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Two Essays on Technology Usage and Its Impact on Consumer Experience in Cultural Contexts

par

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Résumé

Cette thèse de doctorat examine l'impact de la technologie sur les expériences culturelles des consommateurs à travers deux essais. Le premier essai explore le rôle des applications mobiles en tant que guides touristiques numériques dans l'influence de l'appropriation des services culturels par les visiteurs. Le second essai analyse l'utilisation de l'intelligence artificielle (IA) dans la finalisation d'œuvres d'art posthumes et ses effets sur les perceptions des consommateurs.

L'essai 1 se concentre sur l'interaction entre technologie et appropriation des services dans un contexte culturel phygital, en prenant comme étude de cas Cité Mémoire—l'une des plus grandes installations de projections vidéo en plein air au monde. À travers une autoethnographie, des entretiens approfondis et des observations, l'étude révèle que les visiteurs s'approprient séparément mais simultanément le service principal et la technologie de service, avec des cycles distincts d'appropriation technologique observés tout au long du processus. Les résultats indiquent que le niveau de maîtrise technologique des visiteurs influence diverses dimensions de l'appropriation des services. Cet essai enrichit la littérature en démontrant comment la technologie façonne les expériences de service dans des environnements phygitaux, élargissant la conceptualisation de l'appropriation des services pour inclure à la fois les services principaux et les technologies de service.

L'essai 2 examine l'application de l'IA générative dans la finalisation d'œuvres d'art posthumes. En utilisant une approche mixte, l'étude explore les perceptions des consommateurs concernant les œuvres d'art posthumes complétées par l'IA et leurs implications pour l'héritage des artistes décédés. L'étude 1 utilise une analyse de contenu pour identifier des attitudes divergentes des consommateurs envers ces œuvres. L'étude 2, une expérience basée sur des

scénarios, révèle que des niveaux élevés d'implication de l'IA ont un impact négatif sur les perceptions d'authenticité des consommateurs et sur leurs attitudes envers l'œuvre. L'étude 3, également expérimentale, montre que le contrôle créatif exercé par l'artiste sur la vision artistique et l'exécution influence positivement les évaluations des consommateurs, ainsi que leur perception d'authenticité et d'éthique. Ces résultats enrichissent la compréhension théorique des œuvres d'art posthumes complétées par l'IA, de l'aversion pour les algorithmes et du contrôle créatif dans un contexte posthume.

Ensemble, ces essais apportent de nouvelles perspectives sur le rôle de la technologie dans la formation des expériences et perceptions des services culturels, contribuant au discours plus large sur l'engagement culturel médiatisé par la technologie.

Mots clés : Expérience de service phygitale, appropriation du service, appropriation de la technologie, œuvres d'art posthumes, IA générative, collaboration humain-IA, implication de l'IA, contrôle créatif, héritage de l'artiste décédé

Méthodes de recherche : recherche qualitative, expérimentation, méthode mixte

Abstract

This PhD thesis investigates the impact of technology on consumers' cultural experiences through two essays. The first essay explores the role of mobile applications as digital tour guides in influencing visitors' appropriation of cultural services. The second essay examines the use of artificial intelligence (AI) in completing artworks posthumously and its effects on consumer perceptions.

Essay 1 focuses on the interplay between technology and service appropriation within a phygital cultural context, using Cité Mémoire—one of the world's largest outdoor video-projection installations—as a case study. Employing autoethnography, in-depth interviews, and observations, the study reveals that visitors appropriate the core service and the service technology separately but concurrently, with distinct mini-technology appropriation cycles observed throughout the process. The findings indicate that visitors' levels of technological mastery influence various dimensions of service appropriation. This essay contributes to the literature by demonstrating how technology shapes service experiences in phygital environments, expanding the conceptualization of service appropriation to include both core services and service technologies.

Essay 2 examines the application of generative AI in the posthumous completion of artworks. Using a mixed-method approach, the study explores consumers' perceptions of AI-completed posthumous artworks and their implications for the legacy of deceased artists. Study 1 employs content analysis to identify divergent consumer attitudes toward AI-completed artworks. Study 2, a scenario-based experiment, finds that higher levels of AI involvement negatively impact consumers' perceptions of authenticity and their attitudes toward the artwork. Study 3, also experimental, shows that an artist's creative control over the artistic vision and

implementation positively influences consumer evaluations, perceived authenticity, and ethicality. The findings extend theoretical understanding of AI-completed posthumous artworks, algorithm aversion, and creative control in a posthumous context.

Together, these essays provide novel insights into the role of technology in shaping cultural service experiences and perceptions, contributing to the broader discourse on technology-mediated cultural engagement.

Keywords: phygital service experience, service appropriation, technology appropriation, posthumous artworks, generative AI, human-AI collaboration, AI involvement, creative control, legacy of the deceased artist

Research methods: qualitative research, experimentation, mixed method

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AI: Artificial Intelligence

To my family, for their unwavering love and support,

To my supervisors, for their invaluable guidance and encouragement,

And to my past self, for choosing this path and persevering through every challenge.

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When I was young, I loved singing, and at the age of seven, I chose to learn the violin among many other hobbies. Despite my passion for the arts, I had never attended a high-level artistic performance before university because my small hometown didn't have such opportunities. This early experience inspired me to pursue a career in the development of the cultural industry. I am deeply grateful to Richard Maloney, who was teaching at Boston University at the time, for recommending me to François Colbert, which helped me come to HEC Montréal.

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Introduction

The integration of technology into arts and culture has expanded significantly in recent years, reshaping how individuals create, distribute, promote, experience, and engage with artistic and cultural products and services. Technologies such as augmented reality (AR), virtual reality (VR), generative AI, and blockchain have introduced novel possibilities for the arts, making cultural experiences more dynamic and interactive (Lockhart 2024; "The Digital Renaissance: How Technology Is Revolutionizing the Art World," n.d.). These advancements have not only redefined artistic boundaries but also increased accessibility, enabling a broader audience to participate in and appreciate the arts.

Numerous examples highlight the transformative impact of technology on the arts. Virtual reality has facilitated immersive museum experiences, such as the Louvre's VR program that offers detailed views of iconic works like the *Mona Lisa* (Rea 2019). Generative AI has emerged as a tool for creative production, capable of generating original works and even completing unfinished masterpieces, such as Beethoven's Tenth Symphony (Goodyer 2021). Similarly, blockchain technology has revolutionized the art market by providing secure authentication and monetization of digital art through non-fungible tokens (NFTs) (Souza 2024). These applications demonstrate how technology is enhancing cultural consumption and reimagining the relationship between creators and audiences.

The influence of technology on arts consumption is both profound and multifaceted. Streaming platforms such as YouTube, Spotify, and online theater services have brought music and performances into people's homes, breaking down geographical and financial barriers (Kozachun 2024). At the same time, these technological innovations raise questions about the

authenticity of art, the role of human creativity, and the intimate nature of cultural experiences. For instance, AI-generated artworks challenge traditional notions of authenticity and originality, sparking ethical and philosophical debates (King 2024; Lockhart 2024).

Given these complexities, it is essential to deepen our understanding of the broader implications of technology in arts and culture. While these advancements open up new opportunities for arts consumption, they also challenge traditional cultural norms and values. For example, the growing reliance on digital tools necessitates critical discussions about preserving authenticity, fostering community, and safeguarding cultural heritage (Buragohain et al. 2024). Understanding these dynamics will help ensure that technology not only enhances the accessibility and enjoyment of the arts but also upholds their integrity and cultural significance.

This thesis explores the applications of technology in art production and cultural experiences, as well as its impact on arts consumption with two articles (see Figure A).

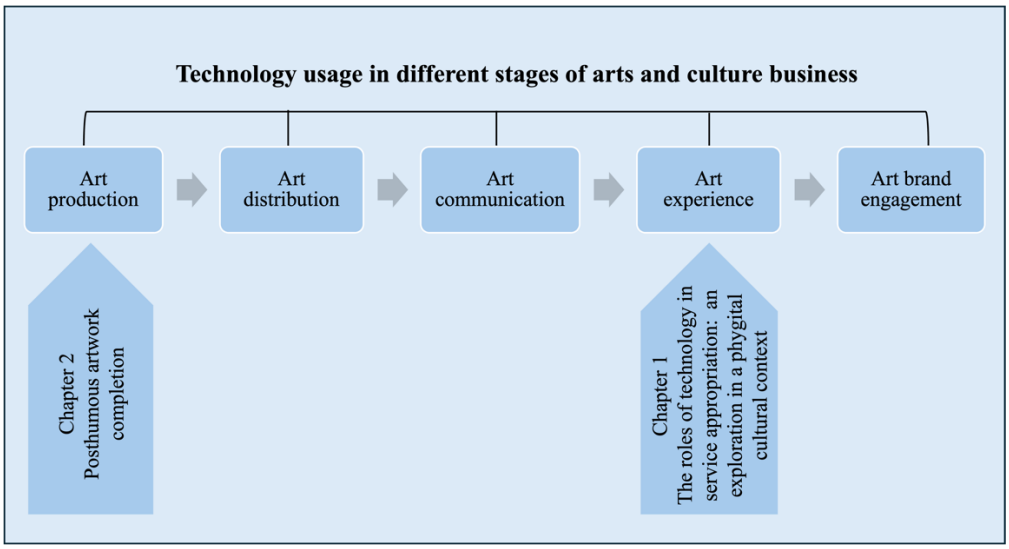

Figure A: Overall conceptual framework

The first article "The Role of Technology in the Experience Appropriation Process: An Exploration in a Phygital Cultural Context" examines how consumers' appropriation of technology influences service appropriation in a phygital cultural service setting. Using the case of Cité Mémoire, this research delves into this key question: How does the integration of technology into the consumption experience influence the service appropriation process in a phygital setting? The findings reveal that visitors experience multiple mini cycles of technology appropriation (using a mobile app) within the broader process of appropriating the core service (Cité Mémoire video projections). While the technology appropriation process operates independently of service appropriation, it remains embedded within it. Visitors must divide their attention between engaging with the mobile app (technology) and the video projections (core service), leading to increased cognitive workload and frequent interruptions in their flow experience.

The second article "Posthumous artwork completion" explores the use of artificial intelligence (AI) in the completion of posthumous artworks, focusing on its impact on consumer perceptions and its implications for the legacy of deceased artists. Across three studies, the factor AI involvement level in the posthumous creative process and artists' creative control (over the artistic vision and the implementation process) are found to significantly influence consumers' attitudes toward the posthumous artwork. The findings reveal nuanced insights into public attitudes toward AI-completed artworks.

In the following chapters, I present the two articles with theoretical background, method, and discussion accordingly.

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Chapter 1:

The roles of technology in service appropriation: an exploration in a phygital cultural context

Abstract

Recently, technology has significantly altered the servicescape of cultural services, shifting consumer experiences from purely physical to a more blended, phygital environment. This study delves into how consumers' interaction with technology influences their overall cultural experience appropriation in a phygital setting. This study is a qualitative exploration in the context of Cité Mémoire, an outdoor video-projection installations in the world. We find that visitors appropriate the technology and the core service separately but concurrently. The level of mastery visitors achieved with the technology impacted each service experience appropriation operation from different dimensions. This study extends the discussion of cultural experience appropriation. Consumers' use of technology influences the appropriation process from various dimensions, shedding light on how consumers' digital encounters intertwine with their core service experiences.

Keywords: phygital experience, experience appropriation, technology appropriation

1.1 Introduction

The adoption of service technologies has been transforming cultural experience from physical to phygital. Phygital refers to the combination of physical and digital elements in a service context to offer unique and compelling consumption experiences (Batat 2022a). Mobile apps have emerged as one of the most widely used digital channels employed by cultural service providers to interact with their customers. Notably, various cultural organizations have embarked on the rapid adoption of mobile apps to enhance consumer experience. For instance, commencing in 2009, cultural organizations such as the National Gallery in London, the British Library, the Metropolitan Museum of Art, the American Museum of Natural History, and the Musée du Louvre have introduced mobile apps to promote access to their cultural services and enhance consumer experiences, blurring the lines between the physical and digital realms and thus altering the consumer experience to phygital (Dua 2014; Grobart 2011; Hanussek 2020).

Indeed, technology has become an integral component of cultural services. Consumers' experience with the technology, for example, their usage of a mobile app, can influence their overall cultural experience (Åkesson, Edvardsson, and Tronvoll 2014; Ballina, Valdes, and Del Valle 2019; Hume 2015; Makarem, Mudambi, and Podoshen 2009; Stocchi et al. 2022) and impact what we call service appropriation, defined as the process by which consumers co-create their service experience and make it their own (Mifsud, Cases, and N'Goala 2015). The majority of existing research on cultural experience appropriation primarily focuses on consumers' appropriation of core services in physical contexts . For instance, Carù and Cova (2005, 2006) analyze consumers' musical experience co-creation process through the lens of appropriation theory. They provide evidence that concert audiences appropriate the classical music concert with the assistance of various service elements, such as the Maestro, the music pieces played, the

musicians and fellow audience members. These elements help consumers feel at ease in the service context (nesting practice), stimulate their exploration of intriguing elements (investigating practice), and ultimately allow them to attribute personal significance to the service experience, making it their own (stamping practice). However, as technological elements become prevalent in services, it's essential to comprehend how consumers' use of technology impacts their cultural service appropriation in a phygital setting (Batat 2022a; Klaus 2021). While Kirk, Swain, and Gaskin (2015) have explored the effect of technology usage on consumers' perceptions, leaving the relationship between technology adoption and core service appropriation (appropriation of the artwork) unexplored. Maubisson, Rivière, and Coutelle (2022) found that in a phygital heritage setting, the use of AR devices had mixed effects on perceived value. The AR device in use increased value at some dimensions while decreasing value at other dimensions. These studies mainly focus on the consequences of technology usage. Taking a process-based approach, this study continues to explore consumers' appropriation in a phygital cultural setting, to deepen our understanding of the effect of technology usage. Hence, our research delves into this key question: How does the integration of technology into the consumption experience influence the service appropriation process in a phygital setting? By taking up this question, we seek to determine the roles played by technology appropriation in consumers' cultural service appropriation process, which can help to explain the positive and negative consequences of technology adoption.

