The cultural experience in a museum from inside out

How side openings and view interfere with users’ perception and preferences in art galleries

Irene Sofia Ceron
The cultural experience in a museum from inside out

How side openings and view interfere with users’ perception and preferences in art galleries

Irene Sofia Ceron | May 2019
# Table of contents

- Acknowledgements .......................................................................................... 7
- Abstract .............................................................................................................. 9
- Introduction ...................................................................................................... 11
- Background ...................................................................................................... 13
  1. MUSEUM&CULTURE ................................................................................. 13
  2. MUSEUM&DAYLIGHT .............................................................................. 15
  3. MUSEUM&VIEW ....................................................................................... 16
- Methodology .................................................................................................... 25
- Case study: *Stockholm’s Nationalmuseum* ....................................................... 29
  1. Introduction: the museum renovation, design and principles ................. 29
  2. Case study: selection of the exhibition rooms ........................................... 35
  3. Case study: rooms’ analysis ....................................................................... 38
- Results ............................................................................................................. 43
- Discussion ....................................................................................................... 49
- Conclusion ....................................................................................................... 53
- List of illustrations .......................................................................................... 54
- Bibliography ................................................................................................... 56
- Appendix ......................................................................................................... 59
Acknowledgements

First, I would like to express my gratitude to my tutor Sofia, for her help, guidance and valuable feedback throughout the preparation of the thesis. I would also like to thank Isabel, as academic advisor, for her patience, her precious advice and for all the time dedicated to this work. In addition, I am very thankful to the ALD course and its professors, because for two times, they have given me the possibility to learn about my passion and discover new ones in such a stimulating environment.

I would like to thank the classmates of 2019 for the nice time we spent together preparing the thesis supporting each other through the various challenges, and also those classmates from the previous cycle who reassured me all the times that I needed it. A particularly huge thank you goes to Arianna, who spent a lot of time discussing with me about each step of this work, and greatly helped me with the surveys from their initial ideation. I am also very thankful to Sebastian, who kindly translated such surveys from the English to the Swedish version, making a lot of visitors more willingly to take part in this research; and finally to Alan, Isaac and again Arianna who came to Nationalmusuem to help me collect answers.

In addition, I wish I could say thank you once more to all the participants of the surveys, especially those who took them with a smile and kind words of encouragement, without them this thesis could not have been possible.

Finally, I would like to thank my loved ones back home, who showed nothing else than support. Thank you to Andrea, but especially to my parents, who gave me the chance to follow my passion and make study my one priority. You gave me anything I could have wished for and much more, your love for me never ceases to amaze me, I wish that through the values you taught me and the possibilities you gave me, I’ll make you proud.
Abstract

This thesis discusses the role of side openings in museums, in relation to users’ visiting experience. The research particularly focuses on the feature of view, analysing if the connection with the outside environment provided through windows, results in an enriched museum’s experience and enhanced cultural identity. The analysis is based on the case study of the Nationalmuseum in Stockholm, where three rooms with stronger, moderate and weaker connection with the outside environment have been evaluated through visitors’ surveys. Results show that the public revealed considerable awareness about windows and their landscape and yet the view was rarely considered a distracting feature. The available literature on daylight in museums hardly includes view among the acknowledged daylight benefits, and, also due to the difficulty in controlling the daylight intake, side openings have gained a bad reputation in the museum field. However, as in the analysed case study, the view was considered by many as an enriching part of the visiting experience, this thesis calls for further research on the role of view in exhibition rooms and on how to include it properly in museums’ design.

Keywords:
Museum | Daylight | View | Window | Side opening | Connection with the outside environment | Visual connection | Users’ experience | Cultural identity
Introduction

After decades of dominance of the “white cube” theorised by Brian O’Doherty [19] as the ideal form of the art gallery - conceived as a place free of context, where connection with reality is abolished, to create a more intimate relationship between visitors and artworks in which time and social space are excluded - nowadays, some studies [3] claim that such alienating space does not favour visitors museum’s experience. Museums are important institutions in contemporary society which add to the cultural identity of a specific place and community.

From the architectural point of view, there is a well-documented trend that sees new museums being built as iconic landmarks [9, 20]; in this case museums become works of art themselves, capable of regenerating entire urban fabrics, to create new centralities and habits in the urban environments, taking the role of cultural sounding boards. If from the exterior, museums have such a strong cultural identity that buildings such as Frank O. Gehry’s Guggenheim Museum and Pei’s Louvre Pyramid have become symbols of the City of Bilbao and Paris respectively, can we confirm this cultural uniqueness when analysing museums from their interior space?

This thesis wants to investigate the connection between art galleries space and the outside environment under visitors point of view. There are two main topics that this research takes into consideration: daylight and side openings, which are also the two main aspects that guarantee the connection with the outside environment. Research has proved that daylight should be included in the museum luminous environment because of its many benefits: spectral qualities of natural light enhance the viewing experience, visitors get tired from the lack of time of day and weather cues experienced in white cubes, and in addition, natural light is sustainable and energy efficient. [8] However, if some architectural solution, such as skylights, are widely acknowledged to be efficient in museum environments, critics don’t evenly agree on side openings, which are less favoured solutions as they can lead to glare, and need to have efficient control systems.

In the present work, I will investigate one case study considering selected exhibition rooms which present large side openings with a good quality view of the exterior environment, to understand to what extent this daylight intake and connection with the outside environment influences (positively or negatively) the visitors’ museum experience and overall preferences.
Objectives

Museums, view and daylight can open up a wide range of discussion topics regarding the lighting field; from very technical aspects concerning the conservation of the artworks to very perceptive ones regarding user experience. In my study, I address the perception side because my focus is about the users’ visiting experience. To narrow the topic of this thesis down enough to get a satisfactory in-depth analysis of this field, this study will investigate the following research questions:

1. What are users preferences in relation to daylight openings? Is a visual connection with the outside environment enhancing or worsening the museum experience? Is it distracting? Or does it give positive cues?

2. Do daylight openings interfere (positively or negatively) with users perception of the artworks in the exhibition room? Does the view build a perceivable composition with the artwork?

3. Are visitors aware of the view, or in other words, is the view considered by the users as part of the museum experience? Does it make a difference to have a strong connection with the outside environment? Does it build up cultural identity from the interior space?

4. Are side openings an overall advantage to the museum’s visitor experience?

I set up these question to understand if side openings can really contribute to the museum experience from a cultural point of view, adding to the cultural identity of exhibition space as opposed to the white cube. For instance, in the analysed case study, I will try to understand if people are more aware of being in that specific location because of the view. And if this is considered an advantage for the users’ satisfaction, or if it is considered distracting, or, if it is not noted at all. Overall, is it important to have a cultural and visual connection with the outside environment when visiting a museum?
Background

1. MUSEUM&CULTURE

While “museums” as we know them today did not emerge until the 18th century, valuable private collections date back thousands of years. This thesis doesn’t aim to cover the history of museums as institutions but it’s interesting to consider that, through the centuries, they slowly shifted from being a private niche ambient to be an interactive experience open to all kinds of public. The focus of this section is to consider the role of museums as cultural institutions, considering the bond that therefore they have to the local culture, and how this reflects on the architecture field.

