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Something is Lurking: The Impact of Liminality on the Emotional Valence of Buildings

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Something is Lurking: the Impact of Liminality on the Emotional Valence of Buildings

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by

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Annandale on Hudson, NY

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To the ghosts and mysteries of Bard College– may you forever remain unsolved.

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Abstract

This proposed study examines the effect of architectural liminality on the emotional experience of occupying buildings. Liminality is a quality of strangeness in built spaces which arises from deviations in normal, expected, or logical design. These deviations may create a sense of unease or being creeped out. The proposed study tests the self-reported emotional reaction of participants to one of two buildings, one having liminal traits and the other being without them. It is hypothesized that a greater degree of discomfort or nervousness will be reported in the liminal space than in the nonliminal.

Introduction

The Root Cellar Incident

It was the night of Punk Rock Prom, 2022. I was sitting with two of my friends on the steps of Hegeman Hall at Bard College in Annandale on Hudson, New York. The show was in Root Cellar, a small venue in the basement of an adjoining building. From where we sat, we could see the entrance– the singular ingress and egress– very clearly. The concert had a few different bands and we arrived just as one set was ending, so we hung out outside waiting for the next act. There was a group of 15, maybe 20 people gathered across the courtyard, apparently waiting too. After a few minutes, we heard the

first noises of a sound check. There was speaker static, some drums, and a few guitar chords. It sounded like the next band was warming up. Right away, we got up and started heading back to Root Cellar. The group across the courtyard was closer to the door so they got there first. We were 20, maybe 30 seconds behind them. We opened the door, unsuspecting, and filed in. Immediately, something was wrong. It was too quiet and too cold and too dark. The place was deserted. No people, no instruments, no speakers. The sound board was cold. The air was cold. It felt like no one had been there in days, but somehow it also felt like something had *just* happened. Something was not right. I am not ashamed to say that I cried out of fear. We tried so hard to think of an explanation but there just wasn't one. We all saw the same thing with complete clarity and confidence. Every detail corresponded. If it was a hallucination, it was a perfectly collated group hallucination. Root Cellar, as I mentioned, has one way in and one way out. There's nowhere to hide– we searched the whole place. I put it to you: what the hell happened that night?

There are many words to describe this experience, though none truly capture it. *Creepy* is definitely a start, though. So began a senior project concept. This project has evolved considerably since the original idea. At first, the study was going to be about ghosts and where they come from, and then was narrowed down to haunted spaces and

what makes them feel haunted, which was ultimately condensed to an examination of the architectural quality of liminality. The core of this study is the question of what makes a space feel creepy. Seeing 15-20 people disappear into thin air will definitely do the trick, but what else is at play?

Evolutionary Impact of Spatial Design

Every moment has a setting. The setting can be a defining feature of that moment, depending on the defining features of the setting. Some places are just downright creepy, and lend themselves perfectly to creepy moments. While creepiness is an incredibly difficult thing to measure in a space, there are many traits of structures which can be evaluated. Based on research thus far, including Jay Appleton's 1975 book "The Experience of Landscape" and Francis T McAndrew's 2020 article "The Psychology, Geography, and Architecture of Horror: How Places Creep Us Out," it seems that certain evolutionary cues generate predictable reactions to different characteristics of settings. The qualities of visibility, cover, and a quick exit are very key to a person's comfort in a space. Appleton (1975) theorizes that the most safe and comfortable space is one which has both prospect (a view of any oncoming dangers) and refuge (a place to hide from danger). Appleton and McAndrew both cite Barry Greenbie's 1982 summary of this concept: "you can see without being seen and eat

without being eaten." In nature, this may be some arrangement like a copse of trees in a field which provides cover but leaves an open view of the surrounding area. In built environments, protected spaces and clear visibility are features of architecture which may be created in many ways.

Legibility

The natural feature of prospect is translated into architecture as legibility: the clarity of a building's layout and ease with which it can be navigated. A space which is easy to understand and orient oneself in is naturally a more comfortable space than one which is unusually laid out or difficult to navigate. There is an innate comfort in a structure which is predictable. This architecture can be termed legible, as it is easy to read. Illegible architecture, by contrast, presents a problem with navigation and may feel less safe. The somewhat more abstract concept of liminality also relates to the comfort of predictability. In a liminal space, some trait of design is actively wrong– the architecture is illogical or unexpected, or the space does not appear as it should, or in some way it does not fit with reality. Presence of liminality or lack of legibility produce spaces which are ambiguous and confusing. Ambiguity in architecture or design limits a person's ability to predict or respond to threats and so generates a feeling of general unease.

