PicturePerfect: Exploring self-presentation and social dynamics through photo taking and sharing at art museums

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1. Introduction

The rise of social media has made photo taking and photo sharing an integral and natural part of people's experience when exploring new places. Art museums, with their visually appealing and intellectually stimulating exhibitions, offer numerous opportunities for visitors to capture and curate "Instagrammable" moments. In addition to their exhibitions, art museums have long been associated with notions of high culture and exclusivity, with art itself carrying rich symbolic meanings. Therefore, sharing one's access to art and artistic tastes often conveys complex messages beyond aesthetics. Meanwhile, social media platforms enable individuals to meticulously curate and selectively present specific aspects of their lives. Interpersonal interactions on these platforms are diverse, spanning various media formats and engaging a wide spectrum of individuals, including complete strangers. The complexity of offline visits to art museums and online social exchange made us interested in understanding how the interplay between these factors influences people's in-person experience, online self-presentation, and social dynamics. Through social media content analysis and semi-structured interviews, this research aims to explore and answer this question.

2. Previous Research

2.1 Social and Overall Experiences at Art Museums

Numerous studies have delved into the impact of human interactions and relationships on visitor experience in art museums. Researchers have suggested "to have a nice day out," "to bring children," and "people watch" as motivations behind many museum visits (Prentice et al., 1997; Koran and Koran, 1986). Falk and Dierking (2000) claim that within the physical space of a museum, key aspects of a visitor's journey, such as physical trajectories, interpretation of artifacts, and allocation of attention, are all products of their interactions with fellow visitors. Christidou (2016), through dissecting video recordings that capture brief exchanges among art museum patrons, challenges the conventional belief that these individuals are "static and silent," while emphasizing the "[non-ocularcentric]" nature of their experience. Furthermore, research conducted through interviews with art museum visitors has identified five major benefits of group interaction in enhancing the visitor experience, as listed by Debenedetti (2023): "mutual enrichment," "recreation," "reassurance," "prestige," and "transmission of knowledge". Debenedetti (2023) also suggests that visitors, whether initially in groups or on their own, often actively search for a balance between social interactions and personal privacy, with the aim of optimizing their overall visitor experience.

2.2 Photography Activities in Art Museums

Prior research and relevant articles have revealed both positive and negative sentiments surrounding photography activities in art museums (Bland, 2014; Gibson, 2013; Kerr, 2014; Stylianou-Lambert, 2017). According to Stylianou-Lambert (2017), even visitors holding negative sentiments would still take photos in an art museum for a variety of reasons, including the desire "to share" the photos with others. Online platforms have evolved over the years to accommodate people's need to circulate photographs, and art museum visitors do use these platforms to share archives of artwork photos (Killer, 2011). However, limited research has been done to delve into the impact of photo-taking and sharing behavior on art museum visitors' in-person experience, self-presentation online, and social dynamics with others.

2.3 Rise of Social Media and its Significance to Museums and Visitors

Social media is becoming an increasingly integral part of people's everyday lives (Azzaakiyyah, 2023). Many organizations, including museums all over the world, are utilizing popular social media such as Instagram to support their marketing efforts (Adamovic, 2013; Vrana et al., 2019; Fletcher and Lee, 2012; Chung et al., 2014). In the meantime, visitors are actively posting photographs of their museum experiences on social media platforms (Weilenmann et al., 2013; Budge, 2017). However, as claimed by Bosello and van den Haak (2022), current empirical studies on the intersection of museums and social media are primarily dedicated to "the perspective of museum professionals" with an insufficient investigation of "visitor-generated content".

2.4 Existing Research on Instagram Posts Created by Museum Visitors

Several existing research on Instagram posts created by museum visitors serve as valuable references for content analysis in this research. For instance, Arias (2018) studied over 4,000 Instagram posts to illustrate the power of "visual narratives" in the context of the Museum of Islamic Art (MIA) in Doha. Budge (2017) used "visual content analysis" to uncover the nuances in art museum visitors' engagement with physical artifacts. Amanatidis et al. (2020) looked at Instagram posts to study people's reactions to the outreach efforts of museums in Greece.

2.5 Symbolic Interactionism: Art Museums Associated with Class and Status

This research applies social psychology theories to decipher art museum visitors' online social activities centered around their Instagram posts. One important theory involved is symbolic interactionism on how people develop and attach meanings to symbolic items through daily interactions with others (Burke, 2006). Examples of such symbolic items include language, gestures, and apparel, and they help convey information, thoughts, and ideas among humans (Burke, 2006). Art museums have long been associated with the idea of exclusive and inaccessible "high culture" (Griffin, 2023). Chan (2010) explored the correlation between social stratification and cultural consumption which includes attending arts events. Zolberg (1984) discussed the issues of elitism behind art museums as cultural institutions. These previous works inspired us to investigate whether or not on social media platforms, art museum experiences are being used as a symbol for general self-expression, or in some cases, a subtle token of class, wealth or certain levels of aesthetics and sophistication to convey a sense of superiority.

2.6 Self-presentation Online

The dramaturgical theory of Goffman (1959) describes humans as actors with a well-furnished "front stage" and a more authentic "backstage". A person's "expressions given" may be different from their "expressions given off" (Goffman, 1959). There have been numerous debates on the detrimental effects of social media on people's self-regard (Laplante, 2022). Some discussions in this area revolve around the genuineness and accuracy of self-presentation online (Nguyen, 2022). Huang et al. (2021) survey the concept of "identity reconstruction" where people conceal or furnish certain aspects of themselves online to present an idealized version of themselves. This research examines the possible ways in which people use the symbolic meanings behind art museums for online identity reconstruction and impression management.

2.7 Online Communities

Using the Instagram data of followers of a few art museums as a starting point, Chang et al. (2022) discovered a large network graph consisting of clusters of small social communities surrounding the art museums. Haythornthwaite (2009) discusses the possibility of community formation regardless of "physical co-location and a geographic touchstone" in the presence of "computer-mediated communication". This research also aims to uncover the presence and variations of art museum visitor communities on social media platforms.

3. Research Questions

This research is centered on the following questions.

1. How are visitors taking pictures and sharing photos on social media during and after an art museum visit?
2. How are visitors experiencing the in-person visit mediated by their photo-taking? How does social media sharing affect the museum experience?
3. How does social psychology manifest in art museum visitors' photo-taking and photo-sharing behaviors?

4. Methods

4.1 Social Media Content Analysis

For the social media content analysis, we chose four art museums located in the San Francisco Bay Area. For each museum, we collected approximately 100 public Instagram posts created by its visitors. We coded these posts based on visitors' photo-sharing behavior and online interactions with others. Quantitative analysis was conducted on the coding results, and qualitative analysis was performed to identify notable examples and patterns among the collected posts.

4.1.1 Museum Selection

We selected the following four art museums:

1. San Francisco Museum of Modern Art (SFMOMA)
2. Legion of Honor
3. Asian Art Museum (AAM)
4. de Young Museum

4.1.2 Data Collection

To collect posts on Instagram, we used Zeeschuimer, an open-source Firefox browser extension created by the Digital Methods Initiative at the University of Amsterdam. As we manually open an Instagram post on Firefox, Zeeschuimer captures the URL of that post and saves it in an .ndjson file. This .ndjson file can then be converted to a .csv file using zeehaven, a file conversion tool developed by the Public Data Lab.

For each selected art museum, we searched for its location tag on Instagram and manually clicked through approximately the most recent 150 posts associated with that tag. The URLs of these posts were recorded and written into a .csv file, following the process described in the paragraph above. Subsequently, the resulting .csv file was uploaded to Google Sheets. The data collection for the four museums took places on the following dates:

- San Francisco Museum of Modern Art (SFMOMA): March 14, 2024
- Legion of Honor: April 12, 2024
- Asian Art Museum (AAM): April 6, 2024
- de Young Museum: March 15, 2024

On Google Sheets, we manually opened the URLs, reviewed the posts and filtered out posts that were considered ineligible for the content analysis based on the following criteria:

1. Posts containing only video clips without any photos
2. Regular or co-authored posts with at least one private author
3. Posts with metadata erroneously captured by Zeeschuimer
4. Posts published by non-regular visitors that are not within the scope of this research, such as a museum's official account, individuals using the museum for wedding photos, etc.
5. Posts that had been deleted by the time of the content analysis
6. Duplicate posts collected due to errors in Zeeschuimer

After filtering, we selected the first 100 posts for each museum for coding purposes.

