Immersive study of Gestalt variables in uncanny geographies.

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2023

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ABSTRACT

We conducted two preliminary studies to test the hypothesis that 'haunted, sacred, or enchanted' spaces are characterized by certain environmental Gestalt variables that define their space syntax or architectural phenomenology and thus help to consciously or non-consciously shape people's associated impressions or perceptions. Study 1 involved the development of a pilot Visitor Experience Questionnaire (VEQ: 18 items) to quantify Gestalt effects. Factor analysis revealed a four-factor solution defined by a setting's capacity for Affordance, Ambiguity, Presence, and Sentimentality. Study 2 used this new tool with three participants exhibiting disparate encounter-proneness, who participated in an immersive experience at a 'haunted' historic house museum. The experimentally-blinded participants spent 10 minutes alone in nine different rooms and then completed the VEQ and the Survey of Strange Events (SSE) measure of subjective and objective ghostly anomalies. Results showed that the participants' anomalous experiences had good levels of congruency across their contents and locations of occurrence. Further, Gestalt ratings significantly correlated with both the participants' SSE reporting patterns and independent 'hauntedness' ratings of the test rooms based on prior witness accounts. These findings support the idea that altered-anomalous experiences in enchanted (i.e., sacred or haunted) spaces represent an interactionist phenomenon that is partly mediated or moderated by principles of environmental psychology.

> *The uncanny arises out of the supposedly and necessarily empty character of the supernatural as a category; it is not so much that the uncanny fills this category (with ghosts, revenants etc.) – though it may do this readily enough – as that it suggests a fundamental indecision, an obscurity or uncertainty, at the heart of our ontology, our sense of time, place, and history, both personal and cultural.* (Collins & Jervis, 2008, p. 2)

Introduction

Uncanny geographies is our adopted moniker for localized areas and settings associated with high-strangeness, or what social scientists sometimes refer to as 'sacred, haunted, or enchanted spaces' that often fuel exceptional human experiences (Bermudez, 2015; Dagnall et al., 2020; Puhle & Parker, 2021). Marinelli and Ricatti (2003) arguably introduced the term in their discussion of "emotional geographies of the uncanny" (p. 5), which referenced emotional spaces where the inhabitants' perceptions, memories, narratives, and identities had both familiar and unfamiliar elements. Other authors have since knowingly or unwittingly used variations of the phrase, including "uncanny landscapes" (Griffiths & Thurgill, 2013), "the urban uncanny" (Huskinson, 2016), "domestic uncanny" (Kaika, 2004), "uncanny modernity" (Collins & Jervis, 2008), "the uncanny place" (Smith & Ironside, 2022), "phenomenology of the uncanny"

(Trigg, 2012), "uncanny atmospheres" (Fuchs, 2019; Hitchen, 2021), and "monumental space and the uncanny" (Hook, 2005).

These latter descriptions have been applied primarily to studies of empathetic place attachment, identity, or embodiment. Such work, by virtue of its theoretical and conceptual focus, often resists quantification. Our approach, in contrast, focuses on the attributes of settings that can alter consciousness in marked ways. Thus, understanding uncanny geographies can inform dominant concepts in environmental psychology, such as situational-enchantment, numinism, wayfinding, spontaneous fantasies, sense of place, and neuroarchitecture (e.g., Banaei et al., 2017; Bermudez, 2015; Drinkwater et al., 2022; Franchetto, 2020; Franz, 2021; Goldhagen, 2017; Holloway, 2010; Houran, 2022; Lidov, 2006; Lovell & Griffin, 2022; Lovell & Thurgill, 2021; Mazloomi et al., 2014; Peng et al., 2020; Petersen, 2017; Skandali & Blundell, 2021; van Elk et al., 2016; Wang et al., 2022; Wells, 2017; Wells & Baldwin, 2012).

Prime illustrations of the above issues include 'haunted houses or hauntings,' which are popular cultural constructions inherently linked to paranormal tourism and heritage psychology (Hanks, 2016; Holloway, 2010; Houran et al., 2020; Pirok, 2022). To clarify, these reported occurrences involve locations where people report clusters of unusual psychological or *subjective* experiences (*S*, e.g., apparitions, sensed presences, hearing voices, and unusual somatic or emotional manifestations) and physical or *objective* events (*O*, e.g., apparent object movements, malfunctioning electrical or mechanical equipment, and inexplicable percussive sounds like raps or knocks) (for a review, see Houran & Lange, 2001a). It is also important to understand that the S/O anomalies characterizing haunt episodes and poltergeist-like outbreaks collectively form a probabilistic and unidimensional hierarchy (Houran, Lange et al., 2019). In other words, percipients typically report a predictable sequence or stacking of different ghostly 'signs or symptoms.' This observation suggests the existence of a core 'encounter' phenomenon that manifests to particular people under certain conditions and thus can be modelled as a biomedical syndrome (Laythe, Houran, Dagnall et al., 2021; Laythe et al., 2022).

However, recent reviews (Dagnall et al., 2020; Houran et al., 2020; Jawer et al., 2020) reveal that both parapsychologists and mainstream researchers have rarely applied principles of environmental psychology to fieldwork studies of uncanny geographies, and notably settings that are presumably haunted or otherwise sacred. This is unfortunate, as studies increasingly suggest that ghostly episodes are an interactionist phenomenon (Ironside & Wooffitt, 2022), involving the "right people in the right settings" (Laythe et al., 2018, p. 210). Speaking to this idea, research consistently indicates that anomalous experiences in haunt-related contexts correlate with thin mental boundary functioning (Houran, Kumar et al., 2002; Houran, Wiseman et al., 2002; Laythe et al., 2018; Ventola et al., 2019), i.e., the concept of heightened sensitivities to internal and external stimuli (Evans et al., 2019; Lange, Houran et al., 2019; Thalbourne & Maltby, 2008). These findings likewise agree with Jelic et al.'s (2016) systems theory (or

bidirectional person–environment processes) approach to understanding people's experiences of natural and built environments.

Much literature indeed suggests that at least six Gestalt variables help to shape people's perceptions of settings or spaces (Jawer et al., 2020), namely: (a) *Affordance* ("a possibility for action" provided by the environment or the degree of interaction between the surrounding space and the visitor), (b) *Ambiguity–Threat Processes* (a "risk assessment" in terms of a visitor's feelings of comfort or discomfort within the surrounding space), (c) *Atmosphere* (the overall "tone and impact" of the surrounding space to the visitor), (d) *Immersion–Presence* (the extent to which the visitor feels physically present within—and totally focused on— the surrounding space), (e) *Legibility* (the ease with which the surrounding space can be recognized, organized into a pattern, and then recalled—specifically related to clear/unobstructed views and protective places to hide), and (f) *Memory-Associations* (surrounding space contains colours, symbols, textures, objects, sounds, odours, or a sense of 'time' with personal meaning to the visitor). Hence, this study might be the first comparative analysis of Gestalt effects on visitors' perceptions in a reputedly haunted house.

Study 1: Development of a Visitor Experience Questionnaire (VE Q)

We found only a few instruments in the literature pertinent to embodied cognition or sense of place, i.e., the perception, bonding, or attachment that a person has towards a specific environment (for a review and discussion of frameworks and tools, see Boley et al., 2021; Raymond et al., 2010; Shamai & Ilatov, 2005). Moreover, Grassini and Laumann's (2020) systematic review identified several questionnaires that purportedly gauge an individual's degree of mindfulness within simulated environments, with Witmer and Singer's (1998) Presence Questionnaire being the most prevalent. Other approaches address psychological connection to 'nature' (Kleespies et al., 2021; Pramova et al., 2022), or comprise coding systems for people's perceptions of important features that characterize personal living spaces (Gosling et al., 2005a, 2005b), sacred architecture (Bermudez, 2015; Jones, 2000), memorable tourism experiences (Hosany et al., 2022; Lange et al., 2022), biophilic design (Browning et al., 2014; Zare et al., 2021), or the flow patterns of *feng shui* (Bonaiuto et al., 2010; Kryżanowski, 2021). Moreover, some inventories specifically focus on transformational ideations or perceptions that consistently manifest to visitors within certain natural or built environments. These include the state of 'enchantment' (Houran, Lange et al., 2022) and the experience of 'frisson,' i.e., transcendent psychophysiological moments when listening to music (Harrison & Loui, 2014).

Beyond that, there is growing research on Hillier and Hanson's (1984) larger concept of 'space syntax'. This theory originated to present a reliable method to evaluate the syntactic properties of different spatial configurations of large-scale environments and understand how these can impact a range of human behaviours. These aspects include (a) *integration*, or how easy it is to reach a

certain street segment from any part of the city; (b) *connectivity*, or the number of intersections a street segment has; and (c) *intelligibility*, or the legibility of a neighborhood or a city. These three measures—tangential to the six Gestalt variables noted earlier—have been widely used to objectively model group- or societal-level behaviours within cross-cultural contexts (e.g., Askarizad & Safari, 2020; Lee & Seo, 2013; Long et al., 2007; Summers & Johnson, 2017; Zerouati & Bellal, 2020). Of course, the psychological mood or character of spaces has also been studied and discussed within contexts oriented more to interpersonal intimacy comfort, and leisure (see, e.g., Appleton, 1975; Eliovson, 1978; Reznikoff, 1983; Silverman, 2019).

The lack of suitable measurement approaches for our purposes required the creation of a brief measure of Gestalt variables that could be administered easily in fieldwork studies of person-level perceptions of natural and built environments. Drawing on the initial ideas and recommendations from Jawer et al.'s (2020, Table 2, pp. 82–83) scoping review, we drafted, discussed, and finalized three items for each of the six Gestalt variables mentioned in the introduction, i.e., Affordance, Ambiguity and Threat Processes, Atmosphere, Immersion and Presence, Legibility, and Memory and Associations. This set of 18 items was worded as statements to be rated on four-point Likert scales anchored by Strongly Disagree (1) and Strongly Agree (4). Total raw scores thus range from 18 to 72, with higher scores indicating increased perception of the respective environmental influences. We also included a global rating of a visitor's experience (i.e., Overall Vibe)—"Your first impression of this surrounding space/area/room:" Very Good Vibes (5), Good Vibes (4), No Vibes (3), Bad Vibes (2), or Very Bad Vibes (1). Appendix B gives the full questionnaire, for which we conducted an initial psychometric analysis, as detailed below.

Method

Participants

Pilot data derived was from a convenience sample of 40 respondents (age range 18–69 years; 61% women) recruited from the general population via social media advertisements. The original sample consisted of 96 individuals who registered for a larger research project that explored putative psi functioning at a reputedly haunted house, but, unfortunately, we experienced a high attrition rate for unknown reasons. For instance, volunteers might have decided against participating either because the sessions ran on a weekend, or the test site was located in a distant, rural area. Others perhaps reconsidered participating due to their fear of the paranormal (see Silva & Woody, 2022). Larger sample sizes are obviously preferable for psychometric studies of pilot measures, but some authors have argued that n values as low as 30 are acceptable for computing Cronbach alpha coefficients for internal reliability (Bujang et al., 2018) or conducting Rasch analyses to explore the scaling properties of questionnaire items (Wright & Douglas, 1975).

Measures

In addition to basic demographic questions and the VEQ measure, we administered the 17-item ('true/false') Revised Transliminality Scale (RTS: Lange, Thalbourne et al., 2000; see also Houran et al., 2003). Transliminality denotes a "hypersensitivity to psychological material originating in (a) the unconscious, and/or (b) the external environment" (Thalbourne & Maltby, 2008, p. 1618). This perceptual–personality variable thus parallels both Hartmann's (1991) mental boundary construct and the concept of sensory-processing sensitivity (Aron & Aron, 1997). The Rasch reliability of the instrument is 0.82, and RTS scores (M = 25, SD = 5) consistently predict different syncretic cognitions, somatization and hypochondriacal tendencies, and lower psychophysiological thresholds (for overviews, see Evans et al., 2019; Houran et al., 2006; Lange, Houran et al., 2019). Thus, we expected that Transliminality would correlate positively with people's sensitivity to the Gestalt variables in their immediate space.

