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Art interventions in an urban environment. The effect of familiar versus unfamiliar artworks on well-being.

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Doris Jessica Avram BA BSc

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Abstract

Urbanization and increasing city density pose growing challenges to public mental health, making it essential to design restorative urban environments that promote well-being. While nature has been widely studied in this context, the potential of public art as a restorative element remains underexplored. Drawing on theories from aesthetic research, particularly the role of cognitive fluency and familiarity in shaping aesthetic appreciation, this study investigated whether familiar versus unfamiliar artworks in an urban public space affect environmental evaluation, perceived restoration and well-being. In a mixed-method field study, 119 participants were randomly assigned to one of three conditions: familiar artwork, unfamiliar artwork, or no artwork (control). Subjective measures of anxiety, stress, negative mood and positive mood were collected before and after a brief intervention, as well as restorative and environmental evaluations after the intervention. Although no significant group differences between the conditions were found, all participants showed improvements in well-being after the intervention. A follow-up online study with 26 participants allowed for a comparison of all conditions, including an empty street setting, and revealed that environments with artworks were perceived as more restorative and aesthetically appealing. The study provides important implications based on its null results. While the main hypotheses were rejected, the findings highlight the psychological benefits of short urban breaks. Participants across all conditions showed improved mood, even without art interaction. Moreover, the findings indicate that public art may be more effective in visually monotonous areas, where aesthetic enhancements are more noticeable and impactful.

Zusammenfassung

Urbanisierung und zunehmende städtische Verdichtung stellen eine wachsende Herausforderung für die psychische Gesundheit der Stadtbewohner dar. Dies unterstreicht die Bedeutung der Gestaltung städtischer Umgebungen, die das Wohlbefinden fördern. Während Grünflächen in diesem Zusammenhang bereits umfassend untersucht wurden, bleibt das Potenzial von Kunst als Element zur Steigerung des Wohlbefindens im urbanen Raum bislang weitgehend unerforscht. Aufbauend auf Theorien aus der empirischen Ästhetik, insbesondere zur Rolle von kognitiver Verarbeitungsflüssigkeit und Vertrautheit, untersuchte diese Studie, ob bekannte gegenüber unbekannten Kunstwerken in einem öffentlichen Raum die Umweltbewertung, die psychologische Restaurierung und das Wohlbefinden positiv beeinflussen. In einer Feldstudie wurden 119 Teilnehmende zufällig einer von drei Bedingungen zugewiesen: bekannte Kunstwerke, unbekannte Kunstwerke oder keine Kunstwerke (Kontrollbedingung). Vor und nach einer kurzen Intervention wurden subjektive Maße zu Angst, Stress, negativer und positiver Stimmung erhoben; Umweltbewegungen sowie wahrgenommene Restaurierung erfolgten nach der Intervention. Obwohl keine signifikanten Gruppenunterschiede zwischen den Bedingungen festgestellt wurden, zeigten alle Teilnehmenden Verbesserungen im Wohlbefinden. Eine ergänzende Onlinestudie mit 26 Teilnehmenden ermöglichte den Vergleich aller Bedingungen, einschließlich einer leeren Straßenumgebung und zeigte, dass Umgebungen mit Kunstwerken restaurativer und ästhetisch ansprechender wahrgenommen werden. Die Studie liefert wichtige Implikationen auf Basis ihrer Ergebnisse. Obwohl die Hypothesen verworfen wurden, unterstreichen die Ergebnisse die Vorteile kurzer urbaner Pausen. Teilnehmende aller Bedingungen zeigten Wohlbefindungsverbesserungen, auch ohne direkte Interaktion mit Kunst. Zudem deuten die Ergebnisse darauf hin, dass öffentliche Kunst besonders in visuell monotonen Bereichen wirksam sein könnte, da ästhetische Veränderungen dort stärker wahrgenommen werden.

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1. Introduction

1.1 Urbanization and health

Urbanization is one of the most profound social transformations of our time, with more than 50% of the world's population now living in urban areas, a number projected to be 70% by 2050 (Gruebner et al., 2017). Whilst living in a big city brings many economic, social and cultural benefits, it can also pose a threat to the health and well-being of their inhabitants. Research found that the prevalence of mental health problems such as anxiety, depression or psychotic disorders may be increased in urban areas (Ventriglio et al., 2020; Penkalla & Kohler, 2014; Xu et al., 2023). Neuroimaging research has found that city living and early urban upbringing influence stress-related brain regions, such as elevated amygdala activity, a brain region responsible for emotional reactivity and threat processing (Lederbogen et al., 2011). These findings imply that the urban environment may directly contribute to psychological strain.

In view of an ever-growing and densifying population, the design of public spaces has gained importance in both scientific as well as policy discourse, to effectively promote the well-being of city dwellers through their everyday life experiences. In particular, the quality, accessibility and composition of urban environments have become central discussions on preventative mental health strategies (Bertram & Rehdanz, 2015). For instance, longitudinal evidence shows that moving to greener areas is associated with sustained improvements in mental health (Alcock et al., 2014). Hartig et al. (2014) suggests that contact with nature contributes to health through stress reduction, physical activity, improved air quality as well as social cohesion. Such findings highlight the importance of urban infrastructure as a public health resource. As evident from past literature, previous studies have heavily focused on nature and greenery in urban planning. However, recent research in environmental psychology has begun to explore the well-being impacts of built environments such as urban components that people interact with in everyday life. Yet, a significant research gap remains, as it is still not fully understood whether, and in what ways, built environments contribute to health and well-being outcomes

This thesis aims to assess the impact of built environments in urban public spaces on the well-being states of its users to fill this specific research gap. I specifically focus

on the effects of artworks in urban public spaces from which we expect benefits for well-being. Below, I will introduce the literature review on the link between aesthetic experiences induced by artworks and well-being benefits, as well as why assessing this aspect in urban public spaces is particularly interesting and meaningful.

1.2 Aesthetic experience and its impact on well-being

Research in the field of aesthetics has reported that interacting with art can support psychological well-being across diverse populations and settings. As a form of visual art engagement, museums and art galleries have been shown to enhance emotional reflection, foster social inclusion and stimulate cognitive engagement (Camic & Chatterjee, 2013). Museum-based interventions lead to improvements in emotional states such as feeling absorbed, cheerful and inspired among socially isolated individuals (Thomson et al., 2017). Trupp et al. (2023) found that engaging with online art reduced negative mood and anxiety, particularly among individuals with a high-level trait of aesthetic responsiveness. Digital art exhibitions have also shown to foster cognitive immersion and emotional connection, thereby supporting restorative psychological experiences (Xia et al., 2024). Similarly, Cotter et al. (2022) explored how different art engagements influence psychological flourishing. The authors suggest that greater immersion, defined as focused attention, emotional resonance, and absorption in the art, leads to improvements in well-being domains. Therefore, the quality of the art experience, particularly the depth of immersion, may be important in translating art engagement into psychological benefits. Mastandrea et al. (2019) links aesthetic experiences with well-being through neuroscientific findings. They argue that viewing visual art activates brain regions involved in emotion regulation and reward, such as the orbitofrontal cortex, which may explain the stress-reducing and mood-enhancing effects observed in previous research. The authors emphasize the potential of art and museum settings as supportive environments for promoting well-being. A scoping review reinforces these findings by showing that art engagement contributes to the prevention and treatment of both mental and physical health conditions, supporting its integration into public health strategies (Fancourt & Finn, 2019). Together, these findings underscore the important findings that art experiences can promote psychological and emotional well-being.

The connection between art engagement and restorative experiences align with a long-standing influential framework for understanding the relationship between environments and psychological well-being, such as Attention Restoration Theory (ART; Kaplan & Kaplan, 1989) and Stress Recovery Theory (Ulrich et al., 1991). Both theories explain why certain environments help the recovery of depleted cognitive resources, stress, and mental fatigue. Natural environments are particularly effective in fostering these restorative processes because they offer “soft” stimulation that is engaging but not cognitively demanding. The theory identifies four key components that characterize a restorative environment:

1. Being away: A mental break from everyday thoughts and demands.
2. Fascination: The effortless ability to focus attention.
3. Coherence: An environment which has rich stimuli without being confusing.
4. Compatibility: An environment which aligns with an individual’s purposes.

Although both theories emphasize the significance of nature and greenery as places with high restorative potential, the components in ART can also be achieved by engaging with art. Interacting with artwork requires multiple and complex cognitive processes, such as memory integration, meaning making, sometimes intense emotional reaction with various appraisals (e.g., Leder et al., 2004; Pelowski et al., 2017). It is plausible to assume that such cognitive activities would result in restorative experiences like being away, fascination, and/or coherence. Related to this argument, Meidenbauer et al. (2020) challenges the assumption that nature itself holds inherent psychological advantages by demonstrating that the affective benefits typically attributed to natural environments are largely driven by aesthetic preference rather than nature itself. In this study, nature and urban images were matched for preference and no significant difference in mood improvement was found. While highly preferred natural scenes lead to affective improvements, the same was observed for equally preferred urban images. Therefore, the authors argue that it is not the environment type but the degree of aesthetic appeal that best predicts affective improvements.

Following this, Mikuni et al. (2024) placed artistic installations directly into urban streetscapes and found that they led to significant reduction in anxiety, stress and negative mood. Importantly, these effects were comparable to those observed with urban greenery, suggesting that art can offer similar mental benefits in environments where green infrastructure may be limited. The study also found that aesthetic

evaluations, such as beauty, meaningfulness, liking, and restorative potential were positively associated with well-being outcomes. As one of the first field studies directly comparing art and nature in a real-world urban environment, this research provides important evidence that artistic interventions can function as restorative elements. However, a recent scoping review (Chana et al., 2024) also highlights that built heritage and artistic urban elements were one of the most underexplored components in environmental research, despite showing promising links to well-being. This defines a clear need for future research to investigate how aesthetic qualities of built environments can contribute to mental health improvements. To move beyond the observation that art is linked to well-being, it is important to examine how it exerts these effects. Specifically, what qualities of art contribute to their restorative impact? To address this question, it is essential to draw on empirical studies from aesthetics and cognitive psychology that investigate the mechanisms of art evaluation and appreciation.

1.3 Cognitive fluency and aesthetic experience

Past research has identified cognitive fluency as a central mechanism in shaping affective responses to stimuli. Processing fluency refers to the subjective ease with which a stimulus is mentally processed. Accordingly, stimuli that are easier to process tend to elicit more positive emotional responses. Reber et al. (1998) demonstrated that images were rated as more beautiful when preceded with matching primes, higher contrast or presented for longer duration. These non-repetitive fluency enhancements resulted in increased liking. Extending on this, Reber et al. (2004) proposed that aesthetic pleasure arises not from objective stimulus features but from the perceiver's fluent processing experience, suggesting that perceived fluency plays an important role in positive aesthetic evaluation. Forster et al. (2015) manipulated perceived processing fluency using false physiological feedback and demonstrated that not only the objective ease of processing but also the subjective felt fluency significantly influenced aesthetic evaluations. This supports fluency theory by confirming that ease of processing shapes aesthetic appreciation. Additionally, it further shows that even subjective beliefs, which are shaped by top-down cues like false feedback, can influence how fluency is felt and how much an object is liked. Belke et al. (2010) demonstrated that artworks were rated more favorably when accompanied by

semantically matching titles, showing further evidence for top-down influences in aesthetic evaluations. It expands the assumption about perceptual fluency by showing that not only visual but also semantic coherence shapes affective responses towards artworks. In this regard, Pelowski et al. (2017) present the Vienna Integrated Model of Art Perception (VIMAP), which offers a dynamic perspective on the interplay between bottom-up and top-down factors that shape the experience of art, suggesting that the aesthetic perception is far more complex than a matter of cognitive fluency alone.

Closely tied to processing fluency is the concept of familiarity, which shapes aesthetic appreciation through what is known as the mere exposure effect. First described by Zajonc (1968), the mere exposure effect proposes that repeated exposure to stimuli increase their likability, even in the absence of conscious recognition. As repeated stimuli are easier to cognitively process, they generate a positive affect, linking familiarity together with processing fluency (Bornstein & Craver-Lemley, 2004). This may also explain why widely reproduced or culturally important artworks tend to receive higher aesthetic judgements (Cutting, 2003). It was also found that the frequency of image exposure, such as through books, media or museums, predicted cultural canonization of paintings (Cutting, 2006). Experimental research has also identified attention as a modulator of the mere exposure effect. For example, in complex visual scenes, the mere exposure effect only enhanced liking when viewers actively attended the stimuli (Yagi & Inoue, 2018). To expand the concept of the mere exposure effect, Lee et al (2001) proposed that it produces a feeling of uncertainty reduction. Familiar stimuli are therefore perceived as safer and more predictable, leading to a decrease in cognitive load and subsequent increase in affective evaluation. This also aligns with the ART. Going back to urban living, familiar stimuli may counteract the otherwise hectic and loud environments and lead to an improved sense of well-being through safety and control over the situation.