4.1.3 Coding Scheme

The coding scheme was developed iteratively. In the first iteration, we created a draft list of tags related to visitors' photo sharing behavior and interactions on Instagram. Two members of the research team independently coded the posts for the de Young Museum using these tags. During coding, we considered all images in a single post and applied a tag to the post if any of the images matches its definition. Subsequently, they reconciled any differences in their coding results, adjusting, merging, splitting, adding, or removing tags as necessary. The same process was applied to posts for SFMOMA, AAM, and the Legion of Honor, with the coding scheme being refined in each iteration. Eventually, we arrived at the following coding scheme:

Table 1

Final coding scheme for social media content analysis

Tag	Values	Description
artsy_profile	True	Whether art is presented as a consistent theme in the author's Instagram profile
	False	

Tag	Values	Description
art_present	True	Whether artwork is present in the photos
	False	
engagement_model	Traditional	If artwork is present, how the visitor is engaging with the artwork
	Interactive	
	Co-create	
person_present	True	Whether people are present in the photos
	False	
image_subject	Single	If people are present, whether they are captured in a single or group photo
	Group	
with_others	True	Whether the author of the post alludes (by photos, tags or caption) that they visited the museum with someone else
	False	
themed_outfit	True	Whether people in the photos are dressed in themed outfits that match the exhibition
	False	
envi_present	True	Whether the photos capture the architecture, interior design and outdoor environment of the art museum
	False	
non_museum	True	Whether the post includes photos of experiences outside the museum. For example, a dinner after visiting an art museum is considered 'non-museum'.
	False	

Tag	Values	Description
exhibit_desc	True	Whether the photos or caption contains description of an exhibition
	False	
artwork_desc	True	Whether the photos or caption contains description of an artwork
	False	
reflect_detailed	True	Whether the caption contains detailed reflection on the art museum experience
	False	
reflect_generic	True	Whether the caption includes generic reflections on the art museum experience. For example, phrases like "it was amazing" or "it was stunning" are considered generic reflections.
	False	
social_exp	True	Whether the caption describes the visitor's social experience during the art museum visit
	False	
comment	True	Whether the post received any comment
	False	
comment_response	True	Whether the author of the post responded to any comments
	False	
discuss_art	True	Whether the comments discuss artwork, exhibitions or the art museum
	False	

Tag	Values	Description
visit_interest	True	Whether people in the comment section expressed interest in visiting the museum after seeing the post, or if the author of the post encouraged others in the comment section to visit the museum.
	False	
none_art	True	Whether there are comments unrelated to artworks, artists, exhibitions, or art museums, such as compliments on the author's outfit or comments consisting only of emojis
	False	
cont_companionship	True	Whether people who visited the art museum together in-person continued their social interaction in the comment section
	False	
hashtag	True	Whether the caption contains any hashtags
	False	
hashtag_location	True	Whether location hashtags are used
	False	
hashtag_art	True	Whether hashtags related to artworks, artists, exhibitions, or art museums are used
	False	
hashtag_other	True	Whether any other types of hashtags are used
	False	

4.1.4 Synthesis

Using the final coding scheme above, two members of the research team independently coded the posts for all four art museums. Next, we used https://xlcompare.com to highlight the discrepancies between their coding results. The two members then met up in-person to reconcile the differences and obtain a final coding result. During this process, we encountered a few instances where posts had been deleted or authors had switched their accounts to private. We filtered out those posts as well.

Based on the final coding result, we tallied the number of posts associated with each tag and analyzed the quantitative data to identify patterns. During the coding process, the two members of the research team also noted key observations and patterns among the collected Instagram posts. These findings were grouped into themes and integrated with the themes identified in the semi-structured interviews.

4.2 Semi-structured interviews

To supplement the quantitative social media content analysis and tackle some limitations of that practice such as not getting the details behind the photo and subjective experiences of the museum visits, we decided to conduct semi-structured interviews. To understand the motivations and impact of photographing and photo sharing post-visit, these semi-structured interviews with art museumgoers and Instagram users helped us uncover their perspectives and tendencies.

4.2.1 Recruitment

4.2.1.1 Screening Survey

To recruit participants for our interviews, we specifically targeted individuals who met the following criteria: 1) had prior experience visiting art museums, 2) engaged in photo-taking during their museum visits, and 3) shared the photos they took on social media platforms. To achieve this, we developed a Screening survey and distributed it across our personal, professional, and academic networks. In total, we received 288 responses from various channels, encompassing individuals with ages ranging from 19 to 52.

4.2.1.2 Selection Process

To ensure we captured diverse perspectives on the topic, we carefully filtered through the responses to our screening survey. We aimed to include insights from both art experts who frequent museums regularly and casual museumgoers. For instance, when assessing the frequency of museum visits, we selected participants who reported visiting more than five times a year, while also including a few who visited 2-5 times annually for comparison. After reviewing other relevant responses, we extended interview invitations via email to eligible participants. As an incentive for their participation, we offered a $25 Amazon gift card to each participant who completed the interview.

4.2.2 Interview Process

Over the course of our study, we conducted a total of 12 interviews via Zoom, supplemented by one pilot interview conducted in person to review and edit the interview questions. Each interview session lasted approximately one hour, providing ample time for in-depth exploration of our research questions. While we followed the structure outlined in our interview guide (attached in the Appendix), we also encouraged open conversation to elicit valuable and spontaneous insights from each participant. There were at least one interviewer and one note taker present at every interview session to better facilitate the interview process.

4.2.3 Interview Analysis

For synthesizing our interview findings, we mostly used qualitative inductive analysis. The analysis is mostly done through three steps: transcription, identification, and affinity analysis.

4.2.3.1 Transcription

Throughout most of our interviews, we ensured that 2-3 note takers were present to capture the nuances of the conversations. We conducted live manual transcriptions to meticulously record the participants' responses. Additionally, we utilized Zoom's closed captions feature to enhance our transcription accuracy. Furthermore, we recorded most of the interviews and utilized Adobe software to generate closed captions for the recordings. This comprehensive approach allowed us to gather exact quotes from participants, serving as concrete evidence to substantiate our findings.

4.2.3.2 Executive Summary and Identify Key Findings in Transcripts

For each interview, the interviewer identified the key findings from the transcripts, and wrote an executive summary and de-briefed everyone on the team who was not present in the interview. See below for an example of part of an executive summary:

A.D. is a frequent art museum attendee and avid Instagram user. During this interview, A.D. provided insights into their museum-going habits, driven by a combination of personal interest, habit, filling time when traveling to different cities, and exposure to museum advertisements on social media. They described a consistent practice of taking photos during museum visits, capturing various subjects including artworks, architectural details, and intriguing scenes (but no portraits of themselves/their companion, described as "it's cringe"). The participant's motivation for photo sharing on Instagram was multifaceted, serving as a means to document memories, potentially looking for acquaintances in that city and as a form of shaping their own online identity, as described by the participant "Look, I am so cultured".

4.2.3.3 Affinity Mapping on Figma

After we have discussed every interview session individually, we conducted an affinity mapping exercise on Figma. In this exercise, we pull out insights from each participant and group them into themes and patterns that emerged. From this inductive analysis, we were able to identify themes such as "*Motivation of photo taking and sharing*", "*How they learned about the museum/exhibition*", "*Preparation before going to the museum*", etc. See below for a high-level view of our affinity mapping board:

Figure 1
Affinity mapping board to synthesize findings from interviews

We then further combed through our findings from the museum's perspective and museum visitors' perspectives, identifying the tensions between the two parties and possible avenues where we could resolve the tension. We asked questions such as:

- Instagrammable
  - *What are the benefits and costs of Instagrammable attractions?*
- Misinformation
  - *Where are people getting their information from?*
  - *What kinds of information are they getting?*
- Informing
  - *What aspects of the institutions do museums want to promote?*
- Educational
  - *Why do we want to educate the public?*
  - *In what format do we and should we educate the public?*

Followed is an overview of our board for identifying opportunities. You can view the details of both boards in the Appendix.

Figure 2
Board for identifying tension points and design opportunities
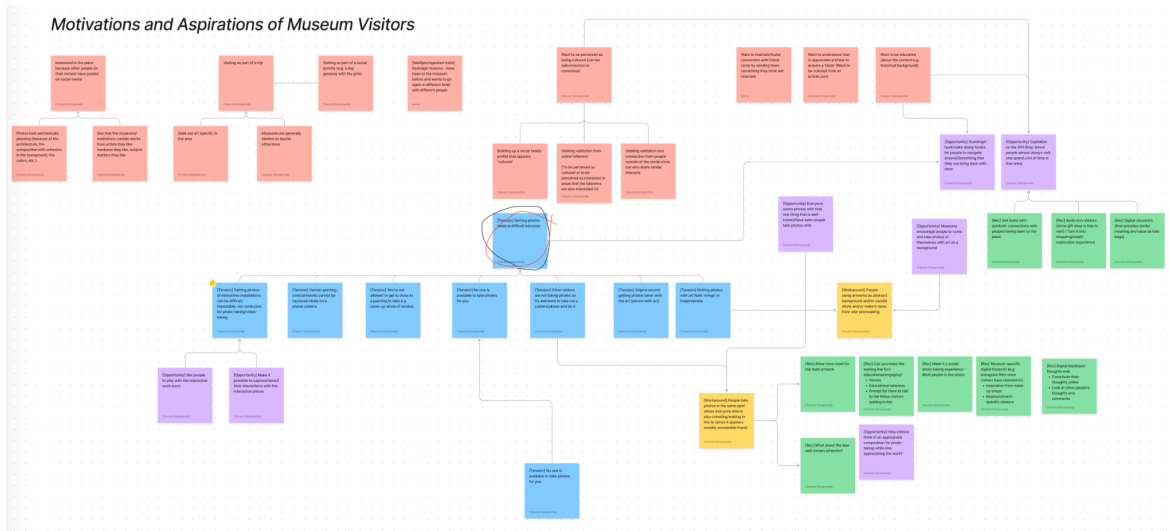
4.3 Methods Limitations

Due to the manual process of our social media analysis and interviews, our methods and findings are subject to the following limitations:

1. Instagram Posts vs Stories: Since we only have access to an extreme subset of Instagram's public posts (given the Terms of Services and manual effort limitations), the observations and syntheses are based on the nature of posting that may differ significantly from posts on private accounts. Additionally, all interview participants reported posting more on Instagram Stories than they did posts, which suggest that a large volume of Instagram data on art museum visits is not stored permanently (Stories disappear after 24 hours) and inaccessible by public researchers.