In the sections that follow, we begin by reviewing existing literature on phygital experiences and appropriation theory. Subsequently, we introduce our research context—the Cité Mémoire project—and the study methodology. Lastly, after outlining our findings, we present the theoretical and managerial implications of the study.

1.2 Consumers' Phygital Experience

Since the pioneering work of Holbrook and Hirschman (1982) into the experiential aspect of consumption, consumer experience has been a focus of exploration (Jaakkola, Helkkula, and Aarikka-Stenroos 2015). Helkkula (2011) identifies three ways of characterizing service experience: phenomenological (Arnould and Price 1993; Carù and Cova 2003, 2005; Holbrook and Hirschman 1982), process-based (Edvardsson, Enquist, and Johnston 2005), and outcome-based (Åkesson, Edvardsson, and Tronvoll 2014; Holloway, Wang, and Parish 2005). This study adopts the process-based approach, defining consumer experience as "a service process that creates the consumer's cognitive, emotional, and behavioral responses, resulting in a mental mark, a memory" (Edvardsson, Enquist, and Johnston 2005).

Many factors influence consumers' experiences (Carù and Cova 2005; 2006; Hume et al. 2006) , and technology is among them (Buhalis et al. 2019; Hume 2015). As service providers increasingly integrate technologies into service delivery, consumer consumption experiences have evolved from physical to phygital (Ballina, Valdes, and Del Valle 2019; Batat 2022a, 2022b; Batat and Hammedi 2022). Phygital refers to "a holistic and integrative ecosystem that adopts a consumer standpoint as a starting point and then integrates a combination of physical, human, digital and media content elements, platforms, technologies, and extended realities, among others; the goal of phygital is to offer unique and compelling consumer experiences that should guarantee a coherent continuum in the delivery process of consumer value (intrinsic/ extrinsic) provided from digital to physical and vice versa" (Batat, 2022a, 10). In a phygital context, consumers integrate physical and digital resources to co-create their personalized experiences. Understanding how consumers utilize technology and how it influences their

interactions and perceptions of other service elements is crucial for service providers in crafting a seamless phygital experience.

1.3 Service Appropriation

Appropriation theory, adapted from environmental psychology by Carù and Cova (2005, 2006), elucidates how service elements can immerse consumers in their consumption experiences. It involves “an exercise of authority, control and physical or psychological power over an object or place” (Carù and Cova, 2005, 43). Through service appropriation, consumers integrate various service elements to interpret the core service and make it their own (Mifsud, Cases, and N’Goala 2015), aligning with the concept of service experience co-creation. As noted by Jaakkola, Helkkula, and Aarikka-Stenroos (2015), service experience co-creation occurs when the interaction between actors “influences their subjective responses to or interpretation of the elements of the service" (p.193). Therefore, we argue that appropriation theory proves valuable in explaining consumers' efforts to comprehend and respond to diverse service elements in a service encounter, revealing the process of service experience co-creation.

Service appropriation comprises six dimensions: service knowledge, service consciousness, self-adaptation to service, service control, service creation, and psychological ownership of the service (Mifsud, Cases, and N’Goala 2015). Service knowledge refers to consumers’ cognitive perception of service information. Service consciousness involves the “mental representation of the service and roles that consumers must perform” (Mifsud,Cases, and N’Goala 2015, 716). Self-adaptation to the service relates to the changes consumers make to their behaviors in order to adapt to the service. Service control refers to consumers’ sense of control over the service. Service creation is the additional service value consumers co-created.

Psychological ownership refers to consumers' feelings of "it is mine", which closely relates to their self-concepts and identities.

Appropriation is a process that consists of three major practices: nesting, investigating, and stamping (Carù and Cova 2005; 2020). Nesting refers to consumers' active search for familiar elements as anchorage points in a new experiential context, offering a sense of security. Investigating follows, where consumers explore new, unknown elements to enhance their understanding and control over the service. Finally, in the practice called "stamping," consumers bring this new knowledge to their nest and attribute personal meanings to the experience through imaginative and intellectual activity. It is the outcome of the appropriation activity.

Extant service appropriation research mainly focuses on the consumers' experience co-creation in physical contexts, like classical music concerts (Carù and Cova 2005) or traditional healthcare services (Mifsud,Cases, and N'Goala 2015) . Limited research delves into the role of technology in consumer service appropriation. For instance, Kirk, Swain, and Gaskin (2015) propose a conceptual model on technology appropriation and its effect on valuation. However, the technology appropriation in this research refers to the way consumers adopt and use technology, which is an immediate result of the technology adoption. Our study, however, views technology appropriation as a process integrated into the overall service experience, encompassing consumers' interactions and responses to technological artifacts.

1.4 Method

The goal of this study is to explore how the technology adoption influences the service appropriation. To achieve this goal, we adopt an embedded single case study design (Yin 2014).

1.4.1 Case: Cité Mémoire Project

The context of this research is the Cité Mémoire project, one of the world's largest outdoor video-projection installations situated in Montréal. The project comprises 26 video projections about the history of the city paired with soundtracks, which are displayed on the walls of buildings and houses around the historic city center. Stories and characters are presented in the projections with the help of images, voiceovers and music. Two illustrative tableaux are provided in Appendix I.

Open six evenings every week throughout the year, the Cité Mémoire project allows public access through a free mobile app. This app, available in four languages, grants visitors access to the project's soundtrack, predefined visit circuits, and projection location maps. Before their visit, visitors need to download these maps and circuits to their mobile devices. Screenshots of the mobile app are available in Appendix II. The app plays a pivotal role in visitors' experiences, enabling them to locate projections, plan visits, control video play, and listen to each tableau's soundtrack. Without the app, visitors can neither access projection locations nor learn detailed historical stories.

We chose to study the Cité Mémoire for two reasons. First, the Cité Mémoire project solely offers a complete experience through its app, making consumers' visit a phygital experience. Without the app, visitors miss out on finding projection locations and accessing various experiences linked to the video projections. Cité Mémoire thus provides an appropriate context for our research of consumers' phygital experience. Secondly, the Cité Mémoire project, as a cultural tourism experience service, offers a richer context to explore the phygital

consumption experience. Unlike utilitarian services, cultural consumption is experiential in nature (Boorsma 2006; Holbrook and Hirschman 1982). In addition, technological platforms are seen as enablers of co-creation in the cultural tourism service ecosystem that the Cité Mémoire project occupies (Buhalis et al. 2019).

1.4.2 Research design, data collection and analysis

This study was composed of two phases, an exploratory phase, and the main study phase.

Exploratory Phase: We initiated our research in the summer of 2019 with two primary steps. The first step involved an autoethnography (Wall 2006) conducted by the lead author with the purpose of familiarizing ourselves with the project and recognizing possible issues visitors may have. The first author noted her visit experience in detail and reflected on it. Based on her experiences and notes, we developed an interview guide in which we aimed to learn how visitors interact with the mobile app and how they perceive their technology usage and their overall experience throughout the consumer journey. Moving to the second step, we shadowed participants during their visits and conducted semi-structured interviews afterward. To identify potential participants, a purposeful random sampling strategy (Patton 2002) was employed. Qualification criteria included an interest in cultural projects and smartphone proficiency. Recruitment was through various Montréal WeChat and Facebook groups. Six participants volunteered and scheduled visits at their convenience. We sent them general information about the Cité Mémoire project prior to their visits briefly explaining what Cité Mémoire project was and asking them to download the mobile app. We left participants to explore what they needed to do to complete their visits. Participants had the liberty to leave the study at any point to ensure a natural visit experience with minimal researcher intervention. During their visits, the lead author

observed and documented visitors' reactions and experiences. The participants' visits to the Cité Mémoire were followed by 30-minute interviews.

The interview transcripts, observation notes and the researcher's autoethnography notes were analyzed with the help of NVivo 12 software. The multiple information sources (autoethnography, observations, interviews) allowed data triangulation. Results from the exploratory study highlighted visitors' substantial focus on mastering the mobile app while simultaneously engaging with the Cité Mémoire video projections. The data suggested that the concurrent process of technology appropriation significantly impacted visitors' service appropriation, influencing their enjoyment and satisfaction. These findings prompted adjustments in the interview guide to further explore the relationship between these two types of appropriation.

Main Study: The main study took place in the summer and early fall of 2020, considering Montréal's climate conditions. Due to the social distancing required by the COVID-19 pandemic, the shadowing method was not feasible, leading us to switch to online follow-up interviews. The same sampling and recruitment strategy as in the preliminary study was adopted. A total of 21 persons agreed to participate. Detailed participant information is presented in Table 1.1. To better visualize their visiting experience and compensate for the absence of observation, we increased the number of questions related to visitors' behaviors and emotions during their visits. For example, we asked visitors to describe in detail what they did and how they felt during visits because we couldn't observe their visit through shadowing. These semi-structured in-depth interviews were conducted within a week after each participant's visit in order to gather insights from visitors' fresh memories of their experiences. Each lasted 60 to 90 minutes. Participants who visited the Cité Mémoire in a group could choose to conduct their interviews alone or

accompanied. In total, 17 interviews (14 individual interviews and 3 group interviews) were conducted, focusing on visitors' feelings, thoughts, and actions in relation to Cité Mémoire and the app before, during and after their visit.

Table 1.1 Information of Participants

	Visitor No.	Age	Years in Montréal	Visit in Group/Alone	Gender	Status	Interview Date
Exploratory Study	1	20-30	9	Alone	F	Undergraduate Student	Jun. 2019
	2	20-30	2	Group	F	Graduate Student	Jun. 2019
	3	20-30	2	Group	F	Graduate Student	Jun. 2019
	4	20-30	2	Alone	M	Graduate Student	Jun. 2019
	5	20-30	5	Group	F	Work Professional	Jun. 2019
	6	30-40	5	Group	M	Work Professional	Jun. 2019
Main Study	7	30-40	4	Group	M	Graduate Student	Aug. 2020
	8	30-40	4	Group	F	Undergraduate Student	Aug. 2020
	9	20-30	2	Group	F	Graduate Student	Aug. 2020
	10	20-30	23	Group	M	Work Professional	Sept. 2020
	11	20-30	1	Group	F	Graduate Student	Sept. 2020
	12	30-40	3	Group	F	Work Professional	Sept. 2020
	13	30-40	1	Alone	M	Work Professional	Sept. 2020
	14	30-40	9	Group	M	Work Professional	Sept. 2020
	15	30-40	1	Group	M	Work Professional	Sept. 2020
	16	30-40	5	Group	F	Work Professional	Sept. 2020
	17	20-30	4	Group	F	Undergraduate Student	Sept. 2020
	18	20-30	3	Group	M	Graduate Student	Sept. 2020
	19	20-30	3	Group	F	Graduate Student	Sept. 2020

	20	30-40	4	Group	F	Graduate Student	Sept. 2020
	21	20-30	1	Group	F	Graduate Student	Sept. 2020
	22	20-30	1	Group	F	Graduate Student	Sept. 2020
	23	20-30	6	Alone	F	Graduate Student	Sept. 2020
	24	40-50	2	Group	M	Work Professional	Sept. 2020
	25	40-50	2	Group	F	Graduate Student	Oct. 2020
	26	20-30	Less than 1 year	Alone	F	Graduate Student	Oct. 2020
	27	40-50	1	Group	F	Graduate Student	Oct. 2020

Note: To protect participants' privacy, names of visitors have been disguised by visitor numbers.

Following the interviews, we employed an iterative coding process to analyze data (Bingham and Witkowsky 2022; Saldaña 2016). NVivo 12 software was used to facilitate the process. The coding process involves three phases: first-cycle deductive coding, second-cycle inductive coding, and third-cycle deductive coding. The purpose of the first cycle of coding is to re-organize the data according to the subject of appropriation ("appropriation of core service" and "appropriation of technology"). These two *priori* codes were developed in alignment with our research question. We reviewed the interview transcripts and used attribute coding to sort the data into two blocks of text: appropriation of Cite Memoire historical stories (core service) and appropriation of technology. In the second cycle of coding, we followed an inductive process in order to understand visitors' experiences with the core service and with the mobile app. We began with open coding on each block of text, where we extracted and coded the visitors' behaviors, emotions, cognitive activities, and value perceptions. We then conducted pattern coding, condensing the codes into analytic concepts (Miles, Huberman, & Saldaña, 2014). For example, the codes "exploring app function" and "setting app language" were condensed into a pattern code "learning to use the app". In the third cycle of coding, we developed codes aligned

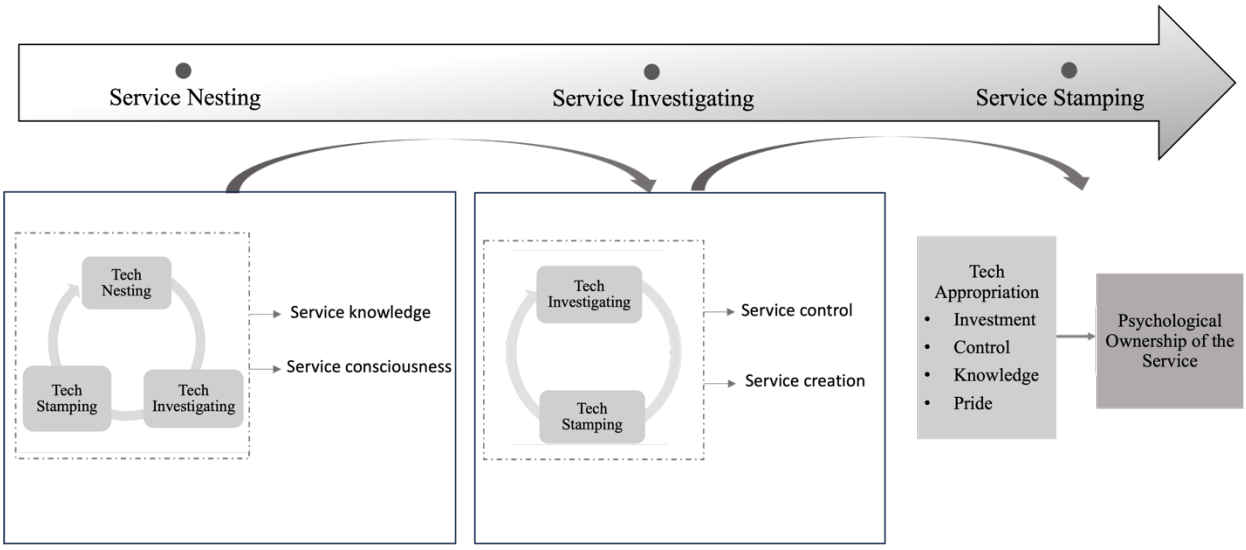
to concepts from the appropriation process (Carù and Cova 2005; 2006) and service appropriation dimensions (Mifsud, Cases, and N'Goala 2015). We then sorted the codes we developed in the second coding cycle into theory-aligned categories: core service nesting, core service investigating, core service stamping, technology nesting, technology investigating, technology stamping, service knowledge, service consciousness, service control, service creation, and psychological ownership.