From the 70s, museums were no longer considered buildings whose only aim was to protect and gather artworks and objects of cultural value, but also buildings able to gather people and complementary activities like research and experimentation; museums became machines for cultural production and reflection, not only conveyor of material works but also a condenser of intangible assets, such as the forms of expression of every social and cultural environment, engaging an increasingly wider public. Architecture itself was no stranger to such changes as the museum architecture through the years has been the means by which each society was able to communicate and transmit collective values, making the museum take the role of a “cultural sounding board”.

This last century can be easily considered the museum century, as museums transformed from temples of art to places of entertainment and cultural integration. If in the past the objects-subjects of the collections were for sure more important than the space that welcomed them, today the container, or the museum space, has freed itself from the previous schemes and sometimes it is itself, more than the collections guarded, the catalyst that attracts the visitors. From a technical point of view, contemporary museums have become the symbol of architectural experimentation. Especially in the case of the museum, it seems that the path chosen by contemporaries is that of an almost obsessive search for iconicity. Starting from the Guggenheim of Bilbao by Frank Gehry, the architecture of icons has become a true architectural phenomenon globally recognised; the museums are themselves works of art capable of regenerating an entire urban fabric and they tent to become not just cultural poles but symbols of cultural identity as well.

However, this thriving for iconicity sometimes leaves behind the connection between this cultural entity and local culture. Museums like the up-cited Guggenheim has become a symbol of the city of Bilbao, but it could easily have been placed in any other city and be as iconic elsewhere. There is a tendency for new museums to be designed, as long as the exhibition rooms are concerned, as introverted bubbles where the art prefers to be shown as less contaminated as possible from the outside environment. More often, museums connect with their city through their public space, with auditoriums, open-air squares, cafe and activities; but the visiting experience of the exposed art in the galleries is often a very self-referring environment, which rarely leaves an impression of a strong relation between that specific art, the container (which is the museum) and the cultural environment they are in (that specific city, society, culture and values). Obviously, not every museum follows this introverted tendency in the exhibition rooms, and not every museum is recently built; there are a lot of museums that are historical buildings and have a lot of openings which connect them visually with the environment they are in.

The aim of this research is to focus on those that have a strong bond with their surroundings and see some examples where such where the connection with the city was taken in consideration in the
designing of the visiting experience. Obviously, openings are the most evident means through which this connection is enabled, but, especially regarding the museums’ architecture, they are a really sensitive subject because they open the discussion of daylight in exhibition environments which calls for its own section in this investigation.

2. MUSEUM & DAYLIGHT
Daylight in museums is a very controversial topic. Concerns about the relation between light and art preservation started in the second half of the 20th century; when the first researches on light damage to exhibits appeared, many museums turned on artificial lighting systems only, which were easier to control. [13]

Nowadays research has developed on this topic and we can find two main schools of thought: the first defending an exclusive use of artificial lighting for museums; and the second aiming at integrating daylight as well. [21] Arguments are understandable for both sides. It must be said that not all artworks have the same behavior under light, some pieces like pigments, paper and textiles (but also video and media) are more photosensitive than sculptures or even oil paintings.1 Other arguments of artificial light defendants include that daylight is too variable, while artificial light can mimic daylight variation remaining controllable and predictable. It is universally acknowledged that daylight is more difficult to control than artificial light, and it also carries a level of UV radiation that is difficult to eliminate. Nowadays, however, the second branch, siding for daylight integration is growing and growing. Research has shown that daylight provides benefits under many levels:

- Reduced energy consumption.
- Benefits to human health and well-being.
- The varied appearance of the space.
- It provides a connection to the location, the weather outside and the time of the day.
- Better colour rendering
- Better visual comfort

Even if museums are becoming more and more interactive, it’s fair to say that the large majority of museums appeal to the sense of sight. Being related to visual art, exhibition spaces aim to enhance human perception and visual environmental qualities, and despite its many benefits daylight could still create a lot of discomfort and damage if not well integrated into the design and properly controlled. [16]

Even for those who side for daylight in museums, not all design solutions are considered suitable. It’s important to remember that successful lighting depends on a deeper knowledge of all the characteristics of the light entering the building. Lighting conditions are strongly related to location, both in sense of coordinates and latitude and of position in relation to its environment. For this purpose, it is necessary to know in depth the typologies of openings that would integrate better in the design.

There are many classifications for openings considering different aspects, the most general one divides them between top lit and side lit. The character of top lit windows is that they provide a very even horizontal distribution of light throughout the space, while with side lit windows light concentrates more around the windows and fades to the opposite side, depending on the depth of the building, creating an uneven distribution of light on the horizontal surface of the room [13]

The geometry of the windows is also of great importance, the size influence the amount of daylight intake, and the height influence the depth daylight can reach.

---

1 Recent research shows that oils react to light mostly when they are new, but old oil paintings like the one exposed in historical museums develop a certain resistance to photo-sensitivity over time [14]
Side openings are considered by many the more challenging solution when applied to museum lighting, because they are very difficult to control due to the direct light intake (if they are not faced north), and they can lead to glare and visual discomfort. Some professionals and critics have very severe positions about this, for instance the designer and art director Steven Hefferan has stated that: “Windows are the most problematic daylight introducing building form and there is no practical way to maintain favorable viewing conditions at conservation light levels in a gallery with windows”; he defines shades and scrims as a last-ditch solution to an existing problem, that should not be considered for new construction.

This introduces to the topic of control systems for daylight intake. Nowadays, technology and progress in the research have come out with the most innovative and sophisticated solutions for lighting control. In their study about Daylighting museums [21] Oliveira and Guedes count among innovative light-control techniques solutions like light-directing louvers, light shelves, movable shading systems, mirrored systems, prismatic glazing, and light pipes, all together with optimised façade layout, space configuration and lighting system. In their opinion, the focus should be to identify the optical glazing properties that provide adequate daylight levels while avoiding glare. Besides being controversial, side openings are the solution creating the strongest cultural bond because they allow the city context to be seen. Since the aim of this thesis is to state whether this could positively add to the museum experience and since available technology together with proper design could easily make up for most of the disadvantages of side openings, the hypotheses of the author is that windows should be considered a challenging but doable possibility in the museum design.

A conscious and accurate design can turn the challenges of side windows in opportunities.

The image on the right shows an interior photograph of Turner Contemporary Art Gallery in the UK, opened in 2011. This gallery, designed by David Chipperfield Architects in collaboration with Arup, is situated on Margate’s seafront. Here, the museum layout and the careful positioning of windows and skylights enables the galleries to be lit with indirect daylight and diffused sunlight without the need for complex control systems.
3. MUSEUM & VIEW

Among academic studies, there is a lot of literature that considers the influence of windows on humans’ comfort and performance, but it mostly covers either the health field or, in relation with architecture, the residential and working environment, where people on average spend most of their time. Little is known in literature about the effect of windows in the visiting experience of museums’ exhibition rooms so this section will focus on the aspects of general research that can be applied also on the museums’ case, and in the end of the chapter, some examples of exhibitions rooms that were designed with special care towards windows and its views will be given.