While processing fluency helps explain why certain stimuli are more positively evaluated, it cannot fully account for the appreciation of complex or novel stimuli. To address this, Graf and Landwehr (2015) introduce the Pleasure-Interest Model of Aesthetic Liking (PIA), which is a dual-process model that integrates both fluency-based pleasure and interest driven processing. According to this framework, aesthetic appreciation can arise through two hierarchical processes: a fast, automatic response based on fluent processing and a slower, reflective path which is driven through

successful engagements with initially disfluent, novel or complex stimuli. The model also supports an inverted U-shape relationship between complexity and liking (Berlyne, 1974). This suggests that moderate disfluency, when paired with the viewer's motivation and ability to solve it, yield higher aesthetic appreciation than either simplicity or overwhelming complexity. This explains why artworks that initially appear unfamiliar or difficult may be appreciated more, as they invite and reward deeper cognitive engagement. Belke et al. (2015) provided empirical support for this dual-processing theory of aesthetic evaluation, showing that liking for challenging portraits increased after repeated exposure and cognitive engagement. This dual route perspective aligns with previous influential models of aesthetic appreciation which propose that appreciation results after a series of different cognitive stages. Leder et al. (2004) present an art processing model that defines different stages and variables involved in aesthetic appreciation and judgement. Viewers would engage with artworks through a sequence of perceptual analysis, implicit memory integration, explicit classification, cognitive mastering and evaluation. Synthesizing insights from Berlyne (1974), Reber et al. (2004) and Leder et al. (2004), a recent study with eye-tracking data investigated whether people prefer familiar or novel artworks (Song et al., 2021). They examined how this preference is influenced by certain artwork characteristics such as content and complexity when participants view repeated and novel paintings. The study found that while fluency and familiarity generally lead to increased liking, novelty and complexity was often preferred, especially by less experienced viewers.

1.4 Study rationale and hypotheses

Taken together, the reviewed literature suggests that aesthetic preference is shaped by both perceptual fluency as well as cognitive engagement, with familiarity often enhancing liking through easier processing. However, novelty can also generate aesthetic value through different factors such as motivation to engage into a more complex experience. In urban environments, which are marked by heightened sensory load and cognitive demands, familiar environments may provide a form of psychological ease, potentially supporting restoration and well-being. Despite theoretical foundation, the specific role of familiarity in form of public art on well-being remains unexplored.

The present study addresses this gap by experimentally manipulating the familiarity of artworks in a real-world urban art installation. Participants were randomly assigned to one of three conditions: viewing (1) familiar artworks, (2) unfamiliar artworks, or (3) no artworks (control condition) displayed at a public installation (Graetzloase) in Vienna. Each participant spent a few minutes interacting with the space and completed short questionnaires on well-being, restoration, aesthetic and environmental evaluations before and after the experience. This study aims to answer the following research questions:

1. Do artworks in public urban spaces influence people's well-being?
2. Is the familiarity of the artworks associated with stronger psychological benefits?

Therefore, I propose three hypotheses:

- **H1:** Participants interacting with familiar artworks will evaluate the environment of the artistic installation higher in beauty, liking and in perceived safety of the location compared to the ones interacting with unfamiliar artworks and control condition. Nonetheless, as unfamiliar artwork can also contribute to aesthetic qualities, participants in this condition still evaluate the above measures higher than the ones in control condition.
- **H2:** Participants interacting with familiar artworks will experience greater psychological restoration compared to the ones interacting with unfamiliar artworks and the control condition. As interaction with unfamiliar artwork can also serve as a restoration source, participants in the unfamiliar condition might still experience greater restoration than the ones in control condition.
- **H3:** Participants interacting with familiar artworks will show stronger improvements in overall well-being (measured by reductions in anxiety, stress, and negative affect) compared to participants interacting with unfamiliar artworks and control condition. Participants not interacting with art in the control condition will show the least improvements in well-being.

2. Methods

This study has been pre-registered at OSF before data collection took place (Avram et al., 2024).

2.1 Study design

This study used a mixed-methods design with two factors: intervention type and measurement time. The intervention type consisted of three levels: the intervention decorated with (1) familiar artwork, (2) unfamiliar artwork, and (3) no artwork (control condition). Each participant came to the testing location once and interacted with only one type of intervention during the visit. Hence, the intervention type was set as a between-subject factor. Measurement time (pre and post) was a within-subjects factor, with subjective well-being measured before and after the interaction with the intervention.

In the familiar artworks condition, participants were exposed to well-known artworks that had been identified as highly familiar in a pre-study. This condition was designed to investigate the potential effects of familiarity on environmental and restorative evaluations as well as well-being. In the unfamiliar artworks condition, participants viewed artworks which were lower in familiarity according to pre-study ratings. This allowed us to test specifically whether familiarity itself influenced the outcomes observed. In the no artworks condition, participants interacted with the same urban environment as in the other conditions, although no artwork was present. This allowed us to examine whether the presence of artworks in general influenced environmental ratings and well-being.

Data collection took place during October and November in 2024, two months in Vienna known for good weather conditions. We chose this season as people do not feel discomfort from the temperature and weather conditions. To reduce the potential influence of weather or time-related factors, we distributed the three intervention conditions evenly across the four-week period. The data collection was conducted only under good weather conditions. Additionally, within the conditions involving artworks, we varied the order in which the artworks were displayed each day at the testing location. This daily rotation was aimed at counteracting artwork order effects.

2.2 Participants

Participants were recruited from an online recruitment platform (SONA system). Our exclusion criteria were (1) younger than 18 years old, (2) a previous participation in a field study conducted by the researchers in a similar testing environment, and (3) a current or previous mental health disorders. The participants received course credits for their participation. The number of participants was decided prior to the experiment

based on a priori power analysis using G power (Faul et al., 2007). For the priori power analysis, we aimed to achieve 0.80 power, detecting a middle effect size f of .25 with an alpha level of .05. The power analysis suggested 120 participants in total, 40 for each condition. A total of 134 participants were recruited for the study, however, several participants had to be excluded based on predefined criteria to ensure data quality. Exclusion reasons included (1) technical issues during data collection such as survey closing unexpectedly, (2) major disturbances during any part of the procedure such as people talking to the participants during pre-measurements, intervention or post-measurements phase as well as (3) explicit reports of disruptive external factors like excessive noise or cold temperatures noted in the questionnaire. Participants were also excluded if (4) it started to rain during their session or if (5) they failed to follow the instructions such as reading a book during the intervention. Another participant had to be excluded (6) because they participated in a similar study conducted by the research team and one had to be excluded because (7) they were familiar with the experimenter. The final sample of 119 participants (92 female, 26 male, 1 other, M age = 21.36, SD age = 3.29) were included in the analyses.

2.3 Environment

The study took place on Liebiggasse, an urban side street located in the first district in Vienna, adjacent to Ebendorferstraße and near the University of Vienna. The surrounding area includes several university buildings, notably the Faculty of Psychology, from which a large proportion of participants were recruited. The street is characterized by residential and institutional buildings and features historic Viennese architecture typical of the city's inner districts. These buildings have ornate facades, large windows and decorative details that contribute to the streets' aesthetics. The testing site was situated on the right side of Liebiggasse, within a designated Graetzloase (neighborhood oasis, see 2.4 Intervention section below). From this location, participants had no direct view of Vienna's historic city hall, although it was visible before and after the intervention. Liebiggasse is lined with parked vehicles and bicycles, though it has moderate traffic volume due to the adjacent street. There is no greenery visible from the testing location. The Graetzloase itself is placed next to the backside entrance of the university building, where students and pedestrians frequently walked on the pavement next to the testing location.

2.4 Intervention

The intervention was implemented in a designated Graetzloase (Figure 1). The physical structure of the Graetzloase intervention used in this study was identical to that described in Mikuni et al. (2024). It consisted of a ground-level platform with approximately the size of a standard parking space (4.5m x 2.1m x 2.53m), constructed from repurposed materials. The oasis is semi-enclosed, therefore separating it from street traffic but accessible via the sidewalk of the street. It includes benches, a table, chairs and a metal grid structure.



Figure 1.

Familiar artworks condition.

For the artwork conditions, the canvas with the printed image of the artworks were attached to the grid of the Graetzloase using chains. To manipulate the familiarity in the presented artworks, we selected six artworks for the artwork conditions (Figure 2, Figure 3 and Figure 4). An online pre-study with $n = 18$ was conducted to determine which artworks were perceived as familiar and unfamiliar. Participants reported high

levels of familiarity with the artworks by Dalí ($M = 9.33$, $SD = 2.14$), Van Gogh ($M = 8.61$, $SD = 2.66$) and Hokusai ($M = 9.33$, $SD = 2.20$).

The artworks identified as familiar are:

- (1) Van Gogh's *Sunflowers* (1888, Post-Impressionism)
- (2) Hokusai's *The Great Wave off Kanagawa* (1831, Ukiyo-e)
- (3) Dalí's *The Persistence of Memory* (1931, Surrealism)

For the unfamiliar condition, artworks were selected based on (1) the results of the pre-study and which (2) closely match the familiar pieces in terms of composition, color, genre, and/or theme. By doing so, we made sure to create stimuli set by different artists yet having significant differences in the level of familiarity compared to the familiar artworks. Participants reported lower familiarity with artworks by Ende ($M = 4.00$, $SD = 2.54$), Matisse ($M = 2.83$, $SD = 2.48$), and Courbet ($M = 3.61$, $SD = 2.59$).

The artworks identified as unfamiliar are:

- (1) Henri Matisse's *Daisies* for Van Gogh (1919, Post-Impressionism)
- (2) Gustave Courbet's *Stormy Sea* for Hokusai (1869, Realism)
- (3) Edgar Ende's *Büßerinnen* for Dalí (1958, Surrealism)

To prevent recognition of the artists by their signatures, the signatures were digitally removed from all artworks using the software GIMP (GIMP Development Team, 2024). This ensured that participants would focus solely on the artwork itself, rather than recognizing it through the artist's signature. Additionally, the artworks were subtly altered to avoid cuts caused by printing on canvas. The results of the pre-study can be found in the appendix (Table A).



Figure 2.

Artworks used in the familiar (left, Dalí) and unfamiliar (right, Ende) condition.



Figure 3.

Artworks used in the familiar (left, Hokusai) and unfamiliar (right, Courbet) condition.



Figure 4.

Artworks used in the familiar (left, Van Gogh) and unfamiliar (right, Matisse) condition.

2.5 Measured variables

This study employed well-being measures commonly used in environmental and art psychology, drawing on instruments established in earlier research (e.g. Mikuni et al., 2024).

Subjective well-being: anxiety, stress, affective mood state

The State-Trait Anxiety Inventory (STAI-S; Grimm, 2009) was used to assess perceived anxiety and consisted of 20 items on a 4-point Likert scale. Perceived stress levels were measured on a scale ranging from 0 to 100. Affective states were evaluated using the Positive and Negative Affect Schedule (PANAS; Krohne et al., 1996), which includes 20 items rated on a 5-point Likert scale and assessed mood across two dimensions: 10 positive and 10 negative states. These scales were included to test hypothesis **H3** (well-being).

Aesthetic evaluation

In the familiar and unfamiliar artwork conditions, participants completed individual aesthetic evaluations for each of the three displayed artworks. These evaluations were designed to assess participants' subjective responses, attention and prior exposure to the stimuli. The following questions were answered on a 7-point Likert scale (1 = *not at all*, 7 = *very*) unless noted otherwise. These aesthetic evaluations were included for exploratory purposes to investigate the relationship between aesthetic and environmental evaluations (Mikuni et al., 2024)

To assess perceived familiarity, participants were asked "*How familiar is this artwork to you?*". This question was designed as a manipulation check item, allowing us to confirm whether the familiarity manipulation between the two conditions was successful. Participants then rated their aesthetic experience using three items "*How much do you like this artwork?*", "*How beautiful do you find this artwork?*" and "*How interesting is this artwork to you?*". Based on prior research in art and aesthetics, the questions were included as core components of aesthetic experience (Leder et al., 2004). Attention was measured by asking "*How much attention did you pay towards this artwork?*". Participants were then asked to estimate the proportional time spent engaging with each artwork using the question: "*How much time did you spend interacting with this artwork? Please respond in percentage. 100% refers to the total time spent with all three artworks in the test environment*". To distinguish between perceived and actual familiarity participants were also asked "Have you seen this artwork before?" with response options "*no*", "*once*", "*a few times*", or "*many times*". This item was included to assess prior exposure independently of subjective familiarity ratings. Lastly, participants were asked to identify the creator of the artwork: "*Do you know the artist who created this artwork? Please name the artist. If not, you may skip this question*".

This aesthetic evaluation served as indicators of the participants' art interest and art knowledge and were also used for another project beyond the scope of this thesis.

