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The Aesthetics of the Contemporary Urban Landscape and its Implications for Well-Being

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Abstract
In an increasingly urban world, more citizens are exposed to urban landscapes, including the aesthetics of these environments. Despite psychological research supporting the existence of a positive relationship between environmental aesthetics and well-being, the aesthetics of contemporary urban landscapes (UL) are subordinated to variables such as functionality and economic redeeming. The purpose was to study how citizens perceive contemporary UL in terms of aesthetics and how this relates to well-being. Using photographs of UL in an online questionnaire, quantitative and qualitative ratings of aesthetics and well-being were obtained of 63 participants. Results showed that contemporary UL were perceived as less aesthetic than traditional UL and associated with words suggesting a negative connotation. Analyses could not confirm a positive relationship between UL aesthetics and well-being. A qualitative analysis revealed a tendency to evaluate well-being negatively in relation to contemporary urban landscapes. As these findings suggest that aesthetics should be considered in urban planning, further research should focus on the possible relation between UL aesthetics and well-being.

Keywords: Aesthetics; urbanism; well-being; urban landscape; contemporary urban development; capitalism.

1. Introduction

Research in the domains of environmental psychology and neuropsychology has significantly illuminated the relation between aesthetics and the environment. Evidence suggests that particular environmental features, such as natural spaces and fractal-rich components, elicit aesthetic appeal in humans, and these characteristics are commonly discernible in conventional architectural styles (Brielmann et al., 2022; Joye, 2007; Lavdas and Schirpke, 2020; Taylor, 2021). The importance of aesthetics in urban planning is further emphasized by the positive relationship between aesthetics and well-being (Hidalgo, 2008; Aziz Amen & Nia, 2018; Amen & Kuzovic, 2018, Amen & Nia; 2021; Aziz Amen; 2017 Galindo & Corraliza, 2012; Sallis et al., 2012; Brielmann et al., 2022). In particular, traditional architectural design has been found to have a positive impact on human well-being (Brielmann et al., 2022).

The housing landscape in Munich has undergone significant transformations since 1900 due to rapid population growth and urbanization. The resulting housing shortage led to the construction of new residential neighborhoods, such as Schwabing and Au-Haidhausen, characterized by ornate facades and decorative elements in the Gründerzeit architectural style (Landeshauptstadt München Referat für Stadtplanung, 2018). However, after World War II, large-scale housing developments known as "Plattenbau" were built on the city's outskirts to address the need for affordable housing, leading to a shift towards functionalism and short-term economic considerations. An example of the diminishing aesthetic value can be seen in the neighborhood of Neuperlach, where an architect involved in certain projects described the area as lacking visual appeal and aesthetic pleasure (Sattler in Haubrich, 2013). In recent years, Munich has once again faced a housing crisis with a scarcity of affordable housing and rising living costs. To address this issue, there is a demand for the development of new housing across the city. However, architects and journalists have pointed out that the new developments often prioritize functionalism over aesthetics, resulting in a homogeneous and uninspiring cityscape (Matzig, 2017; Pfeil in Welte, 2017). These criticisms highlight the dissatisfaction with the architectural approach adopted in Munich's residential areas, emphasizing the need to examine the aesthetics of UL in Munich and its potential impact on well-being.

Given the positive relationship between urban aesthetics and well-being, this study aims to investigate this relationship regarding traditional and contemporary architectural styles in one of Munich's historic districts Au-Haidhausen. This study aims to contribute to our understanding of the importance of aesthetics in the contemporary UL and its relationship with the well-being of citizens.

2. The Aesthetics of the Contemporary Urban Landscape

2.1. A Historical Perspective on the Evolution of Aesthetics

Aesthetics is a field that endeavors to understand the nature of beauty and the underlying philosophical foundations of art (Real Academia Española, 2022; Collins, 2022). While its etymological origins can be traced back to the ancient Greeks (Bayer, 1961/2014), its establishment as a distinct discipline did not occur until the 18th century, primarily due to the influential work of Alexander Gottlieb Baumgarten, a German philosopher (Bayer, 1961/2014). Notably, the study of

aesthetics predates its formalization as a scientific subject, as evidenced by the creative endeavors of prehistoric humans in crafting objects and visual media that possessed inherent aesthetic appeal (Campos Bueno, 2010).

Over the years, aesthetics has been shaped and redefined by various philosophical thoughts and movements. From Greek philosophy through the Middle Ages and Renaissance to the mid-18th century, aesthetics was primarily concerned with the contemplation of sensory perception and the beautiful (Masiero, 2018). The German philosophers Baumgarten and Kant were pivotal in establishing aesthetics as an independent discipline that examined the relationship between art and beauty (Bayer, 1961/2014; Soto-Bruna, 1987). From this point on, the dissociation of beauty and aesthetics was inaugurated (Moratiel, 2018). In the 19th century, this dissociation between was deepened, and a rethinking of aesthetics occurred that embraced the opposite of beauty, namely ugliness (Calvo Fernández, 2018). Despite this new fixation on the ugly, the traditional ideal of beauty and its relationship with aesthetics persisted (Calvo Fernández, 2018). It was not until the 20th century that avant-garde movements emerged, proposing the *death of beauty* and the expression of art without any constraints, including aesthetics (Bayer, 1964/2014). It is at this moment that, with the Modern Movement, beauty ceased to be considered as the supreme end of art (Moratiel, 2018). It is evident, therefore, that the concept of beauty and the discipline that studies it have evolved with the passing of time and no unanimous definition has been reached. Regardless, it appears that the pursuit of beauty, the pleasure it brings, and the desire to comprehend it have existed even before it was identified by its current name, as noted by Bayer (1961/2014, p.7) who claimed that "aesthetics has existed [...] even since prehistory." This suggests that the appreciation of beauty can be seen as an integral, and thus important, part of human nature.

2.2. **Aesthetics and well-being**

Research in environmental psychology supports the notion that exposure to aesthetically pleasing environments is positively related to individuals' well-being. Galindo and Corraliza (2012) discovered that aesthetic judgments are associated with various positive biological functions, such as stress reduction, mood enhancement, attention restoration, and a sense of coherence, in humans. Similarly, Hidalgo (2008) emphasized the psychological advantages of aesthetically pleasing environments, including their positive effects on relaxation, fascination, and escapism. Furthermore, it has been found that aesthetically pleasing UL are positively related to walkability (Zhou et al., 2019) which, in turn, can benefit residents' physical health (Berke et al. 2007; Sallis et al., 2012).

