Light and Mystery in Architecture

PAULA BEZ CARDOSO
LIGHT AND MYSTERY IN ARCHITECTURE

Paula Bez Cardoso
Tutor: Thomas Schielke, Ph.D.

KTH Royal Institute of Technology
Degree Project in Architectural Lighting Design
AF270X | Second Cycle | 15.0 credits
May 2020

Paula Bez Cardoso
Tutor: Thomas Schielke, Ph.D.
Abstract

Studies suggest that mystery can increase curiosity and interest for certain spaces. This topic becomes highly relevant in current times, when contemporary architecture turns its concerns towards sharp vision. The result is a legacy of highly Instagramable buildings, that lack the quality of generating emotional engagement and pleasing other senses than vision (Pallasma, 1996). In fact, it is this impossibility to completely understand something in the visual field that characterizes mysterious spaces. Yet, the lack of clear information may cause dichotomous, sometimes overlapped, feelings. From anxiety to expectation of a pleasant reward or of finding a magical secret spot. In both cases, the consequence of mystery is feeling of anticipation and, consequently, willingness to explore the space to overcome that feeling. There seems to be a consensus among the masters of architecture about the power of light and shadow to create mysterious, curious and magic atmospheres. However, the subjectivity involved in the perception of mystery and its associations make it a hard quality to be assessed. This thesis intends to shine a light in the topic and contribute to equip architects and designers with a tool that might help to create more sensitive, engaging multisensorial architecture.

Key words: light, shadow, perception, mystery, architecture, legibility.
“Mist and twilight awaken the imagination by making visual images unclear and ambiguous” (Pallasmaa 1996, p. 46). This mysterious effect is caused when it is not possible to completely perceive something in the environment and, consequently, the observer becomes engaged in a “pleasant challenge to the imagination” (Hubbard & Kimball, 1929). Many authors relate mystery with curiosity or interest for a certain place. In the field of environmental psychology, considerable amounts of research have been done and suggest a positive relationship between rated mystery and rated preference (Stamps 2004).

However, environments in which complete understanding is somehow compromised may also provoke negative feelings, such as anxiety. In both cases, mystery results in the inclination to explore the space in order to satisfy an expectation either of overcoming negative feelings or of being somehow rewarded. This study will use a definition of mystery based on Kaplan and Kaplan’s (1989): mystery is the quality of a space that cannot be immediately completely understood from the original vantage point and that encourages the observers to explore it to fulfill the missing information.

Based on that previous definition, a literature review has been conducted in the field of architectural theory, environmental psychology, and stage lighting design to find lighting-related attributes of the space that might create mystery in architecture. Although the architectural theory literature did not present specific instructions on how to create mystery, it provided subjective evidence and examples that contributed to the process of inference that culminated in the hypothesis. In the field of environmental psychology, many studies have been conducted and some physical attributes have been suggested to create mystery in nature, but only a few have been done in built environments. The stage lighting design literature presents some techniques used in theatre to manipulate atmosphere and perception that might be applicable to architecture.
1.1. Relevance and Aim

Contemporary architecture seems to lean towards the extinction of mystery. In *The Eyes of the Skin*, Juhani Pallasmaa (1996) addresses the issue of glass architecture. He states that it has weakened the character of the window as an intermediary between the private and the public spectrum and quotes the Mexican architect Luis Barragán: “Transparency has been forcing people to live public lives”. At the same time, spaces have become less interesting to the senses – specially the haptic - due to the overestimation of sharp vision and, among other things, the lack of mystery and variety provoked by shadow (Pallasmaa, 1996). For the architect, “a remarkable factor in the experience of enveloping spatiality, interiority and hapticity is the deliberate suppression of sharp, focused vision” (Pallasmaa, 1996).

Although many studies have been done on mystery and preference in the field of environmental psychology, a meta-analysis by Stamps (2004) has shown that the results of different studies vary substantially and therefore it is difficult to understand the degree and direction of this relationship. In addition to that, most of the studies refer to natural scenes. Among the studies that refer to built scenes, few include indoor settings.

This master thesis is an investigation through literature review and an experiment on lighting-related properties of the space (LRPS) that can be used by architects and designers to create mystery and therefore increase interest in indoor spaces. The aim of the experiment is to estimate the strength of the relationship between three different LRPS, consolidated during the literature review, and the perception of mystery in museums.

The choice for working with museums lies on three main reasons. First, the function of these buildings allows freer and less traditional architectural solutions. Second, museum visitors are usually curious and inclined to explore the space. Lastly, it seemed reasonable to avoid buildings of frequent attendance, such as residences and offices, due to the possible mitigation of the mystery effect derived from familiarity with the space.

Although it is probably possible to create mystery by manipulating artificial light, the experiment will consider only daylight. This decision derives from the fact that daylight directly influences the architectural form. When Peter Zumthor (2006) referred to daylight as an “almost spiritual quality” of architecture, the architect is referring to its power of mystery as it is something “beyond all understanding”. For Louis Kahn (1959, apud. Mc Carter, 2005, p.137) “no space is really an architectural space unless it has natural light”. 

Fig. 1.2 - Iglesia de la Candelaria, Zafra, Spain. Photograph: Paula Bez Cardoso, 2016
Main question:

A. Is it possible to create mystery in indoor spaces by manipulating lighting-related properties of the physical environment (visual occlusion, shadow and visibility of light sources)?

Secondary questions:

B. Do people usually associate mystery in architecture with a positive or a negative stimulus?
C. If the answer for A is yes, how intense is the relationship between mystery and interest in exploring indoor spaces?
D. If the answer for A is yes, how effective is each one of these properties to create interest in exploring indoor spaces?
E. Do the results differ between professionals of architecture related fields and non-professionals?

1.2. Thesis Framework

Light and Mystery in Architecture

This master thesis will conduct an experiment to explore the hypothesis that it is possible to create mystery in architecture through the application of one of the following lighting-related properties of the space (LRPS):

**Visual occlusion:** occurs when part of the information in the room is not visible because there is something between the observer and the hidden information (Stamps 2007).

**Hidden light source:** is a specific type of visual occlusion that occurs when the presence of light is perceived only through a surface or medium and the source itself is not visible from a certain point of view.

**Shadow:** occurs when part of the information in the space is completely or partially hidden due to the presence of shadow.

These LRPS are based on literature review in the fields of architectural theory, environmental psychology and stage lighting design and are discussed in detail in the Background section.
2. background

Renowned theatre director Robert Wilson uses light to change sense of space. One of his techniques to create mystery in theatre is to gradually light the elements in the scene, so the audience slowly gets information in an additive process (Holmberg, 1996). In architecture, this process of getting more information can be achieved with movement of the observers and it can be related Le Corbusier’s architectural promenade. Although there is no literature with a structured explanation of light and the nature of this architectural promenade, one excerpt of the Œuvre Complète describes the Villa Savoye as a prime example where the concept is present. According to the architect, the building provides “constantly varied, unexpected, sometimes astonishing aspects” as one moves from one place to another (Birksted 2009).

This notion of exploring the space and gradually learning more about it is present in the pattern of mystery in the informational model of Kaplan & Kaplan (1989). The authors attribute preference to natural environments to the basic human needs of understanding and exploration of the space and to how immediate these needs are fulfilled. The combination of these two domains result in four different informational factors (see table 2.1.).

In Kaplan and Kaplan’s preference matrix, coherence (quality of being easy to make sense of the environment) and complexity (quality of a space in which many visual elements are available) require little inference. In other words, they are mainly dependent on the two-dimensionality of the space. On the other hand, legibility (quality of a space that is easy to understand and to remember, where one can efficiently locate himself) and mystery depend on its three-dimensionality because they require the observer to interpret the space. In this case, the observer is requested to predict what other extra information is available from different vantage points. The Kaplans’ work suggests that natural scenes rated higher in coherence, complexity, legibility and mystery tend to be rated higher in preference as well.