Time spent at the testing location

Participants were asked if the time at the site was sufficient, with response options of "Yes". "*No, I would have liked more time.*" and "*No, I would have liked less time.*" If participants selected that they wanted more time, they were asked to specify the

additional time they would have preferred in minutes as well as the reasons for additional time. If participants selected that they wanted less time, they were asked to specify the reasons for that as well. This open-ended question was designed to explore why participants may have wanted more or less time during the intervention. This provided qualitative insights into what aspects of the intervention they found enjoyable, engaging, potentially lacking or unenjoyable. To preserve the ecological validity of the field setting, participants were not explicitly instructed to interact with the artworks. This approach ensured us that their interaction with the intervention reflected a natural encounter with the art installation, as it might occur in everyday urban environments. The open-ended question therefore allowed us to investigate if they wanted to engage more with the artworks. Additionally, responses to this item served as an exclusion criterion if the participants indicated anything major disruptive as described above. Since this experiment was conducted in an uncontrolled urban setting, factors such as excessive noise, cold weather or construction work could have occurred and potentially influenced participants' experience or well-being measures.

Environmental evaluation

To assess participant's perception of the testing environment in general, a combination of validated and single-item measures was used. Participants completed the Perceived Restorativeness Scale (PRS; Hartig et al., 1997), a 26-item questionnaire rated on a 7-point Likert. The PRS covers all four dimensions of psychological restoration: *being away*, *coherence*, *fascination* and *compatibility*.

In addition, participants rated several single-item evaluations to capture further aesthetic qualities of the environment.

- (1) Street safety: "*How safe did you feel in this environment?*"
- (2) Street familiarity: "*How familiar are you in general with the environment/street?*"
- (3) Street liking: "*How much did you like this environment?*"
- (4) Street beauty: "*How beautiful did you find the environment?*"
- (5) Street interest: "*How interesting did you find the environment?*"

All responses were rated on a 7-point Likert scale (1 = *not at all*, 7 = *very much*). These items were included to specifically test for hypothesis **H2** (restoration) and **H1** (environmental evaluation).

Socio-demographics and art knowledge

This included age, gender, and education. Additionally, participants completed two items from the Big Five Inventory (BFI-10; Rammstedt & John, 2006). To assess participants' art knowledge, the Vienna Art Interest and Art Knowledge Questionnaire (VAIAK; Specker et al., 2018) was completed. These items were included for another project, but not reported here as this is beyond the scope of this thesis

2.6 Procedure

Our data collection was conducted from October 10th until November 12th, 2024, on weekdays from 9 a.m. until 5 p.m., only in good weather conditions.

Upon arrival, participants were provided with information about the field study procedure, such as the duration and the fact that they will spend time outside. Then, they walked together with the experimenter to the location of the pre-measurements, which was on the adjacent street from the meeting point around the corner. They were asked to sit on a foldable chair on the pavement and were provided with an informed consent sheet. Afterwards, they received a QR code or a link to the study questionnaire to start the pre-measurements on their mobile device. The pre-measurements consisted of all prior described subjective well-being measures.

After completing the pre-measurements, they were asked to lock their mobile device and pause the questionnaire. The experimenter then brought them to the intervention location, around the corner on Liebiggasse. They were instructed that the Graetzeloase in front of them is their testing location and they will spend three minutes in it. They were free to explore inside, standing or seated, but not allowed to use their phones, read a book, smoke, eat, drink or talk to others. No instructions were given to specifically interact with the artworks. To prevent other people from entering the testing location, a sign and a rope were hung in front of the intervention. The participants were alone in the oasis, as only one person was tested at one time. The experimenter was semi-visible by walking around the corner, so the participant did not feel watched.

During the participants interaction with the testing environment, the experimenter counted cars, bikes and people bypassing the testing street for one minute to assess the environmental settings during the testing. Additionally, parked cars, bikes or motorbikes as well as any other occurrences, such as construction work, loud noise or

pedestrians asking about the study were noted. The weather at the time of testing was also noted using the local weather report during the testing time as the weather fluctuated during the day and between the weeks.

After the intervention, the participants were brought back to the pre-measurement location. They were asked to proceed with the questionnaire on their phones for post-measurements. First, the participants answered the same well-being questions as before. Afterwards they were asked about the time spent at the testing location. Then, they were asked about the aesthetic (if they were assigned to the familiar or unfamiliar condition) and environmental evaluations, both given in a random order to avoid any biases by the order of the questions asked. Lastly, art knowledge and socio-demographic questions were asked in the questionnaire. Once the participants finished, they received a debriefing sheet.

3. Results

All analyses were conducted using R Studio (R Core Team, 2024). In total, we analyzed $n = 39$ answers for the control condition, $n = 40$ for the familiar condition and $n = 40$ for the unfamiliar condition. Before continuing with the main hypotheses, we investigated the manipulation check to ensure that the intervention was perceived as intended. Table 1 reports the mean values as well as 95% confidence intervals for the item “*perceived familiarity*” per artwork. As shown in the mean values and confidence intervals, we concluded that our familiarity manipulations were successful.

Table 1.

Descriptive statistics for perceived familiarity across artwork conditions.

Perceived Familiarity	Condition	M	SD	95% CI	
				lower	upper
Van Gogh	familiar	5.10	2.10	4.42	5.78
Hokusai	familiar	5.08	2.35	4.32	5.83
Dalí	familiar	5.25	2.15	4.56	5.94
Matisse	unfamiliar	2.52	1.93	1.90	3.14
Ende	unfamiliar	2.25	2.02	1.60	2.90
Courbet	unfamiliar	2.50	1.97	1.87	3.13

Note: N = 40 for both conditions. [Minimum Score for perceived familiarity, maximum score for the perceived familiarity]: [1,7].

To examine the participant's prior exposure to the artwork, we assessed if they encountered the artwork before and if yes, how often they were previously exposed to it. For most artworks from the unfamiliar condition, the most dominant answer was "no". Specifically, 85% of participants reported never having seen Ende's *Büßerinnen before*, 75% Courbet's *Stormy Sea* and 70% for Matisse's *Daisies*. In contrast, the most dominant answer for the familiar condition was "many times". 55% reported having seen Hokusai's *The Great Wave* multiple times before, 50% had encountered Dalí's *The Persistence of Time* multiple times and 42% reported to have seen Van Gogh's *Sunflowers* multiple times before. Participants were also asked to identify the artists of the presented artworks. Recognition rates varied considerably across all artworks. Van Gogh had a recognition rate of 35%, followed by Dali with 17.5% and Hokusai with 2.5%. No participants from unfamiliar conditions recognized either Courbet, Matisse or Ende.

3.1 Assessing H1: Environmental evaluations

A series of one-way ANOVAs were conducted for each environmental evaluation variable (street *liking*, street *beauty*, street *interest*, street *familiarity* and *perceived*

safety) to test **H1**. Levene's tests indicated that the assumption of homogeneity of variances was met for all variables (all $p > .05$), however, Shapiro-Wilk test for normality were significant across all five scales (all $p < .05$). Given that the sample size was sufficiently large in each condition, and ANOVA is known to be robust to violations of normality, we proceeded with the analysis. In Figure 5, the violin plot illustrates the distribution of ratings for the environmental evaluation across all three conditions. The descriptive statistics for environmental evaluations can be found in the appendix (Table B). The ANOVA results (see Table 2) revealed no significant differences between the familiar, unfamiliar and control groups on any of the environmental evaluations measures. Therefore, hypothesis **H1** was rejected.

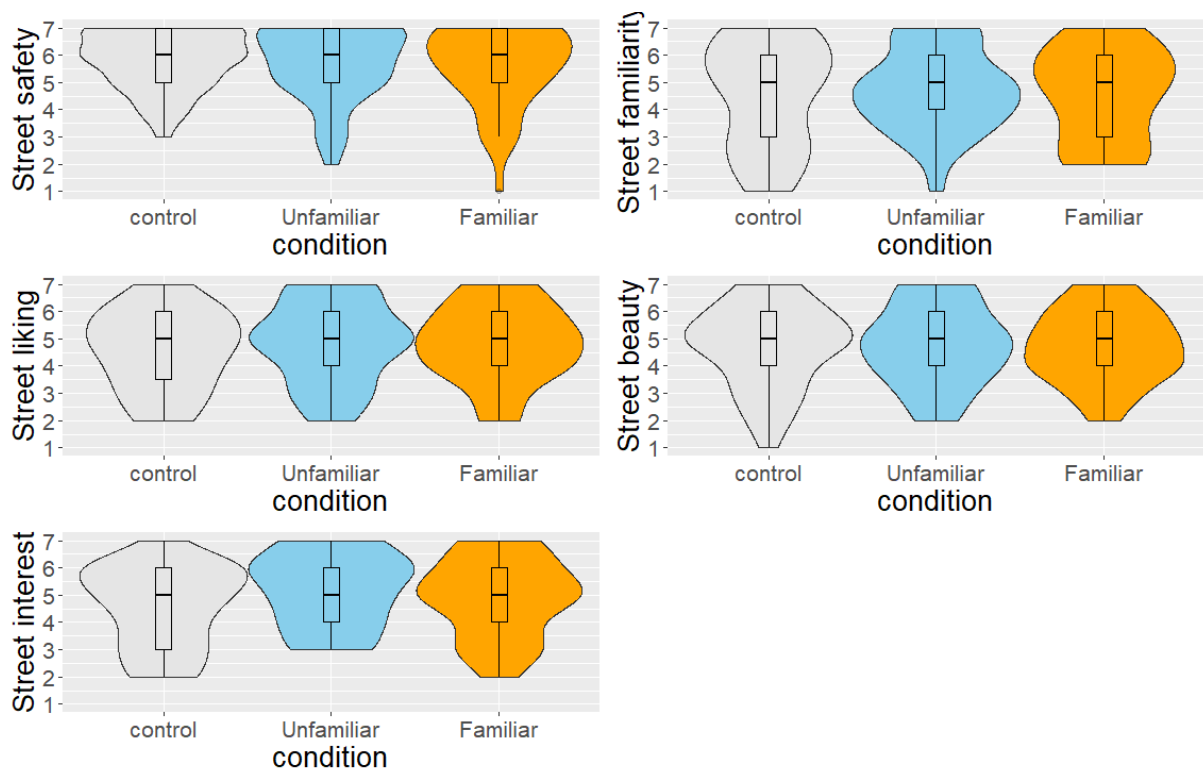


Figure 5.

Violine plot for environmental evaluations of the testing location, $N = 119$.

Table 2.

ANOVA statistics for measurements of environmental evaluation.

DVs	<i>F</i>	<i>p-value</i>	<i>Eta</i> ²
<i>Street safety</i>	0.59	.555	0.01
<i>Street familiarity</i>	0.16	.853	0.00
<i>Street liking</i>	0.38	.683	0.00
<i>Street beauty</i>	0.02	.984	0.00
<i>Street interest</i>	1.82	.166	0.03

Note: *N* = 119

3.2 Assessing H2: Perceived restoration

To test **H2**, one-way ANOVAs were conducted for the PRS and its subscales (*Being away, fascination, coherence and compatibility*). Levene's tests indicated that the assumption of homogeneity of variances was met with all PRS variables (all $p > .05$). The Shapiro-Wilk tests showed that residuals were normally distributed for the total PRS score ($p = .59$) and the *compatibility* subscale ($p = .86$). *Being away, fascination* and *coherence* (all $p < .05$) showed violations of the normality assumption. Similar with H1, we proceeded with the analysis as the sample size per condition is large enough for the ANOVA to be robust against this violation. Violin plots illustrating the distribution of PRS scores across conditions are presented in Figure 6. The descriptive statistics of PRS evaluations can be found in the appendix (Table C). The ANOVA results (see Table 3) revealed no significant group difference for either the total PRS score or any of the subscales. Therefore, hypothesis **H2** was rejected.

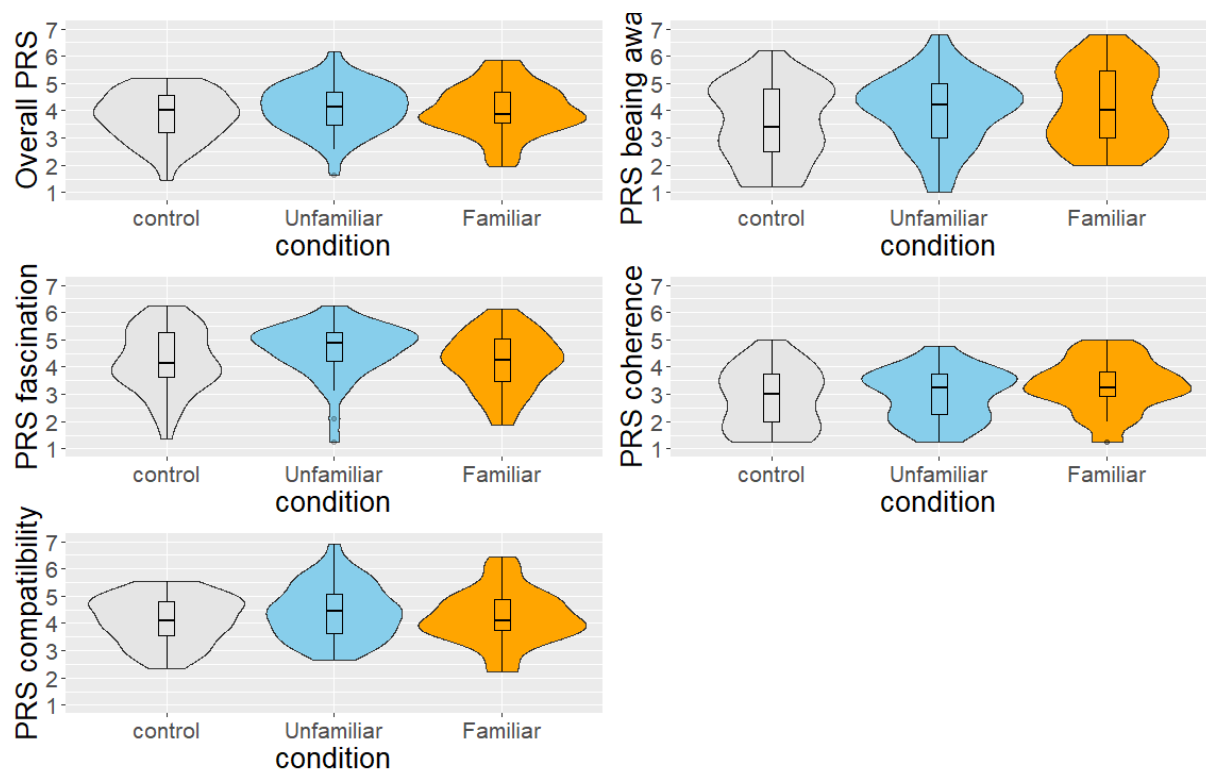


Figure 6.