2. Instagram Public vs Private Accounts: As noted in several areas of this report, there is potentially a selection bias among individuals who choose to make their Instagram accounts public versus those who keep them private. Almost all of our interview participants kept their accounts on private mode, while those who keep them public also have another private account that is only seen by close friends. We also noticed that several

accounts and posts we used in the social media analysis were for commercial or self-promoting purposes and the content was actually not related to the museum or the artworks included on those posts.

3. Key Differences Among Museums: While we find key differences in visitor type and posting behaviors in posts across the four museums, we recognize that the physical accessibility of these museums could have a major influence on who frequents these institutions. In terms of location, the Legion of Honor is quite difficult to get to from Downtown San Francisco via public transportation and may result in a self-selected group of visitors who are knowledgeable about art and eager to take the trip out to the area. Similarly, the Asian Art Museum is in an area that is often associated with crime and avoided by most locals and tourists alike. Hence, those who choose to visit the museum may also be extremely invested in art and art history. Through the social media analysis, we also find that people visited the SFMOMA and the de Young Museum as part of a day trip that included other nearby tourist attractions. This may lead to a disproportionate number of out-of-town guests and non artsy_profile visitors in our dataset due to the museums' proximity to Downtown San Francisco and the Golden Gate Park, respectively.

4. Interviews represent a suboptimal format for gaining insights into the problem at hand. Ideally, we would shadow participants as they navigate through the museum, observing their actions and eliciting real-time thoughts through think-aloud protocols—a method we initially planned to employ. However, logistical constraints, including the in-person nature of this approach and challenges in adhering to museum policies, led us to pivot towards conducting interviews where participants recall and discuss their experiences retrospectively. While we acknowledge the potential for discrepancies between recollection and actual behavior, this approach represents the best available solution for exploring the problem under the circumstances.

5. Results

5.1 Research Question 1: How are visitors taking pictures and sharing photos on social media during and after a museum visit?

To understand the effect of mobile devices and social media usages on museum visit experiences, we first document the multitude of photo-taking and photo-sharing behaviors reported by our interview participants and observed from the Instagram posts. Overall, we find a significant diversity in photo-taking and photo-sharing preferences, and a combination of different behaviors taken from across the spectrums. We solicited comments and narratives about interview participants' photo-taking behaviors by first discussing their motivations for visiting an art museum. In most conversations, participants were able to pinpoint specific reasons for visiting a museum and specific characteristics of the museum or the artworks that motivated them to take photos of. In this section, we present the key motivations and behaviors to demonstrate the diversity as well as the fundamental themes that are common across preferences.

5.1.1 Motivations for Taking Pictures in Art Museums

Most participants reported taking pictures for documentation purposes. The memory-keeping purpose of photo-taking and photo-sharing is also evident in the social media analysis dataset, in which individuals coupled their posts with captions that suggested a 'good time' or a pleasant social experience. As for the medium of photo-taking, most participants used the cameras on their mobile devices, with some directly using the in-app camera on Instagram to take the photos. A small number of participants use professional cameras to take photos. Several participants also remarked on Instagram's Stories Archive feature and reported actively using it for keepsake purposes. For photos that involve specific pieces of artworks, participants mostly shared that they took photos of the pieces they 'liked,' while a few mentioned that they did so to be able to look up more information about the artworks at a later time.

5.1.1.1 Characteristics of Artworks that are 'Instagrammable'

Through the social media analysis, we find that a selected set of exhibitions at each museum is featured significantly more often on Instagram posts than others. Refer to the tables below for examples of such artworks.

Table 2

No. of posts analyzed for SFMOMA	No. of posts featuring	
	Yayoi Kusama: Infinite Love	Olafur Eliasson's One-way color tunnel
97	32	27

Number of posts featuring popular artworks at SFMOMA

Table 3

No. of posts analyzed for de Young Museum	No. of posts featuring		
	Fashioning San Francisco	The Letter Writing Project by Lee Mingwei	Irving Penn Exhibition
99	52	7	6

Number of posts featuring popular artworks at de Young

Table 4

No. of posts analyzed for AAM	No. of posts featuring Murakami: Monsterized
99	34

Number of posts featuring popular artworks at AAM

These pieces are often large-scale, bright, and vivid in colors, and are featured prominently within the museum (e.g. taking up an entire wall). Across the posts from all four museums, we also notice significantly more posts associated with exhibits and installations that are interactive or offer individuals an opportunity to co-create through their act of taking photos. For example, Yayoi

Kusama's *Infinite Love* exhibition at the SFMOMA (opened in October 2023) features dreamlike, room-sized installations (*Infinity Mirror Rooms*) that invite visitors to take mirror selfies for resulting images with endless reflections (Kusama, 2023).

Figure 3
Dreaming of Earth's Sphericity, I Would Offer My Love

Note: By Yayoi Kusama, 2023, installed in the exhibition "Yayoi Kusama: I Spend Each Day Embracing Flowers" at David Zwirner gallery in New York, May 11–July 21, 2023.

This artwork is not only interactive in that visitors are able to walk through the space and have access to the full range of their body movements, but it also provides a co-creating opportunity for visitors to construct their own artistic environments using lights, reflections, and patterns of overlapping, multi-colored circles. Among the posts we analyzed, images taken at the SFMOMA feature the greatest number of 'co-creating' opportunities (45 out of 97), defined by images of individuals captured with the artworks in a creative or distinctive pattern. For example, many posts include mirror selfies of individuals with Lutz Bacher's *Black Beauty* (2012-13), a shattered mirror positioned horizontally on the floor. The fractures help transform a regular mirror selfie into self-portraits with fractal mirror effect. At de Young, several posts feature individuals writing letters at

The Letter Writing Project installation as part of Lee Mingwei's *Rituals of Care* exhibition. The project "*invites visitors to sit and write a letter they have always meant to send but never did,*" and this results in Instagram posts that are accompanied by in-depth, personal reflections that occurred while letter writing (Fine Arts Museums of San Francisco, 2024). We believe that interactive and co-creating artworks and installations such as these offer visitors the opportunity to be creative and reduce the barriers for non-artists to create beautiful visual artifacts.

However, it is important to recognize that these interactive and experiential installations are also the ones that are the most famous on mainstream media. Kusama's works, especially the Infinity Mirror Rooms, have been exhibited globally and are well-known for their sold-out tickets and long waiting lines. The fame associated with some of these artworks has likely made it more likely for visitors to have learned of these pieces prior to their visit or to recognize the works as soon as they enter the gallery. For example, two participants cited Vincent van Gogh's *The Starry Night* (1889) on view at the Museum of Modern Art in New York City and Leonardo da Vinci's *The Mona Lisa* at the Louvre in Paris as examples of pieces that most people would try to capture a photo of, despite crowds that may be present or unappealing angles they would have to take pictures of the images from. Given that most of the posts we analyzed in the social media study feature the same set of what we consider 'famous' pieces, we believe that this fame pathway works bi-directionally such that visitors are more likely to take photos of works they have heard of or have seen on other people's social media profiles and therefore a limited number of artworks appear more frequently on social media and the mainstream media, generating a positive feedback loop. Sometimes, museum curators also make it evident that the museums would like to feature these famous pieces by displaying them or featuring them prominently in exclusive spaces. At the New York MOMA, the *Starry Night* is displayed in the same gallery with other Impressionist works by Cezanne, Gauguin, Seurat, and Van Gogh, among others, but the artwork is one of the few that occupies its own wall, suggesting its exclusive appeal. For museums that house lesser-known or culturally-specific artworks and artifacts, we notice more images of artifacts that appeared valuable such as the *Crowned and bejeweled Buddha image and throne* from Myanmar (1860-1880) displayed at the Asian Art Museum, which is both large in scale (measures H. 136 in x W. 82 in x D. 68 in) and decorated with elaborate, intricate designs painted in red and gold ([Crowned and bejeweled Buddha image and throne], 1860-1880).