The relationship between preference and mystery might be related to an evolutionary adaptation to assure safety. Understanding the space is important to quickly recognize enemies and to know how to proceed in case of attack. In this case, exploring the space would derive from the need to identify running paths and hiding spots (Hediger, 1950, 1955 apud Stamps 2004, p. 13). Places where perception is compromised can either represented danger or not, and therefore they demand attention (Stamps 2007).

Mystery is a subjective quality, that can cause dichotomous, sometimes overlapped, feelings. From anxiety to expectation of a pleasant compensation or a magical secret spot. In both cases, the consequence of mystery is a feeling of expectation and, consequently, willingness to explore the space to overcome this feeling. Mystery differs from suspense because suspense does not necessarily encourage the observer to explore or to discover the unknown. Mystery also differs from surprise in the sense that the information is continuous with what is previously available, rather than complete new and unexpected (Kaplan & Kaplan...
Light and Mystery in Architecture

Although less common, a mysterious space that causes negative feelings might be desirable sometimes. The Jewish Museum building in Berlin, by Studio Libeskind (fig. 2.6) portrays the Jewish history and culture through architectural expression. The Jewish history is marked by moments of anxiety, uncertainty and disorientation, expressed in the complex geometry of the interiors and the mysterious atmosphere of the museum.

A study on landscape settings by Gimblett, Itami & Fitzgibbon (1985) found three main physical attributes for spaces considered mysterious: spatial definition, distance of view and screening. Spatial definition is related to how surrounded by elements the scene is. As openness increases, mystery decreases. Scenes with lower distances of view, measured from the viewer to the closest forest stand, were rated as more mysterious. In general, lower distances of view and spatial definition are attributes of architecture. Screening is the “degree to which views of the larger landscape are visually obstructed or obscured” (Gimblett, Itami & Fitzgibbon 1985). As screening increases, mystery increases as well. The condition of an obstructed view is equivalent to the LRPS of visual occlusion, while the condition of an obscured view is equivalent to the LRPS of shadow in this study.

Stamps (2007) studied the effect of level of light, depth of view and visual occlusion in mystery for galleries, French crescents and parks. Although level of light was the overall most influential variable, in galleries, the only example of an indoor setting, visual occlusion played the most important role in creation of mystery. The study also suggests that depth of view can be an influential covariate in environmental mystery. Scenes with shorter depth ranges, in general, correspond to higher rated mystery.

This study’s experiment will investigate the influence of visual occlusion, hidden light source and shadow in the creation of mystery. It is not intended to approach all the possible ways to create mystery in indoor spaces with light, but to offer a starting point to further research on the topic.

2.1. Visual Occlusion

To create visual occlusion, it is necessary that a medium or an element completely or partially blocks an area or the totality of the field of view. Both studies by Gimblett, Itami & Fitzgibbon (1985) and Stamps (2007) suggest that visual occlusion increases perception of mystery.

A classical example of visual occlusion is a natural scene with a bend in the path, where its sequence is gradually revealed as the observer moves in the space (Kaplan & Kaplan, 1989) (fig. 5.1).

A prime example of mystery in architecture where occlusion is present is the Therme Vals building in Switzerland, by Peter Zumthor (fig. 2.3). Apart from the occlusion created by the steam itself, the central semi-labyrinthine form of the plan creates partially occluded views as one moves in the space, while two peripheral long corridors keep the building legible enough. Slits in the ceiling, allowing some light to come in without revealing its source, and partially shaded interiors also contribute to increase the sense of mystery in the building.

This thesis will focus on partial occlusion because complete occlusion is not directly related to lighting.
2.2. Hidden Light Source

Light itself is only visible when it meets matter. If the source is not visible, we perceive the character of light by looking at the surfaces or medium which light touches or passes through. The presence of daylight openings where the outside is hardly visible is very common in Le Corbusier's work, for example.

In one of the towers in Chapel of Notre Dame du Haut, Ronchamp, a soft diffuse light which the source is not visible, creates a mysterious atmosphere and drives the observer to look up (Plummer, 2013).

In the Monastery of Sainte Marie de la Tourette, despite of the darkness of the space, a closed church perforated with several openings, which Le Corbusier describes as a miracle box, allow a mysterious light to come inside the building and create eye attraction (Plummer, 2013).

Perhaps the most prominent exemplary of hidden light sources in Le Corbusier’s work is the Church of Saint Pierre (fig. 2.4). The east wall of the church is carved with several irregular small holes arranged according to the Orion Constellation, creating points of light on the wall. The horizontal openings eliminate the view and bring diffused coloured light inside. In the late mornings, Waves of light are visible and dynamically change with the movement of the sun. The duration and direction of these movements is not predictable, and it is hard to tell where the come from, creating a highly mysterious and spiritual atmosphere (Plummer, 2013).

A similar strategy is used by the Mexican architect Luis Barragán (fig. 2.5), considered “the true magician of intimate secrecy, mystery and shadow in contemporary architecture” by Pallasmaa (1996, p. 47). In many of his projects, he minimizes direct view to the sky to protect against harsh sunlight and create half-light in his mysterious architecture (Schieltz, 2018).

De Vazquez (2004) includes the work of Barragán in the so called Latin American Magic Realism, in which the everyday ordinary world is juxtaposed with magic and mysticism. Light and shadow are used to represent or even to materialize the divine and mystic. This magical atmosphere, with aspects that seem to be beyond human understanding, possibly contribute to the mysterious character of Barragán’s work.

In general, when the observer does not completely understand something in an indoor environment it means that legibility is somehow compromised. One exception is the use of elements that seem to have a connection with divinity or with magic and therefore are not totally comprehensible, but not necessarily reduce the legibility of the space.
Throughout time, light and shadow have represented a positive-negative duality. While light frequently represents divinity, life, goodness and knowledge, darkness usually symbolizes the mundane, evil, death and ignorance. In Plato’s Allegory of the Cave, shadows and darkness are metaphors to ignorance and to the superficial comprehension of reality, while light represents knowledge and truth. The Bible also refers to light many times as a metaphor to divinity, goodness and wisdom, while darkness is often associated with evil, suffering, ignorance and with the unknown.

In the art and architectural context, the light-shadow duality is very present and have the power to create mystery (Fig. 2.6). Tanizaki (1977), for instance, attributes the mysterious character of traditional Japanese architecture to the sensible use of light and shadows. The author frequently highlights the differences between western and eastern cultures. While the west is constantly seeking for the eradication of shadow, Asian art and culture values the aesthetics of shadow and its delicacy and elegance.

The following quote from Alvar Aalto, in Aalto & Schildt (1998), highlights the potential of shadow to conceal information and to create mystery:

> The night gains an incredible value in that it erases space. The fire invents light and heat, and through this light darkness gains new importance: it creates the story, it entertains. The fire invents a room where there is light. The fire is a producer of space, and in the shadow, mystery is born. (Aalto, Alvar 1998, p.115)

In cinema and theatre lighting, shadow plays an important role in the mood of the scenes too. Contrast between light and shadow creates drama (fig. 2.7) while low light levels and shadows are used in stage lighting to create mysterious foreboding (Dunham, 2011). Similarly, in cinematography, shadows can be used to create mystery, and usually negative moods such as loneliness and fear (Landau 2014). Robert Wilson manipulates light and shadow to shape the space in his plays:

> Light alone can create the effect of enclosed space, a campfire on a dark night forms a cave of light circumscribed by a wall of darkness… It follows, therefore, that if you wish to create an effect of openness you cannot employ concentrated light. (Wilson, Robert 1996, p. 122)

The German expressionist cinema, for example, uses distorted artificial shadows and spaces to create a bizarre atmosphere. In The Cabinet of Dr. Caligari, directed by Robert Wiene, some sets have painted shadows and almost two-dimensional spaces (Pramaggiore and Wallis, 2005). This mix of darkness with a space which the forms and dimensions seem incomprehensible create mysterious scenarios.