Procedure

The respondents visited a three-level historic house museum known as 'The Whispers Estate'.[1] This privately owned, Victorian-era residence (non-occupied) is a popular tourism site due to its folklore and enduring reputation for being haunted (Laythe & Houran, 2019, pp. 214–216). The earliest discovered records indicate that the house was built in 1894, and its current external condition could be described as 'poor' and its internal condition as 'fair.' We rented the site for both Studies 1 and 2, so that the procedures described in this report were closed to the public and conducted under more highly controlled conditions.

Our pilot sample (segmented into smaller groups of about eight people) was asked to spend approximately 10 minutes in the dining room of the house collectively and then complete a paper-and-pencil version of the VEQ, along with (a) basic demographic variables, and (b) several rating scales used in previous research protocols (see Houran, Wiseman, & Thalbourne, 2002) to gauge participants' *Prior Exposure* ["Have you heard (e.g., from friends, television programs, or websites), where in the Whispers Estate people have reported unusual experiences?": Definitely Yes, Probably Yes, Uncertain, Probably No, Definitely No) and *Present Expectation* ("Do you expect to have any unusual experiences in The Whispers today?": Definitely Yes, Probably Yes, Uncertain, Probably No, Definitely No)].

This was the only task in which the group rated Gestalt variables in the immediate environment. Further, there are several reasons why we used this particular room for the VEQ pilot testing: (a) the area was a logical and convenient meeting place for the respondents who later participated in a different set of unrelated research procedures elsewhere in the house,

1. https://whispersestate.godaddysites.com

and convenient meeting place for the respondents who later participated in a different set of unrelated research procedures elsewhere in the house, (b) the setting was a large enough space for the groups to stand comfortably and experience the setting, and (c) it was a 'control' area that had almost no prior reports of anomalous phenomena. Thus, this group of respondents merely provided pilot data for us to examine the psychometric properties of the VEQ tool, which later featured in the immersive exercise in Study 2 using an independent group of participants.

Results

Readability

Table 1 gives the readability statistics for the VEQ as calculated using the Readability Analyzer.[2] The results indicate that the pilot measure reflects a 7th to 9th grade level (USA) of reading comprehension.

Table 1..

Readability Statistics for the Visitor Experience Questionnaire

Metric	Score
Flesch Reading Ease	62.59
Gunning Fog Scale Level	11.18
Flesch–Kincaid Grade Level	6.58
SMOG Grade	10.41
Dale–Chall Score	7.87
Fry Readability Grade Level	7.00

Factor structure

The Cronbach alpha for the VEQ was 0.73, which meets Kline's (1986/2015) threshold for satisfactory reliability. Yet these six Gestalt variables might not be unidimensional. Here we conducted an exploratory maximum likelihood factor analysis on the 18 variables, followed by Varimax rotation using the *scikit-learn* software (Pedregosa et al., 2011). Missing values were replaced with the mean value of the variable. Table 2 shows our preferred solution, with the first three factors explaining 27%, 13%, and 12% of the total variance, respectively. All loadings are low but they form a highly consistent pattern as is indicated by the bolded entries. The first factor (interpreted as *Presence*) combines the six Atmosphere and Immersion items, as their loadings on this factor consistently exceed those on all other factors. Similarly, the third factor captures all three Memory-Association items and so is construed as *Sentimentality*. Not

2. https://datayze.com/readability-analyzer

surprisingly, the six Ambiguity and Legibility items have opposite loadings on Factor 2, which likely reflects that increases in Legibility inherently involve lower Ambiguity, although not necessarily vice versa. Higher scores on this factor therefore denote greater overall *Ambiguity*. Interestingly, the three Affordance variables did not load on a common factor; in fact, they did not load appreciably on *any* of the factors. This is not because factor extraction was terminated prematurely, as Table 4 also shows a fourth factor that explained 6% of the variance but lacked a clearly interpretable pattern. As a result, we pragmatically treat the three *Affordance* items as a pseudo or putative factor throughout this report.

Reliability and scaling properties

Using the factor structure described above, the four factors were Rasch scaled using the rating scale model with four ordinal categories 0, 1, 2, and 3. The right portion of Table 2 indicates that the items showed acceptable fit, as only one of the item's Outfit statistics exceeded 1.4 (Lange, 2017)—i.e., Item 6 of the Presence factor had an Outfit of 1.60, which significantly exceeds 1 ($p < 0.05$). However, as shown in Figure 1, together the six items acceptably reproduce the relation between respondents' ratings (y-axis) and their estimated trait levels (x-axis). Specifically, as indicated by the surrounding 95% confidence interval, only one marginal excursion outside the 95% confidence interval can be observed near the highest trait levels (top right portion of Figure 1).
Table 3 shows the standard Pearson correlations between the four Gestalt factors (above the diagonal), as well as their reliabilities (on the diagonal, bolded), and their attenuation-corrected correlations (below the diagonal). It can be seen that of the four sub-factors Affordance is by far the least reliable (Cronbach alpha = 0.23), which is not surprising given the factor analysis results. Also, this factor correlates lowest with all other factors when computing the standard Pearson correlation shown above the diagonal. However, when correcting for attenuation, the highest (absolute) attenuation-corrected correlation occurs between Sentimentality and Affordance (below the diagonal). Yet this coefficient ($r = 0.67$) is not sufficiently high to blur the distinction between Affordance and Forgetting (i.e., the opposite of memory and associations). These findings argue for adding Affordance items in order to increase the reliability of this ostensible factor and thus obtain a clearer pattern of results.

Table 2.

Exploratory Factor Analyses of the 18-Item Visitor Experience Questionnaire

	Factor loading				Rasch analysis	
Factor/item	Factor 1	Factor 2	Factor 3	Factor 4		
Interpretation	*Presence*	*Ambiguity*	*Sentimentality*	*Affordance*	Location	Outfit
Affordances						
Space has many different uses	0.07	0.05	–0.05	–0.02	0.50	1.02
Space makes me curious to explore	–0.02	0.05	–0.08	–0.09	–0.31	0.82
Space has interesting possibilities	–0.04	0.00	–0.06	–0.06	–0.19	1.06
Memory						
Space reminds me of places/people in my life	0.01	–0.09	**0.10**	–0.09	–0.74	1.00
Space feels familiar to me	–0.08	0.03	**0.22**	0.01	0.01	0.90
Space elicits a memorable life experience	0.01	–0.05	**0.24**	0.00	0.72	0.54
Atmosphere–Immersion						
Space elicits strong emotions	**0.25**	–0.08	–0.06	0.06	0.92	0.94
Space has a definite mood to it	**0.17**	0.00	–0.04	–0.07	–1.21	1.00
Space elicits different emotions	**0.24**	–0.12	0.03	0.00	0.51	0.78
Space deeply moves me	**0.20**	–0.02	–0.01	–0.02	0.31	0.75
Space totally grabs my attention	**0.20**	–0.02	–0.03	–0.10	–1.69	1.18
Space takes me outside my usual self or experience	**0.16**	0.01	0.03	0.01	1.16	1.62
Ambiguity–Legibility (reverse scored)						
Space makes me feel 'on alert'	0.13	**–0.23**	0.01	0.01	–1.80	0.94
Space makes me disoriented	0.06	**–0.19**	0.03	–0.01	–0.55	0.56
Space makes me want to leave	0.03	**–0.12**	0.02	0.05	–0.01	0.52
Space makes me feel safe (–L)	–0.12	**0.17**	–0.03	0.03	0.22	1.19
Space is easy to navigate (–L)	–0.10	**0.13**	–0.04	–0.03	1.18	1.40
Space has easy layout/ details (–L)	–0.03	**0.12**	0.01	0.01	0.96	1.28

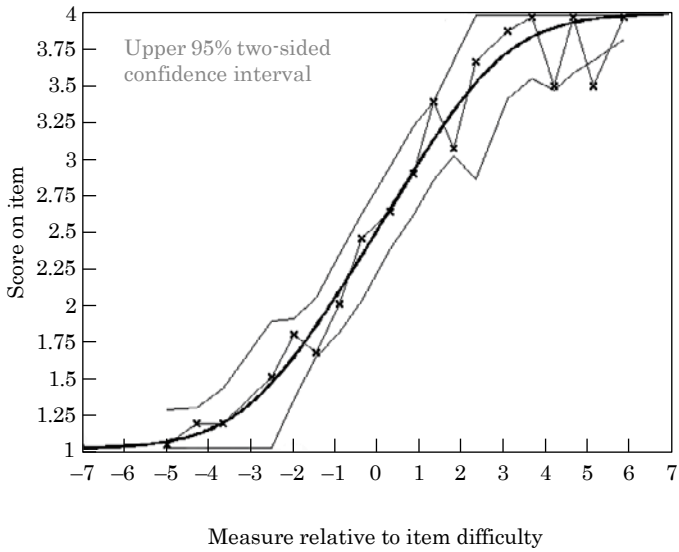

Figure 1. Reproducibility of Presence *ratings.*

Table 3.

Reliabilities and Inter-Correlations for the Four Gestalt Factors

		1	2	3	4
1	Affordance	**0.23**	–0.24	0.21	–0.02
2	Sentimentality	–0.67*	**0.56**	0.27	0.08
3	Presence	0.58*	0.49*	**0.82**	0.21
4	Ambiguity	–0.04	0.11	0.25	**0.66**

Bolded values on the diagonal = internal reliabilities.
Above the diagonal = attenuated Pearson correlations.
Below the diagonal = attenuation-corrected Pearson correlations.

*$p < 0.05$.

Construct validity

Two Spearman rank-order correlations were used to assess validity. First, the total VEQ scores were significantly associated ($r_s = 0.32$, $p < 0.05$) with how the experients perceived the Overall Vibe of the area or room. Second, the total VEQ scores and RTS (Transliminality) scores showed a moderately strong relationship ($r_s = 0.44, p < 0.05$). In other words, the perception of environmental Gestalt variables was associated with the respondents' sensitivity levels to both internal- and external-based stimuli. Table 4 breaks down this result by Gestalt variables was associated with the respondents' sensitivity levels to both internal- and external-based stimuli. Table 4 breaks down this result by

Table 4.

*Spearman Rank-Order Correlations Between Transliminality (RTS) Scores and Ratings on Gestalt Variables (Visitor Experience Questionnaire: VEQ) for the Dining Room in the Haunted House Immersive Exercise (*n = *40)*

	VEQ total	Affordance	Ambiguity	Presence	Sentimentality
RTS	0.44*	0.31*	0.21	0.37*	0.40*
Prior Site Knowledge	0.35*	0.45**	–0.15	0.39*	0.09
Present Site Expectation	0.30*	0.02	0.25	0.40*	–0.05
Overall Vibe	–0.07	0.30*	–0.41*	0.19	–0.21

*$p < 0.05$, **$p < 0.01$.

examining the associations between Transliminality, Overall Vibe, and the four-factor solution for Gestalt variables. Moreover, the total VEQ scores also correlated with participants' *Prior Knowledge* ($r_s = 0.35$, $p < 0.05$) and *Present Expectation* ($r_s = 0.30$, $p < 0.05$) concerning The Whispers Estate. This provides additional evidence for expectancy-state effects with Gestalt variables.

An illustrative practical application

The respondents reported no difficulties with understanding or using the VEQ items to rate the attributes or mood of the dining room in The Whispers. We expect, therefore, that our tool can be administered equally well via hard copy or digital versions. Table 5 shows the averaged environmental Gestalt ratings, and it can be seen that the respondents perceived the room as generally higher in Affordance but relatively lower in Ambiguity, Presence, and Sentimentality. This Gestalt profile corresponded to a mean Overall Vibe rating of 3.59 (range = 1 to 5), indicating that the space elicited 'neutral to slightly good vibes' for the respondents. This result is consistent with the room's reputation as a 'paranormally quiet' area, as well as research documenting more positive feelings toward communal eating activities (Dunbar, 2017) and the opinions of interior designers who characterize 'dining rooms' as particularly welcoming and versatile spaces for social bonding (Pingel, 2021).

