Examining Attendee Motivation and Satisfaction at an Immersive Art Exhibition: A Case Study of the Van Gogh Exhibition

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Abstract

In recent years, academic research has delved deeper into the realm of visitor motivation and satisfaction within museums and galleries. However, a specific dimension - the immersive art exhibition - remains largely unexplored in terms of attendee motivation and satisfaction. This dissertation seeks to bridge this gap by quantitatively examining the factors that motivate individuals to engage in immersive art experiences and determining whether their expectations are met. The Van Gogh immersive art exhibitions, which are the one of the earliest organised immersive art exhibitions and the most popular ones in the world, serves as the focal case study. A mixed-method approach, encompassing survey-based analysis and text analysis, was employed for this study. In the survey study, eight motivations factors were proposed based on the characteristics of this immersive art exhibition, from both personal and societal contexts. Five satisfaction factors which correspond to the motivations were also investigated for testing whether the expectations of attendee were met or not by the exhibitions. For text analysis, a dataset was compiled from Twitter and Facebook, consisting of posts that detailed personal experiences, feelings, and opinions related to the Van Gogh immersive art exhibitions. Sentiment analysis was performed and word cloud visualisations were generated for evaluating the attendee attitude towards the exhibitions. Results indicated that novelty was the most important motivation for attendance, and both the survey study and text analysis consistently showed high levels of satisfaction towards the Van Gogh immersive art exhibitions.

Keywords: immersive art exhibition, motivation, satisfaction, text analysis, Van Gogh

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Chapter 1

Introduction

Immersive art exhibitions are a rapidly evolving art form garnering attention from art enthusiasts and academic researchers alike. Such exhibitions offer attendees a deep engagement in the artistic experience through technologies such as virtual reality devices, interactive equipment, and immersive settings (M. Wang, 2011). Although research in this domain (Stogner, 2011; Murao, 2022; Diodato, 2022) has largely centered on the employed technologies, there is a noticeable gap in understanding the attendees themselves, particularly their motivations and overall satisfaction.

While academic research has increasingly focused on the motivations and satisfaction of museum and gallery visitors, the motivations and satisfaction related to immersive art exhibitions, a novel art display format, remain relatively unexplored. Immersive art exhibitions, with their unique approach to presenting artworks, can be viewed as advanced versions or nuanced extensions of conventional museums and galleries. Studying the factors that engage audiences in immersive exhibitions might provide insights comparable to the allure of traditional art venues. Since 1998, researchers (K.-S. Park, Reisinger, and H.-J. Kang, 2008; Packer and Ballantyne, 2002; Axelsen, 2006; Ryan and Glendon, 1998) have conducted research on the motivations for participating in museums, art galleries and other events, proposing various potential motivations as well as frameworks for structural modeling. Recent research has shifted its lens toward immersive events (Sobitan and Vlachos, 2020; Y. Kim and H. Lee, 2022) and measuring museum visitor satisfaction (Cotter, Fekete, and Silvia, 2022).

Traditional survey studies remain the cornerstone for understanding visitor motivations and satisfaction (Sobitan and Vlachos, 2020; Y. Kim and H. Lee, 2022; Cotter,

Fekete, and Silvia, 2022). Yet, the rise of big data analytics, especially sentiment analysis through natural language processing, has offered a fresh perspective. This approach, often applied to social media posts, can assess user satisfaction (Wankhade, Rao, and Kulkarni, 2022). Given that attending immersive art exhibitions can be viewed as a consumption experience, social media feedback offers valuable insights. Prominent language models, such as GPT-4.0 (OpenAI, 2023), enhance sentiment analysis, driving business optimizations and improved offerings for consumers (Sudirjo et al., 2023). The capabilities of GPT-4.0, particularly in sentiment analysis, are increasingly recognized (Belal, She, and Wong, 2023).

This research employed both methods: traditional surveys and text analysis of social media posts, to evaluate motivations and satisfaction levels of immersive art exhibition attendees. The focus was the widely renowned Van Gogh immersive art exhibition (Beck, 2023), which has attracted over 5 million visitors since 2017 (Fever Labs, 2023). This exhibition, among the earliest of its kind, stands as a benchmark in the realm of immersive experiences. Its popularity ensures an ample dataset for text analysis. Common tags like "Van Gogh immersive art exhibitions" on social media platforms provided a wealth of data, allowing the implementation of big data anlaytics for evaluating visitor sentiment towards the exhibitions.

This research presented a novel framework of combining the survey study with text analysis to quantitatively measure attendee motivation and satisfaction for immersive art exhibitions. Eight motivation factors including novelty, learning, escapism, entertainment, self-expression, personal interest, social interaction, and recommendation were measured in the survey study, along with five corresponding satisfaction factors. Descriptive statistics were calculated to investigate the influence of each motivation factor as well as the level of satisfaction for attendee expectation in every related aspect. A dataset was compiled from Twitter and Facebook, consisting of posts that detailed personal experiences, feelings, and opinions related to the Van Gogh immersive art exhibitions. Text analysis including sentiment analysis and word cloud visualisation was performed to investigate the overall attitude of attendees towards the exhibitions. Findings spotlighted that novelty was the most prominent motivation for attendance, and both the survey study and text analysis consistently showed high levels of satisfaction toward the Van Gogh immersive art exhibitions.

Chapter 2

Literature Review

This chapter reviews the prevailing relevant literature on immersive experience, immersive art exhibitions, as well as studies investigating attendee motivation and satisfaction at art museums, gallery or other events. The first section focuses on scholarly inquiries into the realm of immersive art, elucidating its definition, diverse forms, and associated technological applications. Subsequent sections delineated the foundational concepts of visitor motivation and satisfaction, respectively.

A widely recognised methodology was employed to conduct the literature review, aligning with the recommended approach outlined by Webster and Watson (2002). Specifically, the utilised method involved a keyword search-based strategy for identifying relevant scholarly articles. Through this systematic approach, an understanding of current applied theories about immersive art experience, the technologies it applied and an analysis of prevailing trends was obtained. Notably, despite the growing academic interest in immersive art, discernible research gaps persist, particularly concerning the relationship between immersive art experience and visitors' attitudes, motivations, and satisfactions. Due to the relatively novel concept of immersive art in the academic field, there was limited existing research on the subject. Considering that, the literature revealed more studies pertinent to the visitor experience in galleries and museums, providing a foundation for the design and contextualisation of this study.

2.1 Immersive Experience and Art

In recent years, both ordinary consumers and event participants had increasingly sought more immersive experiences, and numerous businesses were meeting this demand by offering highly interactive activities (Sobitan and Vlachos, 2020). Immersive experience was defined as the feeling of truly being present in a virtual reality setting. This sensation was brought by the design aspects of a computer-driven environment that emphasize vividness, realism, user control, and enjoyment(Tcha-Tokey et al., 2016). In this context, the form of art creation has been influenced and changed with the development of technology. According to X. Kang, W. Chen, and J. Kang (2019), the traditional physical art experience was transitioning towards a more web-based environment. In academic field, immersive art was always viewed as a part of digital art in recent study. Whitmyer (2022) stated that to analyse immersive art installations, it needed to be connected with digital art.

Although It has undergone a long period of development, defining an immersive art experience is still a challenging task. In other words, it eludes a clear-cut definition. However, immersive art is by no means a new concept. C.-W. Chang (2021) mentioned that since the 1980s, science and technology art exhibitions have increasingly focused on engaging with audience, which could be regarded as the concept of the prototype of immersive art.

Throughout history, the art world has been driven by market demands to continuously seek ways to capture the attention of audiences. Skrzypczak (1970) suggested that when people view cultural and artistic performances, expressing their desires and showing artistic empathy are important for them. Consumers were always looking for unique, extraordinary, and impressive experiences that "dazzle their senses", "touch their hearts", "engage them personally", and "stimulate their minds" (Schmitt, 1999). Immersive art experience can satisfy those needs to some extent. According to Whitmyer (2022), immersive art installations was defined as an expression of human creativity and skill and a culmination of various elements, including visual art, technology and technological art, lighting, music, and music art, among others. The audience can engage with the artworks, acquiring a sensory experience and participating in the process of recreation. Gao, Yang, and Yuan (2022) pointed out that by using individuals' sensory and cognitive experiences, immersive art exhibitions crafted an atmosphere that allowed participants

to immerse themselves in a specific state, offering a fully immersive experience. They also mentioned that audience did not need a strong artistic appreciation or a high level of artistic accomplishment to visit immersive art exhibitions, which can prove that the audience for immersive art is quite extensive (Gao, Yang, and Yuan, 2022).

The types of immersive art experience were rich, from art exhibitions, installations, museums to some online tours which are based on media platform and other tools can all be defined as a kind of immersive art. The experience of immersive art can attract both art lovers and the person who was interested in sort of all-encapsulating experience (Whitmyer, 2022). One of the manifestations of immersive experience was the immersive art exhibition. An immersive art exhibition was defined as a kind of art exhibition where the visitors were fully immersed in the art experience, achieved through various techniques, like virtual reality, interactive elements, and immersive environments (M. Wang, 2011). An immersive art exhibition could be found in different settings, such as galleries, museums, and other cultural institutions, offering an immersive and unique way to experience art (W. Li and X. Huang, 2023). Immersive exhibitions can foster a profound bond between the attendees and the artwork (Vi et al., 2017). This type of exhibitions stimulated the viewer's senses beyond what conventional exhibitions offer, creating a more immersive experience for the attendees (J. Park et al., 2022). According to Grenga (2022), Lucas Samaras's "Room No. 2." was one of the most earliest examples of immersive art experiences, which is also widely known as the name called "the mirror roo". "Van Gogh Alive" was another early immersive exhibition which brought masterpieces to life and provided visitors with the sensation of stepping directly into Van Gogh's paintings (Beck, 2023).

In all kinds of immersive art experience, the feeling of immersion as well as the interaction with the presented artworks constitute as the most prominent elements in the immersive art. As discusses before, these required elements by immersive art could only be achieved by advanced technologies. Usually, an immersive art exhibition requires not only one type of technology, but a combination of different techniques in design. Stogner (2011) introduced that in immersive exhibitions, commonly employed technologies include projections, auditory elements, illumination techniques, virtual or augmented reality systems, interactive interfaces, sensory detectors, and tracking mechanisms. Nowadays, techniques encompasseing video projection mapping, spatial sound systems, augmented

reality (AR), virtual reality (VR), MIDI/OSC, desktop audio workstations (DAW), software for digital art/content creation, haptic sensors, and wearable technology are more frequently used (Murao, 2022). In Sharpe and Silva (2019)'s article about the most popular art exhibition and museum in 2018, it was introduced that the world's largest and mostly visited museums now provided visitors with online exhibition and 3D virtual tours on their website (e.g., Louver Museum and the National Museum of China), making the experiences more immersive.