In the paper: “WHAT WE KNOW ABOUT WINDOWS AND WELL-BEING, AND WHAT WE NEED TO KNOW”, Veitch, Christoffersen, and Galasiu [26] give an extended literature-based insight on what is known about the effects of windows on human well-being. Their findings point out that windows contribute to:

- Spatial Appearance (spaces with windows are generally preferred over those without, and if one considers a wall to create a boundary, they make it permeable by providing a view to the world beyond)

- Visual Comfort

- Stress and Restoration. It’s very interesting that studies pointed out that providing a view of outdoors can promote restoration following stressful experiences, especially if the view is considered attractive. In addition, it has been proven that access to nature through window views improves well being through physiological calming, improved attention focus, and improved mood and satisfaction.

This study demonstrate that empirical research proved the benefits on human being not only of daylight through windows (which allows to see, regulates important physiological functions, and promote positive feelings and alertness) but also of view through windows, which make spaces look pleasant and provide connection to the environment, contributing to safety and restfulness. An interesting aspect that this study covers is that the view has a positive effect on well-being especially when it is considered attractive; another study from Matusiak and Klöckner particularly focuses on this aspect of evaluating the view quality finding out which parameters affect the most this evaluation. This study itself starts from a background of literature review which considers important, in considering the view as high-quality, some aspects like:

- the width of the view in relation to the amount of information, meaning more the information given by the view more it is found interesting (Tuaycharoen)

- the type, amount and structure of information add to the quality more than the quantity of information itself; in particular, users satisfaction is significantly affected by the presence of natural elements in the view (Kaplans)

- the horizontal stratification of the view is considered important: the best quality view includes a layer of the sky, a layer of the city or landscape and a layer of the ground.” (Markus)

Matusiak’s study follows up on the literature because it shows the absence of an agreed upon set of view combined quantity and quality criteria since quantity criteria alone (width, angle, etc..) are not enough because they don’t convey information about the content and composition of the view. For this reason, they set an experimental-based study to find the parameters that affect the most the quality view finding out that the ones summarised in the following chart are the most effective:

<table>
<thead>
<tr>
<th>DESCRIPTOR</th>
<th>INSUFFICIENT</th>
<th>SUFFICIENT</th>
<th>GOOD</th>
<th>EXCELLENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of view window(s)</td>
<td>&lt; 13°</td>
<td>&gt; 13°</td>
<td>&gt; 27”</td>
<td>&gt; 30 m</td>
</tr>
<tr>
<td>Distance of the view</td>
<td>&lt;6°m</td>
<td>&gt; 6 m</td>
<td>&gt; 12 m</td>
<td>&gt; 30 m</td>
</tr>
<tr>
<td>Number of layers:</td>
<td>only sky or</td>
<td>landscape</td>
<td>minimum all layers included</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ground ground layer is included</td>
<td>layers are included</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental information:</td>
<td>time and weather</td>
<td>time weather and location</td>
<td>time, weather, location and one of: nature and people</td>
<td></td>
</tr>
<tr>
<td>Content and quality of landscape:</td>
<td>urban low or rural low or rural middle</td>
<td>Natural/ rural low or urban middle</td>
<td>Natural/ rural middle or urban high</td>
<td>Natural/ rural high or urban high</td>
</tr>
<tr>
<td>Composition:</td>
<td>Poor balance and/or the central part of the view is dominated by undesired elements.</td>
<td>Poor balance but at least the central part of the view is free from undesired elements.</td>
<td>Good balance and the central part of the view is free from undesired elements.</td>
<td>Very good balance and the view is free from undesired elements.</td>
</tr>
</tbody>
</table>

Fig. 5 | Chart taken from Barbara Matusiak’s conference paper: How to evaluate the quality of view out through the window?
This study was of particular interest for the research because when evaluating the windows view of the case study these parameters were used to establish those that had a stronger, moderate and weaker connection with the outside environment.

There are examples where museums are created with a clear intention of connecting to the culture of the place, even during the exhibition and also through a direct visual connection with the outside environment. In Milan, for instance, in the heart of the most central square, the Museo del Novecento, opened in 2010, exhibits its XXth century Italian art in rooms with huge openings that face an astonishing view of Milan’s Cathedral. The project is a renovation of an ancient palace (Palazzo dell’Argentario) where the architects Italo Rota and Fabio Fornasari maintained just the external façades, changing drastically the whole interior program and layout. In my personal opinion, having visited the museum, both the typology of the exhibition, the location and the stunning view contribute to the visiting experience during which the strong feeling of Milan cultural identity is always present. [1]

Another evident example of connection with the local identity is given by the New Acropolis Museum by Bernard Tschumi Architects, completed in 2009. Located in Athens’s historic area the museum stands around 300mt southeast of the Parthenon. This location was carefully selected to enable a dialogue between the Museum’s exhibition spaces and the Acropolis buildings. The building has three layers and it “culminates in the Parthenon Gallery, a rectangular, glass-enclosed, sky-lit space that is rotated 23 degrees from the rest of the building so as to align with the Parthenon. The gallery’s glass outer walls allow visitors uninterrupted, 360-degree views of the ancient temple and the surrounding city.” [7] Here, despite the south exposition and the Mediterranean latitude, the whole architecture of the museum revolves around the connection with the external environment to give an authentic and engaging experience of ancient Greece.

The last example that I found interesting to mention is Renzo Piano’s Fondation Beyeler, in Basel. This museum was designed with the aim of integrating the exhibition with the cultural landscape of Berower Park, in a combination of nature, art, and architecture. The museum is shielded from the street level because a pond was appositely created in front of the building which it is sunk into the ground; however, the view still opens to the natural landscape. Daylight is captured on the North and blocked on the East and West. The lightweight glass roof protrudes far beyond the stone walls, protecting the glass facades from the sun. [11] “To the South, the pond filled with water lilies reflects Monet’s works and creates a smooth transition between interior and exterior.”
Methodology

This research will consider Stockholm Nationalmuseum as a case study; the building is a XIXth-century palace which recently underwent an extensive renovation which will be discussed in the next chapter. It was chosen because of the abundance of daylight openings (both on sides and ceilings) and because the majority of them provide a quality view of central Stockholm and its waterfront. The study investigates three rooms in the palace, where daylight openings have a weaker, moderate and strong connection with the outside environment according to the parameters set through Matusiak's study [18]. Those spaces are to be analysed during the daytime, where this connection is evident the most, and during dark hours, which would be virtually considered as “lacking visual connection”, as from the bright environment of the exhibition room the outside environment would be less noticeable.

The methodology applied in this research consider a combination of
• literature review & research,
• qualitative and quantitative assessment of the case study,
• personal observations,
• surveys.

1. Literature review & research
The background section of this thesis is all based on literature review and research, this chapter helped me framing the problem and get a deeper understanding of the aspects I was more interested to investigate:
• Museums daylight openings theories and examples,
• Literature on the effect of view to users behaviour and perception of the space

However, literature was taken in consideration for the whole thesis process; in particular, I took scientific papers investigating users preference and satisfaction as well as daylight evaluation in museums, as a reference to assess a suitable methodology. As well, I found other master theses on the topic of daylight in museums useful to structure this research.