Table 5.

*Averaged Ratings of Gestalt Variables (Four-Factor Solution) in the Dining Room of the Haunted House Immersive Exercise (*n = *40)*

Overall Vibe (*M* = 3, range = 1–5)	Total VEQ score (*M* = 45, range = 18–72)	Affordance (*M* = 7.5, range = 3–12)	Ambiguity (*M* = 18, range = 6–24)	Presence (*M* = 18, range = 6–24)	Sentimentality (*M* = 7.5, range = 3–12)
3.59	41.65	10.53	11.08	14.33	5.73

Study 2: Exporatory field study of Gesalt variables

Research suggests that 'ghost narratives'-as personal beliefs, shared stories, or putative experiences-can be powerfully memetic and immersive experiences due in part to their inherent Versatility, Adaptability, Participatory Nature, Universality, and Scalability (i.e., the VAPUS Model; see Hill et al., 2018, 2019; Houran et al., 2020). It also helps when such narratives are rooted in a historical foundation that reinforces a sense of authenticity or salience (Hanks, 2016). Particularly, Franz (2021) described the idea of "haunted intimacy, where ghosts exert a personal and relational presence to the material world; hauntings invite the living into an affective and sympathetic relationship to the space and the past" (p. 382). Previous studies have therefore used reportedly haunted environments to study the psychology of expectancy effects and immersive experiences in externally-valid contexts (e.g., Cocchiarella & Drinkwater, 2019; Escolà-Gascón & Houran, 2021; French et al., 2009; Houran, Lange et al., 2022; Langston & Hubbard, 2019; Pharino et al., 2018; Tashjian et al., 2022; Wiseman et al., 2002).

Note that an 'immersive experience' is customarily defined as an illusory environment that completely surrounds you such that you feel that you are inside it and part of it (Rheingold, 1991). The term originated with technology environments designed to command the senses such as virtual, augmented, or mixed realities. But paranormal-related activities and experiences help to redefine 'immersive' in terms of psychological absorption, or the "disposition for having episodes of 'total' attention that fully engage one's representational (i.e., perceptual, enactive, imaginative, and ideational) resources" (Tellegen & Atkinson, 1974, p. 268). Simply put, this entails the cognitive capacity for involvement in sensory and imaginative experiences in ways that alter a person's perception, memory, and mood, with important behavioural and biological consequences. This view dovetails nicely with Moeran's (2009) distinction in ethnography between a 'participant observer' and 'observant participant.' The former method of information gathering presents more opportunities for mobile positioning, outward gazing, and inscription, whereas the latter approach allows more opportunities for fixed positioning, inward gazing, and incarnation (Seim, 2021).

Similarly, rather than just partake in a techno-generated illusion, paranormal enthusiasts invest time and resources in the hope of personally experiencing something visceral and enthralling in real life. Such individuals often become 'betwixt and between' reality and fantasy, by encountering events or having experiences that directly challenge or expand their understanding of reality and their place in it (Drinkwater et al., 2022; Holloway, 2010; Houran, Lange et al., 2022). This state of situational enchantment is fascinating in itself, and bridges parapsychology with the humanistic and transpersonal psychologies (Lange & Houran, 2021). Accordingly, we conducted a field study to test whether participants with different perceptual–personality profiles would report altered-anomalous experiences during a prolonged and immersive

'haunted house' experience (Hypothesis 1), and whether such perceptions would be congruent in content and location across the participants (Hypothesis 2), as well as correlate to the type or intensity of Gestalt variables in the local environment (Hypothesis 3).

Method

Participants

We pre-screened our network of professional contacts for three individuals with different perceptual–personality profiles, relatively easy access to the field study location, presumed fear control due to prior experience with fieldwork settings, and the mindset to take this exercise seriously. This approach allowed us to isolate one person to each level of the test site during every phase of the proceedings. Participation was entirely voluntary and could be stopped at any time. Our participant selection process was more pragmatic than structured. That is, we simply asked our contacts how many prior haunt-type experiences they have had. This metric was subsequently used to estimate their respective trait levels of Transliminality and Paranormal Belief, which then allowed us to quickly identify the most suitable candidates for our purposes. In particular, more haunt experiences implies higher Transliminality and Paranormal Belief, whereas fewer haunt experiences suggests lower Transliminality and Paranormal Belief (see e.g., Laythe et al., 2018).

This selection approach worked well, as can be seen in Table 6. Our volunteers had different combinations of age and gender, and, most importantly, varying questionnaire levels of Transliminality and Paranormal Belief (i.e., New Age Philosophy and Traditional Paranormal Beliefs). These three participants thus represent a spectrum of encounter-proneness, as corroborated by their scores on the Survey of Strange Events (Houran, Lange et al., 2019; see below for details) pertaining to their lifetime inventory of (entity) encounter experiences prior to this study. Specifically, Visitor C was 'strongly encounter-prone' (i.e., above-average Transliminality/above-average Paranormal Beliefs), Visitor A was 'moderately encounter-prone' (average Transliminality/above-average Paranormal Beliefs), and Visitor B was 'weakly encounter-prone' (below-average Transliminality/below-average Paranormal Beliefs).

Measures

As in Study 1, the participants completed the RTS (Lange, Thalbourne et al., 2000; see also Houran et al., 2003) prior to their on-site visit. We also administered Lange, Irwin and Houran's (2000) Rasch version of Tobacyk's (1988, 2004) Revised Paranormal Belief Scale (RPBS). The original 26-item, Likert-based form (seven response categories anchored by "strongly disagree to strongly agree") has an artificial structure of seven factors due to differential

Table 6.

Demographic and Perceptual–Personality Profiles of the Immersive Participants

	Visitor A	Visitor B	Visitor C
Age (years)	57	42	24
Gender	Female	Male	Male
Lifetime history of encounter experiences* (M = 50, SD = 10)	52.1	38.4	65.6
Prior exposure to the Haunted House Museum†	2	2	2
Present expectation at the Haunted House Museum‡	3	1	0
Revised Transliminality Scale (M = 25, SD = 5)	23.1	18.3	28.5
Rasch-RPBS: New Age Philosophy (M = 25, SD = 5)	28.24	21.35	28.24
Rasch RPBS: Traditional Paranormal Beliefs (M = 25, SD = 5)	29.85	20.54	28.38

*Measured by Rasch scores on the Survey of Strange Events (Houran, Lange et al., 2019).
†"Have you heard (e.g., from friends, television programs, or websites), where in the Whispers Estate people have reported experiencing unusual phenomena?" (Definitely Yes = 4, Probably Yes = 3, Probably No = 2, Definitely No = 1, Uncertain = 0).
‡"Do you expect to experience any unusual phenomena in The Whispers today?" (Definitely Yes = 4, Probably Yes = 3, Probably No = 2, Definitely No = 1, Uncertain = 0).

item functioning, i.e., sex and age response biases. Correcting for these measurement problems with a 'top-down purification' procedure using Modern Test Theory, Lange, Irwin et al. (2000) showed that the RPBS comprises only two, moderately correlated belief subscales that ostensibly reflect different issues of control.

Specifically, New Age Philosophy (NAP) (11 items, Rasch reliability = 0.90) seems related to a greater sense of control over interpersonal and external events (e.g., "Some individuals are able to levitate (lift) objects through mental forces"), whereas Traditional Paranormal Beliefs (TPB) (5 items, Rasch reliability = 0.74) seem more culturally transmitted and beneficial in maintaining social control via a belief in magic, determinism, and a mechanistic view of the world (e.g., "Through the use of formulas and incantations, it is possible to cast spells on persons"). Several studies support the construct validities of these two subscales (Houran et al., 2001; Houran & Lange, 2001b; Houran et al., 2000), which both have a *mean* of 25 (SD = 5).

Finally, the visitors completed the VEQ and Survey of Strange Events (SSE) ratings for each of the nine test rooms in the haunted house that they visited alone, as per the protocol outlined below. The SSE (Houran, Lange et al., 2019) is a 32-item, 'true/false' Rasch (1960/1980) scaled measure of the overall perceptual intensity (or depth) of a ghostly account or narrative via a checklist of anomalous experiences inherent to these episodes. The SSE's Rasch item hierarchy specifically represents the probabilistic ordering of S/O events according to their endorsement rates but rescaled into a metric called 'logits.'

Higher logit values denote higher positions (or greater difficulty) on the Rasch scale (Bond & Fox, 2015). More information about the conceptual background and psychometric development of this instrument is provided by Houran et al. (Houran, Laythe et al., 2019, Houran, Lange et al., 2019; Houran et al., 2021).

Rasch-scaled scores range from 22.3 (= raw score of 0) to 90.9 (= raw score of 32), with a mean of 50, SD = 10, and Rasch reliability = 0.87. Higher scores correspond to a greater number and intensity of anomalies that define a percipient's experience. Supporting the SSE's construct and predictive validities, Houran, Lange et al. (2019) found that the phenomenology of 'spontaneous' accounts (i.e., ostensibly sincere and unprimed) differed significantly from control narratives from 'primed conditions, fantasy scenarios, or deliberate fabrication.' Follow-up studies with the SSE further support its value for content analyses of qualitative reports (Houran, Little et al., 2022; Lange et al., 2020; Laythe, Houran & Little., 2021; Little et al., 2021; O'Keeffe et al., 2019).

Immersive test environment

We again used The Whispers Estate historic house museum to examine the perceptual depth of self-reported S/O anomalies relative to the type or intensity of Gestalt effects present within the physical environment. However, unlike the larger project involving the participants in Study 1 (see Lange et al., in press), this research neither directly considered nor explored the ontological reality of spiritual or parapsychological phenomena.

Table 7 outlines the house's three levels and corresponding Hauntedness ratings for each of the nine test rooms. We derived these scores from an 'expert panel' rating exercise (see Bertens et al., 2013) involving the site owner and the second author, both of whom have different facets of knowledge about the site's folklore, prior witness reports, and results from scientific research at the location. Each panelist independently rated the degree of Hauntedness associated with each test room (i.e., "Based on your personal knowledge about and experiences with the Whispers, please rate each of the following nine rooms in terms of their relative 'hauntedness,' i.e., how often different people or groups report mysterious experiences or events within each area."). Response categories followed a five-point Likert scale: Reports Never Occur (1), Reports Rarely Occur (2), Reports Sometimes Occur (3), Reports Often Occur (4), and Reports Almost Always Occur (5). We then averaged the panelist's raw scores to produce a final set of Hauntedness ratings for the set of test rooms.

Procedure

We used only three volunteers for this exercise to ensure they had ample space, quiet, and time at the location for truly immersive experiences. The exercise was also conducted at night to coincide with the quietest period in the surrounding neighborhood. Each volunteer was experimentally blinded to the

Table 7.

Averaged 'Expert Panel' Ratings of Hauntedness for the Test Rooms in the Haunted House Immersive Exercise

	Hauntedness rating* (range = 1–5)
First level	
Doctor waiting area/room	3
Doctor examination room/bathroom	3
Parlor	2.5
Second level	
Jessie's chamber/room	3.5
Rachael's room	4
Servants' quarters	3.5
Nursery/stairwell room-area to the attic	2.5
Third level	
Attic loft bedroom	2.5
Attic seance room	2.5

*Reports Never Occur (= 1), Reports Rarely Occur (= 2), Reports Sometimes Occur (= 3), Reports Often Occur (= 4), Reports Almost Always Occur (= 5).

identity and details of the test site prior to the study. They were given a paper packet on-site that contained VEQ and SSE measures to complete for each test room. These questionnaires were clearly labelled to ensure accurate data collection and transcription. The group gathered in the dining room of the house where the second author (B.L.) briefly explained the logistics of the sessions to the participants. Specifically, each was asked first to "feel and soak in the mood or vibe of each test room" and then record their impressions using the VEQ. They were next to walk around and explore the room while alone and in any manner that they wished, i.e., act as observant participants (Moeran, 2009). The only requirements were that they were neither to touch any of the items in the rooms, nor to make any noises that could contaminate the other visitors' impressions or perceptions.