Another way of creating mystery is to immerse the observer in shadow, from where it should be possible to see a partially enlightened area, causing curiosity to explore further (Joye 2007).
3. Methodology

3.1. Experiment

To better understand what causes the perception of mystery and in attempt to answer the main and secondary questions of this study, an experiment have been done through a survey (Fig. 3.2).

3.1.1. Computer-generated images

Two different architectural settings (A.S.) were designed to provide some variety of application of the LRPS. Each one has four different variables: visual occlusion, hidden light source, shadow, and a neutral image. The two different A.S. that have the same variable applied will have similar treatment, for example, both will create occlusion through translucent materials.

Studies suggest (Stamps, 2007 and Gimblett, Itami & Fitzgibbon 1985) that the effect of mystery is higher at shorter distances of view and therefore the images were designed following that instruction. The different settings were designed with similar overall dimensions and positions of the observer (one-point perspective). Only daylight was considered. Materials with intermediate reflectance were chosen for both architectural settings to avoid extremely high or low reflectance surfaces (Graph 3.1).

To create similar intensities of effect of the LRPS, the percentage of the area of the visual field correspondent to each LRPS is similar among the variations of images.
Architectural Setting 01

Fig. 3.3 - Neutral image, Architectural setting 01. Renders taken in Florianópolis, Brazil, winter solstice 15:30.

Fig. 3.4, 3.5, 3.6 - Variations: (from left to right) visual occlusion, hidden light source and shadow. Renders taken in Florianópolis, Brazil, winter solstice 15:30.

Fig. 3.7 - Plan view (top) and section (bottom) of architectural setting 01. Scale 1:200
Architectural Setting 02

Fig. 3.8 - Neutral image. Architectural setting 02. Renders taken in Florianópolis, Brazil, winter solstice 15:30.

Fig. 3.9, 3.10, 3.11 - Variations: (from left to right) visual occlusion, hidden light source and shadow. Renders taken in Florianópolis, Brazil, winter solstice 15:30.

Fig. 3.12 - Plan view (top) and section (bottom) of architectural setting 02. Scale 1:200.
3.1.2. Survey

3.1.2.1. First Section

The first section of the survey aims to identify if people tend to associate mystery in architecture with a positive or a negative stimulus (fig. 3.13*).

3.1.2.2. Second and Third Sections

The second section corresponds to Architectural Setting 01 and the third section corresponds to Architectural Setting 02. In these sections, each image was rated in paired comparison within its architectural setting in terms of legibility of the space (how easy it is to understand the architecture and its elements) and preference for exploring the space using a seven-degree scale (fig. 3.14). The central option in the scale means the images are equally legible and that the respondent has no preference for exploring, respectively. The neutral image will allow measurement the impact of each LRPS in the scene through comparison.

The two questions derive from the definition of Mystery used in this study. Since mystery can be a subjective term, the core of the definition - based on understanding and inclination to explore the space - was considered to formulate the questions.

3.1.2.3. Demographic Questions

The last section of the survey corresponds to demographic questions, such as age, gender, field of higher education and continent.

*Complete survey layout can be found in Section 8.5 of the Appendix
4. results

4.1. Respondents Profile

A total of 163 respondents answered to the survey, of which 58.9% are professionals or students in the end of a course in architecture, urban planning, lighting design or interior design (graph 4.1). Female respondents correspond to 60.1% of the total (graph 4.2). The majority of the respondents (69.3%) are from South America, followed by Europe (19%), Asia (9.8%), North America (less than 2%) and Africa (less than 1%) (graph 4.3). Most of the respondents are younger than 31 years old (72.4%) (graph 4.4)*.

*Respondents Profile tables are available in Section 8.3 of the Appendix.
4.2. Section 01

More than 80% of the respondents considered mystery in architecture as a positive aspect (graph 4.5) and more than 95% associated mystery with exploration of the space or attraction for specific areas, either for a positive or for a negative reason. Only two respondents wrote their own description of what mystery means for them and they are transcribed below:

Respondent 02: "Willingness to explore the space in order to overcome the curiosity caused by suspense."

Respondent 152: "A curiosity to follow up on out of placed fragments."

4.3. Sections 02 and 03

Each image was scored according to the respondents’ answers to the paired comparisons. The answers were converted in points from -3 to +3, depending on the intensity of the option (slightly = 1 or -1, moderately = 2 or -2 and highly = 3 or -3). If the image was preferred, a positive value was attributed to it. If the image’s pair was preferred, a negative value was attributed to it. If there was no preference, both images scored zero. Since each image was evaluated three times by the same respondent, the maximum score possible is +9 and the minimum is -9. A detailed table with the results is available in the Appendix. The means, median and variation of the data are shown in the following graphs.
**Light and Mystery in Architecture**

**Legibility - ARCHITECTURAL SETTING 01**

"Which space seems more legible (easy to understand the architecture and its elements) to you?"

Graph 4.6 - Legibility paired comparison score scale of the lighting related properties of the space and neutral image

**Exploration - ARCHITECTURAL SETTING 01**

"Which space do you prefer to explore?"

Graph 4.8 - Exploration paired comparison score scale of the lighting related properties of the space and neutral image

**Graph 4.7 - Legibility of the space paired comparison score scale of the lighting related properties of the space and neutral image**

**Graph 4.9 - Exploration of the space paired comparison score scale of the lighting related properties of the space and neutral image**
Light and Mystery in Architecture

**Legibility - ARCHITECTURAL SETTING 02**

"Which space seems more legible (easy to understand the architecture and its elements) to you?"

```
occlusion  shadow  hidden light source  neutral image
```

```
Lowest Legibility: -3,41  -1,93  +1,98  +3,37
Highest Legibility: 0  +3  +6  +9
```

Graph 4.10 - Legibility paired comparison score scale of the lighting related properties of the space and neutral image

```
neutral image
```

```
occlusion
```

```
hidden light source
```

```
shadow
```

```
Lowest Legibility: -3  -1,41  -1,26  +0,4  +2,69
Highest Legibility: 0  +3  +6  +9
```

Graph 4.12 - Exploration paired comparison score scale of the lighting related properties of the space and neutral image

```
neutral image
```

```
occlusion
```

```
hidden light source
```

```
shadow
```

```
Lowest Legibility: -3,1  -3,2  -3  -2  -1
Highest Legibility: 0  1  2  3  4
```

Graph 4.11 - Legibility of the space paired comparison score scale of the lighting related properties of the space and neutral image

```
Lowest Legibility: -3,1  -3,2  -3  -2  -1
Highest Legibility: 0  1  2  3  4
```