These initial studies show that aesthetically pleasing UL can enhance well-being. Correspondingly, it is plausible that a low aesthetic quality of UL can have a negative impact on well-being. García-Doménech (2015) argued that a low aesthetic quality of UL can cause anxiety and restlessness. However, further research is needed for a better understanding of this relationship and the mechanisms behind it.

The aforementioned studies suggest that aesthetics can influence our well-being. However, the subjective nature of this construct impedes a clear delineation and operationalization of the term aesthetics. In this sense, it becomes more relevant to understand the psychological implications as well as the biological processes that underly aesthetic experience. The field of neuroaesthetics focuses on understanding the neural correlates of aesthetic experience (Chatterjee & Vartanian, 2014). It could be shown that the same brain networks are activated both in the perception of beauty and in the creation of artworks which suggests that there is a neurological basis for aesthetic experience. Moreover, different brain areas are activated when something seems ugly to us (Cela-Conde, 2021).

Neuroaesthetics has further been experimentally applied to the field of urbanism and architecture. Several studies have shown that prefrontal brain regions and the hippocampus are activated during the evaluation of architectural aesthetics (Coburn et al., 2017; Vartanian et al., 2013; Kirk et al., 2009). This raises the question, which features of the environment are regarded as aesthetically pleasing. Various studies suggest a preference for natural spaces over artificial ones (as discussed in: Chatterjee & Vartanian, 2014). Characteristics in artificial elements that resemble natural elements, such as fractals, activate brain areas related to the perception of beauty (Chatterjee & Vartanian, 2014). It has been demonstrated that, when incorporated into the built environment, fractals can evoke sensations of naturalness and are preferred over non-fractal designs (Brielmann et al., 2022; Joye, 2007; Lavdas & Schirpke, 2020; Taylor, 2021). Moreover, Brielmann et al. (2022) argue that the use of multiple fractals and biophilic architecture in urban design can have a positive impact on health and well-being because they are easier for our brain to process. Likewise, façades that share a mathematical structure similar to that of trees increase the sense of well-being (Brielmann et al., 2022). This, in turn, reinforces the previous assertion that aesthetics in urbanism is related to well-being.

Brielmann et al. (2022) contend that traditional architectural designs, which feature fractals resembling those found in nature, create more pleasant surroundings and lower stress levels compared to modernist designs. Taken together, this suggests that contemporary UL are perceived as less aesthetic with respect to traditional UL. It should be noted, however, that there is currently a lack of empirical evidence concerning other potential factors or explanations that may account for the increased aesthetic appeal of traditional UL in comparison to contemporary ones. The following section discusses the historical connection between architecture, UL, and aesthetics.

2.3. Aesthetics and contemporary urban development

The influence of aesthetics on human well-being in urban development has been recognized to a significant extent. For instance, over 2,000 years ago, Vitruvius proclaimed that a building should possess three essential qualities: firmitas (durability), utilitas (utility), and venustas (beauty) (Eberhard, 2009). Nonetheless, the 19th century brought about rapid urbanization, which resulted in unchecked sprawl and functional disarray in cities, prompting the emergence of urbanism, which sought to combine productivity and habitability from a rational approach.

Avant-garde architects in the 20th century proposed a new model of the modern city, which focused on rational and economical designs and abandoned unnecessary variables such as aesthetics to produce buildings on a massive scale. The modernist conception of the city emphasized strict functional zoning, segregation of circulation, and standardization of building typologies, with no room for aesthetics. Buildings had to be serialized, modularized, and heliothermically oriented, prepared for mass production. Ornamentation was sometimes categorized as a "show of depravity" (Capel Sáez, 2005, p. 229). This approach quickly spread throughout Europe and America, and the economic crisis resulting from the 1929 Wall Street Crash furthered the rationalist approach. This model of city was established as a universal model, easily reproducible on a global scale, and "programmed to supplant the historical city" (Vázquez, 2016, p. 63). In this model of city, the building is considered as an autonomous machine, detached from its surroundings, a machine capable of being reproduced industrially (Choay, 2009).

After 1945, following the end of the Second World War and its terrible consequences, the functionalist approach of the Modern Movement triumphed in the need to build homes on a massive scale (Capel Sáez, 2005). The rationalist and functionalist architectural design promoted by these architects, along with the new techniques and materials available, allowed for the industrialization of the construction process, which was taken advantage of by large construction companies allowing them to introduce rationalization systems into the construction process (Capel Sáez, 2005).

The rational and functional approach of the Modern Movement led to a widespread rejection of traditional humanist principles with regard to construction, favoring a design focused on utility (Chatterjee et al., 2021). The utilitas quality eclipsed the others, a design based on quantifiable variables such as cost, speed, and efficiency prevailed. Difficult-to-measure variables, such as aesthetics and the experience of occupants, were relegated. In addition, the comparative advantage arising from the reduction in construction costs and the increase in efficiency and resource utilization gave wings to the development of the modern mass housing construction industry (Capel Sáez, 2005).

This approach focussed, however, on productivity. The architects of the Modern Movement sought to standardize and homogenize construction for ethical purposes (Capel Sáez, 2005), since their goal was to alleviate the housing crisis and improve the living conditions of citizens (Borja & Muxí, 2003). However, the developmental capitalism of the decade following World War II stripped this approach of all complexity, adopting a speculative logic (Borja & Muxí, 2003). The homogenization, standardization, and simplicity of forms, the use of reinforced concrete, the simplicity of façades, etc., allowed real estate developers to build more floors, make better use of plots, reduce construction costs, and ultimately multiply profits.

The speculative logic that permeates mid-20th century urban development makes the urbanization process one of the main means of capital accumulation (Harvey, 2007), becoming a fundamental mechanism for the reproduction of the capitalist class (Borja, 2014). Starting in the 1980s, this process accelerated with neoliberal capitalism, a political-economic ideology that brought principles of privatization, liberalization, and minimal state intervention to urban politics and management (Harvey, 2017).

Consequently, the responsibility for designing and shaping the urban landscape has often been delegated to private entities. Through operations to rehabilitate and improve the landscape or develop urban spaces, these private economic agents select investment-deficient spaces on which to apply a certain injection of capital. This injection of capital leads to the revaluation and subsequent commodification of the urban space for the extraction of a certain surplus value. In other words, the decision-making process in relation to the configuration of the urban landscape is oriented towards generating economic returns.