Among all the techniques mentioned above, the augmented reality (AR) and virtual reality (VR) are most commonly implemented in immersive art and immersive experience and discussed in recent studies. As discussed by T.-L. Chen, Lai, and T.-K. Yu (2021), immersive exhibitions intend to activate the five senses of visitors, facilitate interactions between visitors and artworks, incorporate advanced technology for diverse purposes, and offer individuals additional opportunities to encounter artworks through new devices at any time in any place. Studies focusing on such technologies used in the immersive art seek to investigate the positive impacts on visitor experience. For example, it was proven that the immersive experience created by the AR techniques foster profound levels of audience engagement (Cárdenas Gasca et al., 2022). It has been also shown that the AR can boost immersion, and thereby has been used into marketing to increase consumer engagement (Deng, Unnava, and H. Lee, 2019), resulting in the enhancement of the overall satisfaction of the product users (Hilken et al., 2017). Diodato (2022) explored the aesthetics surrounding VR technology. The researcher investigated how VR technology enhanced the aesthetics of virtual experiences and why the immersive creation would transcend physical limitations. It highlighted the significance of embodiment and interaction within the virtual space, emphasizing the role of gestures, movements, and haptic feedback in enhancing the sense, of presence and agency for users. Given these findings, it could be assumed that in the context of the immersive exhibitions, a more immersive experiences, consisting of active engagements with audience and the strong feelings of immersion, would lead to higher satisfaction of the attendees, helping people escape from the everyday reality.

The study by Chisholm (2018) analysed other new technologies like eye tracking and image recognition, which make the user experience becoming more exciting, social, and educational. With such techniques, Cheng and C.-C. Tsai (2020) emphasised the poten-

tial of immersive experiences to enhance learning, engagement, and emotional responses in science and art exhibition contexts. The study also contributed to how immersive environments can shape cognitive experiences and offered insights for designing effective exhibition experiences. The various application contexts of these techniques make the entertainment, education, and social interaction potential motivations for people to attend the immersive exhibitions.

Additionally, immersive art exhibitions had a strong vitality on social media. Many immersive art exhibitions have gained popularity for their ability to deliver high-impact and highly shareable experiences, making them ideal for Instagram and other social media platforms. Visitors were provided with visually captivating and shareable content, which might explain the growing number of immersive art exhibitions featuring artists such as Klimt, Cezanne, Kandinsky, and Kahlo. These exhibitions have tapped into the desire for visually stunning and share-worthy experiences (Compton, 2022). It was precisely because of the widespread dissemination of immersive art on social media that this research can conduct text analysis by capturing content related to immersive art exhibitions from social media.

It worthy mentioning that a recent study by Trunfio and Campana (2020) explored how the innovation of museum service aspects (especially the VR and AR technology) enhanced visitors' experiences and satisfaction. Serravalle et al. (2019) argued that the immersive technologies enhanced the value proposition and helped cultural offering of museums become more accessible and gain a wider audience. These studies have shown that the novelty stands as an important type of attraction for visitors to participate in immersive art events.

2.2 Immersive art and U&G Approach

The uses and gratifications (U&G) approach emphasised that through using media, people would gratify their needs and wants (Rosengren et al., 1987). During its early emergence, this definition was primarily applied in the field of traditional mass communication (Katz, Blumler, and Gurevitch, 1973). It was defined that people search for the media source to satisfy their needs and interests (Katz, Blumler, and Gurevitch, 1973; Pornsakulvanich, Haridakis, and Rubin, 2008; Wu, S.-C. Wang, and H.-H. Tsai, 2010). Through using

media, people could fulfill their needs which steamed from social and psychological contexts and also stimulated motives that shaped media consumption, resulting in cognitive, emotional, and behavioral effects (Pornsakulvanich, Haridakis, and Rubin, 2008; Rubin, 2009). In other words, according to different needs and motivations, people chose and used a specific media. With the advancement of technology, the concept of media has become more broadened. The content of the U&G theory research has also become more diverse. J. Kim and K. H. Lee (2018) had a study about using U&G approach to understand why people choose high-tech devices like smartphone apps. Rauschnabel (2018) connected this theory to the application of AR and VR.

Y. Kim and H. Lee (2022) believed that this approach can be used for exploring the users' motivations of watching 360^o VR art. According to Facebook CEO Mark Zuckerberg, he envisioned a future where digital viewing methods, such as augmented reality, will potentially replace traditional forms of art and media. Zuckerberg suggested that advancements in technology will enable immersive digital experiences that can rival or even surpass the impact of traditional art forms (López-Dıéez, 2021). It was worthy noting that this perspective represented a single viewpoint and was subject to ongoing discussions and debates within the art and media industries. However, it can still be an inspiring aspect because immersive art exhibitions, in this context, can be seen as a kind of media for the visitors. Considering that, U&G approach can also be viewed as a good theoretical background for understanding the motivations and whether people's expectations were satisfied after visiting Van Gogh immersive art exhibitions.

2.3 Van Gogh Immersive Art Exhibition

The immersive art exhibition, "Van Gogh: The Immersive Experience," offered visitors a distinctive combination of storytelling, spatial design, technological integration, and interactive features, creating a both memorable and educational experience for visitors. The physical space of the exhibition hall was used to create an immersive environment, combined with an array of cutting-edge technological tools, including projection mapping, virtual reality, and interactive multimedia, to curate a distinctive and interactive engagement for attendees (W. Li and X. Huang, 2023). Originating in 2001, this acclaimed exhibition has been featured in numerous global cities, including Berlin, London,

Paris and across twenty cities in the United States (Lukyanova, 2023). As underscored by S. Yu (2022), the Van Gogh immersive art exhibition has an extensive history of evolution and has garnered significant international acclaim. Given its sustained prominence, widespread acceptance, and the essential elements it possesses of immersive art exhibitions, and it emerged as an exemplary subject for case study analysis in this research.

2.4 Motivation of Visitors

A motivation can be described as an internal element that stimulates, guides, and harmonizes an individual's actions. (Iso-Ahola, 1982). Motivation could be explained by Maslow's theory of needs, which was described using a hierarchy of five needs: basic physical needs, safety, belonging, self-worth, and achieving one's full potential (Maslow, 1954). Numerous existing studies have demonstrated the importance of researching user motivation. It could be used to discern and categorize various tourist segments, facilitating targeted product development and promotion (Smith and Costello, 2009). Crompton and McKay (1997) posited three rationales for a deeper understanding of motivation: first, it served as a foundational instrument for tailoring offerings to customers; secondly, it manifest a direct correlation with customer satisfaction; and thirdly, it was indispensable in understanding a customer's decision-making processes.

Although there existed no literature related to visitors' motivation for attending Van Gogh immersive exhibitions, numerous research have paid attention to motivations that drive people to attend museums and galleries, participate in all kinds of events and go for a travel or a trip. Scholars proposed various factors that motivate attendees to choose a place and go there. According to Vroom (1964), motivation was influenced by three key factors: expectancy, instrumentality, and valence. Falk and Dierking (2000) explored the motivations of visitors to art museums . They summarized motivation factors in three different context: the personal, social, and physical contexts. Based on the proposed framework by Falk and Dierking (2000), Axelsen (2006) conducted a study on how to attract more audiences to attend art galleries by developing a "visiting context" framework that categorized the motivations behind special event visitation. From another perspective K.-S. Park, Reisinger, and H.-J. Kang (2008) revealed that motivations can be broadly categorized into extrinsic, originating outside the individual, and intrinsic,

emanating from within the individual. These can be further sub-classified into physical, cognitive, affective, conative, and spiritual dimensions. A later proposed model (Falk, 2008) of visitor identity introduced five distinct visitor identities: Explorers, Facilitators, Professionals/Hobbyists, Experience seekers, and Spiritual pilgrims/Re-chargers. Each visitor identity was on behalf of one kind of possible motivational statements for the participants.

More recently, based on the expectancy theory proposed by Vroom (1964), Luo and Ye (2020) proved that tourists who anticipate diverse and distinct experiences and can satisfy their generative needs will exhibit heightened motivation to visit museums. The uniqueness and novelty of immersive art exhibitions themselves could provide visitors with rich and unique experiences. Another recent study (Y. Kim and H. Lee, 2022) mainly explored the motivations of the consequences of participating in function of adding 360-degree virtual reality (VR) into art activities. They pointed out three motives that mostly influence individuals to choose these art experiences: learning from entertainment, pursuing social conformity, and convenient to get access to art and do research, revealing that the pursuit of learning from entertainment emerged as the most influential factor shaping the transportation experience of audiences while viewing 360-degree VR art. Using sensory, localisation, and participatory factors, Sobitan and Vlachos (2020) examined the motivations of audiences attending any type of immersive events.

Considering that the similarity of immersive art exhibitions to galleries and museums, the framework of examining motivations for visiting the special events in gallery and museums could also be used for discussing immersive art exhibition.

2.5 Satisfaction of Visitors

Customer satisfaction was the emotional state of contentment or disappointment that arose from comparing the perceived impact of a product or service with the anticipated value (T. Chen et al., 2020). There has been several studies on customer satisfaction and different models for analysing the customer satisfaction were established (Geus, Richards, and Toepoel, 2016; Burton, Louviere, and Young, 2009; De Rojas and Camarero, 2008; Harrison and Shaw, 2004). The study conducted by Geus, Richards, and Toepoel (2016) emphasises the multi-dimensionality of event experiences, identifying facets like enter-

tainment, escapism, and learning as crucial satisfaction indicators. Complementing this, Burton, Louviere, and Young (2009) highlights the significance of attributes such as exhibit quality and perceived educational value in not just satisfying visitors, but enticing them to return. It was also proven that the visitor's mood is pinpointed as a pivotal determinant of satisfaction, with ambiance and staff interactions as key modulators (De Rojas and Camarero, 2008).

