so far. Recently, there have been some developments in neurological studies of behaviour–environment areas (Vartanian et al., 2013; Vartanian et al., 2015). These studies have analysed the emotional effects and visualised environmental features (Jelic, Tieri, De Matteis, Babiloni, & Vecchiato, 2016), introduced principal components of architectural experience (Moosavian, Amin Zadeh Gohar Rizi & Shahcheraghi, 2020), or provided the evaluative perception of and other non-contemplative responses to architecture (Robinson & Pallasma, 2015; Mallgrave,2016). Nevertheless, there are a few systematic studies on the direct relationship between physical structure and the utility of architectural space. At the same time, other studies have analysed the emotional effects (Böhme, 2018) and mental effects (Fitch et al., 2014) of architectural experience, whereas psychological studies have tried to prove the reconstruction potential for mental concentration and experience of spiritual environments (Herzog, Ouellette, Rolens, & Koenigs, 2010). Nonetheless, most of these studies were inspired by the conceptual, neurological, and empirical framework of research proposed by Freedberg and Gallese (2007) and are still being developed. Furthermore, phenomenological studies have pointed out the empirical relationship of buildings for the stimulation of wonderful states (excitement) to perceive the concept of architectural experience (Bermudez, 2011; Bermudez et al., 2017).

Since the proposed theoretical models have structural differences in levels and content with their presented methods being ambiguous, there is still no consensus on the use of a specific theoretical model in various research contexts, especially regarding experience in architectural aesthetics. At the same time, there are no specific studies based on the identification of aesthetic components in architecture through an approach to the aesthetic experiences of humans. Therefore, analysis of the existing theoretical models in line with the

research objective of this study with respect to the findings of cognitive sciences to recognise the nature of architectural aesthetics in terms of the visualised nature of experience can help better perceive the topic theoretically from a new perspective.

Theoretical foundations of research
• Considerations of cognitive sciences in attitudes towards architectural aesthetics
Generally, architectural topics are classified as two major categories simultaneously to develop and explore aesthetics: 1- conceptual studies (normative paradigms) and 2- empirical studies (positive paradigms) (Moosavian, Amin Zadeh Gohar Rizi & Shahcheraghi,2021).

Empirical studies emphasise the main topics of perception with a special focus on environmental preferences. They are considered a tool for developing the perception of mental processes as the basis for the aesthetic selections of humans. In fact, identifying and perceiving the factors of "perceptive experience" leading to an individual's aesthetics or joy refer to the studies of perception, recognition, and attitude focusing on "empirical theories" and known as "empirical aesthetics". This dynamic perspective has resulted in new ideas and opinions, the outcomes of which include the specialised terminologies of aesthetics and relevant problems regarding the perception of form/space and its effects on the human experience as an impetus for research. Based on the correlation analysis in accordance with scientific and quasi-scientific techniques, such empirical studies rely on individual experiences to analyse aesthetic experiences (Lang, 2009, 120). They look for two factors: 1- the aesthetic factors that result in an aesthetic response; 2- differences in preferences for these factors among experts and the public, which refer to their mental, physical, and behavioural reactions caused by different factors of aesthetics (Liu & Chuang, 2014, 2).

Various empirical views have nowadays provided a novel description of human experience with the environment. 1- The pragmatism view of experience, meaning, and value-based on Dewey's ideas: John Dewey defined the concept of experience as an active, dynamic relationship between a living organism and the surrounding environment. According to Dewey, experience generally means interaction, constantly sustainable action-reaction, an action-mixed process, and an organism's relationship with its environment (Dewey, 2005). 2- Phenomenology of the physical mind, especially in Merleau-Ponty's method and less rooted in the ideas of Husserl and Heidegger who focused on the lived experience (Merleau-Ponty, 1982). 3- The cognitive sciences of the second generation that follow the studies of physical cognition (psychology, neurology, linguistics, and anthropology) (Jelic et al., 2016). 4- The ecological philosophies that emphasise the processes of human-environment signification (Rapoport, 1990). Hence, given these views, the empirical findings of cognitive sciences, especially those of neurological studies, introduce a better theoretical context for this study.

According to cognitive sciences, the corresponding content and senses of architectural experience include a combination of cognitive, emotional, and sensory elements. Therefore, Aesthetics is considered a subjective experience obtained from experience-related subjective processing. This experience includes a feeling of joy and a kind of emotion; therefore, neurological aesthetics[1] is described as a newly emerged discipline within the framework of neurological sciences with regard to the perception of biological foundations of aesthetics experiences. Neurological aesthetics results from various areas of neurological sciences such as perception, feeling, meaning, attention, and decision-making and provides relevant information. These experiences include feelings, evaluations, and actions that are stimulated by the objects and processes that are produced and interpreted. In fact, neurology merges empirical aesthetics with cognitive-emotional neurosciences. Therefore, the use of "embodied experience" can be considered the axial characteristic of joy in architecture, and the full perception of experience joy and formation of aesthetic value in architecture would require cognition. It is an "active cognition"

of attention to qualitative perceptions. In cognitive sciences, architectures are assumed to be able to design "environmental capabilities", something which indicates that people's experiences of environments are naturally based on the chance of action and are known through factors of sensorimotor knowledge and motivation. Hence, the cerebral activities that are the base for the aesthetic perception of architecture might simultaneously involve different mechanisms and circuits of the brain that are responsible for regulating physical, emotional, and cognitive reactions. In fact, such neural-physiological and behavioural signs can indicate the visual-emotional effects of feelings. Moreover, the idea that latent physical reactions play a role in architectural experience can be traced in the theories of "empathy". Such theories suggest that observing architectural shapes can result in physical reactions that create the relationship between aesthetic and emotional dimensions and physical involvement with the space.