Capitalism, particularly through developmental and neoliberal practices, has transformed urban space into a mere commodity (Lefebvre, 1974/2013), facilitating its exploitation for capital accumulation. By treating urban space as a commodity, it has been possible to replicate this commodity globally (Jiménez et al., 2018). However, as Jiménez et al. (2018) note, this mass production ultimately leads to homogenization, resulting in a uniform pattern - the generic city (Koolhaas, 2006).

This way of creating urban space, supported by the current economic and urban development model, legitimizes political and economic forces to remake urban space according to the needs of global capital (Lindner & Sandoval, 2021). Since these economic actors have the power to decide the design and configuration of spaces and their landscape, authors such as Lindner and Sandoval (2021) argue that the aesthetics promoted by these actors are oriented towards consumption. Thus, they create seductive spaces that end up driving exclusionary urban transformations. Given their exclusionary nature and characteristics, these authors define this aesthetics as gentrification aesthetics (Lindner &

Sandoval, 2021). Paradoxically, as they highlight, an urban landscape devoid of identity and originality ends up being configured, characterized by striking architecture, an abundance of pseudo-public spaces, predictable urban ornaments, etc.

2.4. Aesthetics and urban landscapes

In the last decades of the 20th century and the first of the 21st, the uniformity in the creation of urban spaces has worsened, so cities have lost their specific place connotations (Fariña Tojo, 2015). The contemporary urban space and its architecture reflect characteristics that can be described as "cloned, copied, decontextualized or banal" (Fariña Tojo, 2015, p. 163). We observe how the generic city of Koolhaas is reproduced on a global scale and at an accelerated pace. Thus, a progressive divorce has occurred since the mid-20th century between politicians, technicians and society (Fariña Tojo, 2015), which has led us to "forms of city planning that are alien to rationality and common sense" (Fariña Tojo, 2015, p. 166). This distancing from the contemporary urbanization process from society and ultimately from the human, leads us to the so-called Urbanalization (Muñoz, 2008; Nia & Suleiman, 2018). Based on the relationship presented above between the urban landscape and aesthetic valuation, it is conceivable that this distancing also applies to aesthetics.

Ultimately, *Urbanalization* can lead to a reduction in identification with the urban landscape. The accelerated and easily replicable mass production of urban space has stripped these spaces of their identity. Urban spaces and their landscapes are no longer representative and are limited to reflecting the global trends of contemporary urbanism with slight representative modifications of the place (Muñoz, 2008; Caymaz & Hamameh, 2020).

In short, the process of uncontrolled expansion and progressive fragmentation, which characterizes the contemporary city (Pellitero, 2011), has led to a mosaic of generic and anodyne urban spaces that have lost their quality of place. Hybrid spaces - which do not distinguish between city, suburb and countryside (Pellitero, 2011) - and diffuse and contradictory in nature, make the subject feel lost and helpless (Pellitero, 2011).

Given the collective nature of the UL and its impact on citizens, it is essential to improve its aesthetics. Physical elements such as buildings and their architectural design are highly representative of the UL and play a significant role in shaping citizens' experiences. The quality of the UL can directly and indirectly impact citizens' well-being, and a sick UL can indicate the ailments that affect the city. Thus, improving the aesthetics of the UL is essential for creating a more livable and healthy environment for citizens.

3. Research question and hypotheses

In conclusion, aesthetics has a rich historical background and has undergone significant transformations over time. In the context of urban development, aesthetics has been overshadowed by functional and economic considerations, leading to the homogenization and commodification of contemporary UL (Fariña Tojo, 2015; Lefebvre, 1974/2013; Muñoz, 2008; Pellitero, 2011;). In contrast, traditional architectural designs are characterized by elements such as natural fractals which are perceived as more aesthetically pleasing and related to higher well-being (Brielmann et al., 2022). In general, previous research indicates a positive relationship between individuals' well-being and exposure to aesthetically pleasing environments (Galindo & Corraliza, 2012; Hidalgo, 2008). It can, thus, be assumed that contemporary UL has a low aesthetic quality which in turn has a negative impact on well-being.

The current work aimed to provide empirical evidence for the following two research questions:

(i) How does the general public perceive the contemporary UL in terms of aesthetics?

(ii) What implications do the aesthetics of the UL have on their well-being?

And it was hypothesized that:

Hypothesis 1. The citizens will perceive contemporary UL less aesthetically pleasing than traditional UL.

Hypothesis 2. After observing contemporary UL, the well-being of citizens will be lower compared to observing traditional UL.

Hypothesis 3. There is a positive relationship between the aesthetics of UL and well-being.

4. Methods

The design of the study aimed to obtain both quantitative and qualitative data using a mixed-methods approach. This approach is often preferred in urban studies as it allows for a comprehensive analysis of the subjectivity of urban space. This is vital in understanding urban aesthetics and landscape, as it enables capturing the subjectivity of urban space (García Ayala, 2006; Greene et al., 1989; Kleih et al., 2021). The study was inspired by the *photoword* technique and adapted to use in an online survey instead of an interview format. According to García Ayala (2006), the *photoword* technique is an effective method for studying urban imaginaries, as it presents the urban space as a scenario that evokes memories, thoughts, symbols, and urban references. In a first step, stimuli in the form of primary visual information through photographs of six selected urban spaces were collected. In the following, these stimuli were implemented in an online questionnaire to collect reactions of citizens' aesthetic perception and well-being in relation to the stimuli.

4.1. Participants

Participants in the study were required to be 18 years of age or older, with no restrictions based on geographic origin or residence. The sample for the experimental research was selected to ensure representativeness of the adult population in Munich, based on an analysis of Munich residents (Statistisches Amt München, 2022). Munich's population includes at least 45% migrants or individuals with a migrant background (Statistisches Amt München, 2022). In order to reflect this characteristic of the city's population, the sample comprised both German and non-German nationals.

A total of 259 participants were initially selected but 195 were excluded for not completing at least 94% of the questionnaire. The final sample consisted of 63 participants, with an average age of 34.4 years (SD = 14.1; range: 18-82 years). Of the final sample, 38 were male and 25 were female, residing in four countries, with the majority from the United States and Germany. Additional sociodemographic characteristics are presented in Table I (supplementary material). A summary of participant responses to study variables is presented in Table II (supplementary material).