Moreover, satisfaction could be regarded as a key factor motivating visitors to revisit the same destination and establishing loyalty, as numerous studies empirically substantiated the significance of it (Brida, Pulina, and Riaño, 2012; Petrick, 2004; T. Y. Choi and Chu, 2001; Cronin Jr and Taylor, 1992; Harrison and Shaw, 2004). In other words, high satisfaction of users or consumers will positively impact their intentions to purchase. (Gotlieb, Grewal, and Brown, 1994).

Additionally, Han and Hyun (2015) articulated that satisfaction may be conceptualized within the purview of an affective process. Their scholarly exploration delineated satisfaction as travelers' evaluative judgment of the entirety of product or service consumption experiences, largely characterized by emotional or affective dimensions. Similarly, in this research, satisfaction mainly pertained to the visitors' comprehensive appraisal of their experiences in Van Gogh immersive exhibitions, notably the emotional aspects. Brida, Pulina, and Riaño (2012) determined that individuals develop expectations about their visit. They experienced satisfaction when the actual visit surpassed their expectations. It can be inferred that if an attendee's expectations and needs were met during their participation in the exhibition, then his or her attitude towards the exhibition would be satisfactory. Moreno Gil and Ritchie (2009) also pointed out that satisfaction was indeed influenced by some of the motivations. The study of satisfaction in this research focused on whether visitors' expectations driven by different motivation factors were satisfied after visiting the Van Gogh immersive art exhibitions.

Chapter 3

Methodology

This chapter details the research methodology in four sections. The first section introduces the research questions. The second delves into the survey study, highlighting participant recruitment, study purpose, and the design of the questionnaire. The third section describes the process of gathering and analyzing social media content, including sentiment classification and word cloud visualization. The final section discusses the study's limitations and ethical considerations.

3.1 Research Question

This study aimed to explore the motivations driving attendees and to assess their level of satisfaction with immersive art exhibitions, with a specific focus on the Van Gogh immersive art exhibition. Given this objective, the research addressed the following questions:

1. What motivates individuals to attend the Van Gogh immersive art exhibition?
2. Are the expectations or desires that motivate individuals to attend satisfied by their experience at the Van Gogh immersive art exhibition?
3. How satisfied is the general public, beyond those surveyed in the study, with the Van Gogh immersive art exhibition?

While motivations have been explored in the context of immersive events (Sobitan and Vlachos, 2020), museums (Brida, Dalle Nogare, and Scuderi, 2016; Cotter, Fekete,

and Silvia, 2022), and various other events (Nicholson and Pearce, 2001; Yolal, Çetinel, and Uysal, 2009), no existing research specifically delves into attendee motivation for immersive art exhibitions, an emergent and significant art form as detailed in Section 2.1. This research aimed to address not only the first two questions but also to quantitatively assess distinct motivational factors and determine the extent to which related expectations or desires are fulfilled through a survey study. Recognizing the limitations of the survey, particularly its restricted participant pool, the research also analyzed attendees' experiences, emotions, and views shared on social media. This approach aimed to provide insights into public sentiment regarding the Van Gogh immersive art exhibition, using text analysis methods such as sentiment classification and word cloud visualization to understand broader attitudes.

3.2 Survey Study

As mentioned before, the survey study was designed to examine the motivations and satisfaction of attendees towards Van Gogh immersive art exhibitions. In particular, this study focused on what defines and characterises the motivations, and whether the motivations that drives expectations and desires were satisfied by this immersive art exhibition.

3.2.1 Aim

This survey study aimed to identify what motivations attendees brought with them when they visited the exhibition and whether they were satisfied through the experience in the exhibition. In line with prior studies (Sobitan and Vlachos, 2020; Brida, Dalle Nogare, and Scuderi, 2016; Cotter, Fekete, and Silvia, 2022; Nicholson and Pearce, 2001; Yolal, Çetinel, and Uysal, 2009) that examined visitors' motivations, this research views visitor motivation as a composite of various factors, as introduced in Section 3.2.3. Consequently, the research sought to investigated the significance of each factor. Echoing the approach of Kirchberg and Tröndle (2015), where they evaluated whether people's expectations of their visiting matched their experiences in the museum or not, this study delved deeper into the motivation factors driving expectations and desires, investigating their fulfillment after visiting the immersive exhibition. It could also be explored whether different types

of expectations are more readily met than others.

3.2.2 Participants

The survey targeted adults who had attended any Van Gogh immersive art exhibition, regardless of the location or country of the exhibition. Individuals who had experienced any version of these exhibitions were eligible to participate. Eligibility was broad, as most versions of these exhibitions were orchestrated by the same organizing company (Fever Labs, 2023). Before the primary research, a pilot study was carried out to validate the survey's relevance and appropriateness for the target audience.

The primary recruitment method involved social media platforms such as Twitter, Instagram, Red, and Weibo. By searching for terms like 'Van Gogh immersive art' and 'Van Gogh immersive art exhibitions', individuals sharing pertinent experiences in their posts were identified. Upon contacting and inviting these individuals, those expressing interest were redirected to Qualtrics [1]. Here, they would be presented an information sheet and a consent form, and subsequently, their answers were recorded on the same platform.

3.2.3 Survey Design

The frameworks proposed in the previous studies (Axelsen, 2006; Sobitan and Vlachos, 2020; J. Kim and M. Lee, 2022) were applied to this research in conjunction with the specific features of Van Gogh immersive art exhibitions. The survey was designed as a multi-item questionnaire, consisting of three parts.

The first part included statements regarding various motivation factors for attending Van Gogh immersive art exhibition. There were in total 18 motivational statements encompassing two different contexts: *personal* and *social contexts*. Following Axelsen (2006), the *personal context* is an individual's perspective shaped by their beliefs, experiences, and emotions during the event. The *social context* captures the collective atmosphere from attendees' interactions and shared experiences. In contrast to the approach taken by Axelsen (2006) for museum visitors, this study did not consider the *physical context*, which was defined as the tangible environment and setting of the event. The decision stemmed from the observation that Van Gogh immersive art exhibitions,

[1] https://qualtrics.kcl.ac.uk/jfe/form/SV_74LPPVqiL5lpjGC

regardless of location or time period, consistently presented similar themes and designs. Consequently, these exhibitions provided analogous physical contexts.

The second part contained six statements corresponding to the attendee satisfaction of the experience with the exhibition. The statements were derived based on the motivation factors that relate to expectations of attendee. For the first two parts, participants were required to rate each statements using a five-point scale: (1, 'Strongly disagree'), (2, 'Disagree'), (3, 'Neutral'), (4, 'Agree') and (5, 'Strongly agree').

The final part consisted of three demographic questions querying gender, age, and educational background of the attendee. Results collected from this part could used for analysing which groups are more likely to attend Van Gogh immersive art exhibitions.

Details of the statements in the first two parts are provided below:

Motivation in Personal Context

1. ***Novelty*** Research has shown that some individuals visit museums purely from curiosity about their content (Brida, Nogare, and Scuderi, 2017). To determine if curiosity similarly drives attendance at the Van Gogh immersive art exhibition, the following two statements were proposed.

   Q1: I attended because the exhibition was a novel experience for me.

   Q2: I was curious about the exhibition itself.

2. ***Learning and Improvement*** According to Hooper-Greenhill and Moussouri (2000), learning is most effective in entertaining contexts. Exhibitions often promote personal meaning-making and facilitate learning (J. Kim and M. Lee, 2022). Thus, the intent to learn was investigated as a motivating factor.

   Q3: I wanted to deepen my understanding of immersive art.

   Q4: I wanted to gather diverse insights about Van Gogh's artworks.

3. ***Escapism*** Many visitors are attracted to spaces where they can momentarily step away from daily life's usual constraints Dann, 1977; Chylińska, 2022; Sobitan and Vlachos, 2020. The appeal of interacting with visually engaging exhibits significantly contributes to this drive for "escape." It is evident that escapism serves as a

crucial motivational factor, especially as immersive art offers visitors the opportunity to deeply immerse themselves in an alternate environment.

Q5: The exhibition might offer me an escape from my daily routine.

Q6: I wanted to feel immersed in a different reality.

4. ***Entertainment*** M. Li, Z. Huang, and Cai (2009) posited that the underlying drive for entertainment stems from an individual's inclination towards engaging and immersive experiences. This notion is further corroborated by Phelan, Bauer, and Lewalter (2018), who observed that a subset of the population seeks entertainment value when visiting museums. Brida, Dalle Nogare, and Scuderi (2016) further accentuated this idea by suggesting that the primary impetus for many visitors to frequent museums lies in their pursuit of recreational activities.

   Furthermore, entertainment is not an isolated concept but can be integrated with education. Drawing on this perspective, Wiberg and Jegers (2003) created the term "edutainment", conceptualising it as a fusion of entertainment and education. This amalgamation facilitates a conducive environment for learning, combining enjoyment with knowledge acquisition. The relevance of edutainment underscores the significance of both entertainment and educational motives in the context of museum visits and other similar events like immersive art exhibitions.

   Q7: The exhibition might provide me with entertainment.

   Q8: I wanted to view art and relax at the same time.

5. ***Self-Expression*** Individuals demonstrate a propensity to consume products or services that resonate with their self-concept, deriving satisfaction from acquisitions that reinforce this match. (Sirgy and Danes, 1982) Consuming goes beyond practical product attributes; it is also about self-expression and personality display (N. Choi, D. Park, and Na, 2009). Therefore, it is expected that the audience's self-expression desire might influence their motivation to attend Van Gogh immersive art exhibitions.

   Q9: Attending the exhibition could be an expression of my personal choices.

   Q10: Being part of the exhibition could let me display my artistic preferences.

6. ***Personal Interest*** In line with the theoretical framework proposed by Falk (Falk, 2006; Falk, 2008), professionals and hobbyists are inherently inclined to pursue avenues that align with their specific interests. Falk's seminal research described this inclination as a core motive. Such individuals selectively curate content, leveraging museums and galleries as instrumental mediums to satisfy their interests. The Van Gogh immersive art exhibition is likely to attract audience with interests of Van Gogh's oeuvre or those appreciate immersive art exhibitions. Consequently, this study underscores the dimensions of specialized and personal interests, employing specific statements to assess these factors.

   Q11: I am interested in immersive art.

   Q12: I have specific interest towards Van Gogh.

Motivation in Social Context

1. ***Social Interaction*** A large number of visitors perceive visits to galleries and museums as social experiences (Debenedetti, 2003). Through visiting the museums, some visitors believe that they strengthen bonds with their family members and other people (Jafari, Taheri, and Vom Lehn, 2013). Masberg and Silverman (1996) documented that heritage site visitors would have significant interactions with their companions during or after the visiting period. Similarly in the context of immersive exhibitions, social interactions could play an important role in terms of driving people to attend the events.