Figure 4
*Crowned and bejeweled Buddha image
and throne*

5.1.1.2 Motivations for Taking Photos with Artworks

Since most posts on Instagram feature artworks, either exclusively or with individuals, we dedicated a significant part of our interviews process toward addressing the motivation behind this behavior. In addition to the attractiveness of large-scale, colorful artworks and the opportunity to co-create, participants concurred on the value of capturing the 'famous' artworks to demonstrate on social media that they 'have seen' these well-known pieces. The need to capture these works may be innate or sparked by an environment in which other visitors are crowding in front of a single work and trying to get a picture of it: "*The Van Gogh museum is way too popular, and most people would take a picture of themselves with the artwork, with the face of Van Gogh. So when it comes to that, it's something that you have to… people have to prove that they've been there by taking that one particular photo. So I might lose my guard a little bit and get a picture of myself with my face on it to prove that I've been to that museum.*" Interactive installations also attract more photo-taking than still images, possibly due to their co-creating opportunities as well as the opportunities to record the visitors' interactions with the artworks to keep as a memento. As

expected, many participants reported taking photos of works that had personal, meaningful connections to them. Many Instagram posts we analyzed also include in-depth reflections or detailed anecdotes about how the artworks affected the account's owner or reminded them of an important event, person, or time in their personal history.

One interesting trend we noticed among the Instagram posts, specifically at the SFMOMA, is the use of contemporary artworks as a background without including information about the pieces themselves. Despite the common perceptions that modern and contemporary art, especially abstract expressionism, is difficult and too perplexing to understand and appreciate, we see several posts that include such works. Most of these images feature the individual facing away from the camera, appearing in a 'candid' posture, and we hypothesize that these abstract pieces serve as a great backdrop for a creative and 'artsy' self-portraits commonly associated with an art museum visit. These self-portraits often feature abstract pieces that are either monochrome or in very bold colors such as red. Based on interactions we see in the Comments section in response to such portraits, it is evident that the photos serve to emphasize the individuals and there is no discussion about the artworks featured in the background in any of these posts.

Figure 5
Example of self-portrait that features an abstract piece in very bold color.

5.1.1.3 Motivations for Not Taking Self Portraits with Artworks

While all participants reported having taken photos *of* the artworks, only a handful chose to include themselves into those photos and turn them into self-portraits. This trend is also consistent with Instagram posts we analyzed that consist of a mix of photos of artworks with and without individuals (in the **Limitations** section, we discuss the self-selection bias among posts gathered from public Instagram profiles). When asked about the reasons why participants chose *not* to take photos of themselves with the artworks, we found a variety of reasons, many of which were new or unheard of for us. One participant shared their belief that they attribute the person standing next to a painting to the artist themselves or consider it "*a joke or a meme that someone is pretending to be [the] artist.*" Another participant shared that they "find it *cringe* to stand next to a piece of art and take a picture of it," suggesting the existence of some socially acceptable photo-taking pictures that intersect with social media and aesthetic taste. Multiple participants also commented on the challenges and limitations of taking photos of artworks and with themselves. For example,

one participant argued that fitting both the individual and the painting into a single frame would make the latter much smaller, defeating the purpose of capturing an artwork that carries personal meaning. One participant also mentioned the limitations of the in-app camera on Instagram and suggested that horizontally shaped artworks generally fit better inside the camera frame and therefore they are less likely to capture artworks that are vertically positioned.

Getting photos taken with an artwork is also heavily influenced by the social environment. Several participants shared that they found it "*awkward*," inappropriate, or inconvenient to get photos of themselves with the artworks, especially if they were at the museum alone and had to request help from a stranger. We also find a limited number of selfies with the artworks in our social media analysis dataset, suggesting that while photo-taking is a common practice at art museums, certain types of images are more socially acceptable than others.

5.1.2 Motivations for Not Taking Photos in Art Museums

Similarly to the decision for getting photos taken *with* artworks, the decision to take photos at all is also heavily influenced by the presence of other visitors' taking photos or the lack thereof. Several participants recalled instances when they felt compelled to take photos of a particular artwork because they noticed a large number of other visitors were already doing so. Conversely, they also felt uncomfortable and inhibited from taking photos in areas in which there was no other visitor currently taking photos. This suggests a phenomenon of herd behavior in a setting that carries significant cultural expectations and the importance of other visitors, mostly strangers, on a visitor's visit experience, behaviors, and potentially satisfaction. Most participants were aware of and have been to exhibitions where photography was not allowed. Most commented that they understood why the rules were put in place while one remarked that the prohibition made them much more conscious of their behaviors and made them feel more "tense" while navigating through the museum.

Participants also commented on the time and attention tradeoffs between taking photos and focusing on the artworks and the surroundings. One participant reported that they limited their photo-taking and social media use during a recent museum visit to "try to be *more present*." The participant who reported feeling tense in a no-photography environment also remarked that the

policy did nonetheless make them more attentive to the artworks, spend more time reading the texts, and reflecting on the underlying meanings of the works; "*It's a little more tense but I get to focus a little more.*"

5.1.3 Findings from Social Media Analysis

In addition to the motivations discussed, analysis of the Instagram posts also yields several insights that were not shared by the participants. These observations shed light on more subtle aspects of an art museum visit that may compel visitors to take photos as well as the specific characteristics of each museum we studied that may have led to distinct observations.First, we recognize the selection bias among the visitors that may result in large differences in demographics, preferences, and photo-taking and sharing behaviors. In our samples, we inspected the account's main profile and determined whether their overall feed and the majority of their posts consist of photos and reflections that are art-related (coded as '*artsy_profile*'). Many of the individuals we collected data on self-classified themselves as artists on the profile.

Table 5

	SFMOMA	Legion of Honor	AAM	de Young
No. of posts analyzed	97	95	99	99
artsy_profile	12	24	19	11

Number of posts tagged as artsy_profile for each art museum

We categorized all forms of creative expressions, including embroidery, pencil drawings, and textiles, as arts. Others posted mostly photos of artworks and visits to art museums. The results above show that profiles collected from the Asian Art Museum and the Legion of Honor can be more frequently labeled with the '*artsy_profile*' code than the other two museums. This was an interesting finding because the artifacts and artworks displayed at the Asian Art Museum and the Legion of Honor appear to be more muted, solemn, and less 'flashy' than those on display at the SFMOMA and the de Young museum and may have appealed to a different group of visitors. We

hypothesize that the more 'niche' and less 'Instagrammable' artifacts and artworks displayed at the former two museums attract a different group of visitors than those on display at the latter two. More discussions about the different characteristics of the four museums and the visitors are discussed in the Limitations section.

Additionally, how the artifacts and artworks are displayed also result in different photo-taking behaviors. Most items at the Asian Art Museum are stored inside glass containers and the lighting is generally quite dark. Hence, it may be more difficult for individuals to take photos with the artworks due to potential reflection, sub-optimal lighting, and the perception that artifacts inside containers are to be appreciated in detail rather than taken photos from afar ('*untouchable*'). As discussed in the earlier section, we find that many photos taken at the SFMOMA consist of individuals in front of abstract paintings, whereas this behavior was not observed in posts from the Asian Art Museum (due to the nature of the collections consisting mostly of artifacts) or the Legion of Honor, in which paintings are realistic and contain depictions of human figures and real-life scenes.

Another common behavior we see across photos taken at the de Young Museum and the Legion of Honor is photography with architecture and the built environment. In particular, most posts feature individuals in the courtyard and especially next to the marble columns, which are the key defining architectural features at the museum. The museum building is often considered a 'piece of Europe in San Francisco' as it is a replica of the *Palais de la Légion d'Honneur* in Paris.

Figure 6

Examples of photos taken at the de Young Museum and the Legion of Honor with architecture and the built environment.
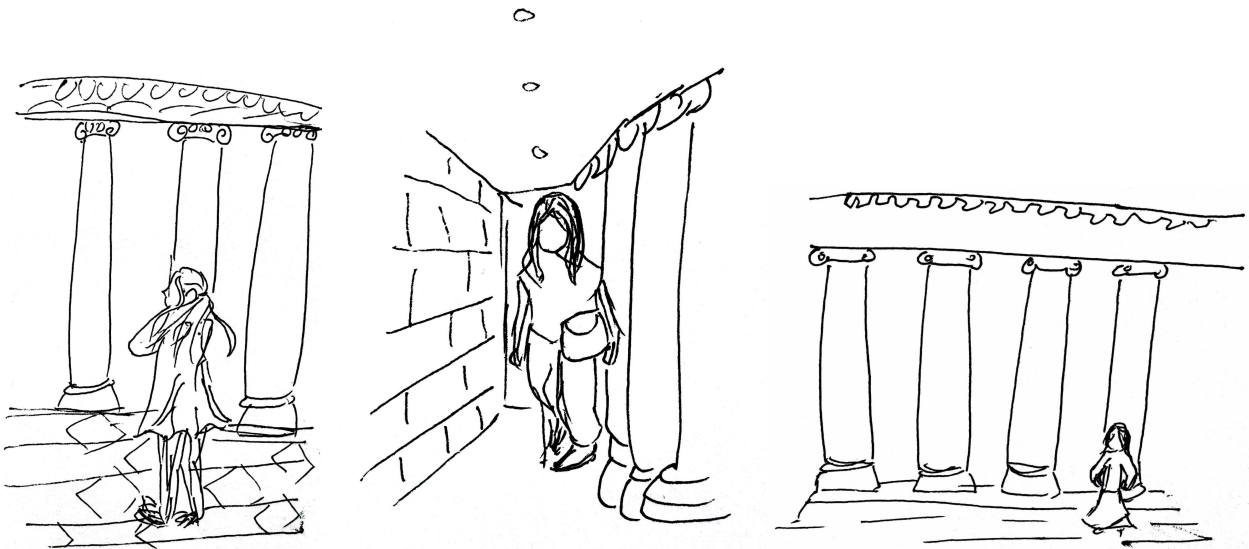
Outside of the de Young Museum features a sculpture garden that houses several large-scale pieces that are frequently photographed and are observed in many posts. Therefore, we observe that photos taken at these two museums often contain shots of the architectural features both inside and outside of the galleries.