2. Qualitative and quantitative assessment of the case study
I analysed the museum layout and features after renovation, and I set criteria to evaluate
the different typology of rooms to find three rooms that had different quality of view but still similar features in terms of space dimensions, brightness and overall likeability, so that when asking visitors about the different rooms these other features would not greatly affect the results of the survey. Once selected, the three chosen rooms (with strong, moderate and weak connection with the outside environment) were analysed in depth with architectural drawings, photos and lighting schemes.

3. Personal observations
I used personal observation to understand the visitors’ behaviour in each of the rooms, investigating the relationship between certain behaviours and inferred users preferences along with the general impact of the windows on visitors. This helped me in an early stage to structure the survey, but also along the discussion to compare if the result of the survey and people’s general behaviours were going along, in other words, if people were truly aware of the effect of windows on their behaviour. Through personal observations I assessed if people have a general tendency to approach towards the windows in the exhibition rooms, noting down the time they generally spend in front of the openings, if they look out or just pass by, if they pause and stay long to admire the view and so on. (eg. Length of stay during day hours and dark hours, position in the room, evident discomfort situations.)

4. Survey
The survey was a crucial part of this research because is the means through which I could really assess users’ preferences and satisfaction in the visiting experience. The survey was structured as a one-page-long multiple choice questionnaire (see appendix), to make it easy for the visitors to answer it during the visit. A lot of question are graded both to have a more truthful spectrum of answers and to be able to compare the different analysed scenarios. The survey is the same for every room and every room conditions (day or night) and the visitors are asked to fill it just after visiting the room. The visitors are not expected to be the same in each of the rooms and situations.

The survey was drawn up to address the research questions illustrated in the objectives; it is structured in five sections, targeting mainly two aims:
1. Comparing daytime to night-time to see the influence of the connection (IC) with the outside environment
2. Comparing the three chosen rooms to see the influence of the strength of the connection (ISC) with the outside environment.

- The first section is about the general appreciation of the room (IC)
- The second is about the lighting (IC)
- The third and fourth is specifically about the relationship with the view (IC) + (ISC)
- The fifth is about the cultural identity

In the methodology, all these four tools are combined to directly address the objectives’ questions and to try to achieve well-supported and relevant findings through the results and discussion.

Fig. 10 | Comparison between daytime situation (considered in relation to the connection of the window with the outside environment) and night-time situation with rolled-down blinders (considered as no-connection)
Photo: Irene Sofia Ceron

Methodology
Case study: Stockholm’s Nationalmuseum

This section illustrates the Stockholm’s Nationalmuseum as a case study. The introduction describes the general features of the museum, its location, surroundings and layout. A focus is given on the renovation it underwent from 2013 to 2018 and the principles of the new design especially regarding the daylighting system. Having clarified how the building works the next section focus on the selection of the three exhibition rooms considered as a case study, defying the criteria used to make such choices. This is followed by an in-depth analysis of each of the rooms.

1. Introduction: the museum renovation, design and principles

Stockholm’s Nationalmuseum is the national gallery of Sweden and also Sweden’s largest art museum. The museum is located on the main harbour on the peninsula of Blasieholmen in central Stockholm, facing the Royal Palace (on the other side of the water). From the southern corner of Blasieholmen, where the building is located, there’s a clear view of four of Stockholm’s city fourteen islands: Stadsholmen, Helgeandsholmen, Skeppsholmen and Djurgården, however, from there is also possible to see Sodermalm’s and Östermalm’s waterfronts. The building, inspired by North Italian Renaissance architecture, was designed by the German architect Friedrich August Stüler (1800-1865) - who also designed the Neues Museum in Berlin - and it was opened in 1866 taking twelve years to be completed. Like other European national galleries, the Nationalmuseum’s history is largely tantamount to the development from royal to state-owned, and ultimately publicly available, collections. Speaking about the art itself, the Nationalmuseum’s historical collection has a wide range of diversity, spacing from paintings, sculpture, furniture, ceramics and glass from 16th century to present days.

In 2012, the architectural offices Wingårdhs and Wikerståhl were commissioned to plan the Nationalmuseum’s extensive restoration. Over time, a number of temporary interventions and reorganizations had progressively distorted the spatial organization and visitor experience; windows had been covered to keep out daylight, the climate control was outdated, the exhibition rooms were tiring to the visitors and the circulation had become inefficient. Consequently, the task of the renovation consisted of bringing back to life both the building and the way of displaying the collections, without compromising the original architecture. In particular, there was the need to maximise the exhibition surfaces, improve the logistics with alternative patterns of movement for the audience and the art, and finally replace all technical systems.
After a six-year gestation, “a dark museum has become a bright museum” (Wingårdhs Arkitektur); the museum’s original floor plan having two yards with access to natural light has been recreated, as both of the atria are now enclosed under new glass roofs and a tall lift tower in the Southern atria solves both circulation and logistic. Large air ducts have been installed and concealed. The exhibition space has been expanded and received a new thematic set design and colour schemes, which allows twice as many visitors and almost three times as many works. Previously covered windows have been taken up again to let in light and show the views towards the city. The art, the design, the lighting and the atmosphere, everything works together to contribute to the cultural heritage experience. [21]

“As the windows regain their importance in the interior, it becomes possible to experience the art in a new way. Daylight and views in exhibition halls were long regarded as a threat to both art and experience. Today, we know more about their great importance for both refreshment, orientation and the art experience as such, as well as that light does not pose such a great threat to older paintings as it was previously believed.”

Gert Wingårdh

The daylight and exhibition lighting project was commissioned to Kardorf Ingenieure that worked together with the architects from the competition to the executive phase. Since the museum was originally built to be experienced mostly with natural light (electric light was not available at that time), the team decided to bring back daylight in the museum as much as possible, also considering that contemporary technology gives the opportunity to measure, calculate and control the daylight. The building gets natural light mostly from skylights and side openings: the exhibition halls are placed around two courtyards (A) so that the main ones are given natural light. The halls on the museum’s highest floor (B), on the other hand, receive daylight through large glass roofs (C).