Next, the participants used the SSE to document any altered–anomalous experiences they had while in the given test room. After these instructions, the participants were randomly assigned to their first test room, to which they were promptly escorted and left alone for 10 minutes as timed using a digital stopwatch. At the end of each session, the first author (J.H.) announced the time and directed participants to their next rooms for another immersive session. The facilitator was likewise experimentally blinded to the specific reports that participants made in the various test rooms. At the end of the full rotation of test rooms, the second author (B.L.) debriefed the participants about the reported history, folklore, and prior witness reports associated with The Whispers Estate.

Results

Hypothesis 1: Altered–anomalous experiences will be facilitated by an immersive 'haunted house' experience.

The results largely confirmed our expectations. Each participant had at least one anomalous experience during the immersive exercise, which agrees with prior studies showing that activities associated with paranormal tourism predictably elicit anomalous experiences (e.g., Houran, Lange et al., 2019; Houran et al., 2020; Wiseman et al., 2003). But the participants' different psychological profiles might suggest that Visitor C (highly encounter-prone) would show the highest SSE and VEQ scores, followed by Visitor A (modestly encounter-prone) and Visitor B (weakly encounter-prone). The participants reported a total of 17 *S/O* events over the span of 90 minutes. The bulk of these (n = 14) were indeed attributable to Visitor C, but, contrary to expectations, Visitor B (n = 2) reported twice as many anomalies as Visitor A (n = 1). The summed SSE scores (i.e., perceptual intensity of *S/O* experiences) across the nine test rooms showed a similar pattern: Visitor C = 271.6, Visitor B = 216.7, and Visitor A = 208.7 (see Table 8).

These results cannot be explained entirely by expectancy or suggestion effects (e.g., Houran, 2002; Houran, Wiseman et al., 2002; Lange & Houran, 1997), as all the participants responded with "Probably No" to the screening question, "Have you heard (e.g., from friends, television programmes, or websites), where in The Whispers Estate people have reported experiencing unusual phenomena?" Moreover, there was a strong inverse correlation ($r = -0.76$, $p < 0.05$) between SSE scores and the index of explicit anticipation, i.e., "Do you expect to experience any unusual phenomena in The Whispers today?" This indicates that the onset and perceptual intensity of *S/O* anomalies correlated with lower (versus higher) visitor expectations immediately preceding the immersive exercise. Finally, consistent with the results above, Visitor C had the highest total VEQ scores across all nine test rooms (sum = 365), followed by Visitor B (sum = 340), and Visitor A (sum = 310).

Hypothesis 2: Altered–anomalous experiences will be congruent in content and location across the three participants.

Table 8 lists the participants' SSE and VEQ scores (and individual endorsement patterns) across the nine test rooms. The average SSE scores per room indicate that the anomalous experiences reported by the three participants specifically centred on five of the nine test rooms. And, consistent with our hypotheses, the participants' experiences further clustered in three of these rooms (a 60% congruence in location). Plus, despite their different perceptual–personality profiles, the participants had good levels of congruency in their reported *S/O* experiences. Visitors B and C ($r = 0.50$, $p < 0.05$) showed the highest correlation in their SSE reporting patterns, followed by Visitors A and C ($r = 0.41$, $p < 0.05$). This suggests that Visitor C (strongly encounter-prone)

was sensitive to the same stimuli affecting Visitors A and B, both of whom were less encounter-prone. However, Visitors A (modestly encounter-prone) and B (weakly encounter-prone) showed a noticeably negative correlation ($r = -0.19$, not significant) in their SSE reporting patterns. This implies important differences in their respective levels of vigilance, detection, or aberrant salience.

We should note that the Hauntedness ratings of the nine test rooms showed a positive but near-zero correlation ($r = 0.04$, not significant) with the participants' SSE scores. The same pattern was found for Hauntedness ratings and the participants' averaged ratings of the Overall Vibe of each room ($r = 0.04$, not significant). This indicates that our participants' anomalous experiences often occurred in rooms that did *not* correspond to those areas most associated with prior witness reports as per the expert panel. We conclude, therefore, that Gestalt variables might not be the only, or the most important, mediators or moderators of anomalous experiences at The Whispers (or other types of uncanny geographies). In other words, Gestalt variables certainly influenced the perception of *S/O* anomalies by our participants, but we do not know to what extent environmental effects similarly contributed to prior witness reports in other areas of the house.

Hypothesis 3: Altered–anomalous experiences will correlate with the type or intensity of Gestalt variables in the local area or environment.

The results generally affirmed our expectations. First, the averaged ratings of relative Hauntedness across the nine test rooms showed a moderately high association ($r = 0.48$, $p < 0.05$) with total VEQ scores. Second, we found moderately high associations between the participants' ratings of Gestalt variables (per total VEQ scores) in the nine test rooms and the participants' total number ($r = 0.43$, $p < 0.05$) and perceptual intensity of the haunt experiences (per SSE scaled scores) in those same rooms ($r = 0.41$, $p < 0.05$). Furthermore, SSE scores showed consistently positive correlations between the individual Gestalt variables, although the effect sizes ranged from weak to moderately strong (see Table 9). The one notable exception to this pattern was Ambiguity, which had a negative association with SSE scores. Curiously, this outcome seemingly argues against McAndrew's (2020) view that haunted houses are perceived as 'spooky or creepy' due to their ambiguous and threatening internal layouts.

Table 8.

Summed Ratings of Anomalous Experiences and Gestalt Effects (Four-Factor Solution) Reported in the Haunted House Immersive Exercise

	SSE (range = 22.3–90.9)	Overall Vibe (range = 1–5)	Total VEQ (range = 18–72)	Affordance (range = 3–12)	Ambiguity (range = 6–24)	Presence (range = 6–24)	Sentimentality (range = 3–12)
Room 1							
Visitor A	22.3	3	32	9	12	8	3
Visitor B	22.3	3	30	10	9	8	3
Visitor C	35.2	3	42	10	11	18	3
Average	*26.6*	*3.0*	*34.7*	*9.7*	*10.7*	*11.3*	*3.0*
Room 2/3							
Visitor A	22.3	4	32	9	10	10	3
Visitor B	22.3	2	38	9	12	14	3
Visitor C	22.3	3	35	9	11	12	3
Average	*22.3*	*3*	*35*	*9*	*11*	*12*	*3*
Room 4							
Visitor A	30.3	4	31	7	9	12	3
Visitor B	22.3	2	38	11	7	13	7
Visitor C	38.4	4	29	10	7	9	3
Average	*30.3*	*3.3*	*32.7*	*9.3*	*7.7*	*11.3*	*4.3*
Room 5							
Visitor A	22.3	3	31	7	12	9	3
Visitor B	22.3	3	39	8	12	12	7
Visitor C	35.2	2	47	8	16	20	3
Average	*26.6*	*2.7*	*39.0*	*7.7*	*13.3*	*13.7*	*4.3*
Room 6							
Visitor A	22.3	3	35	7	13	12	3
Visitor B	30.3	2	42	10	13	16	3
Visitor C	35.2	4	46	9	16	18	3
Average	*29.3*	*3.0*	*41.0*	*8.7*	*14.0*	*15.3*	*3.0*
Room 7							
Visitor A	22.3	3	38	9	13	13	3
Visitor B	22.3	2	47	12	20	12	3
Visitor C	22.3	3	41	8	15	14	4
Average	*22.3*	*2.7*	*42.0*	*9.7*	*16.0*	*13.0*	*3.3*
Room 8							
Visitor A	22.3	3	36	7	14	12	3
Visitor B	22.3	3	40	10	20	7	3
Visitor C	22.3	2	40	7	14	16	3
Average	*22.3*	*2.7*	*38.7*	*8.0*	*16.0*	*11.7*	*3.0*
Room 9							
Visitor A	22.3	4	38	7	12	13	6
Visitor B	22.3	3	28	9	10	6	3
Visitor C	22.3	3	33	6	10	14	3
Average	*22.3*	*3.3*	*33.0*	*7.3*	*10.7*	*11.0*	*4.0*
Room 10							
Visitor A	22.3	3	37	8	14	12	3
Visitor B	30.3	3	38	12	14	8	4
Visitor C	38.4	3	52	11	12	19	10
Average	*30.3*	*3.0*	*42.3*	*10.3*	*13.3*	*13.0*	*5.7*

Conclusions

Real-time data on visitors' experiences strongly suggest that environmental Gestalt variables are significantly related to the perception of some *S/O* anomalies at The Whispers Estate. The strongest influences were observed for Presence, Affordance, Sentimentality, and Ambiguity, respectively. We should caution that these trends might not indicate a stable heuristic but instead reflect situational or site-specific nuances. Moreover, the perception of Gestalt effects also correlated with people's perceptual–personality profiles, and notably a permeable mental boundary structure as measured by transliminality. These findings imply that investigators of putative haunts (and other kinds of uncanny geographies) should augment their current methods with notations about, if not measurements of, Gestalt variables in their (a) documentations of the physical characteristics of haunted places, and (b) content analyses of percipients' reports. This approach should help to contextualize altered–anomalous experiences within the larger framework of systems theory and environmental psychology. Consequently, we recommend

Table 9.

Spearman Rank-Order Correlations Between Participants' Anomalous Experiences (SSE Scores) and Gestalt Ratings Across the Test Rooms in the Haunted House Immersive Exercise

	Overall Vibe	Total VEQ score	Affordance	Ambiguity	Presence	Sentimentality
SSE	0.35	0.11	0.42	–0.32	0.24	0.51

All p values >0.05 due to sample size (n = 9).

that fieldwork investigators expand their current assortment of methods by using the full 18-item VEQ to collect and share raw data on Gestalt effects until the instrument's psychometric properties and outputs can be fully optimized. Our rationale is that all data points are important, even though we might not know yet how best to use or interpret them.

General discussion

It might be presumed that the environmental Gestalt variables considered here are concepts that are too ephemeral or nebulous to comprehensively isolate and research in real-world settings. However, our results recommend the VEQ as a promising approach to their operationalization and measurement in controlled studies of sacred, haunted, or enchanted spaces. To be sure, our interactionist view of haunt-type experiences (Ironside & Wooffitt, 2022; Laythe, Houran, Dagnall et al., 2021; Laythe et al., 2022) is supported by the moderately strong and positive association we found between haunt-type

experiences and Gestalt variables in an externally valid setting. In other words, the psychological impact of a location's physical and holistic features has an important relationship with the detection or interpretation of *S/O* anomalies. There is also evidence that this effect is fuelled predominantly by higher degrees of Affordance, Presence (i.e., immersion + atmosphere), and to some extent the Sentimentality of an experient's immediate space. Taken all together, these preliminary results lend strong credence to the hypothesis that complex or nuanced factors in environmental psychology and architectural phenomenology influence perceptions in ghostly episodes (Houran, 2000; Jawer et al., 2020; McAndrew, 2020).

Our study was admittedly exploratory and took several liberties. Future research should, therefore, address several limitations with our approach and findings. First, larger-scale studies with diverse populations would improve on the smaller convenience sample used here. We are certainly encouraged by the present findings but still regard them as preliminary. Second, it needs to be determined whether our results extend to other types of altered–anomalous experiences, and particularly (entity) encounter experiences stemming from ritual or otherwise organized settings (e.g., Caputo et al., 2021; Gukasyan, & Nayak, 2021; Jones, 2000). Another limitation is that we only tested Gestalt variables relative to 'built' structures. Thus, new studies ought to explore replications using 'outdoor or open-air' uncanny geographies of a natural (e.g., Berner, 2020) or man-made kind (e.g., Bermudez, 2015). Moreover, we underscore that our documented effects represent *perceptions* of Gestalt variables rather than direct measurements of features or attributes of structures and settings. This means that VEQ data provides 'psychological maps' of locations rather than 'physical maps' (see Welwood, 1977). Future research might thus correlate or validate subjective perceptions against actual environmental or spatial measurements.