Violine plot for PRS and subscales on environmental evaluations, $N = 119$.

Table 3.

ANOVA statistics for measurements of perceived restorativeness.

DVs	F	p -value	Eta^2
PRS	1.34	.267	0.02
Being away	2.19	.116	0.04
Fascination	1.84	.163	0.03
Coherence	1.8	.17	0.03
Compatibility	0.81	.449	0.01

Note: $N = 119$

3.3 Assessing H3: Well-being

To investigate whether participants in the familiar condition experienced greater improvements in well-being than in the other two conditions (**H3**), we conducted a multivariate ANOVA (MANOVA) as well as a series of mixed-design ANOVAs with time (pre-measurements vs. post-measurements) as a within-subject factor and condition (familiar, unfamiliar and control) as a between-subject factor. For the analysis, all four well-being measures were analyzed: *anxiety* (STAI), *perceived stress*, *positive mood* and *negative mood* (PANAS). Prior to statistical analyses, assumption checks indicated significant Mardia tests as well as significant Box M tests. As MANOVA and mixed-design ANOVA are generally robust to normality and homogeneity violations with a sufficient sample size, analyses were performed as planned. Both linearity and multicollinearity tests indicated no assumption violation. MANOVA showed a significant main effect of time, indicating that well-being improved from pre-measurements to post-measurements across all conditions. There was no significant main effect of the condition and no interaction between time and conditions. Boxplots of the well-being measures distributions are shown in Figure 7 and the descriptive statistics for well-being measures can be found in the appendix (Table D). Complementary mixed-design ANOVAs for each well-being variable support the MANOVA results and can be found in Table 4. Overall, interactions with the urban intervention, regardless of condition, led to significant improvements in well-being across all four measures. Therefore, hypothesis **H3** was rejected.

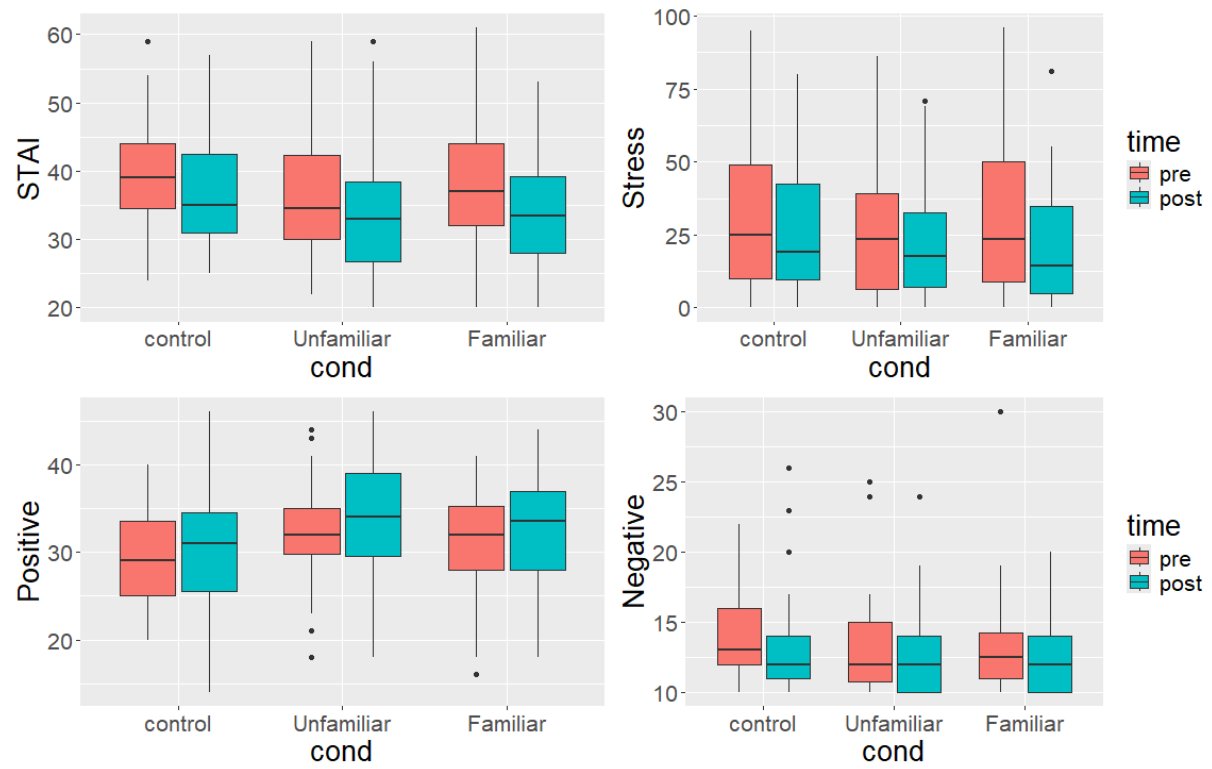


Figure 7.

Boxplots for well-being measures, $N = 119$.

Table 4.*Mixed-design ANOVA statistics for well-being measures.*

DVs	<i>Parameter</i>	<i>F</i>	<i>p-value</i>	η^2
Anxiety	Time	13.65	.000	0.11
	Condition	1.74	.179	0.03
	Time:Condition	0.59	.558	0.01
Stress	Time	25.96	.000	0.18
	Condition	0.43	.654	0.01
	Time:Condition	1.57	.212	0.03
Positive Mood	Time	11.54	.000	0.09
	Condition	2.52	.08	0.04
	Time:Condition	0.56	0.57	0.01
Negative Mood	Time	5.32	.023	0.04
	Condition	0.56	.574	0.01
	Time:Condition	0.07	.937	0.00

Note: $N = 119$

3.4 Time spent at the testing location

Participants in all three conditions were asked how much additional time they would have liked in the intervention setting. On average, participants in the familiar condition stated that they wanted the most additional time ($M = 5.3$ minutes), followed by the unfamiliar condition ($M = 5.2$ minutes). The control condition showed slightly lower additional time requests ($M = 4.6$ minutes). Afterwards, they were asked to state why they wanted more time. To analyze the open-ended responses, a qualitative content analysis was conducted. Each response was coded based on recurring keywords that

reflected the indicated focus or motivation during the intervention period. This approach allowed for the development of thematic categories that emerged directly from the content of the responses, rather than from a predefined coding scheme. In some cases, a single response touched on multiple aspects and was therefore assigned to more categories. The resulting thematic categories included: *relaxation*, *environment*, *settling-in*, *buildings*, *people*, *artworks*, *interest*, and *reflection*. These categories provided the basis for a comparative summary of response patterns across the different conditions.

In the control condition ($n = 12$ responses), the most common theme was *environmental* engagement, including aspects like observing surroundings, appearing in 6 responses. This was followed by *relaxation*, mentioned in 4 responses, where participants described the act of doing nothing as calming or enjoyable. A distinct theme was *settling-in*, where 3 participants expressed a desire for more time to adjust or become comfortable in the setting. Additionally, *buildings* as a specific object of attention were mentioned in 2 responses, while social observation (*people*) and *other personal intentions* (e.g., prayer, self-reflection) were each mentioned once. In the familiar condition ($n = 13$ responses), the most frequently mentioned category was *relaxation*, appearing in 5 responses. Participants often described the environment as calming or enjoyable, and some emphasized the value of taking time to slow down. *Artwork* appeared in 3 responses, where individuals expressed a desire to spend more time with them. *Environment* (2 responses) and *settling-in* (2 responses) were also mentioned, capturing both the sensory experience of the intervention and the need for more time to adjust. Other themes, such as *buildings* and *people*, were mentioned once each. In the unfamiliar condition ($n = 17$ responses), the responses were more diverse. *Relaxation* remained a prominent theme, mentioned in 6 responses, while *artworks* appeared in 7 responses, suggesting that art played an important role in the engagement of this urban setting. *The environment* was also expressed in 5 responses, and *settling-in* appeared in 3 responses, again reflecting a need for more time to feel fully present or comfortable. Additional themes included *buildings* (2 responses), *people* (1 response), *interest* (1 response), and *reflection* (1 response), showing that participants also used the time for introspection or deeper engagement.

Participants were also asked whether they would have preferred less time and, if so, to explain why. To analyze participants' reasons for preferring a shorter time during the intervention, the same qualitative analysis approach was used. In the control

condition ($n = 2$ responses), one participant noted the cold, grey environment and lack of natural elements, categorizing this as *monotone colors*, *no greenery* and *not relaxing*. The other response mentioned feeling alone, which was placed under *other*. In the familiar condition ($n = 2$ responses), one participant criticized the lack of greenery and color (categorized as *monotone colors* and *no greenery*), and the other mentioned discomfort due to the test setup, therefore categorized as *test situation*. Though the participant still appreciated the general environment, the discomfort was central. In the unfamiliar condition ($n = 3$ responses), one participant mentioned the overall setting as oppressive (*environment negative*), another cited being overstimulated, noted pixelated artworks, and feeling observed, which were categorized under *artworks negative* and *test situation*. A third participant disliked the steel structure (*negative environment*) but positively referenced the surrounding architecture (*buildings positive*).

3.5 Complimentary analyses

Correlations

To explore the relationships between aesthetic and environmental evaluations, a correlation matrix was computed using participants' responses across both familiar and unfamiliar artwork conditions. Aesthetic artwork evaluations (*familiarity*, *beauty* and *interest* averaged across artworks) as well as environmental evaluations (*PRS*, *safety*, *street familiarity*, *street liking*, *street beauty* and *street interest*) were therefore used for this complimentary analysis. The goal was to identify whether artwork evaluations are associated with how participants perceive the surrounding urban environment. Pearson correlation coefficients with an alpha level of .05 were calculated. The results are visualized in the correlation plot (Figure 8).

Artwork familiarity did not correlate significantly to all environmental evaluations, including PRS. Small correlations between *artwork familiarity* and *artwork beauty* ($r = .33$) and *interest* ($r = .26$) can be observed. *Artwork beauty* and *artwork interest* show small to moderate correlations between PRS, *street liking*, *street beauty* and *street interest*. Additionally, correlation plot shows moderate positive correlations between PRS and environmental evaluations such as *street beauty* ($r = .52$), *street liking* ($r = .58$), and *street interest* ($r = .49$). A smaller correlation of $r = .36$ was observed with *perceived safety* of the environment and PRS. There is no significant correlation

between PRS and street familiarity, though PRS is moderately correlated with *artwork beauty* ($r = .4$) and *interest* ($r = .42$).

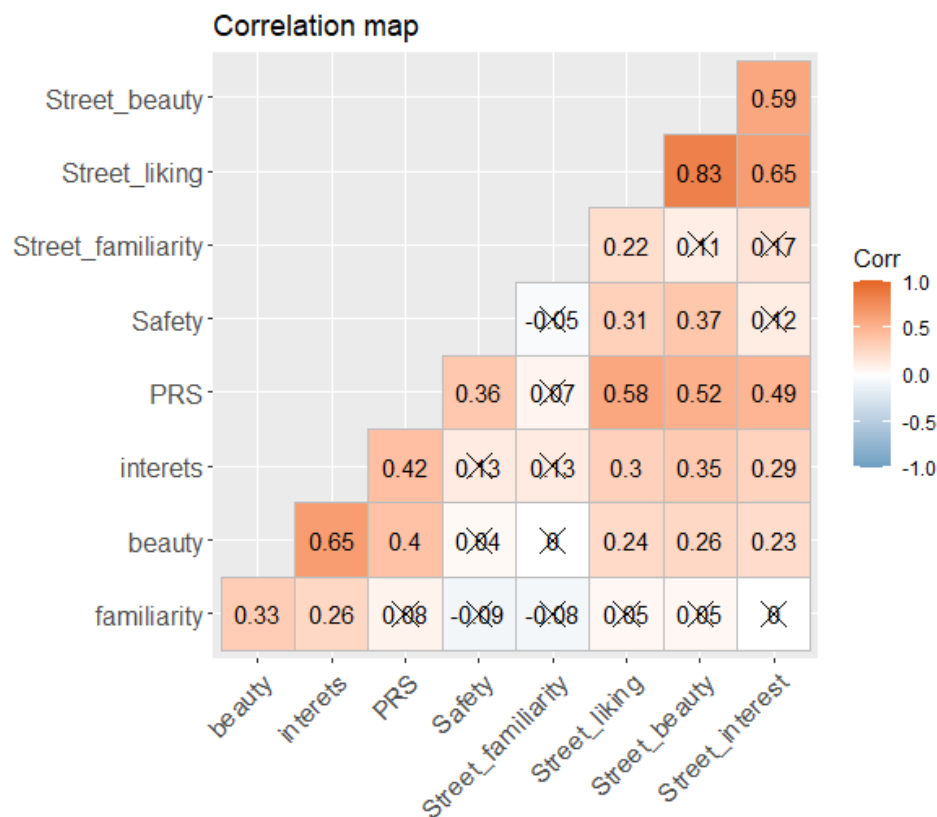


Figure 8.

