Cities 143 (2023) 104579

Contents lists available at ScienceDirect

Cities

journal homepage: www.elsevier.com/locate/cities

Environmental appraisals in outgroup cultural landscapes: The role of Muslim elements in urban settings

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ARTICLE INFO

Keywords:
Walking
Environmental appraisals
Cultural landscape
Religious minorities
Intolerance
Muslim

ABSTRACT

Cultural landscapes can contribute to positive environmental appraisals. However, previous studies focused on exposure to ingroup culture. Referring the debate in Europe on Muslim symbols in the public sphere, this study examines the effect of exposure to outgroup cultural cues on environmental appraisals. We compare environmental appraisals of participants from France, Germany, and the Netherlands after a simulated walk in an outgroup (Muslim) cultural landscape or a religiously-neutral environment. The effect of the Muslim setting was contingent on intolerance, with tolerant individuals reporting more positive environmental appraisals in the Muslim environment. However, this effect reversed as intolerance increased, and more intolerant individuals perceived the Muslim environment more negatively than the control. These findings offer an alternative view to the idea that the visibility of Muslim symbols in the public space has negative effects. Instead, we reveal a nuanced interplay between the urban environment, sociopolitical context and individual-level differences.

1. Introduction

Environments play a significant role in shaping wellbeing, as they impact perceptions, behaviors, and mental states (Gesler, 1992; Kaplan, 1995). While previous research has focused on the positive effects of natural environments on wellbeing (Hartig, 2021), growing evidence indicates that cultural landscapes and historical elements can also contribute positively to wellbeing (Weber & Trojan, 2018). Cultural landscapes are generally preferred over culturally-neutral settings (Liu et al., 2020) and improve restorative perceptions (Weber & Trojan, 2018) and affective experiences (Bornioli et al., 2018).

However, it is currently unclear whether positive environmental experiences are independent of the idiosyncratic content and context of the cultural landscape. Previous studies have focused on landscapes embedded with elements of the ingroup culture, thus neglecting the influence of outgroup cultural cues. Yet, investigating the impact of outgroup cultural symbols on environmental and wellbeing perceptions is crucial, particularly in Western societies facing increased cultural diversity and power dynamics between native majority and newcomer minority cultures.

Specifically, there is a strong debate in many European countries regarding the accommodation of Muslim symbols in the city, such as veil wearing; mosque saliency; presentation of the Islamic star and crescent symbols; and the existence of halal butcheries, shisha cafes, and other public manifestations of the Muslim outgroup. This debate calls for an empirical investigation of the influence of outgroup cultural symbols on environmental and wellbeing perceptions. Thus, this study examines the environmental appraisals of the majority group in an environment featuring Muslim cues. Although the current literature supports that the experience of ingroup cultural landscapes enhances wellbeing (Liu et al., 2020; Weber & Trojan, 2018), we hypothesize that urban landscapes that integrate outgroup cultural elements may have a differential influence on individuals depending on their attitudes toward this outgroup.

Literature within the social sciences indicates that religious and social group identities have important implications for perceptions,

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https://doi.org/10.1016/j.cities.2023.104579
Received 24 November 2022; Received in revised form 6 July 2023; Accepted 21 September 2023
Available online 3 October 2023
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beliefs, and behaviors (Ben-Nun Bloom et al., 2021). Members of the religious majority may perceive public manifestations of outgroup symbols as threatening, as they undermine the saliency and monopoly of the majority culture (Ben-Nun Bloom et al., 2014). Throughout Europe, Muslim immigrants in particular endure intolerance as a religious outgroup (Bayrakli & Hafez, 2020). We thus suggest that the effect of Muslim elements in the public space on environmental appraisals is contingent on a person's level of social and political intolerance toward Muslims: as intolerance increases, the positive effect of a cultural landscape reverses.

To investigate the impact of outgroup symbols and individual-level differences on environmental appraisals, we conducted an experiment simulating two versions of a typical urban environment. One version included outgroup (Muslim) religious elements, while the other version replaced these with religiously-neutral features. Native participants were randomly assigned to interact with one of the two simulated environments, and then reported about their environmental appraisals. We repeated the experiment in three European countries to examine whether the effects of outgroup symbols and individual-level intolerance are consistent across different sociopolitical contexts. The next sections illustrate the key ideas on the wellbeing value of cultural landscapes and the role of attitudes toward outgroups in environmental appraisals and experiences.

1.1. Environmental and wellbeing appraisals of cultural landscapes

The share of the global urban population is expected to rise to two-thirds by 2050 (United Nations [UN], 2019). This rapid urbanization trend increases the urgency of making urban environments healthier, more inclusive, and more liveable. This interest is primarily because living in cities is associated with poorer psychological health than living in rural areas (Gruebner et al., 2017). Therefore, identifying urban environments that support positive environmental appraisals is a key step in improving the functioning of cities.

Several theories from psychology and geography have identified characteristics of the environments (primarily natural) that support positive environmental and wellbeing experiences. Attention Restoration Theory (ART; Kaplan, 1995) identifies four restorative properties of environments: settings that can a) aid psychological recovery if they promote a feeling of distance from daily routines (being away), b) display a well-organized context (extent), c) generate soft interest and attention (fascination), and d) meet people's needs and inclinations (compatibility). The framework of therapeutic landscapes based on the seminal work by Gesler (1992) explores how the combination of physical environments, social conditions, and human perceptions contribute to healing and wellbeing (Gesler, 1992). This emphasizes the relational aspects of individuals' interactions with the surrounding environment and the consequent personal experiences and associations (Conradson, 2005).