However, since the original openings in the roofs and façades were so large, daylight is controlled properly to guarantee that the exhibited objects are not to be damaged through an attentive selection of the properties of the glass in windows (all the previous ones from 1910s and 20s were replaced) and ceilings and through a calibrated combination of natural and artificial lighting. To protect the artworks the maximum illuminance level was set to 200 lux (50 lux for the photosensitive), applied to both natural and artificial light. Daylight is used for ambience lighting of the rooms while adjustable spotlights highlight the artworks. The museum was designed to have an average of three-quarters of the light to come from outside and a quarter from artificial lighting. To control the daylight intake fine darkening curtains are used on the side openings; it’s a flexible solution because when needed by closing them they only emit five per cent of the light, still remaining see-through allowing the view from inside out.
2. Case study: selection of the exhibition rooms

To answer the guiding questions of this research and understand if it is important to have a cultural and visual connection with the outside environment when visiting a museum, I decided to select three exhibition rooms to take as a case study in the Nationalmuseum, according to their view. The aim was to select three samples with a stronger, moderate and weaker connection with the outside environment and test the user experience both during daylight and night-time to understand:

1. If the view has an overall impact on the museum experience (comparing daylight situation, meaning connection with the outside environment to night-time situation that is here considered as no connection with the outside environment)

2. If the quality of the view has an overall impact on the museum experience (comparing the rooms)

Fig. 13 | Scheme of the classification of the room typologies with associated pictures. The scheme is done by the author on the basis of Wingårdhs Architects released plans. Photos: Irene Sofia Ceron and Arianna Paris

The first step into this process was to define the selection of the sample rooms. To assess the quality of the view I referred to the studies mentioned in the background section: MUSEUM&VIEW, taking into consideration the depth of the view, the layers visible, the information it provides, and the characteristics of the landscape. The exhibition rooms of the museum are placed in the first and second level; according to their layout, there are several typologies of rooms with side openings as summarised in the scheme below: Besides the layout of the room and number of windows in it there are also other parameters that affected the quality of the view in the museum:

- The height of the window: on the first-floor windows are generally higher and starting from the floor level, while on the second floor they start 1,8 meter above the ground.
- The level: on the second floor windows frame the upper part of the landscape, and no ground level
- The orientation: on the North-West and North-East side the view is less deep because there are closer obstacles around, while the other two sides face the waterfront
- The dimming system: while the roll-up blinds are see-through they are white on the northern side and black on the southern side and so more noticeable.

Fig. 14 | Photos of the dimming system. Photos: Irene Sofia Ceron and Arianna Paris

All this considered, I decided to take as samples three rooms that would be perceived similar from the visitors perspective for the exception of the connection with the outside environment. This because if only the quality of the view was considered in rooms with very different dimensions, art selection, and also level of brightness, I would expect to get biased results based on the general appeal and atmosphere of the room. For these reasons, I selected typology C, E and G as case study.
• **STRONG CONNECTION WITH THE OUTSIDE ENVIRONMENT: typology C**

The C typology are large rooms on the first floor with openings towards the outside environment and the inner court. Each one has a specific colour according to the art period. The openings facing the outside environment are large floor-to-ceiling windows and each room has 5 of them. The stronger connection with the outside happens in the South-West façade, in the 1800-1870 room and the temporary exhibition room.

![Temporary exhibition hall](image)

**Fig. 15 | Temporary exhibition hall**  
1st floor South façade  
*Photo: Irene Sofia Cerini*

![1800-1870 exhibition hall](image)

**Fig. 16 | 1800-1870 exhibition hall**  
1st floor South façade  
*Photo: Linus Lintner*

• **MODERATE CONNECTION WITH THE OUTSIDE ENVIRONMENT: typology E**

The E typology are large rooms with three large windows on the wall sides of an octagonal apse. This typology repeats on the first and second floor in the central part of the N-E façade. Facing the greenery of the park behind the museum and Ostermalm’s waterfront on the background.

![16th century exhibition hall](image)

**Fig. 17 | 16th century exhibition hall**  
2nd floor North façade  
*Photo: Linus Lintner*

![Turn of the 20th century exhibition hall](image)

**Fig. 18 | Turn of the 20th century exhibition hall**  
1st floor North façade  
*Photo: Linus Lintner*
3. Case study: rooms’ analysis

According to these three typologies I selected the three rooms that most suited as a case study:

- The 1800-1870 exhibition hall which will be now referred to as *Yellow pillar hall* (Typology C)
- The Turn of the 20th century exhibition hall which will be now referred to as *Taupe exhibition room with apse* (Typology E)
- The 18th century exhibition hall which will be now referred to as *Pigeon blue exhibition room* (Typology G)

The scheme below represents the view that can be seen from the openings of each of the three rooms and it also aims to explain the elements of such views that led to classify them as strong, moderate and weak connection with the outside environment.
**Case study: Stockholm’s Nationalmuseum**

**STRONG CONNECTION: Yellow pillar hall | first floor, on the southern side**

**Room Description:**
This large exhibition room is one of the four galleries on the first floor. It is on the southern façades and has two rows of windows, one facing the inner court and the other facing the waterfront and Royal Palace. This study only considers the ones facing outside. (In orange in Fig. 20)

The exhibition creates a sort of corridor in front of the windows facing the exterior, directly in front of them statues and marble objects are exposed.

The bright yellow walls make the atmosphere very warm especially when direct sunlight enters the room, creating sun patterns on the floors and walls.

**Observations:**

- **Daytime**
  The room is very bright, spotlights are always on to focus on the artworks but, especially when it’s sunny outside, the room feels lit by natural light. This give a uniform and dynamic lightning on the side of the windows. There is not a lot of contrast and paintings and statues are easy to be seen.

- **Night-time**
  During night-time there is more contrast and glare can occur. However, the room remains moderately bright also during night hours. At dusk curtains roll up, giving for around half an hour (in April), the strongest connection with the city waterfront, before it gets dark.

**Prevailing materials:**  
- Yellow walls  
- Green ceiling  
- Light brown parquet  
- Brown frames  
- White marble

**Fig. 23 | Photographs of the room during daytime and night-time**


**MODERATE CONNECTION: Taupe exhibition room with apse | 1st floor, central on the northern side**

**Room Description:**
This large exhibition room is the central piece on the Northern façade of the first floor. It has grey taupe walls and it has three large windows placed in the apse. The view from the opening has some greenery on the foreground and Norremalm’s waterfront in the background. In the apse, part bronze statues are placed facing the main room so that when visitors look at them the windows are always in the background.

Being in the Northern side and with taupe walls, the atmosphere here is averagely cold, but the room is still perceivable as bright. Daylight in this room is mostly diffused.

**Observations:**

- **Daytime**
  The room is moderately bright, the brightest part is towards the windows while the rest is more dim; there is quite some contrast and some spotlights create glare on some of the paintings.

- **Night-time**
  During night-time there is more contrast and the room feels moderately dim. There sculptures in front of the windows are lit in a quite dramatic mood, which helps to catch the attention on this back side of the room.

**Prevailing materials:**  
- Taupe walls  
- Bronze sculptures  
- Green ceiling  
- Light brown parquet  
- Brown frames  
- White marble
WEAK CONNECTION: Pigeon blue exhibition room | 2nd floor, central on the southern side

Room Description:

This large exhibition room is the central piece on the southern façade of the upper floor. It has light blue walls and it has three couples of large windows on one wall, daylight comes in also from a large skylight [highlighted in light blue in the drawings on the side] in the wide stucco ceiling; the ceiling is much higher compared to the other rooms, and the windows are placed higher on the wall as well. For this reason, the view from the openings frames only the sky from most of the room. The exhibition focus on paintings hanging in the three walls without windows and a row of objects exposed on the other one. The room feels very spacious because in the middle there are only 5 sculptures, one in the centre of the room and the other four placed right below the corners of the skylight.