To further understand the relationship between technology (mobile app) appropriation and service (video projections and historical stories presented) appropriation, we used a visual mapping strategy (Langley 1999; Miles, Huberman, and Saldaña 2014). By using the sequence of service appropriation practices as a timeline, we positioned the technology appropriation practices along this axis to analyze their influence at different stages. Throughout the process, our research team regularly engaged in online meetings to discuss and reach a consensus on data analysis and findings.

1.5 Findings

Our data suggests clearly that visitors experience technology appropriation (mobile app) and core service appropriation (the video projections) separately but concurrently. More specifically, we find several mini technology appropriation cycles across visitors' service appropriation process (the Cité Mémoire video projections). And visitors' technology appropriations influence not only the process of the core service appropriation but also the result of it. Figure 1.1 illustrates how technology appropriation influences each practice of service appropriation.

Figure 1.1 Mini technology appropriation processes across the service appropriation



1.5.1 Technology Appropriation in Service Nesting

Visitors' nesting practices relating to the core service encompass the activities in which visitors engage to search for external anchorage points and prepare themselves for investigating unfamiliar elements. Technology, as an important service element for Cité Mémoire, plays a critical role in this service nesting operation. We found that visitors were unable to establish an anchorage within the core service without engaging in the technology appropriation. They had nesting, investigating, and stamping practices on the mobile app. These technology appropriation operations served as the key anchorage points utilized by visitors during their Cité Mémoire visit experiences.

Visitors downloaded the app, browsed the available options, and selected their preferred language. While exploring the app's functionalities, they relied on their prior knowledge (their nest), drawing from similar design elements and functions in other apps they were familiar with.

These nesting actions mostly happened automatically. Visitors then dedicated approximately five to ten minutes exploring the app's functionalities provided by the service provider and the project details incorporated within the app. This process allowed them to gather relevant knowledge about both the app and the Cité Mémoire project.

> *I found there were five options [on the homepage of the app]. Two of them were about the setting; three of them were about the tour stuff. So, I looked at all of the three [to learn about the tour]. (Visitor #4).*

Following their investigation of the mobile app, visitors formed opinions about both the app's design and its content. For instance, Visitor #1 found the app to be straightforward in presenting visit route options, whereas Visitor #12 perceived the app as poorly designed and unhelpful in planning her visit or comprehending the project.

> *I think it is pretty clear about the visit routes. There are a few routes in total. All the routes are marked out in the map (Visitor #1)*

> *I felt it [the app] was not very helpful. First, I felt confused because there was too much content in the app. It was not clear, especially when there were too many options. And also, I felt the UX of this app was not well designed. For example, some buttons were on the top of my screen and it was not touch sensitive. It didn't respond when I clicked it. It was not smart. The app page cannot be adjusted automatically according to my screen. (Visitor #12)*

Visitors also experienced emotions like confusion, anxiety and concern when they explored the app. Our data indicates that in the pre-visit phase, many visitors grappled with negative emotions likely due to the unfamiliarity with both the project and the technology.

By assessing the app's design, assimilating new information from the app, and considering their emotional responses during app usage, visitors developed an overall grasp of the project. This led them to craft a personalized visit plan, which acquainted them with the project's context and content. Most visitors expressed a certain level of understanding of the visit (service knowledge) and recognized the necessity of using the app to engage with the project (service consciousness). This was achieved by appropriating the mobile app.

> *We downloaded it [the app] and then kind of just ended up playing with it…Seeing through the app that all the different icons and clicking through the icons, I could see there was some virtual reality stuff, umm… maybe just videos, like historical videos or something. I basically just played with everything and was like 'okay. we'll figure it out when we get there or get downtown or something'. And then my partner played with it and figured out more [about the project and visit plan] before we actually left home." (Visitor #25)*

A few visitors didn't develop the correct service consciousness (they need to master the app in order to enjoy their visits) as they didn't successfully appropriate the mobile app.

I downloaded the app before the visit. It seemed I had to choose a circuit. And then I was asked to download the map of the circuit I chose. At the end, I abandoned the app. I didn't know how to use the app. It looked very weird and it was not user-friendly. It made me lose desire of using it. I was asked to download too much stuff. It was troublesome. It was not a useful app. I didn't want to use it, at least for me. (Visitor #16)

1.5.2 Technology Appropriation in Service Investigating Phase

As visitors proceeded to explore the Cité Mémoire projections, their understanding of the mobile app and the project, along with their pre-established visit plan, served as anchorage points, aiding their physical and sensory investigation of the Cité Mémoire project at the location.

We followed the map [we downloaded the mobile app beforehand] walking around the Old Port. According to the map, it was easy to find projection sites. The map was accurate. (Visitor #22)

Interestingly, visitors started their exploration of the project by further exploring the mobile app. We observed another technology appropriation cycle during this phase. Using their prior knowledge of the app as an internal reference point, visitors skipped nesting practices and started their technology appropriation processes by investigating unfamiliar mobile app functions (Stavraki et al., 2018). Some found it easy to find out how to use the mobile app to access the projections, while some felt confused regarding the app function and the project design.

I guess I just kind of see where my little cursor was in relation to the closest (projection location) umm… on the map. And so I went to the closest one. And then I clicked on it (the icon on the map) and then that was straightforward enough that I just had to swipe umm… for the video to start play and for it to sync with uhh… for the audio to start play and for it (the audio) to sync with the projection. And that was good. (Visitor #26)

The first projection we watched was "the burning of the Parliament in Montréal". We saw a senior couple watching it and we joined them. We didn't know there were audios in this app playing along with the video projections on the walls. It took us a while to find out there were audios to listen to. Then we listened to the audio while we were watching that projection. (Visitor #12)

In the phase of service investigation, the mobile app can empower visitors when they successfully master it, enabling them to personalize their visit experience (service creation) and control the public play of the video projection (service control). On one hand, some visitors appreciated the utilitarian benefits the app brought to them, which was freeing them from a rigid visit schedule. It allowed them to co-create their experience through the mobile app, personalizing their interactions and relishing the Cité Mémoire evening with their friends (service creation).

We can decide where to go. We can decide how long we spend time on each point or something like that. We can discuss what are the plots and what are our feelings… And I think it's cool that we can just start it whenever we want. So, we went to the café. We came out and we can just go and wait another minute for the video to start. You know what I mean to say? It's not like oh you did not reach this time, so you cannot do this. So, the freedom to roam about and still go and watch the video is cool. (Visitor #18 & #19)

On the other hand, some visitors reported that their enjoyment of the video projections (service creation) had been frequently interrupted by the mobile app. Their attention had been split to manage the mobile app and the video projections at the same time. Having to listening to the soundtrack with earphones also impeded their communication with their companions. Using the app interrupted their "flow" experience.

The audio was interrupted whenever I closed the app. For example, when I switched to the camera to take photos, I lost the audio. And when I re-opened the (Cité Mémoire) app, I had to re-choose the circuit, re-load the map and re-connect the audio. It's better to keep the audio running in the background when we use other apps. (Visitor #15)

When I stared at the screen of my phone, I lost track of the video on the wall and missed part of the visual elements…And also when I walked

around the city with my friends, I preferred to chat with my friends rather than wearing earphones to listen to the app. (Visitor #3)

Visitors' sense of control over the Cité Mémoire projections stemmed from their ability to utilize the mobile app to decide when to play the videos, thereby controlling the projections (service control). This capability not only surprised visitors but also provided them with enjoyment and amusement. Essentially, the use of the mobile app evoked emotions such as excitement and dazzlement, inciting psychological responses like self-awareness and satisfaction.

So, at the first projection site, it was really surprising for me [to control the playing of the video]. I feel like I can control the city… I can play a movie on the building walls of the city. (Visitor #4)

I, by the way, I was surprised. I didn't realize that we would actually trigger the projection. I thought that it was always playing in a loop. So, that was a neat… umm… that was a fun trick… [I felt] a little dazzled, impressed…maybe a little self-conscious. (Visitor #24)

On the other hand, in instances where the mobile app underperformed, some visitors experienced a sense of dissatisfaction regarding their ability to control their experience (service control).

I felt that I was so stupid. We didn't really know [that the soundtrack would automatically synchronize with the video projection]. We first blamed the app at the beginning: 'Why don't they have any pause button [to control the playing of the video]?' But eventually it's like…okay we didn't really get it. (Visitor #21)

1.5.3 Technology Appropriation in Service Stamping

After their explorations, visitors started assigning personal meanings to their experience, drawing from the emotions and values they discerned through interactions with the mobile app (technology) and the video projections (core service).

I like the fact that the videos were waiting for us, you know. It's not for everyone. It's like exclusively for us. Like I told you I thought that it would run all night, every like 10 minutes. But … it was not like that. Yeah. It was only activated (by us through the app) when we got there. (Visitor #27)

I've taken walking tours of cities with human guides before…. and it felt like being in a group of strangers where everyone was a tourist. But I think that's a different experience compared to what Cité Mémoire offers. I've done those tours in cities where I was a tourist and travelling, but this was different because it's a city I live in. Also, with the headphones, you're kind of in your own world anyway. (Visitor #26)

(I felt) a little self-conscious. Uhh… it feels obviously like we're tourists and like we're, you know, doing this thing and not just blending in and walking around the town. But also, just like helping inform people about it felt like uhh… yeah, like kind of cool. Like I'm showing you something that's in your city that you didn't even know about, kind of thing. (Visitor #25)

It was a nice thing to do. Maybe next time if some of my friends come (to Montréal), I will show them this project… This is one more thing I can show my friend. (Visitor #21)

As evident from the earlier excerpts, visitors' engagement with the mobile app, their feeling of controlling the video projection, their understanding of the app and service content, and their pride in publicly presenting the video projection made them feel a psychological ownership of the service. They felt the video projections were there exclusively for them, rather than for everyone. Their sense of control generated by controlling the video projection and their visits through the mobile app enabled them to feel closely associated with the city. And the Cité Mémoire project was seen as part of their leisure collection, something they can show their friends.

1.6 Discussion

This study discusses how consumers' technology appropriation influences the service appropriation in a phygital cultural service setting. In the case of Cité Mémoire, visitors underwent several mini technology (mobile app) appropriation cycles in their core service (Cité Mémoire video projections) appropriation. The technology appropriation process was independent from the service appropriation, but embedded in it. Visitors had to split their attention between the appropriation of the mobile app (technology) and the video projections (core service), which caused an increase in their workload and constant interruptions of their flow experience. Meanwhile, technology appropriation influenced both the process of the service appropriation and the result of it. At the beginning of the visit experience, technology appropriation played a critical role in establishing anchorage points for visitors to understand the service and form imagery projection of the service. Once they started to explore new elements in the service, technology appropriation can facilitate or interrupt visitors' service control and service creation. Eventually, the technology appropriation practices can impact visitors' development of the psychological ownership of the service and their visit experiences. Without successful technology appropriation, visitors may struggle to engage with the service and fully enjoy their experience.

1.6.1 Theoretical Contributions

First, this paper contributes to the burgeoning research on phygital service experiences by elucidating the role of technology usage in the experience co-creation process within a phygital context. For instance, Mele *et al.* (2021) outline millennial consumer phygital journey in four

stages: connect, explore, buy, and use. However, the involvement of technology in this consumer experience remains unclear, especially in differentiating phygital from non-phygital experiences in terms of co-creation. Our results reveal the involvement and effects of technology in each phase of core service appropriation, providing empirical proof for the conceptualizations of phygital by Batat (2022a) as a holistic and integrative ecosystem, combining physical, human, digital, and media content elements to ensure a coherent value co-creation process. We found technology appropriation practices across the entire service appropriation process. Without a successful technology appropriation, consumers can neither cognitively understand the service nor emotionally enjoy their experience. Meanwhile, since consumers have to appropriate not only the service content, but also the technology, their immersions in the experience are frequently interrupted by the use of the technology. Consumers' attentions have to switch between the technology (mobile app) and video projections (core service) constantly, reducing their enjoyment. This is consistent with the research findings of Maubisson *et al.* (2022) about the duality of physical and digital environment in the context of technology mediated culture experience.

Second, this study contributes to consumer experience research. Building on the foundational work of Holbrook and Hirschman (1982), most previous research has focused on the dimensions of experience (e.g., social, cognitive, ambiance) and its outcomes (e.g., satisfaction, perceived value, loyalty) (Colbert 2023). This paper extends the cultural experience literature by arguing that experience, particularly in a phygital context, is a process encompassing a series of behaviors and perceptions. While some studies have examined the experiential process (Carù and Cova 2005; 2006; Stavraki, Plakoyiannaki, and Clarke 2018), they typically concentrate on consumer experiences after arrival at the cultural event. We propose

that a cultural experience begins even before reaching the event location. In the case of Cité Mémoire, consumers' engagement with the project starts when they explore the mobile app prior to their visit. This pre-visit phase is crucial, as it influences their subsequent experience at the event.

Third, this study also contributes to the appropriation literature. Prior research has indicated that consumers appropriate the experience from multiple dimensions through various service elements (Carù and Cova 2005; 2006; Mifsud, Cases, and N'Goala 2015) and it mainly focuses on consumers' appropriation of the core service within a physical context. This study broadens this discourse on service appropriation, asserting that, in a phygital context, consumers not only appropriate the core service but also the service technology, with the appropriation of technology influencing each service appropriation operation across different dimensions. Consumers acquire service knowledge and develop service consciousness through technology appropriation in the service nesting phase. Subsequently, in the service investigating phase, they gain service control and complete service creation through technology appropriation. Finally, consumers' technology appropriation contributes to their perceived psychological ownership of the service during the service stamping phase, because they invest time and effort to manipulate and control the app, develop a deep understanding of the mobile app, and experience a sense of pride in their ability to control the video playback. These drivers of psychological ownership align with findings in previous research (Danckwerts and Kenning 2019; Kirk, Swain, and Gaskin 2015; Peck and Luangrath 2023).