4.2. Stimuli

The complexity of urban reality and the challenges associated with utilizing cities in empirical research necessitate a rigorous delimitation and contextualization of research efforts. In the present study, the geographical scope was limited to the district Au-Haidhausen in Munich. Regarding the stimuli used in the study, the focus was placed on the architectural design of buildings, particularly external elements such as the façade and roof. These fixed elements occupy a large proportion of the visual field and thus enjoy great prominence within visual perception (Lynch, 1964). The architectural design of buildings being the visible parts of UL further constitute a critical component of the city's image, thus implying a high representativeness of the UL.

To facilitate aesthetic evaluation, a temporal dichotomy (contemporary - traditional) was established, with contemporary and traditional categories defined based on construction dates and architectural styles. Since the aim of this study was to analyse how contemporary UL impacts the well-being of citizens, the construction dates were limited to the last two decades of the 21st century. Facades categorized as contemporary fulfilled the following characteristics:

- Buildings designed *after* 1945
- Architectural styles from the Modern Movement to the present

Facades categorized as traditional fulfilled the following characteristics:

- Buildings designed *before* 1945
- Architectural styles prior to the Modern Movement

The geographical scope was limited to the city of Munich specifically to a series of representative urban spaces of the district of Au-Haidhausen (see Figure 1), including Orleansstraße, Auenfeldstraße, and Welfenstraße, which feature both traditional and contemporary architecture. Au-Haidhausen was originally a rural settlement that joined Munich in the 19th century and underwent significant urbanization and industrialization. The neighborhood was heavily damaged in WWII but rebuilt afterward. Today, Au-Haidhausen is a lively area with a mix of restored historical and contemporary buildings. The selected urban space showcases traditional Gründerzeit architecture in the first part and contemporary architecture in the second part. The latter corresponds to the recent urban development of Welfenhöfe and Welfengarten in the Welfenstraße during the 2010s-2020s.

Figure 1. Map of the district of Au-Haidhausen in Munich (left) and exemplary architecture in the district (right)

Sources: Left. Above: Google Maps (2022). Left below: Landeshauptstadt München (2013). Right above: Landeshauptstadt München (2013) and right below: author.

The use of visual stimuli presented in a digital medium is a technique that has been used in studies of urban perception, such as for assessing the perceived safety of certain urban environments (Hidalgo, Salesses & Schechtner, 2013) or for evaluating the aesthetic value of certain squares in the city of Madrid (González Moratiel, 2018). For the stimuli of this study, multiple photographs were taken with the goal to obtain comparable graphic material and to avoid biases, e.g., due to different lighting and weather conditions. Six UL along the chosen urban area in Au-Haidhausen were photographed using a NIKON D5000 camera. The photographs were taken on the same day within a 30-minute interval to ensure similar lighting and weather conditions (as suggested by González Moratiel, 2018). According to the above mentioned criteria for contemporary and traditional UL stimuli were categorized, resulting in six photographs (three contemporary and three traditional, Figure 2).

Figure 2. Stimuli used in study

Traditional

Stimulus 1

Stimulus 2

Stimulus 3

Contemporary

Stimulus 4

Stimulus 5

Stimulus 6

4.3. Measures

Besides the six stimuli of contemporary and traditional UL, measured variables included aesthetic ratings (quantitative and qualitative), well-being ratings (quantitative and qualitative), and demographic characteristics as control variables. The measurement of aesthetic ratings is not uniform in the literature. Vartanian et al. (2013) used dichotomous questions to measure aesthetic ratings. However, this method does not allow for high differentiation as it assumes that aesthetic rating is a categorical variable. In contrast, Galindo and Corraliza (2012) and Kirk et al. (2009) used a continuous approach that allows for representing aesthetic ratings on a continuum. In the present study, a similar continuous approach was used, and several items were used to capture aesthetic rating in response to the presentation of stimuli. Specifically, participants were asked to rate the presented stimuli on "How much do you like this place?", "How attractive do you find this place?", and "How beautiful do you find this place?" on a Likert scale from 1 (not at all) to 5 (very much).

To measure participants' positive and negative mood states, the abbreviated version of the Positive and Negative Affect Schedule (PANAS; MacKinnon et al., 1999) was used. This short form allows for the measurement of positive and negative mood states that participants feel at that moment through ten items. The reliability and validity of this short form have been shown to be acceptable (MacKinnon et al., 1999). In addition to quantitative measures, qualitative measures were also used in this study to to complement the numerical ratings and capture the subjective nature of aesthetics. Participants were asked to describe the place they just saw with a maximum of three adjectives and to describe in one word how this place makes them feel. Furthermore, demographic characteristics such as age, gender, education level, residence, and origin were measured as control variables. Table 1 summarizes the measured variables, which include aesthetic rating (quantitative and qualitative), well-being (quantitative and qualitative), and control variables.

Table 1. Objective indicators Study variables and their operationalization.

Variable	Operationalization	Time point
Aesthetic evaluation	How much do you like this place; how attractive do you find this place; how beautiful do you find this place? (1 = not at all - 5 = very much); Summarize in three words, on what aspects of this place did you base your ratings; Describe with maximum three adjectives the place you just saw.	T2, T3, T4, T5
Well-being	PANAS (MacKinnon et al., 1999) Describe in one word how this place makes you feel.	T1, T2, T3, T4, T5
Control variables		T6
Age	How old are you?	