Table 6

	Legion of Honor	de Young
No. of posts analyzed	95	99
envi_present	58	29

Number of posts tagged as envi_present for Legion of Honor and de Young

5.1.4 Photo-Sharing Behaviors on Social Media

5.1.4.1 General Trends of Social Media Photo-Sharing

While our original research question focuses on Instagram as the main photo-sharing platform, we also found that all interview participants use the platform as their primary social media platform for not only photo-sharing but also for communicating with their social circle. Overall, we also observe a wide spectrum of behaviors in terms of posting time (right after taking the photo to days or weeks after the visit), intended audience (posted as a public Instagram post or an Instagram story restricted to only Close Friends), content of posts' captions (vary from deep personal reflections to only emojis or none), and the use of hashtags (excessive to none).

I. *Posting Time*

Most participants reported posting the photos after the museum visit, most frequently a few hours after. Some are planning to post the photos as part of a series to document their trip to a particular city and therefore have kept the photos unposted for weeks after the visit. Interestingly, two participants shared that they preferred to post stories immediately after taking the photos or during the museum visit in order to attract live interactions and conversations from their Instagram followers. Both participants engaged in this practice on solo visits to keep themselves company.

"*Maybe I want people to react with me somehow, especially when I'm visiting this museum alone. Having these people who engage with me on social media while I am there is like keeping me a sense of company.*"

II. *Intended Audience*

Most participants commented on the '*public*' exposure of Instagram posts. Even though all of them have private Instagram accounts, they prefer to post photos of museum visits via Stories, which they consider to be more personal, private, and less '*permanent*.' Many interview participants remarked about the '*permanent*' notion of an Instagram post and shared that the process of completing an Instagram post often requires more time and mental effort than posting a story. While some prefer the latter to specifically utilize the Story Archive feature, many also mentioned that Stories can be made exclusive to a selected set of friends (Close Friends) while their Instagram

followers, despite being a private account, often include distant acquaintances whom they did not feel comfortable sharing their day-to-day lives with.

III.   Captions

Most interview participants reported either writing concise captions or no captions at all. It is important to note that all our participants have private Instagram accounts while the social media analysis consists of public posts. Hence, we see a different pattern among the latter in which a substantial number of posts include long reflections and personal stories. At the same time, we also observe that most captions are not necessarily related to the museum, the artworks, or the general area of art. Many captions allude to the social experiences by including mentions of names or descriptors that suggest the museum visit was part of a trip or gathering with others.

Table 7

	SFMOMA	Legion of Honor	AAM	de Young	Total
No. of posts analyzed	97	95	99	99	390
exhibit_desc	45	18	32	50	145
artwork_desc	19	11	18	16	64
reflect_detailed	9	9	13	11	42
reflect_generic	21	9	18	24	72
social_exp	13	5	6	15	39

Coding results of caption-related tags

IV. Hashtags

Through this research, we learned of specific groups of users that demonstrate heavy use of hashtags. They include art lovers using art-related hashtags, such as *#ModernArt*, *#watercolor* and *#AsianArt*, to indicate their topics of interest. There are also photographers and individual consultants/business owners, whose line of business is often not art related. Photographers often include generic hashtags such as *#photography* and *#photooftheday*, location-specific hashtags such as *#sfphotography*, and individual-specific hashtags that include the photographer's name and/or their photography business name (e.g. *#AlanJoePhotography*).

Table 8

	SFMOMA	Legion of Honor	AAM	de Young	Total
No. of posts analyzed	97	95	99	99	390
hashtag	25	31	48	45	149
hashtag_location	18	18	33	30	99
hashtag_art	14	15	36	24	89
hashtag_other	13	19	24	26	82

Coding results of hashtag-related tags

5.1.4.2 Motivations for Photo-Sharing on Social Media

When prompted about the motivations for sharing photos on social media, we discover a wide-range of motivations, many of which are social in nature and directed at the audience, both private and public.

I.   Personal Motivations

As discussed in the previous section, many participants utilized the Instagram Stories Archive feature as a "*memory board*" or a "*journal*," which explains their reasons for posting in the first place. Some also reported that they would occasionally revisit the archive collections to "*re-live a certain days [they had]*" and found great value in having a record-keeping tool to look back to. Some participants also consider their Instagram account as an extension of their self-expression and would post images of artworks that they resonate with or found to be enjoyable and personally meaningful.

II.   Social Motivations

In the process of crafting an Instagram story or an Instagram post, all interview participants think about how their intended audience would perceive the post and how that would serve to reinforce their social relations and their identity among social circles. Because the practice of going to an art museum is often associated with an upper-class leisure activity, some participants actively choose to participate in this practice to appear '*sophisticated*' and '*able to appreciate art,*' mostly to their entire Instagram circle with one participant specifically mentioned a group of acquaintances they would like to make an impression on. This participant was conscious of the group's higher socio-economic status and stated that "*they think [the people in that group believe themselves to have] good taste [in art] so if [the participant wants] to join them, [they are] supposed to have good taste of art*" by demonstrating via Instagram Stories that they frequent art museums and are a fan of specific artists. Another participant also associated the choice of visiting an art museum as part of a trip in a new city as a more '*sophisticated*' option. Interesting, they compared their own motivation of "*chasing [the] air of culture and education and sophistication*" with a coffee drinking trend among people who are not coffee drinkers but would like to appeal to be. Unlike coffee, art museum visits are still perceived as inaccessible, and many participants derive social status value from this pre-conception when they post photos from the visit to signal their lifestyle's choices and exclusivity. A photo taken at an art museum not only suggests that the person has the financial ability to afford such a lifestyle, but it also suggests that the individual has the knowledge, training, or background required to appreciate art.

While we observe the need for social appeal and validation from posts about art museums, some participants shared that they also naturally seek out conversations, relationships, and companionships through their regular use of social media and photo-sharing. One participant specifically sought out "*a broader social presence,*" which requires that they post on Instagram Stories frequently and include a diverse range of content to appeal to different groups of people. Some participants selectively choose to photograph artworks or areas in the museums that convey 'inside jokes' or humor that can be understood among their social media circles.

Another motivation for posting is to educate the social circle, either about the existence of the art museum or the knowledge gained from specific exhibitions and artworks. A few participants commented on the lack of awareness of art museums and exhibitions among the general population and believed that their posting about the museum could serve as a marketing tool to support the museum's outreach. Others found stories, messages, and learnings from exhibitions to be extremely valuable or resonating deeply with their values and shared those images to reinforce their position on certain topics.

Other social motivations may include posting in order to let their social circle know that they are visiting a new city and potentially reaching old friends and acquaintances who currently live in the area. Through the social media study, we also find that several individuals framed their visits as a social experience and the emphasis is on the other individuals who went with them, who are often highlighted either by tagging or explicitly in the captions. This form of posting often includes no mention of the art appreciation experience.

5.2 Research Question 2. How are visitors experiencing the in-person visit mediated by their photo-taking? How does social media sharing affect the museum experience?

In examining the impact of photo-taking on visitors' experiences within art museums, our research has revealed a multifaceted interplay between the physical and digital realms. The act of capturing photos, spurred by the prevalence of social media, has significantly shaped how visitors engage with artworks and the museum environment. We have observed instances where visitors prioritize composing the perfect shot over examining the artwork, alter their attire to enhance photo aesthetics, and even queue for photos of renowned pieces. These behaviors underscore the

evolving nature of museum visitation, where the boundaries between offline and online engagement blur. Below we will outline how their in-person museum experiences are impacted by photo-taking and social media.

Please note that our study combines photo-taking and social media as interconnected phenomena due to their observed direct causal relationships: people primarily take photos with the intention of sharing them on social media platforms. While we acknowledge that there are instances where visitors may not take photos for social media purposes or choose not to post the photos they take online, within the scope of our research, we consider these two activities together as integral components of contemporary museum visitation practices.