   Q13: I wanted to connect with new people who also appreciate such exhibitions.

   Q14: Sharing this experience might strengthen my bond with friends and family.

   Q15: Attending the exhibition could be a great way for me to spend quality time with loved ones.

2. ***Recommendation*** As discussed in the research by (Cotter, Fekete, and Silvia, 2022), visiting to museums occurs when the exhibitions were recommended by other people. Recommendation was proven as one of the strongest factors that influence people to attend the museums. This study, therefore, investigated the influence of recommendations on people to attend the immersive art exhibitions as well.

Q16: The advertisement of the exhibition attracted me.

Q17: Others recommended the exhibition to me.

Q18: Some well-known people went, so I got curious.

Attendee Satisfaction

This part presents statements formulated to assess visitors' satisfaction across various dimensions post-visit. While most of these statements originate from the previously discussed motivational factors following the U&G theory, three factors — self-expression, personal interest, and recommendation — were excluded. For those motivated by self-expression, attending the exhibition is the act of expression, and the exhibition itself doesn't necessarily need to meet any specific expectation. Given this rationale, the study omits the self-expression motivational factor when gauging attendee satisfaction. Similarly, personal interests and recommendations might influence attendance but do not pertain directly to exhibition expectations. Additionally, a statement targeted at measuring the visitors' overall satisfaction with the exhibition was included. The final set of statements to measure satisfaction is as follows:

1. ***Novelty*** Novelty gauges the attendees' sense of discovery and new experiences. It's crucial to determine if the exhibition was able to satiate the attendees' curiosity and provide them with a unique experience.

   Q19: The exhibition satisfied my curiosity about immersive art or Van Gogh artworks.

2. ***Learning and Improvement*** This factor assesses the educational value of the exhibition. It's essential to know if attendees felt they gained new insights or knowledge from their visit.

   Q20: I obtained new knowledge from the exhibition.

3. ***Escapism*** Escapism measures the attendees' ability to detach from their daily routines and immerse themselves in the art. It's vital to understand if the exhibition served as a refuge or a break from everyday life.

   Q21: The exhibition helped me "escape" from the real life.

4. ***Entertainment*** Entertainment evaluates the fun and enjoyment attendees derived from the exhibition. It determines if the exhibition was able to engage and captivate the audience.

   Q22: The exhibition fulfilled my entertainment demands.

5. ***Social Interaction*** Social interaction gauges the exhibition's role in fostering connections, be it with family, friends, or like-minded individuals. It's important to discern if the exhibition facilitated meaningful interactions.

   Q23: The exhibition helped me interact with my friends, families or other people who share the same interest.

6. ***Overall Satisfaction*** This offers a holistic view of attendees' contentment with the exhibition, summarizing their general feelings and sentiments.

   Q24: Overall, the exhibition satisfied my expectations.

3.2.4 Analysis

The questionnaire data was analyzed using Python, leveraging the capabilities of libraries such as `pandas`, `numpy`, and `scipy`. Drawing inspiration from the study on visitor motivation at immersive events (Sobitan and Vlachos, 2020), this robust analytical framework was structured as follows:

1. Demographic details of participants were presented using percentages and frequencies.

2. For each statement, means and standard deviations were computed. To evaluate the prominence of distinct motivational factors and understand attendees' satisfaction levels, percentages of ***Agree*** and ***Disagree*** responses for every context, factor, and statement were ascertained.

3. To identify key determinants of satisfaction, correlations between individual satisfaction statement ratings and the composite satisfaction score were analysed.

3.3 Social Media Text Analysis

In this research, both ChatGPT (OpenAI, 2023)—a leading large language model (LLM) in natural language processing—and the programming language, Python (Van Rossum and Drake Jr, 1995), were employed for tasks of data collection, cleaning, and analysis. Figure 3.1 illustrates the data processing pipeline. Coding implementation was included in the supporting materials.

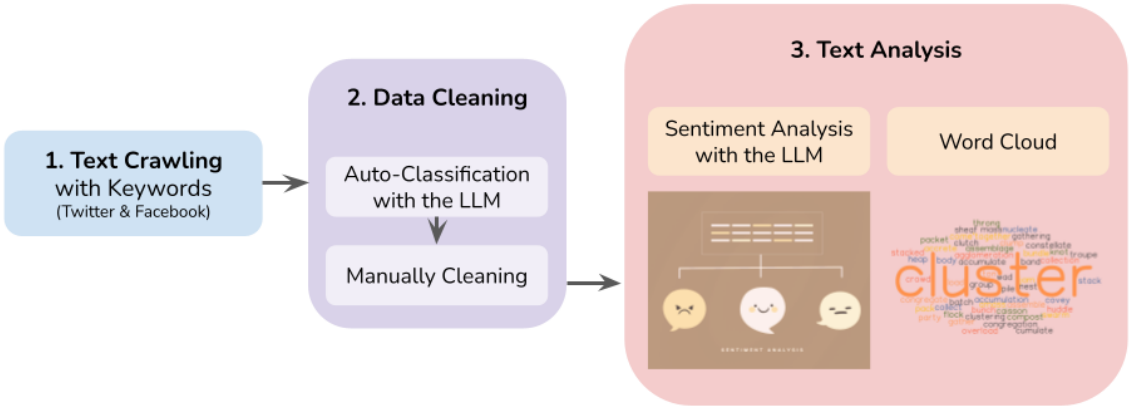

Figure 3.1: Text analysis pipeline for posts from Twitter and Facebook platforms

3.3.1 Data Collection with Text Crawling

Despite Instagram's significant reach and influence as a social media platform, its primary content comprises images and emojis. This nature of content makes Instagram suboptimal for text-based analysis. Consequently, the study pivoted to Twitter and Facebook as the principal data sources. To curate relevant content, the keywords 'Van Gogh immersive art exhibitions' and 'Van Gogh immersive experience' were utilized. For Twitter, data was collated spanning January 1st, 2021, through August 9th, 2023—the latter being the date of data extraction. In contrast, Facebook's restricted accessibility permitted only the retrieval of the most recent posts associated with the keywords. In total, 3,751 posts containing the keywords were extracted from Twitter, while 235 were curated from Facebook.

3.3.2 Data Cleaning

Auto-Classification with the Large Language Model (LLM)

The retrieved posts not only covered personal opinions and feedback about the Van Gogh immersive art exhibitions but also encompassed advertisements, location details, and other content considered irrelevant to the study's objectives. To eliminate irrelevant content, the GPT-4.0 large language model (OpenAI, 2023) was used. This model was applied to evaluate whether the content of posts directly related to personal experiences, feelings, or opinions concerning the Van Gogh immersive art exhibitions. Using the provided API of the model, requests were dispatched and classification results—where 1 signifies "yes" and 0 indicates "no"—were received in return. Figure 3.2 shows a sample process of how the model was requested to classify the post and send the results. The classification results were collected and organised for further processing.

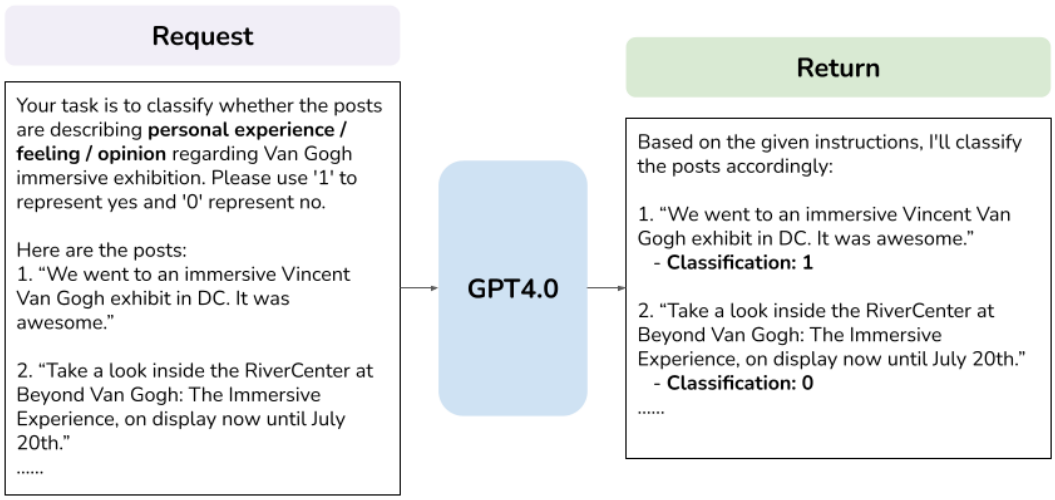

Figure 3.2: A sample showing how to request the GPT4.0 to classify the text content in the posts

Manual Verification and Cleaning

While GPT-4.0 has shown reliability and accuracy in text classification tasks, as noted by (Alshami et al., 2023), it is not without errors. To address these inconsistencies, two reviewers manually verified the classification outcomes of the 3,751 posts generated by

the LLM. This process ensured that the posts accurately captured personal experiences, feelings, or opinions related to the Van Gogh immersive art exhibitions. Of the automatically classified posts, approximately 5% had errors, which were corrected. Only posts written in English were considered in this research. After the filtering, a total of 1,428 posts were identified as valid content for deeper analysis. It's essential to highlight that these selected posts not only encompass reviews or feedback given after attending the exhibition but also convey individuals' aspirations to visit the exhibition. Both perspectives were deemed vital for the study's objective.

Subsequent to the primary verification process, a stratified random sampling technique was employed. A representative sample, consisting of 50 posts, was extracted to ascertain the distribution across three distinct categories: *feedback*, *desire*, and *irrelevant*. Preliminary findings indicated that approximately 12% of these posts expressed intentions either in favor of or against attending the exhibition. Concurrently, a predominant 84% of the sample was delineated as experiential feedback. Notably, even in the wake of rigorous auto-classification followed by manual verification, around 4% of the posts were categorized as *irrelevant*.