Proven by the recent neurological findings, these theories have emphasised the vital role of sensorimotor areas in the perception of artworks (Vecchiato et al., 2015 a, 426). Furthermore, Freedberg and Gallese (2007) first proposed a theoretical framework for the analysis of aesthetic experience based on the neurological interpretation of the empathy theory in emotional-physical accordance with works of art. They started their work by analysing the concept of empathy in the feeling of physical experience with art and architecture, an area which was developed by Robert Wisher and Heinrich Wolflin in the late 19th century and Theodor Lips in the early 20th century2. Accepting the empathy theory of "embodied simulation", they interpreted the motor system and activation of visual mechanisms (i.e., simulation physical actions and emotions) as an aesthetic experience. According to Wolflin's study of empathy in architecture, Freedberg and Gallese suggested that those processes were involved in the perception of spaces. The main hypothesis of their approach is the "interaction of a motor system" in the aesthetic experience. In that system, physical simulations are described as empathy

for tactile senses, motions, gestures, and actions. Thus, a spectator is automatically able to create a feeling of empathy towards the representative content of an artwork. As a result, this theoretical framework (based on the role of empathy and embodied simulation) of the aesthetic experience leads to tangible feelings, motions, and implicit actions. In other words, the motor system is activated by the representative content of an artwork and an automatically created inceptive relationship between a work of art and a spectator. This theory indicates that the activation of embodied mechanisms plays a key role in the aesthetic experience and that these mechanisms can lead to the perception of aesthetics in architectural spaces. It also shows that the perception and intention of interaction with the environment can involve motivational factors. According to them, the architectural experience operates based on the precognitive activation of the embodied mirror mechanisms3, in which the stimulation of actions, emotions, and physical senses is involved. In other words, empathising or showing physical and empathetic reactions towards works of art can be a "spontaneous empathetic reaction" that causes a "preliminary response" (Freedberg & Gallese, 2007, 197–203). Generally, these findings indicate that empathy is related to equally psychological and physiological changes and the intensity of non-objectively perceived emotion in aesthetic reactions. Moreover, the aesthetic experience indicates an empathetic involvement that includes a series of an individual's physical reactions.

Focusing on the cognitive process of experience, neurological studies have addressed neurological mechanisms between architecture and aesthetic experience, especially "spontaneous experiences". According to their results, the joy of beauty resulting from an architectural experience includes cognitive and emotional processing which occurs automatically and spontaneously[4] (Ma, Hu & Wang, 2015, 279). Therefore, the main task of cognitive development, i.e. perceptive function, results from interaction with the environment and is expanded by the accumulation of knowledge and emotional effect. Hence, what is

perceived as joyful is based on the identifiable patterns caused by the preliminary emotional mechanisms (Xenakis, Arnellos & Darzentas, 2012, 216). Moreover, cognitive theories state that there is something like a thought or evaluative judgment within the heart of every emotional experience that guarantees a form of cognitive elements justifying the active use of thinking (Levinson, 2011, 244).

Accordingly, studies have analysed how spatial features moderate and modify "physical self-awareness"[5] and addressed the perception of neurophysiological correlations and relationships associated with the cerebral circuits involved in visualisation, sensorimotor integration, and positional orientation.

Such hypotheses were validated positively through the recent neurological results (Vecchiato et al., 2015b). According to neurological findings, the activity of the sensorimotor cortex is an intermediary factor in the automated and pre-reflective perception of activities based on the theory of embodied simulation. The visual areas of the brain are also involved in aesthetic processing and can reflect neurological responses to visual stimuli. Eventually, activating the orbitofrontal cortex is accompanied by processing the rewarding stimuli, and improving the activities of the frontal lobe is related to the judgments on aesthetic parameters (Jelic et al., 2016, 9). Moreover, if positive aesthetic feelings reach high levels, they will activate the reward circuit in the nervous system (Menninghaus et al., 2019, 53).

In addition, the hypothesis that architectural perception can include the reward-regulating cerebral circuits and emotional processes was developed through the extensive literature on aesthetic judgments. Generally, it should be mentioned that aesthetic experiences are the newly-emerged states of mutual interactions and effects between nervous systems, i.e. 1- sensorimotor system, 2- feeling–value system, and 3- meaning–knowledge system known as effective mechanisms in which aesthetic experiences affect each other through those systems. Thus, when only objects are observed and focused on instead of outcomes, aesthetic experiences are distinguished from other evaluative

feedback. In this theoretical model, the findings indicate the roles of sensorimotor systems in the automated processing of elemental features of aesthetic objects as well as cognition and interaction through the embodied mechanisms. Finally, the role of the meaning–knowledge system in the aesthetic experience is indicated by the studies that have analysed the conditions in which the stimuli are reflected by changes of activity in the rewarding and feeling nervous circuit (Chatterjee & Vartanian, 2014, 2), (Fig. 1).

According to Chatterjee and Vartanian (2014), these cerebral networks interact with each other while perceiving an object and can play a key role in perceiving architectural aesthetics. Based on this framework, the sensorimotor system can automatically process the objects and environmental features that interact with a spectator through embodied mechanisms. The evaluative-emotional system processes the information regarding proximity, avoidance, wanting, and loving; however, the meaning-knowledge system has been left very unknown because it has a very extensive distribution in the brain and depends strongly on an individual's expertise and cultural conditions. Although the existing dynamic relationship between cerebral networks has not been analysed accurately, it can be valuable to present an extensive hypothesis regarding the nature of architectural experience including its aesthetic dimension as well as the relationships between these empirical results and recent scientific reports on aesthetic experience. First, the evidence of the sensorimotor system for object perception indicates that the aesthetic experience results from the interaction between a spectator and an object. Moreover, the role of emotional-feeling evaluation systems[6] shows that an aesthetic experience is an embodied phenomenon directed related to adaptation, whereas the perception of aesthetics is associated with better adaptation to the environment (Jelic et al., 2016, 9).