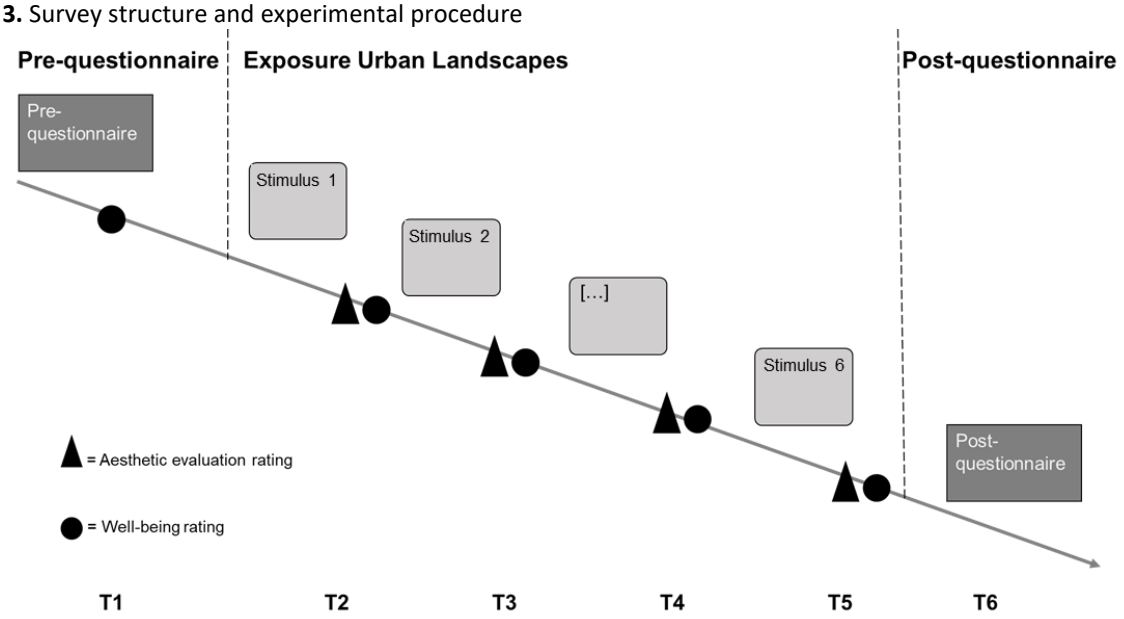
Gender	What gender do you identify with? (three levels: female, male, diverse)
Educational level	What is your highest level of education? (1. Only reading and writing; 2. Primary School Graduate; 3. Secondary School Graduate; 4. Diploma or Advanced Vocational Training; 5. University Degree, Master and/or Bachelor; 6. Doctorate)
Residence	What city do you currently live in?
Origin/Origin	What country are you from ?

Note. T = Time point; PANAS = Positive and Negative Affect Schedule.

4.4. Procedure

The questionnaire was divided into three parts: a pre-questionnaire (T1), followed by the presentation of stimuli (T2-T5), and a post-questionnaire (T6). In the pre-questionnaire, participants were informed about the study's objective and content and participants' well-being was assessed for the first time. Following this, participants were shown one of the environmental stimuli at a time in a randomized order. After exposure to the stimuli participants did the aesthetic ratings and repeated the PANAS for each of the stimuli. This process was repeated for each of the six stimuli to analyse differences in aesthetic evaluation and well-being in relation to the types of stimuli (contemporary or traditional). The order in which participants viewed the stimuli was randomized to avoid order effects. Finally, the post-questionnaire obtained responses to the control variables. Figure 3 outlines the experimental procedure.

Figure 3. Survey structure and experimental procedure



4.5 Quantitative Analysis

JASP (version 0.14.1) was used to perform quantitative analysis on the data. Data preparation involved calculating the mean aesthetic rating value for each of the six stimuli and forming mean values for the Positive and Negative Affect Schedule subscales for each stimulus. Two new variables were created to categorize participants' residence and origin and were used as covariates in the analysis.

To test whether the aesthetic evaluation of traditional UL (stimuli 1-3) was higher than contemporary UL (stimuli 4-6) (hypothesis 1), an analysis of covariance (ANCOVA) was conducted. ANCOVA was preferred over a t-test with a subsequent regression analysis as it allows for the inclusion of covariates in the same analysis, which can enhance statistical power. The dependent variable was the aesthetic rating, and the within-subject factor was Condition (traditional or contemporary). Residence (Munich or not; Europe or not) and Origin (Europe or not) were used as covariates to account for the potential influence of cultural context and identity on the aesthetic perception of UL. In

addition, age and education were included as covariates to investigate the relationship between aesthetic evaluation and other sociodemographic characteristics.

To test hypothesis 2, which posits that well-being is higher for traditional UL compared to contemporary ones, two ANCOVAs were conducted. In the first ANCOVA, the dependent variable was the Positive PANAS score, with Condition (traditional, contemporary) as the within-subject factor, and covariates including age, education, residence (Europe or not), residence (Munich or not), and origin (Europe or not). The second ANCOVA used the Negative PANAS score as the dependent variable, with the same covariates as the first analysis.

To explore hypothesis 3, three Spearman correlation analyses were conducted to examine the potential relationship between aesthetic evaluation and well-being. Since the variables were not normally distributed, Spearman correlation was chosen. The first analysis included the total aesthetic evaluation (mean of the aesthetic ratings for all six stimuli), the mean Positive PANAS, and the mean Negative PANAS. The second analysis included the same variables but only for the traditional stimuli, while the third analysis included the same variables but only for the contemporary stimuli. Age, education level, residence (Europe or not), residence (Munich or not), and origin (Europe or not) were controlled for in all three analyses as covariates.

4.6 Qualitative analysis

To prepare the data for the subsequent analysis all responses to the qualitative questions about aesthetic evaluation and well-being (Summarize in three words: What aspects of this place did you base your evaluations on?; Describe the place you just saw using a maximum of three adjectives) and the qualitative question about well-being (Describe how this place makes you feel in one word) were translated to English since the survey was conducted in three languages. Native speakers were used for back translation.

After translating the responses, a frequency count was conducted for each word collected in the questionnaire for both aesthetic evaluation and well-being using MS Excel. Additionally, a frequency-weighted sentiment analysis of each term recorded in the questionnaire was performed using ChatGPT-3.5. According to Wang, Z., Xie, Q., Ding, Z., Feng, Y., & Xia, R. (2023), the preliminary study on ChatGPT's sentiment analysis capabilities indicates its potential as a universal sentiment analyzer. The results of the sentiment analysis were grouped by evaluation type, aesthetic and well-being, as well as the traditional and contemporary stimuli.

5. Results

5.1. Quantitative analysis

Aesthetic evaluation

In the ANCOVA with aesthetic evaluation as the dependent variable, a main effect of Condition was found ($F(1, 119) = 42.22$, $p < .001$). The η2 (partial) was 0.262, indicating a large effect (Cohen, 2009). Following this main effect, the post-hoc comparison (Tukey) showed that the aesthetic evaluation of traditional UL ($M = 2.90$) was higher than that of contemporary UL ($M = 2.04$) with a difference of 0.86 ($SE = 0.13$), $p < .001$. The d of this comparison was -1.11, which indicates a large effect (Cohen, 2009). These results support hypothesis 1.

Among the covariates, age ($F(1, 119) = 4.34$, $p = .039$, η2 (partial) = 0.035), education level ($F(1, 119) = 5.99$, $p = .016$, η2 (partial) = 0.048), and residence in Munich ($F(1, 119) = 6.74$, $p = 0.011$, η2 (partial) = 0.054) were significant. Residence in Europe and European origin were not significant (see Table 2 for more detailed statistical information on this analysis).