3.3.3 Data Analysis

Sentimental Analysis

Sentiment analysis seeks to categorize textual, and occasionally multimedia content, into positive, neutral, or negative sentiments. This approach has seen a rise in application, especially when examining data from online communities, blogs, and other digital collaboration tools (Chaturvedi et al., 2018). When combined with Natural Language Processing (NLP) techniques, sentiment analysis becomes even more powerful, helping to understand public feelings and inform decision-making (Schuller, Mousa, and Vryniotis, 2015). Additionally, recent research has noted an increase in active users on social media platforms (Dixon, 2023). These platforms serve as rich sources of user interactions, from comments to reviews. This influx of user-generated content provides a vast amount of data for potential analysis (Yadav and Vishwakarma, 2020).

Similar to the data cleaning process, the data analysis leveraged the robust sentiment analysis capabilities of the current LLM. The filtered posts served as input data, with

the model tasked to classify each post into one of three sentiment categories: positive, neutral, or negative. To quantify the sentiment, sentiment scores (SS) were assigned to three sentiment categories: positive (1), neutral (0), and negative (-1). The average sentiment score (ASS) of attendees towards the Van Gogh immersive art exhibition, as reflected by social media posts over a time period T, is given by:

$$ASS = \frac{1}{n} \sum_{i=1}^{N} SS_i, \tag{3.1}$$

where the i^{th} post was published within time period T and $SS_i \in \{-1, 0, 1\}$.

The equation 3.1 computes the average sentiment score, ASS, across N posts during T. Drawing from methodologies in previous studies that used sentiment analysis to evaluate user satisfaction (Al-Otaibi et al., 2018; Gang and Chenglin, 2021; Andrian et al., 2022), this research posits that a higher ASS—indicative of a greater proportion of positive posts—suggests elevated attendee satisfaction. Conversely, a lower ASS, marked by a higher fraction of negative posts, signifies decreased satisfaction.

Word Cloud Visualisation

A word cloud visualises text data by emphasizing frequently occurring words or phrases through varied font sizes and colors. The more frequent the word, the larger and more prominent it appears, offering a quick snapshot of key terms. Commonly employed in fields like politics, business, and education, they can depict content nuances, such as themes of political speeches (Atenstaedt, 2012). In this study, this method illuminated dominant words reflecting attendees' sentiments and experiences at the Van Gogh immersive art exhibitions.

For a more meaningful cloud visualization, the NLP tool "spacy cleaner" (spacy-cleaner, 2022) was employed to filter out stopwords. Stopwords are high-frequency words that, while common, often lack significant standalone meaning. Examples include:

- Articles: a, an, the
- Conjunctions: and, or
- Prepositions: at, by, in, of, on, to
- Pronouns: he, she, this

- Auxiliary Verbs: is, are, was, has

After filtering out stopwords, punctuation, web links, and numbers were removed. Lemmatization was then applied, a process that reduces words to their base form, such as changing "running" to "run". Additionally, words regarding logistical aspects of attending the exhibition were excluded since they don't reflect sentiments. An exhaustive list of words excluded during word cloud creation can be found in the Appendix.

Chapter 4

Results and Discussion

4.1 Survey Study

4.1.1 Demographic Statistics

The survey study was responded by 69 participants over a two-week period. Out of the 69 questionnaires submitted, three were unfinished, remaining 66 were valid for analysis. Participation in the study was optional, and all collected data was stripped of any identifying information to ensure anonymity.

According to the collected responses, it is evident that the predominant attendee of the Van Gogh immersive art exhibition is a female aged between 18 and 24 years. Within this demographic, 65.0% have a bachelor's degree, and 35.0% have pursued post-graduate education. A smaller segment of the respondents (three individuals) were aged above 35 years. Of these, one female holds an undergraduate degree, while the other two males, aged between 35 and 44 years, have varied educational backgrounds.

In summary, 78.8% of the respondents were female, indicating a strong female inclination among the attendees. Furthermore, the majority of these respondents were tertiary educated, with 59.1% having a bachelor's degree and 36.4% with a post-graduate degree. This data suggests that the Van Gogh immersive art exhibition attracts a predominantly young, female, and well-educated audience.

Table 4.1: Demographic statistics of the participants.

Gender	Age	Education Level	Number
Female	18-24 years old	Higher or secondary or further education	1
		College or university	26
		Post-graduate degree	14
	25-34 years old	Higher or secondary or further education	1
		College or university	3
		Post-graduate degree	6
	above 44 years old	College or university	1
Male	18-24 years old	Prefer not to say	1
		College or university	6
		Post-graduate degree	3
	25-34 years old	College or university	2
	35-44 years old	College or university	1
		Post-graduate degree	1
Total	/	/	**66**

4.1.2 Analysis of Motivation Factors

As discussed in 3.2.3, the five-point scale ratings of each motivation statement were used to measure the importance of different motivation factor. As presented in the Table 4.2, means and standard deviations (SD) were calculated based on the ratings of each statement. To offer clarity in the interpretation, responses such as "Agree" and "Strongly Agree" were aggregated into the "Agree" bracket, while "Disagree" and "Strongly Disagree" were merged into the "Disagree" bucket. Given the multifaceted nature of each context, which embeds numerous motivation factors, and the fact that each motivational factor is represented by multiple statements, scores were integrated together to obtain accurate percentage calculations.

The Table 4.2 is methodically structured, elucidating the diverse motivational factors spanning both personal and social contexts. The percentage figures beside each context and motivation factor provide an immediate snapshot of the overall respondent agreement. Subsequently, Table 4.3 shifts the lens to zoom into those motivation statements that registered the highest concurrence and disagreement rates. These tables combined, paint a vivid picture of what truly resonates with attendees and what might be areas

Table 4.2: Means and standard deviations (SD) of motivation statement scores with percentage of ***Agree*** responses in parentheses.

Context	Motivation Factor	Statement	Mean	SD
Personal Context (84.5%)	Novelty (94.7%)	Q1	4.26	1.64
		Q2	4.29	1.63
	Learning and Improvement (87.9%)	Q3	4.17	1.76
		Q4	4.12	1.71
	Escapism (76.5%)	Q5	3.95	1.95
		Q6	4.09	1.89
	Entertainment (90.9%)	Q7	4.24	1.66
		Q8	4.27	1.71
	Self-Expression (81.8%)	Q9	4.17	1.69
		Q10	3.92	1.90
	Personal Interest (75.0%)	Q11	4.09	1.78
		Q12	3.73	1.92
Social Context (63.6%)	Social Interaction (66.2%)	Q13	3.65	1.94
		Q14	3.71	1.89
		Q15	4.02	1.90
	Recommendation (61.1%)	Q16	3.79	1.71
		Q17	3.47	2.13
		Q18	3.30	2.12

of lesser influence or concern. Analyzing the data pooled from Table 4.2 and Table 4.3, the following insights were derived concerning attendee motivations for the Van Gogh immersive art exhibition:

- **Overall Mean Scores**: All motivational factors register mean scores that decisively eclipse the neutral score of three. This clearly underscores that respondents predominantly concur with the motivations posited.

- **Interplay between Personal and Social Drivers**: Motivations in the personal context have a higher overall agreement (84.5%) compared to those in the social context (63.6%). The mean score of the motivation statements was tested significantly (by one-sided t-test with statistic $= 8.56$ and p-value < 0.001) higher than the mean score of those in social context at the significance level $\alpha = 0.05$.

- **Top Three Motivation Factors in Personal Context**:

Table 4.3: Motivation statements: highest percentages of ***Agree*** and ***Disagree*** responses

Statements with the highest ratings of *Agree*	**Percentage**
Q1: I attended because the exhibition was a novel experience for me.	95.5
Q2: I was curious about the exhibition itself.	93.4
Q7: The exhibition might provide me with entertainment.	90.9
Q8: I wanted to view art and relax at the same time.	90.9
Q9: Attending the exhibition could be an expression of my personal choices.	90.9
Statements with the highest ratings of *Disagree*	**Percentage**
Q18: Some well-known people went, so I got curious.	31.8
Q17: Others recommended the exhibition to me.	22.7
Q13: I wanted to connect with new people who also appreciate such exhibitions.	12.1
Q5: The exhibition might offer me an escape from my daily routine.	9.1
Q10: Being part of the exhibition could let me display my artistic preferences.	9.1
Q14: Sharing this experience might strengthen my bond with friends and family.	9.1

1. *Novelty (N)* is the leading motivation factor, with 94.7% of respondents agreeing. This is supported by the high agreement ratings for the statements related to this factor.

2. *Entertainment (EN)* is another significant motivation, with an agreement rate of 90.9%. Statements related to entertainment, such as "the exhibition might provide entertainment" and "wanting to view art and relax", both had an agreement of 90.9%.

3. *Learning and Improvement (L&I)*, with an 87.9% agreement, underscores an intrinsic human desire for personal growth and intellectual nourishment.

Table 4.4 presents p-values resulting from pairwise t-tests conducted on the differences of mean scores between two motivation factors. The results indicate the statistical differences between motivation factors. Where a significant difference (annotated by *, **, or ***) is denoted, this suggests that the mean scores of the two compared factors are statistically different from each other. In other words, the participants rated these motivations differently. Where no significant difference (purely numbers) is shown, the means of the two motivations are statistically similar.

The top two factors, *Novelty* and *Entertainment* in the personal context, are not merely incidental but have been demonstrated to be distinctively higher than their

counterparts in the study. This is supported by the evidence, shown in Table 4.4 that the mean scores for these two factors were significantly higher than those of the other factors, as determined by one-sided t-tests at the significance level $\alpha = 0.05$.

- ***Insights for Motivation Factors in Social Context*** :
  - *Social Interaction (SI)* had a moderate agreement rate of 66.2%, while the statement about wanting to "connect with new people" had a relatively high disagreement rate of 12.1%.
  - *Recommendation (R)* had the lowest agreement rate in the social context at 61.1%. Notably, the statement related to attending due to "others' recommendations" had a disagreement rate of 22.7%.

  As shown in Table 4.4, one-sided t-tests were conducted to compare the mean scores of statements associated with the *Recommendation* and *Social Interaction* factors against those of other factors in the study. The findings indicated that the mean score for the *Recommendation* factor was notably lower than all other factors, with a significance level of $\alpha = 0.05$. Similarly, the *Social Interaction* factor's mean score was significantly lower than all factors, except for *Personal Interest*, at the same significance level of $\alpha = 0.05$.

Table 4.4: Pairwise comparisons of motivation factors: P-values from t-tests. * indicates $p < 0.05$, ** indicates $p < 0.01$, *** indicates $p < 0.001$.