Another contribution of this study to the appropriation literature is the revelation of relationships between the dimensions of service appropriation proposed by Mifsud *et al.* (2015). Service knowledge and service consciousness acquired in the service nesting phase form the

basis of service control and creation. Perceived psychological ownership of the service experience can be perceived as the culmination of service appropriation.

This study also contributes to the understanding of consumers' technology appropriation. Previous research views technology appropriation as an immediate result of technology adoption (Kirk, Swain, and Gaskin 2015). However, this study takes the process approach, considering technology appropriation as a type of consumer experience that comprises multiple appropriation practices: nesting, investigating, and stamping with the technology. This helps to explain previous research findings regarding the impact of technology on service. Studies have highlighted that technology usage can influence service evaluations and value perceptions (Åkesson, Edvardsson, and Tronvoll 2014; Buhalis et al. 2019; Larivière et al. 2013; Meuter et al. 2000; Stocchi et al. 2022; Maubisson, Rivière, and Coutelle 2022). According to our findings, this influence might be due to technology appropriation impacting five dimensions of service appropriation, with service quality significantly reliant on consumers' technology appropriation. Especially, we find that technology usage can influence consumers' perceived psychological ownership of the experiential service which can eventually impact value perception (Kirk, Swain, and Gaskin 2015; Morewedge et al. 2021). Another contributing factor could be the increased effort and workload on the consumers' part as they engage in various practices to effectively use the technology. This increased workload in co-creating their experience might influence the overall service outcome (Bendapudi and Leone 2003; Mende et al. 2017).

Finally, this study contributes to the literature on psychological ownership, which refers to the feeling that something is "mine" (Wiggins 2023; Pierce, Kostova, and Dirks 2003; 2001). Previous research has largely overlooked consumers' psychological ownership of experiences, likely due to the belief that the ability to influence or physically touch a consumption target is

crucial for fostering psychological ownership (Peck and Shu 2009; Atasoy and Morewedge 2018; Wiggins 2023). Given the intangible nature of cultural experiences, it was assumed that consumers are less likely to develop psychological ownership of such experiences. However, our findings suggest that consumers can indeed perceive psychological ownership of an experience, particularly when it is a phygital one. Cité Mémoire visitors gained a sense of control by manipulating the mobile app to influence video projections, which in turn fostered a sense of psychological ownership over their visit experience.

1.6.2 Managerial Implications

Our findings elaborate on consumers' cultural service appropriation process in a phygital context and the way technology is involved in this process. It helps cultural service providers to understand how consumers respond and react to the service elements, especially, the technological element and what dimensions the usage of technology can influence in each phase of consumers' service appropriation. We proposed some strategies below in the hope of helping service providers create a seamless consumer journey.

In the pre-consumption phase, consumers acquire knowledge of the service and their roles within it by familiarizing themselves with the project. The successful adoption of the technology significantly impacts their comprehension of the project's content and their decision to engage with it. In the case of Cité Mémoire, the mobile app stands as the primary tool for visitors to learn about the project and plan their visits in advance. A majority of visitors expressed a level of confusion and anxiety regarding the app. Some even abandoned the app or cut short their visit due to difficulties in navigating it or finding relevant information. Their

challenging experience with the technology deters them from advancing to the phase of investigating the service. Similar issues are common across many services. Therefore, we propose two solutions to assist service providers in avoiding this predicament.

First, it is important to intentionally simplify the design of technologies to make them user-friendly. Providing a concise "new user tutorial" within such apps can alleviate potential consumer anxiety and confusion. Additionally, service providers might explore additional avenues for consumers to grasp service knowledge and comprehend their roles within the service. A comprehensive service introduction on a website or integrating a chatbot into the app could assist consumers during the service nesting phase. Non-technological service elements, such as printed booklets or human staffs, might also be valuable for consumers who prefer such resources.

As consumers transition to the service investigating phase, using technology empowers them to feel a sense of control and personalize their experience. Cultural service technology designers should strive to create a more interactive interface that caters to consumers' desire for control, especially in public contexts. Our study's findings suggest that consumers feel self-conscious and excited when manipulating the mobile app to project videos onto city walls, particularly when there are onlookers. These emotions intensify in the presence of bystanders and significantly impact the overall evaluation of the consumption experience, making it remarkable and memorable (Becker and Jaakkola 2020). Another advantage of consumers engaging with technology is its influence on their perception of psychological ownership of the experience. The more consumers invest in using and controlling the technology, the stronger their sense of psychological ownership, which, in turn, affects their assessment and the outcome of the service (Peck and Luangrath 2023).

1.6.3 Limitations and Future Research

While we've elucidated the process of co-creating a cultural experience through the mobile app and analyzed its significant effects on consumer experience, the applicability of the model we've developed to other contexts and different service technologies remains uncertain. Cité Mémoire is a cultural experiential project, akin to other experiential services and products, making it challenging for visitors to predetermine their experience. In our scenario, visitors primarily aimed for an enjoyable night while delving into cultural and historical city stories. Essentially, consumers' expectations and assessments of experiential services can significantly differ from those of utilitarian products (Huang, Lurie, and Mitra 2009). Consequently, the influence of technology on the co-creation process might vary based on consumers' consumption objectives and the nature of the product in consideration. These two defining factors could be further explored through experimental studies in the future to delineate the boundary conditions.

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Appendix I **Example Tableaux of Cité Mémoire**

Photo 1: Tableau about black history in Montréal

Photo 2: Tableau about Joe Beef’s funeral

Appendix II **Screenshots of the Cité Mémoire Mobile App**

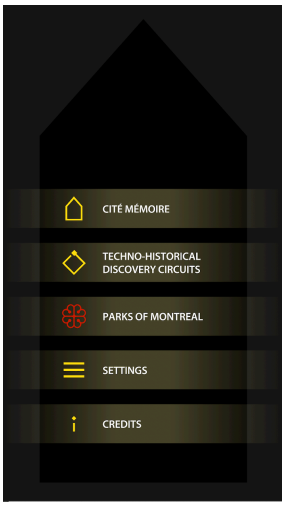


Photo 1: The home page of the app

Photo 2: Example circuit and map

Chapter 2:

The Posthumous Completion of Artworks

Abstract

Generative AI, as a subfield of AI, is capable of assimilating artists' styles, voices, and techniques, utilizing these components to generate novel artworks. Recently, it has been employed to finalize unfinished artworks initiated by deceased artists. This study considers the AI-completed artworks as products emerging from the collaboration between humans and AI and examines consumers' perceptions of AI-completed posthumous artworks. We adopt a mixed method in this study. Study 1 uses content analysis to explore consumers' perceptions of AI-completed posthumous artworks. It reveals that consumers hold divergent attitudes toward AI-completed posthumous artworks. Study 2, a scenario-based experiment, finds that the level of AI involvement in the posthumous creative process negatively influences consumers' perceived authenticity and attitudes towards the artwork. Study 3, which is also an experiment, indicates that original artists' creative control over both the artistic vision and the implementation have positive influence on consumers' evaluation of the artwork, perceived authenticity and ethicality. From a theoretical standpoint, this study advances our comprehension of AI-completed posthumous artwork and algorithm aversion. It also extends the scope of research on creative control by examining its impact in the context of posthumous creations.

Keywords: posthumous artworks, generative AI, human-AI collaboration, AI involvement, creative control, legacy of the deceased artist

2.1 Introduction

Posthumous artworks are significant in the art world due to their economic, emotional, and cultural impacts. Economically, the passing of an artist often triggers a "death effect," where the scarcity of new works increases demand and prices for existing pieces. This phenomenon is supported by studies demonstrating a notable postmortem price premium (Cuntz and Sahli 2023). Emotionally, posthumous artworks resonate deeply with audiences, serving as tributes to the artist's legacy and fostering ongoing engagement with their creative vision. Culturally, these works enrich the historical narrative of human creativity, ensuring the artist's enduring relevance and influence (Hecker and Karol 2022).

In recent years, Artificial Intelligence (AI) has emerged as a transformative tool in the arts (Anantrasirichai and Bull 2022). Technologies such as Generative Adversarial Networks (GANs) and deep learning have been used to create art that mimics human styles and techniques ("The Evolution of AI Art – From GANs to Deep Learning.," n.d.; The artist editorial 2024). In 2018, the first painting created by AI was auctioned for $432,500 (Alleyne 2018). Tencent Music Entertainment, a Chinese entertainment company, developed and released 1,000 tracks featuring AI-generated vocals, one of which amassed over 100 million streams (Stassen 2022). A new Rembrandt-style painting was created with a collaborative effort involving data scientists, developers, engineers, and art historians after an exhaustive examination of the entire collection of Rembrandt's paintings (Blakemore 2016). However, a strong bias exists against AI-generated art, as many consumers question its authenticity and express concerns about its potential to replace human creators (Shank et al. 2023; Horton Jr, White, and Iyengar 2023; Magni, Park, and Chao 2024; Bellaiche et al. 2023; Chiarella et al. 2022; Chamberlain et al. 2018; Millet et al.

2023; J. W. Hong, Peng, and Williams 2021; Castelo, Bos, and Lehmann 2019; Tigre Moura and Maw 2021).

Notably, generative AI has been employed to finalize unfinished artworks initiated by deceased artists. For instance, in 2019, Huawei, a Chinese technology company, utilized AI through the Huawei Mate 20 Pro smartphone to complete Schubert's Symphony No. 8 (Kennedy 2019). Similarly, the BeethovenX AI project, comprising a group of data scientists and musicologists, completed Beethoven's Symphony No. 10 with AI assistance(Caldwell 2021). More recently, Paul McCartney, a member of The Beatles, employed artificial intelligence to create a new Beatles song using John Lennon's voice (Pareles 2023).

The use of AI in completing posthumous artworks introduces additional complexities. Using AI to complete posthumous artwork can be seen as a special case of human-AI collaboration because part of the artwork was done by the deceased artist, and the remaining part was completed by AI. Research has shown that artworks labeled as the results of human-AI collaboration are perceived less valuable than human-created artworks and such biases not only influence perceptions of the artworks but also affect views of the associated artists (Horton Jr, White, and Iyengar 2023; Messer 2024).

However, unlike living artists who can actively guide and control AI tools in their creative process, AI usage was not of the deceased artists' intention and deceased artists cannot influence how AI is used to extend their legacy. Since previous research shows that artists' motive to use AI influences how audiences evaluate the artwork (Magni, Park, and Chao 2024), the usage of AI outside the decease artist's plan may affect how audiences perceive the artwork. And the lack of creative control also raises concerns about whether AI-completed posthumous artworks can genuinely resonate with audiences or if they might be perceived as tarnishing the

artist's legacy (Jones 2017). The potential for AI to either enhance or undermine the commemoration of an artist remains uncertain, highlighting the need for careful consideration and dialogue about the ethical implications of using AI in this context. As such, while AI offers exciting possibilities for extending artistic legacies posthumously, it also poses significant challenges that require thoughtful navigation.

To better understand this issue, this study explores public's opinion about the AI-completed posthumous artwork. Our research questions are "How do consumers evaluate AI-completed posthumous artwork? How does the AI usage in the completion of posthumous artwork influence the deceased artist's legacy?"

We examine the influence of AI involvement levels and two dimensions of artists' creative control: control over the artistic vision and control over the implementation process. The results reveal a negative effect of AI involvement in the posthumous creative process and a positive effect of artists' creative control. These findings enhance our understanding of consumers' reactions to the use of AI in the completion of posthumous hedonic products, offering valuable insights for artists in managing their personal brands and legacies after their passing.

In the following sections, we review relevant literature and propose six propositions. We then test these propositions through three studies and conclude the chapter with a discussion of the theoretical contributions and practical implications.

2.2 Conceptual background

2.2.1 Evaluation Bias toward the AI-generated arts

Art is regarded as a medium of self-expression, intrinsically tied to the identity and intent of its creator (Hertzmann 2018). The evaluation of artworks is often closely associated with the artist's perceived effort, innovation, and authenticity. Recently, artificial intelligence (AI) has increasingly been utilized in the creation of art, from visual arts to music. Research has shown that public has evaluation bias towards AI-generated creative content (Shank et al. 2023; Horton Jr, White, and Iyengar 2023; Magni, Park, and Chao 2024; Bellaiche et al. 2023; Chiarella et al. 2022; Chamberlain et al. 2018; Millet et al. 2023; J. W. Hong, Peng, and Williams 2021; Castelo, Bos, and Lehmann 2019; Tigre Moura and Maw 2021). Compared to human-generated art, AI-generated works are frequently deemed less valuable, creative, and authentic. Additionally, audiences tend to perceive AI-generated creations as requiring less effort and as being incapable of evoking profound emotional responses such as awe (Millet et al. 2023).

These biases are deeply rooted in anthropocentric values, which position creativity and artistic expression as uniquely human traits that distinguish people from machines (Millet et al. 2023). The application of AI in artistic production challenges these anthropocentric beliefs, raising concerns about the erosion of boundaries between humans and machines. Interestingly, studies reveal that such biases against AI-generated works are largely confined to artistic domains. For instance, while audiences judge AI-created art more harshly than human-generated art, they exhibit no significant bias when evaluating AI-generated commercial content, such as marketing posters (Magni, Park, and Chao 2024; Granulo, Fuchs, and Puntoni 2021; Millet et al. 2023). This discrepancy underscores the uniquely human-centric nature of art and creativity,

highlighting why AI's integration into the arts provokes great concern and resistance. These findings emphasize the need for further investigation into the implications of AI in arts, as they touch on fundamental aspects of human identity and cultural values.

Evaluation biases against AI-generated art are not limited to artworks solely created by AI. Even in cases of Human-AI collaboration, where both humans and AI contribute to the creative process, public evaluations reveal persistent biases against AI involvement. Studies indicate that artworks produced through Human-AI collaboration are generally rated lower in value, creativity, and authenticity compared to those solely created by humans(Messer 2024; Horton Jr, White, and Iyengar 2023). This suggests that the integration of AI into artistic creation, even as a collaborator, fails to fully alleviate skepticism regarding its role in the creative process.