Table 2. ANCOVA Results with Aesthetic Rating as Dependent Variable

Variable	*F*	*p*	*η² (partial)*
Traditional vs. Contemporary	23.622	< .001	0.262
Age	2.426	.039	0.035
Level of Studies	3.353	.016	0.048
Residence in Europe	0.179	.573	0.003
Residence in Munich	3.774	.011	0.054
European origin	0.0001	.987	0.00002

Well-being

The ANCOVA with the dependent variable of Positive PANAS did not show a main effect of Condition ($p = .171$). Among the covariates, only age was significant ($F(1, 119) = 8.72$, $p = .004$, η2 (partial) = 0.068). The rest of the statistical values of this analysis are presented in Table 3.

Table 3. ANCOVA Results with PANAS Positive as Dependent Variable

Variable	*F*	*p*	*η² (partial)*
Traditional vs. Contemporary	1.896	.171	0.016
Age	8.721	.004	0.068
Level of Studies	1.725	.192	0.014
Residence in Europe	0.680	.411	0.006
Residence in Munich	0.009	.927	0.00007
European origin	0.105	.746	0.0008

The ANCOVA with the dependent variable of Negative PANAS also did not show a significant main effect of Condition (p = .085). Of the covariates, residence in Europe (F(1, 119) = 5.09, p = .026, η2 (partial) = 0.041) and residence in Munich (F(1, 119) = 5.39, p = .022, η2 (partial) = 0.043) were significant. The rest of the statistical values for this analysis are presented in Table 4.

Table 4. ANCOVA Results with PANAS Negative as Dependent Variable

Variable	*F*	*p*	*η² (partial)*
Traditional vs. Contemporary	3.014	.085	0.025
Age	0.556	.457	0.005
Level of Studies	0.600	.440	0.005
Residence in Europe	5.088	.026	0.041
Residence in Munich	5.392	.022	0.043
European origin	3.840	.052	0.031

Relationship between aesthetic assessment and well-being

The first correlation analysis with the total values did not show any significant relationship between the variables (see Table III, supplementary material). Regarding the correlation analyses with the values of traditional and contemporary UL, no significant relationship between the variables was found either (see Table IV and V, supplementary material).

5.2.Qualitative analysis

Aesthetic evaluation

For the traditional stimuli, some of the most commonly mentioned words were "color," "colorful," and "colors," indicating the significance of vibrant and diverse hues in participants' evaluations. Additionally, terms such as "trees," "architecture," and "buildings" were frequently used, suggesting that natural elements and architectural structures played a substantial role in the aesthetic appraisal. On the other hand, words like "boring," "ugly," and "grey" also appeared frequently, indicating that certain aspects of the traditional environment were perceived negatively. Turning to the contemporary stimuli, participants frequently used words such as "green," "normal," and "grey" to describe the place. This suggests that the presence of greenery, a sense of familiarity, and a subdued color palette are prominent aspects that might have influenced their aesthetic evaluation. Words like "cars," "windows," and "building" were also commonly mentioned, implying that elements related to transportation and architectural features garnered attention. Interestingly, terms like "sad" and "quiet" appeared more frequently than in the traditional stimuli, possibly indicating a different emotional response associated with the contemporary setting. The frequency of responses for aesthetic evaluation, divided into traditional and contemporary categories is presented in Table 5.

Table 5. Frequency of Responses for Aesthetic Evaluation

Traditional	Repetition	Contemporary	Repetition
color	25	boring	42
colorful	24	green	17
colors	18	normal	17
trees	17	ugly	17
architecture	16	grey	16
buildings	16	cars	15

street	16	Color	15
beautiful	12	windows	15
dense	12	building	14
boring	11	buildings	13
clean	11	gray	13
old	11	quiet	13
nice	10	sad	13
traditional	10	trees	13
walkable	10	architecture	12
cars	9	neutral	12
windows	9	clean	11
classic	8	street	11
density	8	calm	10
facade	8	comfortable	10

Note. Extract of the twenty most repeated words for contemporary and traditional stimuli.

Well-being

After seeing the traditional stimuli, participants frequently mentioned feeling "bored", "normal," and "calm". Words like "happy," "good," and "neutral" were also common, indicating positive or balanced emotional states. However, terms such as "depressed" and "lonely" were mentioned, suggesting the presence of negative emotions in the traditional context. For the contemporary stimuli, participants expressed feeling "bored," "meh," and "depressed" more frequently than after seeing the traditional stimuli. This could indicate dissatisfaction with contemporary UL. Words like "good", "neutral", and "comfortable" were also mentioned, reflecting a relatively positive or neutral emotional state. Notably, terms like "lonely", "sad", and "stressed" appeared more frequently compared to the traditional stimuli, indicating a potentially higher prevalence of negative emotions in the contemporary environment. Table 6 presents the frequency of responses for well-being, categorized as traditional and contemporary.

Table 6. Frequency of Responses for Well-being

Traditional	Repetition	Contemporary	Repetition
bored	12	bored	24
normal	9	meh	6
calm	8	depressed	5
happy	7	good	5
good	6	neutral	5
neutral	6	nothing	5
comfortable	4	sad	5
interested	4	comfortable	4
okay	4	fine	4
better	3	lonely	4
content	3	normal	4
depressed	3	quiet	4
familiar	3	stressed	4
fine	3	tired	4

lonely	3	annoyed	3
meh	3	okay	3
small	3	unhappy	3
uncomfortable	3	uninspired	3
anxious	2	active	2
boring	2	alright	2

Note. Extract of the twenty most repeated words for contemporary and traditional stimuli.

Relationship between aesthetic assessment and well-being

As depicted in Table 7, responses to aesthetic evaluation of traditional stimuli received a positive score of 0.30, indicating a moderate level of positivity. There was also a presence of negative sentiment, with a score of 0.18. The majority of responses fell into the neutral category, receiving a score of 0.52. In the contemporary aesthetic evaluation, the responses received a slightly lower positive score of 0.26. The negative sentiment, however, was more pronounced than for the traditional stimuli, with a higher score of 0.38. With regard to well-being, responses to traditional stimuli had a higher positive score of 0.53, suggesting a generally positive sentiment. The negative sentiment scored 0.29, while the neutral category received a lower score of 0.18. In contrast, the contemporary well-being responses had a lower positive score of 0.22, indicating a less positive sentiment. The negative sentiment was more prominent, scoring 0.52, and the neutral category received a score of 0.26.