One extreme example of illegible architecture is the legendary Winchester Mystery House in San Jose, California, which earns its reputation as a deeply unsettling "haunted" house by virtue of its extremely irregular floor plans (Fig. 1). Legend has it that Sarah Winchester, heiress to the Winchester Repeating Arms Company, built the house as a means of escaping the vengeful spirits of those killed by the Winchester repeating rifle. Supposedly, the unusual layout and the constant changes in design were intended to confuse the spirits. The construction spanned from 1886 to 1922, ending only with Sarah's death (winchestermysteryhouse.com). Over the course of the project, many conflicting architectural plans merged to create a large and rambling house full of strange and illogical features such as staircases to nowhere, second story exterior doors that open into thin air (Fig. 2), and completely inaccessible hidden rooms. In a space such as this, it is impossible to know what to expect around each corner. Even without evident threats, this is an environment which naturally feels creepy.

Figure 1: The Winchester Mystery House

Image: Atlas Obscura

Figure 2: The Door to Nowhere

Image: The New Haven Register

Operationalizing Creepiness

Creepiness is an incredibly difficult concept to operationalize. It can only be measured by self reports, and the nature of a "creeped out" feeling is subjective. However, attempts have been made to explore what causes a feeling of creepiness. A 2018 study by Langer & König piloted the Creepiness of Situation Scale (CRoSS) to attempt to measure creepiness in several situations. In human interactions, creepiness may be generated by behavior which is unusual or unpredictable. Individuals were rated as creepier if they diverged, even subtly, from typical social behavior. The authors chose to define creepiness as "a potentially negative and uncomfortable emotional response paired with perceptions of ambiguity toward a person, technology or even during a situation." (p. 2-3). The aspect of uncertainty is key to the specific experience of "creepiness." Phrased by McAndrew & Koehnke in their 2016 article "On the Nature of Creepiness," "it is not the clear presence of danger that makes us feel creepy, but the uncertainty of whether danger is present or not" (p. 2). This concept is called Threat Ambiguity. When a person or situation seems off in some way, but not in an identifiable or understandable way, the imagination can run wild and wander into very scary places.

Recreational Horror

There are situations in which a person is prepared to expect the unexpected. A visitor to the Winchester House may be considerably less uneasy knowing details about the house's oddities and being ready or enthused to explore a strange space. This intentional foray into mysterious circumstances presents a much safer situation, as the individual is able to predict an experience of the cultivated unknown even without knowing the details beforehand. The popularity of confounding spaces such as corn mazes is facilitated by expectations of a certain kind of mysterious environment. Francis McAndrew's 2020 article "The Psychology, Geography, and Architecture of Horror: How Places Creep Us Out" pieces apart this distinction. While the unknown is generally something which generates anxiety, what is known about the unknown eases it. For example, a topiary maze may disorient or baffle visitors, but any surprises within are generally positive. Even if a person doesn't know exactly what to expect, the location is not very alarming when it can be assumed that they may stumble across a fountain or a statue that may be unexpected but is regardless safe and enjoyable.

This is a stark contrast to a space such as a haunted house, in which surprises and discoveries are expected to be negative. Even in situations such as this, a person can have a generally accurate expectation for what they will experience. It may be a

chainsaw-wielding madman or a horrifying zombie, but the individual knows that these are really employees in costumes. Depending on their experience with haunted houses, individuals may be very well equipped to anticipate what will happen. Predictability can make even scary-themed situations feel comfortable.

One assertion that McAndrew (2020) makes is that a person may be exposed to alarming stimuli without experiencing fear when the exposure is distanced and controlled. For example, many horror movie fans watch protagonists make terrible survival choices and enjoy yelling at the screen. Being safely on the other side of the TV, it is easy to assume "if I were in that situation, I would know exactly what to do. You wouldn't see me investigating the strange noise in the basement." Without any risk of actually facing such threats, a person may even feel a sense of power from their confidence that they would perfectly handle a dangerous situation.

The Uncanny Valley

Many non-human organisms and objects can read as human. Any kind of face-like shape with identifiable eyes, nose, and mouth can convey humanity. As explored by many including Kanwisher et al. (1997), the fusiform face area is a region of the human brain which is eager to identify anything even remotely face-like as a human face. Likewise, any shapes which could be interpreted as a head, body, and limbs may be

anthropomorphized. Humans look for the human in everything. This can be a very pleasant exercise. A roomba with googly eyes is an instant friend. Pretty much any object with googly eyes can be personified. These objects turned creatures are typically seen as cute or funny. They have just enough human characteristics to be anthropomorphized.