Correlation plot for environmental evaluations and artwork evaluations. $N = 40$ for both conditions (familiar and unfamiliar).

Artwork evaluations

To examine potential differences in artwork evaluations between the two artwork conditions, descriptive statistics were computed for each presented artwork (Table E in the appendix). The evaluations included measures of *liking*, *beauty*, *interest* and *attention*. While slight variations were observed across individual artworks, the 95% confidence intervals for all four aesthetic evaluation metrics overlapped between the artworks in both conditions. Therefore, no meaningful differences in aesthetic evaluation or attention were found in the field study.

3.6 Follow-up online Study

A follow-up study was conducted between January 7th and January 29th to extend and complement the findings of the field study. Surprisingly, the results of the field study indicated that there were no significant differences in well-being outcomes across the conditions, despite theoretical expectations. The lack of significant differences in environmental evaluations across conditions may explain the absence of notable effects on well-being outcomes. In response, a follow-up online study was designed to assess whether participants' evaluation of the environment would have differed if they were exposed to all three intervention conditions. Therefore, the follow-up study used a within-subject design. Here, participants viewed and rated all three intervention conditions sequentially, enabling comparisons between them. Additionally, a fourth condition was added: the testing street without the Graetzloase installation. This condition was included to assess how participants evaluated the environment without any urban installations, since even the control condition yielded significant well-being improvements. By comparing the empty street to the original conditions, we aimed to isolate the specific contribution of the Graetzloase on environmental evaluations. This allowed us to test whether viewing the different settings would lead to more differentiated environmental evaluations, potentially revealing effects that were masked in the field due to the between-subjects design.

Participants

As this was an online study, all participants from the field study ($N = 134$) were contacted via email and invited to voluntarily participate in the follow-up. The invitation included a link to the online questionnaire and a short description of the purpose of the follow-up study. Participation was entirely optional. Of the 134 invited, a total number of $n = 26$ participants (19 female, 6 male, 1 other, M age = 21.65, SD age = 3.17) completed the follow-up survey. Completion was defined as reaching the end of the questionnaire and answering all obligatory items.

Materials

For the online follow-up study, we used photographs of the field study conditions (familiar artworks, unfamiliar artworks, no artworks). These photographs were taken specifically for the follow-up to ensure consistent lighting, background and high visibility of the intervention. Disturbing elements such as parked bicycles and clutter in the

pictures were digitally removed. Additionally, the viewing angle and framing were matched across all three conditions to present the intervention as uniformly as possible across all conditions. A fourth image was created to present the newly introduced empty street condition for this online study. With the use of Photoshop (Adobe Inc, 2024), the complete Graetzloase (Figure 9) was digitally removed with the aim of presenting a version of the street with no intervention at all. This allowed us to test how participants evaluated the street without the installation.



Figure 9.

Illustration of the 4 experimental conditions in the online follow-up study (left familiar and empty, right unfamiliar and control).

Measures

In the follow-up study, participants viewed all four conditions presented in a randomized order to minimize order effects. For each condition, participants completed

almost the same set of environmental and aesthetic measures as in the field study. The measures included:

(1) Perceived Restorativeness Scale (PRS; Hartig et al., 1997)

This scale consisted of 26 items rated on a 7-point Likert scale and included the four components of psychological restoration: *being away*, *fascination*, *coherence* and *compatibility*.

(2) Environmental evaluations

Participants evaluated each environment shown on the image using the following single-item questions from the field study, rated on a 7-point Likert scale:

- Street liking: *“How much did you like this environment?”*
- Street beauty: *“How beautiful did you find this environment?”*
- Street interest: *“How interesting did you find this environment?”*
- Street familiarity: *“How familiar are you in general with the environment/street?”*
- Street safety: *“How safe did you feel in this environment?”*

(3) Aesthetic evaluations

Participants completed the following aesthetic evaluations for each displayed artwork on a 7-point Likert scale unless stated otherwise.

- Artwork familiarity: *“How familiar is this artwork to you?”*
- Artwork liking: *“How much do you like this artwork?”*
- Artwork beauty: *“How beautiful do you find this artwork?”*
- Artwork interest: *“How interesting do you find this artwork?”*
- Artwork contact: *“Have you seen this artwork before?”* (response options: *“none”, “once”, “a few times”, “many times”*)
- Artist recognition: *“Do you know the artist who created this artwork?”* (open text, not forced answer)

(4) Qualitative questions

After participants viewed and rated the conditions, they were asked to fill in qualitative questions about aspects that they liked/did not like about the environment in general. These questions were aimed at giving additional exploratory insights into participants' aesthetic and environmental preferences.

- *“Which element would make the urban street appear more beautiful or pleasant? Elements can include physical objects (e.g., artworks, green spaces), specific characteristics of the surroundings (e.g, colors), or the overall atmosphere (e.g., warmth, safety, etc.) Please enter your opinion in the text box below.”*
- *“Which element would make the urban street appear less beautiful or pleasant? Please enter your opinion in the text below.”*

(5) Demographics

At the end of the questionnaire, participants were asked to report on which condition they had taken part in the field study for exploratory analysis purposes. They were also asked to fill in basic demographic information (*age, gender and education*). Lastly, they had the option to enter their email address to participate in a raffle for gift vouchers as compensation for their time.

3.7 Results follow-up study

Environmental and PRS evaluations

To evaluate the impact of intervention type on environmental evaluations and perceived restoration, a series of one-way robust ANOVAs were conducted due to the small follow-up sample ($N = 26$). In Figure 10, the violin plot illustrates the distribution of environmental evaluation ratings across all four conditions. In Figure 11, the violin plot illustrates the distribution of PRS ratings across all four conditions.

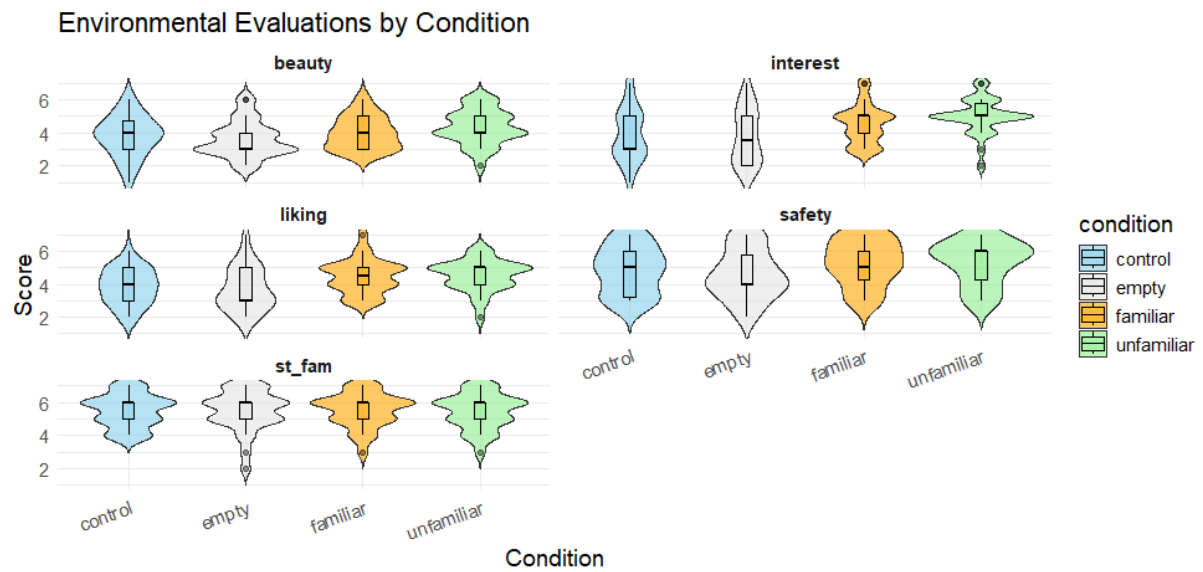


Figure 10.

Violin plot for environmental evaluations of the intervention in the follow-up study. $N = 26$.

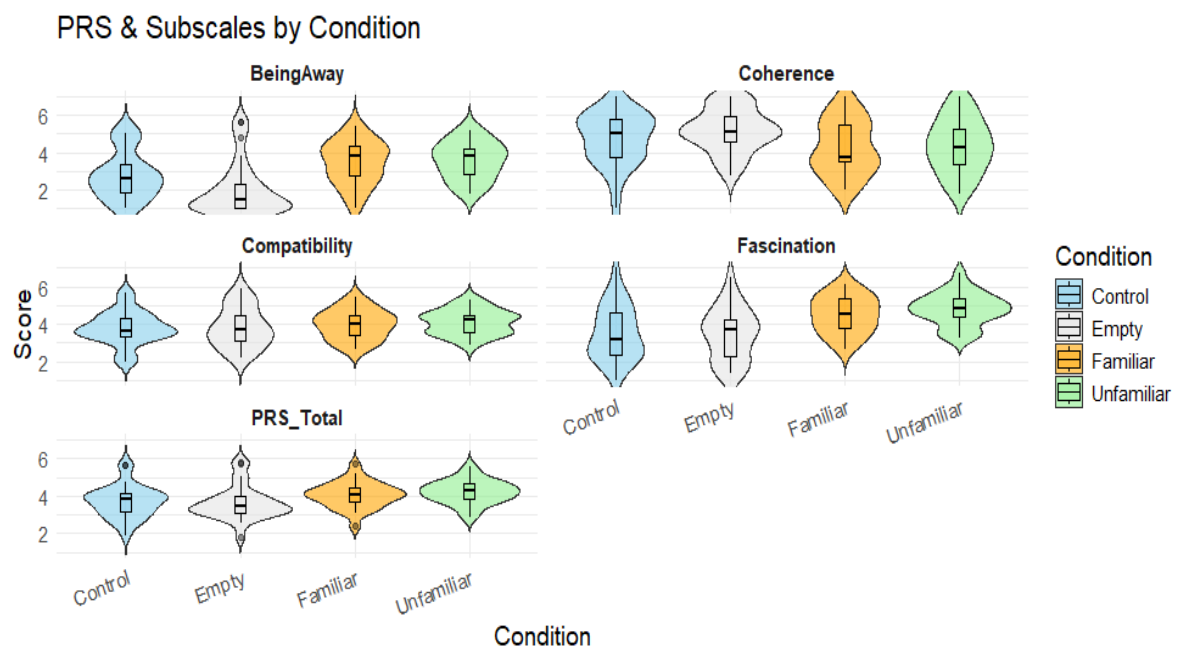


Figure 11.

Violin plot for PRS evaluations of the intervention in the follow-up study. $N = 26$.

ANOVAs of the environmental and PRS evaluations can be found in Table 5. Intervention type significantly influenced *street interest* ($p = .007$), *street beauty* ($p = .004$), and *street liking* ($p = .014$). Robust post-hoc comparisons showed that the unfamiliar artwork condition received higher ratings than the empty condition across all three dimensions (*street interest*: $p = .032$; *street beauty*: $p = .002$; *street liking*: $p = .039$). For *street interest*, the unfamiliar condition was also rated significantly higher than the control condition ($p = .023$), but differences between familiar and unfamiliar artworks were not significant.

Regarding perceived restoration, a robust one-way ANOVA showed a significant effect of intervention type on the overall PRS score. Post-hoc comparisons revealed that the unfamiliar artwork condition was rated significantly more restorative than both the control ($p = .041$) and empty condition ($p = .001$). The familiar artwork condition also received significantly higher ratings than the empty condition ($p = .027$), though it did not differ significantly from the control or unfamiliar conditions. Among the PRS subscales, *being away* and *fascination* showed condition effects. For *being away*, both artwork conditions were evaluated higher than the empty condition ($ps < .01$). The unfamiliar condition also differed significantly from the control ($p = .010$), and the familiar condition from the empty ($p < .001$). For *fascination*, the unfamiliar artwork condition received significantly higher ratings than both the control ($p = .004$) and empty ($p = .007$) conditions, with the familiar condition also differing from control ($p = .033$) and marginally from empty ($p = .043$).