Table 7. Sentiment Analysis Summary

Qualitative Responses	Positive Score	Negative Score	Neutral Score
Aesthetic Evaluation - Traditional	0.30	0.18	0.52
Aesthetic Evaluation - Contemporary	0.26	0.38	0.35
Well-being - Traditional	0.53	0.29	0.18
Well-being - Contemporary	0.22	0.52	0.26

6. Discussion

The aim of this experiment was to evaluate the perceptions of citizens regarding the aesthetic aspects of contemporary UL and their impact on well-being. The findings demonstrated that these UL are frequently regarded as less aesthetically pleasing compared to traditional UL, and that contemporary UL, at least on a qualitative level, are associated with more negative sentiments regarding well-being. This emphasizes the significance of incorporating aesthetic considerations into urban planning practices and underscores the necessity for additional research to explore the potential connection between UL aesthetics and well-being.

The first objective of this study was to determine whether the aesthetic evaluation of contemporary UL was lower than that of traditional UL. European cities, characterized by an urban morphology that houses architectural heritage accumulated over centuries in their historic centers, can be considered a reflection of the pursuit of beauty, consolidated over generations through the common effort of all inhabitants. However, multiple historical factors of a social, cultural, political, economic, etc. nature led artistic movements to question the need for aesthetics in architecture. Although it is an open debate that goes beyond the limits of this study, various authors suggest that the aesthetic variable was displaced from this discipline, subordinated to rationalization and functionalism (Capel Sáez, 2005; Gastón, 2020; Vázquez, 2016).

The hypothesis was that contemporary UL would be perceived as less aesthetically pleasing than traditional ones (hypothesis 1). This was confirmed in the present study, as the aesthetic evaluation was lower for contemporary UL than for traditional ones. The qualitative analysis corroborated these findings, as adjectives with a negative connotation were more frequently used to describe contemporary UL than traditional UL. Words such as bored, ugly, depressed and sad were associated with contemporary UL. Regarding traditional UL, although the word bored was often used to describe their aesthetics, the word beautiful was used more frequently. The qualitative analysis also suggests that variety in colors is a standout aspect when evaluating the architecture of a space aesthetically, with words like color or colorful being the most commonly used by participants to describe the aesthetics of traditional urban spaces. The tendency to point out vegetation as an aesthetic element (Chatterjee & Vartanian, 2014) is also confirmed in this analysis. However, It should be noted that this aspect was highlighted in both contemporary and traditional UL.

In summary, the results support the assumption that contemporary UL are less aesthetic than traditional design. Furthermore, the results of this study support previous findings in neuroaesthetics regarding higher aesthetic evaluations for traditional architectural designs (Brielmann et al., 2022; Chatterjee & Vartanian, 2014). The scope of this study is not enough to confirm that this higher aesthetic evaluation is due to their similarity to elements of nature such as fractals.

Brielmann et al. (2022) also demonstrated that exposure to traditional UL induced a reduction in stress and therefore an improvement in well-being. Thus in the second hypothesis, it was assumed that after observing contemporary UL, citizens' well-being would be lower than when observing traditional UL. However, the quantitative results of this study did not confirm this assumption. Well-being (both positive and negative) did not differ between the two types of UL. Therefore, this study fails to confirm the assumption that there is a relationship between architectural style and well-being. Nevertheless, the qualitative analysis does suggest a tendency towards negatively evaluating well-being in relation to contemporary UL. Adjectives such as *sad*, *depressed*, and *unhappy* were more often associated with stimuli referring to contemporary UL than traditional ones. These findings are not robust enough to draw any conclusions which is why further research is needed to understand the relation between both variables.

Finally, previous studies demonstrated a positive relationship between the aesthetic quality of the environment and well-being (Galindo and Corraliza, 2012; Hidalgo, 2008). These studies, along with the findings of Brielmann et al. (2022) and Chatterjee & Vartanian (2014), supported the assumption that the aesthetic quality of the UL and well-being would be positively related. That is, high aesthetic evaluations would be related to greater well-being (hypothesis 3). However, this hypothesis could not be confirmed, as no correlation was found between the two variables.

This study has strong evidence, both quantitatively and qualitatively, that there is a difference in aesthetic evaluations of contemporary and traditional UL, with the former being perceived as less aesthetically pleasing. At the same time, there was a tendency towards lower qualitative well-being with regards to contemporary UL. However, the results are not strong enough to corroborate the assumption that (i) contemporary UL are associated with less well-being , and that (ii) there is a relation between aesthetic evaluation and well-being. This could be attributed to the constraints of the methodology, as elaborated in the subsequent paragraph. Nevertheless, it is important to acknowledge the possibility that there may be no inherent relationship between aesthetics and well-being in the context of UL, or that this connection might not be as significant as presumed. This highlights the importance of further research. The results revealed a consistent perception that contemporary UL were less aesthetically pleasing compared to traditional UL. These findings highlight the importance of incorporating aesthetics into urban planning practices and emphasize the necessity for further research to investigate the potential link between UL aesthetics and well-being.

Limitations

This study can be considered as part of a larger series of studies exploring the aesthetic quality of the UL, encompassing more than just architecture. Future studies should broaden the analysis of architectural styles beyond traditional vs. contemporary. The study acknowledges the significance of elements like vegetation, traffic, and people in shaping our perception of the UL. To improve accuracy, future studies should employ diverse stimuli and perspectives, including eye-level viewpoints of pedestrians. In-depth interviews and on-site visits could enhance well-being measurement. Longer exposure and more realistic stimuli, such as videos or in situ visits, may be necessary to capture urban space effects accurately. Considering other senses like hearing, touch, and smell is important in understanding urban perception. Incorporating neuroaesthetics and virtual reality technologies can deepen the understanding of the aesthetics-well-being relationship.

The study's limitations also include the absence of personal interviews, use of photographs instead of realistic stimuli, and a small sample size of educated participants from Western countries. To mitigate biases, future research should increase sample size and include diverse cultural backgrounds, particularly in the Global South. Conducting in-depth interviews and using a common language would clarify interpretation nuances across languages.