The results of the two studies can be used as evidence regarding the roles of feelings and reward in the perception of architectural aesthetics. In particular, Vartanian analysed the effects of rectangular and curved lines (Vartanian et al., 2013) and ceiling height
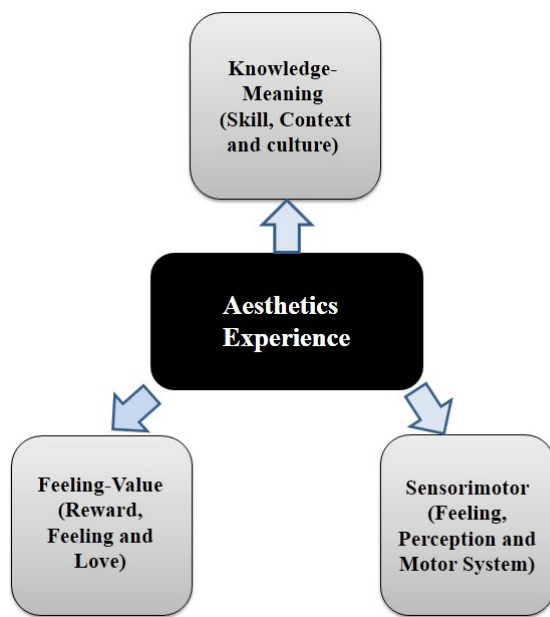
Fig. 1. The trilogy of aesthetic experience. Source: Chatterjee & Vartanian, 2014, 2.

with perceived attachment (Vartanian et al., 2015) on the judgment of aesthetics and proximity-avoidance decisions of spectators (by visualising the images of architectural spaces through the FMRI test). This first study proved that interaction with an artificial environment and perception of such an environment could include motivational and emotional factors. For instance, perceiving the environments whose characteristics are the marginal lines of their curved façades can activate the reward circuits formed in cerebral cortices (Vartanian et al., 2013); therefore, observing an architectural space leads to the activation of neural networks regulating reward and judgment. This indicates the participation of emotional, cognitive, and contextual factors involved in the perception of aesthetics (Vecchiato et al., 2015b, 2). At the same time, this view supports the "interaction of sensory and conceptual hypotheses" in the aesthetic experience[7]. For instance, the second study proved these results by analysing the pleasantness through the observation of spaces with different architectural features (e.g., ceiling height and openness/closedness of spaces). Therefore, the structure of interaction between sensory and conceptual hypotheses plays a major role in the visual-motor processing of architecture (ibid., 13). In other words, a perceived open-closed space can affect

aesthetic judgments. An open-closed space can be considered a degree of perceived motion in the space. According to Vartanian et al., Stamps argued that the degree of motion and movement in the space was described more accurately as "permeability", which includes visual permeability and motor permeability. In a more comprehensive framework, the preference and priority of an architectural space are the functions of to what extent they facilitate visual/motor permeability (Stamps, 2005 quoted inVartanian et al., 2015, 4-5). From the perspective of cognitive sciences, the interference of latent physical reactions in architectural perception and experience indicates that observing architectural shapes leads to physical reactions and represents the relationship between aesthetic and emotional dimensions and involvement of the body with the space. These findings demonstrate the vital role of sensorimotor regions in the perception of space. The theoretical framework of the embodied simulation and the concept of empathy in the aesthetic experience refer to tactile senses, gestures, and implicit motions. The perception and intention of interaction with an artificial environment through the created capabilities can also involve motivational factors. Therefore, the results of these studies present specific evidence, based on which the perception of aesthetics depends on the stimulated implicit and inner activities including emotional experiences, evaluation processing, and context-related factors. Hence, the necessity of adjusting the body posture and appropriate action in architectural environments would be an instance regarding the activation of attention and motivation for allowing a spectator to have an informed experience as an experiencing or physical institution as well as the perception of aesthetics in this regard.

In fact, it should be stated that the architectural experience leads to the perception of aesthetics. Given the sensory perception of its elements, this topic places special emphasis on subjective or cognitive effects that indicate a few points. First, this dimension is relatively harmonious with aesthetics. In other words, the architectural experience is a two-sided arrow that points at both a subject and an object at the same

time. Second, the subjective reaction/attitude towards aesthetic experience is an area that requires the analysis of experience. Thus, it is necessary to focus on the inner dimensions of experiences. It is also essential to pay attention to subjective components and not to analytical components in the aesthetic experience. Therefore, it can be concluded that the aesthetic experience of knowing a location is acquired through the "embodied aesthetics" approach, which relates the phenomenology of perception to cognitive sciences.

The aesthetic experience of architecture is a combination of perception, cognition, and evaluation emphasising human feelings through critical thinking. In this case, rationality has an extensive meaning and does not oppose feelings. Both concepts of "cognition" and "visualisation" are important to preferences and any actions related to the identification of aesthetics. This knowledge of rationality is closely related to the idea of practical reasoning. Unlike inductive reasoning in which a result is necessarily obtained from the previous hypotheses, practical reasoning leads to an action. In practical reasoning, the result cannot be obtained from the previous hypotheses, for there is no positive public hypothesis as to "Always do X." In fact, practical reasoning requires the physical and subjective identification of whole from an unclear number of special components. This structural process is experienced actively; therefore, "cognition" should be used because practical reasoning exists in the architectural experience by nature.

Like an action, an aesthetic experience results from reasoning and evaluation. Human attitudes towards architecture include the informed states of the mind which have one direction, i.e. intention for an action. The human experience of architecture is informed because it includes the concept of spatial perception of architecture on which it focuses. In this approach, emphasis should be placed on the ability to justify and describe "experience" by adopting a non-formic process of contemplation and thinking. Humans are not passive and can experience the space that does not fall in a separate category based on the objectivity–subjectivity division. Humans are active, and aesthetic

judgments include or require the justification of experienced actions, feelings, and perceptions. More importantly, judgments are significant indices of relation to the world, and emphasis on its cognitive nature indicates that they are sensitive to variable degrees of subjective and perceptive structures.