Fig. 26 | Plan and section of the room: Openings, Exhibition, Entrance, Point of view
Scale 1:300, drawings by the author

Fig. 27 | Photographs of the room during daytime and night-time
Photos by: 1. Kardorff Ing., 2,3,4. Irene Sofia Ceron

Observations:

- **Daytime**
  
  The room is very bright and it feels lit by natural light only, coming from the side windows and the skylight. However, there is a lighting system behind the skylight that helps control the light levels. The light is very uniform.

- **Night-time**
  
  The light at night comes from the skylight only and it still feels bright and uniform but the colours change consistently.

Fig. 28 | The three rooms in comparison
Photos: Linus Lintner
Results

Surveys’ procedure

Before presenting and discussing the results of the surveys, some considerations have to be made regarding the survey procedure itself. This study is based on a total of 134 surveys collected in 5 different days; due to the shortage of dark hours available to do the surveys' only 33 surveys (around 10 per room) were collected at night.

Another consideration that is found relevant to the study concerns the visitors’ path in the museum. During days of observations, it appeared that a lot of people don’t follow the typical chronological order of the museum visit (starting from top floor 1500 room to first floor contemporary art).

Usually, the typical order would be to see the blue room at the end of second floor visit, so first of the three selected. Then on the first floor, first the yellow one and then the gray. People were asked to fill in the surveys on the threshold between two rooms, in which I considered to be the “exit” of the selected room. However, since the visitors also came backwards, it can’t be certain that the people answering the surveys just finished visiting the room. In addition, for the last section of the survey which considers the cultural identity of the museum, maybe some of the visitors in the blue room started from that very room so, since the windows mostly frame the sky, they didn’t really experience the connection with the outside environment as much as others. Last, when in the survey visitors were asked if they were tired of the visit it’s impossible to state at what point of the visit they were.

SURVEYS Results

Extended results of the surveys are presented in the appendix. Herby, I will state the main highlights.

1. Regarding the general appreciation of the room and lighting (section 1 and 2 of the surveys), results show that visitors liked the rooms in a similar way, comparing day and night situations. The yellow room was liked slightly more at night (when 50% liked it very much, compared to 30% during the day) and the gray room at night was the only situation where a significant percentage (17%) voted for the upper bottom of the scale (between not at all and very much).

---

1 Nationalmuseum is open until 21.00 only on Thursdays, and night surveys took place in late March, beginning of April, meaning that after the 31st of March, with daylight saving time, dark hours happened after 20.30.
Both during day and night, in the blue room, the general atmosphere was greatly appreciated, but the art pieces were what visitors mostly liked about all the rooms. In the yellow room at night, 33% of the answers considered the lighting what was most enjoyable, while 24% considered it enjoyable in the blue room during day; for the rest of the cases lighting was considered as a value just for around 9% of the answers. In the yellow and blue room, more than 40% of people experienced glare at night, while the rate was about 30% in the gray one, both during day and night. In any case, around 70% of the people found the artworks well lit in all situations and rooms, with the exception of the blue room at day which scored 94%. The large majority of the people found the blue (night and day) and yellow room (night) pleasantly bright while the gray was considered moderately bright/dim by the most. Almost all the visitors were aware that at night the rooms were lit by artificial light, while during the day almost 60% in the blue room thought that there was only natural light. In the gray and yellow room, half of the visitors experienced both artificial and natural light and 30 to 40% thought it was only artificial.

2. Regarding the relation between the view and the visiting experience (section 3 and 4 of the surveys), results show that while in the gray and yellow room the large majority (81 and 89%) of visitors were aware of the presence of the windows during the day and only half of them noticed them during the night, in the blue room (which is the one with the biggest window/wall ratio) the situation was opposed: 64% of the visitors noticed the windows in the day but 90% did at night. To establish to what extent the visitors were aware of windows and view they were asked how many windows they could recall and what typology of landscape they could see, without looking back at the room. The majority of the people were aware of the number of windows in the yellow and gray room, but the blue one was found more tricky. (Fig. 30)
While at night the majority of the visitors either stated that they didn’t remember what was outside, or that the view was blocked/dark or in some cases they chose the most general answer which was part of the city. In all situations, most of the people didn’t find the windows view distracting, only few (max 25%) said that they looked recurrently towards the windows and this happened mostly during the day. The question that got the most varied result was whether the visitors considered the windows’ view part of the visiting experience. As it shows by the graphs (Fig. 31 a/b) during the day, visitors were more likely to find that the view had an impact on their visit, especially in the yellow room which is the one with the strongest connection with the outside environment.

3. For what concerns cultural identity (5th and last section of the survey), it is important to note that out of 134 people, 91 were Swedish. In 5 settings the large majority of people interviewed was part of Nordic culture, with the exception of surveys taken in the yellow room at night, where only one person out of 10 was Swedish. In the yellow and blue room, most of the people (90% and above) who said to have visited other museums in Stockholm found Nationalmuseum more connected to the city than the others, in the gray room, the rate was around 50%. Among the reasons they found to think so, the possibility of seeing the city from inside the museum was not the first choice, but on average almost 30% of the people found it relevant.
Discussion

Considering the results, it can't be stated that visitors liked the rooms more during the day than during the night, so when the view was more evident. However, it must be said that due to the season of the year, many night surveys were not taken in complete darkness, and at dusk, when the curtains lift up automatically, there is a transition of time when the connection with the outside is even stronger than during daylight.

Even if the appreciation rate of the rooms didn't change significantly during day and night, results show a positive attitude towards natural light and openings. Especially in the blue room during the day, where there are no spotlights and the space feels lit only by natural light\(^1\), almost all the visitors found the space pleasantly bright and the artworks very well lit.

Despite the large openings, often placed right behind the exposed objects, almost all the visitors didn't see the view as distracting, and especially in the room with the strongest connection with the outside environment, the view gave positive cues becoming part of the visiting experience. This comes both from the surveys and from the observation of people's behaviour, in fact in the yellow room, many people approached the side of the windows facing the Royal Palace first. A lot of people also stopped to look and take photos of the outside environment, some of them even lifted the curtains (during daylight hours) to take the photo. In addition, in the surveys, the outside view was considered as one of the most enjoyable aspects of the room (10\%) only in the yellow room during daylight.

Generally, people were more aware of the view in the room with a stronger connection with the outside environment (yellow). On this topic there is one aspect that needs to be considered: unexpectedly, in the blue room (weakest connection) during the night, almost everyone noticed the windows, while only 64\% did during the day. This strangeness could be due to the scarcity of surveys during the night, but also to the fact that the six windows occupy almost all the wall surface and maybe, such big black canvases (at night) are more noticeable than clear blue/cloudy sky canvases on the pigeon blue wall.

For what concerns cultural identity, the typology of the exhibition and the central location of the museum were found more effective parameters to show the bond between Nationalmuseum and

\[^{1}\] During daylight, it’s hard to tell if the blue room is lit by natural light only or if the lighting behind the skylight is also on. As there are no spotlight in this room, it sure feels like natural light only in a bright sunny day.
the city of Stockholm, but 1/3 of the answers also considered the view from the inside to the outside as relevant. In addition, I personally think that the view was one aspect that reminded the visitors of the central location throughout the whole visit because the Royal Palace and the waterfront are very present in most of the rooms.