Graph 4.13 - Exploration of the space paired comparison score scale of the lighting related properties of the space and neutral image

```
Which space seems more legible (easy to understand the architecture and its elements) to you?"

"Which space do you prefer to explore?"

34

35
4.3.1. Mean of the Scores

In both architectural settings, occlusion was rated the least legible option, followed by Shadow (graphs 4.6 and 4.10). All the variations were considered less legible than the neutral image, except from hidden light source in AS01.

In both architectural settings, Hidden Light Source was rated the most interesting option to explore, followed by Neutral Image, Occlusion and Shadow (graphs 4.8 and 4.12). The only image rated in average as both less legible and more interesting to explore than the neutral image was the Hidden Light Source in AS02 (graphs 4.10 and 4.12).

Although Shadow and Visual Occlusion were rated as less legible than the neutral image, when taking only the mean into account they were also considered less interesting to explore, in both architectural settings. Occlusion and Exploration had relatively similar results for both legibility and exploration in both architectural settings. The data, in general, varied.

4.3.2. Percentage of Respondents

The mean of Occlusion is lower than the mean of the Neutral Image in terms of interest for exploring the space. However, the boxplot of these two variations overlap each other in certain extent (graphs 4.9 and 4.13) and around 38% of the respondents rated occlusion as more interesting to explore than the neutral image in both architectural settings (graph 4.15).

Approximately 24% and 34% of the respondents considered Shadow more interesting to explore than the Neutral image, in architectural settings 01 and 02, respectively (graph 4.15).

About 79% and 64% of the respondents considered Hidden Light Source more interesting to explore than the neutral image, in architectural settings 01 and 02, respectively (graph 4.15).

Respondents tended to agree more regarding legibility than interest in exploration of the space for Shadow and Occlusion. Approximately 90% and 95% of the respondents rated occlusion as less legible than the neutral image in architectural settings 01 and 02, respectively. About 92% and 89% rated Shadow as less legible when compared to the neutral image in architectural setting 01 and 02, respectively (graph 4.14).

All the three variations were considered more mysterious (less legible and more interesting to explore) in architectural setting 02 than 01 (graph 4.16). Although the mean of the results reveals that only hidden light source in architectural setting 02 is less legible and more interesting to explore than the neutral image, all the three variations were voted as less legible and more interesting to explore than the neutral image by a certain percentage of the respondents. In fact, when comparing only the percentages, occlusion was more effective than hidden light source (graph 4.16) to create mystery.

Graph 4.17 shows that between 53% and 69% of the respondents considered the images less legible and less interesting to explore or more legible and more interesting to explore than the neutral image, indicating possible positive correlation between legibility and interest in exploring the space.
4.3.3. Correlations

The scores of the neutral images were subtracted from the scores of each one of the three variations of images of both architectural settings for the question about legibility and for the question about interest in exploring the space, resulting in a score range from -18 to +18. This is an attempt to mitigate the effect of other architectural elements on the respondents’ decisions and so the effect of the variation itself (occlusion, hidden light source and shadow) could prevail.

Since both variables for legibility and interest in exploring the space are ordinal variables and the data is mostly not highly skewed, the correlations were calculated using Spearman’s coefficient (r). However, the Spearman’s coefficient values (r) resulted very similar to Pearson’s correlation coefficient values (r) in this case.

<table>
<thead>
<tr>
<th>Architectural Setting 01</th>
<th>Architectural Setting 02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less legible and less interesting to explore</td>
<td>Less legible and less interesting to explore</td>
</tr>
<tr>
<td>More legible and more interesting to explore</td>
<td>More legible and more interesting to explore</td>
</tr>
</tbody>
</table>

4.3.3.1. Occlusion

There is a significant positive moderate relationship between rated legibility and rated interest in exploring the space for occlusion in architectural setting 01 (graph 4.18), r(161)=0.45, p<0.001. For occlusion in architectural setting 02, there is a significant positive weak relationship between rated legibility and rated interest in exploring the space (graph 4.19), r(161)=0.27, p<0.001.

4.3.3.2. Hidden Light Source

There is a significant positive moderate relationship between rated legibility and rated interest in exploring the space for Hidden Light Source in architectural setting 01 (graph 4.20), r(161)=0.45, p<0.001, and in architectural setting 02 (graph 4.21), r(161)=0.40, p<0.001.

4.3.3.3. Shadow

There is a significant positive weak to moderate relationship between rated legibility and rated interest in exploring the space for shadow in architectural setting 01 (graph 4.22), r(161)=0.54, p<0.001, and in architectural setting 02 (graph 4.23), r(161)=0.49, p<0.001.

4.3.4. Difference Between Fields of Education

To understand if the judgement of legibility and interest for exploring the space varies depending on the field of higher education of the respondents, the partial correlations were analysed separately for layman and professionals*.

All the results of the partial correlations are significant p<0.001, except from occlusion for professionals in architectural setting 02 which the result is not significant, and the correlation is very close to zero.

*Professionals and students in the end of a course in architecture, urban planning, interior design and/or lighting design.
Graph 4.18 - Positive relationship between rated legibility and rated interest in exploring the space for occlusion in architectural setting 01.

Graph 4.19 - Positive relationship between rated legibility and rated interest in exploring the space for occlusion in architectural setting 02.

Graph 4.20 - Positive relationship between rated legibility and rated interest in exploring the space for hidden light source in architectural setting 01.

Graph 4.21 - Positive relationship between rated legibility and rated interest in exploring the space for hidden light source in architectural setting 02.
Graph 4.22 - Positive relationship between rated legibility and rated interest in exploring the space for shadow in architectural setting 01.

Graph 4.23 - Positive relationship between rated legibility and rated interest in exploring the space for shadow in architectural setting 02.

Discussion

5.

Light and Mystery in Architecture

Fig. 5.1 - Mysterious sunset in Beijing, China. Photograph: Paula Bez Cardoso, 2014
5. Discussion

The neutral image was used in the survey to provide a baseline to evaluate the effect of the lighting-related properties of the space (LRPS) and mitigate the influence of external elements in the judgement of legibility and of interest in exploring the spaces. In this sense, a LRPS can be potentially considered effective in creating mystery if its correspondent image is rated according to two prerequisites:

- The image is rated as less legible than the neutral image.
- The image is rated as more interesting to explore than the neutral image.

The prerequisites derive from the following definition of mystery:

"Mystery is the quality of a space that cannot be immediately completely understood from the original vantage point and that encourages the observers to explore it to fulfill the missing information."

When considering only the mean values obtained from the ratings of all the respondents, the only LRPS capable of creating mystery would be hidden light source, in architectural setting 02 (graphs 4.10 and 4.12). One of the possible causes why the same could not be observed in architectural setting 01 is that image 02 had windows in both variations (neutral image and hidden light source). As opposed to 02, architectural setting 01 might have been interpreted as lighter and therefore more legible, since the neutral image did not have any windows.

However, there is a possibility that hidden light source in AS 01 has been interpreted as having a magical atmosphere, what would still characterize mystery without necessarily decreasing legibility.

As opposed to the means, when analysing the data in percentage of number of respondents that judged each LRPS according to the two prerequisites of mystery, the three variations obtained very similar results (graph 4.16). In this case, occlusion would be the most effective LRPS to create mystery, followed by hidden light source and shadow. In general, respondents tend to agree more regarding legibility than interest in exploring the space, suggesting that interest in exploration is more subjective than legibility.