	N	**L&I**	**ES**	**EN**	**SE**	**PI**	**SI**	**R**
Novelty (N)	/	0.06	(**)	0.43	(**)	(***)	(***)	(***)
Learning and Improvement (L&I)	0.06	/	0.12	0.10	0.15	(**)	(***)	(***)
Escape (ES)	(**)	0.12	/	(**)	0.42	0.15	(*)	(***)
Entertainment (EN)	0.43	0.10	(**)	/	(*)	(***)	(***)	(***)
Self-Expression (SE)	(**)	0.15	0.42	(*)	/	0.09	(**)	(***)
Personal Interest (PI)	(***)	(**)	0.15	(***)	0.09	/	0.13	(***)
Social Interaction (SI)	(***)	(***)	(*)	(***)	(**)	0.13	/	(**)
Recommendation (R)	(***)	(***)	(***)	(***)	(***)	(***)	(**)	/

In essence, personal motivations, especially those tied to the exhibition's novelty and entertainment, stood out as the primary drivers for attendance. Immersive art exhi-

bitions, in particular, cater to these individual desires by offering attendees a unique opportunity to delve into a world that contrasts with their everyday reality. The allure of such exhibitions lies in their ability to transport visitors into a different realm, allowing them to become part of the artwork and experience it from within. This type of engagement is difficult to replicate in traditional settings, making the immersive experience an irresistible draw for many.

Conversely, while social motivations held some influence, they were markedly less persuasive in the context of immersive experiences. Perhaps the personal nature of immersion makes external validation less crucial. After all, being enveloped in an art piece is an intensely individual experience, even if shared collectively. Statements related to both recommendations and social interactions recorded lower levels of agreement and encountered greater dissent. This might indicate that, when it comes to immersive exhibitions, word-of-mouth or peer influence doesn't hold the same sway as personal intrigue and the promise of an unparalleled aesthetic journey. As the boundaries between viewer and art blur, the decision to attend becomes a deeply personal one, driven more by intrinsic curiosity than external pressures.

4.1.3 Analysis of Satisfaction Factors

Following the methodology used for assessing motivation factors, the means, standard deviations (SD), and the percentage of ***Agree*** responses were computed for each satisfaction statement based on their ratings. As detailed in Table 4.5, attendees expressed the highest satisfaction with the *Novelty* aspect, recording a 94.0% agreement. This was closely trailed by *Entertainment* with a 90.9% agreement, reflecting a high level of attendee contentment in these areas. Conversely, *Escapism* recorded the lowest agreement at 59.1%, suggesting that the exhibition might not have effectively provided an escape from daily routines for some attendees. However, the overall satisfaction with a 89.4% agreement rate, indicates the predominantly positive feedback from attendees. To delve deeper into attendee satisfaction, the 'Percentage of Satisfied Attendees' (PoSA) was introduced. This metric represents the proportion of participants who selected ***Agree*** for both motivation and the corresponding satisfaction factors. These values can be found in Table 4.6. The results suggested that attendees' expectations concerning novelty (96.0%), entertainment (95.0%), and social interaction (92.4%) were predominantly

Table 4.5: Means and standard deviations (SD) of satisfaction statement scores with percentage of ***Agree*** responses in parentheses.

Context	Satisfaction Factor	Statement	Mean	SD
Personal Context (81.4%)	Novelty (94.0%)	Q19	4.17	0.65
	Learning and Improvement (81.8%)	Q20	4.09	0.76
	Escapism (59.1%)	Q21	3.71	1.06
	Entertainment (90.9%)	Q22	4.14	0.78
Social Context (83.3%)	Social Interaction (83.3%)	Q23	3.97	0.78
Overall (89.4%)		Q24	4.18	0.89

met. Conversely, the desire for escapism (70.3%), or the wish to break away from daily routines, was the least fulfilled expectation among attendees.

Table 4.6: Spearman rank-order correlation coefficient for satisfaction scores comparing individual satisfaction factor to the overall satisfaction, verified via permutation tests, and percentage of satisfied attendees (PoSA).

Satisfaction Factor	Correlation	Statistic	P-value	PoSA(%)
Novelty	**0.354**	3.029	0.002	**96.0%**
Learning and Improvement	0.277	2.302	0.012	87.1%
Escapism	0.229	1.881	0.033	70.3%
Entertainment	**0.375**	3.238	0.001	**95.0%**
Social Interaction	0.294	2.466	0.008	**92.4%**

As depicted in Table 4.6, the Spearman rank-order correlation coefficients offer a quantitative assessment into the association between distinct satisfaction factors and the overall satisfaction score. This rank correlation metric is particularly pertinent when drawing associations between two ordinal data sets. Compared with the other factors, *Novelty* and *Entertainment* exhibited stronger correlations with overall satisfaction, as indicated by their correlation values of 0.354 and 0.375, respectively. Based on the permutation tests, all the correlations were significantly positive at the significance level $\alpha = 0.05$, suggesting that each individual factor was positively linked with the overall satisfaction of attendees.

4.2 Social Media Text Analysis

4.2.1 Sentimental Analysis

In accordance with the verification procedures outlined in Section 3.3.2, the sentiment classification accuracy of GPT-4.0 was assessed. From a random sample of 50, discrepancies were identified between the model's classifications and human judgments in three instances. This corresponds to an accuracy rate of 94%, with a 95% confidence interval (CI) ranging from 87.4% to 100%. Based on research criteria established considering the current state-of-the-art (Habimana et al., 2020), an accuracy greater than 85% is mandated. Given this benchmark, the model emerges as a trustworthy method for sentiment analysis.

Table 4.7 provides a breakdown of valid posts, classified by sentiment, for each year from January 2021 to August 2023 in relation to the Van Gogh immersive art exhibition. The data encompasses the count of posts, their respective percentages for each sentiment category, and an average sentiment score (ASS) with its corresponding 95% confidence interval (CI) for each year.

Table 4.7: Yearly count (percentage) of valid posts and the corresponding ASS (with 95% CI) from January 2021 to August 2023.

Year	**2021**	**2022**	**2023**	**Total**
Positive (1)	426 (82.2%)	504 (82.5%)	237 (79.2%)	1167 (81.7%)
Neutral (0)	48 (9.3%)	51 (8.3%)	29 (9.7%)	128 (9.0%)
Negative (-1)	44 (8.5%)	56 (9.2%)	33 (11.0%)	133 (9.3%)
Total	518	611	299	1428
ASS with 95% CI	0.74±0.05	0.73±0.05	0.68±0.08	0.72±0.03

Across the span of three years, a significant majority of the posts—around 80% each year—expressed positive sentiments about the exhibition. This indicates consistent satisfaction, suggesting robust attendee motivation to either attend or discuss the exhibition. Throughout the three years, the ASS consistently remained positive, fluctuating between 0.68 and 0.74. The stable nature of the ASS underscores the overwhelmingly positive reception of the exhibition. However, a slight uptick in negative sentiments, from 8.5% in 2021 to 11% in 2023, hints at certain aspects of the exhibition that might not have fully resonated with a segment of attendees over time. Parallel conclusions can be derived from

Figure 4.1, which delineates a monthly breakdown from January 2021 to August 2023, detailing the count of valid posts and the ASS, accompanied by its 95% CI, in the context of the Van Gogh immersive art exhibition. Most months showcase an ASS indicative of positive sentiment, reinforcing the satisfaction levels of attendees and discussants.

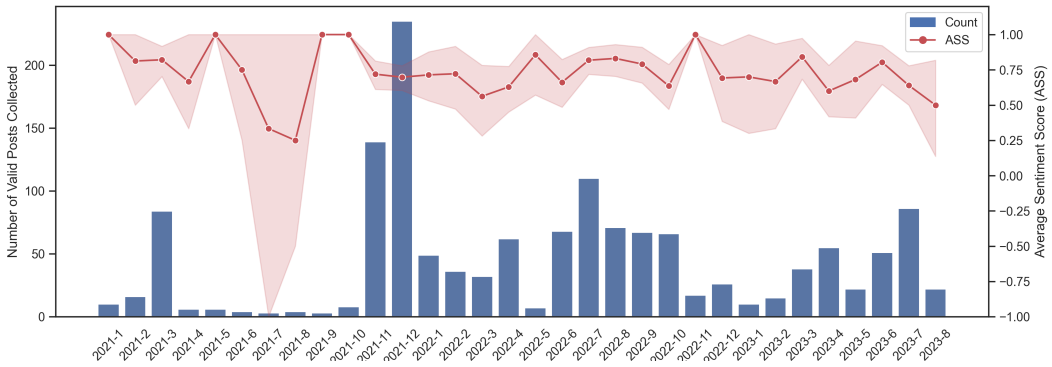

Figure 4.1: Monthly count of valid posts and their corresponding average sentiment scores (with 95% CI) from January 2021 to August 2023.

It's noteworthy that the diminished engagement from March 2021 to September 2021 aligns with the pervasive impact of the pandemic. Numerous art and cultural events worldwide grappled with analogous challenges, witnessing decreased participation and engagement owing to health apprehensions and stringent travel curbs. Yet, the enduring positive sentiment during these trying times, even if derived from a smaller sample, signifies that the exhibition maintained its allure for those who interacted with it.

4.2.2 Word Cloud Visualisation

The word cloud provides a graphical representation of word frequencies derived from posts discussing the Van Gogh immersive art exhibition, as elaborated in Section 3.3.3. In such visualizations, the prominence of a word is directly proportional to its frequency within the analyzed content. Consequently, words with larger typographic representations were more recurrent in discussions, whereas those depicted smaller were less prevalent. Word frequencies were ascertained from the entire dataset, as well as from subsets of posts labeled as positive or negative. These frequencies informed the generation of the respective word clouds illustrated in Figure 4.2 and Figure 4.3.