An evident characteristic of aesthetic experience is the spontaneous deviation of people's attention. In fact, people do not focus on the environment but on themselves and their perceptive skills such as feelings (Trentini, 2015, 415). Although the effects of events are felt intrinsically (like emotions), the impetus comes from the extrinsic factors such as characteristics, place, and time, for emotional and physical feelings play a major role in the experience and has a significant debate relationship that underlies and transfers the nature of aesthetic experience. In fact, this kind of experience is multisensory in terms of its foundations and also includes a judgment beyond the multiple senses such as direction, gravity, balance, stability, motion, progression, continuity, and scale. It means that the direct and immediate judgment of a spatial character summons all the existential and visual senses of humans and is perceived in a scattered and minor way rather than accurately and consciously. In addition, the complicated evaluation leads to a transient process by combining perception, memory, and imagination, for the capability of every space and location is an invitation and recommendation of separate and specific activities that create an empirical and transient character in addition to the environmental atmosphere and the spirit of a space and forms a specific and perceptive identity. Thus, humans evaluate architectural aesthetics not only through senses but also through their embodied imagination

• **Conceptual model for perception of aesthetic experience in architecture**

First, it is necessary to mention that the proposed conceptual model is basically different from the formic and fundamental structures of models in the psychological of art. In fact, the models for the psychology of art consider the aesthetic experiences of art to be resulting from the consecutive and

separate steps of information processing formed in a hierarchical process. Each of these models analyse a specific component differently within the process of perceiving the aesthetic experience of an artwork. However, the proposed conceptual model adopts a combinatorial view. In addition to being inspired by the content structures of models in the psychology of art, the proposed model indicates the effective role of the human sensorimotor system in processing the aesthetic features of a space and recognising them through interaction with the help of embodied mechanisms in perception and architectural experience.

Unlike the other multistep models in the psychology of art that start perceptive processing at lower steps, the proposed model follows the cognitive processing of style, content, and context at higher steps. Finally, it results in cognitive mastery, perception, and evaluation, which are mainly based on the acquired expertise (like the model proposed by Leder & Nadal, 2014). By contrast, such hierarchical processing of the proposed model includes parallel processing that is independent of perceptive aspects and cognitive aspects (i.e., individual experiences, memory, cultural context, knowledge, expertise, innovation/acquaintance8, interest, and preference). These two processing aspects are linked in the aesthetic experience of architecture through the active and continuous human–architecture "physical knowledge" context9. Furthermore, this is consistent with the "embodied cognition" approach. In fact, this model proposes a pattern of embodied aesthetics that integrates objective and subjective aspects of aesthetics through aesthetic interaction.

This model distinguishes between two processing methods. In these two policies, the processing is parallel and independent to a great extent. The first method is perceptive processing based on the emotional evaluation. In other words, an architectural artwork might be either beautiful or not beautiful. If it is beautiful, a responsive mechanism for aesthetics is activated in the brain. This bottom-up mechanism is usually universal among individuals and operates based on the subjective evolution of the stimulation potential of drivers. Generally, this type of evaluation is

naturally pleasant by itself (Menninghaus et al., 2019, 51), including an individual's evaluation of an impetus apart from the needs and goals. The second method is cognitive processing that is a function of syntactic content. In fact, cognitive processing is somehow a top-down process. In general, if the processing is satisfactory in both ways, an aesthetic experience will emerge. For instance, if perceptive processing (perceptive aesthetics) is intensified with a successful dominance over cognitive processing (cognitive aesthetics), a combinatorial mechanism (activation of perceptive and cognitive paths) will probably emerge, and feelings can be extracted through both policies to moderate the aesthetic experiences of architecture. According to Silvia's "subjective evaluation" theory, it can be proven that emotions result from the subjective evaluation of events and that a variety of emotional reactions to a space includes a spectrum of feelings of aesthetics such as wonder and excitement as well as another variety of emotions based often on knowledge. Therefore, as Silvia's theories of the emotional evaluation suggest, a subjective experience does not result from external self-stimulating characteristics, whereas its subjective construct comes from the cognitive process of evaluating external objects[10] (Silvia, 2005). This model differentiates between external information (drivers and context) and the internal representation within an architecture's processing system and that of an audience. External information includes the drivers, i.e. architectural elements and concepts by which architectural artworks are created and observed. In a processing system, information is encoded from right to left, and arrows indicate the flow of information. This model also includes the feedback and top-down processing cycles flowing in the cognitive processing step.

The stimuli are encoded by the mechanisms of sensory perception. A user of the space obtains the information pertaining to not only visual perceptions but also combinatorial sensory perceptions in interaction with the space. Moreover, the already existing conceptual information can be reread from the memory. The arrows indicate two separate paths of information processing:

perceptive processing that includes general emotional reactions and cognitive processing that brings about the resultant reactions of content interpretations[11]. Therefore, if the processing of both paths is satisfactory (common activities of perceptive and cognitive activities) and if perceptive processing and cognitive processing are intensified with emotions inferred separately from both paths, aesthetic experiences will emerge. Moreover, the primary emotional responses have motivational foundations[12], whereas motivation affects behaviour and prepares a cognitive factor to act by directing it towards interaction with space and the proximity-avoidance space behaviour. In fact, motivation is the driving force of perception, behaviour, and the creation of personal preferences. In the sensory encoding step, a few stimulating codes affect the neural system and aesthetics processing mechanism of humans unconsciously. At the same time, those codes reveal the exciting signs that coincide with perceptive concepts and spatial experience.

As discussed earlier, this model is based on the fact that aesthetic experiences result from the continuous reactive interaction between humans and architecture. It is also based on principles of perception, cognition, and emotions in relation to the stimulation potentials of architectural elements. Hence, according to Berline, it should be stated that aesthetic attraction appears to be a model that depends on the stimulation effects of general or structural features (Akalin, Yildirim, Wilson & Kilicoglu, 2009, 125). Berline also believed that stimulation was related to what was called coactive variables (i.e., novelty, unexpectedness, wonder, contrast, heterogeneity, complexity, and uncertainty). Berline called those variables "coactive" because their ability to create stimulation depends on the comparison of an assumed stimulus with a standard stimulus but differs from the human memory stimulus and causes stimulation (Franken, 2017, 566). Furthermore, Berline's motivation theory is based on the concept of exploration, and the existing uncertainties lead to the need for exploration and curiosity, which are both considered joyful (Akalin et al., 2009, 125).