Both the analysis of the means (graphs 4.6 to 4.13) and the percentages (graph 4.17) seem to indicate a relationship between legibility and interest in exploring the space. In fact, there is a positive significant correlation between legibility and interest in exploring the space for all the three LRPS. Most of the correlations are moderate, except from occlusion in architectural setting 02 (graph 4.19), which is weak. In graph 4.19, it seems that a smaller proportion of the respondents form another trendline, in which interest in exploring the space increases as legibility decreases (graph 5.1). This secondary overlapped trendline is constituted mainly of votes of professionals and students of architecture and related fields, suggesting that professionals and non-professionals might have different judgements of what makes a space interesting.

In fact, the correlation analysis isolating professionals and students of architecture and related fields and non-professionals suggests that the positive relationship between legibility and interest for exploration is higher among laymen. In this sense, it is possible that mystery is more relevant to professionals than to non-professionals. Nevertheless, legibility seems to be more relevant to create interest for exploration than mystery in both cases.

Particularly in the LRPS shadow, most of the respondents (72% A.S.01 and 60% A.S.02) considered these spaces less interesting to explore, regardless of their perception of legibility. Because most respondents associate mystery with a positive feeling of anticipation, the historical negative symbolism of shadow is a possible cause why this LRPS was the least preferred option to explore. Another possible reason can be inferred from the comments of some respondents, who mentioned that the rooms with shadow looked closed to the public, weakening their interest in exploration. In the case of deep shadows, the principle of continuity of the information in the space is weakened and it is also possible that the observers had anticipated negative surprises.
5.1. Conclusion

Most of the respondents consider mystery in architecture as an effect derived from a positive stimulus. The great majority relates mystery with interest in exploring the space or attraction for the “mysterious” areas. It is possible that the mystery in the scenes have triggered negative feelings and that this contributed to more legible spaces to be rated, in general, as more interesting to explore.

In other words, it is possible that legibility is more relevant than mystery to create interest in indoor space, in most of the cases. The effect of mystery usually requires some degree of reduced legibility. Very low legibility might be disturbing because it can cause disorientation due to the lack of visual cues (Lam, 1992).

On the other hand, if it would be possible to create mysterious indoor spaces without drastically reducing their legibility, it is very likely that the effect of mystery would be appreciated by the observers. That seems to be the case of hidden light source in both architectural settings, specially AS01.

It is not usual that the architect intends to create mysterious spaces that cause negative feelings to the users. However, if that is the architect’s intention, shadows, specially deep shadows, seem to be the most effective LRPS to create this type of mystery.

However, it is not clear enough if shadows can or cannot create mystery that generates positive feelings. To clarify that, an on-site experiment would probably be more efficient than a computer-generated images experiment.

In addition, the variety in the answers regarding both intensity of the choices and the choices themselves and the different comments left in the survey suggest that the preference for exploring indoor spaces where legibility is high is not unanimous and that the degree of subjectivity regarding preference is high.

Mystery is a very special architectural tool. It is up to the architect or designer to have enough sensibility to decide when it is appropriate to use it. Reducing legibility does not necessarily decreases interest, but it has to be done with caution and aligned to the project’s conceptual intentions.

5.2. Limitations and Future Studies

Initially, the surveys would be conducted through the observation of physical models by the respondents as an attempt to generate spaces visually closer to the reality and to include the LRPS that depends on the three-dimensionality of the space (ambiguous sense of scale). Due to the Covid-19 pandemic, it was necessary to adopt measures to prevent the spread of the virus. For this reason, the surveys were conducted remotely, and computer-generated images were used instead.

In Kaplan and Kaplan’s (1989) preference matrix, legibility and mystery require that the observer to interpret the space and predict what other information is available from different vantage points. Although the survey contained instructions to the respondents to imagine themselves in the space, it is possible that a three-dimensional model experiment or an on-site experiment would produce more reliable results.

Future studies in the topic should include more variety of architectural scenes to reduce the influence of other architectural elements in the results than the ones being studied. Also, it is important to find a way to assess the difference between spaces that achieved mystery through reduced legibility or through other solutions. This could be done by adjusting the first paired comparison question in the survey (“which space is more legible?”). Questions about what kind of feeling the images raise could also help to clarify the effect of the LRPS. These changes would improve the survey at the expense of longer and demotivating surveys or of varied surveys applied to a larger number of respondents.
6. Bibliography


Tanizaki, J 1977, In Praise of Shadows. Leete's Island Books, New Haven, CT.


7. List of Figures

Fig. 2.2 - Flickr user Andrew Carr, 2010, John Pawson: Plain Space exhibition, Design Museum, London, photograph, accessed March 2020, [https://www.flickr.com/photos/andrewpaulcarr/5097474824/in/photolist-8LzTEY-26e2qpl-3yXJL2-3mWNQL-E6A9C-2l6HtKX-21PX36-24nFkP-PE5dkm-2dXhFin-5DVZG-vfM XRn-2ceznWu-25weir-22dsZ3P-5F4nN2-23Y539v-F4vNL5-GsT1Xb-2ivmDo-2hYcgbC-22ojJ35W-24dYAz-TKPM69-WWTJ-Aj-26ArvDA-LBXUzp-z2mo2aT-24QH7zd-2cknTN0-xqKkZ0s-22ZQATP-2hUBGLT-28Z AssR-JKz7di-23jLld-232g5AY-20zupD-UUwyFx-25gymTM-TiMHcy-ZuYy21-Curves-25Gjivq-24WBVeFPJkPw-UeJGJ7d-5bbQz-UW2Itz-33E%20CC%20BY-NC-ND%204.0> CC BY-NC-ND 4.0

Fig. 2.3. Flickr user Pedro Varela, 2007, Therme Vals 1, photograph, accesses May 2020, [https://www.flickr.com/photos/rucativava/470637217/in/faves-187548293015/]> CC BY-ND 4.0

Fig. 2.4 - Flickr user Jacques Meynier de Malviala, 2015, Eglise St Pierre Intérieur 10H34 AM, photograph, accessed May 2020, [https://www.flickr.com/photos/jacquesmeynierdemalviala/22546500517/in/photostream]> CC BY-NC-ND 4.0

Fig. 2.5 - Flickr user elena_mch, 2006, Gilardi House by Luis Barragan, photograph, accessed May 2020, [https://www.flickr.com/photos/elena_mch/6005434399/]> CC BY-NC-ND 4.0

Fig. 2.6 - Flickr user Dominic Simpson 2009, Jewish Museum Berlin 12, photograph, accessed March 2020, [https://www.flickr.com/photos/goodnight_london/3453296275/in/photolist-6ga3EX-PBb5cf-6geazC-QTvr1P-QQ3xPS-QjjoBW-QjkckA-F5hmQT-dbYto5X-QH73d6-PD7Q9P-PD7Tjr-QEoC1U-PB9xTG-4e9SyW-9g]> CC BY 4.0

Fig. 2.7 - Larsson, Emma 2019, Untitled, photograph, courtesy of the author.
This lighting related property of the space was not included in the body of the thesis due to the impossibility to include it in the experiment. Ambiguous sense of scale depends on many factors related to the three-dimensionality of the space, and could not be evaluated with images, only through mockups or through real environments.

The understanding of objects depends on the angle from which light is coming and position of the observer (Dunham, 2011). For this reason, some specific scenarios might either need movement of the light source or, in the case of architectural settings, of the observer to provide understanding of the three-dimensionality of the space.

The use of smoothly curving edges in uniform surfaces with evenly distributed lighting (see image) might make the understanding of dimensions and shapes ambiguous. In theatre and cinema, cycloramas are seamless background devices with curving edges used to create the impression of great distances or infinity. Curving edges with uniform lighting might confuse the observers because they make it difficult to take depth cues.

Our visual system determines size and distance by combining two types of depth cues: oculomotor cues and cues from retinal images. Oculomotor cues are based on the movement of muscles in the eye and are useful for relatively close images. The cues from the retinal images are retinal disparity, familiar size (the size of known objects can be inferred by familiarity), pictorial cues and motion cues. Retinal disparity is the slightly different images formed at the retina due to the difference in position of the left and right eye and it is used to determine distance. Pictorial cues are cues that can be drawn, for example, perspective lines, occlusion (an object in front of another would partially overlap it), relative height, texture gradient (closer objects are more detailed) and atmospheric perspective (objects in distance are less distinguishable and often have a hazy, bluish appearance). Motion cues help to identify distance because closer objects appear to move faster (Willinghan & Riener 2009).