Interpreting the results, it becomes evident that the Van Gogh immersive art exhibition garnered a predominantly positive response. This is corroborated by the frequent

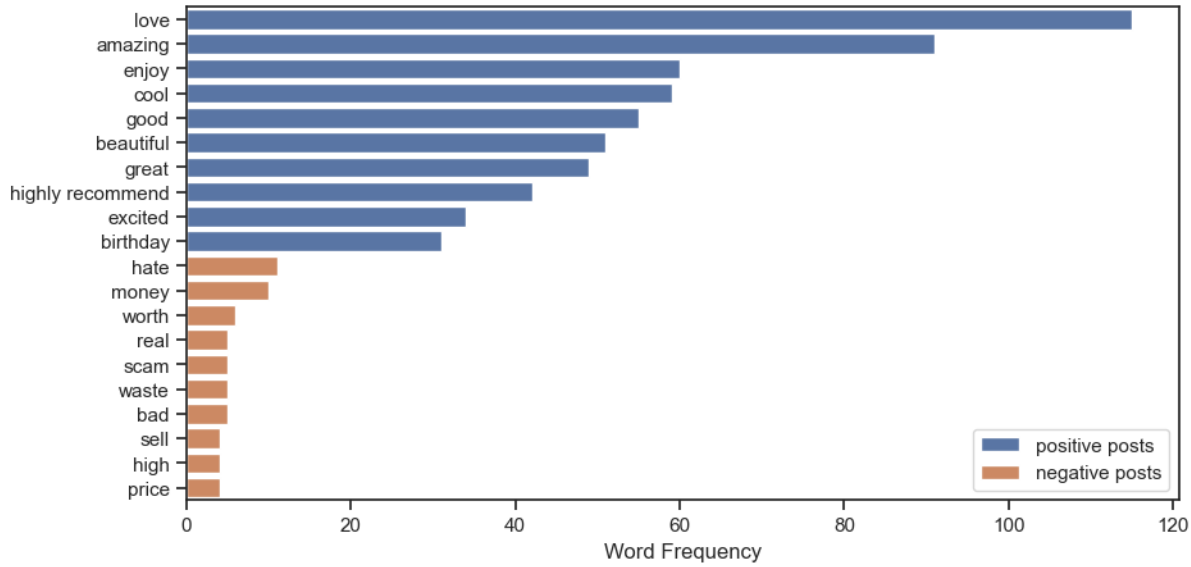

Figure 4.2: Top 10 most frequent words in both positive (blue) and negative sentiment (orange) word clouds.

appearance of affirmatory words such as 'love', 'amazing', and 'enjoy', signaling profound attendee appreciation. The substantial congruence between the word clouds derived from the aggregate posts and those labeled positive underscores the prevailing positive sentiment, aligning with the outcomes of the sentiment analysis. Conversely, while the word cloud reflecting negative sentiments is characterized by fewer terms, it highlights specific areas of contention, particularly pertaining to value perceptions. Terms like 'scam' and 'waste' suggest that a segment of attendees may perceive a disconnect between the exhibition's offerings and its value proposition, raising concerns about fulfillment of expectations and value for money.

4.3 Discussion

4.3.1 Attendee Motivation

By conducting the survey study, this research addressed the first question proposed in Section 3.1 through quantitatively measuring a various motivations for people to enter the Van Gogh immersive art exhibitions. Findings from the survey study revealed a significant association between the motivation to attend the Van Gogh immersive art exhibition and demographic attributes. Specifically, educational attainment and gender emerged as factors influencing individuals' decisions to partake in immersive experiences. The data

Figure 4.3: Word clouds representing all posts, positive sentiment posts, and negative sentiment posts (top to bottom).

collected from the survey indicated that the predominant portion of participants at the Van Gogh immersive art exhibition possessed at least a bachelor's degree, if not a master's or higher. This suggested that individuals with advanced educational qualifications exhibit a greater propensity to engage in immersive art exhibitions. The attendees exhibited a notable female predominance, a trend consistent with the findings of Sobitan and Vlachos (2020), which explored visitor demographics across various immersive events.

Descriptive statistics from the survey revealed that participants prioritized *Novelty* as the top motivation. In this research, *Novelty* was delineated as the intrinsic curiosity and uniqueness emanating from Van Gogh immersive art exhibition. According to Gao, Yang, and Yuan (2022), immersive art exhibitions synthesize diverse components, encompassing new media technology, multi-sensory engagement, and interactive mechanisms,

thereby offering visitors an unprecedented experiential dimension. Considering the inherent innovation and uniqueness of immersive art exhibitions, the prominence of *Novelty* as the leading factor for attendees was understandable. This observation aligned with the conclusions drawn by studies on motivations for attending immersive events (Sobitan and Vlachos, 2020) and art museums (Cotter, Fekete, and Silvia, 2022). Apart from *Novelty*, the significant motivators that emerged were *Entertainment* followed by *Learning and Improvement*. These observations resonated with the study by Moussouri (1997). In the research, it was discerned that visitors to museums and exhibitions predominantly sought a "learning-oriented entertainment experience", viewing these as complementary dimensions of a multifaceted leisure pursuit. Furthermore, the primary motivators for museum visitors were identified to be education and entertainment, surpassing other considerations. This distinction with our findings insinuated that attendees of immersive art exhibitions, which might be perceived as a specialized type of exhibition, not only aligned with typical museum motivations but were more likely influenced by the exhibition's novelty.

Surprisingly, unlike what Cotter, Fekete, and Silvia (2022) found in their research, where personal interests stood as an important motivation for people to visit art museums, this research found that personal interests were less influential for people to attend the immersive art exhibition compared with other factors.

When comparing personal and social contexts, the results indicated that personal motivation factors play a more pivotal role than social factors. This suggested that individuals are primarily influenced by personal motivations when opting to attend immersive art exhibitions. Among the various motivation factors assessed, recommendations were the least influential in attracting attendees to the exhibition. Analysis of posts from social media platforms revealed that negative sentiments sometimes arose in response to excessive advertisements and recommendations concerning the Van Gogh immersive exhibitions.

4.3.2 Attendee Satisfaction

To evaluate attendee satisfaction for the Van Gogh immersive art exhibitions, both a survey study and text analysis of social media posts were employed, addressing the questions presented in Section 3.1. The survey captured satisfaction using participants' ratings on

statements related to distinct factors. Meanwhile, sentiment classification in the text analysis served as an indicator of satisfaction, while the word clouds visualised the frequency of words concerning sentiment. The survey results, which showed a strong overall satisfaction, were consistent with both the sentiment analysis and the word cloud visualizations. In these analyses, a majority of the posts conveyed a positive sentiment, and words associated with positive feelings were prominently featured in the visualizations.

The immersive nature of the art exhibition hinges on its ability to captivate attendees on multiple fronts. This multidimensionality is evident in the satisfaction factors listed. The emphasis on *Novelty* and *Entertainment* is a testament to the evolving nature of art exhibitions that go beyond just displaying artworks, instead immersing the attendees in a world that stimulates their curiosity and entertains them. The high levels of satisfaction in these areas highlight the exhibition's success in creating a fresh, engaging environment that resonates with the contemporary art enthusiast.

The survey study indicated that attendees' expectations concerning novelty, learning, entertainment, and social interaction were largely met. However, the desire for 'escape' was less fulfilled, with roughly 40% of respondents not expressing satisfaction in this regard. Prior research (Dann, 1977; Chylińska, 2022; Sobitan and Vlachos, 2020) posits that escaping the daily routine is a significant motivation, anticipated to be satisfied during trips or visits. The presence of words like 'trip' and 'travel' in the word clouds shown in 4.3 suggests attendees might harbor such expectations in immersive art exhibitions. These findings hint that the current immersive exhibitions may struggle to transport attendees away from their daily realities, agreeing with findings by Sobitan and Vlachos (2020) for a broader range of immersive events. The modern world is filled with distractions, and it takes a profound, enveloping experience to transport attendees to another realm, enabling them to momentarily forget their daily worries and immerse themselves fully in the world of art. The exhibitors might consider incorporating elements like augmented or virtual reality, ambient soundscapes, or tactile experiences to amplify the feeling of being in another world.

Overall, while text analysis through sentiment analysis and word clouds provides an immediate and overarching snapshot of attendee sentiment, the questionnaire offers a more granular insight into attendee motivations and the exhibition's success in meeting those. Together, they presented a comprehensive understanding of the attendee moti-

vation and satisfaction to the Van Gogh immersive art exhibition, providing insights to assist future iterations of the exhibition better meet attendee desires and expectations.

4.3.3 Limitations

Limitations of the Survey Study

The following three limitations were considered as the main restrictions for the survey study.

1. A conspicuous limitation is the inadequacy of the sample size within survey study. The sample size is comparatively modest when compared with similar studies (J. Chang, 2006; Van Zyl and Botha, 2004; K. Kim, Uysal, and J. S. Chen, 2001) on motivations of event visitors. Insufficient sample size may produce the following problems. Firstly, an insufficient sample size might result in unreliable or inaccurate representation of the target population, thereby affecting the accuracy of research results. Secondly, due to the limited sample size, analysis of the differences in motivation between different groups cannot be conducted. For example, the current sample size is insufficient to verify whether people in different gender groups have differences in their motivations for attending the exhibitions.

2. More motivation factors could be included. As mentioned in Section 3.2.3, this research didn't consider motivation factors in physical context. However, the Van Gogh immersive art exhibitions encompass different immersive art exhibitions themed around Van Gogh. Despite the similar theme, different design and locations might lead to differences in the atmosphere or the content of the exhibitions (Gao, Yang, and Yuan, 2022), which might influence the motivations of visitors. Therefore, factors related to physical context could be further investigated in future studies.

3. For each satisfaction factor, only a general statement was proposed for evaluation. Minor differences among possible directions with respect to the factor might be overlooked. For example, the current study has difficulty learning the differences of satisfaction between learning and self-development in the exhibitions, while both of them could be considered as an aspect of the *Learning and Improvement* factor.

Limitations of Social Media Text Analysis

Firstly, the platforms used for data crawling were limited as mentioned in Section 3.3.1. Posts were only gathered from Twitter and Facebook. Furthermore, only posts ranging from 2021 to 2023 were collected from Twitter while the immersive exhibitions began in 2017. Due to restrictions of the platform API, the temporal range for posts collected from Facebook was even more restrictive, with data spanning only the recent months. A larger size of data might lead to more comprehensive analysis of the texts. Secondly, even with manually correction, classification errors were still observed in the post-verification for both data cleaning and sentiment classification. This might lead to minor deviations in the reported statistics.

4.3.4 Ethical Considerations

The entire process was conducted in strict adherence to the ethical guidelines established by the College Research Ethics Committee. An ethical approval for this research project was granted by the REMAS, the King's College London Ethical Office. After assessing and finishing the ethical review, this research was considered to be of minimal ethical risk. The data was crawled following the rules and permissions of the platforms (Twitter and Facebook). Apart from data crawling, participants for the survey study were completely voluntary and anonymous. In order to help them clearly understand the aim of this research, information sheet and consent form were provided. They were also informed that they could refuse to answer even during the process of completing the questionnaire. The data collected from participants would be stored inline the EU General Data Protection Regulations (GDPR) and will be deleted after the dissertation has been submitted. Those data will never be used for other purposes.