However, it is noteworthy that Human-AI collaborative artworks tend to be evaluated more favorably than those created solely by AI (Horton Jr, White, and Iyengar 2023). This difference highlights a nuanced perception among audiences, where the inclusion of a human efforts in the creative process lends a degree of credibility and emotional resonance to the artwork. Nonetheless, these findings underscore the enduring challenge of integrating AI into artistic domains, as the presence of AI—whether as a creator or collaborator—continues to evoke biases that question the legitimacy and value of its creations.

2.2.2 AI involvement in the creative process

Researchers have noted that AI can be integrated into the creative process in various ways: AI can assist or inspire the human creator, collaborate with human artists as co-creator in

the process of creation, or independently create the artwork with little or no human intervention, which is termed full automation (Tigre Moura and Maw 2021; Negrete-Yankelevich. and Zaragoza 2014).

Tigre Moura and Maw (2021) indicate that both music listeners, who listen to music for hedonic purpose, and music professionals, who directly involve in the professional activity in the music industry and have a better understanding of AI automation in the creative process, have negative perception of musicians' credibility and low purchase intension of AI created music. Hong et al. (2022), comparing full automation (AI creates the whole artwork) to no automation (human creates the whole artwork), find that consumers' perceived AI automation doesn't influence music evaluation. Tigre Moura (2023) further explore human-AI co-creation, in which both human and AI are involved in the creative process. They show that AI involvement level positively influences consumers' perceived process novelty, but has no effect on consumers' value perception.

Along with these previous studies, we argue that the level of AI involvement in the posthumous creative process can impact consumers' perception of the artwork. When a substantial portion of the artwork is completed by the artist before their death, leaving only a small percentage to be finalized by AI, the artist's creative influence remains deeply embedded in the unfinished piece. This ensures that the completed work aligns closely with the artist's original intent, even when AI is involved in its posthumous completion.

2.2.3 Creative control

According to Valsesia, Nunes, and Ordanini (2016), creative control refers to the extent to which the artist takes responsibility for the entire creative process. It can be further divided into

the ideation phase, where artists generate artistic vision based on their reflections on their experiences and their lives, and the implementation phase, where artists transform their artistic vision into artworks (Messer 2024). Building on this definition, we understand an artist's creative control over an artwork as encompassing two key dimensions: control over the artistic vision and control over the execution of the art production. Both dimensions have influence on how consumers perceive and evaluate the artwork.

In the case of posthumous artwork completion, we argue that deceased artists can retain certain level of creative control over the posthumous artworks through explicit instructions or documentation of their artistic vision and production methods. If the artist has left detailed guidance on their artistic vision and production techniques, these directives can enable secondary agents to faithfully execute the work in a manner consistent with the artist's original intent. This preserves the artist's creative control, even posthumously, by ensuring that their aesthetic and conceptual priorities continue to shape the final creation. Therefore, we hypothesize that artists' creative control over the creative process (vision and implementation) influences consumers' attitudes toward the artwork.

2.2.4 The Impact of Perceived Authenticity

Authenticity refers to the extent to which a product is considered a faithful execution of its creator's vision (Valsesia, Nunes, and Ordanini 2016). Previous research has found that consumers' evaluation of artworks is influenced by their perceived authenticity of the artwork (Valsesia, Nunes, and Ordanini 2016). When AI is involved in the creative process, authenticity is also an important factor which affects artwork evaluation (Messer 2024). In the case of posthumous artwork completion, the perceived authenticity relating to the posthumous artwork

can also be an influential factor. Therefore, we hypothesize that authenticity mediates the effect of artist's creative control and AI involvement on consumers' attitudes towards the posthumous artwork.

2.2.5 The Impact of Perceived Ethicality

The use of AI in artistic production raises significant ethical concerns, particularly because AI challenges traditional notions of humanness in the creative processes (Tubadji, Huang, and Webber 2021). Artworks, especially those that form part of a deceased artist's legacy, are often regarded as a profound reflection of human expression and cultural heritage. Posthumous artworks, as a critical part of human civilization, are uniquely tied to the authenticity and creative intent of their original creators. When AI is employed to complete such works, it introduces a potential threat to the integrity of these artworks, thereby raising ethical concerns about the role and agency of AI in shaping human artistic legacies.

These concerns are especially pronounced in the context of posthumous artwork completion, where the use of AI might fundamentally alter public perceptions of such works. Ethical doubts regarding the appropriateness and authenticity of AI involvement could lead to skepticism about the cultural and emotional value of these artworks. As posthumous creations are important in preserving and celebrating human civilization, any disruption to their authenticity caused by AI may result in diminished appreciation and trust. Consequently, addressing the ethical implications of AI's role in completing posthumous artworks is essential to safeguarding their significance within human culture.

2.3 Theoretical Framework

Based on what we presented above, here are the general propositions we will explore in this research. The theoretical framework is displayed in Figure 2.1.

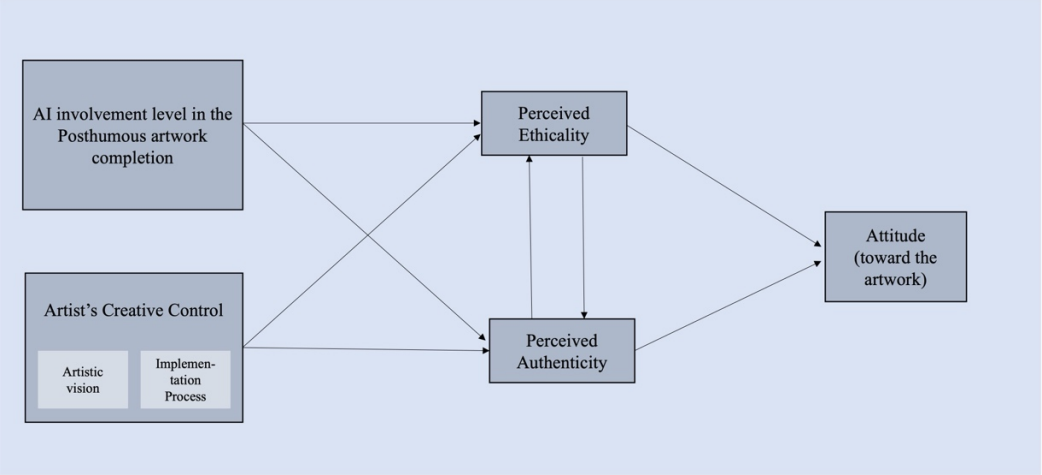


Figure 2.1: *Theoretical framework*

Proposition 1: AI involvement level negatively influences consumers' attitude toward the AI completed posthumous artwork.

Proposition 2: Perceived authenticity of the artwork mediates the effect of AI involvement level on consumers' attitude toward the AI completed posthumous artwork.

Proposition 3: Perceived ethicality of AI usage mediates the effect of AI involvement level on consumers' attitude toward the AI completed posthumous artwork.

Proposition 4: Artists' creative control, including the control over the artistic vision and control over the implementation process, positively influences consumers' attitude toward the AI completed posthumous artwork.

Proposition 5: Perceived authenticity of the artwork mediates the effect of artists' creative control (control over the artistic vision and control over the implementation process) on consumers' attitude toward the AI completed posthumous artwork.

Proposition 6: Perceived ethicality of AI usage mediates the effect of artists' creative control (control over the artistic vision and control over the implementation process) on consumers' attitude toward the AI completed posthumous artwork.

2.4 Study 1

Study 1 was an exploratory study. It was designed to explore consumers' attitudes towards posthumous completion of artworks with AI with field data. Given previous research on AI-generated content was in the context of living musicians, we intended to have a better understanding about how consumers appreciate AI usage in the posthumous artwork context.

To achieve this, we conducted an online search to identify notable instances of posthumously completed artworks, with a particular emphasis on music compositions. Three prominent cases emerged: *Beethoven's Symphony No. 10*, *Schubert's Symphony No. 8*, and *The Beatles' new song, "Now and Then."* These cases were selected due to their diversity in AI application and musical style, which enabled a comprehensive examination of consumer responses across different cases. Consumer attitudes were assessed through an analysis of comments posted under YouTube videos featuring these three musical pieces. This qualitative approach provided insights into public perceptions of AI's role in posthumous artistic creation.

2.4.1 Method

We conducted a content analysis on YouTube comments. Three posthumous artwork completion cases were selected: the completion of Beethoven's Symphony No. 10, wherein AI was predominantly responsible for completing the majority of the symphony due to the fragmented nature of Beethoven's original musical sketches; the completion of Schubert's Symphony No. 8 by Huawei[1] with AI assistance, where AI contributed to composing the last two movements to complete the symphony; and The Beatles' new song 'Now and then,' created with AI support to incorporate the voice of the deceased artist, John Lennon where human artists completed majority of the creation work.

To capture a comprehensive view of consumers' reactions, we selected YouTube videos of the music as well as related news reports. Table 2.1 provides detailed information regarding the YouTube videos and associated comments included in this study.

Table 2.1 Information of YouTube Videos used in the Exploratory Study

Cases	**Video Content**	**Video Title**	**No. of views**	**No. of Comments**	**Webpage Address**
Beethoven X Project	Symphony No. 10 completed by AI performed by Bonn Orchestra	Beethoven X: The AI Project: Complete (Bonn Orchestra)	205,813	472	https://www.youtube.com/watch?v=Rvj3Oblscqw
	CBC news report about Beethoven's Symphony No. 10	Beethoven's last symphony finished with the help of artificial intelligence	51,361	57	https://www.youtube.com/watch?v=rTuK4iqQtPI&t=1s
	Euronews report about Beethoven's Symphony No. 10	Artificial intelligence is writing the end of Beethoven's unfinished symphony	13,305	20	https://www.youtube.com/watch?v=H9FVwzrCcDs

[1] Huawei is a Chinese company, providing information and communication technology infrastructure and smart devices.

Schubert's Symphony No. 8	Audio of Schubert Symphoney No. 8	Franz Schubert - Symphony No.8 in B minor, D.759 ("Unfinished") finalized by artificial intelligence	57K	435	https://www.youtube.com/watch?v=_6OUGRsslJY
	Audio of Schubert Symphony No. 8	The Symphony No. 8 from Schubert ("The Unfinished") actually finished by an A.I.	58K	241	https://www.youtube.com/watch?v=RCo8Feho1RI&t=56s
The Beatles song "Now and Then"	The official audio of the new Beatles song	The Beatles - Now And Then (Official Audio)	8.3M	33,817	https://www.youtube.com/watch?v=AW55J2zE3N4

Comments on these videos featuring AI-completed posthumous artworks were manually collected and analyzed. Given the exploratory nature and objectives of this study, we employed open coding to examine consumer reactions. Specifically, we focused on identifying consumers' emotions, perceptions, and attitudes toward the AI-assisted completion of artworks.

For instance, expressions such as "touching," "excited," and "pleasure" were categorized as emotional responses. Statements beginning with "I think…," "I believe…," "I recognize…," "I find…," and "sounds like…" were classified as perceptions. Meanwhile, expressions such as "I like…," "…is better than…," and "this is really bad…" were associated with attitudes. This coding framework allowed for a structured analysis of consumer responses to AI-generated posthumous artworks.

2.4.2 Findings and discussion

Upon analyzing numerous consumer comments, divergent attitudes among consumers regarding AI-completed posthumous artworks emerged in both the Beethoven and Schubert

cases. Some individuals exhibited enthusiasm and satisfaction with the 'realization' of the unfinished artwork, while others expressed criticism regarding the ethicality of AI usage in art creation and the quality of the AI-completed music. Notably, among those holding positive attitudes toward the AI-completed artworks, many displayed favorable perceptions of AI. Conversely, individuals with negative attitudes toward the AI-completed artworks expressed concerns about the perceived authenticity of the artwork, ethical considerations, and apprehensions regarding AI potentially replacing human creative endeavors.

Interestingly, we did not observe a divergence in attitudes in the case of The Beatles. All comments exhibited a supportive stance toward both the artwork and the artists, resonating with a pervasive sense of nostalgia evident throughout the commentary. This unanimity might be attributed to the relatively limited level of AI involvement in this instance, which may have reduced potential concerns about authenticity and creative integrity. Unlike cases where AI assumes a more prominent role in completing an artist's work, the subtle application of AI in The Beatles' case likely preserved the perception of human creativity and authenticity.

Another possible reason could be the temporal proximity of the deceased artist: Beethoven and Schubert passed away long ago, whereas John Lennon is a relatively modern artist who passed away more recently.

In connection with this factor, another contributing reason for the positive reception could be consumers' strong emotional attachment to John Lennon. As a cultural icon whose music has deeply resonated across generations, Lennon's legacy evokes a unique sense of personal and collective nostalgia. This emotional connection may overshadow any hesitations about the technological aspects of the artwork's production, fostering a more accepting attitude among fans. Furthermore, the context of The Beatles as a globally beloved pop band, with its emphasis

on shared memories and mass appeal, may contribute to this reception. Pop music, by nature, often fosters a sense of inclusivity and familiarity, which can amplify the emotional resonance of posthumous releases.

2.5 Study 2

This study aimed to examine the effect of AI involvement on consumers' attitudes. We conducted an online experiment manipulating the degree of AI involvement in the posthumous artwork completion. We expected consumers to have different attitudes toward the posthumous completed artwork when the artwork is mostly completed by AI comparing to it mostly being done by the artists.

2.5.1 Method

2.5.1.1 Experimental design

This study was designed as a single factor, two levels (low AI involvement v.s. high AI involvement) between-subjects experiment. We recruited 200 participants from Prolific and compensated each of them 1.2 GBP. They were randomly assigned to one of the two conditions: AI completed the majority (95 percent) of the artwork (high AI involvement), and AI completed a limited percentage (5%) of the creation work (low AI involvement). Experiment scenarios are displayed in Appendix I. 11 responses were removed due to failure of attention check, yielding a final sample of 189.