For instance, physical attributes that contribute to the space syntax of an uncanny setting have been quantified manually (Wiseman et al., 2003) and sometimes digitally using tools like the *depthmapX v0.5* software developed by University College London that can perform different types of space syntax techniques. There are also more advanced and expensive approaches that involve laser imaging, detection, and ranging (Lidar). Also called 3-D laser scanning, this technique is a special combination of 3-D scanning and laser scanning that produces fully rendered digital twins of a given environment (Shan & Toth, 2018; Taylor, 2019). The first author (J.H.) was part of an investigation that used this technology in a fieldwork study that informed the 2010 Nat Geo television documentary *American Paranormal: Haunted Prison*.[3] Lidar mapping helped the team to identify areas susceptible to environmental factors like infrasound effects (Tandy, 2002), which possibly contributed to haunt reports at the famous Eastern State Penitentiary historical site (see Houran et al., 2020, pp. 300–302). Applications like these might assist future

research in examining the extent to which Gestalt effects are idiosyncratic to individual experients or can be quantified directly and generalized across people with different perceptual–personality profiles.

Our study was further confined to Gestalt effects in lone individuals. The impact of multiple participants on the perception of these environmental variables was therefore not tested. Yet previous studies highlight the importance of social influences on paranormal belief and experience (Drinkwater et al., 2019; Hill et al., 2018, 2019; Markovsky & Thye, 2001; Wilson & French, 2014), as well as immersive experiences more broadly (Kyrlitsias et al., 2020). Thus, social interaction can affect how people construct and make sense of altered–anomalous events (Childs & Murray, 2010; Drinkwater et al., 2019; Eaton, 2018; Ironside, 2017; Ironside & Wooffitt, 2022). As discussed by Ironside and Wooffitt (2022), the body plays a fundamental role in establishing the uncanny status of events through interaction with space, objects, and other bodies. Specifically, social interaction may impact how Gestalt variables are perceived, understood, and reported relative to S/O events within versus outside of one's personal space. For instance, we might expect percipients to rate environments as lower in Ambiguity–Threat, Legibility, or Immersion–Presence when they are accompanied by others.

Additionally, testing whether the perception of Gestalt factors and anomalous experience align within local groups of people would give valuable insights into the juxtaposition of social and spatial environments. To be sure, much contemporary scholarship presents the uncanny as profoundly social in nature or as a product of people's uneasy relationship with social forces like modernity (Johnson, 2013, 2014) or political violence (Sime, 2013). Thus, rather than being a mere feature of a particular place, uncanny geographies might be a cultural site produced through interactions among people, social forces, and the built and natural landscapes. This approach might further clarify the role of Gestalt variables in the formation of anomalous experiences that involve potential 'contagion' effects from *interpersonal* (e.g., Laythe et al., 2017) or *environmental* cues (e.g., de Groot et al., 2012).

We speculate that Gestalt variables work in additive ways to define the space syntax of settings at the person-level, and that some environmental configurations are more conducive than others for influencing people's emotions or perceptions. This could happen covertly, as with the idea that sacred architecture involves an "invisible order of things" (Mizrahi, 2018, p. 44), or overtly, as per Stroik's (2018) architectural principles of sacred spaces.

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Particularly, Gestalt variables might (a) serve as psychological cues that directly stoke or contextualize anomalous experiences (Houran, 2000), (b) heighten people's vigilance and attentional focus to S/O events in their immediate environment (Lange & Houran, 2001), or (c) foster anxiety or 'dis-ease' reactions in experients (McAndrew, 2020) which might facilitate anomalous experiences via state transliminality (Evans et al., 2019). A combination of these or other scenarios are also possible. In particular, it seems likely that Gestalt variables reinforce or relate to Browning et al.'s (2014) principles of biophilic design or Jones' (2000) phenomenology of sacred architecture comprising the concepts of *orientation* (i.e., allurement of a space), *commemoration* (i.e., actual events or history associated with a space), and *ritual context* (i.e., quality, role, and outcome of the theatrical aspects of a space). On this latter point, we might even discover that environmental features specifically link to Kapitány et al.'s (2020) functional characteristics of ritual experiences.

These competing ideas offer a greenfield for future studies and motivate us to reconsider the term *uncanny* as something more than a mere adjective without an ideological framework. Prior uses of the term might have served as a 'boundary object' as per Star and Griesemer's (1989) conceptual framing. That is, it allowed for scholarly conversations across different academic disciplines or theories, albeit in sometimes diverging ways. Since Sigmund Freud published his classic essay "Das Unheimliche" (or "The Uncanny") in 1919, the term has certainly permeated social scientific and humanistic research. Scholars have revisited and reimagined the concept in myriad ways and have traced the production of the uncanny in literature (Wolfreys, 2001), architecture (Vidler, 1993), and technology (Gahrn-Andersen, 2022). In contemporary vernacular, 'uncanny' has come to mean a sense of disruption or disorientation; to experience the uncanny is to face the strange or unfamiliar (see Freud, 1970, 1973; Jentsch, 1997; Masschelein, 2011).

But parallelling McAndrew's (2020) views, Thomas Fuchs (2019) offered a more precise definition with a darker tone, i.e., "The uncanny can be phenomenologically described as an atmosphere of defamiliarization which captures the affected with an overwhelming, centripetal effect. This effect places him or her in existential uncertainty, *Bangnis*, anxiety and terror precisely through its intangibility and ambiguity" (p. 115). This description fits aspects of 'situational-enchantment' (see Drinkwater et al., 2022; Houran, Lange et al., 2022), but to us fails as a properly balanced characterization of uncanniness. We prefer to build on Jentsch and Freud's ideas and propose that uncanny geographies are better understood as "liminal landscapes," i.e., settings with qualities that disorient people and thus produce dis-ease states, especially for those with looser mental boundaries. (Laythe et al., 2022, pp. 43–44). But, contrary to Fuchs (2019), we contend that uncanny geographies can produce *distressing* (McAndrew, 2020) or *enriching* (Drinkwater et al., 2022) thoughts and feelings. This paper only scratches the surface, so further research is clearly needed to understand how principles in environmental psychology

and architectural phenomenology mediate or moderate anomalous–altered experiences. In fact, we expect at this stage that most studies along these lines will necessarily be exploratory (or hypothesis-generating) rather than confirmatory (or hypothesis-testing).

Speaking more broadly, our preliminary findings also can guide more comprehensive research on environmental Gestalt variables as psychological constructs and their relation to place identity or attachment. We should first verify whether the six presumably distinct variables that help to influence people's impressions of spaces or settings indeed constitute four factors (i.e., Ambiguity, Presence, Sentimentality, and Affordance) or involve a different solution. This sort of initiative could likewise enlighten the ongoing debate about the dimensionality of the 'sense of place' concept (Boley et al., 2021; Cole et al., 2021; Devine-Wright, 2011; Hernández et al., 2007; Peng et al., 2020; Raymond et al., 2010; Trentelman, 2009). But, as it stands, our VEQ findings justify a larger-scale effort to study the factor structure and psychometric properties of the VEQ (or future modifications) using robust analytics grounded in Modern Test Theory (e.g., Houran, Lange et al., 2019; Lange, 2017; Lange, Ross et al., 2019). Improved tools and models like these should help to advance our scientific understanding of uncanny geographies and people's perceptions of other types of settings or spaces. The implications and applications of new findings in this domain can thus act as a bridge between the neighbouring sciences of consciousness studies and environmental psychology. We expect that this juncture is an obvious and open doorway to narrative theory, which would construe experiences of uncanny geographies as subjective and pliable constructions versus objective and fixed representations of physical reality (de Rivera & Sarbin, 1998; Jones, 2000; Oakley & Halligan, 2017).

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ACKNOWLEDGMENTS

This study was ancillary to research supported by the BIAL Foundation (bursary No. 30/20) for which we express our gratitude. We thank Rich Ballard, Damien J. Houran, Cindy Little, and Brandon Massullo for their assistance. Raw data are available to qualified researchers upon request from the Institute for the Study of Religious and Anomalous Experience (ISRAE).

REFERENCES

Appleton, J. (1975). *The experience of landscape*. John Wiley & Sons.

Aron, E. N., & Aron, A. (1997). Sensory-processing sensitivity and its relation to introversion and emotionality. *Journal of Personality and Social Psychology*, *73*, 345–368. https://doi.org/10.1037/0022-3514.73.2.345

Askarizad, R., & Safari, H. (2020). The influence of social interactions on the behavioral patterns of the people in urban spaces (case study: The pedestrian zone of Rasht Municipality Square, Iran). *Cities*, *101*, 1–16. https://doi.org/10.1016/j.cities.2020.102687

Banaei, M., Hatami, J., Yazdanfar, A., & Gramann, K. (2017). Walking through architectural spaces: The impact of interior forms on human brain dynamics. *Frontiers in Human Neuroscience*, *11*, Article 477. https://doi.org/10.3389/fnhum.2017.00477

Bermudez, J. (Ed.) (2015). *Transcending architecture: Contemporary views on sacred space*. Catholic University of America Press. https://doi.org/10.2307/j.ctt130h9f6

Berner, U. (2020). Mountains as sacred spaces. *Culture and Religion*, *21*, 18–30. https://doi.org/10.1080/14755610.2020.1858545

Bertens, L. C. M., Broekhuizen, B. D. L., Naaktgeboren, C. A., Rutten, F. H., Hoes, A. W., van Mourik, Y., Moons, K. G. M., & Reitsmaet, J. B. (2013). Use of expert panels to define the reference standard in diagnostic research: A systematic review of published methods and reporting. *PLOS Medicine*, *10*, Article e1001531. https://doi.org/10.1371/journal.pmed.1001531

Boley, B., Strzelecka, M., Yeager, E., Ribeiro, M., Aleshinloye, K., Woosnam, K., & Mimbs, B. (2021). Measuring place attachment with the Abbreviated Place Attachment Scale (APAS). *Journal of Environmental Psychology*, *74*, Article 101577. https://doi.org/10.1016/j.jenvp.2021.101577

Bonaiuto, M., Bilotta, E., & Stolfa, A. (2010). Feng shui and environmental psychology: A critical comparison. *Journal of Architectural and Planning Research*, *27*, 23–34.

Bond, T. G., & Fox, C. M. (2015). *Applying the Rasch model: Fundamental measurement in the human sciences* (3rd ed.). Routledge. https://doi.org/10.4324/9781315814698

Browning, W., Ryan, C., & Clancy, J. (2014). *14 patterns of biophilic design: Improving health & well-being in the built environment*. Terrapin Bright Green. https://www.terrapinbrightgreen.com/reports/14-patterns

Bujang, M. A., Omar, E. D., & Baharum, N. A. (2018). A review on sample size determination for Cronbach's alpha test: A simple guide for researchers. *Malaysian Journal of Medical Sciences*, *25*, 85–99. https://doi.org/10.21315/mjms2018.25.6.9

Caputo, G. B., Lynn, S. J., & Houran, J. (2021). Mirror- and eye gazing: An integrative review of induced altered and anomalous experiences. *Imagination, Cognition, and Personality*, *40*, 418–457. https://doi.org/10.1177/0276236620969632

Childs,C.,& Murray,C.D.(2010)."We all had an experience in there together":A discursive psychological analysis of collaborative paranormal accounts by paranormal investigation team members. *Qualitative Research in Psychology*, *7*, 21–33. https://doi.org/10.1080/14780880903304543

Cocchiarella, F., & Drinkwater, K. (2019). Para-design: Engaging the anomalous, a design research workshop to investigate paranormal phenomena through a series of location based studies. In: *IASDR 2019*, 02 September 2019–05 September 2019, Manchester Metropolitan University. http://e-space.mmu.ac.uk/624351

Cole, L., Coleman, S., & Scannell, L. (2021). Place attachment in green buildings: Making the connections. *Journal of Environmental Psychology*, *74*, Article 101558. https://doi.org/10.1016/j.jenvp.2021.101558

Collins, J., & Jervis, J. (Eds.) (2008). *Uncanny modernity: Cultural theories, modern anxieties*. Palgrave Macmillan. https://doi.org/10.1057/9780230582828_1

Dagnall, N., Drinkwater, K., O'Keeffe, C., Ventola, A., Laythe, B., Jawer, M. A., Massullo, B.,

Caputo, G. B., & Houran, J. (2020). Things that go bump in the literature: An environmental appraisal of "haunted houses." *Frontiers in Psychology*, *11*, Article 328. https://doi.org/10.3389/fpsyg.2020.01328

de Groot, J. H. B., Smeets, M. A. M., Kaldewaij, A., Duijndam, M. J. A., & Semin, G. R. (2012). Chemosignals communicate human emotions. *Psychological Science*, *23*, 1417–1424. https://doi.org/10.1177/0956797612445317

de Rivera, J., & Sarbin, T. R. (1998). *Believed-in imaginings: The narrative construction of reality*. American Psychological Association. https://doi.org/10.1037/10303-000

Devine-Wright, P. (2011). Place attachment and public acceptance of renewable energy: A tidal energy case study. *Journal of Environmental Psychology*, *31*, 336–343. https://doi.org/10.1016/j.jenvp.2011.07.001

Drinkwater, K., Laythe, B., Houran, J., Dagnall, N., O'Keeffe, C., & Hill, S. A. (2019). Exploring gaslighting effects via the VAPUS model for ghost narratives. *Australian Journal of Parapsychology*, *19*, 143–179.