Table 5.*Robust one-way ANOVAs for environmental and PRS evaluations in follow-up study.*

DVs	<i>F</i>	<i>p-value</i>	<i>Eta</i>²
<i>Street safety</i>	1.82	.162	0.26
<i>Street familiarity</i>	0.03	.990	0.04
<i>Street interest</i>	4.73	.007	0.46
<i>Street beauty</i>	5.28	.004	0.30
<i>Street liking</i>	4.11	.014	0.36
<i>Overall PRS</i>	6.58	.001	0.43
<i>Being away</i>	13.81	.000	0.57
<i>Fascination</i>	8.15	.000	0.50
<i>Coherence</i>	2.90	.050	0.29
<i>Compatibility</i>	1.00	.403	0.19

Note: N = 26

Artwork evaluations

The descriptive statistics for perceived familiarity across the artworks confirmed that familiarity manipulation was successful, just as in the field study, as the confidence intervals do not overlap between familiar and unfamiliar conditions (Table 6).

Table 6.

Descriptive statistics for perceived familiarity across artwork conditions (familiar, unfamiliar) in follow-up study.

Perceived Familiarity	<i>M</i>	<i>SD</i>	95% CI	
			lower	upper
Van Gogh	5.35	2.23	4.45	6.51
Hokusai	5.65	2.12	4.80	6.51
Dalí	5.46	1.82	4.73	6.20
Matisse	2.31	1.62	1.65	2.96
Ende	2.19	1.52	1.57	2.80
Courbet	1.92	1.62	1.26	2.58

Note: $N = 26$. [Minimum Score for perceived familiarity, maximum score for the perceived familiarity]: [1,7].

To assess if there were differences across aesthetic evaluations of the artworks, robust one-way ANOVAs (Table 7) were conducted for *artwork liking*, *artwork beauty*, *artwork interest* and *artwork familiarity*, all of which showed significant differences ($ps < .05$). Post-hoc comparisons did not reveal any differences across familiar and unfamiliar artworks (Figure F in the appendix).

Table 7.

ANOVA statistics for aesthetic evaluations of follow-up study.

DVs	<i>F</i>	<i>p-value</i>	<i>Eta</i>²
<i>Artwork liking</i>	3.74	.007	0.39
<i>Artwork beauty</i>	11.15	.000	0.48
<i>Artwork interest</i>	3.94	.005	0.31
<i>Artwork familiarity</i>	56.759	.000	0.64

Note: *N* = 26. Significant results are shown with Bonferroni correction.

Qualitative responses

Participants were asked two open-ended questions: (1) “Which element would make the urban street appear more beautiful or pleasant?” and (2) “Which element would make the urban street appear less beautiful or pleasant?”. The goal was to identify environmental qualities or features that influence participants' aesthetic and emotional evaluations of urban streets. Using qualitative content analysis, responses were coded according to recurring themes and keywords, with each statement categorized into one or more themes depending on its content.

For the preferred environmental features (*n* = 25 responses), the most dominant category was *greenery*, appearing in 23 responses. Participants emphasized a desire for natural elements such as plants, trees, flowers, and green spaces. Other frequently mentioned preferences included *warmth* (6 responses), *more colors* (7), and *artworks or cultural elements* (5). Some responses mentioned *no cars* (3) and *functional objects* (benches, water fountains, 2).

The non-preferred environmental features (*n* = 25 responses) were overwhelmingly characterized by *grey colors* (8), *concrete* (5), *cars* (6), and *litter* (6). Other negative aspects included *noise* (4), *coldness* (3), *less aesthetic buildings* (4), *metal features* (), and *lack of greenery* (2).

Correlation

In the follow-up study, a correlation plot was computed to examine the relationships between participants' evaluations of the artworks and their environmental evaluation. Aesthetic evaluations of the artworks (*artwork familiarity*, *artwork beauty*, *artwork interest*, *artwork liking* and *artwork contact*, averaged across all artworks) and environmental variables (*PRS*, *PRS subscales*, *safety*, *street familiarity*, *street liking*, *street beauty*, and *street interest*) were included in the analysis. Pearson correlation coefficients were calculated, and a Bonferroni correction was applied to account for multiple comparisons. An alpha level of .05 was used to determine statistical significance. Although the correlation plot visually depicts the patterns of association between the variables, no significant correlations between environmental and artwork evaluations can be observed.

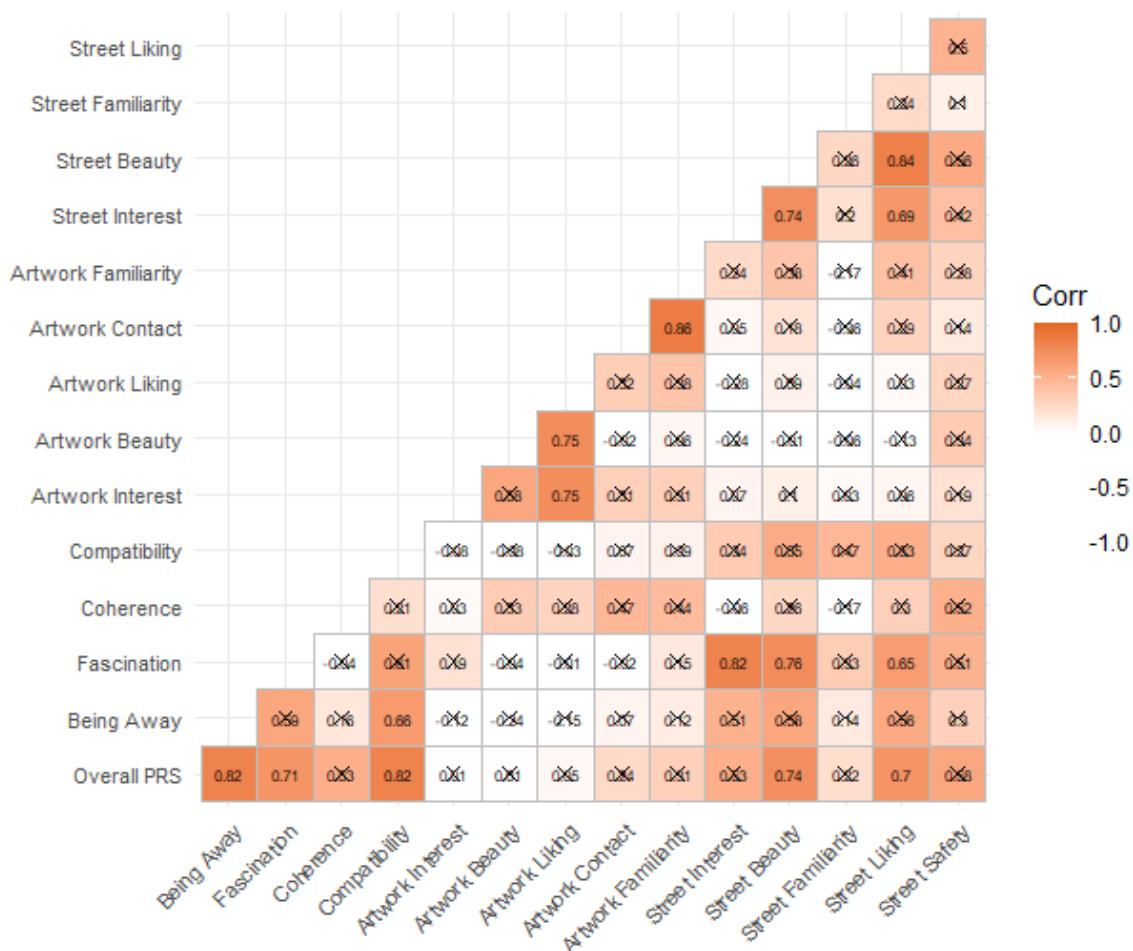


Figure 12.

Correlation plot with environmental, PRS and artwork evaluations, $N = 26$.

4. Discussion

The present study investigated whether the presence of familiar artworks in an urban environment influence environmental evaluations, perceived restoration and well-being. Three main hypotheses were proposed: that familiar artworks would lead to higher environmental and safety evaluations, greater perceived restoration, and stronger improvements in well-being compared to unfamiliar and control condition. Overall, the results did not confirm these hypotheses. We found no difference in environmental evaluations, perceived safety (**H1**) and perceived restoration (**H2**) between the three conditions. Surprisingly, participants from all three conditions, even in a control condition where the participants did not interact with any artworks, showed reductions in stress, anxiety and negative mood as well as improvements in positive mood after the intervention. However, there was not a significant difference between the three conditions (**H3**).

Below, I present my argumentations on why the hypotheses were rejected as well as potential future directions.

4.1 Environmental evaluations

A plausible explanation for no significant differences in environmental and safety evaluations may lie in the aesthetic character of the testing location. The Graetzloase was embedded in Vienna's first district, an architecturally rich area marked by historic buildings and the nearby city hall. This environment likely introduced a ceiling effect, where already high aesthetic evaluations reduced the sensitivity to detect differences by the artwork interventions. The qualitative analysis showed that references to the surrounding architecture and the aesthetic appeal of the buildings were present across all three conditions. Additionally, the participant sample, primarily psychology students from the nearby university, may have been already familiar with the site. While we scheduled data collection early in the semester to reduce prior exposure, it is likely that many had passed through the street before. This may have reduced the perceived familiarity of the interventions, further reducing possible effects on environmental judgement. Together, these factors likely constrained the variability of responses, resulting in null findings.

However, this has important implications for urban planning. Artistic installations could be particularly effective in areas that are low in aesthetic quality. In contrast to green interventions, which often require long-term planning and ongoing maintenance, artistic installations offer a much more flexible solution. They can be implemented rather quickly on existing urban infrastructure, such as fences and walls without requiring structural changes. This makes them ideal for areas where greenery is not feasible due to space limitations or environmental conditions. Deploying colorful, artistic interventions in visually monotonous spaces could increase perceived environmental quality and evoke aesthetic interest. This aligns with findings from the follow-up study, where many participants expressed a dislike for monotonous elements such as grey, concrete and metal structures as well as a general lack of color, highlighting the potential of vibrant color and art to counteract visual uniformity.

4.2 Familiarity and fluency

Although the familiarity manipulation in artworks was successful in both the field and the follow-up study, it did not result in any differences across environmental, restorative, aesthetic art evaluations and well-being results. This is surprising given the theoretical foundation from fluency-based aesthetic research (e.g. Reber et al., 2004). While fluency theories suggest that familiar stimuli should be evaluated more positively due to easier cognitive processing, this view does not fully capture the complexity of how viewers respond to novel or disfluent stimuli. In dual-process models such as the PIA (Graf & Landwehr, 2015), aesthetic appreciation can also arise from effortful, interest driven engagement with novel stimuli. Unfamiliar artworks in this study may have triggered this route. An additional explanation may be the inverted U-shaped relationship between stimulus complexity and aesthetic appreciation (Berlyne, 1974). According to this, stimuli that are too simple or overly familiar may fail to sufficiently stimulate cognitive interest, while excessively complex or novel stimuli may overwhelm the viewer. In the context of our study, the familiar artworks may have lacked the level of perceptual challenge needed to sustain interest. This is also supported by Song et al. (2021), who showed that novelty is often preferred among less experienced viewers. Given the mean age of the participants, this might have contributed to the results. Furthermore, the artworks used were not perceived as exclusively familiar or unfamiliar, which may have blurred the perceptual contrast required for a strong fluency

effect. Combined with the richness of surrounding urban stimuli, this may have diluted the specific influence of familiarity on environmental and aesthetic evaluations. The absence of significant effects in different conditions should not be seen as a failure of fluency theories but rather highlight the complexity of cognitive and affective processes that shape real-world aesthetic experiences in a dynamic urban setting.

4.3 Restorative environments

In relation to perceived restoration, the field study did not reveal any significant differences in the restorative potential between the intervention conditions. Neither the presence of artworks nor the level of familiarity appeared to influence participants' evaluations. However, this pattern shifted in the follow-up online study, where participants rated environments with artworks as more restorative. This contrast points to important methodological and contextual differences between the two studies that may explain the divergence in outcomes. The field study employed a between-subjects design, with each participant experiencing only one condition in a real-world urban setting. In contrast, the follow-up study used a within-subjects design, where participants evaluated all conditions presented through images in an online environment. This design allowed for direct comparison between conditions, potentially enhancing participants' sensitivity to aesthetic variation. One plausible explanation is that the restorative benefits of the art installation became more salient when participants were able to compare different conditions side by side. In the field study, individual differences may have masked these subtle effects, particularly in a real-world setting with additional environmental stimuli. This aligns with Mikuni et al. (2024), who suggest that expectations shaped by prior experiences can lead to disappointment when subsequent spaces appear empty or less stimulating. These findings also point to an important implication for urban planning: aesthetic interventions might be most effective in areas where change is visible and meaningful to residents. In residential neighborhoods, where people are more familiar with the baseline environment, aesthetic improvements may be more noticeable and appreciated. In contrast, aesthetically rich or tourist-heavy areas, where users may only experience the space briefly or without a point of comparison, the impact of such interventions may be less pronounced.