5.2.1 Seek Real-time Interactions on Social Media for a sense of company

For participants who share the photos they took during their visit, we observed two main motivations 1) receiving live recommendations from the followers who might have been to this exhibition before and 2) seeking a sense of company. On the first motivation, participants sought real-time recommendations from their followers who may have previously visited the exhibition, enhancing their anticipation for the upcoming experience. Participants recalled the behavior of taking photos along the way and posting them on social media so "people know what to expect in the next hours". By documenting their journey through photos posted on social media, participants aimed to provide insights into what others could expect during their visit, facilitating the exchange of recommendations based on firsthand experiences.

On the second motivation, participants expressed a desire for companionship, particularly during solo museum visits. Posting photos in real-time on platforms like Instagram stories facilitated live interaction with their social media audience, providing a sense of virtual companionship. "*I'm the type of poster on social media who experiences something and has to share it right now*", and the same participant expressed that "*having these people who engage with me on social media while I'm there is like keeping me a sense of company*". For participants that went as a group, we also observed similar motivation, "*I went to the MET with two of my best friends. They were dating. That made me feel kind of alone*", hence the participant was posting photos on social media to combat the feeling of loneliness.

5.2.2 Museum Navigation Being Influenced by Taking Photos

A major way photo-taking impacts the museum experience is by influencing visitors to adjust their route and time allocation for each artwork, particularly when considering the opportunity to photograph or pose with renowned pieces. This influence on participants' navigation yielded three noteworthy observations: 1) participants spent more time and mental effort thinking about photo composition rather than appreciating the details of the artwork itself; 2) participants willingly queued to capture images of famous pieces; 3) participants tended to linger longer in front of artworks with compositions conducive to photography, suggesting a shift in focus towards visually captivating displays.

5.2.2.1 Photo Composition

Participants recall investing considerable time and effort in crafting the perfect photo composition, driven by the desire to capture images deemed suitable for sharing on social media platforms. One participant emphasized the need to produce high-quality photos, stating, "*It makes me want to take photos of better quality just because of the possibility of posting it on social media later. I cannot take shitty pictures. It takes me a longer time*". Additionally, another participant noted their reluctance to photograph horizontally oriented artworks due to the vertical orientation of social media screens. Consequently, some expressed frustration over potentially missing out on the intricate details of the artwork in person, as a significant portion of their time in front of the piece was devoted to achieving an optimal photo rather than fully appreciating its physical presence.

5.2.2.2 Queue to Take Photos

Several participants described the practice of waiting in line to capture photos of renowned artworks. When questioned about their experience of waiting, the majority expressed minimal frustration or annoyance.

5.2.2.3 Physical Setup that are Conducive to Photography

Participants often prolong their time in front of artworks that are positioned favorably for photography. These artworks typically have characteristics such as a larger frame, vertical orientation, expansive size spanning an entire wall, centralized placement within the room, or

enhanced lighting. For instance, one participant mentioned capturing a photo of "*Woman Leaving the Psychoanalyst*" by Remedios Varo simply because of its substantial size, occupying an entire wall at the Art Institute of Chicago. Despite lacking prior knowledge about the artwork, the participant assumed its significance based on its prominent display. "*What I recall is this was one of Varo's more famous works and this art was hung on one wall. It occupied one whole wall while other minor works would share a wall. So naturally, I thought that this one was one of the more-famous and comparatively-speaking, this was more intriguing*".

5.2.3 Self-presentation through Outfits

Another notable impact of photo-taking on the museum experience is its influence on visitors' attire choices. This phenomenon became apparent during our coding research, particularly with visitors dressing up for exhibitions like "*Fashioning San Francisco: A Century of Style*" at the de Young Museum. Subsequently, this observation was corroborated during interviews, where participants mentioned "dressing up to match the theme" or being mindful of their attire before visiting the museum. We identified several trends: 1) individuals dressing in accordance with the exhibition's theme, 2) selecting outfit colors that complement the museum's ambiance, and 3) opting for more sophisticated attire to appear presentable in photos.

5.2.3.1 Dressing For the Theme

We observed a notable pattern of visitors dressing up in elegant attire and engaging in photo-taking activities with the mannequins showcasing presented outfits during the "*Fashioning San Francisco: A Century of Style*" exhibition at the de Young Museum. With the push by the de Young Museum to use #FashioningSF and @deyoungmuseum (Instagram) or @famsf.org (TikTok), this trend was particularly prominent in our content analysis, owing to the recent surge in posts and the high volume of social media engagement.

I.   Outfit Color

Several participants revealed that they deliberated over their outfit colors before heading to the museum. One participant, in particular, expressed a preference for neutral colors, aiming to convey an image of attentiveness rather than seeking attention: "*Sometimes I tend to dress more in plain colored shirts and pants because I don't want to look too showy going to the museum. I*

subconsciously wear this type of clothes whenever I visit art museums because I want to feel like I'm there to take in information and look at things and appreciate things instead of being the center of the room".

II.   Sophisticated Attire

The inclination to dress more sophisticatedly or elegantly was also evident among our participants, with some even showcasing their attire during interviews. They perceived museum visits as an "adult-like activity" and felt the need to appear "presentable" to ensure their photos turned out well. Additionally, some participants mentioned coordinating their outfits as a group and discussing their attire choices beforehand.

5.2.4 Other Impacts

Other ways social media and photo taking have been influencing in-person museum visits include 1) Visitors often take photos of artworks that they believe would interest their friends who are not physically present. This behavior extends the museum experience beyond the individual, allowing participants to share their discoveries with others in their social circle. 2) Participants reported being more conscious and aware of their surroundings during museum visits where photography was restricted or not allowed.

On the no photo policy, one participant highlighted the significance of novelty during museum visits. They compared experiences in small museums versus larger ones like the MET, noting that while the MET has a vast collection, smaller museums may struggle to maintain novelty if all their artworks are posted on social media beforehand. This participant emphasized the importance of encountering something unique and unanticipated, expressing a desire to "*chase that novelty*" and engage with artworks that others may not have discovered yet.

5.3 Research Question 3. How does social psychology manifest in art museum visitors' photo-taking and photo-sharing behaviors?

Part of this study is to explore the intersection of social psychology and art museum visitors' behaviors regarding photo-taking and photo-sharing. Through qualitative analysis, several themes emerged, shedding light on the underlying motivations and mechanisms guiding these behaviors.

5.3.1 Status and Self-Presentation

Status operates as a critical and explicit determinant, serving as a key factor in perpetuating social inequality. Status beliefs encompass cultural perceptions or assumptions regarding the esteem, agency, or competence associated with specific social categories. These beliefs often confer greater respect or authority onto certain groups within society, predicated upon factors such as occupation, education, wealth, or social standing.

In the context of engaging with art, participants displayed a heightened awareness of the status imbued in such activities. Art was perceived as a symbol of high culture and sophistication, reflective of one's refined taste and elevated socioeconomic status. Drawing parallels to "cosplay" or the act of dressing up, participants described adorning themselves for museum visits as a means of asserting adulthood and personal aesthetic preferences.

People have multiple identities and often vary the way they present and communicate with others based on context and audience (Goffman, 1959). In the realm of online self-presentation, participants grappled with the phenomenon of context collapse (Marwick & Boyd, 2011). Unlike the physical world, where we present ourselves based on who we are interacting with, in the online world, multiple audiences converge, making it challenging to tailor presentations for specific viewership. Therefore, we tend to post overly positive messages on social media without knowing the particular audiences. Consequently, the desire for exclusivity became more pronounced, with participants showing satisfaction from presenting themselves as individuals who visit art museums and perhaps comprehend artworks beyond the grasp of others. Participants have a belief that "art is high culture" and want to present themselves as "cultured" since the audience is unclear. The ability to frequent art museums was also viewed as a marker of prestige and discernment, further enhancing one's perceived status within social circles.

5.3.2 Identity Management

Social identification guides individuals to embrace the norms and behaviors of their in-group, while social comparison shapes perceptions of identity and intergroup relations through evaluating oneself and one's group in relation to others. In the context of photo-sharing behaviors, participants' actions were driven by their pursuit of identity construction and management, with a preference

for Instagram's story feature over posts due to the belief in its ability to leave a lasting imprint on one's identity. Maintaining an "artsy" profile on platforms like Instagram emerged as a deliberate strategy for integrating art as a consistent element in one's online persona, as individuals often modify their identities to bolster self-verification. Furthermore, the validation process, facilitated by engagement metrics like likes and comments, played a pivotal role in affirming and reinforcing individuals' identities against perceived social standards, creating a positive feedback loop that incentivized the sharing of similar content to further augment their identity.

5.3.3 Belief Expression through Art Sharing

Social comparison prompts individuals to craft an idealized self-image, especially online, emphasizing positive traits to conform to social desirability biases. This concept is tight to the idea of impression management, which entails a strategic curation of symbols and behaviors to align with audience expectations. In this study, we observed the sharing of artwork photos served as a means for individuals to convey their personal beliefs, values, and impressions. Participants demonstrated a propensity to share artworks that resonated with their ideological perspectives, as evidenced by examples such as Dalit art and HIV-related works. Deep reflections and emotionally charged statements in photo captions indicated a profound engagement with the artworks, reflecting participants' attempts to communicate their beliefs through visual mediums.