Thus as feeling and emotions contribute to architectural

evaluation, it can be stated which "Motivation" or "Stimulation" is closely related to the initial stage of the evaluation process.

According to Russel and Mehrabian, stimulation is a subjective activity that describes an individual's emotional state with a singular dimension that varies from drowsiness to extreme excitement[13] (Russel & Mehrabian ,1978). In fact, aesthetic responses are defined as appropriate feeling preferences or emotional evaluation (Ulrich, 1983; Wohlwill,1976), which are activated with a wide variety of environmental stimuli. Emotional reactions can be evaluated with emotional preferences considered appraisable reactions and experiential meaning of an individual for the environment (Nasar, 1994).

An initial pleasant factor should be stimulated to arouse feelings with a pleasurable aesthetic value. Aesthetic feelings require important motivational tendencies and prepare the next actions. In this view, the primary evaluation phase compares the current event with ordinary and normal priorities. The satisfactory factors have an intrinsic positive outcome pointing out different forms of emotional interactions through "spontaneous acceptance"[14], which leads to active human participation in an architectural space. The secondary evaluation phase is the informed section of the process, in which evaluation occurs more slowly. The cognitive variables involved in emotional stimulation do not indicate the cognitive conditions for a specific feeling; according to Silvia's approach (2005), they express further meanings for the stimulation of feelings. As this approach suggests, representations in the second evaluation phase lead to richer aesthetic meanings through the differentiation process as the cognitive factor aiming to reduce uncertainty for the user of space and help the user's informed action through the proximity-avoidance process[15].

In a behavioural response, emotional states can be considered relevant to practical desires. In this model, emotional patterns are considered an interactive expression pattern such as motion, and practical desires are assumed as an emotional state based on practical tendencies. The desire to approach or avoid a

stimulus is a major dimension of emotion. According to the previous studies, the evaluation of a stimulus has a reliable relationship with a behavioural desire to approach a stimulus or avoid it (Vartanian et al., 2013, 2015). This model suggests the performance outcomes of two parallel processes, the first of which is the subsystem of aesthetic evaluation (perceptive processing) that mainly affects the stimulation and extraction of emotional meanings of aesthetics. The second one is the subsystem of cognitive variables (cognitive processing) playing a major role in achieving the explorative behaviour of the use of space. These two subsystems have organisational relationships and affect the preparedness of an action by an independent agent (user). In particular, the emotional outcomes (feelings) of these two subsystems are considered functional indices that enhance the "positive experience" formed through active human–architecture interaction (Fig. 2). In this model, the aesthetic experience includes causative and systematic relationships between (positive and negative) emotional values and aesthetic judgment, for they are created through the interactions of cognitive factors with the environment. Aesthetic emotions are considered the functions that have evaluation mechanisms because a cognitive factor tries to solve uncertainty in a specific interaction. In fact, an aesthetic experience is a combination of deliberate emotional and cognitive processes employed to evaluate the interactive potential of people in the space. The model aims at a process by which the stimulation of primary aesthetic feelings of joy can affect the development of aesthetic evaluation and resultant emotions. Moreover, the motivational attitudes obtained from the evaluation of emotions lead to the preparedness and willingness of a user to behave in the space.