While the field study did not show significant condition effects on restoration or well-being, the qualitative responses still offered valuable insights. Participants across all conditions, including the control group, frequently expressed a desire to remain longer at the intervention site. Many mentioned wanting to observe the surroundings or artworks longer, suggesting that the environment fostered a sense of visual and experiential interest. This aligns with the “fascination” component ART (Kaplan, 1995) and implies that it was still active, even if not statistically significant. Cotter et al. (2022) emphasize that the quality and depth of the art experience are critical factors in eliciting psychological benefits. In the present study, the brief duration of exposure, limited to just a few minutes, may not have been sufficient for participants to fully engage with the environment. Interestingly, in the follow-up study, participants focused on green elements such as trees and plants when asked what would improve the environment. This discrepancy may be due to differences in how questions were framed: the field study invited spontaneous, open-ended feedback, while the online study directed participants' attention more explicitly toward desired environmental features, potentially amplifying preexisting preferences for greenery. Nevertheless, these observations support the growing body of literature suggesting that restoration is not limited to natural environments. Built settings with cultural richness, visual coherence, and architectural or artistic detail can also evoke restorative responses (Horvat & Ribeiro, 2023; Scopelliti et al., 2019). Our findings contribute to this perspective, showing that even in the absence of measurable effects across conditions, the aesthetic engagement facilitated by art may still hold meaningful restorative value.

4.4 Well-being

The present study revealed improvements in well-being not only in the artwork conditions, but also in the control condition, which lacked any aesthetic manipulation. Despite the absence of artwork stimuli, participants in this condition, who were simply asked to spend three uninterrupted minutes in the intervention space, reported reductions in anxiety, stress, negative mood and even improvements in positive mood. These findings are particularly relevant within the context of urban mental health challenges. As highlighted in the introduction, urban environments are characterized by high sensory stimulation and cognitive demands, all of which contribute to chronic stress, attentional fatigue, and increased vulnerability to mental health disorders

(Ventriglio et al., 2020; Penkalla & Kohler, 2014; Xu et al., 2023). Even brief interventions that facilitate disengagement from urban overstimulation may produce measurable psychological benefits. The improvements observed suggest that the well-being potential of urban interventions may not solely depend on visual or aesthetic enhancements. Rather, the opportunity to pause and disengage from smartphones and other demands of a hectic urban context may itself induce well-being benefits. The positive mood increase observed in our control condition contrasts with findings from previous work, such as Mikuni et al. (2024), where artistic and green interventions reduced negative affect but did not enhance positive affect.

These findings offer some practical implications. They suggest that even non-aesthetic interventions, such as small, quiet areas that encourage breaks can serve as effective tools to mitigate urban stress. Particularly in densely populated areas where greenery or artistic infrastructure is not feasible, elements like benches and tables may yield benefits. Second, they highlight the value of contrast: within overstimulating city environments, an interruption-free space may be perceived as especially calming or restorative simply by breaking the surrounding pattern of cognitive and sensory load.

4.5 Implications for future studies

The findings of this study open several opportunities for future research on the impact of art interventions in urban environments on well-being. To capture more precisely the effects of aesthetic or visually engaging interventions, future studies should conduct their intervention in locations that are neutral or visually less rich. Alternatively, using immersive technologies such as virtual reality could allow researchers to simulate urban spaces while precisely controlling environmental variables from interfering with surrounding stimuli. Future research should also consider longer or repeated exposure, as a three-minute intervention was perceived as too short and may not have led to sufficient restorative effects as intended. Additionally, a hybrid design that combines within- and between-subject elements may offer more balanced statistical sensitivity. Lastly, future research should aim to recruit more heterogeneous samples such as a mix of art students and non-art students. This may help to better understand how individual differences in art perception influence preferences for familiar versus novel artworks, and under what conditions these preferences translate into well-being benefits.

4.6 Conclusion

As outlined in the introduction, urbanization and densification lead to elevated stress and anxiety levels and other mental health issues. The well-being results show empirical support for the relevance of this study and underscore scientific and policy discourse advocating for environments that promote well-being in any form, not just green/art environments. Supporting this, qualitative responses in the field study revealed that participants across all conditions expressed a desire to spend more time in the testing environment, as they felt three minutes was not enough to settle in and relax. This implies a desire for space in which people can take a break and unwind from the hectic urban environment. Improvements in positive mood suggest that even small breaks from everyday routines in an urban environment actively elevate positive feelings.

5. Literature

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7. Appendix

Table A.

Descriptive statistics of perceived familiarity ratings across artworks in pre-study.

Artist	M	SD	95% CI	
			lower	upper
Van Gogh	8.61	2.66	7.29	9.93
Hokusai	9.33	2.20	8.24	10.43
Dalí	9.33	2.14	8.27	10.40
Matisse	2.83	2.48	1.60	4.07
Ende	4.00	2.54	2.74	5.26
Courbet	3.61	2.59	2.32	4.90
Hopper	5.67	3.55	3.90	7.43
Macke	3.56	2.53	2.30	4.81
Mondrian	6.17	3.57	4.39	7.94
Nicholson	2.78	2.41	1.58	3.98
Seurat	6.61	3.09	5.07	8.15
Sloan	2.78	1.80	1.88	3.67

Note: $N = 18$. [Minimum Score for perceived familiarity, Maximum Score for the perceived familiarity]: [1,10].

Table B.
Descriptive statistics for environmental evaluations.

	<i>M</i>	<i>SD</i>	95% CI	
			lower	upper
<i>Perceived Safety</i>				
Control	5.84	1.09	5.49	6.20
Unfamiliar	5.67	1.35	5.24	6.11
Familiar	5.52	1.46	5.05	5.99
<i>Street Familiarity</i>				
Control	4.51	1.96	3.88	5.15
Unfamiliar	4.72	1.50	4.25	5.21
Familiar	4.58	1.68	4.04	5.11
<i>Street Liking</i>				
Control	4.59	1.46	4.11	5.06
Unfamiliar	4.86	1.51	4.36	5.33
Familiar	4.83	1.39	4.38	5.27
<i>Street Beauty</i>				
Control	4.69	1.52	4.20	5.19
Unfamiliar	4.75	1.46	4.28	5.22
Familiar	4.72	1.33	4.30	5.15
<i>Street Interest</i>				
Control	4.56	1.48	4.08	5.04
Unfamiliar	5.18	1.33	4.74	5.60
Familiar	4.90	1.44	4.44	5.36

Note: *N* = 119. [Minimum Score, Maximum Score for the perceived familiarity]: [1,7].

Table C.*Descriptive statistics for PRS and subscales.*

	<i>M</i>	<i>SD</i>	95% CI	
			lower	upper
<i>Perceived restorativeness scale (PRS)</i>				
Control	3.77	0.90	3.49	4.07
Unfamiliar	4.10	0.89	3.81	4.38
Familiar	4.01	0.93	3.71	4.31
<i>Being Away</i>				
Control	3.53	1.41	3.07	3.99
Unfamiliar	4.03	1.29	3.62	4.44
Familiar	4.14	1.40	3.70	4.59
<i>Fascination</i>				
Control	4.22	1.15	3.85	4.60
Unfamiliar	4.61	0.99	4.30	4.93
Familiar	4.21	1.05	3.87	4.54
<i>Coherence</i>				
Control	2.48	1.40	2.03	2.94
Unfamiliar	2.51	1.35	2.08	2.94
Familiar	3.00	1.32	2.57	3.42
<i>Compatibility</i>				
Control	4.14	0.87	3.86	4.42
Unfamiliar	4.40	0.99	4.09	4.72
Familiar	4.23	0.98	3.91	4.54

Note: N = 119. [Minimum Score, Maximum Score]: [1,7].

Table D.*Descriptive statistics for well-being measures.*

	Pre				Post			
	<i>M</i>	<i>SD</i>	95% CI lower	95% CI upper	<i>M</i>	<i>SD</i>	95% CI lower	95% CI upper
<i>Anxiety</i>								
Control	38.85	7.95	36.27	41.43	37.13	8.48	34.38	39.88
Unfamiliar	35.98	8.98	33.10	38.85	35.55	9.08	30.65	36.45
Familiar	37.90	9.11	34.99	40.81	34.35	7.77	31.86	36.84
<i>Stress</i>								
Control	31.15	24.99	23.05	39.25	25.95	22.61	18.62	33.27
Unfamiliar	26.70	22.64	19.45	33.94	21.62	19.22	15.47	27.77
Familiar	30.72	25.48	22.57	38.87	20.55	20.57	13.97	27.13
<i>Positive mood</i>								
Control	29.44	5.23	27.74	31.13	30.28	6.27	28.25	32.31
Unfamiliar	31.77	5.55	30.00	33.55	33.65	6.48	31.57	35.72
Familiar	30.87	6.13	28.91	32.84	32.17	6.64	30.05	34.30
<i>Negative mood</i>								
Control	13.97	2.97	13.01	14.94	13.30	3.49	12.18	14.44
Unfamiliar	13.48	3.89	12.23	14.71	12.95	3.20	11.92	13.97
Familiar	13.33	3.68	12.15	14.50	12.55	2.81	11.66	13.45

Note: N = 119.

Table E.

Descriptive statistics for aesthetic evaluations of the artworks (familiar/unfamiliar condition)

Artist	DV	M	SD	95% CI	
				lower	upper
Dali	liking	4.80	1.52	4.31	5.29
Hokusai	liking	5.30	1.38	4.86	5.74
Van Gogh	liking	5.08	1.46	4.61	5.54
Courbet	liking	5.13	1.24	4.73	5.52
Ende	liking	4.38	1.98	3.74	5.00
Matisse	liking	4.66	1.53	4.16	5.13
Dali	interest	5.82	1.48	5.35	6.30
Hokusai	interest	4.78	1.64	4.25	5.30
Van Gogh	interest	4.08	1.51	3.59	4.56
Courbet	interest	5.18	1.33	4.75	5.60
Ende	interest	5.60	1.50	5.12	6.08
Matisse	interest	3.60	1.67	3.07	4.13
Dali	beauty	4.40	1.58	3.89	4.91
Hokusai	beauty	5.38	1.37	4.94	5.81
Vangogh	beauty	5.10	1.56	4.59	5.60
Courbet	beauty	5.17	1.35	4.74	5.60
Ende	beauty	3.67	1.80	3.09	4.25
Matisse	beauty	4.85	1.56	4.35	5.34
Dali	attention	4.95	1.55	4.45	5.44
Hokusai	attention	4.42	1.76	3.85	4.99
Vangogh	attention	3.80	1.34	3.37	4.22
Courbet	attention	4.42	1.53	3.93	4.91
Ende	attention	4.92	1.83	4.33	5.51
Matisse	attention	3.85	1.70	3.30	4.39

Note: N = 40 for both conditiuons. [Minimum Score for aesthetic evaluations, Maximum Score for aesthetic evaluations]: [1,7]

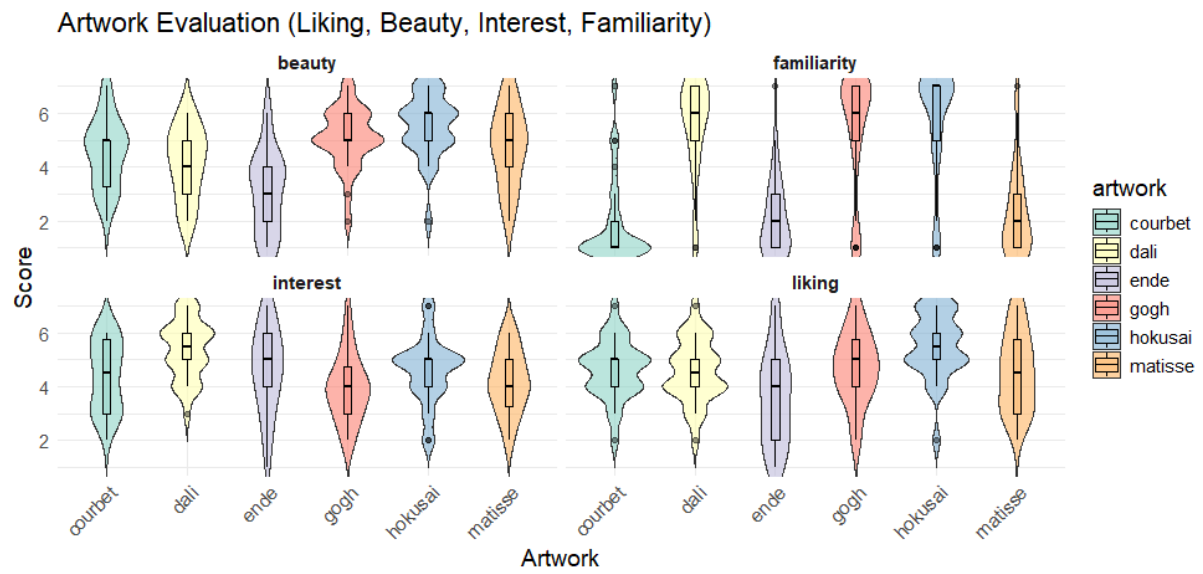


Figure F.