However, this anthropomorphization gets much less cute when it isn't done *the right way*. It is very difficult to draw this distinction. Masahito Mori first explored this concept in his 1970 article "The Uncanny Valley." Mori asserts that there is a trajectory of emotional responses to human-esque stimuli in which reactions are positive to slightly humanoid objects such as robots which resemble humans somewhat, and are very clearly not human even if some of their traits are anthropomorphized. However, stimuli can reach a point where they are TOO humanoid. For instance, many robots are designed to look, speak, and act as human as possible. However, these robots cannot be made to seem exactly human. Something is off with them– the face is too still, the voice is too monotone, the movements are too jerky… these are stimuli which are ALMOST human but clearly not human. These stimuli typically produce very unsettled and unnerved reactions. As the stimuli become more human, there comes a point where they are indistinguishable from actual humans, and the creepiness alleviates. Charting this

trajectory results in a graph of affinity with objects which dips profoundly into a "valley" of negative reactions to stimuli which are too human but not human enough (Fig.3). When something is familiar but distinctly WRONG in some way, this is deeply unsettling and produces a feeling of being creeped out. Oftentimes, the nonhuman traits are not immediately apparent. A less accurate robot may have what reads as a face, but if it is purple and sparkly and has cartoonish features, it is very obviously not human and has been given stylized human traits for purposes of cuteness. However, when a robot's face has realistic features, and it is only the nuances of expression, movement, or voice which are just not quite right, the unease which accompanies ambiguity is produced. A classic example of this is Sophia, a disturbingly human robot who just gets creepier the more she tries to mimic human expressions (Fig.4). There is a feeling of wrongness– and potentially some vague unspecified danger– which creates creepiness or uncannyness.
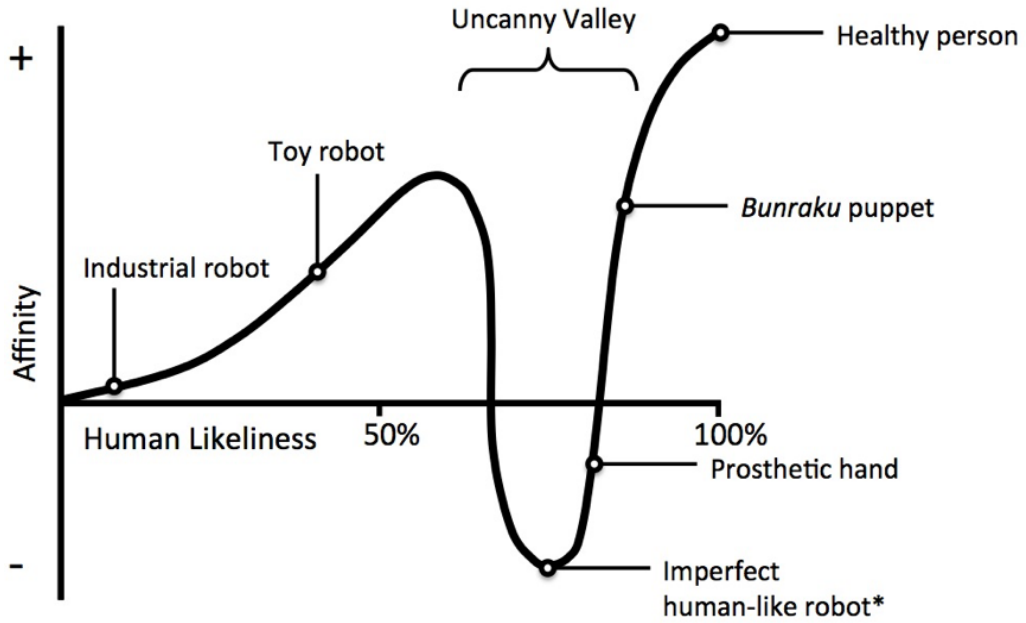
Figure 3: Graph of The Uncanny Valley
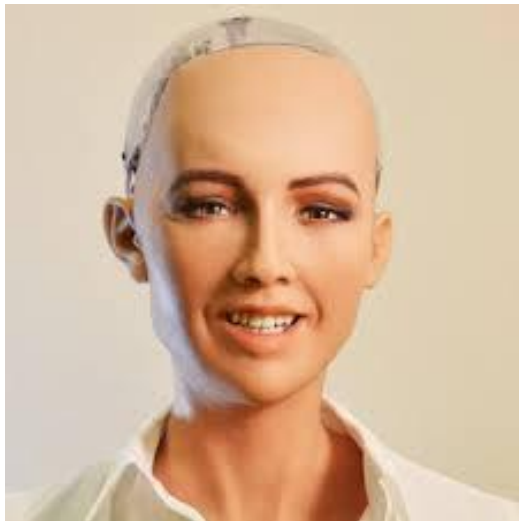Image: The Oxford Scientist