Among urban settings, one focus area has been on cultural spaces and landscape, e.g. environments characterized by human-made artefact with associated cultural process values (Taylor, 2012). According to scholars, the cultural landscape is characterized by both physical elements (visible features such as settlements, buildings, objects) and non-physical ones (intangible constructs such as cultural meanings, symbols, ideologies) (Stephenson, 2008). Increasing evidence, building on the theories outlined above, indicates that some cultural landscapes within the city can support positive environmental and wellbeing perceptions (Bornioli et al., 2018; Bornioli & Subiza-Pérez, 2023; Liu et al., 2020; Weber & Trojan, 2018). According to a review by Weber and Trojan (2018), historical and cultural places have the highest potential to aid in restorative experiences in built environments. Examples of cultural landscapes which were found to support positive environmental and wellbeing appraisals include old towns (Bornioli et al., 2018), Chinese parks with cultural elements (Liu et al., 2020), and historic squares (San Juan et al., 2017). According to the literature, the positive outcomes of exposure to cultural and historical places might be partially explained by the physical characteristics of historical settings, such as moderate perceived complexity, architectural variety, and a certain level of prospects (Bornioli & Subiza-Pérez, 2023). Historical and cultural urban settings are compatible with some characteristics identified by restorative environment theories to support positive environmental appraisals because they induce fascination and a feeling of distance from daily routines (Bornioli et al., 2018).

In addition to the role of physical features, individual characteristics also greatly influence how people experience cultural landscapes. Theories of therapeutic landscape (Gesler, 1992) and favorite restorative places (Korpela & Hartig, 1996) emphasize individual-level subjective experiences within restorative and therapeutic processes. A growing body of evidence indicates that personal meanings associated with such environments can contribute to environmental experiences and perceptions (Ratcliffe & Korpela, 2016), including in built environments (Subiza-Pérez et al., 2021).

Among these, place attachment and identification, defined as personal emotional and cognitive bonds between individuals and places (Lewicka, 2010; Scannell & Gifford, 2010), have an important role. Bornioli et al. (2018) discussed how engagement with the identity of place and its collective history contributes to positive appraisals in the British context during urban walks. In the study, historical and cultural elements were perceived as symbols of the city's identity, and engaging with the symbolic identity of the city increased interestingness, place attachment, and perceived restoration. Hence, cultural and historical elements might contribute to positive wellbeing experiences and perceptions not only due to physical characteristics, but also by activating a sense of identity. In addition, places where people experience more positive attitudes toward them and that are evaluated as more interesting, safe, and engaging might be perceived as being closer (Ralph et al., 2020). This, in turn, might discourage walking intentions (Bornioli et al., 2019).

However, although cultural settings might improve the environmental appraisal for individuals who belong to or identify with the expressed culture, appraisals of cultural landscapes might depend on the congruency of the activated identity or whether an individual belongs to the culture expressed in the cultural landscape. In this regard, there seems to be a lack of research examining the role of group identities on environmental appraisals and perceptions in an intergroup context. One exception is the experimental study by Morton et al. (2017), which explored the effects on performance of exposure to natural environments which did not reflect participants' national identity, and found that such exposure can undermine perceptions and performance. In addition, Gravelle et al. (2021) found, based on longitudinal data, that residential proximity to mosque was associated with increased support for the radical right. Taken together, these studies seem to indicate that intergroup dynamics can be complex – with potential differing effects of exposure on perceptions between outgroups and ingroups. Based on these premises, we hypothesized that an environment embedded with cultural outgroup cues is associated with more positive environmental appraisals than a neutral environment. The next section outlines why this is a relevant top-down trait that might influence restoration and environmental appraisals, especially concerning Muslim symbols.

1.2. Cultural landscape and social identities

Considerable literature in psychology indicates that the activation of outgroup cues is a source of threat and that this threat is related to an increased resentment toward the outgroup (McLaren, 2003; Riek et al., 2006). Social Identity Theory proposes that we derive self-esteem from the groups we identify with, and are motivated to maintain positive distinctiveness for our group. As a result, we are sensitive to cues regarding the presence and status of other groups (outgroups) in our environment (Tajfel, 1974). Encounters with outgroup symbols may activate our group identity, threaten the group identity, and trigger

negative experiences (Walker & Ryan, 2008). As Brown (1995, p. 174) noted, people respond to threats to their social identity "by increased attempts to differentiate the ingroup positively from outgroups," boosting their ingroup identification and loyalty, and resenting the outgroup (Brewer, 1999). Accordingly, intolerance, prejudice, or outgroup-oriented negative sentiment may be driven by the will to strengthen the ingroup cohesion and one's esteem rather than antagonism toward the other groups (Brewer, 1999).

Inducing a threat to one's social identity, salient outgroup cues in the cultural landscape can also affect the environmental appraisal. Place identity and place attachment encompass a person's values (Altman & Low, 1992; Devine-Wright & Clayton, 2010; Stedman, 2002), sense of self (Stedman, 2002), and social identities (e.g., religious and ethnic identity, Scannell & Gifford, 2010). Place identities involve anxiety and defense functions, which relate to what should and should not be in the space (Proshansky et al., 1983). A gap between the expectations from an environment and what we experience in it may foster feelings of threat and insecurity, undermining place attachment and even facilitating the motivation to avoid being in the place (Proshansky et al., 1983). Such gaps can also result in a reduced sense of safety and feeling less control, which is associated with negative reactions toward places (Brown et al., 2003; Lewicka, 2010).

Religious identity is one of the most politicized identities in many societies (Fearon & Laitin, 2003). Indeed, cues presenting outgroup religion were found to affect a range of sociopolitical attitudes, and are often threatening to one's social identity (Ben-Nun Bloom, Arikan, & Courtemanche, 2015). Outgroup religious cues are also particularly interesting in environmental appraisals, as religious identity is one of the most recognizable in the physical environment due to its institutionalization. Places of worship, designated shops, symbols, and clothing make religious identities particularly visible.

Of the many outgroup religious and ethnic groups in the context of European cities, Muslim religion is one of the most contested (Doebler, 2014). The symbolic identity threat (threat to one's cultural and religious identity) is a strong predictor of Islamophobia (e.g., anti-Muslim racism), and the symbolic aspects of Islamophobia have strong links to the visibility of Muslim symbols in the public sphere (Burchardt & Griera, 2019; Saroglou et al., 2009). It is often suggested that the controversy over the visibility of Islam in the European public sphere (such as minarets, halal shops, and wearing a veil by Muslim women) represents a struggle over the nature of the public space because public spaces are shaped by visibility rules of the hegemonic ideological narratives (Burchardt & Griera, 2019). Accordingly, Muslim cues in a Western European environment might potentially threaten social identity for a person from the majority group or trigger negative experiences (Walker & Ryan, 2008).