Violin plot for aesthetic evaluations of the artworks, $N = 26$.

Appendix G

Qualitative Analysis Field Study

Control (more time)

1. weil ich schön fand kurz nichts zu tun und die Fassaden beobachte
(relaxing & buildings)
2. weil es sehr entspannend war, die aufgabe zu haben, nichts zu tun
(relaxing)
3. um eine Gebet fertig zu sprechen (other)
4. Weil ich mich erst entspannt hatte, als es schon vorbei war & ich hatte wenig Zeit zum Erkunden der Gegend. (settling-in & environment)
5. Um mehr zu betrachten (environment)
6. Weil ich zum ersten Mal, seit ich nach Wien bekommen bin, das Gefühl hatte, dass ich einfach ruhig dasitzen darf und nichts machen muss (relaxing)
7. die zeit war zu knapp um mich an die dinge um mich herum zu gewöhnen und mich komplett zu entspannen (settling-in & environment)
8. Weil ich mir die Gebäude noch genauer anschauen wollte.
(buildings)
9. Ich fand es angenehm die Leute zu beobachten wie sie ihre Arbeit aufsuchten oder erledigten. Gegenüber war ein Maler an einer Fassade das war schön anzuschauen. 3 Minuten kamen mir lange vor. (environment & people)
10. To understand better how I feel in it (environment)
11. Die Zeit war zu kurz, um wirklich die Stimmung der Umgebung gut spüren zu können und sich dazu zu gewöhnen. (settling-in & environment)
12. Weil ich mich angefangen habe zu entspannen (relaxing)

Control (less time)

1. Ich fand die Sitzgelegenheit bzw. diese Grätzooase sehr langweilig bzw. nicht unbedingt beruhigend, es ist kalt, grau, dunkel, keine sonne, keine lebensige natur, da fühlt sich dort sitzen nicht so ausruhend an wie es sein sollte
(monotone colors, no greenery, not relaxing)

2. Ich habe mich alleine gefühlt (other)

Familiar (more time)

1. Gefühl für Ort bekommen (environment)
2. Man konnte sich auf seine Sinne konzentrieren (relaxing)
3. Um noch mehr rumzuschauen (environment)
4. Es war entspannend (relaxing)
5. Um mir die Gemälde genauer anzuschauen (artworks)
6. Um mir die Bilder genauer anzuschauen (artworks)
7. Es ist sehr entspannend und man kann Menschen beobachten (relaxing, people)
8. weil der gedanke dass ich in einer studie bin noch präsent war und die zusätzlichen minuten mir denke ich helfen würden den moment zu 'genießen' (settling-in)
9. Entspannend (relaxing)
10. Sonnig, nett, schöne Gasse (buildings)
11. erstmal bin ich rum gelaufen nach 3 min hbe ich mich erst hingesetzt und hätte mehr zeit im Sitzen verbringen sollen (settling-in)
12. bisschen mehr Zeit zum Ankommen und Entspannen (relaxing)
13. Weil ich Interesse für Kunst habe und sie mir gerne länger ansehe (artworks)

Familiar (less time)

1. Alles war einfach grau in grau, pflanzen usw haben gefehlt (monotone colors, no greenery)
2. Die Testsituation war ein bisschen unangenehm, da man ein bisschen beobachtet gefühlt hat (wahrscheinlich größtenteils wegen der Absperrung davor). Die umgebung selbst aber war schön. (environment & test situation)

Unfamiliar (more time)

1. mir wurde nicht langweilig. ich wäre gerne geblieben bis mir langweilig geworden wäre (interest)
2. Beautiful paintings and beautiful buildings (artworks & buildings)
3. Weil ich die Bilder und die Menschen länger beobachten wollte (artworks & people)
4. damit ich mich ein bisschen mehr auf die Umgebung konzentrieren kann (environment)
5. Ich hab ein bisschen Zeit gebraucht, um einen guten Ort für mich innerhalb der Grätzloase zu finden und hätte dann da gerne mehr Zeit verbracht (settling-in & relaxing)
6. Um noch mehr entspannen zu können (relaxing)
7. um die Bilder genauer anzuschauen, um ein bisschen zur Ruhe zu kommen (artworks & relaxing)
8. Nicht um die Kunst besser zu betrachten, sondern sich darauf einzulassen und einzufühlen. (artworks)
9. Die Zeit ist sehr schnell vergangen, ich denke 3 Minuten reicht um sich entweder auf die Kunstwerke oder auf die „Einrichtung/ das Konzept“ der Oase zu konzentrieren, jedoch nicht für beides. (settling-in, artworks & environment)
10. Ich hatte nicht genug Zeit alles wahrzunehmen (settling-in)
11. Es war entspannend (relaxing)
12. Hätte gerne mehr über mich reflektiert und nachgedacht (reflecting)
13. Ich bin gerne in der Stadt vor allem weil Wien eine sehr schöne Stadt ist und liebe es mal nicht am Handy zu sein und mich auf meine Umwelt zu konzentrieren (buildings & environment)
14. Um sich noch mehr auf die Umgebung und Bilder einlassen zu können (environment & artworks)
15. Um mir die Bilder und Umwelt detaillierter anschauen zu können (environment and artworks)
16. Weil es ein besonderer Moment der Ruhe war, eine Aufgabe nichts zu tun. (relaxing)
17. es war sehr schön und sehr entschleunigend. man sitzt nicht oft in der Öffentlichkeit ohne eine Nebenbeschäftigung zu haben (relaxing)

Unfamiliar (less time)

1. es war etwas bedrückend auf dem Gelände (environment negative)
2. beobachtet gefühlt, sehr viele Reize, Bilder etwas verpixelt (artworks negative, test situation)
3. Durch die Stahlkonstruktion habe ich mich ein wenig begrenzt gefühlt, die Umgebung Rundherum mit den Blick auf die wunderschönen klassizistischen Gebäude in der Umgebung waren viel ansprechender (environment negative, buildings positive)

Qualitative Analysis Follow-up study

Positive

1. Grünanlagen, Wärme, Eleganz, Kultur (greenery, warmth, cultural value)
2. Mehr Bäume, eventuell kunstvolle Gartentees (greenery, art)
3. Naturelemente (Blumen, Pflanzen etc); etwas Grünes; wärmer; angenehmere Stühle (greenery, warmth)
4. Bilder von Natur, Natur, Grün (artworks, greenery)
5. Warm, wenns etwas größer wäre vielleicht, platz für mehr leute also, und grüner, also wenns eine fußgängerzone wäre, die autos weg wären dann wärs sehr schön (warmth, no cars, greenery)
6. wenn es Pflanzen gäbe; Metallgerüste/Laternen/Radständer in einer Farbe (beige würde schon reichen statt des kalten Silbers) würde es lebendiger und wohlgiger machen; vielleicht leise Musik oder so etwas, die vom Straßenlärm etwas ablenkt, wobei das auch zu viel sein könnte zwecks Reizüberflutung; vielleicht auch eher ein geschlossener abgeschirmter Raum (so eine Art Bushaltestellenhütte) :) (more colours, greenery)
7. Mehr Grünflächen (greenery)
8. Grünanlagen, Bäume, warme Farben (an den Gebäuden), Malereien an den Gebäuden oder auf den Straßen (greenery, artworks, warmth)
9. Pflanzen (greenery)
10. Mehr Pflanzen, Bäume, Bänke zum Verweilen, mehr Radwege, mehr Grün (greenery)
11. Farben, bequemer (more colours)

12. Grünflächen, Offenheit anstatt verschlossene Bereiche, mehr Farbe anstatt nur weiß (greenery and more colours)
13. Pflanzen, saubere Umgebung, Charakter der Gebäude individuell, farbenfroh, sicher (greenery, more colours, warmth, clean)
14. Grünanlagen, Holz, Farben wie blau, grün, lila (greenery, more colours)
15. Grünanlagen (greenery)
16. Bäume/Grün, Farben nur wenn Sie sich gut ins restliche Umgebungsbild einfügen (greenery and more colours)
17. sicher, leise, Grünanlagen, Sitzplätze, warm (greenery, warmth colours, objects)
18. Grünanlagen bzw. allgemein Pflanzen (auch im kleineren Rahmen in Blumenkästen o.Ä.), Kunstwerke auch aber da finde ich, dass wenige aber dafür interessante und gut zur Gegend passende Kunstwerke effektiver sind, was auch gut ist sind Sachen die man als Passant benutzen kann (Bänke, Trinkwasserbrunnen usw.) (greenery and artworks, objects)
19. Grünanlagen mit mehr Blumen, offene Plätze (greenery)
20. Pflanzen, ruhige Holzbänke etc (greenery)
21. Grünanlagen, mehr Wohnhäuser mit Dachterrassen Zugang, Plätze mit Cafes, Offenheit gegenüber allen Menschen (greenery)
22. grünanlagen und mehr platz, mit parkenden autos wirkt es sehr eng (greenery, no cars)
23. Atmosphärisch (other)
24. Begrünung, Bäume, Kletterpflanzen (greenery)
25. Entspannte Fußgängerwege mit Pflanzen, Geschäften/Gastronomie und Kunst/Musik (greenery, music)

Negative

1. Betonblöcke, Schmutz, Enge (concrete, litter)
2. Müll, kahle Wände, nur Beton (litter, concrete)
3. mehr grau, mehr eingekerkert (grey colours)
4. Mülleimer (garbage bin)
5. mehr charakterlose Bauten (less aesthetic buildings)
6. weniger leben, mehr autos, wenig platz, viel "künstlicher" lärm im sinne von autos, ampeln, öffis (cars, traffic, noise)

7. Noch mehr Reize, die nicht gut aufeinander abgestimmt sind (beispielsweise schiefe überlappende Bilder, die nicht absichtlich/ästhetisch zusammenpassen) (less aesthetic artworks)
8. Autos, Baustellen (cars, construction)
9. graue Farben, wenn alles gleich bzw. monoton aussieht (grey colours)
10. Mehr Beton, mehr Autos, mehr Lärm, noch mehr Grau (concrete, grey colours, noise, cars)
11. Grau, kalt (grey colours, cold)
12. Kalt und farblose Gebäude, zu viele Zäune versperrte Bereiche, kaum Grünflächen (cold, less aesthetic buildings, no greenery)
13. graue schmucklose Gebäude, enge Straßen, erdrückend viele Menschen, keine grünen Flecken, viel Hintergrundlärm (grey colours, noise, less aesthetic buildings)
14. Metall, Farben wie gelb, rot, beige (metal)
15. große Werbung, viel grau (grey colours, advertisements)
16. Mehr Parkplätze (cars)
17. laut, schmutzig, dunkel (noise, litter, darkness)
18. V.a. das Fehlen von solchen Elementen trägt zu so etwas bei, wenn in einer Straße nichts ist was einen irgendwie anzieht (interessante Sachen zum anschauen oder funktionale Sachen zum benutzen), dann ist eine Straße auch nur das, mit Elementen die einen anziehen kann man eine Straße selber auch als Zielort betrachten (no functional/cultural street)
19. Blockhäuser, kalt, grau (grey colours, cold, block buildings)
20. mehr metall/ mechanistische Bauten (metal)
21. Beton, Hass (concrete)
22. noch mehr autos, schmutz (litter and cars)
23. Sympathisch (other)
24. Graue Flächen, Flache leere Hauswände, Zugeparkte Straßen (grey colours, cars)
25. Asphalt, keine Pflanzen, keine Kultur (concrete, no greenery)

Erklärung zur Verwendung von Künstlicher Intelligenz (KI)

Hiermit erkläre ich, dass ich die folgenden KI-Hilfsmittel zur Erstellung meiner Masterarbeit mit dem Titel „Art Interventions in an urban environment. The effect of familiar versus unfamiliar artwork on well-being.“ verwendet habe. Ich versichere, dass die Kennzeichnung der verwendeten KI-Hilfsmittel vollständig ist, inkl. Verwendungszweck, Produktname, als auch ggfs. Prompts und Outputs des KI-Hilfsmittels. Ich verantworte die Auswahl und die Übernahme sämtlicher Ergebnisse der von mir verwendeten KI-Hilfsmittel vollumfänglich selbst.

Verwendungszweck*	Produktname des KI-Hilfsmittels	Ggfs. Prompt (Input) und Output des KI-Hilfsmittels
Übersetzung und sprachliche Verbesserungen eigener Textpassagen ins Englische, Verbesserung der Satzstruktur, Vermeiden von Wiederholungen	ChatGPT	z.B. • How can I rewrite this paragraph that it reads better? • Can you translate this sentence in English • How can I formulate this better? • What can I say instead of xyz
Programmierhilfe für statistische Auswertung in RStudio	ChatGPT	
Übersetzung Englisch/Deutsch	DeepL	

* Hilfsmittel zur Überprüfung von Grammatik und Rechtschreibung oder der automatisierten Erstellung des Literaturverzeichnisses sind von dieser Erklärung ausgenommen.