Figure 4: Sophia the Robot
Image: London Speaker Bureau

Liminality

Only recently has the concept of the Uncanny Valley been applied to environments and architecture under the term liminality. The same principles of threat ambiguity apply: in spaces that feel "off" in some way, feelings of unease or creepiness are often generated. Prior to any attempts to operationalize liminality, the concept was popularized on the internet as a category of intriguingly disturbing place images. The story seems to begin in 2019 with an anonymous post in a paranormal forum on the social media site 4chan. The post asked users to contribute "disquieting images that just feel 'off'" (Aesthetics Wiki). This post and the ensuing responses began an aesthetic phenomenon which became known as Liminal Space.

These images tend to share many traits. They are often liminal in the sense of motion. Transitional spaces such as hallways and staircases are common. The unifying features of these images include familiarity of the environment and an unusual lack of social presence. Many pictures are of public places normally populated in the daytime, seen empty at night. This is a common version of a space which is missing a key component in order to feel right and normal. These spaces are also usually devoid of features or adornments, or contain features which do not fit the general environment. A seemingly endless, empty, unadorned hallway (Fig. 5) that is dimly lit by fluorescent

lights is a good example. In many cases, these extremely featureless spaces evoke a sense

of deja vu. An empty hallway, or a grim hotel pool, or some other cookie cutter public

place are types of spaces that most people have likely encountered. However, in this case

the space is somehow "off," and may often elicit a dreamlike sense of displacement in

space and time. These deviations from typical expectations of architecture and context

can create a similar feeling of unease as that which people experience in response to

uncanny humanoid stimuli.
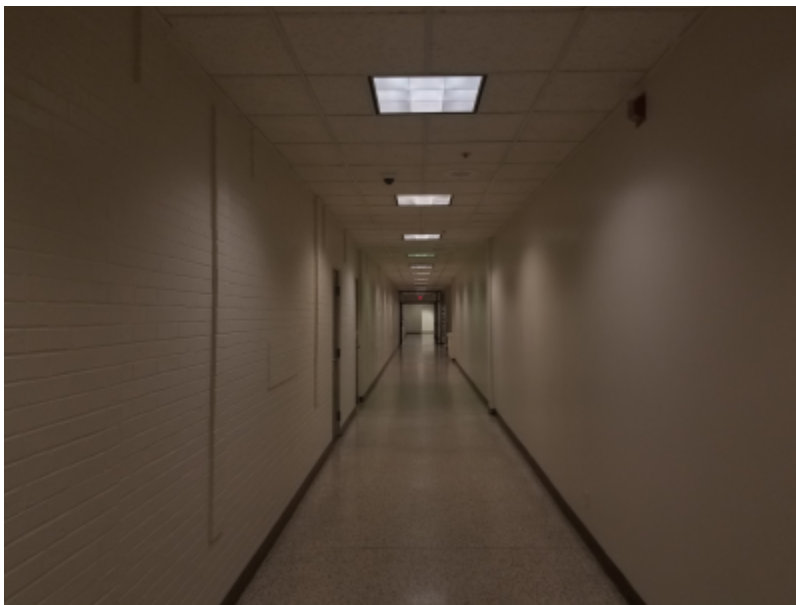
Figure 5: Liminal Hallway
Image: Pintrest

Figure 6: Liminal Room
Image: TRASHMAG

This phenomenon was recently examined by Diel & Lewis' 2022 article

"Structural deviations drive an uncanny valley of physical places." This set of

experiments tested the impact of realism on participants' perception of CGI generated

images of spaces. The stimuli consisted of renderings of interior environments which

were distorted in some way. These included images drawn from the internet and follows

the internet's concept of liminality, tending towards motifs including hallways, empty

public places, entirely unmarked and seemingly endless locations, poor and/or no

lighting, and unusual architectural or design features. Another set of stimuli isolated the

distortion aspect of liminality with CGI images of normal interiors in which some

specific feature was altered. These alterations included switching doors and windows, changing the sizes of objects in the room to be incongruous, or copying features of the space to give a strange repetition effect. These sets of liminal images were compared against a control sample of normal interior images. A later study honed in on the specific characteristics of distortions in size, repetition, displacement of features or objects, and lack of normal features.