Participants were first asked to report their knowledge of classical music and Beethoven, and their attitude towards AI on 7-point Likert scales (1=not at all/very negative, 7=very

much/very positive). Next, each participant was required to listen to a 30-second excerpt of the symphony after reading a one-page description illustrating how AI is employed to complete the unfinished symphony No. 10 of Beethoven. As a manipulation check, participants completed a 7-point Likert scale question indicating whom completed majority of the symphony (1=AI, 7= Beethoven).

Subsequently, we assessed participants' perceived authenticity of the artwork, perceived ethicality of AI usage, and their attitudes toward the artwork and the artist with 7-level scales (1=very negative, 7=very positive). Finally, we invited participants to describe their opinions on using AI to complete posthumous artwork. This question was to help us understand the reasoning behind participants' attitudes. Participants' demographic information was also collected.

Table 2.2 Variable measurements and scales

	Variable	**Dimensions**	**Items**
Control Variables	Attitude towards classical music (Moulard et al. 2014)		Unfavorable/Favorable
			Dislike/Like
			Bad/Good
	Fanship		I am a fan of Beethoven
	Knowledge of classical music (Styvén 2010)		I know pretty much about classical music
			I am a classical music connoisseur
			I don't feel knowledgeable about classical music
			I know less about classical music than others
	Knowledge of Beethoven (Styvén 2010)		I know pretty much about Beethoven
			I am an expert of Beethoven
			I don't feel knowledgeable about Beethoven
			I know less about Beethoven than others
	Attitude towards AI (Grassini 2023)		I believe that AI will improve my life.
			I believe that AI will improve my work.
			I think I will use AI technology in the future.
			I think AI technology is positive for humanity.
DV	Attitude towards the artwork (Moulard et al. 2014)		Mediocre/Exceptional
			Not at all high quality/Extremely high quality
			Bad/Good
	Attitude towards Beethoven (Moulard et al. 2014)		Dislike/Like
			Unfavorable/Favorable
			Bad/Good

	Brand image perception		This artwork impacts my impression of Beethoven
			This artwork impacts the reputation of Beethoven
			This artwork impacts the legacy of Beethoven
Mediator	Perceived authenticity (Nunes, Ordanini, and Giambastiani 2021)	Accuracy	The song truthfully represents the artist's thoughts
		Connectedness	The song is engaging
		Integrity	The song is consistent with the artist's style
		Legitimacy	The song respects for traditions and styles of a certain genre (classical music)
		Originality	The song is unique
		Proficiency	The song achieves a musical sophistication
Mediator	Perceived ethicality (Snipes, LaTour, and Bliss 1999)		Unfair/Fair
			Unjust/Just
			Not morally right/Morally right
			Not acceptable to my family/Acceptable to my family
			Culturally unacceptable/Culturally acceptable
			Traditionally unacceptable/ Traditionally acceptable

2.5.1.2 Manipulation check

An independent sample t-test confirms the expected differences between the high AI involvement (M=1.3261, SD= 0.75751 , n=92), and the low AI involvement (M=6.8351 , SD= 0.37306 , n=97) conditions. The difference was significant t (187)= -63.923, $p < 0.001$. Participants in the high AI involvement condition were more likely to identify AI completed the majority of the symphony, while participants in the low AI involvement condition were more likely to identify Beethoven completed the majority of the symphony.

2.5.2 Results

A total of 189 participants were included in the dataset. Participants' responses were independently measured, which fulfilled the assumption of independency.

2.5.2.1 Descriptive Statistics

97 participants were randomly assigned to the low AI involvement condition and 92 to the high AI involvement condition. Table 2.3, below, presents the main descriptive statistics.

	AI Involvement	N	Mean	Std. Deviation
Attitude towards artwork	High	92	5.3225	1.11209
	Low	97	5.6632	0.94953
Attitude towards Beethoven	High	92	5.7319	1.10856
	Low	97	5.7869	1.05868
Influence on the artists' legacy	High	92	4.8587	1.18212
	Low	97	5.1031	1.03454
Perceived authenticity	High	92	4.8351	0.99923
	Low	97	5.3952	0.81767
Perceived ethicality	High	92	4.3623	1.44213
	Low	97	4.6942	1.51319

Table 2.3: *Descriptive statistics*

We conducted a MANCOVA analysis to assess the differences among the two conditions (low v.s. high AI involvement) on the dependent variables (perceived attitude toward symphony, attitude toward Beethoven, perceived influence on artist's legacy, perceived authenticity, and perceived ethicality) after controlling for consumers' knowledge of the music genre, consumers' knowledge of the artist, fanship, consumers' attitude towards the music genre, and consumers' attitudes towards AI. Levene's test revealed that the assumption of homogeneity of variance was not violated ($p > .05$) in any of the dependent variables. We also checked the normality of residuals of the five dependent variables (attitudes towards the artwork, attitudes towards Beethoven, influence on artists' legacy, perceived authenticity, and perceived ethicality). Residuals of influence on artists' legacy and residuals of perceived authenticity were normally distributed (influence on artists' legacy: between -3.00 and 3.00; perceived authenticity: between -4.00 and 4.00, while residuals of attitudes towards artwork, attitudes towards Beethoven and

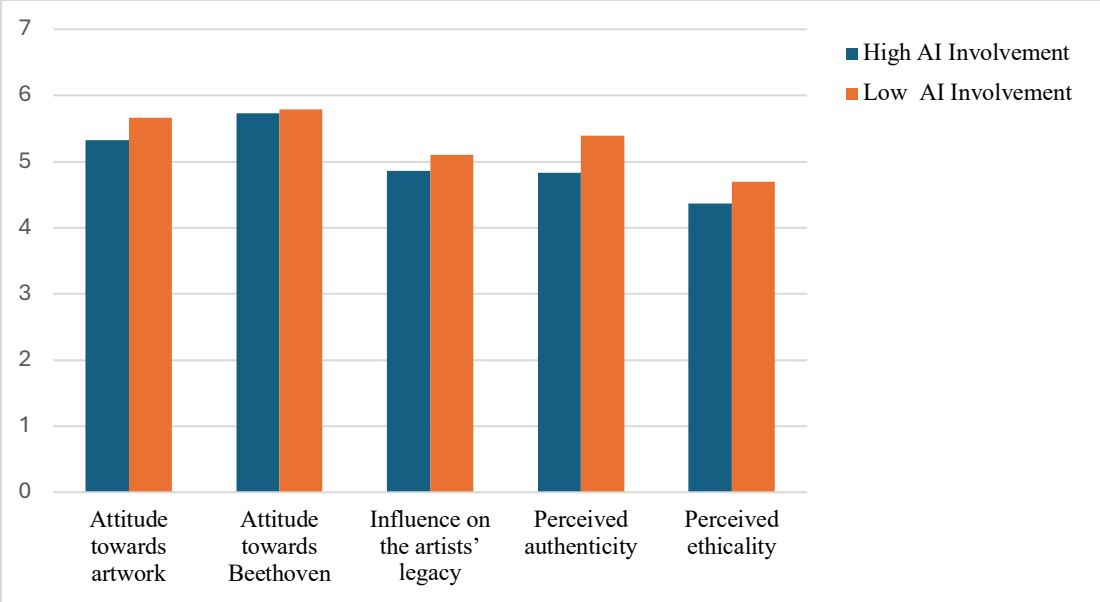
perceived ethicality were not perfectly normal distribution. There were a few low-frequency outliers. Since the violations were not severe, the assumption of multi-normality was generally verified.

The analysis revealed that the level of AI involvement negatively influences consumers' attitudes towards the posthumous artwork ($F(1,182)=5.180$, $p=0.024<0.05$, 95%CI [0.043, 0.606]) and consumers' authenticity ($F(1, 182)=17.298$, $p<0.001$, 95%CI [0.277, 0.777]). The effects of AI involvement level on consumers' perceived impact on the artist's legacy, perceived ethicality, and their attitude towards the artist were not significant. Table 3 presents the analysis result.

Table 2.4: *Result of ANOVA analysis*

Variable	**F**	**Sig.**	**95% Confidence Interval**
Attitude toward symphony	5.180	0.024***	[0.043, 0.606]
Attitude toward the artist	1.040	0.309	[-0.119, 0.374]
Perceived impact on artist's legacy	1.373	0.243	[-0.120, 0.470]
Perceived authenticity	17.298	<0.001***	[0.277, 0.777]
Perceived ethicality	1.379	0.242	[-0.155, 0.609]

Figure 2.2 Comparison of the differences between the different level of AI involvement



We also examined the mediation effect of the perceived authenticity of the artwork and the perceived ethicality of AI usage. None of them mediated the effect of AI involvement on the consumers' attitude towards the artwork (authenticity: BootCI [-0.0218, 0.1386]; ethicality: BootCI [-0.0362, 0.0218]).

To better understand the results, we then analyzed participants' opinions about using AI to complete posthumous artwork. Five different opinions were observed.

Opinion 1: As long as the music is labelled as AI creation, it is acceptable.

"As long as it is clearly labelled as being created with AI, I am for it."

"I think it's nice that we can hear something that would never have been finished without AI."

Opinion 2: Using AI to complete Beethoven's music is fine. But it is not acceptable for living musician to use AI in music creation.

> *"I think to finish Beethoven's piece it is ok to us AI. Its something fun and unique was to finish it. But for living composers its not the best idea to use AI because humans are much more creative and talented than AI."*

> *"I think it is tough to say, in some instances it seems acceptable like with unfinished works such as Beethoven. With artists who are currently producing music, using AI seems like cheating almost."*

Opinion 3: It is fine to use AI to create classical music because living musicians don't compose much classical music.

> *"It is acceptable given the fact that it was already 95% completed by Beethoven. It would be interesting to hear more classical music created 100% by AI."*

> *"I think it's a positive because different genres of music that are good but people do not produce a lot of anymore can be created by AI which does not cost a lot of resources to do."*

Opinion 4: It is fine to use AI to finish music. It is not acceptable to use AI to create the whole song.

> *"I think it's acceptable to use AI in music but only when it's a small percentage/amount of input from AI relative to human."*

"I think it was acceptable to use AI to complete Beethovens 10th symphony as he had the first movement complete or nearly complete, and notes to where he wanted it to go. Plus, there is a considerable body of work to draw on to get the feel and style of Beethoven. I believe this is just as acceptable as a friend of Puccini's completing his final opera when he passed away with it unfinished. What I do not think is acceptable is using AI to create "original works". In the first place, it can't do that, it would have to take from the work of others. Also, it is art and creativity that make us human and to take this away and turn it over to a machine is to rob us of what is us."

Opinion 5: It is nice to use AI to complete posthumous music.

"I think it's nice that we can hear something that would never have been finished without AI."

2.5.3 Discussion

In the case of using AI to complete Beethoven's Symphony No. 10, this study reveals a nuanced public reaction that varies depending on the level of AI involvement. While participants' attitudes towards Beethoven, their perceptions of his artistic legacy, and their ethical evaluations of the project remain unaffected by the degree of AI involvement, their attitudes towards the completed artwork and the perceived authenticity of the artwork differ significantly. This suggests that audiences tend to separate their evaluations of the deceased artist from their assessments of the artwork produced posthumously. Despite variations in the level of AI

involvement in the completion of the symphony, the public's respect for Beethoven and his historical legacy remains untarnished. This phenomenon contrasts with reactions observed in contexts involving prehumous artwork completion, where the AI usage in the artwork creation has influence on the evaluation of the artist (Tigre Moura and Maw 2021).

The lack of significant influence of AI involvement on attitudes toward Beethoven and his legacy may be attributed to several factors. One plausible explanation is the temporal distance: Beethoven passed away centuries ago, and this historical separation could reduce audiences' aversion of AI usage in the posthumous artwork completion.

Interestingly, participants also do not perceive the use of AI in posthumous artwork completion as unethical, even when AI contributes significantly to the final product. This acceptance may stem from generally positive attitude toward AI, reflecting an openness to technological innovation in artistic contexts. However, despite the absence of ethical concerns, participants exhibit a negative attitude towards the artwork heavily completed by AI. A possible explanation lies in the ambiguity surrounding the degree of the original artist's creative control. If it is unclear how much direction the artist provided in the AI-involved creative process, audiences may feel uneasy about the authenticity and integrity of the final artwork. We examine the effect of creative control in the following study.

2.6 Study 3

Except for AI involvement in the creative process, the artist's creative control over the process also influences consumers' attitudes. Study 3 is an online experiment examining the effect of the artist's creative control level over the artwork. Since we believe that artist's creative

control over an artwork involves two perspectives, control over the artistic vision and control over the implementation process, this experiment manipulates two factors: control over artistic vision and control over the implementation process. We expected that both of the factors would have an impact on consumers' perceptions.

2.6.1 Method

2.6.1.1 Pre-test

We conducted a pre-test to check our manipulations. Beethoven and his unfinished Symphony No. 10 were used in the experiment scenario (see Appendix II). Two hundred participants recruited through Prolific were randomly assigned to one of the four conditions: "the artist never left detailed notes explaining his artistic vision, and he never explicitly expressed his opinion on whether the artwork should be completed" *(low control over artistic vision, low control over implementation process)*; "the artist never left detailed notes explaining his artistic vision, but he explicitly expressed his hope of the artwork to be completed" *(low control over artistic vision, high control over implementation process)*; "the artist left detailed notes explaining his artistic vision, but he never explicitly expressed his opinion on whether the artwork should be completed" *(high control over artistic vision, low control over implementation process)*; "the artist left detailed notes explaining his artistic vision, and he explicitly expressed his hope of the artwork to be completed" *(high control over artistic vision, high control over implementation process).* We then invited participants to answer two questions ("According to the story above, how much do you agree that Beethoven left detailed notes explaining how he wanted the symphony to sound like?", and "According to the story above, how much do you agree that Beethoven wanted the symphony to be completed?") on 7-level scales (1=not at all,

7=very much). 20 participants returned their submissions due to comprehension failure, which resulted in a sample of 180.

Two individual independent sample t-tests were conducted to check our manipulations. The results confirmed that the difference between the low control over the artistic vision (M= 1.31, SD= 0.63, n= 89) and high control over the artistic vision (M= 6.37, SD=0.84, n= 91) was significant $t(178)= -45.62$, $p<0.001$. Participants in the low control over the artistic vision condition were less likely to identify the artist has control over the artistic vision of the posthumous artwork, compared to participants in the high control over the artistic vision condition.