Accord to McAndrew, emotional evaluation includes attributing an emotional quality to an object or a situation, whereas the emotional evaluation of an environment directs the attitudinal behaviour or avoidance of humans (McAndrew, 2014, 74). The emotional responses of an environment include evaluating sensory reactions. In fact, sensory evaluation refers to the attribution of an emotional feature to an environment such as love/indifference and inferences regarding a place or its implicit meanings such as judging it as a friendly/unfriendly environment. An individual's emotional reaction is about his/her intrinsic attitudes towards the environment such as joy or pleasantness16. Therefore, aesthetic reactions to sensory evaluations might include certain emotions such as joy, pleasantness, and appropriateness as well as physiological and behavioural reactions. It can then be stated that the main dimensions of an emotional experience (joy, beauty, and attraction) refer to the qualitative and perceptive features of an environment such as cohesion/complexity and legibility/mysteriousness affected by Kaplan's theory (Kaplan & Kaplan, 1989) and having a role in the process of forming an aesthetic experience. In fact, the main factors that affect sensory perceptions generally include the things that arouse human feelings and affect someone's emotional evaluation of a place. Nevertheless, the underlying layers of this feeling should include the other features of positive aesthetics. In other words, although perceptive features such as discipline, mystery, cohesion, and complexity can be the most important perceptive factors in determining the aesthetic feeling, other aesthetic features (e.g., balance, clarity, novelty, and unity) are importantly effective and improve the aesthetic dimension of architecture by having tangible roles in the aesthetic content of a place. Schlosberg proposed a 3D theory of emotion including 1- pleasantness-unpleasantness, 2- attention-rejection, and 3- activity (Schlosberg, 1954 quoted in Khodapanahi, 2017, 214). Accordingly, three major components can be classified for the emotional responses of a place as 1- emotional response, 2- physiological response, and 3- behavioural response. In addition, the following three sources should also be taken into account to access the emotional evaluation process: 1- attention, 2- emotional involvement, and 3- memory. Hence, the artworks that are more interesting, more emotional, deeper, and less likely to be boring will induce a positive subjective experience in the mind.
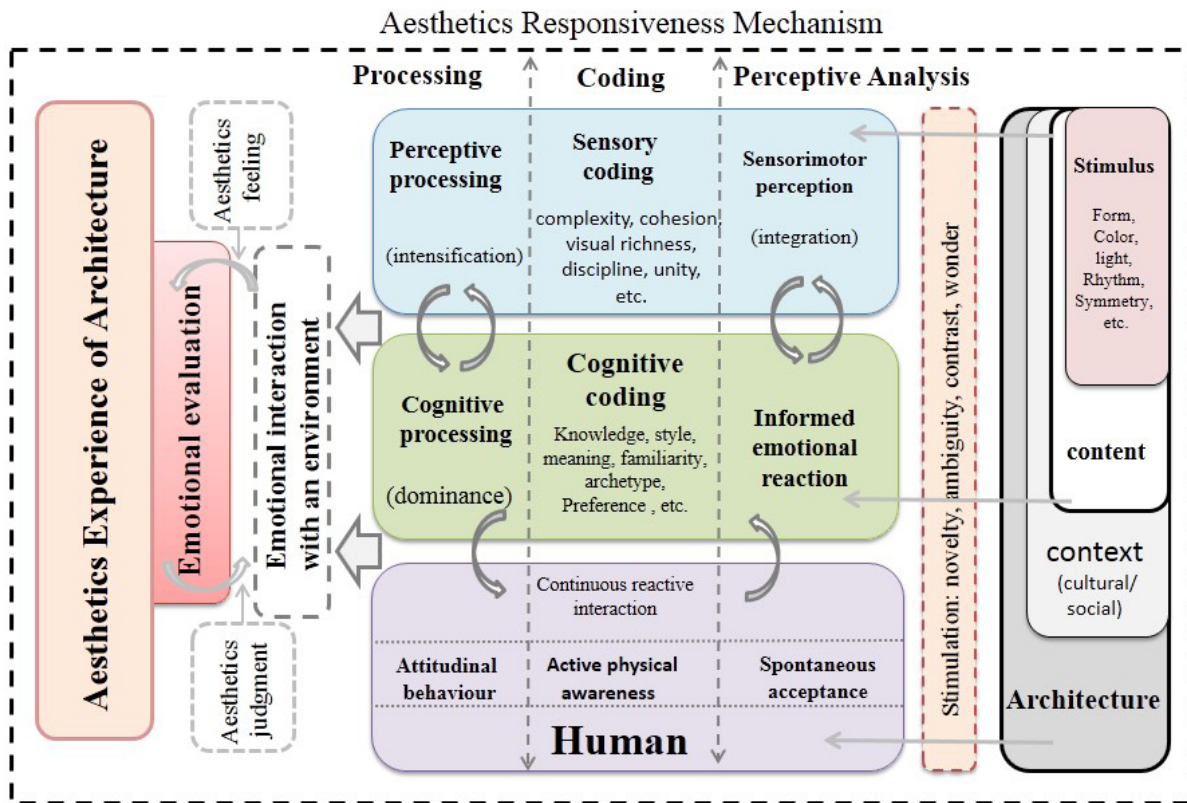
Fig. 2. The conceptual model for the aesthetic experience perception process in architecture. Source: Author.

According to the proposed model, the components that are considered the basic constituents of the structure of this experience will be activated through emotional responses in the space. If there is positive emotional processing, they will form the aesthetic experience of architecture. These components are as follows: 1- The perceptive component that indicates the structures of stimuli (architectural and spatial elements) and reflects certain dimensions such coordination, colour, texture, rhythm, discipline, and balance in an architectural combination perceived as a rich set of perceptive qualities; 2- The motivational component that consists of sensory emotions or practical desires of preparedness for behaviour in the space; 3- The sensorimotor component that includes the physiological responses of humans to the space, activates the interactive dimension reflecting the resultant capabilities of an architectural experience, and also includes the five senses; this component consist of factors such as direction, gravity, balance, stability, motion, progression, continuity, and scale; 4- The cognitive component that indicates content (meaning) and context of an architectural artwork; 5- The emotional component that is also known as an emotional experience and reflects positive and negative emotions in terms of effects on the audience of a space; 6- The behavioural component that includes the expressive behaviour and an active informed action including proximity to or avoidance of a space. Furthermore, these components were developed in terms of an embodied aesthetic approach in relation to perception, feelings, and action. They result in the constituent elements of an aesthetic experience through the key principles related to every component in an interconnected and interactive state (Table 1).

Conclusion

The conceptual structure of the proposed theoretical model is based on the principle that every experience has a structure and pattern created through a harmonious and coordinated structure. Therefore, an experience is a generality resulting from the dynamic interaction between an individual and an environment. In addition to its separate sections, this generality has

Table 1. The components affecting the formation of an aesthetic experience in architecture. Source: Author.

Components	Features of Components
Perceptive components	Morphologic, structural, and configuration features and attributes of a building such as proportion, rhythm, scale, colour, light, shade, hierarchy, engineering/spatial system, and locational relationships resulting in perceptive experiences.
Motivational components	All environmental variables whose effects lead to subjective activities of humans and orientation of human feelings and behaviour.
Sensorimotor components	The attributes that result in a sense of spatial exploration and curiosity through five senses and sensorimotor induction (e.g., direction, gravity, balance, motion, progression, and continuity).
Cognitive components	The perceptive experience emphasises a perceiver's knowledge and affects an individual aesthetic judgment under the influence of different factors such as meaning, memory, history, culture, social class, individual features, prior experience, interest, and preference.
Emotional components	Positive emotional processing that occurs as aesthetic feelings through the space emotional evaluation. Individuals give emotional reactions to stimuli or conditions in different ways (not in the same way).
Behavioural components	The attributes that lead to practical desires of humans in an environment through spatial stimulation potentials. The proximity motivation means the willingness to approach a stimulus and the motivation to avoid it.

multiple dimensions. In-depth experiences of a building require a fundamental phenomenological campaign from a third-person perspective to a first-person perspective. In other words, a human's experience (me) of a building (it) should change from me and it as a dichotomy to a "unity of experience", in which a subject and an object are merged. This integration is created through the potential conditions of architecture and attracts humans; therefore, the user of space reaches from a third-person perspective to a first-person perspective. It can then be stated that the aesthetic dimension of an architectural artwork can be perceived as a potential in the physical structure of an artwork, and the aesthetic dimension emerges only when humans perceive architecture and can penetrate its potential texture of aesthetic features through a subjective experience. Hence, this experience results from the dynamic character of a space that creates perceptive conditions for the realisation of potential aesthetic qualities of a building.