Drinkwater, K., Massullo, B., Dagnall, N., Laythe, B., Boone, J., & Houran, J. (2022). Understanding consumer enchantment via paranormal tourism: Part I—Conceptual review. *Cornell Hospitality Quarterly*, *63*, 195–215. https://doi.org/10.1177/1938965520967920

Dunbar, R. I. M. (2017). Breaking bread: The functions of social eating. *Adaptive Human Behavior and Physiology*, *3*, 198–211. https://doi.org/10.1007/s40750-017-0061-4

Eaton, M. A. (2018). Manifesting spirits: Paranormal investigation and the narrative development of a haunting. *Journal of Contemporary Ethnography*, *48*, 155–182. https://doi.org/10.1177/0891241618756162

Eliovson, S. (1978). The Japanese garden. In S. Kaplan (Ed.), *Humanscape: Environments for people* (pp. 170–174). Duxbury Press.

Escolà-Gascón, A., & Houran, J. (2021). Paradoxical effects of exposure to nature in "haunted" places: Implications for stress reduction theory. *Landscape and Urban Planning*, *214*, Article 104183. https://doi.org/10.1016/j.landurbplan.2021.104183

Evans, J., Lange, R., Houran, J., & Lynn, S. J. (2019). Further psychometric exploration of the transliminality construct. *Psychology of Consciousness: Theory, Research, and Practice*, *6*, 417–438. https://doi.org/10.1037/cns0000163

Franchetto, A. (2020). Imaginal architectural devices and the ritual space of medieval necromancy. *Endeavour*, *44*, Article 100748. https://doi.org/10.1016/j.endeavour.2021.100748

Franz, M. K. (2021). Haunted intimacy: Spectral and vital space within a historic house museum. *Museum & Society*, *19*, 382–394. https://doi.org/10.29311/mas.v19i3.3830

French, C. C., Haque, U., Bunton-Stasyshyn, R., & Davis, R. (2009). The "Haunt" project: An attempt to build a "haunted" room by manipulating complex electromagnetic fields and infrasound. *Cortex*, *45*, 619–629. https://doi.org/10.1016/j.cortex.2007.10.011

Freud, S. (1970). Das unheimliche (1919). In *Studienausgabe*, Bd. IV (pp. 241–274). Fischer.

Freud, S. (1973). The 'uncanny.' In *The standard edition of the complete psychological works of Sigmund Freud* (pp. 218–256). *Translated by James Strachey in collaboration with Anna Freud*, Vol. XVIII (1917–1919). The Hogarth Press & The Institute of Psychoanalysis.

Fuchs, T. (2019). The uncanny as atmosphere. In G. Francesetti and T. Griffero (Eds.), *Psychopathology and atmospheres: Neither inside nor outside* (pp. 101–118). Cambridge Scholar Publishing.

Gahrn-Andersen, R. (2022). Seeming autonomy, technology and the uncanny valley. *AI and Society*, *37*, 595–603. https://doi.org/10.1007/s00146-020-01040-9

Goldhagen, S. W. (2017). *Welcome to your world: How the built environment shapes our lives*. HarperCollins.

Gosling, S. D., Craik, K. H., Martin, N. R., & Pryor, M. R. (2005a). The personal living space cue

inventory: An analysis and evaluation. *Environment and Behavior*, *37*, 683–705. https://doi.org/10.1177/0013916504274011

Gosling, S. D., Craik, K. H., Martin, N. R., & Pryor, M. R. (2005b). Material attributes of personal living spaces. *Home Cultures*, *2*, 51–88. https://doi.org/10.2752/174063105778053436

Grassini. S., & Laumann, K. (2020). Questionnaire measures and physiological correlates of presence: A systematic review. *Frontiers in Psychology*, *11*, Article 349. https://doi.org/10.3389/fpsyg.2020.00349

Griffiths, R., & Thurgill, J. (organizers). (2013). Uncanny landscapes conference, The Centre for Creative Collaboration, London, 4–8 March. https://uncannylandscapes.wordpress.com

Gukasyan, N., & Nayak, S. M. (2021). Psychedelics, placebo effects, and set and setting: Insights from common factors theory of psychotherapy. *Transcultural Psychiatry*. https://doi.org/10.1177/13634615209836 84

Hanks, M. (2016). *Haunted heritage: The cultural politics of ghost tourism, populism, and the past*. Routledge.

Harrison, L., & Loui, P. (2014). Thrills, chills, frissons, and skin orgasms: Toward an integrative model of transcendent psychophysiological experiences in music. *Frontiers in Psychology*, *5*, Article 790. https://doi.org/10.3389/fpsyg.2014.00790

Hartmann, E. (1991). *Boundaries in the mind: A new psychology of personality*. Basic Books.

Hernández, B., Carmen Hidalgo, M., Salazar-Laplace, M., & Hess, S. (2007). Place attachment and place identity in natives and non-natives. *Journal of Environmental Psychology*, *27*, 310–319. https://doi.org/10.1016/j.jenvp.2007.06.003

Hill, S. A., Laythe, B., Dagnall, N., Drinkwater, K., O'Keeffe, C., Ventola, A., & Houran, J. (2019). "Meme-spirited": II. Illustrations of the VAPUS model for ghost narratives. *Australian Journal of Parapsychology*, *19*, 5–43.

Hill, S. A., O'Keeffe, C., Laythe, B., Dagnall, N., Drinkwater, K., Ventola, A., & Houran, J. (2018). "Meme-spirited": I. A VAPUS model for understanding the prevalence and potency of ghost narratives. *Australian Journal of Parapsychology*, *18*, 117–152.

Hillier, B. & Hanson, J. (1984). *The social logic of space*. Cambridge University Press. https://doi.org/10.1017/CBO9780511597237

Hitchen, E. (2021). The affective life of austerity: Uncanny atmospheres and paranoid temporalities. *Social & Cultural Geography*, *22*, 295–318. https://doi.org/10.1080/14649365.2019.1574884

Holloway, J. (2010). Legend-tripping in spooky spaces: Ghost tourism and infrastructures of enchantment. *Environment and Planning D: Society and Space*, *28*, 618–637. https://doi.org/10.1068/d9909

Hook, D. (2005). Monumental space and the uncanny. *Geoforum*, *36*, 688–704. https://doi.org/10.1016/j.geoforum.2004.11.009

Hosany, S., Sthapit, E., & Björk, P. (2022). Memorable tourism experience: A review and research agenda. *Psychology & Marketing*, *39*, 1467–1486. https://doi.org/10.1002/mar.21665

Houran, J. (2000). Toward a psychology of "entity encounter experiences." *Journal of the Society for Psychical Research*, *64*, 141–158.

Houran, J. (2002). Analysis of haunt experiences at a historical Illinois landmark. *Australian Journal of Parapsychology*, *2*, 97–124.

Houran J. (2022). "Haunted house" research in the mainstream. *Parascientifica*, *1*, 4–14. https://www.ppri.net/parascientifica

Houran, J., Hill, S. A., Haynes, E. D., & Bielski, U. A. (2020). Paranormal tourism—Market study of a novel and interactive approach to space activation and monetization. *Cornell Hospitality Quarterly*, *61*, 287–311. https://doi.org/10.1177/1938965520909094

Houran, J., Hughes, L. F., Thalbourne, M. A., & Delin, P. S. (2006). Quasi-experimental study

of transliminality, vibrotactile thresholds and performance speed. *Australian Journal of Parapsychology*, *6*, 54–80.

Houran, J., Irwin, H. J., & Lange, R. (2001). Clinical relevance of the two-factor Rasch version of the Revised Paranormal Belief Scale. *Personality and Individual Differences*, *31*, 371–382. https://doi.org/10.1016/S0191-8869(00)00143-4

Houran, J., Kumar, V. K., Thalbourne, M. A., & Lavertue, N. E. (2002). Haunted by somatic tendencies: Spirit infestation as psychogenic illness. *Mental Health, Religion & Culture*, *5*, 119–133. https://doi.org/10.1080/13674670210141061

Houran, J., & Lange, R. (Eds). (2001a). *Hauntings and poltergeists: Multidisciplinary perspectives*. McFarland & Co.

Houran, J., & Lange, R. (2001b). Support for the construct validity of the two-factor conceptualization of paranormal belief: A complement to Thalbourne. *European Journal of Parapsychology*, *16*, 52–61.

Houran, J., Lange, R., & Laythe, B. (2022). Understanding consumer enchantment via paranormal tourism: Part II—Preliminary Rasch validation. *Cornell Hospitality Quarterly*, *63*, 216–230. https://doi.org/10.1177/1938965520971276

Houran, J., Lange, R., Laythe, B., Dagnall, N., Drinkwater, K., & O'Keeffe, C. (2019). Quantifying the phenomenology of ghostly episodes—Part II: A Rasch model of spontaneous accounts. *Journal of Parapsychology*, *83*, 168–192. https://doi.org/10.30891/jopar.2019.02.05

Houran, J., Laythe, B., Lange, R. Dagnall, N., O'Keeffe, C., & Drinkwater, K. (2021). Ghostly episodes in modern psychometric perspective. *Mindfield: Bulletin of the Parapsychological Association*, *13*(2), 30–40.

Houran, J., Laythe, B., O'Keeffe, C., Dagnall, N., Drinkwater, K., & Lange, R. (2019). Quantifying the phenomenology of ghostly episodes—Part I: Need for a standard operationalization. *Journal of Parapsychology*, *83*, 25–46. https://doi.org/10.30891/jopar.2019.01.03

Houran, J., Little, C., Laythe, B., & Ritson, D. W. (2022). Uncharted features and dynamics of the South Shields Poltergeist. *Journal of the Society for Psychical Research*, *86*, 129–165.

Houran, J., Thalbourne, M. A., & Ashe, D. D. (2000). Testing a psycho-anthropological view of paranormal belief and experience. *North American Journal of Psychology*, *2*, 127–138.

Houran, J., Thalbourne, M. A., & Lange, R. (2003). Methodological note: Erratum and comment on the use of the Revised Transliminality Scale. *Consciousness and Cognition*, *12*, 140–144. https://doi.org/10.1016/S1053-8100(02)00025-9

Houran, J., Wiseman, R., & Thalbourne, M. A. (2002). Perceptual-personality characteristics associated with naturalistic haunt experiences. *European Journal of Parapsychology*, *17*, 17–44.