In a similar vein to the concept of legibility, in which spaces are predictable and easy to navigate, this study found that "inconsistent or configurally deviating environments may appear less comprehensible, predictable, safe, and generally less pleasant" (p. 2). The Uncanny Valley applied to built environments goes a step further in architectural illegibility. To be uncanny, a space must be not only confusing but actively *wrong* in some concrete and baffling way. Such a space can be described as liminal. Diel and Lewis (2022) define liminal spaces as "ambiguous, distressing, or "off" physical places" (p. 2). This proposed experiment hypothesizes that such spaces will produce an emotional valence of creepiness.

Experimental Design

Overview

This experiment will focus on the variable of liminality in architecture and its impact on the emotional valence of built spaces. Two buildings of contrasting ages and architectural styles will be used as stimuli. These buildings have been evaluated by the experimenter as liminal and non-liminal based on layout and design features. The plan is to briefly survey participants on their emotional state and experience with Bard's campus prior to seeing the buildings (to confirm eligibility), then give a more detailed survey after the tour enquiring about their emotional reactions to the buildings. This data will be analyzed with a t-test to examine differences in emotional response in relation to building style.

Methods

Participants

Participants will be drawn from prospective Bard students who are visiting for the first time and have never seen these buildings. Participants will be ineligible if someone they know closely has attended Bard. All participants must be 18 or older. A total of 100 participants will be recruited, 50 in each condition. This number has been

reached through the consideration that it should be plenty, and as this is a proposed

experiment, recruitment is a non-issue. Conditions will be randomly assigned in the

hopes that groups will be roughly balanced in gender and other factors. This design is

between-subjects, so each participant will only tour one building. These participants

will be lured in by the promise of the real dirt on Bard and compensated with tote bags.

Materials

The stimuli in this proposed experiment include two buildings on Bard campus,

each serving as an example of the presence or lack of liminality. Avery, the Bard film

building, is an excellent example of liminal architecture (Fig. 7). This building has many

features which do not seem quite right– the hallways are not at right angles and seem to

flow together without any distinguishing features. There are also some specific design

items which seem poorly designed, such as a closet that is on a platform some 4 ½ feet

above a staircase (Fig. 8). This building seems to take poor design to a downright

disturbing level. While certainly not the only building on campus which is arguably

liminal– something is very, very wrong with Robbins for example– Avery provides

extremely specific examples of liminal characteristics such as the labyrinthine layout

devoid of landmarks and the assorted downright bizarre features, most notably the door

floating in space.

Figure 7: Avery Hall (Exterior)

(Image: Bard College)

Figure 8: The Floating Door

While it is extremely difficult to measure a lack of liminality, some liminal traits

have clear opposites and several of these are seen in Olin Hall (Fig. 9). The floors are

uniform in layout without being too identical, and the rooms are comfortable in a very

banal way. Without being featureless to the point of strangeness, Olin has a very simple

design with neutral colors and uncomfortable wooden furniture. Olin can be taken as an

example of uniform and predictable architecture. Of course, most buildings which are

not liminal are nonliminal. Many buildings on Bard campus could be used as the

non-liminal option. Olin has been selected because of its simple layout and

unremarkable architecture. If liminality is an atmosphere, Olin is perhaps one of the

least atmospheric buildings on campus. Alas this judgment has to be largely subjective

at the end of the day but some building or other needs to be selected.

Figure 9: Olin Hall (Exterior)

(Image: Bard College)

Figure 10: Olin Hall (Interior)

Scales:

To measure participant reactions, scales will be borrowed from other works in modified formats. The CRoSS scale as piloted by Langer and König (2018) involved 14 statements (p. 5) eg. "I felt uneasy during this situation" which participants would agree or disagree with on a scale of 1-10, with 1 meaning strongly disagree, 10 meaning strongly agree, and 5 being neutral. Most of the 14 statements are vague enough to also apply to tours of buildings. The ones that seem most helpful are:

- I felt uneasy during this situation

- I had an indefinable fear during this situation

- I did not know exactly what to expect of this situation

- I did not know how to judge this situation

Statements will also be added::

- I feel lost in this building

- I feel that this building is poorly designed

- I would be displeased if this was my major's building

- I would be uncomfortable in this building at night

Data will be measured through self-reports. Participants will rate how strongly

they agree with each statement on the 1-10 scale. These values will in turn be averaged

for an overall creepiness value for each building.