7. Conclusion

Since the 20th century, environmental psychology and neuropsychology applied to aesthetics have shed light on aesthetics applied to the environment. Such research suggests that humans find certain characteristics of the environment beautiful, such as a preference for natural spaces and elements rich in fractals (Brielmann et al., 2022; Joye, 2007; Lavdas & Schirpke, 2020; Taylor, 2021). These characteristics can frequently be found in traditional architecture (Brielmann et al., 2022). The present research developed in the European city of Munich, comparing traditional and contemporary UL, has confirmed this predilection for traditional architectural design over contemporary designs. The latter have not only been considered less aesthetically pleasing in the quantitative analysis, but the qualitative analysis has shown how contemporary architectural design has been associated with terms suggesting a negative connotation such as boring, ugly, sterile, and monotonous.

The significance of the aesthetic variable in urban planning is theoretically reinforced by a positive relationship between aesthetics and well-being (Hidalgo, 2008; Galindo & Corraliza, 2012; Sallis et al., 2012; Brielmann et al., 2022). However, the present research could not confirm this positive relationship between UL aesthetics and well-being. Nevertheless, the qualitative analysis conducted in this study regarding this relationship provides first evidence supporting a negative relationship between contemporary architectural design and well-being. Methodologically, this

study has shown that the mere perception of digital images was sufficient for participants to identify which UL they found less aesthetic and which they found more aesthetic.

Contemporary UL exhibits a design pattern similar to that observed in the stimuli analyzed in this study, with common characteristics such as simple and linear shapes, neutral colors, and lack of ornamentation. These features conflict with the positive well-being effects identified by science. To manage the UL in a way that respects human well-being, public and private managers must understand the importance of aesthetics in urbanism. Replicating the study's methodology to assess aesthetic perception and well-being in entire neighborhoods can identify areas that require investment and apply specific measures and regulations. Private managers can also replicate the methodology to consult with neighbors and facilitate acceptance of their projects. This study is an initial inquiry that should be followed by further research, such as using virtual reality and Big Data analysis to study the population and urban spaces in greater detail. Although the study's results do not conclusively link urban aesthetics and well-being, they highlight the importance of urban landscape design for citizens' well-being. While this study did not provide definitive evidence, it is highly plausible, based on theoretical grounds, that there exists a relationship between aesthetics and well-being. Research across various disciplines has consistently suggested such a connection. Consequently, the author strongly advocates for additional research in this field to uncover and improve our understanding of this relationship. Ultimately, this endeavor has the potential to enhance the overall quality of our lives in urban environments.

In conclusion, while the results of this study do not allow for a categorical assertion that links the aesthetics of contemporary UL with the well-being of citizens, they do suggest that public and private managers should have tools at their disposal that allow them to identify possible deficits in the level of urban landscape aesthetics of their cities. The qualitative results of this study highlight the importance of considering aesthetics in the design of urban landscapes, which should be viewed as an essential aspect of urban planning.

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Conflict of Interests
The author declares no conflict of interest.

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Supplementary Material

Table I. Sociodemographic Characteristics of Participants

Characteristic	*n*	%
Gender		
Male	38	60.32
Female	25	39.68
Residence		
United States	25	39.68
Germany	17	26.98
Spain	5	7.94
Sweden	4	6.35
France	2	3.18
New Zealand	2	3.18
Argentina	1	1.59
Australia	1	1.59
Canada	1	1.59
Colombia	1	1.59
Czech Republic	1	1.59
Slovakia	1	1.59
Italy	1	1.59
Peru	1	1.59
Origin		
United States	25	39.68
Germany	14	22.22
Spain	5	7.94
Sweden	4	6.35
Canada	2	3.18
Colombia	2	3.18
France	2	3.18
Italy	2	3.18
Argentina	1	1.59
Australia	1	1.59
Czech Republic	1	1.59
Slovakia	1	1.59
Lithuania	1	1.59
New Zealand	1	1.59
Peru	1	1.59
Venezuela	1	1.59

Note. N = 63 participants with a mean age of 34.4.

Table II. Estadísticas Descriptivas de las Variables del Estudio

Table II. Descriptive statistics of the study variables

Variables	*M*	*DE*
Aesthetic evaluation		
Stimulus 1	3.17	0.87
Stimulus 2	2.61	0.98
Stimulus 3	2.93	1.06
Stimulus 4	1.93	0.79
Stimulus 5	2.45	0.99
Stimulus 6	1.73	0.78
Traditional (total)	2.90	0.87
Contemporary (total)	2.04	0.68
PANAS Positivo		
Stimulus 1	11.62	4.78
Stimulus 2	10.81	4.39
Stimulus 3	11.33	4.92
Stimulus 4	10.25	4.87
Stimulus 5	10.81	4.60
Stimulus 6	9.86	4.24

Traditional (total)	11.25	4.36
Contemporary (total)	10.31	4.26
PANAS Negativo		
Stimulus 1	6.10	2.13
Stimulus 2	6.95	2.88
Stimulus 3	6.37	2.39
Stimulus 4	7.29	3.18
Stimulus 5	6.62	2.70
Stimulus 6	7.71	3.58
Traditional (total)	6.47	2.22
Contemporary (total)	7.21	2.72

Note: Aesthetic evaluation = average of the three aesthetic evaluation questions. Stimuli 1 - 3: traditional, Stimuli 4 - 6: contemporary. Traditional (total) and contemporary (total) refer to the average of the respective three stimuli. PANAS = Positive and Negative Affect Schedule.

Table III. Results of Spearman Correlation Analysis (total)

	1	**2**	**3**
1. Valoración estética (total)	-	-	-
2. PANAS positivo (total)	0.085	-	-
3. PANAS negativo (total)	0.004	0.238	-

Note: p* < .05, p** < .01, p*** < .001. None of the correlations are significant.

Table IV. Results of Spearman Correlation Analysis (Traditional Stimuli)

	1	**2**	**3**
1. Valoración estética (tradicional)	-	-	-
2. PANAS positivo (tradicional)	0.214	-	-
3. PANAS negativo (tradicional)	-0.115	0.150	-

Note: p* < .05, p** < .01, p*** < .001. None of the correlations are significant.

Table V. Results of Spearman Correlation Analysis (Contemporary Stimuli)

	1	**2**	**3**
1. Valoración estética (contemporáneo)	-	-	-
2. PANAS positivo (contemporáneo)	0.167	-	-
3. PANAS negativo (contemporáneo)	-0.113	0.184	-

Note: p* < .05, p** < .01, p*** < .001. None of the correlations are significant.