Huskinson, L. (Ed.) (2016). *The urban uncanny: A collection of interdisciplinary studies* (1st ed.). Routledge. https://doi.org/10.4324/9781315681177-1

Ironside, R. (2017). Discovering strange events in empty spaces: The role of multimodal practice and the interpretation of paranormal events. *Journal of Pragmatics*, *120*, 88–100. https://doi.org/10.1016/j.pragma.2017.09.005

Ironside, R., & Wooffitt, R. (2022). *Making sense of the paranormal: The interactional construction of unexplained experiences*. Springer Nature. https://doi.org/10.1007/978-3-030-88407-9

Jawer, M. A., Massullo, B., Laythe, B., & Houran, J. (2020). Environmental "Gestalt influences" pertinent to the study of haunted houses. *Journal of the Society for Psychical Research*, *84*, 65–92.

Jelic, A., Tieri, G., De Matteis, F., Babiloni, F., & Vecchiato, G. (2016). The enactive approach to architectural experience: A neurophysiological perspective on embodiment, motivation, and affordances. *Frontiers in Psychology*, *7*, Article 481. https://doi.org/10.3389/fpsyg.2016.00481

Jentsch, E. (1997). On the psychology of the uncanny (1906). *Angelaki*, *2*, 7–16. https://doi.org/10.1080/09697259708571910

Johnson, A. A. (2013). Progress and its ruins: Ghosts, migrants, and the uncanny in Thailand.

Cultural Anthropology, *28*, 299–319. https://doi.org/10.1111/cuan.12005

Johnson, A. A. (2014). *Ghosts of the new city: Spirits, urbanity, and the ruins of progress in Chiang Mai*. University of Hawai'i Press.

Jones, L. (2000). *The hermeneutics of sacred architecture: Experience, interpretation, comparison* (2 vols). Harvard University Press.

Kaika, M. (2004). Interrogating the geographies of the familiar: Domesticating nature and constructing the autonomy of the modern home. *International Journal of Urban and Regional Research*, *28*, 265–286. https://doi.org/10.1111/j.0309-1317.2004.00519.x

Kapitány, R., Kavanagh, C., & Whitehouse, H. (2020). Ritual morphospace revisited: The form, function and factor structure of ritual practice. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, *375*, Article 20190436. https://doi.org/10.1098/rstb.2019.0436

Kleespies, M. W., Braun, T., Dierkes, P. W., & Wenzel, V. (2021). Measuring connection to nature—An illustrated extension of the Inclusion of Nature in Self Scale. *Sustainability*, *13*, Article 1761. https://doi.org/10.3390/su13041761

Kline, P. (1986/2015). *A handbook of test construction: Introduction to psychometric design*. Routledge.

Kryžanowski, Š. (2021). Feng shui: A comprehensive review of its effectiveness based on evaluation studies. *International Journal of Advances in Scientific Research and Engineering*, *7*, 61–71. https://doi.org/10.31695/IJASRE.2021.34103

Kyrlitsias, C., Michael-Grigoriou, D., Banakou, D., & Christofi, M. (2020). Social conformity in immersive virtual environments: The impact of agents' gaze behavior. *Frontiers in Psychology*, *11*, Article 2254. https://doi.org/10.3389/fpsyg.2020.02254

Lange, R. (2017). Rasch scaling and cumulative theory-building in consciousness research. *Psychology of Consciousness: Theory, Research and Practice*, *4*, 135–160. https://doi.org/10.1037/cns0000118

Lange, R., & Houran, J. (1997). Context-induced paranormal experiences: Support for Houran and Lange's model of haunting phenomena. *Perceptual and Motor Skills*, *84*, 1455–1458. https://doi.org/10.2466/pms.1997.84.3c.1455

Lange, R., & Houran, J. (2001). Ambiguous stimuli brought to life: The psychological dynamics of hauntings and poltergeists. In J. Houran and R. Lange (Eds.), *Hauntings and poltergeists: Multidisciplinary perspectives* (pp. 280–306). McFarland & Co.

Lange, R., & Houran, J. (2021). Replicable survey evidence for an 'enchantment-psi' loop. *Journal of Transpersonal Psychology*, *53*, 140–156.

Lange, R., Houran, J., Evans, J, & Lynn, S. J. (2019). A review and re-evaluation of the Revised Transliminality Scale. *Psychology of Consciousness: Theory, Research and Practice*, *6*, 67–89. https://doi.org/10.1037/cns0000153

Lange, R., Houran, J., Sheridan, L., Dagnall, N., Drinkwater, K., O'Keeffe, C., & Laythe, B. (2020). Haunted people syndrome revisited: Empirical parallels between subjective paranormal episodes and putative accounts of group-stalking. *Mental Health, Religion, & Culture*, *23*, 532–549. https://doi.org/10.1080/13674676.2020.1767552

Lange, R., Houran, J., & Tracey, J. B. (2022). Many happy returns: Preliminary study on retrospective and prospective experiences of enchantment. *Tourism and Hospitality Research*, *22*, 376–383. https://doi.org/10.1177/14673584211035774

Lange, R., Irwin, H. J., & Houran, J. (2000). Top-down purification of Tobacyk's Revised Paranormal Belief Scale. *Personality and Individual Differences*, *29*, 131–156. https://doi.org/10.1016/S0191-8869(99)00183-X

Lange, R., Laythe, B., & Houran, J. (in press). Pre-registered field test of an 'enchantment-psi' loop. *Journal of Parapsychology*.

Lange, R., Ross, R. M., Dagnall, N., Irwin, H. J., Houran, J., & Drinkwater, K. (2019). Anomalous

experiences and paranormal attributions: Psychometric challenges in studying their measurement and relationship. *Psychology of Consciousness: Theory, Research, and Practice, 6*, 346–358. https://doi.org/10.1037/cns0000187

Lange, R., Thalbourne, M. A., Houran, J., & Storm, L. (2000). The Revised Transliminality Scale: Reliability and validity data from a Rasch top-down purification procedure. *Consciousness & Cognition*, *9*, 591–617. https://doi.org/10.1006/ccog.2000.0472

Langston, W., & Hubbard, T. (2019). Shadow walking: Will a ghost walk tour affect belief in ghosts? *Journal of Parapsychology*, *83*, 47–68. https://doi.org/10.30891/jopar.2019.01.04

Laythe, B., & Houran, J. (2019). Concomitant object movements and EMF-spikes at a purported haunt. *Journal of the Society for Psychical Research*, *83*, 212–229.

Laythe, B., Houran, J., Dagnall, N., & Drinkwater, K. (2021). Conceptual and clinical implications of a "haunted people syndrome." *Spirituality in Clinical Practice*, *8*, 195–214. https://doi.org/10.1037/scp0000251

Laythe, B., Houran, J., Dagnall, N., Drinkwater, K., & O'Keeffe, C. (2022). *Ghosted! Exploring the haunting reality of paranormal encounters*. McFarland & Co.

Laythe, B., Houran, J., & Little, C. (2021). The ghostly character of childhood imaginary companions: An empirical study of online accounts. *Journal of Parapsychology*, *85*, 54–74. http://doi.org/10.30891/jopar.2021.01.07

Laythe, B., Houran, J., & Ventola, A. (2018). A split-sample psychometric study of haunters. *Journal of the Society for Psychical Research*, *82*, 193–218.

Laythe, B. R., Laythe, E. C., & Woodward, L. (2017). A test of an occult themed séance: Examining anomalous events, psychosomatic symptoms, transliminality, and electromagnetic fields. *Journal of Scientific Exploration*, *31*, 572–624.

Lee, S., & Seo, K. (2013). Combining space syntax with GIS-based built environment measures in pedestrian walking activity. In Y. O. Kim, H. T. Park, & K. W. Seo (Eds.), *Proceedings of 9th International Space Syntax Symposium, 098*, pp. 1–14. Sejong University Press.

Lidov, A. (Ed.) (2006). *Hierotopy: Creation of sacred spaces in Byzantium and medieval Russia*. Progress-Tradition.

Little, C., Laythe, B., & Houran, J. (2021). Quali-quantitative comparison of childhood imaginary companions and ghostly episodes. *Journal of the Society for Psychical Research*, *85*, 1–30.

Long, Y., Baran, P. K., & Moore, R. (2007). The role of space syntax in spatial cognition: Evidence from urban China. In A. S. Kubat (Ed.). *Proceedings of 6th International Space Syntax Symposium*, *129*, pp. 1–6. Istanbul Technical University.

Lovell, J., & Griffin, H. (2022). Unfamiliar light: The production of enchantment. *Annals of Tourism Research*, *92*, Article 103328. https://doi.org/10.1016/j.annals.2021.103328

Lovell, J., & Thurgill, J. (2021). Extending hot authentication: Imagining fantasy space. *Annals of Tourism Research*, *87*, Article 103138. https://doi.org/10.1016/j.annals.2020.103138

Marinelli, M., & Ricatti, F. (2003). Emotional geographies of the uncanny: Reinterpreting Italian transnational spaces. *Cultural Studies Review*, *19*(2), 5–18. https://doi.org/10.5130/csr.v19i2.3496

Markovsky, B. & Thye, S. R. (2001). Social influence on paranormal beliefs. *Sociological Perspectives*, *44*, 21–44. https://doi.org/10.1525/sop.2001.44.1.21

Masschelein, A. (2011). *The unconcept: The Freudian uncanny in late-twentieth-century theory*. SUNY Press.

Mazloomi, S. M., Ariffin, S. I., & Shahminan, R. N. R. (2014). Predictors of sense of place in Mosques. *Asian Journal of Social Psychology*, *17*, 128–140. https://doi.org/10.1111/ajsp.12053

McAndrew, F. T. (2020). The psychology, geography, and architecture of horror: How places creep us out. *Evolutionary Studies in Imaginative Culture*, *4*, 47–62. https://doi.org/10.26613/esic.4.2.189

Mizrahi, M. (2018, August 12). Sacred architecture and the invisible order of things. *Epoch Times*, pp. 44–51. http://www.epochtimes.co.il/et/210085

Moeran, B. (2009). From participant observation to observant participation. In S. Ybema, D. Yanow, H. Wels, & F. Kamsteeg (Eds.). *Organizational ethnography: Studying the complexities of everyday life* (pp. 139–155). SAGE Publications.

Oakley, D. A., & Halligan, P. W. (2017). Chasing the rainbow: The non-conscious nature of being. *Frontiers in Psychology*, *8*, Article 1924. https://doi.org/10.3389/fpsyg.2017.01924

O'Keeffe, C., Houran, J., Houran, D. J., Drinkwater, K., Dagnall, N., & Laythe, B. (2019). The Dr. John Hall story: A case study of putative "haunted people syndrome." *Mental Health, Religion, & Culture*, *22*, 910–929. https://doi.org/10.1080/13674676.2019.1674795

Pedregosa, F., Varoquaux, G., Gramfort, A., Michel, V., Thirion, B., Grisel, O., Blondel, M., Prettenhofer, P., Weiss, R., Dubourg, V., Vanderplas, J., Passos, A., Cournapeau, D., Brucher, M., Perrot, M., & Duchesnay, E. (2011). Scikit-learn: Machine learning in Python. *Journal of Machine Learning Research*, *12*, 2825–2830.

Peng, J., Strijker, D., & Wu, Q. (2020). Place identity: How far have we come in exploring its meanings? *Frontiers in Psychology*, *11*, Article 294. https://doi.org/10.3389/fpsyg.2020.00294

Petersen, R. (2017). Emotions as the residue of lived experience. *PS: Political Science & Politics*, *50*, 932–935. https://doi.org/10.1017/S1049096517001019

Pharino, C., Pearce, P., & Pryce, J. (2018). Paranormal tourism: Assessing tourists' onsite experiences. *Tourism Management Perspectives*, *28*, 20–28. https://doi.org/10.1016/j.tmp.2018.06.003

Pingel, M. (2021, September 13). The dining room is back: Why so many people are embracing a forgotten space. *The Washington Post Magazine*. https://www.washingtonpost.com/magazine/2021/09/13/dining-room-future-pandemic

Pirok, A. (2022). *The spirit of Colonial Williamsburg: Ghosts and interpreting the recreated past*. University of Massachusetts Press.