However, the response to Muslim cues vastly varies as a result of psychological predispositions, personality, political leanings, and sociodemographic factors (e.g. Ben-Nun Bloom, Arikan, & Courtemanche, 2015; Doebler, 2014). For people who perceive a certain culture or religion as a threat, its visibility in the urban environment may evoke negative feelings. Thus, the study's second hypothesis is that those individuals who perceive Islam as threatening or who are intolerant toward Muslims may be particularly sensitive to Muslim cues in the environment, which might make their environmental and wellbeing appraisals more negative.

There exist a vast country-level differences (Bell et al., 2021). Our hypothesis that threat from and intolerance toward Muslims at the individual level will increase sensitivity to environmental cues can also be extended to the contextual level. Thus, the effect of outgroup environmental cues may be moderated by the sociopolitical context, particularly the threat level and intolerance of the specific outgroup within a country. For example, there is generally less tolerance for religious symbols in the public sphere in countries with a strong secular tradition, such as France, compared to countries with a heritage of multiculturalism, such as the Netherlands (Van der Noll, 2010). For this reason, in this study, we further investigate potential inter-country differences by examining whether the effect of Muslim elements in the cultural landscape on environmental appraisal differs between countries.

1.3. Analytic strategy and hypotheses

Building on the above literature, we examined between-subject differences in environmental appraisals during a simulated walk in two types of urban environments. Half of the participants were exposed to an outgroup's cultural landscape with Muslim elements. In contrast, the other half were exposed to a landscape with religiously-neutral urban elements only, unrelated to ethnoreligious social identities. Following the experimental task, we measured environmental appraisals and perceptions using four scales: place attachment, perceived restorativeness, interestingness, and perceptions of the walk length. We also measured perceived social and political intolerance to examine their moderating effect. Participants were adults from three European countries: France, Germany, and the Netherlands. The study was designed to test the following hypotheses (Fig. 1):

H1. Environments embedded with outgroup cultural elements are associated with better environmental appraisals than religiously-neutral environments.

This hypothesis was formulated in line with previous evidence on the positive effects of exposure to cultural landscapes on environmental appraisals (Bornioli & Subiza-Pérez, 2023; Weber & Trojan, 2018; Bornioli et al., 2018). However, given that outgroup exposure specifically can hinder perceptions (Gravelle et al., 2021; Morton et al., 2017), we also expected that:

H2. Social and political intolerance levels result in a more negative effect of outgroup cultural landscapes on environmental appraisals and experiences.

Finally, informed by the existence of between-country differences in anti-immigrant and attitudes (Bell et al., 2021), our third hypothesis set that:

H3. The effect of the outgroup cultural landscape on environmental appraisals is moderated by the cultural and political contexts (i.e., country of residence).

2. Methods

2.1. Participants and procedure

We recruited 919 participants. Given that we were interested in the influence of outgroup cultural landscapes, respondents who selected Muslim as their religion were excluded from the analysis ($n = 8$). Participants were from France (Paris, $n = 400$), Germany (various cities, $n = 333$), and the Netherlands (Rotterdam, $n = 178$). Participants were invited to participate in an experiment embedded in an online questionnaire. In France and the Netherlands, participants were university students recruited through university participant pools. In Germany, participants were recruited through the university participant pool and social media. The local ethics boards approved each study. In the Netherlands and Germany, students received course credits. In France, they did not receive credits, but some preliminary results of the experiment were presented and discussed with them after data collection was completed.

Respondents were told that they were "going to participate in a virtual walking experience," with the following instructions: "You are invited to attend a lecture [in a] lecture's building which is a few minutes' walk from the bus stop where you will get off. […] You will need to pay attention to the route so that you can explain how to get there." Participants had to click the image in a specific part representing the walking direction to advance in the simulated environment. This area in

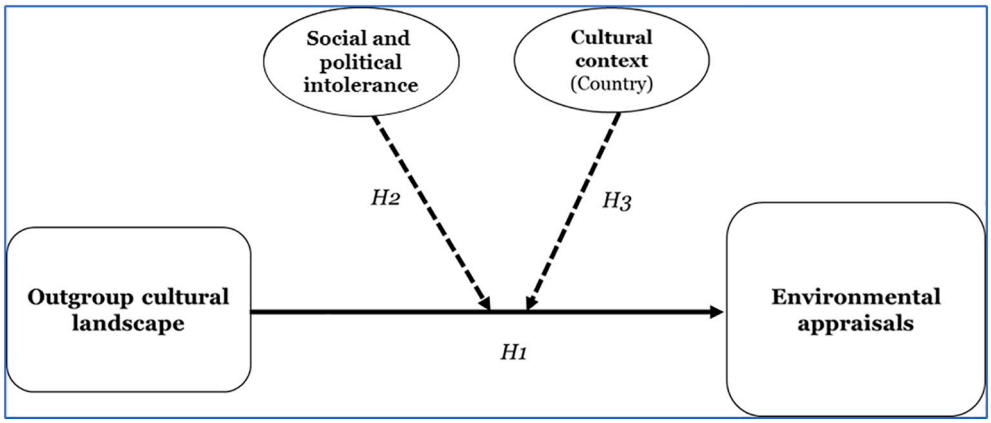


Fig. 1. Hypotheses of the study.

the image was highlighted whenever hovered over by the mouse. Once highlighted, participants could click on the image and move to the next image. The walking route (i.e., the simulated environment) from the bus stop to the lecture hall was constructed of 11 images. The simulated environments in both conditions were identical except for three environmental elements (Fig. 2). The last image was a photo from inside the auditorium, indicating that the route was completed.