Chapter 5

Conclusion

This research established a novel framework of combining the survey study with text analysis to quantitatively measure attendee motivation and satisfaction for immersive art exhibitions, taking the Van Gogh immersive exhibition as a case study. Based on the exhibition's characteristics, eight motivation factors were identified from both personal and societal perspectives. In addition, five corresponding satisfaction factors were examined to determine whether the exhibitions met attendees' expectations. For the text analysis, a dataset was gathered from Twitter and Facebook, capturing posts that shared personal experiences, feelings, and viewpoints about the Van Gogh immersive art exhibitions. This data underwent sentiment analysis, and word cloud visualizations were created to assess attendees' perceptions of the exhibitions. Results showed that attendee were motivated by all the proposed factors, with novelty, entertainment, and learning being the most prominent ones. It was also observed that motivations in the personal context have a higher overall agreement than those in the social context. The survey study as well as the text analysis demonstrated high levels of satisfaction towards the Van Gogh immersive art exhibitions, while the desire for escaping from the daily routine was less fulfilled by the exhibitions. Overall, findings of this research might assist the immersive art industry better meet audience demands, enhance dissemination effects, and thereby elevate the impact and commercial value of exhibitions.

There are some possible direction can be explored in the future studies. Firstly, it would be beneficial to include larger sample sizes and incorporate more comprehensive statements regarding motivation factors as discussed in Section 4.3.3. Second, future research could encompass additional demographic variables such as marital status and

ethnicity to foster a deeper understanding of the subject. Finally, it can be predicted that technologies will continue to advance, resulting in more compelling and interactive immersive art. How the audience motivation and satisfaction will be influenced could be further explored in the future.

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Appendix

A1: Removed Words in Word Cloud

a	about	above	after	again	against	all
also	am	an	and	any	are	aren't
as	at	be	because	been	before	being
below	between	both	but	by	can	can't
cannot	com	could	couldn't	did	didn't	do
does	doesn't	doing	don't	down	during	each
else	ever	few	for	from	further	get
had	hadn't	has	hasn't	have	haven't	having
he	he'd	he'll	he's	hence	her	here
here's	hers	herself	him	himself	his	how
how's	however	http	i	i'd	i'll	i'm
i've	if	in	into	is	isn't	it
it's	its	itself	just	k	let's	like
me	more	most	mustn't	my	myself	no
nor	not	of	off	on	once	only
or	other	otherwise	ought	our	ours	ourselves
out	over	own	r	same	shall	shan't

she	she'd	she'll	she's	should	shouldn't	since
so	some	such	than	that	that's	the
their	theirs	them	themselves	then	there	there's
therefore	these	they	they'd	they'll	they're	they've
this	those	through	to	too	under	until
up	very	was	wasn't	we	we'd	we'll
we're	we've	were	weren't	what	what's	when
when's	where	where's	which	while	who	who's
whom	why	why's	with	won't	would	wouldn't
www	you	you'd	you'll	you're	you've	your
yours	yourself	yourselves	hour	van	gogh	immersive
experience	exhibit	went	see	go	vincent	art
exhibition	vangogh	today	ticket	oneday	day	time
tickets	museum	got	going	painting	way	thing
wanna	visited	work	visit	artist	london	people
think	come	want	room	take	NYC	DC
yesterday	week	night	date	check	year	wait
life	feel	look	know	Singapore	Chicago	sure
right	fucking	Seattle	LA	ad	close	watch
Houston	York	Dublin	Detroit	SF	Bristol	Monet
Harry	Potter	say	Frida	Da	Vinci	Bankruptcy
fuck	company	call	floor	lot	bit	

A2: Ethical Review

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15/05/2023

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Dear Yijin

Investigating the Relationship between Social Media Use and Immersive Art Experience

Thank you for submitting your Minimal Risk Self-Registration Form. This letter acknowledges confirmation of your registration; your registration confirmation reference number is MRSU-22/23-37231

Ethical Clearance

Ethical clearance for this project is granted. However, the clearance outlined in the attached letter is contingent on your adherence to the latest College measures when conducting your research. Please do not commence data collection until you have carefully reviewed the update and made any necessary project changes.

Ethical clearance is granted for a period of **one year** from today's date and you may now commence data collection. However, it is important that you have read through the information provided below before commencing data collection:

As the Minimal Risk Registration Process is based on self-registration, your form has not been reviewed by the College Research Ethics Committee. It is therefore your responsibility to ensure that your project adheres to the Minimal Risk Guiding Principles and the agreed protocol does not fall outside of the criteria for Minimal Risk Registration. Your project may be subject to audit by the College Research Ethics Committee and any instances in which the registration process is deemed to have been used inappropriately will be handled as a breach of good practice and investigated accordingly.

Record Keeping:

Please be sure to keep a record of your registration number and include it in any materials associated with this research. It is the responsibility of the researcher to ensure that any other permissions or approvals (i.e. R&D, gatekeepers, etc.) relevant to their research are in place, prior to conducting the research.

In addition, you are expected to keep records of your process of informed consent and the dates and relevant details of research covered by this application. For example, depending on the type of research that you are doing, you might keep:

- A record record of all data collected and all mechanisms of disseminated results.
- Documentation of your informed consent process. This may include written information sheets or in cases where it is not appropriate to provide written information, the verbal script,or introductory material provided at the start of an online survey.
  Please note: For projects involving the use of an Information Sheet and Consent Form for recruitment purposes, please ensure that you use the KCL GDPR compliant Information Sheet & Consent Form Templates
- Where appropriate, records of consent, e.g. copies of signed consent forms or emails where participants agree to be interviewed.

Audit:

You may be selected for an audit, to see how researchers are implementing this process. If audited, you and your Supervisor will be asked to attend a short meeting where you will be expected to explain how your research meets the eligibility criteria of the minimal risk process and how the project abides by the general principles of ethical research. In particular, you will be expected to provide a general summary of your review of the possible risks involved in your research, as well as to provide basic research records (as above in Record Keeping) and to describe the process by which participants agreed to participate in your research.

Remember that if you at any point have any questions about the ethical conduct of your research, or believe you may have gained the incorrect level of ethical clearance, please contact your supervisor or the Research Ethics Office.

Data Protection Registration

If you indicated in your minimal risk registration form that personal data would be processed as part of this research project, this letter also confirms that you have also met your requirements for registering this processing activity with King's College London in accordance with the UK General Data Protection Regulation (UK GDPR).

More information about how the UK GDPR affects researchers can be found here.

Please note that any changes to the storage, management, or type of personal data being collected should also be included in a modification request.

We wish you every success with your project moving forward.

With best wishes,

The Research Ethics Office

On behalf of the College Research Ethics Committee

A3: Participant Information Sheet and Consent Form

The full design of the questionnaire could be accessed through https://qualtrics.kcl.ac.uk/jfe/form/SV_74LPPVqiL5lpjGC

Information Sheet for Participants

This participant information sheet has been written to help you decide if you would like to take part. It is up to you whether you wish to partake in the study. If you decide to participate, you are unable to withdraw from the study as it is completely anonymous; we cannot link you back to your responses. If you do not want to participate, please do not complete the study. There are no penalties or detrimental effects if you do, or do not, decide to take part in the study.

1. What is the purpose of the study and what would taking part involve?

The purpose of this study is to examine the motivations of individuals who have participated in the Van Gogh immersive art exhibition and their satisfaction levels after participation. If you decide to participate, you will need to answer the questionnaire. Overall, the study is expected to **take you about 3 minutes**, and only has to be completed once.

2. Why am I being invited?

You are being invited to participate in this research study because we are looking for adults (aged 18+) with an interest in immersive art exhibitions and have attended any one of Van Gogh immersive art exhibitions. You should not take part in this study if you didn't participate in any Van Gogh immersive art exhibition or are under the age of 18.

3. What will happen if I take part?

If you agree to take part you will complete a survey anonymously. The survey will ask you questions about your motivations of visiting the Van Gogh immersive art exhibition and whether you are satisfied with it.

4. Do I have to take part?

Participation is completely voluntary. You should only take part if you want to and choosing not to take part will not disadvantage you in anyway. If you choose to take part you will be asked to provide your consent. To do this you will be asked to indicate that you have read and understand the information provided and that you consent to your anonymous data being used for the purposes explained. You are free to withdraw at any point during completion of the survey, without having to give a reason. Withdrawing from the study will not affect you in any way. Once you submit the survey, it will no longer be possible to withdraw from the study because the data will be fully anonymous. Please do not include any personal identifiable information in your responses.

5. Data handling and confidentiality

This research is anonymous. This means that nobody, including the researchers, will be aware of your identity, and that nobody will be able to connect you to the answers you provide, even indirectly. Your answers will nevertheless be treated confidentially and the information you provide will not allow you to be identified in any research outputs/publications. Your data will be held securely by the questionnaire hosting service Qualtrics. Only researcher will be able to access it.

6. What will happen to the results of study?

The results of the study will be summarised in dissertation paper. And it will not be shared with any third parties or made publicaly availably.

7. Who should I contact for more information?
If you have any questions or require more information about this study, please contact me using the following contact details: k21153437@kcl.ac.uk

Consent To Participate

Please ensure that you have read and understood the information above and asked any questions before you proceed. If you have any questions, please contact a member of the research team.

If you are happy to consent to your (fully anonymised) data being collected, please continue onto the next stage of the test by clicking "Next" button. By doing so, you are agreeing to the following terms:

- I confirm that I have read and understood the information sheet dated 14th August, 2023 for the above project. I have had the opportunity to consider the information and asked questions which have been answered to my satisfaction.
- I understand that my participation is voluntary and that I am free to stop taking part in the study at any time without giving any reason and without my rights being affected.
- I understand that my data will be accessed by the Yijin Zhu.
- I understand that my data will be securely stored in Qualtrics platform and in accordance with the data protection guidelines of the King's College London for around 1 months in fully anonymised form.
- I understand that I can access the information I have provided and request destruction of that information at any time prior to anonymisation. I understand that following anonymisation I will not be able to request withdrawal of the information I have provided.
- I agree to take part in the above study.

A4: Supporting Materials

All supporting materials including the codes and crawled data could be accessed at https://drive.google.com/drive/folders/1rgcQXqz5PYRSuo90bI0sPQVhs8OUBoRh?usp=sharing