For the eligibility confirmation questionnaire given at the start of the

experiment, the Positive and Negative Affect Scale (PANAS) as created by Watson,

Clark, and Tellegen (1988) will be used. This scale asks for the degree to which people

have experienced 20 different emotions on a scale of 1 to 5, with 1 indicating slightly or

not at all, 3 indicating moderately, and 5 indicating extremely. The original scale asks

for emotions over the past week to be reported, but in this experiment, reports will be

specific to the day of the experiment. The PANAS scale yields two values– positive and

negative affect scores– based on the averages of scores on positive and negative

emotions. Participants who report extreme positive or negative emotion (scoring above or below 2 standard deviations from the mean) at the time of the experiment will not be eligible as their emotional state will be affected in ways completely unrelated to the buildings.

Procedure:

Participants will be met at the Stevenson gym, from which neither of the stimulus buildings are visible. The experiment will be conducted during the early afternoon on a weekend day when few people are expected to be in these buildings. The pre-tour survey establishing baseline emotional state and confirming eligibility will be conducted here. After the survey, participants will be led to the building. Participants will be taken one at a time so that they are not influenced by the reactions of others in a group and to erase potential impacts of social presence. This is a between-subjects design so it does not matter if multiple buildings are seen on the way. The participant and experimenter/tour guide will proceed to the given building and be shown the outside (by the main entrance). They will then tour the entirety of these buildings. Following the tour, they will return outside to fill out the post-tour survey. Finally, the tote bags and secrets will be administered.

Planned Analyses:

The comparisons in this study will be between each of the two buildings. Comfort/fear ratings as measured by CRoSS will be the primary variable for comparison. The liminal and nonliminal buildings will be compared with a T-test. Averages of responses to each CRoSS scale statement prompt on the post-experiment questionnaire that will in turn be averaged together to obtain an overall average creepiness value. A significance value of 0.5 will be used. Data above or below 2 standard deviations from the mean will be excluded. A similar analysis will be used to determine eligibility of participants based on baseline emotional state at the beginning of the experiment as rerported on the PANAS scale.

Predicted Results:

It is predicted that participants will report feeling more creeped out in the liminal building. Scores for individual measures on the CRoSS scale are expected to show more discomfort and uncertainty in Avery than in Olin. Overall averages are also expected to reflect greater discomfort in the liminal space. Presumably Avery will be rated as a less desirable working environment. There may be any number of variables which might affect these scores apart from liminality, but evidence of relationships between liminality and evaluations of creepiness suggest that degree of liminality may

positively correlate with feelings of discomfort. The following graph (Fig. 10) demonstrates the breakdown of each measure of participant reactions along with the overall score for each building.
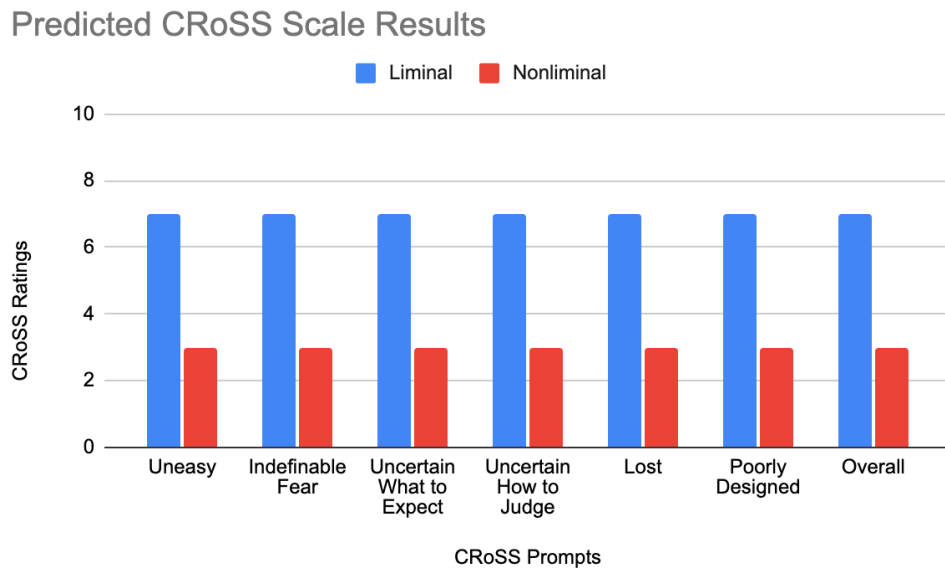
Figure 10: Graph of predicted results

Discussion

Review

Many factors contribute to how a person feels in a physical location. In natural or built environments alike, many physical traits of the space impact the emotional valence. Liminality, or what Diel & Lewis (2022) call the Uncanny Valley of Physical Spaces, is a construct of unsettling architectural or decorative traits which generate a feeling of creepiness in a building. More research dating further back has explored the

effect of legibility on a space. The characteristics of prospect, refuge, and escape are evolutionarily based factors for feelings of safety or danger. Still, many potential factors have yet to be explored.