2.2. Design of the environment

Sketchup Pro software was used to develop the three-dimensional (3D) models of the two urban environments randomly assigned to participants (the Muslim environment and the control). Both settings were identical except for three urban elements replaced in the Muslim environment (Fig. 2). First, a café with an Arab-looking oriental design and elements replaced a more neutral-looking café (Fig. 2, image set 4). Second, a mosque was embedded in the environment, replacing a large public building that appeared in the control condition (Fig. 2, image set 7). Third, Islamic stars and crescent symbols were embedded in a poster that advertised a lecture on Islam instead of a neutral poster in the control condition (Fig. 2, image set 10). We extracted 11 images representing the walking route (described in the Participants and procedure section) for each of the routes. The treatment is coded as 1 for the Muslim setting and 0 for the control.

The urban 3D model was planned to increase ecological validity based on an existing network of streets, preserving the proportion, connectivity level, road and sidewalk widths, and general building lines. The model represents a spatial environment with a radius of 1 km to represent a walking route in a city with an urban background on the horizon. The navigation route presented a walking sequence of about 350 m. After designing the basic models, the models were revised according to the comments from teams of locals from each of the three countries participating in the experiment. Social characteristics, such as local monument buildings, symbols, signs, advertisements, and vegetation, were reduced to reuse the same model in the three European settings. Indeed, the ratings of perceived realism of the simulated environment did not differ by country and were near the middle of the scale in all three contexts (Table 1).

Table 1
Descriptive statistics (independent variables) by country.

Variable	Total sample	Germany	France	Netherlands
Age				
Under 20 yrs (%)	49.6	2.1	93.4	45.5
Over 20 yrs (%)	50.4	97.1	6.6	54.5
Gender				
Male (%)	34.1	24.3	33.9	52.8
Female (%)	65.2	75.1	65.0	47.2
Other (%)	0.7	0.6	1.1	0.0
Political intolerance	4.17	4.71	3.67	4.24
Social intolerance	0.243	0.37	0.17	0.18
Realism of experience	2.52	2.59	2.41	2.61

Note. Table entries are frequencies (age and gender) and means (intolerance and realism).

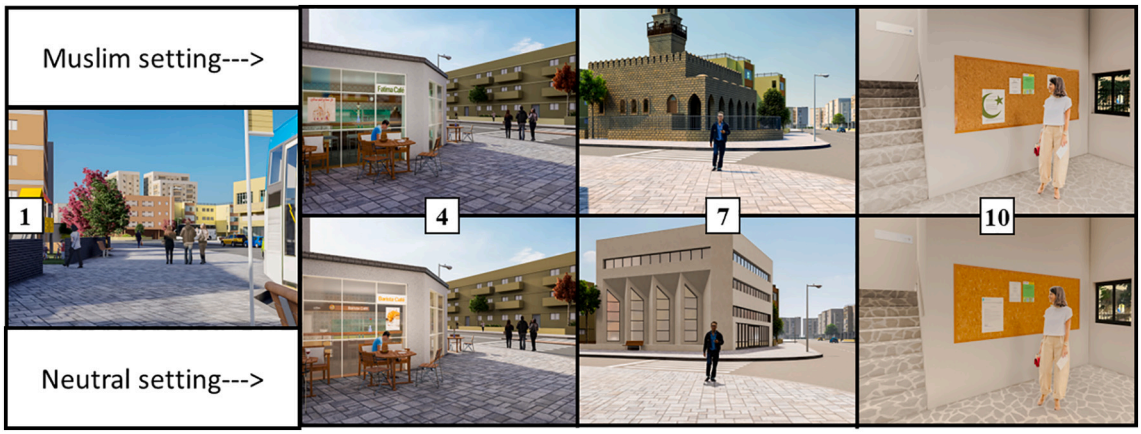


Fig. 2. Simulated routes.
Note. Upper images are from the Muslim route/setting; lower images are from the religiosly-neutral route/setting. Numbers represent the image display order. Image 1 is the first image of the route near the bus stop on both routes. Images 4 (café), 7 (public building), and 10 (poster) were different on each route.

3. Measures

3.1. Outcome measures

Environmental appraisals were measured using the following four scales:

Place Attachment. we used a scale of three items (Kyle, Graefe & Manning, 2005): "I identified with the area," "I felt I belonged to the area," and "I felt I belonged to the people who live in this area" (overall scale reliability alpha = 0.82, France = 0.76, Germany = 0.82, and Netherlands = 0.90), each rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Perceived Restorativeness Scale (PRS), short version (Berto, 2005). It was included in the Dutch and French samples, comprising four items: "This place lets me forget my everyday responsibilities, feel relaxed, and lose myself in my own thoughts," "This was a fascinating place that can keep my curiosity alive and stop me from getting bored," "This was a place where activities and things are orderly and well organized," and "I felt comfortable here as it was easy to find your way around this place," measured on the same 5-point Likert scale (overall scale reliability alpha = 0.70, France = 0.71, and Netherlands = 0.70).

Interestingness, comprised two items (interesting and monotonous) (see Karmanov & Hamel, 2008) and rated on the same 5-point Likert scale, with the monotonous item reversed (overall scale reliability alpha = 0.69, France = 0.70, Germany = 0.67, and Netherlands = 0.61).

Finally, the perceived length of the walk was also rated on a 5-point Likert scale (1 = very short to 5 = very long).

3.2. Moderators and controls

3.2.1. Social intolerance toward Muslims

We adjusted a measure from the European Social Survey (e.g., ESS7) where participants were asked to what extent they would "feel uncomfortable if a close family member married a person" from six different backgrounds: Sub-Saharan African, North African, Western European, Christian, Jewish, and Muslim, rated from 1 (not at all) to 10 (very uncomfortable). We then computed the deviance of the responses for the Muslim background from the average responses for all other backgrounds. This deviance yielded a scale ranging from −9 to +9, with higher values indicating higher Muslim-oriented social intolerance.