In spite of the interesting and very specific insight that this study has developed around the field of outside view in exhibition rooms, it also has some limitations that should be acknowledged and addressed in future research:

1. The sample of answers should be considerably higher to reach significant and trustworthy results.
2. Despite the attempt to select three similar rooms with different views, the rooms ended up differing a lot, both for the general atmosphere and for the way visitors experienced the windows’ view. For instance the gray room is less effective then expected in evaluating the windows’ view because since it’s one of the last rooms chronologically (even if users tent to visit in a random order, so it’s not true for everybody) people are usually tired, and some of them walked by from the entrance to the exit without passing by the windows’ side, which is less likely to happen in the other rooms because of their architectural plans.
3. As already mentioned, it’s a simplification to consider the night situations as view-less, because even if it’s dark outside, the clear glass let in the lights of the city and the weather conditions. It would be interesting for further research to try a similar survey in a more controlled environment, like a set of three rooms with same proportions and windows ratio but with different view quality, exhibiting similar exhibition layouts and art objects, and then considering these settings also blocking the view. This could clear a lot of ambiguous situations and maybe give a key to re-interpret some of the results achieved with the surveys of this study.
Conclusion

This thesis aims at understanding if side openings with an external view can contribute to the visitors’ experience in museums. Findings show that even if the view is not considered a primary element in the appreciation of exhibition experience, people show awareness in the presence of daylight and openings especially when the connection with the outside environment is strong.

Solid literature advises to include daylight in the design of museums and exhibitions’ spaces for its many benefits to the user experience, from visual comfort to agreeableness of the space. Yet, due to the sensiveness of some artworks, indirect solutions are still preferred, as view is not included in the general acknowledged benefits in museums’ literature.

However, nowadays, technology allows for sophisticated solutions that would grant both to control the daylight intake and guarantee a connection with the outside environment.

Given the positive outcome of museums like the one taken as case study, and the others cited in this research, which clearly make the view a central part of the exhibition design, it rises the need for further research to investigate this topic not just from an empirical point of view but also structuring a reference literature able to provide guidelines for the role of the view in the museum experience.

The opinion of the author is that, despite being challenging, it’s important to consider openings and their connection with the city when designing an exhibition room, because through a sapient and conscious design and use of technology, the visiting experience could be considerably enriched.
List of illustrations

Fig. 0 | Cover. I. S. Ceron, Nationalmuseum, Stockholm, 2019, photograph.

Fig. 1 | I. S. Ceron, Nationalmuseum, Stockholm, 2019, photograph; E. Barahona Ede, Bilbao, 2009, photograph.

Fig. 2 | D. Heald, Bilbao, 1997, photograph.

Fig. 3 | I. S. Ceron, 2019, scheme.

Fig. 4 | S. White, Margate, 2012, photograph.

Fig. 5 | I. S. Ceron, 2019, table visualisation of Barbara Matusiak’s chart: Window-view parameters and their threshold values.

Fig. 6 | Photographs: https://www.museodelnovecento.org/it/

Fig. 7 | Photographs: https://www.npr.org/templates/story/story.php?storyId=113889188&t=1554980758900

Fig. 8 | Photographs: https://www.fondationbeyeler.ch/

Fig. 9 | I. S. Ceron, Nationalmuseum, Stockholm, 2019, photograph.

Fig. 10 | I. S. Ceron, Nationalmuseum, Stockholm, 2019, photographs.

Fig. 11 | I. S. Ceron, 2019, Schemes on the basis of Wingårdhs Architects released masterplan and google maps. L. Lintner, Nationalmuseum, Stockholm, 2018, photograph.

Fig. 12 | I. S. Ceron, 2019, Schemes on the basis of Wingårdhs Architects released plans and Nationalmuseum’s orientation maps.

Fig. 13 | I. S. Ceron, 2019, Schemes on the basis of Wingårdhs Architects released plans and photographs.

Fig. 14 | I. S. Ceron, A. Paris, Nationalmuseum, Stockholm, 2019, photographs.

Fig. 15 | I. S. Ceron, Nationalmuseum, Stockholm, 2019, photograph.

Fig. 16 | L. Lintner, Nationalmuseum, Stockholm, 2018, photograph.

Fig. 17 | L. Lintner, Nationalmuseum, Stockholm, 2018, photograph.

Fig. 18 | L. Lintner, Nationalmuseum, Stockholm, 2018, photograph.

Fig. 19 | L. Lintner, Nationalmuseum, Stockholm, 2018, photograph.

Fig. 20 | I. S. Ceron, Nationalmuseum, Stockholm, 2019, photograph.

Fig. 21 | I. S. Ceron, 2019, scheme.

Fig. 22 | I. S. Ceron, 2019, scheme on the basis of Wingårdhs Architects released plans.
Bibliography


Appendix
Surveys’ answers expressed in numbers per room: NIGHT

NIGHT ANSWERS: 16 18 12
To answer the following questions please refer to the room you just visited without looking back to the room.

- How did you generally like the exhibition room? 16 18 12 [ ] [ ] [ ]
- What did you enjoy the most about the room? [ ] [ ] [ ]
- The art pieces: [ ] [ ] [ ]
- How the works were exhibited: [ ] [ ] [ ]
- The general atmosphere: [ ] [ ] [ ]
- The lighting: [ ] [ ] [ ]
- The outside view: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]
- How did you feel about the visit? [ ] [ ] [ ]
- Want to visit again: [ ] [ ] [ ]
- Want to visit: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]

Check the boxes according to your experience regarding the lighting in the room

- The room was lit by: [ ] [ ] [ ]
- Natural light: [ ] [ ] [ ]
- Skylight: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]
- I found the room felt: [ ] [ ] [ ]
- Too bright: [ ] [ ] [ ]
- Pleasantly bright: [ ] [ ] [ ]
- Moderately bright: [ ] [ ] [ ]
- Dark: [ ] [ ] [ ]
- I found the artwork: [ ] [ ] [ ]
- Too light to be seen: [ ] [ ] [ ]
- Modestly light to be seen: [ ] [ ] [ ]
- Too dark to be seen: [ ] [ ] [ ]
- Did you experience any discomfort regarding the lighting? [ ] [ ] [ ]
- If yes, which one? [ ] [ ] [ ]
- Poor colours: [ ] [ ] [ ]
- It was too dark: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]

Please answer the following questions according to your visit experience.

- Without looking back, did you notice the windows facing the outside? [ ] [ ] [ ]
- If yes, how many windows do you think there are on the sides wall? [ ] [ ] [ ]
- If yes, did you notice what kind of landscape was visible through the windows? [ ] [ ] [ ]
- The view was: [ ] [ ] [ ]
- Tight: [ ] [ ] [ ]
- Dark: [ ] [ ] [ ]
- Trees or buildings: [ ] [ ] [ ]
- One building or a portion of it: [ ] [ ] [ ]
- Only the sky: [ ] [ ] [ ]
- Stockholm’s waterfront: [ ] [ ] [ ]
- I don’t remember: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]

Please assess to what extent you agree or not to the following sentences.