The difference between the low control over the implementation process (M= 2.68, SD= 1.53, n= 81) and high control over the implementation process (M= 6.59, SD=0.88, n= 99) was also significant ($t(178)= -21.43$, $p<0.001$). Participants in the low control over the implementation process condition were less likely to identify the artist has control over the implementation process of the posthumous artwork, compared to participants in the high control over the implementation process condition.

2.6.1.2 Experiment design

This study was designed as a 2 (control over artistic vision: low v.s. high) *2 (control over implementation process: low v.s. high) between-subjects experiment. We recruited 400 participants from Prolific and compensated each of them 1.5 GBP. They were randomly assigned to one of the four conditions which had been tested in the pre-test. Six responses were excluded due to the failure of the attention check.

Participants were first asked to report their knowledge of classical music and Beethoven, and their attitude towards classical music on 7-level scales (1=not at all/very negative, 7=very much/very positive). These are the variables we controlled in this study. Next, each participant was required to listen to a 30-second excerpt of the symphony after reading a one-page description illustrating Beethoven's creative control over the creative process of the Symphony No. 10.

Subsequently, we assessed participants' perceived authenticity of the artwork, perceived ethicality of AI usage, and their attitudes toward the artwork with 7-level scales (1=very negative, 7=very positive). We also measured participants' attitudes towards AI, which was another covariate with 7-level scales. Finally, we invited participants to describe their opinions on using AI to complete posthumous artwork. This question was to help us understand the reasoning behind participants' attitudes. Participants' demographic information was collected at the end of the questionnaire.

2.6.2 Results

2.6.2.1 Descriptive Statistics

A total of 394 participants were included in the dataset. Participants' responses were independently measured, which fulfilled the assumption of independency. Table 2.5 exhibits the descriptive data.

	Control over vision	Control over process	N	Mean	Std. Deviation
Attitude towards artwork	Low vision	Low process	95	4.8000	1.39435
		High process	98	5.2960	1.15364
	High vision	Low process	94	5.3475	1.11135

		High process	107	5.2523	1.21129
Authenticity	Low vision	Low process	95	4.4473	1.35640
		High process	98	4.9489	1.09572
	High vision	Low process	94	5.1329	1.14730
		High process	107	5.0685	1.13961
Ethicality	Low vision	Low process	95	3.9754	1.47376
		High process	98	4.6990	1.28201
	High vision	Low process	94	4.3653	1.32864
		High process	107	4.5701	1.44068

Table 2.5: *Descriptive statistics*

2.6.2.2 Results of MANCOVA Analysis

We conducted a MANCOVA analysis to assess whether participants' attitudes towards the posthumous artwork, their perceived authenticity of the artwork, and their perceived ethicality of AI usage differ by the artists' control over the artistic vision and their control over the implementation process, after controlling for consumers' knowledge of the music genre, consumers' knowledge of the artist, consumers' attitude towards the music genre, and consumers' attitudes towards AI.

The Box's test revealed that the assumption of the equality of variance-covariance matrices was not violated (Box's M= 12.564, F (18, 526975.565) =0.688, p=0.827). We also checked the normality of residuals of three dependent variables (participants' attitudes towards the posthumous artwork, their perceived authenticity of the artwork, and their perceived ethicality of AI usage). Residuals of perceived authenticity were normally distributed between -4.00 and 4.00, while residuals of attitudes towards artwork and perceived ethicality were not perfectly normal distribution. There were a few low-frequency outliers. Since the violations were not severe, the assumption of multi-normality was generally verified.

The results of multivariate tests showed that the combined DVs (participants' attitudes towards the posthumous artwork, their perceived authenticity of the artwork, and their perceived ethicality of AI usage) were significantly different by levels of control over the artistic vision (Wilk's λ= 0.968, F (3, 383)=4.236, p=0.006) and levels of control over the implementation process (Wilk's λ= 0.948, F (3, 383)=7.027, p < 0.001). There was also a significant interaction between the two types of control (Wilk's λ= 0.979, F (3, 383)=2.794, p=0.040), after controlling for consumers' knowledge of the music genre, consumers' knowledge of the artist, consumers' attitude towards the music genre, and consumers' attitudes towards AI.

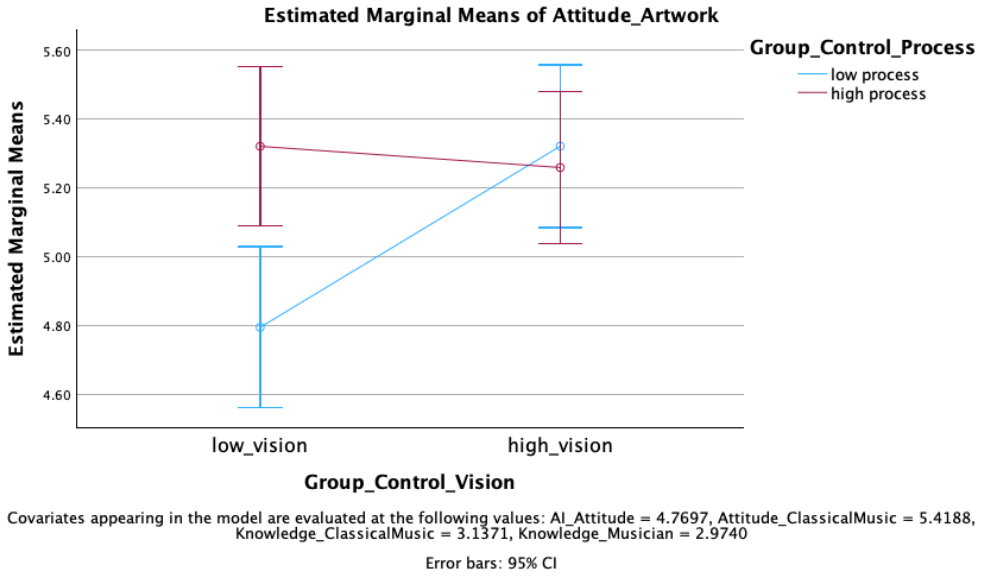
To investigate the impact of each effect on the individual DVs, a univariate F-test using an alpha level of 0.05 was performed. Participants' attitudes towards the posthumous artwork were positively influenced by the level of artists' control over the artistic vision (F (1, 386)=3.910, p=0.049, [0.001, 0.463]) and the level of artists' control over the implementation process (F (1, 386)=3.905, p=0.049, [0.001, 0.463]). Participants' authenticity was positively impacted by the level of artists' control over the artistic vision (F (1, 386) =11.343, p< 0.001, [0.161, 0.611]) and the level of artists' control over the implementation process (F (1, 386) =4.546, p=0.034, [0.019, 0.469]). And participants' perceived ethicality was only positively influenced by the level of artists' control over the implementation process (F (1, 386) =20.252, p=<0.001, [0.289, 0.738]).

	Attitudes towards the artwork		Perceived authenticity		Perceived ethicality	
	F	p-Value	F	p-Value	F	p-Value
Control over the artistic vision	3.910	0.049**	11.343	<0.001***	0.732	0.393
Control over the implementation process	3.905	0.049**	4.546	0.034**	20.252	<0.001***

Control over the artistic vision × Control over the implementation process	6.303	0.012**	6.146	0.014**	5.409	0.021**
Attitudes towards AI	40.142	<0.001***	39.619	<0.001***	195.273	<0.001***
Attitude towards classical music	3.935	0.048**	1.402	0.237	4.560	0.033**
Knowledge of classical music	0.625	0.430	0.148	0.701	0.009	0.924
Knowledge of musician	0.843	0.359	0.398	0.528	0.006	0.936

Table 2.6: *Results of MANCOVA analysis*

When considering the interaction between artists' control over the artistic vision and the implementation process, the effect of artists' control over the implementation process on participants' attitudes towards the posthumous artwork only appeared when artists' control over the artistic vision was low (F (1, 386) =9.901, p=0.002, [0.197, 0.855]). Similarly, the positive effects of artists' control over the implementation process on participants' perceived authenticity and perceived ethicality only appeared in the low control over artistic vision condition (authenticity: F (1, 386) =10.458, p=0.001, [0.207, 0.848]; ethicality: F (1, 386) =22.944, p<0.001, [0.459, 1.097]).



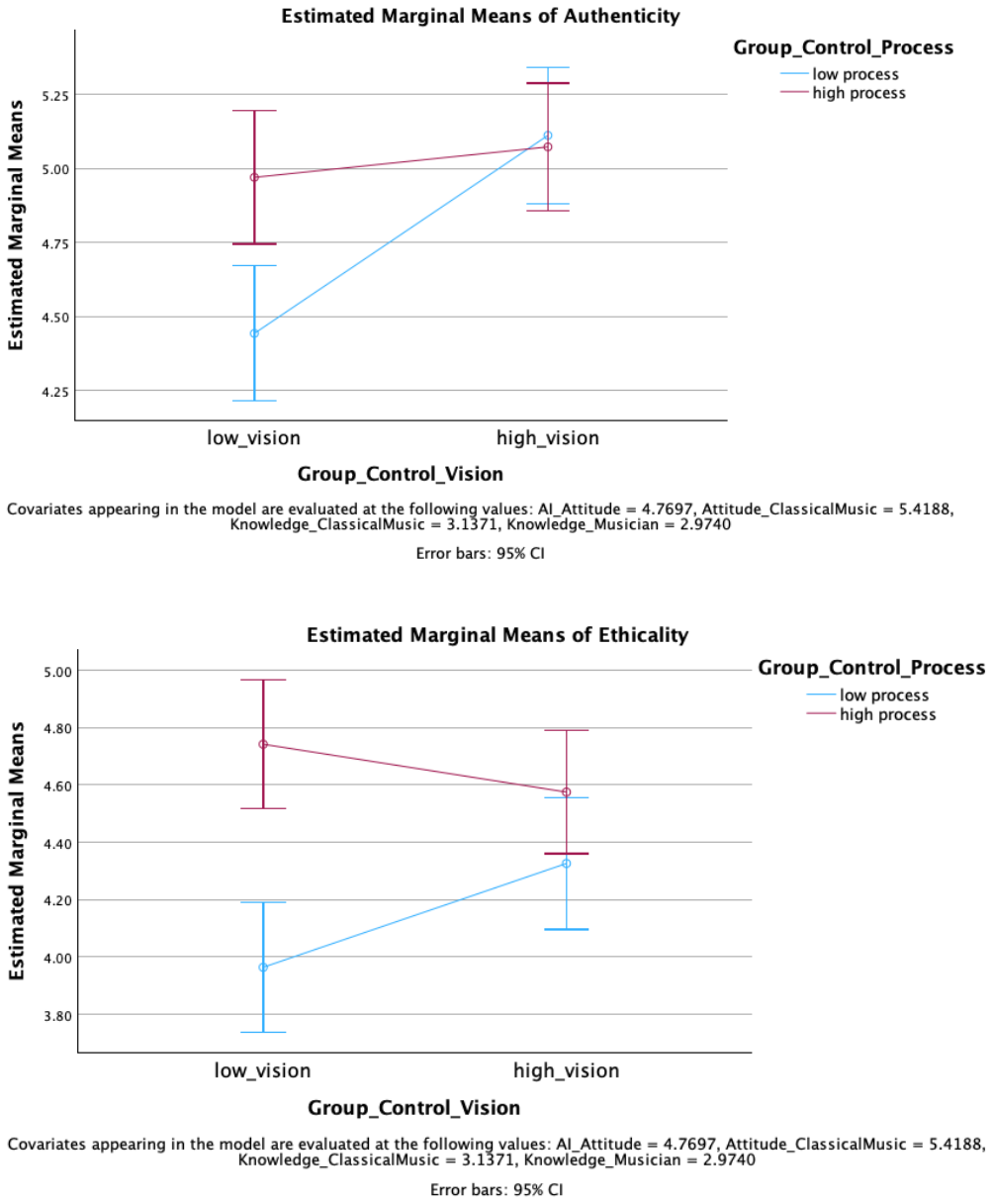


Figure 2.3: *Interactions between the two types of control*

Moreover, the covariate attitude towards AI had significant influences on all three dependent variables (attitudes towards the artwork: $p<0.001$; perceived authenticity: $p<0.001$; perceived ethicality: $p<0.001$), and participants' attitudes toward classical music had significant

influence on their attitudes towards the artwork (p=0.048) and their perceived ethicality (p=0.033).

We also examined the mediation effect of the perceived authenticity of the artwork and the perceived ethicality of AI usage. Two individual mediation analyses were done with SPSS PROCESS 4.2. The indirect effect of artists' control over artistic vision on participants' attitudes towards the artwork through authenticity (effect= 0.3066) was significant (bootstrap CI [0.1247, 0.4944]), but its indirect effect through ethicality (effect= 0.0075) was not significant (bootstrap CI [-0.0099, 0.0331]). Both the indirect effect of artists' control over the implementation process on participants' attitudes towards the artwork through authenticity (effect=0.2000) and it through ethicality (effect= 0.0385) were significant (authenticity: bootstrap CI [0.0131, 0.3905]; ethicality: bootstrap CI [0.0018, 0.0886]).

A bootstrap moderated mediation analysis with artists' control over the artistic vision as the independent variable and artists' control over the implementation process as the moderator followed. The moderated mediation effect was not significant (bootstrap CI [-0.0988, 0.0054]). In low control over implementation process condition, the indirect effect of artists' control over artistic vision on participants' attitudes toward the artwork through authenticity (0.5294) was significant (bootstrap CI [0.2522, 0.8082]). But its indirect effect through ethicality (0.0229) was not significant (bootstrap CI [-0.112, 0.0727]). However, in high control over implementation process condition, neither the indirect effect of artists' control over artistic vision on participants' attitudes toward the artwork through authenticity (effect=0.0860, bootstrap CI [-0.1530, 0.3145]) nor its indirect effect through ethicality (effect=-0.0125, bootstrap CI [-0.0526, 0.0155]) was significant.

2.6.3 Discussion

The two types of creative control—artists' control over the artistic vision and their control over the implementation process—play critical roles in shaping consumers' perceptions of the artwork.

Artists' control over the artistic vision positively influences consumers' perceived authenticity of the artwork and their attitudes toward posthumous artworks. However, it does not affect consumers' perceptions of ethicality. As the level of control artists exercise over the artistic vision increases, consumers' attitudes toward the artwork become more favorable, primarily because they perceive the artwork as more authentic.