5.3.4 Indirect Social Exchange

In this research, we uncovered an "invisible" online community where social exchange is implicitly enabled by art museum visitors' public posting behavior and social media platforms' content recommendation algorithms. During the interviews, several participants reported instances where they learned about an art museum or exhibition through strangers' posts on Instagram's discovery page. In these scenarios, knowledge and experience are being exchanged between strangers who might have never directly connected with each other. Unlike traditional one-to-one social exchanges, these indirect social exchanges operate through a one-to-many channel and do not expect direct reciprocity between information providers and receivers. When visitors create a public post, they contribute their personal knowledge about art museums into a generic pool of information accessible to a broader audience. In many cases, authors use hashtags to indicate their target audience. In the coding process, we discovered several examples of hashtags signaling

specific interest areas and communities, such as impressionism, modern art, architecture, and photography. One interviewee reported that they would intentionally pick relevant hashtags that are most frequently used, maximizing the visibility of his posts. While one-to-one reciprocity is not expected, information providers do expect to benefit from the collective contributions of others on the platform. By posting about art museum related content on social media, visitors feed their preferences in art into the platform's content recommendation algorithm, allowing them to receive more relevant information created by others.

5.3.5 Social Network

When art museum visitors publicly share their experience on social media, they create an opportunity to develop new connecting edges to strangers in their social network. An interview participant reported two instances where strangers reached out to them on Instagram after encountering his public posts on the discovery page. In the first instance, the stranger asked for his permission to reshare a photo of a painting featured in the post. In the second instance, the stranger who was working on a research topic related to the exhibition contacted them with specific questions about the exhibition. However, these social edges are usually very weak and transient. None of these interactions resulted in long-term online connections.

While connections are temporary between strangers, posting about art museum visits indeed helps strengthen long-term bonds between mutual followers. Through these posts, individuals communicate their tastes, interests, and personal interpretations of artwork, fostering deeper connections and shared experiences over time.

Initially, this effect may not be readily apparent if we consider only the outcomes of content analysis. The coding results indicate that there is minimal meaningful communication taking place in the comment sections of art museum visitors' posts. As shown in the table below, more than half of the posts did not receive any comments. Among the comments, only a small portion are related to artwork, exhibitions, art museums or personal reflections. Very few authors responded to comments.

Table 9

Coding results of comment-related tags

	SFMOMA	Legion of Honor	AAM	de Young	Total
No. of posts analyzed	97	95	99	99	390
comment	44	42	38	41	165
comment_response	17	20	18	13	68
discuss_art	9	10	12	13	44
visit_interest	3	1	3	6	13
none_art	39	38	28	31	136
cont_companionship	1	2	1	8	12

However, during the interviews, many participants reported that even though they do not expect meaningful conversations in public comment sections, they have other ways to express their interest and ideas on social media. For example, several participants use Instagram stories to post photos of artwork taken during an art museum visit. Instagram stories, being more interactive than permanent posts, make it easier for followers to react and respond to the content in a more private way. The instant messaging feature behind stories is more conducive for exchange of complex knowledge, interpretation and emotions. The private nature of these conversations also makes people more comfortable about sharing their personal connections with artworks.

One participant expressed that other than having many people commenting and reacting to his posts, he would prefer to have people bring up his art museum experience when they encounter each other in person. Several other participants confirmed that their Instagram posts on art museum visits serve as great offline conversation starters that often lead to group trips to more art museums or art-related events in the future.

One interview participant noted that even if they do not directly discuss art museums with friends on social media, sharing and viewing posts about such experiences still facilitates a deeper understanding between them and their friends, leading to more solid friendship. Artwork often carries profound symbolic meanings, and taste in art is highly personal. Therefore, a post by an art museum visitor can reveal numerous characteristics and beliefs about the person that might be difficult to openly discuss in offline settings.

5.3.6 Instagram Posts as "Information-Based Public Goods"

Kollock (1998) defines public goods as resources that are non-excludable and nonrival. Non-excludable means that even non-contributors have the right to access resources from a public pool, while nonrival means that one's consumption of a public resource does not reduce others' share of that resource (Kollock, 1998). Based on these criteria, posts by art museum visitors are considered information-based public goods. While public goods often present the social dilemma of free-riding (Kollock, 1998; Antin and Cheshire, 2010), there need to be motivational factors to drive continuous content production among art museum visitors. During the interviews, many participants reported seeing public accounts diligently sharing details about art museums, art exhibitions and their personal experiences attending those events on various social media platforms like Instagram, TikTok and Red. In the previous sections, we covered a range of motivations that contribute to this phenomenon. According to Ryan and Deci (1999), these motivations can be classified as intrinsic and extrinsic. One example of intrinsic motivation is the genuine personal connection individuals feel with art, coupled with a desire to educate others about the messages behind artwork. This drives individuals to share and engage with artistic content.Simultaneously, extrinsic motivations such as reputation and recognition incentivize users to curate their online personas and seek validation from their social networks. This interplay between personal interests and external validation underscores the complex dynamics inherent in the sharing of art-related content on social media platforms like Instagram.

6. Discussion and Recommendations

Through this research, we recognize the importance and value of photography at art museums. Not only does it facilitate engagement and social experiences, but it also provides visitors, of various backgrounds and familiarity levels with art, with a welcoming and accessible activity they could participate in. In this section, we discuss the key tension points are fruitful areas for future research, research investigation, and design innovations. Our goal is to support art institutions' commitment to culture and perspectives preservation for the public through their outreach and appeal to a wider audience. We believe that technology, especially the prevalence of social media platforms, can be integrated effectively into museum and exhibition designs to support visitor exploration and foster a sense of community.

Tension point 1: Social norms in art museums

Social Norms is a common constraint when it comes to taking photos in art museums where visitors often feel constrained by prevailing social norms of silence and sincerity, making it awkward or even frowned upon to take photos. It creates a psychological barrier, as individuals may experience peer pressure and feel uncomfortable amidst a crowd of serious art visitors, especially if the museum has limited space for photo-taking. Additionally, solo visitors' lack of assistance exacerbates the challenge as it is not common practice to ask strangers to take photos in an art museum.

Based on the findings and the key tension point, museums can explore several design opportunities:

1. The social norms surrounding photo-taking in art museums often create tension for visitors, who may feel more at ease capturing photos in crowded areas where others are also engaged in similar photo taking activities. Museums can alleviate this tension by establishing designated "Instagrammable" zones within their premises, encouraging visitors to freely capture and share their experiences. These zones feature themed installations that rotate periodically to showcase artworks in permanent collections or special exhibitions as captivating photo backdrops and encourage visitors to return to see the new theme.

2. Recognizing that visitors often encounter queues when waiting to take pictures, museums can enhance visitor's photo taking experience and social engagement by offering more

sharing materials in the waiting lines through visually appealing displays. This can include providing information about the artwork, artist, or historical context through digital filters and physical props. These materials serve a dual purpose, catering to visitors who seek beautiful Instagram background pictures while also facilitating an immersive learning experience, making photography a meaningful behavior against the "old-school" stigma that forbids it. When visitors use these filters, they engage with artwork while unconsciously absorbing information about the artist's style and key features of their work, which they then pass on to others through photo sharing on social media. This helps create positive feelings and feedbacks for visitors when they take photos and share them on social media, therefore reducing their psychological pressure.

For instance, imagine a Kusama filter that mirrors the color theme and multi-mirror effect of the renowned *Mirror Rooms*. This digital replica of the in-person experience not only enhances the enjoyment of the museum visit but also leaves a lasting impression on visitors. They will fondly recall the artist, the mirror room, and the memorable experience at the museum whenever they look back at their posts.

3. Furthermore, museums can optimize exhibit design by considering factors such as lighting and artwork composition, facilitating easier photo-taking, particularly for Instagram users. By tailoring specific areas for photography, museums not only promote the acceptance of photography as a natural and socially acceptable activity but also provide practical opportunities for visitors to capture images. These designated zones play a vital role in enhancing the overall visitor experience, helping to reduce the stigma associated with photo-taking in museum settings.

Tension point 2: Integration of self-exploration and museum's designed intention

This research underscores the long-standing notion that art remains inaccessible to the general public, both due to physical constraints such as cost as well as psychological constraints such as the expectations that one must "get something profound out of the visit." Despite art museums' best efforts to appeal to different audiences through relatable media, messages, and accommodations, the intentions can be significantly limited by this pre-convenied notions. At the same time, the research also uncovers the potential for utilizing social media platforms such as Instagram to make art accessible. In fact, many more people from diverse backgrounds now have

access to and are interested in visiting art museums. However, instead of simply bringing the offline in-person experience online, we propose the enhancement and redesign of the in-person experience, mediated using photo-taking and photo-sharing on social media.

As part of the visitors' identity management process, we discover that interview participants were constantly looking for artworks and aspects of the visit that resonated with their identity and motivations. Participants were able to recall in details art pieces or specific instances during the visit that made a strong impression on them, despite not having posted about those moments on Instagram. **The gap between what visitors is experiencing in-person and the extent to which they are able to express or share it online** is a fruitful space for potential designs.