8.1. Ambiguous Sense of Scale

Fig. 8.1 - The Skyspace installation by James Turrell in Ytterjärna, Sweden, has a white dome with a hole to the sky. When looking up, observers seem to lose sense of distance of the ceiling due to the lack of depth cues. Photograph: author
8.2. Appendix - Pre-Testing

The survey was applied to five people before sending to the respondents in order to test the quality of the questions and possible problems regarding the images. The problems found in the pre-testing stage were:

- Initially, images were rated individually instead of paired comparisons. Some respondents reported that they changed the value of some answers in the scale after seeing the subsequent images. The paired comparisons would assure that respondents have more precise answers when they have a baseline to compare with.

- Some respondents had trouble identifying the differences between the pairs of images. The differences between images were accentuated.

- Some respondents stated that the images with shadow appeared as if the museum was closed. In order to attenuate that effect, people and objects were added to the spaces with shadow. In addition to that, a field available for optional comments was created in the form. This field would allow possible explanations for tendencies in the future responses.

- The pre-testing stage allowed adjustments in the questions and alternatives so they would be as clear as possible.

- Demographic questions were moved to the end of the survey in order to avoid fatigue of the respondents during the main sections.

Table 01 - Survey respondents gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>163</td>
<td>84</td>
<td>79</td>
</tr>
</tbody>
</table>

Table 02 - Survey respondents continent

<table>
<thead>
<tr>
<th>Continent</th>
<th>Total</th>
<th>North America</th>
<th>Europe</th>
<th>Asia</th>
<th>Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>163</td>
<td>113</td>
<td>31</td>
<td>15</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 03 - Survey respondents age

<table>
<thead>
<tr>
<th>Age</th>
<th>Total</th>
<th>Average or older than 31 years old (%)</th>
<th>25 years or older (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>163</td>
<td>72%</td>
<td>46%</td>
</tr>
</tbody>
</table>

8.3. Appendix - Respondants Profile Tables

| Table 01 - Survey respondents gender
| Table 02 - Survey respondents continent
| Table 03 - Survey respondents age

8.4. Appendix - Table Responses Section 01

Answers question 1.

Which of the following options best describes what mystery in architecture means to you?

<table>
<thead>
<tr>
<th>Option</th>
<th>Num. of answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Willingness to explore the space to overcome the anxiety caused by the unknown</td>
<td>53</td>
</tr>
<tr>
<td>Willingness to explore the space to overcome the curiosity caused by the magical atmosphere</td>
<td>77</td>
</tr>
<tr>
<td>Aversion to unknown areas due to possibility of unpleasant surprises</td>
<td>7</td>
</tr>
<tr>
<td>Attraction to unknown areas due to possibility of astonishing surprises</td>
<td>16</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
</tbody>
</table>

Total positive interpretations: 133 (81.80%)
Total negative interpretations: 28 (17.18%)

Table 04 - Results Question 01 of the survey
8.5. Appendix - Survey Layout. Created with Google Forms

Survey on Mystery in Architecture (Museums)

This survey is part of a research on mystery in architecture for a master thesis in Architectural Lighting Design at KTH Royal Institute of Technology in Sweden. Estimated response time is 5 minutes.

*Optional

Which of the following options best describe what mystery in architecture means to you? *

- Willingness to explore the space to overcome the curiosity caused by the magical atmosphere
- Aversion to unknown areas due to possibility of unpleasant surprises
- Attraction to unknown areas due to possibility of astonishing surprises
- Willingness to explore the space to overcome the anxiety caused by the unknown
- Others

Survey on Mystery in Architecture (Museums)

Instructions

In order to answer this survey, please imagine yourself inside the building and that the images correspond to your view. Try to focus on the experience of the space rather than rating the image itself.

Which space seems more legible (easy to understand the architecture and its elements) to you? *

- Space 01
- Space 01 moderately more
- Space 01 slightly more
- They are equally legible
- Space 02
- Space 02 moderately more
- Space 02 slightly more
- I have no preference
- Space 01 much more
- Space 02 much more

Which space do you prefer to explore? *

- Space 01
- Space 01 moderately more
- Space 01 slightly more
- They are equally legible
- Space 02
- Space 02 moderately more
- Space 02 slightly more
- I have no preference
- Space 01 much more
- Space 02 much more
8.5. Appendix - Survey Layout. Created with Google Forms

Which space seems more legible (easy to understand the architecture and its elements) to you? *

- Space 03 much more
- Space 03 moderately more
- Space 03 slightly more
- They are equally legible
- Space 04 slightly more
- Space 04 moderately more
- Space 04 much more

Which space do you prefer to explore? *

- Space 03 much more
- Space 03 moderately more
- Space 03 slightly more
- They are equally preferred
- Space 04 slightly more
- Space 04 moderately more
- Space 04 much more

Which space do you prefer to explore? *

- Space 03 much more
- Space 03 moderately more
- Space 03 slightly more
- They are equally preferred
- Space 04 slightly more
- Space 04 moderately more
- Space 04 much more

Which space do you prefer to explore? *

- Space 03 much more
- Space 03 moderately more
- Space 03 slightly more
- They are equally preferred
- Space 04 slightly more
- Space 04 moderately more
- Space 04 much more
8.5. Appendix - Survey Layout. Created with Google Forms

Which space seems more legible (easy to understand the architecture and its elements) to you? 
- Space RT much more
- Space RT moderately more
- Space RT slightly more

They are equally legible
- Space R10 moderately more
- Space R10 slightly more

Which space do you prefer to explore? 
- Space RT much more
- Space RT moderately more
- Space RT slightly more

Have no preference
- Space R10 moderately more
- Space R10 slightly more

Which space do you prefer to explore? 
- Space RT much more
- Space RT moderately more
- Space RT slightly more

They are equally legible
- Space R10 moderately more
- Space R10 slightly more

Have no preference
- Space RT much more
- Space RT moderately more
- Space RT slightly more
8.5. Appendix - Survey Layout. Created with Google Forms

Which space seems more legible (easy to understand the architecture and its elements) to you?*

[Space 1] [Space 2] [Space 3] [Space 4] [Like this]

Which space do you prefer to explore?*

[Space 1] [Space 2] [Space 3] [Space 4] [Like this]

Comments (optional)

[Optional text field]

[Submit] [Previous]
8.5. Appendix - Survey Layout. Created with Google Forms
8.5. Appendix - Survey Layout. Created with Google Forms

Which space seems more legible (easy to understand the architecture and its elements) to you?
- Space 03 much more
- Space 03 moderately more
- Space 03 slightly more
- They are equally legible
- Space 04 moderately more
- Space 04 slightly more
- Space 04 much more
- I have no preference
- Space 05 moderately more
- Space 05 slightly more
- Space 05 much more
- Space 06 moderately more
- Space 06 slightly more
- Space 06 much more

Which space do you prefer to explore?
- Other

Which space do you prefer to explore?
8.5. Appendix - Survey Layout. Created with Google Forms

Survey on Mystery in Architecture (Museums)

Demographics

Gender
- Male
- Female
- Prefer not to say
- Other

Age
- Under 10 years old
- 10 - 19 years old
- 20 - 29 years old
- 30 - 39 years old
- 40 - 49 years old
- 50 - 59 years old
- 60 years old or older

Where are you from?
- Europe
- South America
- North America
- Asia
- Africa
- Others

What is (are) the field(s) of your higher education?

- Architecture
- Interior Design
- Lighting Design
- Urban Planning
- Other
- Not applicable

Comments (optional)

Save progress

Your progress:

Página 1 de 6

69
8.6. Appendix - Comments left in Section 02 of the Survey

Structure:

Respondent’s number - “Original comment”. (is the respondent a professional or student of architecture or related field?)

“Comment translated to English (if applicable).”

28 - “Achei as imagens mais escuras menos atraentes, a iluminação/cortina transparente, para mim deixou o ambiente mais visível, podendo distinguir os elementos com maior facilidade.” (no)

“I found the darker images less attractive. For me, the lighting/transparent curtains made the room more visible, making it easier to distinguish the elements.”

34 - “Preferi as imagens que usavam a iluminação para compor o ambiente, pois agrega características ao local e ainda assim deixando o espaço “menos poluído.”” (no)

“I preferred the images that used the lighting to compose the room as it adds characteristics to the place and still leaves the space “less polluted”.”