Built spaces are omnipresent in human lives– they create the setting for a great many of our life experiences. Emotional attachments to significant locations run deep, and associations with certain places or types of places can be very profound and very personal. Added to individual reactions to spaces based on experience, there are consistent features which elicit particular feelings and reactions in a more general population. General archetypes of spaces– relaxing, austere, clinical, chaotic, creepy– are united by common traits and create consistent emotional valences. The specific features which create these atmospheres are very difficult to isolate. Is it the innate architecture of buildings that creates these effects? The decor? The lighting? The age or backstory of the building? Innumerable factors contribute to the valence of a space. Spaces which generate fear often have a specific set of common traits. Evolutionary principles of safety-seeking relate to traits such as prospect, refuge, and the potential for escape. The layout of buildings greatly affects how safe and comfortable people feel in it. A space which is familiar, navigable, and predictable tends to feel more safe than one which is not.

Limitations

This study is examining one very specific feature of spaces. Liminal traits are identifiable by a number of metrics, but any building or space has so much more going on. The buildings chosen for this experiment demonstrate liminality or nonliminality based on layout and rationality/familiarity of architecture. However, decor, lighting, social presence, time of day, function of space, and innumerable other factors may contribute to the emotional valence of a space. Liminality itself is created by a combination of these elements. A holistic understanding of the forces affecting the emotional valence of a space would require the analysis of a great many factors. In addition, each of these factors must be operationalized reliably. Scientific definitions for both liminality and creepiness are just recently being developed, and the validity of measures such as the CRoSS scale have yet to be upheld by time and replication. Furthermore, both the CRoSS and PANAS scales used in this experiment rely on participant self-reports, which are notoriously unreliable. With a construct such as creepiness, it is hard to imagine what other measures could be used. More research must be conducted to delve into the possibilities of studying these subjective experiences.

Implications

If the hypothesis of the proposed study is supported, there will be further evidence that liminality as a design trait contributes to feelings of unease, discomfort, and creepiness. The reported emotional reactions as a function of liminal vs non-liminal space would demonstrate a pattern of liminality producing reactions of displeasure or fear. This has implications for both psychological science and architecture. Liminality's influence on emotion reflects evolutionary principles regarding perception of physical safety in assorted settings. For the field of architecture, an understanding of the power and impact of liminality may serve as an important guide for design choices.

Future Directions

This proposed experiment examines the impact of one specific, innate feature of a building. Liminality, although still newly and loosely defined, is a concrete and distinct architectural quality. There seems to be some connection with the essential desirable qualities of a space: prospect, refuge, and escape, as laid out by Appleton (1975) and McAndrew (2020). Liminality contradicts these advantageous traits, offering a confusing and unpredictable environment in which an individual is unclear on what to expect and how to navigate. Liminality often accompanies illegibility. Part of what makes places feel wrong is a sense that the layout is unclear and unexpected. An ideally

comfortable space would be legible– clearly navigable with escape paths clear and areas of prospect or refuge reliably present. Without legibility, these traits and the feelings of safety they produce cannot easily be found.

Liminality and legibility are inherent traits of spaces. But what are the factors that individuals bring into a space, and what role do they play in the emotional valence of the space? The quality of expectation, which is then defied by liminal design, may be a very important feature. Expectations prior to the experience of a space must be based on prior experience or prior knowledge. Where expectation and reality diverge, familiarity dissolves into bafflement or disortientation. For future research, the aspect of surprise and unfamiliarity might be explored more. The unsettling experience of liminality may be closely linked to predictions of how a space will feel, and the ensuing contradiction of those expectations.

Some research exists on the impact of expectations on emotional experiences of spaces. One meta analysis and research proposal by Liu (2020) examined the relationship between predicted emotional reactions to stimuli and actual emotional reactions. Liu's proposed study posed the hypothesis "When reacting to an event, will people experience less intense emotion if they previously forecasted emotional experience of higher intensity, and experience more intense emotion if they forecasted emotional experience

of lower intensity" (p. 7). Where a profound reaction to a space– positive or negative– is expected, a person is prepared to react strongly and will even likely prepare more than necessary. Thus, where people expect the unexpected, they are prepared for the ensuing emotional reaction. Indeed, they even expect their reactions to be greater than they are, based on what they imagine their experience is about to be. This powerful sense of expectation contributes to a powerful sense of unease when the reality of the situation is drastically different than predicted.