Pramova, E., Locatelli, B., Valdivia-Díaz, M., Vallet, A., Quispe Conde, Y., Djoudi, H., Colloff, M. J., Bousquet, F., Tassin, J., & Munera Roldan, C. (2022). Sensing, feeling, thinking: Relating to nature with the body, heart and mind. *People and Nature*, *4*, 351–364. https://doi.org/10.1002/pan3.10286

Puhle, A., & Parker, A. (2021). Dark or paranormal tourism: A major attraction throughout history. *Australian Journal of Parapsychology*, *21*, 7–30.

Rasch, G. (1960/1980). *Probabilistic models for some intelligence and attainment tests.* (Copenhagen, Danish Institute for Educational Research), expanded edition (1980) with foreword and afterword by B. D. Wright. University of Chicago Press.

Raymond, C., Brown, G., & Weber, D. (2010). The measurement of place attachment: Personal, community, and environmental connections. *Journal of Environmental Psychology*, *30*, 422–434. https://doi.org/10.1016/j.jenvp.2010.08.002

Reznikoff, S. C. (1983). *Sensuous spaces: How to create romantic, seductive and sensuous settings*. Whitney Library of Design.

Rheingold, H. (1991). *Virtual reality: Exploring the brave new technologies*. Simon & Schuster Adult Publishing Group.

Seim, J. (2021). Participant observation, observant participation, and hybrid ethnography. *Sociological Methods & Research*. Advance online publication. https://doi.org/10.1177/0049124120986209

Shamai,S.,& Ilatov,Z.(2005). Measuring sense of place: Methodological aspects.*Journal of Economic and Human Geography*, *96*, 467–476. https://doi.org/10.1111/j.1467-9663.2005.00479.x

Shan, J., & Toth, C. K. (2018). *Topographic laser ranging and scanning: Principles and processing* (2nd ed.). CRC Press. https://doi.org/10.1201/9781315154381

Silva, T., & Woody, A. (2022). Supernatural sociology: Americans' beliefs by race/ethnicity, gender, and education. *Socius*, *8*, 1–18. https://doi.org/10.1177/23780231221084775

Silverman, S. M. (2019). *The amusement park: 900 years of thrills and spills, and the dreamers and schemers who built them*. Black Dog & Leventhal.

Sime, J. (2013). Exhumations: The search for the dead and the resurgence of the uncanny in contemporary Spain. *Anthropology and Humanism*, *38*, 36–53. https://doi.org/10.1111/anhu.12001

Skandali, C., & Blundell, E. W. (2021). Conceiving monument networks through lighting design. *Academia Letters*, Article 4496. https://doi.org/10.20935/AL4496

Smith, F., & Ironside, R. (2022). The uncanny place: A critical appraisal of popular paranormal TV shows. *Journal of Popular Television*, *10*, 95–108. https://doi.org/10.1386/jptv_00072_1

Star, S. L., & Griesemer, J. R. (1989). Institutional ecology, 'translations' and boundary objects: Amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39. *Social Studies of Science*, *19*, 387–420. https://doi.org/10.1177/030631289019003001

Stroik, D. (2018, September 1). *Principles of sacred architecture*. Lecture sponsored by the Tocqueville Program (University of Notre Dame) and the Napa Institute. University of Notre Dame. https://think.nd.edu/principles-of-sacred-architecture

Summers, L., & Johnson, S. (2017). Does the configuration of the street network influence where outdoor serious violence takes place? Using space syntax to test crime pattern theory. *Journal of Quantitative Criminology*, *33*, 397–420. https://doi.org/10.1007/s10940-016-9306-9

Tandy, V. (2002). A litmus test for infrasound. *Journal of the Society for Psychical Research*, *66*, 167–174.

Tashjian, S. M., Fedrigo, V., Molapour, T., Mobbs, D., & Camerer, C. F. (2022). Physiological responses to a haunted-house threat experience: Distinct tonic and phasic effects. *Psychological Science*, *33*, 236–248. https://doi.org/10.1177/09567976211032231

Taylor, T. S. (2019). *Introduction to laser science and engineering*. CRC Press. https://doi.org/10.1201/b22159

Tellegen, A., & Atkinson, G. (1974). Openness to absorbing and self-altering experiences ("absorption"), a trait related to hypnotic susceptibility. *Journal of Abnormal Psychology*, *83*, 268–727. https://doi.org/10.1037/h0036681

Thalbourne, M. A., & Maltby, J. (2008). Transliminality, thin boundaries, unusual experiences, and temporal lobe lability. *Personality and Individual Differences*, *44*, 1617–1623. https://doi.org/10.1016/j.paid.2008.01.022

Tobacyk, J. J. (1988). *A Revised Paranormal Belief Scale*. Unpublished manuscript. Louisiana Tech University.

Tobacyk, J. (2004). The Revised Paranormal Belief Scale. *International Journal of Transpersonal Studies*, *23*, 94–98. https://doi.org/10.24972/ijts.2004.23.1.94

Trentelman, C. (2009). Place attachment and community attachment: A primer grounded in the lived experience of a community sociologist. *Society & Natural Resources*, *22*, 191–210. https://doi.org/10.1080/08941920802191712

Trigg, D. (2012). *The memory of place: A phenomenology of the uncanny*. Ohio University Press.

van Elk, M., Karinen, A., Specker, E., Stamkou, E., & Baas, M. (2016). 'Standing in awe': The effects of awe on body perception and the relation with absorption. *Collabra*, *2*, Article 4. https://doi.org/10.1525/collabra.36

Ventola, A., Houran, J., Laythe, B., Storm, L., Parra, A., Dixon, J., & Kruth, J. G. (2019). A transliminal 'dis-ease' model of poltergeist 'agents.' *Journal of the Society for Psychical Research*, *83*, 144–171.

Vidler, A. (1993). *The architectural uncanny: Essays in the modern unhomely*. MIT Press.

Wang, S., Sanches de Oliveira, G., Djebbara, Z., & Gramann, K. (2022). The embodiment of architectural experience: A methodological perspective on neuro-architecture. *Frontiers in Human Neuroscience*, *16*, Article 833528. https://doi.org/10.3389/fnhum.2022.833528

Wells, J. C. (2017). How are old places different from new places? A psychological investigation of the correlation between patina, spontaneous fantasies, and place attachment. *International Journal of Heritage Studies*, *23*, 445–469. https://doi.org/10.1080/13527258.2017.1286607

Wells, J. C., & Baldwin, E. D. (2012). Historic preservation, significance, and age value: A comparative phenomenology of historic Charleston and the nearby new-urbanist community of I'On. *Journal of Environmental Psychology*, *32*, 384–400. https://doi.org/10.1016/j.jenvp.2012.06.002

Welwood, J. (1977). On psychological space. *Journal of Transpersonal Psychology*, *9*, 97–118.

Wilson, K., & French, C. C. (2014). Magic and memory: Using conjuring to explore the effects of suggestion, social influence, and paranormal belief on eyewitness testimony for an ostensibly paranormal event. *Frontiers in Psychology*, *5*, Article 1289. https://doi.org/10.3389/fpsyg.2014.01289

Wiseman, R., Watt, C., Greening, E., Stevens, P., & O'Keeffe, C. (2002). An investigation into the alleged haunting of Hampton Court Palace: Psychological variables and magnetic fields. *Journal of Parapsychology*, *66*, 387–408.

Wiseman, R., Watt, C., Stevens, P., Greening, E., & O'Keeffe, C. (2003). An investigation into alleged 'hauntings'. *British Journal of Parapsychology*, *94*, 195–211. https://doi.org/10.1348/000712603321661886

Witmer, B. G., & Singer, M. J. (1998). Measuring presence in virtual environments: A presence questionnaire. *Presence*, *7*, 225–240. https://doi.org/10.1162/105474698565686

Wolfreys, J. (2001). *Victorian hauntings: Spectrality, gothic, the uncanny and literature*. Red Globe Press.

Wright, B. D., & Douglas, G. (1975). *Best test design and self-tailored testing* (Research Memorandum No. 19). University of Chicago, Statistical Laboratory, Department of Education.

Zare, G., Faizi, M., Baharvand, M., & Masnavi, M. (2021). A review of biophilic design conception implementation in architecture. *Journal of Design and Built Environment*, *21*, 16–36. https://doi.org/10.22452/jdbe.vol21no3.2

Zerouati, W., & Bellal, T. (2020). Evaluating the impact of mass housings' in-between spaces' spatial configuration on users' social interaction. *Frontiers of Architectural Research*, *9*, 34–53. https://doi.org/10.1016/j.foar.2019.05.005

APPENDIX A

Raw Summed Ratings of Gestalt Effects (Original Six Factor Solution) in the Haunted House Immersive Exercise

Visitor	Total VEQ score	*Affordance*	*Ambiguity & Threat*	*Atmosphere*	*Immersion & Presence*	*Legibility*	*Memory & Associations*
Room 1							
A	35	9	6	3	5	9	3
B	33	10	3	4	4	9	3
C	47	10	6	10	8	10	3
Room 2/3							
A	35	9	4	5	5	9	3
B	37	9	4	9	5	7	3
C	36	9	4	7	5	8	3
Room 4							
A	34	7	3	7	5	9	3
B	45	11	3	7	6	11	7
C	36	10	3	5	4	11	3
Room 5							
A	34	7	6	6	3	9	3
B	44	8	7	7	5	10	7
C	46	8	8	12	8	7	3
Room 6							
A	36	7	6	7	5	8	3
B	45	10	7	8	8	9	3
C	45	9	8	9	9	7	3
Room 7							
A	39	9	6	7	6	8	3
B	42	12	10	6	6	5	3
C	40	8	7	7	7	7	4
Room 8							
A	35	7	6	7	5	7	3
B	31	10	8	3	4	3	3
C	41	7	7	9	7	8	3
Room 9							
A	41	7	6	8	5	9	6
B	31	9	4	3	3	9	3
C	34	6	3	9	5	8	3
Room 10							
A	36	8	6	7	5	7	3
B	39	12	7	3	5	8	4
C	53	11	5	9	10	8	10

APPENDIX B

THE VISITOR EXPERIENCE QUESTIONNAIRE (PILOT VERSION)

Please answer all the questions honestly. Your responses are confidential.
Thank you for your participation!

Your first impression of this surrounding space/area/room:

| ---------- | ---------- | ---------- | ---------- | ---------- |
Very Good Vibes Good Vibes No Vibes Bad Vibes Very Bad Vibes

For the following statements, please select the number that best matches your impressions:

1	**2**	**3**	**4**
Strongly Disagree	*Somewhat Disagree*	*Somewhat Agree*	*Strongly Agree*

Affordance: or "a possibility for action" provided by the environment or the degree of interaction between the surrounding space and the visitor.

- This space could have many different uses ___
- This space makes me curious to explore ___
- This space is full of interesting possibilities ___

Ambiguity & Threat: or a "risk assessment" in terms of a visitor's feelings of comfort or discomfort within the surrounding space.

- This space makes me feel "on alert" ___
- This space makes me disoriented ___
- This space makes me want to leave ___

Atmosphere: or the overall "tone and impact" of the surrounding space to the visitor.

- This space makes me feel strong emotions ___
- This space has a definite mood to it ___
- This space makes me feel different types of emotions ___

Immersion & Presence: or the extent to which the visitor feels physically present within—and totally focused on—the surrounding space.

- This space deeply moves me ___
- This space totally grabs my attention ___
- This space makes me step outside my usual self to experience an entirely different state of being ___

Legibility: or the ease with which the surrounding space can be recognized, organized into a pattern, and then recalled—specifically related to clear/ unobstructed views and protective places to hide.

- This space makes me feel safe. ___
- This space is easy to navigate or move around in. ___
- This space has a layout and details that are easy for me to remember. ___

Memory & Associations: or the surrounding space contains colors, symbols, textures, objects, sounds, odors, or a sense of "time" with personal meaning to the visitor.

- This space makes me think of a specific time, place, or person in my life. ____
- This space feels familiar to me. ___
- This space is similar to another setting where I had a very memorable experience ____