In the proposed conceptual model, the aesthetic experience of architecture can be considered a complicated phenomenon that includes various processes created through interaction with environmental conditions or events. This model considers aesthetic preferences to be an indicator of emotional judgments about a place, the perception of which is affected by an individual's motivations and spatial experiences including the complicated and interconnected process of different factors. Therefore, it can be considered that the aesthetic experience results in more complicated processes (e.g., conceptualisation and more complicated

feelings) by interacting with an environment as a major emotional activity. From an empirical perspective, it emerges as a feeling of appropriateness, pleasantness, and attraction. Accordingly, it will be more likely to discover new and different mechanisms for an aesthetic experience in relation to other cognitive processes and phenomena, although most of these intrinsic mechanisms and relationships are not clearly recognisable merely by observing spatial behaviours in empirical studies. Therefore, this experience can be considered a multidimensional concept consisting of subjective dimensions that should be perceived as the active participation of humans in perceptive and experiential processes of the space.

Finally, it can be stated that aesthetics is a subjective experience of subjective processing in relation to experience, which includes a feeling of joy and can also contain a flow of emotions. Hence, this experience emerges as a phenomenon that has functional relationships with the physical processes and emotional reactions of humans. It is also evaluated through direct perception and involvement with the space. In this case, feelings and emotions can efficiently affect cognitive processes in addition to direct effects on behaviour at higher levels in the form of emotional stimulation. Thus, the functional role of aesthetics-based emotional values is to detect further interactive opportunities and reflect other functions that facilitate behavioural decisions and evaluative processes of aesthetics (Fig. 3).

As a result, an aesthetic experience of architecture means the emotional evaluation of the experience of
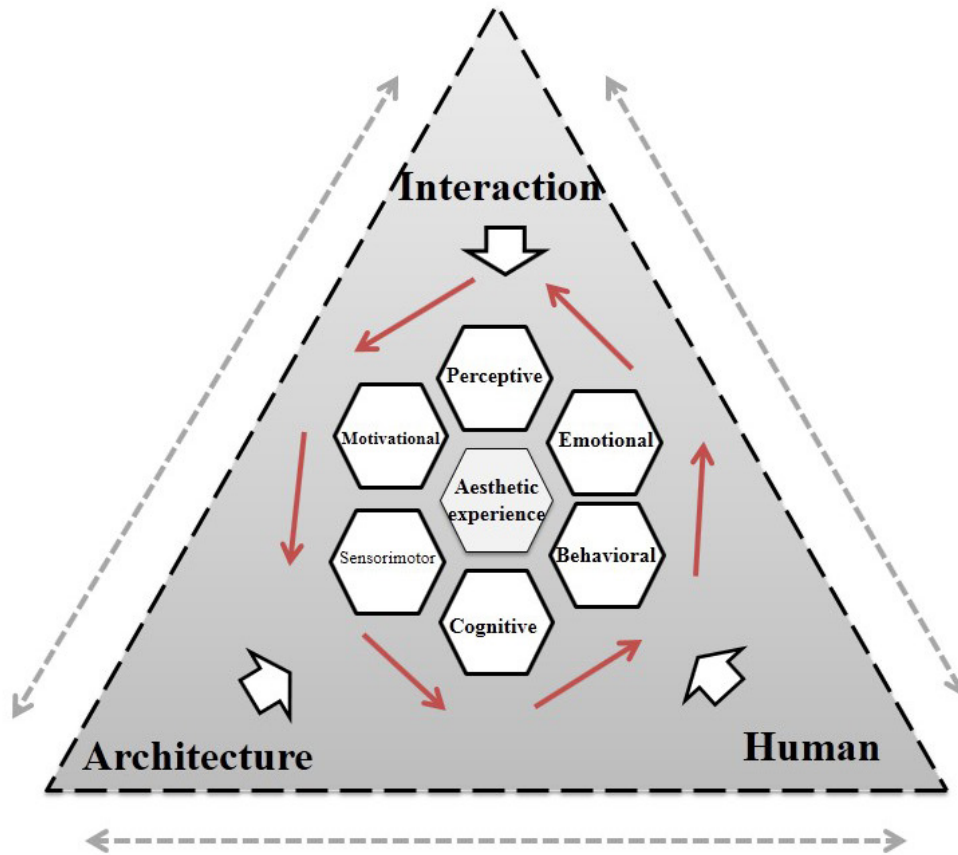
Fig. 3. The components affecting the formation of an aesthetic experience in architecture. Source: Author.

spatial perception based on a direct approach through perceptive, motivational, sensorimotor, cognitive, and behavioural components in a combination of different emotional imaginations (e.g., joy and pleasantness). Therefore, the key features of this experience can be introduced as follows: acceptance and experience of a place as an open and extensive quality through attention; perception through a sensorimotor experience in combination with memory and visualisation; stimulation of an individual's perceptions as the feeling of new probabilities; dichotomy as a dynamic exchange, continuity, and interaction with the space for discourse and participation methods of an individual and a space. Since the main function of a human's cognitive development is the perceptive function resulting from interaction with the environment, it can develop based on the accumulation of knowledge and emotional effects. In this regard, what is perceived as pleasant is based on the recognisable patterns resulting from emotional mechanisms, something which bears great importance, especially in the architectural styles

that cause fundamental and long-lasting changes in the human intellect.