3.2.2. Political intolerance toward Muslims

This measure was calculated using the scales in the annual reports on racism from the National Commission for Human Rights (see CNCDH, 2021), asking whether three customs (wearing a headscarf, wearing a full-face veil, and prohibiting images of the Prophet Muhammad) can be a problem for living in a national society. Each item was measured on a 10-point scale from 1, indicating not problematic at all, to 10, indicating very problematic, with an overall scale reliability alpha of 0.65 (France = 0.72, Germany = 0.58, and Netherlands = 0.61).

A measure of realism of the walk was also determined, comprising three items (on a 5-point scale from strongly disagree to strongly agree) based on the work by Hartmann et al., 2016: "When I looked at the pictures I felt that I was right there in the environment itself," "It seemed like I was actually walking to the lecture," and "I felt like I was physically present in the environment" (overall scale reliability alpha = 0.84, France = 0.81, Germany = 0.89, and Netherlands = 0.82). Additional controls included age, collected as a dummy variable, where 1 indicates younger than 20, and 0 denotes older than 20. The German sample collected the age in years but subsequently recoded as a binary. Other controls included gender (male, female, other).

4. Results

4.1. Descriptive statistics: independent variables

The data were analyzed using Stata 16. Table 1 displays the socio-demographics and descriptive statistics. The sample had a higher share of females, except for Dutch respondents, who were balanced in gender. The three national samples differed in terms of age, with the German sample comprising older participants (M = 34.4, SD = 13.47, age range 18–77, n = 333), the French sample primarily comprising participants from 18 to 20, and the Dutch sample balanced between those 18–20 years old and those over 20.

The t-tests confirmed that social and political intolerance did not vary between the Muslim and control environments (p = .48 and p = .44, respectively). Still, social intolerance varied between countries, as it was significantly higher for German participants than for the rest of the sample (analysis of variance [ANOVA] $p < .05$). As illustrated by a post-hoc Bonferroni comparison test, social intolerance was higher for Germans than for the French (p = .006) and Dutch participants at the 10 % significance level (p = .058). Political intolerance also varied between countries. A one-way ANOVA test followed by a post-hoc Bonferroni comparison test revealed that political intolerance was highest for Germans ($p < .005$) and lowest for the French participants ($p < .005$).

4.2. Hypotheses 1 and 2

To test H1, we conducted t-tests comparing environmental appraisals in the two conditions. Table 2 reveals that the Muslim environment was associated with more positive environmental perceptions than the religiously-neutral setting. However, only differences in interestingness were statistically significant. These results were mirrored using the multiple linear regression, including the environmental condition (Muslim vs. control) and controlling for age, gender, country, and perceived realism of the environment (presented as supplementary materials, Table A1). The regressions indicate that, despite consistently positive coefficients indicating a tendency in the sample for more favorable environmental appraisals in the Muslim environment, only interestingness ratings exhibited a statistically significant difference between the two conditions ($p < .000$). In contrast, the Muslim setting dummy was not statistically significant in the place attachment (p = .766), PRS (p = .662), and perceived walk length (p = .899) models. Hence, H1 was partially confirmed for interestingness but not for place attachment, PRS, and perceived walk length.

In testing H2 concerning the moderating effect of social (Table 3) and political (Table 4) intolerance, we added social and political intolerance and their interactions with the Muslim condition to the linear regression. Table 3 reveals that social intolerance significantly moderated the effect of the Muslim environment on the perceptions of place attachment (p = .014), PRS (p = .022), interestingness (p = .004), and increased the perceived walk length (p = .071) at 10 % statistical significance level.

To facilitate interpretation, Fig. 3 presents the predicted effect of the Muslim environment on the predicted levels of each of the four dependent variables (on the y-axis, each in a separate graph) for varying levels of social intolerance (on the x-axis, ranging from −2.8 to 6.2). The red line represents a coefficient of 0 for the effect of the Muslim setting, such that values with 95 % confidence intervals above the zero line indicate a positive effect on the Muslim environment, and values with 95 % confidence intervals below the zero line indicate a negative effect.

The pattern of the coefficients indicates that, as social intolerance increases, the effect of exposure to a Muslim setting compared to a religiously-neutral setting on environmental appraisal changes from a positive to a negative tendency. Specifically, for participants with lower levels of social intolerance, exposure to the Muslim condition is associated with increased place attachment, PRS ratings, interestingness and a shorter walk perception compared to the control. However, this trend flips signs at about 0.17 in social intolerance for place attachment, PRS,

Table 2
Descriptive statistics and statistical tests on dependent variables (H1).

	n		Means				t-Test	
	Muslim setting	Control setting	Muslim setting	Control setting	Difference Muslim-Control setting	St Err	Test value	p value
Place attachment	443	454	2.73	2.679	0.052	0.064	−0.8	0.418
PRS	276	287	3.179	3.083	0.096	0.069	−1.4	0.163
Interestingness	443	454	3.111	2.511	0.6	0.062	−9.65	< 0.001
	n		%				Chi-square	
	Muslim setting	Control setting	Muslim setting	Control setting	Difference Muslim-Control setting	St Err	Test value	p value
Perceived length of walk	442	454					1.87	0.760
Very short	44	47	9.7	10.6	−0.9			
Short	329	316	72.5	71.5	1			
Neither short nor long	78	73	17.2	16.5	0.7			
Long	3	5	0.7	1.13	−0.6			
Very long	0	1	0	0.2	−0.2			

Table 3
Interaction of social intolerance and Muslim setting: multiple linear regressions (H2).