Some leverage points that could promote engagement and social experiences to counter the prevailing idea that art is inaccessible and exclusive include:

1. Facilitate and encourage questioning: Museums can leverage designs that provoke dialogue while providing ample tools and reminders to visitors that interpretation is an open-ended exercise. Many visitors may not be aware that art appreciation stems from questioning the motives behind the artists' choice of subject matter, medium, and presentation and how a specific piece of art fits within the historical, political, and social context both at the time of its creation and in the present time. These are questions that can only be answered in combination with the interpreter's lived experience and perspective. Therefore, museums can make these questions and guidelines more explicit, such as writing out the questions on the wall, to encourage personal reflection.

2. Make interpretation and exploration social: As the audiences grow more comfortable with questioning, museums can expand the scope of their inquiry by inviting them to share their questions and thoughts with their social circle. For example, museums can ask visitors if the paintings remind them of anybody that they know and whether they would like to forward the image to those people. Museums could also provide some guidance for people on a pair/group visit to discuss with one another such as whether they agree or disagree on the interpretations provided on the wall.

   Since visitors are generally drawn to capture and share their experiences with interactive arts, museums can leverage this preference and incorporate more installations and

exhibitions that make use of cameras, sensors, and visual technologies to create cherished memories and shareable content.

3. Provide an appropriate context for idea sharing and viewing: To counter the inhibiting effect of context collapse on social media, museums can provide a dedicated space, whether offline, online, or hybrid, to facilitate visitors' connections with others and expose them to collective thoughts about the experiences. For example, museums can utilize a unique hashtag that is associated with visitors who have been to the exhibition in-person. While at the exhibition, visitors are encouraged to browse thoughts and reflections as well as image compositions of those who have previous visited the museum, while also leaving thoughts of themselves for future guests. Other online engagements can include quizzes and Instagram Story challenges to facilitate fun inquiries, drawing inspiration from existing activities at science and natural history museums catered to children. Since environments of traditional art museums often involve quiet contemplation, these online environments can help facilitate rich, *loud* discussions and interactions, possibly real-time.

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Appendix

Interview Guide

Context

This interview is part of our capstone project, aiming to investigate how photo sharing on social media platforms after an art museum visit by visitors can influence their experiences during and after the visit. To understand the motivations and impact of photographing and photo sharing post-visit, we conduct this semi-structured interview with art museum-goers and Instagram users to uncover their perspectives and tendencies.

Primary Research Questions
- How are visitors taking pictures and sharing photos on social media during and after an art museum visit?
- How are visitors experiencing the in-person visit mediated by their photo-taking? How does social media sharing affect the museum experience?
- How does social psychology manifest in art museum visitors' photo-taking and photo-sharing behaviors?

Script

Introduction

Hello, my name's [] and I'd like to start by thanking you for making the time to speak with me/us.

To begin, I am going to ask you a series of questions. We want to better understand how photo sharing on social media platforms after an art museum visit by visitors can influence the visitors' experiences during and after the visit.

This interview will last approximately 45 minutes. Please let me know at any point if you want to stop or feel uncomfortable answering any questions. With your permission, I'd like to ask for your consent to use this conversation for our internal research purposes. With your permission, I'd like to ask for your consent to use this conversation for our internal research purposes. I

would also like to turn on closed captions and record this interview. [START RECORDING] You may turn off your camera during the recording. All the data collected in this research will be anonymized and permanently deleted after May 30, 2025.

Do you have any questions for me at this time?

- Tell me a little bit about yourself
- Can you tell me a bit about your experience visiting art museums?
    - How often do you visit art museums?
    - What types of museums do you prefer to visit?
    - Why do you visit art museums? What are your expectations? What do you hope to get out of the visit? And what are your hopes and dreams?
- Do you typically use social media platforms?
    - Frequency of use
    - types of content shared
- Do you typically take photos when you visit art museums?

Theme 1: During-Visit Experiences
- Tell me about the last time you went to an art museum and took photos during the visit, from getting to the museum to after the visit.
    - What museum/exhibition was it?
    - How was the museum experience?
    - What motivated you to visit that museum? How much knowledge did you have about the museum/exhibition prior to going, if any?
        - Where did you get the knowledge from and how?
    - Tell us about your day before going to the museum. Describe what you did. What did you do prior to going to the museum?
        - What did you do when you were there?
    - Pick one of the photos you captured and talk through your thoughts for why you chose to take this photo, and any considerations you made while photographing.

- What motivated you to do so? / Did you have a goal in mind when taking the photo? / What inspired you to take photos?
- What did you take a photo of? And when?
- What's worth taking photos of and sharing in this context?
- Would you be willing to share that photo you took?
- Contrast this with an exhibit in which you did not take a photo. What were the differences?
  - Why didn't you take a photo during that exhibit?
  - Were the overall museum-visiting experiences different?
    - If so, how?
  - How did you feel during this exhibit than that one?
- Can you elaborate on how you felt when you took the photo?
- Did you take any more photos after that?
- Describe how the act of taking photos fits into your museum experience.
- Did you do anything with the photos you took during your visit? If so, what did you do?
  - Sharing? (social media vs. texting)
  - Reviewing?
  - Researching?
  - Deleting?
- If not, why not?
- Now let's think about a museum/exhibition of **different formats and mediums** that you have been to and taken photos in, e.g. interactive exhibitions, specific themed exhibitions, different mediums of the artworks.
  - Reflecting on this experience, do you notice any differences in your behaviors, particularly concerning photo-taking, compared to the museum experience you just recalled?
    - If there are differences, could you elaborate on them?
  - Additionally, could you share the themes of the museum/exhibition and describe your overall experiences?

- ○ How do you believe the different mediums and setups of art museums influence your behavior when capturing photos, if at all?
- Now, let's think about a museum visit in a **different social setting**. If your previous experience was solo, imagine a group visit, and vice versa.
  - ○ Do you observe any differences in your behaviors, specifically related to taking photos, compared to the previous scenario?
    - ■ If so, how?
  - ○ What did you take pictures of?
  - ○ How do you think the different social settings impacted your photo-taking behavior, if they did at all?
- Now let's think about a photo of a **different subject** you took when visiting an art museum. If the subject of the photo you took in the experience you just recalled is the artwork, think about other possible subjects, such as portraits, museum interiors or outdoor architecture, or any other subjects.
  - ○ What subjects do you normally take photos of? Under what scenarios?
  - ○ Why? What motivated you to do so?

— If the visitors do share the photos on social media —
- What are the benefits of the in-person experiences? And how does the potential to share the photos on social media influence your in-person experiences?
- How does the possibility of sharing photos on social media later impact your behavior or interactions with museum exhibits, if so?
  - ○ If yes, can you provide an example?
- Let's compare this experience to a visit without social media in mind, how does the potential for sharing photos online affect your:
  - ○ Engagement with the artwork: Do you spend more time looking at specific details? Do you read labels or descriptions more often?
  - ○ Focus and attention: Do you find yourself getting distracted by taking photos or composing the perfect shot?
  - ○ Overall experience: Is the experience more enjoyable or stressful? More informative or superficial?

Theme 2: Post-Visit Experience

- Do you usually share photos from your art museum visits on social media platforms after you've left the museum?
  - If yes, what motivates you to share them?
    - document memories
    - connect with others
    - share artistic appreciation
  - If not, why? What do you do with the photos?

— If the visitors do share the photos on social media —

- Think about a specific instance where you shared a museum photo online.
  - Why did you share the photos?
  - What kind of online interactions did you have (likes, comments)?
  - How did these interactions, if any, influence your overall museum experience? (e.g., Did they enhance understanding, create a sense of connection?)
- Have you noticed any differences in the way you remember or reflect on your museum visit when you share photos online compared to when you don't?
  - What's different?
- In your opinion, what are the values or benefits brought by post-visit photo-sharing behaviors on social media platforms? Can you provide examples from your own experiences?

Wrap-up:

- What's your opinion on whether online interactions resulting from post-visit photo sharing extend or supplement the benefits of in-person social interactions?
  - If yes, can you elaborate on how?
  - If not, what are the distinctive values of online interactions resulting from post-visit photo sharing?
- How do you perceive the role of social media in shaping your art museum experiences, both during and after your visit?

- ○ Do you feel that photo sharing on social media platforms has changed how you appreciate and engage with art museums compared to before the era of social media? If yes, in what ways?
  - ○ Are there any specific aspects of your museum visits that you feel have been significantly impacted by the potential for photo sharing on social media platforms?
- ● Is there anything else you would like to add or any other thoughts you have regarding the influence of photo sharing on art museum experiences?

Thank you for your insights into your museum experiences and photo-taking behaviors. Your responses will contribute significantly to our understanding of how different settings and subjects influence photographic practices in art museums.

Interview Affinity Mapping Board:

https://www.figma.com/file/AdV89uTcA2I74ueOIapQVh/Affinity-Mapping---MIMS-Capstone?type=whiteboard&node-id=0%3A1&t=4uZmUL7Gnpa8BxU6-1