- I was aware of the time of the day during the room visit: [ ] [ ] [ ]
- During the visit, I recurrently looked toward the windows: [ ] [ ] [ ]
- During the visit, I found the windows view distracting: [ ] [ ] [ ]
- I consider the windows view part of the visiting experience: [ ] [ ] [ ]

Good job! You’re almost done! Please tell me something about you.

- Where are you from? [ ] [ ] [ ]
- Stockholm: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]
- I’ve been living in Stockholm more than 6 months: [ ] [ ] [ ]
- I’ve been living in Stockholm less than 6 months: [ ] [ ] [ ]
- I’ve never been living in Stockholm: [ ] [ ] [ ]

- How well do you feel you know the city of Stockholm? [ ] [ ] [ ]
- Very well: [ ] [ ] [ ]
- Well: [ ] [ ] [ ]
- Fairly well: [ ] [ ] [ ]
- Not so well: [ ] [ ] [ ]
- Not at all: [ ] [ ] [ ]

- Have you recently visited other museums in Stockholm? [ ] [ ] [ ]
- If yes, which one? [ ] [ ] [ ]
- Fotografiska: [ ] [ ] [ ]
- Moderna M: [ ] [ ] [ ]
- Nobel: [ ] [ ] [ ]
- Vasamuseum: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]

- In your opinion, which of the museums you visited has a stronger connection with the city of Stockholm? [ ] [ ] [ ]
- Fotografiska: [ ] [ ] [ ]
- Moderna M: [ ] [ ] [ ]
- Nobel: [ ] [ ] [ ]
- Vasamuseum: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]

- Why do you think so? [ ] [ ] [ ]
- For the typology of exhibition: [ ] [ ] [ ]
- For the location e.g. it’s very central: [ ] [ ] [ ]
- Because you could see the city from the inside of the museum: [ ] [ ] [ ]

THANKS A MILLION!
Irene Sofia

Surveys’ answers expressed in numbers per room: DAY

DAY ANSWERS: 35 38 36
To answer the following questions please refer to the room you just visited without looking back to the room.

- How did you generally like the exhibition room? 35 38 36 [ ] [ ] [ ]
- What did you enjoy the most about the room? [ ] [ ] [ ]
- The art pieces: [ ] [ ] [ ]
- How the works were exhibited: [ ] [ ] [ ]
- The general atmosphere: [ ] [ ] [ ]
- The lighting: [ ] [ ] [ ]
- The outside view: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]
- How did you feel about the visit? [ ] [ ] [ ]
- Want to visit again: [ ] [ ] [ ]
- Want to visit: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]

Check the boxes according to your experience regarding the lighting in the room

- The room was lit by: [ ] [ ] [ ]
- Natural light: [ ] [ ] [ ]
- Skylight: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]
- I found the room felt: [ ] [ ] [ ]
- Too bright: [ ] [ ] [ ]
- Pleasantly bright: [ ] [ ] [ ]
- Moderately bright: [ ] [ ] [ ]
- Dark: [ ] [ ] [ ]
- I found the artwork: [ ] [ ] [ ]
- Too light to be seen: [ ] [ ] [ ]
- Modestly light to be seen: [ ] [ ] [ ]
- Too dark to be seen: [ ] [ ] [ ]
- Did you experience any discomfort regarding the lighting? [ ] [ ] [ ]
- If yes, which one? [ ] [ ] [ ]
- Poor colours: [ ] [ ] [ ]
- It was too dark: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]

Please answer the following questions according to your visit experience.

- Without looking back, did you notice the windows facing the outside? [ ] [ ] [ ]
- If yes, how many windows do you think there are on the sides wall? [ ] [ ] [ ]
- If yes, did you notice what kind of landscape was visible through the windows? [ ] [ ] [ ]
- The view was: [ ] [ ] [ ]
- Tight: [ ] [ ] [ ]
- Dark: [ ] [ ] [ ]
- Trees or buildings: [ ] [ ] [ ]
- One building or a portion of it: [ ] [ ] [ ]
- Only the sky: [ ] [ ] [ ]
- Stockholm’s waterfront: [ ] [ ] [ ]
- I don’t remember: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]

Please assess to what extent you agree or not to the following sentences.

- I was aware of the time of the day during the room visit: [ ] [ ] [ ]
- During the visit, I recurrently looked toward the windows: [ ] [ ] [ ]
- During the visit, I found the windows view distracting: [ ] [ ] [ ]
- I consider the windows view part of the visiting experience: [ ] [ ] [ ]

Good job! You’re almost done! Please tell me something about you.

- Where are you from? [ ] [ ] [ ]
- Stockholm: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]
- I’ve been living in Stockholm more than 6 months: [ ] [ ] [ ]
- I’ve been living in Stockholm less than 6 months: [ ] [ ] [ ]
- I’ve never been living in Stockholm: [ ] [ ] [ ]

- How well do you feel you know the city of Stockholm? [ ] [ ] [ ]
- Very well: [ ] [ ] [ ]
- Well: [ ] [ ] [ ]
- Fairly well: [ ] [ ] [ ]
- Not so well: [ ] [ ] [ ]
- Not at all: [ ] [ ] [ ]

- Have you recently visited other museums in Stockholm? [ ] [ ] [ ]
- If yes, which one? [ ] [ ] [ ]
- Fotografiska: [ ] [ ] [ ]
- Moderna M: [ ] [ ] [ ]
- Nobel: [ ] [ ] [ ]
- Vasamuseum: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]

- In your opinion, which of the museums you visited has a stronger connection with the city of Stockholm? [ ] [ ] [ ]
- Fotografiska: [ ] [ ] [ ]
- Moderna M: [ ] [ ] [ ]
- Nobel: [ ] [ ] [ ]
- Vasamuseum: [ ] [ ] [ ]
- Other: [ ] [ ] [ ]

- Why do you think so? [ ] [ ] [ ]
- For the typology of exhibition: [ ] [ ] [ ]
- For the location e.g. it’s very central: [ ] [ ] [ ]
- Because you could see the city from the inside of the museum: [ ] [ ] [ ]

THANKS A MILLION!
Irene Sofia
Surveys’ answers expressed in percentage:

How did you generally like the exhibition room?

- Not at all
- Fairly disliked
- Slightly disliked
- Neither liked nor disliked
- Slightly liked
- Fairly liked
- Very much

What did you enjoy the most about the room?

- The art pieces
- How exhibited
- General atmosphere
- The lighting
- The outside view

The room was lit by:

- Artificial light
- Daylight
- Both

I found the room felt:

- Too bright
- Pleasantly bright
- Moderately bright
- Moderately dim
- Dim

I found the artworks:

- Too lit
- Well lit
- Poorly lit
- Too dark

Did you experience any discomfort regarding the lighting?

- Yes
- No
During the visit, I found the windows view distracting.

I was aware of the time of the day during the room visit.

I consider the windows’ view part of the visiting experience.

Where are you from?
Have you recently visited other museums in Stockholm?

If yes, in your opinion, which of the museum you visited has a stronger connection with the city of Stockholm?

Why do you think so?
(That Nationalmuseum has a stronger connection with Stockholm in comparison with other visited museums)