Social intolerance	Sense of place scale	PRS	Interestingness scale	Perceived length of walk
Muslim setting	0.0191	0.0622	0.597**	−0.0204
	(0.0573)	(0.0663)	(0.0628)	(0.0385)
Social intolerance	−0.00507	−0.0112	0.0262	−0.00128
	(0.0410)	(0.0615)	(0.0449)	(0.0276)
Muslim setting * Social intolerance	−0.155*	−0.197*	−0.198**	0.0765
	(0.0628)	(0.0854)	(0.0688)	(0.0423)
Age (young)	−0.0304	−0.238*	−0.157	0.00153
	(0.0959)	(0.0962)	(0.105)	(0.0645)
Male	0.0336	0.146*	−0.0316	0.0662
	(0.0598)	(0.0674)	(0.0656)	(0.0402)
Other gender	0.245	0.193	−0.0420	0.0214
	(0.337)	(0.383)	(0.369)	(0.227)
France[a]	−0.812**		−0.440**	0.0471
	(0.108)		(0.118)	(0.0724)
Netherlands[a]	−0.354**	0.115	−0.126	0.202**
	(0.0884)	(0.0845)	(0.0968)	(0.0595)
Realism experience	0.333**	0.293**	0.219**	0.0507**
	(0.0286)	(0.0338)	(0.0313)	(0.0192)
Constant	2.283**	2.326**	2.289**	1.856**
	(0.135)	(0.102)	(0.147)	(0.0905)
Observations	884	549	884	886
R-squared	0.281	0.165	0.178	0.033

Notes: Standard errors in parentheses.
** $p < .01$.
* $p < .05$.
[a] Reference category is Germany except for PRS model where reference category is France.

and perceived walk length and at 3.17 in social intolerance for interestingness. Exposure to the Muslim condition is associated with decreased place attachment, PRS ratings, interestingness and a longer walk perception for participants with higher social intolerance levels compared to the control.

Political intolerance significantly moderated the effect of the Muslim setting on place attachment ($p = .044$) but not PRS ($p = .136$), interestingness ($p = .322$), and perceived walk length ($p = .426$; Table 4). Fig. 4 depicts the interactive effect on place attachment.

The pattern in Fig. 4 replicates the findings depicted in Fig. 3. As illustrated in the graph, exposure to a Muslim environment has a positive and marginally significant effect on place attachment in low levels of political intolerance. However, this positive effect reverses for a political intolerance level of 4 (on a 1 to 10 scale) and becomes negative and statistically significant as political intolerance increases.

Table 4
Interaction of political intolerance and Muslim setting: multiple linear regression (H2).

Political intolerance	Place attachment	PRS	Interestingness	Perceived walk length
Muslim setting	0.250*	0.222	0.668**	−0.0651
	(0.124)	(0.145)	(0.136)	(0.0836)
Social intolerance	−0.00387	0.00448	−0.0196	−0.0136
	(0.0189)	(0.0241)	(0.0208)	(0.0128)
Muslim setting * Social intolerance	−0.0644*	−0.0498	−0.0287	0.0142
	(0.0263)	(0.0334)	(0.0290)	(0.0178)
Age (young)	−0.0213	−0.251**	−0.157	0.0213
	(0.0952)	(0.0960)	(0.105)	(0.0644)
Male	0.0302	0.156*	−0.0389	0.0582
	(0.0603)	(0.0688)	(0.0663)	(0.0408)
Other gender	0.316	0.235	−0.0201	0.00459
	(0.338)	(0.388)	(0.372)	(0.229)
France[a]	−0.824**		−0.466**	0.0539
	(0.107)		(0.118)	(0.0725)
Netherlands[a]	−0.358**	0.130	−0.138	0.201**
	(0.0882)	(0.0848)	(0.0970)	(0.0597)
Realism experience	0.328**	0.287**	0.219**	0.0512**
	(0.0286)	(0.0341)	(0.0314)	(0.0193)
Constant	2.315**	2.312**	2.397**	1.906**
	(0.159)	(0.139)	(0.174)	(0.107)
Observations	885	550	885	887
R-squared	0.282	0.153	0.175	0.028

Notes: Standard errors in parentheses.
** $p < .01$.
* $p < .05$.
[a] Reference category is Germany, except for the PRS model, where the reference category is France.

4.3. Country moderation

To test H3, we included three-way interactions between the country, Muslim condition, and intolerance (social and political and each separately) in the models. The only two significant three-way interactions were detected at the 10 % level. These were perceived walk length (interaction between the Muslim setting and social intolerance affecting the perceived walk length was stronger for the German sample than the French sample, $p = .055$) and the PRS scores (interaction between the Muslim setting and political intolerance was stronger for French sample than the Dutch sample, $p = .075$). Overall, we did not detect systematic differences between countries in the effect of social and political intolerance on environmental appraisals in the Muslim setting. The full results are presented in the supplementary material (Tables A2 and A3).