41 - “Acredito que os espaços que mais deram vontade de explorar foram aqueles que ofereciam alguma pista de que havia algo novo e diferente além do que era visto, como uma área aberta ou uma sala mais escura.” (yes)

“I believe that the spaces that I most wanted to explore were those that offered some clue that there was something new and different than what was seen, such as an open area or a darker room.”

48 - “Interessante, mexe com os sentidos. (no)

“Interesting, it plays with our senses.”

53 - “As imagens onde os ambientes não visíveis na imagem apresentam-se mais escuros por mais que pareçam estarem “desativados” por não terem barreiras, como é o caso das cortinas, ainda causam curiosidade para no mínimo espiar mesmo que não houvesse nada dentro. A presença da figura humana e da escultura também se fazem convidativos de que há sequência dentro do espaço da direita ao fundo.” (yes)

“Even though the images where the spaces not visible in the image are darker appear to be “disabled”, because they have no barriers, as it is the case with curtains, still cause curiosity to at least spy even if there was nothing inside. The presence of the human figure and the sculpture are also inviting that there is a sequence within the space from right to back.”

79 - “Curiosidade para saber o resultado desta pesquisa.” (yes)

“I am curious to know the results of the research.”

82 - “Luz é fundamental em tudo!” (yes)

“Light is fundamental in everything!”

90 - “acho importante diferenciar ‘espaço sem luz’ de ‘espaço iluminado’.” (no)

“I think it is important to differentiate “space without light” from “space with lighting”.

97 - “Prefiro explorar espaços que gerem curiosidade por elementos de luz e sua geometria, do que por elementos sobrepostos (como cortinas).” (yes)

“I prefer to explore spaces that generate curiosity using lighting elements and its geometry rather than using overlayed elements (such as curtains).”

107 - “A partir das imagens, consegui perceber como as diferenças de luz e sombra instigam a nossa imaginação, nos fazem ter um menor entendimento de um ambiente e ter mais curiosidade para explorá-lo.” (yes)

“From the images, I was able to see how the differences in light and shadow instigate our imagination, make us have a lesser understanding of an environment and more curiosity to explore it.”

110 - “Ambos os espaços são legíveis, porém a cortina tira um pouco da visibilidade da entrada a esquerda.” (no)

“Both spaces are legible, however, the curtain takes away some of the visibility of the entrance on the left.”

125 - “The striking direct light cast on the walls creates intrigue and an interest to explore further. It also improves legibility as one can visualise the type of space beyond visual understanding compared to the concealed and dark versions.” (yes)

130 - “While the curtained version hid the architecture I did find it more intriguing as there appeared to be intent of the artist or curator to veil. The Light and Shadow versions gave a perception of space much more strongly and where more engaging as it hinted to what was around the corner.” (yes)

147 - “I find it difficult to decide on my own capabilities about understanding architecture and its elements. I have little to no knowledge about architecture. All of these answers were results of my vivid imagination and gut feeling.” (no)
25 - “Iluminação é tudo!” (no)

“Lighting is everything!”

41 - “Contrastes claro/escuro e jogos de luz tendem a me dar maior preferência para explorar.” (yes)

“Dark/light contrasts and light plays of light tend to make me prefer to explore.”

48 - “Interessante, mexe com os sentidos e confunde.” (no)

“Interesting, plays with our senses and confuses us.”

53 - “Quando não há luz nas salas fechadas passa a sensação de estar desativado afastando a vontade de explorar por terem barreiras físicas como portas e fechamentos de vidro. A abertura zenithal com profundidade além do encanto das formas luminosas chamam a atenção a olhar para o alto para descobrir o motivo daquela abertura, diferente do simples fechamento de vidro da zenithal "rasa".” (yes)

“When there is no light in the closed rooms, the feeling of being deactivated fades away the desire to explore because they have physical barriers such as glass doors and closures. The zenithal opening with depth draws attention to look up to discover the reason for that opening, apart from the charm of the luminous shapes, different from the simple glass closure of the "shallow" zenith.”

90 - “A luz natural faz a diferença.” (no)

“Daylight makes a difference.”

97 - (yes)

110 - “Com as salas escuras quase não se vê a saída ou entrada ao fundo, na parte superior direita.” (no)

“With the dark rooms you can barely see the exit or the entrance in the back, superior right part.”

119 - The spaces in darkness or with translucency make me curious to explore (yes)

124 - The spaces in darkness or with translucency make me curious to explore (yes)

125 - Darkness in the background feels like the space is closed to public rather than an additional space to explore. The skylight with views to sky increases the legibility of the space, but the space with light creeping down with no direct view is more intriguing and mysterious making one believe there is more to explore. Also, the diffused panels offer just enough concealment to encouragement movement into the space and explore more without closing it off completely or making it illegible. (yes)

144 - As I go along in the survey, I feel I get more interested in exporing the darker spaces. (yes)

147 - Feel the same way as I did in the previous page. I felt a strong attraction toward to cavity in the roof in some of the versions of this environment (no)

162 - “Prefiro lugares iluminados e com contraste. E isso também se relaciona intrinsecamente com a legibilidade.” (yes)

“I prefer light places and with contrast. And this is also closely related to legibility.”
### Appendix - Survey Results Converted in Scores

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Neutral</th>
<th>Architectural Setting 01</th>
<th>Shadow</th>
<th>Architectural Setting 02</th>
<th>Shadow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>9</td>
<td>4</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>10</td>
<td>3</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td>11</td>
<td>2</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>13</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>14</td>
<td>15</td>
<td>14</td>
<td>1</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>15</td>
<td>16</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>16</td>
<td>17</td>
<td>16</td>
<td>1</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>18</td>
<td>19</td>
<td>18</td>
<td>1</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>19</td>
<td>20</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>21</td>
<td>20</td>
<td>1</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td>21</td>
<td>22</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>22</td>
<td>23</td>
<td>22</td>
<td>1</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>23</td>
<td>24</td>
<td>23</td>
<td>0</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>24</td>
<td>25</td>
<td>24</td>
<td>1</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>25</td>
<td>26</td>
<td>25</td>
<td>0</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td>26</td>
<td>27</td>
<td>26</td>
<td>1</td>
<td>1</td>
<td>27</td>
</tr>
<tr>
<td>27</td>
<td>28</td>
<td>27</td>
<td>0</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td>28</td>
<td>29</td>
<td>28</td>
<td>1</td>
<td>1</td>
<td>29</td>
</tr>
<tr>
<td>29</td>
<td>30</td>
<td>29</td>
<td>0</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>30</td>
<td>31</td>
<td>30</td>
<td>1</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>31</td>
<td>32</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>32</td>
<td>33</td>
<td>32</td>
<td>1</td>
<td>1</td>
<td>33</td>
</tr>
<tr>
<td>33</td>
<td>34</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>34</td>
<td>35</td>
<td>34</td>
<td>1</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>35</td>
<td>36</td>
<td>35</td>
<td>0</td>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td>36</td>
<td>37</td>
<td>36</td>
<td>1</td>
<td>1</td>
<td>37</td>
</tr>
<tr>
<td>37</td>
<td>38</td>
<td>37</td>
<td>0</td>
<td>0</td>
<td>38</td>
</tr>
<tr>
<td>38</td>
<td>39</td>
<td>38</td>
<td>1</td>
<td>1</td>
<td>39</td>
</tr>
<tr>
<td>39</td>
<td>40</td>
<td>39</td>
<td>0</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>40</td>
<td>41</td>
<td>40</td>
<td>1</td>
<td>1</td>
<td>41</td>
</tr>
<tr>
<td>41</td>
<td>42</td>
<td>41</td>
<td>0</td>
<td>0</td>
<td>42</td>
</tr>
<tr>
<td>42</td>
<td>43</td>
<td>42</td>
<td>1</td>
<td>1</td>
<td>43</td>
</tr>
<tr>
<td>43</td>
<td>44</td>
<td>43</td>
<td>0</td>
<td>0</td>
<td>44</td>
</tr>
<tr>
<td>44</td>
<td>45</td>
<td>44</td>
<td>1</td>
<td>1</td>
<td>45</td>
</tr>
<tr>
<td>45</td>
<td>46</td>
<td>45</td>
<td>0</td>
<td>0</td>
<td>46</td>
</tr>
<tr>
<td>46</td>
<td>47</td>
<td>46</td>
<td>1</td>
<td>1</td>
<td>47</td>
</tr>
<tr>
<td>47</td>
<td>48</td>
<td>47</td>
<td>0</td>
<td>0</td>
<td>48</td>
</tr>
<tr>
<td>48</td>
<td>49</td>
<td>48</td>
<td>1</td>
<td>1</td>
<td>49</td>
</tr>
<tr>
<td>49</td>
<td>50</td>
<td>49</td>
<td>0</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>50</td>