In contrast, artists' control over the implementation process affects not only consumers' perceived authenticity and their attitudes toward posthumous artwork but also their perception of ethicality. As the degree of control artists maintain over the implementation process increases, consumers' attitudes toward the artwork improve, driven by their belief that the artwork is more authentic, and that the use of AI is ethically sound.

Furthermore, these two types of creative control interact to influence consumers' perceptions of artwork authenticity, the ethical use of AI, and their attitudes toward posthumous artwork. The effect of artistic vision control on consumer perceptions and attitudes is evident only when artists have limited control over the implementation process. Similarly, the artists' control over the implementation process impacts consumer perceptions and attitudes only when their control over the artistic vision is minimal.

2.7 General discussion

As the development of new technologies, AI has been used to complete posthumous artworks. The potential for AI to either enhance or undermine the commemoration of an artist remains uncertain. To address this question, we develop six propositions and examine them across three studies.

With study 1, the analysis of consumer comments revealed divergent attitudes toward AI-completed posthumous artworks in the cases of Beethoven and Schubert, with some expressing enthusiasm for the realization of unfinished works and others criticizing the ethicality, quality, and authenticity of the AI-created music. In contrast, no such divergence was observed in the case of The Beatles, where all comments were supportive, driven by nostalgia and emotional attachment to John Lennon. Study 2 shows that the level of AI involvement in the posthumous creative process negatively influences consumers' authenticity and their attitudes towards the artwork, but no influence on their perceptions of the artist and their artistic legacy. Study 3 finds that the two types of creative control—over the artistic vision and the implementation process—play distinct roles in shaping consumer perceptions of posthumous artworks. Control over the artistic vision enhances perceived authenticity and favorable attitudes toward the artwork, but it does not influence perceptions of ethicality. On the contrary, control over the implementation process affects not only authenticity and attitudes but also ethicality, with greater control leading to more positive perceptions and ethical approval.

2.7.1 Theoretical contributions

This research on the AI usage in the posthumous artwork completion advances our understanding of public's attitude towards posthumous artwork, a topic that has received limited attention in prior research. While existing studies have predominantly focused on issues of authorship and ethicality (Hick 2014; Gilden and Hurwitz 2022; Bacharach and Tollefsen 2015), they have rarely explored how consumers perceive posthumous artworks, nor have they examined how such works impact the artists and their legacies. Our research addresses these gaps by focusing on consumer perspectives and discussing the implications of applying new technologies, particularly artificial intelligence (AI), in the completion of posthumous artworks. More specifically, we find that AI usage only negatively influence the evaluation of posthumous artworks, but does not affect the artists' personal brand and their artistic legacy. This differentiation highlights a crucial insight into how technology-driven interventions are received by audiences. While AI may shape judgments of the authenticity, quality, or ethicality of the artworks, it does not alter the public's regards for the artist and their artistic contributions. This distinction underscores the importance of considering both the technological and human dimensions when analyzing the impact of AI on posthumous art creations.

Our study also makes a theoretical contribution to the literature on algorithm aversion by offering insights specific to the context of posthumous artworks. Unlike previous research suggesting that the use of AI negatively impacts both the artist and the artwork, our findings indicate that in the posthumous context, AI usage affects only the evaluation of the artwork itself, without influencing perceptions of the artist or their legacy. This nuance highlights the importance of considering the temporal and contextual factors in algorithm aversion studies.

Additionally, we find that the level of AI involvement plays a critical role in the evaluation of posthumous artworks. As the proportion of AI-contributed completion increases, evaluations of the artwork become more negative. However, AI involvement alone does not trigger ethical concerns among the public. Ethical considerations emerge when attention is directed toward the deceased artist's creative control, particularly control over the implementation process. These ethical concerns, in turn, influence evaluations of the artwork. This finding aligns with Messer's (2024) research on the use of AI by living artists in different phases of creative process, further reinforcing the importance of creative control in shaping consumer attitudes toward AI-involved creative process.

Moreover, this study extends the research on artists' creative control by examining its relevance in the context of posthumous artworks. Previous studies primarily focus on the impact of living artists' direct involvement in the creative process (Messer 2024; Valsesia, Nunes, and Ordanini 2016). However, our findings reveal that creative control also plays a significant role in shaping evaluations of posthumous artworks.

Although deceased artists cannot directly participate in and oversee the entire creative process as living artists do, they can still exert a certain level of control over posthumous creations through their documented artistic vision and directives regarding the implementation process. Our findings indicate that such creative control positively influences public evaluations of posthumous artworks. Higher levels of control—whether over the artistic vision or the implementation process—are associated with more favorable evaluations of the completed works. These findings underscore the importance of preserving and emphasizing the creative intentions of deceased artists to enhance the reception and authenticity of posthumous artworks.

2.7.2 Practical implications

The management of artistic legacies has always been a controversial topic, given the significant social and economic value of an artist's works and brand even after their passing. Recently, global music icon Madonna made headlines when she drafted a detailed and strict will to safeguard her artistic legacy after a near-death hospital incident (Boyle 2023). Among her stipulations, Madonna explicitly stated her opposition to the use of technologies, such as holograms, to represent her or her works posthumously. This highlights the growing importance for artists to strategically plan their artistic legacy in an era of rapid technological advancements.

This research provides valuable insights for artists navigating these challenges. Findings suggest that when evaluating posthumous artworks, the public tends to separate their evaluations of the deceased artist from their assessments of the posthumous artwork. In other words, artists need not be overly concerned that technologically produced or reproduced artworks will damage their established legacy. Audiences appear to treat these newer, technology-driven pieces as separate from the artist's original body of work and brand identity.

However, it remains prudent for artists to take proactive steps if they are unable to complete an artwork due to illness or other physical limitations. Artists may wish to record detailed information about their artistic vision, creative methods, and instructions regarding whether their unfinished artworks should be completed after their death. Such records can help maintain the quality and integrity of any posthumous creations, reducing potential negative outcomes. By providing this form of guidance, artists can ensure that their legacy remains closely aligned with their original intentions, even when future technologies become involved in completing or reproducing their works.

2.7.3 Limitation and future research

This study utilized Beethoven's Tenth Symphony as the case for all experimental scenarios, which introduces the possibility of confounding factors influencing the results. For instance, the type of art genre may affect evaluations of posthumous artworks. Additionally, the lack of significant differences in ethicality perception might be due to the temporal distance from Beethoven's life. Since Beethoven passed away centuries ago, participants may lack strong emotional connections with him, making the use of AI to complete his unfinished works less likely to evoke ethical concerns.

Given these limitations, future research should consider using more contemporary artists and their artworks as experimental cases. Such an approach would allow for a more robust examination of how temporal proximity and emotional attachment to an artist influence perception of posthumous artworks. Moreover, future studies should explore different genres of music and other forms of art to investigate whether the effects observed in this study are specific to classical music or extend to other artistic domains. Expanding the scope of research in this way would provide a more comprehensive understanding of the role of AI in shaping consumer attitudes toward posthumous creations.

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Appendix I Experiment Scenarios used in Study 2

Condition 1: High AI involvement

Ludwig van Beethoven was a German composer and pianist who lived between 1770 and 1827. He is widely regarded as one of the greatest composers in the history of Western music.

Beethoven passed away in 1827 leaving nine symphonies completed and a tenth symphony unfinished. He left some sketches for the tenth symphony, which represented about five percent (5%) of the overall symphony. In 2019, AI has been used to complete the remaining ninety five percent (95%) of the symphony. After the work was finished, a real symphonic orchestra recorded the symphony

Condition 2: Low AI involvement

Ludwig van Beethoven was a German composer and pianist who lived between 1770 and 1827. He is widely regarded as one of the greatest composers in the history of Western music.

Beethoven passed away in 1827 leaving nine symphonies completed and a tenth symphony unfinished. He left some sketches for the tenth symphony, which represented about ninety five percent (95%) of the overall symphony. In 2019, AI has been used to complete the remaining five percent (5%) of the symphony. After the work was finished, a real symphonic orchestra recorded the symphony

Appendix II Experiment Scenarios used in Study 3

Condition 1: Low control over artistic vision, Low control over implementation process

Ludwig van Beethoven was a German composer and pianist who lived between 1770 and 1827. He is widely regarded as one of the greatest composers in the history of Western music.

When Beethoven passed away in 1827, he left behind nine completed symphonies and a tenth symphony that remained unfinished. While he left some sketches for the tenth symphony, he did not leave any detailed notes explaining his creative intentions or indicating how he wanted the symphony to be completed. He never explicitly expressed his opinion on whether others should complete Symphony No. 10 after his death, either.

In 2019, artificial intelligence was employed to complete the remaining parts of the symphony. A team of music historians, musicologists, composers, and computer scientists input Beethoven's entire body of work, along with the available sketches for the tenth symphony to familiarize artificial intelligence with Beethoven's music style. This was to ensure that the final product would sound like Beethoven's music. Once the work was completed, a symphonic orchestra recorded the symphony.

Condition 2: Low control over artistic vision, High control over implementation process

Ludwig van Beethoven was a German composer and pianist who lived between 1770 and 1827. He is widely regarded as one of the greatest composers in the history of Western music.

When Beethoven passed away in 1827, he left nine completed symphonies and a tenth that was

unfinished. Although he left some sketches for the tenth symphony, he did not leave any detailed notes explaining his creative intentions or how he wanted the symphony to be completed. Beethoven confided to a close friend that he could not finish the tenth symphony due to his deteriorating health but would be happy to see his unfinished artwork completed since leaving his artwork unfinished made him anxious.

In 2019, artificial intelligence was employed to complete the remaining parts of the symphony. A team of music historians, musicologists, composers, and computer scientists input Beethoven's entire body of work, along with the available sketches for the tenth Symphony to familiarize artificial intelligence with Beethoven's music style. This was to ensure that the final product would sound like Beethoven's music. Once the work was completed, a symphonic orchestra recorded the symphony.

Condition 3: High control over artistic vision, Low control over implementation process

Ludwig van Beethoven was a German composer and pianist who lived between 1770 and 1827. He is widely regarded as one of the greatest composers in the history of Western music.

When Beethoven passed away in 1827, he left behind nine completed symphonies and a tenth symphony that remained unfinished. Beyond leaving some sketches for the tenth symphony, he also left detailed notes explaining his creative intentions or indicating how he wanted the symphony to be completed. However, he never explicitly expressed his opinion on whether others should complete Symphony No. 10 after his death.

In 2019, artificial intelligence was employed to complete the remaining parts of the symphony. A

team of music historians, musicologists, composers, and computer scientists input Beethoven's entire body of work, along with the available sketches for the tenth Symphony to familiarize artificial intelligence with Beethoven's music style. This was to ensure that the final product would sound like Beethoven's music. Once the work was completed, a symphonic orchestra recorded the symphony.

Condition 4: High control over artistic vision, High control over implementation process

Ludwig van Beethoven was a German composer and pianist who lived between 1770 and 1827. He is widely regarded as one of the greatest composers in the history of Western music.

When Beethoven passed away in 1827, he left nine completed symphonies and a tenth that was unfinished. Beyond leaving some sketches for the tenth symphony, he also wrote detailed notes explaining his creative intentions or how he wanted the symphony to be completed. Beethoven confided to a close friend that he could not finish the tenth symphony due to his deteriorating health but would be happy to see his unfinished artwork completed since leaving his artwork unfinished made him anxious.

In 2019, artificial intelligence was employed to complete the remaining parts of the symphony. A team of music historians, musicologists, composers, and computer scientists input Beethoven's entire body of work, along with the available sketches for the tenth Symphony to familiarize artificial intelligence with Beethoven's music style. This was to ensure that the final product would sound like Beethoven's music. Once the work was completed, a symphonic orchestra recorded the symphony.

Conclusion

Taken together, this thesis explores the effects of technology usage in cultural contexts with two articles. Article 1 finds that visitors appropriate the technology (the mobile app) and the core service (cultural visiting experience) separately but concurrently. And the level of mastery visitors achieved with the technology impacts each service appropriation operation from different dimensions. This study extends the discussion of service appropriation by providing evidence that customers in a phygital context appropriate not only the core service, but also the service technology. Their use of technology influences service appropriation process from various dimensions, shedding light on how customers' digital encounters intertwine with their core service experiences.

Article 2 delves into the utilization of artificial intelligence (AI) in the creation of artworks, specifically focusing on posthumous artwork completion. Study 1 reveals that consumers exhibit varying attitudes towards posthumous artwork completed with AI, with these attitudes potentially influenced by the level of AI involvement. However, the findings from Study 2 suggest that level of AI involvement in the posthumous creative process negatively influences consumers' authenticity and their attitudes towards the artwork, but no influence on their perceptions of the artist and their artistic legacy. Study 3 finds that the two types of creative control—over the artistic vision and the implementation process—play distinct roles in shaping consumer perceptions of posthumous artworks.

This thesis makes several significant contributions to the cultural consumption literature. First, while existing research has established that cultural consumption experiences are multifaceted and complex, most studies focus on motivations and outcomes of consumption.

Little is known about how consumers actually complete the cultural consumption process and how their experiences unfold. Article 1 argues that cultural experiences, particularly in a phygital context, are dynamic processes involving a series of behaviors and perceptions. Additionally, this research highlights the unique complexities of consumers' phygital cultural experiences compared to traditional physical cultural experiences. Specifically, the study finds that the appropriation process in a phygital context is more intricate, requiring consumers to first appropriate the technology before they can engage with the cultural product. This added layer of appropriation makes the overall process more indirect and challenging for consumers.

Furthermore, the research on AI's role in completing posthumous artworks provides deeper insights into the negative impacts of AI usage. The findings reveal that as AI involvement increases and the deceased artist's creative control is low, consumers' evaluations of the posthumous artwork decline. Although AI usage does not directly affect the artist's personal brand, negative attitudes toward the posthumous artworks may ultimately influence perceptions of the artist's legacy since these artworks serve as an emotional connection between the public and the deceased artist.

In summary, this thesis examines the impact of two type of technologies on art production and cultural consumption experiences. Future research could further explore the influence of these technologies on cultural consumption and investigate the effects of other emerging technologies on different aspects of cultural consumption.