5. Discussion and conclusions

This study examined the effect on environmental experiences of

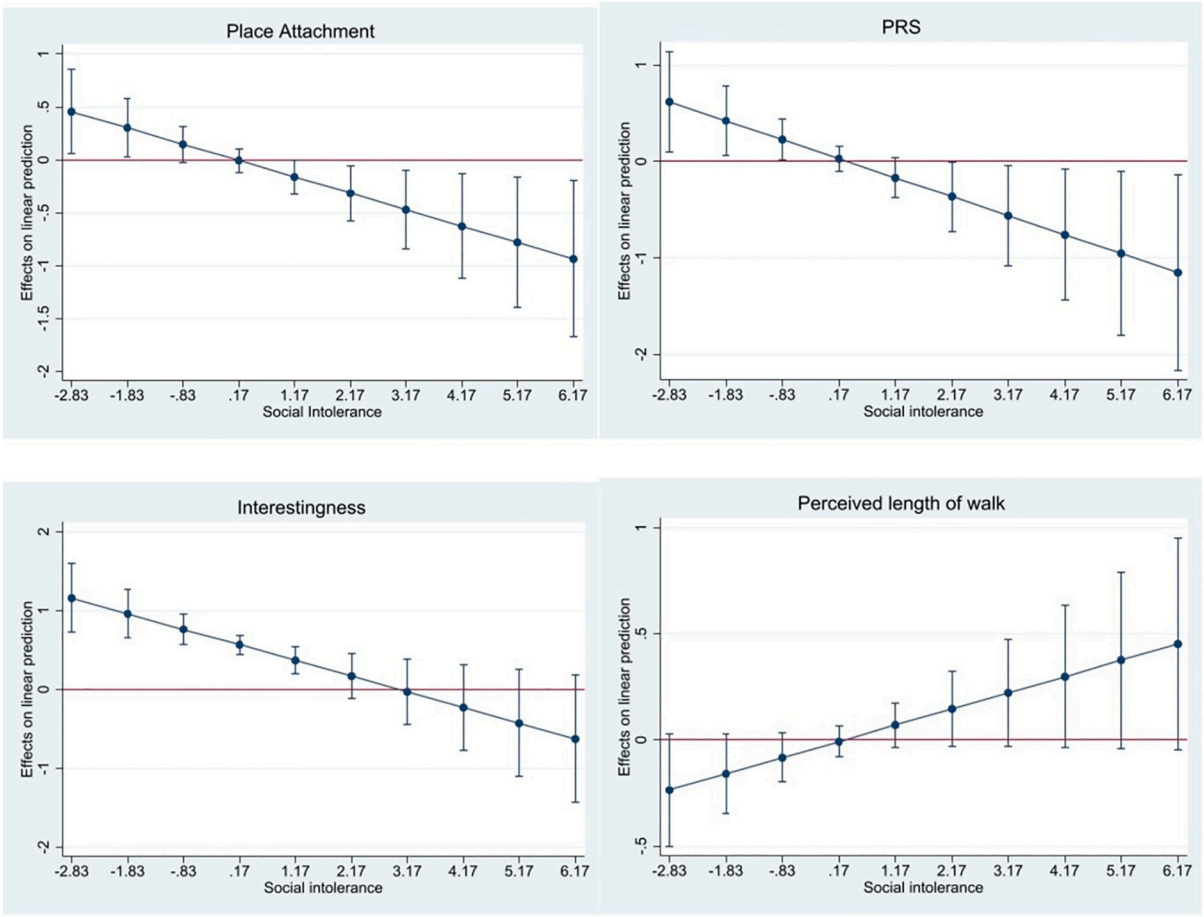


Fig. 3. Social intolerance effect on environmental appraisals.
Note. Graphs include predictive margins with 95 % confidence intervals.

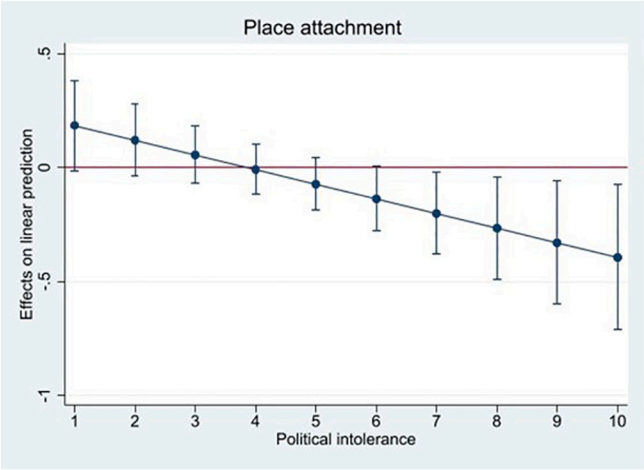


Fig. 4. Political intolerance effect on place attachment.
Note. Graph includes predictive margins with 95 % confidence intervals.

cultural landscapes conveying symbols of the outgroup, especially the contested Islamic culture. First, the results indicate that environmental appraisals in Muslim cultural and religiously-neutral urban landscapes are comparable, with the former exhibiting better ratings in interestingness but not in the three other measures of environmental appraisal. The finding that the environment with outgroup cultural cues is regarded as more interesting and not more negatively than a religiously-neutral environment for the remaining measures aligns with previous research on the positive effects of historical and cultural elements on the environmental experience (Weber & Trojan, 2018). Overall, these findings reveal important implications for cultural integration efforts currently taking place in European cities and beyond (e.g., the newly published European Commission's Anti-Racism Action Plan 2020–2025, European Commission, 2021).

Although previous researchers have examined appraisals in ingroup cultural environments, we demonstrated that outgroup environments, including one of the most stigmatized in Europe (e.g., Muslim), can trigger more positive environmental appraisal, which is a novel finding. The higher ratings of interestingness in the setting with Muslim cues can be explained by the fact that the tangible elements of the cultural landscape, such as the mosque, might have given the environment more complexity and triggered curiosity (Bornioli & Subiza-Pérez, 2023). However, the Muslim environment was not associated with higher ratings of place attachment or restorativeness, suggesting that the Muslim setting captures attention and is engaging but does not induce a sense of belonging and calmness.

In relation to H2, we found that personal proclivities, particularly intolerance, moderate the appraisals of Muslim cultural landscapes. For individuals with higher intolerance toward Islam, exposure to an environment with Muslim cues resulted in less favorable environmental appraisals than in a religiously-neutral environment (H2). Furthermore, only minor differences between countries in the moderating effect of social and political intolerance were identified (H3), indicating that these trends are common in different sociopolitical settings.

This finding is in line with Social Identity Theory because, for some individuals, the visibility of outgroup cues (Tajfel, 1974) may threaten

group identity and trigger negative experiences (Walker & Ryan, 2008). Therapeutic landscape theories also posit that the therapeutic potential of environments depends on subjective experiences and that the same setting might be therapeutic for some and harmful for others (Gesler, 1992). Hence, although previous research has indicated that exposure to ingroup cultural landscapes can stimulate place attachment (Bornioli et al., 2018), the findings indicate that mechanisms are more complex in outgroup environments.

Cultural cues exhibited positive perceptions only when levels of social intolerance were low. Social intolerance also affected the perception of the route length in the Muslim setting. Highly tolerant participants perceived the route as shorter, whereas highly intolerant individuals perceived the route length as longer by almost one scale point on a 5-point scale. This finding aligns with construal level theory (Trope & Liberman, 2010), positing that aspects perceived as more psychologically distant are also perceived as more physically distant. This finding has implications for walkability research and practice. Interesting features also generally contribute to and walking intentions (e.g., Bornioli et al., 2019). In contrast, perceived barriers and unfamiliarity might lead to the overestimation of distances (Ralph et al., 2020), making some individuals potentially reluctant to walk routes with nonendemic elements.