<td>51</td>
<td>50</td>
<td>1</td>
<td>1</td>
<td>51</td>
</tr>
<tr>
<td>51</td>
<td>52</td>
<td>51</td>
<td>0</td>
<td>0</td>
<td>52</td>
</tr>
<tr>
<td>52</td>
<td>53</td>
<td>52</td>
<td>1</td>
<td>1</td>
<td>53</td>
</tr>
<tr>
<td>53</td>
<td>54</td>
<td>53</td>
<td>0</td>
<td>0</td>
<td>54</td>
</tr>
<tr>
<td>54</td>
<td>55</td>
<td>54</td>
<td>1</td>
<td>1</td>
<td>55</td>
</tr>
</tbody>
</table>
### 8.8. Appendix - Survey Results Converted in Scores

<table>
<thead>
<tr>
<th>RESPONDENT</th>
<th>LIGHT AND MYSTERY</th>
<th>OCCLUSION</th>
<th>CC</th>
<th>HIDDEN LIGHT SOURCE</th>
<th>SHADOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>56</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>57</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>58</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>59</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>60</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>61</td>
<td>3</td>
<td>-1</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>62</td>
<td>3</td>
<td>-2</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>63</td>
<td>3</td>
<td>-3</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>64</td>
<td>3</td>
<td>-4</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>65</td>
<td>3</td>
<td>-5</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>66</td>
<td>3</td>
<td>-6</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>67</td>
<td>3</td>
<td>-7</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>68</td>
<td>3</td>
<td>-8</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>69</td>
<td>3</td>
<td>-9</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>70</td>
<td>3</td>
<td>-10</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>71</td>
<td>3</td>
<td>-11</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>72</td>
<td>3</td>
<td>-12</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>73</td>
<td>3</td>
<td>-13</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>74</td>
<td>3</td>
<td>-14</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>75</td>
<td>3</td>
<td>-15</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>76</td>
<td>3</td>
<td>-16</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>77</td>
<td>3</td>
<td>-17</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>78</td>
<td>3</td>
<td>-18</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>79</td>
<td>3</td>
<td>-19</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>80</td>
<td>3</td>
<td>-20</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>81</td>
<td>3</td>
<td>-21</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>82</td>
<td>3</td>
<td>-22</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>83</td>
<td>3</td>
<td>-23</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>84</td>
<td>3</td>
<td>-24</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>85</td>
<td>3</td>
<td>-25</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>86</td>
<td>3</td>
<td>-26</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>87</td>
<td>3</td>
<td>-27</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>88</td>
<td>3</td>
<td>-28</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>89</td>
<td>3</td>
<td>-29</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>90</td>
<td>3</td>
<td>-30</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>91</td>
<td>3</td>
<td>-31</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>92</td>
<td>3</td>
<td>-32</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>93</td>
<td>3</td>
<td>-33</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>94</td>
<td>3</td>
<td>-34</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>95</td>
<td>3</td>
<td>-35</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>96</td>
<td>3</td>
<td>-36</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>97</td>
<td>3</td>
<td>-37</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>98</td>
<td>3</td>
<td>-38</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>99</td>
<td>3</td>
<td>-39</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>100</td>
<td>3</td>
<td>-40</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>101</td>
<td>3</td>
<td>-41</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>102</td>
<td>3</td>
<td>-42</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>103</td>
<td>3</td>
<td>-43</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>104</td>
<td>3</td>
<td>-44</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>105</td>
<td>3</td>
<td>-45</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>106</td>
<td>3</td>
<td>-46</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>107</td>
<td>3</td>
<td>-47</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>108</td>
<td>3</td>
<td>-48</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>109</td>
<td>3</td>
<td>-49</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>110</td>
<td>3</td>
<td>-50</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
### 8.8. Appendix - Survey Results Converted in Scores

<table>
<thead>
<tr>
<th>RESPONDENT</th>
<th>NEUTRAL</th>
<th>OCCULTATION</th>
<th>HIDDEN LIGHT SOURCE</th>
<th>SHADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>3</td>
<td>0</td>
<td>8</td>
<td>-4</td>
</tr>
<tr>
<td>112</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-9</td>
</tr>
<tr>
<td>113</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-8</td>
</tr>
<tr>
<td>114</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-5</td>
</tr>
<tr>
<td>115</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>116</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>117</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>118</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>119</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>120</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>121</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>122</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>123</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>124</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>125</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>126</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>127</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>128</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>129</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>130</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>131</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>132</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>133</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>134</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>135</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>136</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>137</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>138</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>139</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>140</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>141</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>142</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>143</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>144</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>145</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>146</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>147</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>148</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>149</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>150</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>151</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>152</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>153</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>154</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>155</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>156</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>157</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>158</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>159</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>160</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>161</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>162</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>163</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>412</td>
<td>36</td>
<td>36</td>
<td>-554</td>
</tr>
</tbody>
</table>

**MEAN (range from -9 to +9):**

- **Environmental Setting 01:**
  - Legibility: 2,528 (range from -9 to +9)
  - Exploration: 0,221 (range from -9 to +9)

- **Environmental Setting 02:**
  - Legibility: 3,368 (range from -9 to +9)
  - Exploration: 0,405 (range from -9 to +9)
8.9. Appendix - Distribution of Legibility and Exploration Scores

- NEUTRAL IMAGE - IMAGE 01
- NEUTRAL IMAGE - IMAGE 02
- OCCLUSION - IMAGE 01
- OCCLUSION - IMAGE 02
- HIDDEN LIGHT SOURCE - IMAGE 01
- HIDDEN LIGHT SOURCE - IMAGE 02
- SHADOW - IMAGE 01
- SHADOW - IMAGE 02

Legibility  Exploration  2 per. mov. avg. Legibility  2 per. mov. avg. Exploration
LIGHT AND MYSTERY IN ARCHITECTURE

KTH Royal Institute of Technology
Degree Project in Architectural Lighting Design
AF270X | Second Cycle | 15.0 credits | May 2020
e-mail: paulabc@kth.se

Paula Bez Cardoso
Tutor: Thomas Schielke, Ph.D.