Endnote

1. Studies of neural aesthetics combine feelings, science, and experience in natural systems that determine joy and analyse the method of signifying information in the brain and controlling the experience of art and life through feelings. According to neurological studies, perception of aesthetics can be considered a neurological function based on the evolutionary cognitive development. In this regard, Ramachandran argued that solving the initial aesthetics problem (i.e., origin of aesthetics and judgment) would depend on the better perception of communications between visual centers of the brain, emotional (limbic) structures, and inner logic of the cerebral cortex (Ramachandran et al., 2003 quoted in Xenakis, Arnellos & Darzentas, 2012, 216).
2. In the late 19th century, Wolflin and Lips introduced the problem of emotion and association with the body features and effect of spatial motion on its physical experience in relation to feeling and perception. In the inner sensory-formic view, they found the inner sensory values related to the muscular motions and body motions and presented the physiognomy theory. Systematically, Lips analysed the inner sensory-formic relationship and described the dynamic relationship between visual perception and concepts for the first time ever. According to Lips, an architectural element determines not only the visual weight of a work of art but also the attraction and repulsion of that element towards the surrounding elements. Wolflin based his theory on the similarity between forms and physical experiences of the body. According to Arnheim, buildings have expressive quality, and the meanings and concepts that are understandable and recognisable to users have direct relationships with the building form. This theory was introduced as the natural symbolism (Rezazadeh, 2004, 125).
3. The motor neurons that are activated during the execution of an action and the inspection of that action in the eye of another spectator.

4 . According to neurological studies by Zaki and Kavabata in 2008, the decisions made by the anterior and parietal cortices of the brain (i.e., happiness and satisfaction) can be created up to 10 seconds before entering the human unconsciousness. As a result, the human judgment of a building occurs long before the time he/she hesitates to consider more valuable meanings (Mallgrave, 2016, 125).

5. The philosophy of "self-awareness" was introduced in the later writings of Husserl, Phenomenology of Perception by Merleau-Ponty, and recent neurological studies analysing the enactive approach to perception and cognition.

6. Pointing out the important role of emotions in thinking and attitude, Johnson believes that there is no cognition without feelings and emotions, although humans are often unaware of emotional dimensions of thinking and attitude. However, emotions and feelings are considered the main sources of meaning in this view. In fact, feelings and emotions are not the second-order cognitions but are the emotional patterns of human encounter with the world, through which objects can be considered at an initial level. Johnson believes that feelings constitute the process of environment-human interactions and that conditions and situations are usually the main position of feelings, not the mind (Johnson, 2017).

7. This view unifies sensory hypotheses (i.e., pleasantness is positively related to the activation of sensory cortices of the brain and conceptual hypotheses (i.e., pleasantness is positively correlated with the activation of anterior cortices of the brain. Moreover, other studies support the sensory and conceptual hypotheses of aesthetic experience. Their results indicate the evidence that there is a relationship between a moving experience or activity in the areas of processing motion and the experience of pleasantness with the prefrontal anterior cortices. Nevertheless, it appears that these two processes interact with each other within a single window of activity to create an aesthetic experience (Vecchiato et al., 2015b, 12).

8. The seemingly contradictory factors of innovation and acquaintance are the important predictors of positive aesthetic preferences and simultaneous aesthetic feelings. In particular, frequent exposure to the artworks of interest will not often result in fatigue effects on the intensity of emotional responses (Menninghaus et al., 2019, 52). In general, there are two different models for attempt at predicting the probability of aesthetic reactions. The first model is called "preference for being a prototype", which states that individuals are willing to prefer that which is the most evident instance and is familiar to them. The second model is called "preference for difference", which states that if an experience is closely related to an individual's subjective representations, there will then be a slight amount of stimulation and a minimal amount of positive feelings. Positive stimulation and feeling enhances when the differences between an individual's experience and subjective representations increase. Pron concluded that both models were supported to some extent, whereas "preference for difference" was supported more. However, it cannot be sufficient explain this mechanism completely (Bishop, 2007, 65).

9. The amazing experiences of architecture can have great effects on memory and place themselves within the subjective framework of a spectator's embodied knowledge (Bermudez & Ro, 2013, 678).

10. Emotions result from biological and cognitive processes and emotional experiences and make an individual create cognitive explanation. Emotions recall expressive, purposive, and adaptive behaviours. How an individual experiences a specific emotion depends on his/her evaluation of an environment (Franken, 2017, 410).

11. In the view of two emotional systems, humans have two simultaneous systems that activate emotions: 1- The self-simulating biological system that automatically and spontaneously reacts to stimuli; 2- The cognitive system that is based on individual experience and reacts to stimuli by evaluating a meaning as an interpretation. These two emotional systems complete each other (Reeve, 2016, 452).

12. Motivation is a series of complicated organismic and environmental variables, the actions of which lead to public and directed activities of feeling and behaviour (Khodapanahi, 2017, 16).

13. A widely used approach to the evaluation and description of environmental experiences is the environmental psychology method proposed by Russel and Mehrabian (1978). Employing three emotional dimensions (joy, stimulation, and dominance), they described human perceptions of physical environments indicating emotional states (preferences and joy) (Russel & Mehrabian, 1978).

14. Magda Arnold's emotional theory (1960, 1970) places evident emphasis on the concept of cognitive evaluation. According to Arnold, humans first start evaluating stimuli automatically, quickly, and unconsciously; as a result, they grow fond of what is evaluated and considered good (Khodapanahi, 2017, 229). Arnold also described emotion as motivation. Recent studies confirmed Arnold's views on the fact that the evaluation of love/indifference is automatic and quick (Reeve, 2016, 507).

15. Aesthetic feelings express motivational tendencies for proximity or avoidance, the most important of which is the tendency to end, extend, or repeat exposure to an artwork (Menninghaus et al., 2019, 53).

16. Russel and Mehrabian introduced four dimensions of emotional reactions of the environment in an emotional composite rotational model (the complex flow of emotion) (joy, emotion, stimulation, relaxation) (Russel & Mehrabian, 1978).

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