Human brains operate based on expectations in all situations. Thus, a person relies greatly on past experiences and prior knowledge when confronting the prospect of an experience. Familiarity plays a key role. Wilson and Gilbert (2003) assert that when a person's expectations are *close enough* to reality, reality may be neatly tucked within the construct of the expectation (p. 5). The human desire to fit new experiences into past experience surely relates to the advantageousness of spaces or situations which can be accurately predicted. When a person enters a building with an expectation of what buildings usually look like, and then is surprised with something completely contradictory, the discrepancy can produce feelings ranging from mild displeasure to deep unease.

A defiance of familiarity and expectation fuels the particular creepiness of liminality. A supposedly normal space which is *wrong* in some way can be much more disturbing than a place which is intentionally and predictably meant to be creepy. Haunted houses are popular for a reason. They offer a sense of fear and unease which is carefully cultivated by sets, costumed actors, and music. This is a predictable, safe, and controlled kind of scary environment. The distinct creepiness of liminality suggests that unknown threats are far scarier.

Conclusion

Location is a defining factor of experience. The settings in which we live our lives play a very tangible role in how our experiences play out and how we perceive situations and events. Architecture and interior design work towards creating built spaces which are functional, comfortable, and appealing. These factors do not always mesh, and oftentimes aesthetic is prioritized over function or vice versa. There is a balance of beauty and practicality which greatly impacts the feeling of being in a building. An objectively ugly or boring building may be comfortable and functional without being exciting or visually appealing. Likewise, a building may be striking and impressive in design while failing to create a truly practical environment. Form and function are factors which greatly influence the experience of a building. More complex than that

dichotomy are features which may belong to either or both schools of thought, which create specific yet intangible emotional responses. A building which prioritizes function is likely to have many of the traits which make a building appealing. Generally, a simple and practical design will have clear prospect, predictable refuge, and unobstructed escape. These features, even when achieved at the expense of panache, lend themselves to a space which feels comfortable and safe.

Riskier architecture and design may allow more style and beauty in a space, but this may be at a cost to the comfort, legibility, and perceived safety of the building. Sophisticated and artistic design can at times meld form and function successfully, but there is a great potential for an artwork of architecture to sacrifice function in the name of form. This runs the risk of creating a stylish yet completely impractical or uncomfortable space. There can be a bizarre beauty in liminality. The strangeness and emotional power of liminal spaces achieve the artistic goal of a strong reaction– even if the reaction is negative. For a space which is intended for use, this can be a disadvantage. However, a space which is intended for display may benefit greatly from unusual features and the vivid emotions which they may generate. Depending on the intended use of a space, there may be a strong advantage to liminality or non-liminality. Where people work, study, or live, practicality is key and comfort is desirable. However,

some spaces are intended to provoke discomfort. Structures which are intended as art

often intend to create environments which diverge from the typical. This may include

haunted houses and other buildings which are meant to be unsettling or creepy. Here,

liminality is a desirable design feature for its ability to produce unease. In other realms,

structures such as art museums or performance spaces are meant to be provocative.

Liminality generates emotion, which is often the goal in form-focused architecture.

Architects and designers can benefit from an understanding of the power of liminality

in built spaces. Depending on the design goals, liminality may be an asset to cultivate or

a danger to avoid. Whether intentional or not, liminality certainly seems to have a great

influence on how a space functions and feels. A space may feel creepy for very specific

reasons, such as a... *something*... sighting, but is it even scarier not to know why you're

getting the creeps? Death, the dark, or an endless hallway— the unknown prompts a

deep and instinctual dread of dangers lurking unseen.

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Appendix: Preregistration

Wharton
CREDIBILITY LAB
UNIVERSITY *of* PENNSYLVANIA

CONFIDENTIAL - FOR PEER-REVIEW ONLY
The Impact of Liminality on the Emotional Valence of Buildings (#130902)

Created: 05/02/2023 05:07 PM (PT)

This is an anonymized copy (without author names) of the pre-registration. It was created by the author(s) to use during peer-review.
A non-anonymized version (containing author names) should be made available by the authors when the work it supports is made public.

1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
Liminal spaces will produce a greater effect of creepiness in comparison to non-liminal spaces.

3) Describe the key dependent variable(s) specifying how they will be measured.
Self-reported emotional reactions as measured by the Creepiness of Situation Scale (CRoSS).

4) How many and which conditions will participants be assigned to?
Two conditions: Liminal and non-liminal buildings

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
The CRoSS ratings for each condition will be compared using a T-test.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Data above or below 2 standard deviations from the mean will be excluded.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
The sample size will be 100-- 50 participants in each condition.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
Nothing else to pre-register.