Overall, the finding that the effect of Muslim elements in the environment depends on individual-level tolerance settles the conflicting views from studies based, on one hand, on therapeutic landscape theories and restorative environments research and, on the other hand, those based on the social identity paradigm. The former view expects a positive effect for such a cultural landscape, as it increases distinctiveness and interestingness. In contrast, the latter expects a negative effect because such outgroup cues can be threatening and raise concerns about defending the majority cultural identity. These findings suggest that a cultural landscape including outgroup culture can have either positive or negative effects depending on individual-level proclivities.

Finally, social intolerance was a much more robust moderator of the effect of the Muslim cultural landscape than political intolerance. We attribute this difference to the more emotional and inter-relational nature of social intolerance. Thus, the preference for social distance from Muslims captured by the social intolerance measures translates to an uncomfortable feeling in a Muslim setting. In contrast, views on religious freedom for minorities captured by the political intolerance measures may indicate a more principled, abstract-level attitude.

Some limitations must be acknowledged. First, the manipulation in this study was carefully crafted by an architectural and a graphic designer who created a full 3D model to supply a rich simulated environment. However, its external validity is potentially limited, as nonvisual elements, such as acoustic and olfactory features, could be important for experiences in cultural landscapes. The visual simulation might also have influenced the results related to H1, as manipulation checks emphasized that the Muslim environment was perceived as slightly more realistic than the control. Accordingly, the models controlled for perceived realism; yet, future studies might extend this research study to a real-world scenario to avoid biases related to the realism of computer simulations.

Second, analyses are based on convenience samples of volunteers with a mix of students and adults rather than on representative samples. The French sample especially comprised a specific population of students who were more well-off than average, leaning more left-wing and possibly more inclined to tolerance. The German sample was relatively older than the rest. These differences may have affected the results related to H3; hence, further country comparisons, also based on more class and age diversity, are warranted. However, the sample size was large and included views from different European countries, providing a good indication of the robustness of the trends. Third, relatively short scales were used to measure the respondents' environmental appraisals, whereas full versions of the scales might have been preferable and could be used in future studies.

This study also suggests further interdisciplinary research avenues. This study focused on European adults' perceptions of environments with Muslim cues; however, also some other cultural settings might be perceived negatively by outgroups for historical and cultural reasons. Future research should explore the perceptions of other types of cultural environments and contested heritage sites, such as colonial or nationalist heritages. There is a growing phenomenon of murals, statues, and other elements in the public space being removed by groups that deem them offensive, emphasizing the subjective experience of the environment. Scholars are also encouraged to explore wellbeing exposure outcomes in cultural landscapes for both ingroups and outgroups, including physiological and psychological measurements of stress and anxiety. While we explored the effects of social and political intolerance on immediate reactions and experiences, future research is needed to assess how long-term exposure to outgroup environments can affect wellbeing and perceptions in the medium and long term.

Overall, the findings contribute to restorative environments research on the top-down psychological constructs (e.g., personal characteristics) that likely play a role in environmental and restorative experiences. Diverse people might experience cultural environments differently, and the novel finding was that intolerance generates opposite environmental appraisals in cultural landscapes in terms of place attachment, perceived restoration, and interestingness, and influences perceptions of route length. Previous work demonstrated that iconic design elements could increase the perceived restorative potential of environments (Liu et al., 2020); however, we identified traits that can hinder these mechanisms. These findings offer an alternative view to the widely shared idea that the visibility of Muslim symbols in the public space has negative effects, such as making people uncomfortable, creating a feeling of estrangement in one's country, or invoking hostility or disturbance, and should be suppressed. In fact, the results suggest that seeing Muslim symbols can increase perceptions of interestingness.

In terms of policy implications, these findings highlight the importance of encouraging intergroup tolerance, including for the everyday urban experience and individual-level wellbeing. Under social and political intolerance, the immediate environmental experiences of cultural and diverse urban environments may be suboptimal. Previous research suggests that individual factors such as ideology and tolerance are more important predictors of support for mosque visibility than their urban location (Schaffner, 2013). Therefore, and in line with our findings, targeting and reducing intolerance should remain a priority for policymakers to improve experiences of the urban cultural landscape and their potential wellbeing outcomes. Urban planning and landscape policies play a crucial role in fostering social tolerance by enabling positive interactions with minority groups in public spaces. Additionally, cities should consider facilitating educational campaigns aimed at reducing prejudice (Cheikh Husain, 2020; Gravelle, 2021).

Funding

The research was conducted with the support of DAAD Center for German Studies, European Forum at the Hebrew University of Jerusalem, granted to Pazit Ben-Nun Bloom and Jolanda van der Noll; by the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (Grant agreement No. 804031) granted to Pazit Ben-Nun Bloom; and by the Israel Science foundation (grant agreement No. 877/22) granted to Amit Birenboim.

CRediT authorship contribution statement

Anna Bornioli: Methodology, Formal analysis, Investigating, Writing - Original draft preparation, Writing - Review & Editing. Amit Birenboim: Conceptualization, Methodology, Resources, Data curation, Writing - Original draft preparation, Writing - Review & Editing, Supervision. Elodie Druez: Investigation, Methodology, Writing - Review & Editing. Orni Livny: Investigation, Methodology, Resources, Writing -

Review & Editing. Jolanda van der Noll: Investigation, Methodology, Resources, Funding acquisition, Writing - Review & Editing. Nonna Mayer: Investigation, Methodology, Resources, Writing - Review & Editing. Pazit Ben-Nun Bloom: Conceptualization, Methodology, Resources, Funding acquisition, Formal analysis, Writing - Original draft preparation, Writing - Review & Editing, Supervision

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.cities.2023.104579.

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