Spatial future ahead! Augmented reality and anticipated life consequences

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Abstract

Purpose – This study explores how initial exposure to immersive spatial computing experiences using AR headsets generates lasting inspiration and shapes consumers expected long-term life consequences (i.e., enhancement of reality, perceived substitutability and social impact).

Design/methodology/approach – The study uses a time-lagged research design based on 148 first-time users of spatial computing devices (AR headsets). Respondents were interviewed once shortly after being exposed to AR and a few days later. Data is analyzed using partial least squares structural equation modeling (PLS-SEM).

Findings – Users' immediate "inspired-by" experiences predict increased "inspired-to" intentions days later. Such inspiration translates into anticipated consequences such as virtually customizing their physical environments, substituting physical products with AR content, and influencing social relationships with other users.

Research limitations/implications – The current research focuses on positive life outcomes for consumers. However, the ubiquitous and pervasive use of AR may also lead to negative, undesired effects.

Practical implications – The study demonstrates that AR experiences can produce detectable effects long after initial exposure and underscores that AR adoption results from the synergy of hardware and content, providing insights for future research in immersive spatial computing technologies.

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Originality/value – The current research is one of the first to study AR users over time. Drawing on inspiration theory, findings show that an initial exposure to spatial computing through AR can have lasting effects when consumers think about how these technologies could impact their lives.

Keywords Augmented reality, AR, Mixed reality, Spatial computing, Inspiration, Hedonic benefit, Utilitarian benefit, Enhancement of reality, Social impact, Life consequences

Paper type Research article

1. Introduction

The concept of augmenting the real world or blending artificial worlds with people's physical environments has been discussed in academia, industry, and science fiction for decades. In recent years, technological advances in augmented reality (AR) have elevated these visions to mainstream viability, as evidenced by the growing availability of affordable devices and use cases (Statista, 2024; XR Today, 2025). According to recent research (Barta *et al.*, 2025; Flavián *et al.*, 2019) and industry white papers (Strategic Market Research, 2022), AR content can significantly transform the way we interact, work, consume, and live. Increasing computing power will lead to unobtrusive AR devices that seamlessly integrate virtual content and the physical world. AR will become as omnipresent and pervasive as the Internet and smartphones (Regenbrecht *et al.*, 2022, 2024), often labeled as the era of spatial computing. However, very little is known about how consumers anticipate these changes and plan to integrate immersive AR technology into their lives, especially when they have limited experience with such technologies. Insights into consumers' anticipation of innovative AR technologies and experiences will enhance theoretical models of adoption, offering practical guidelines for businesses and policymakers about potential technological and societal impacts.

To address this research gap, the current study builds on inspiration theory (Thrash and Elliot, 2003) and investigates how consumers' initial exposure to immersive AR content through the Microsoft HoloLens influences their anticipated life outcomes. Inspiration remains an underexplored concept in marketing and beyond, yet its potential to meaningfully shape consumer perceptions and goals has gained increasing recognition in recent years. For example, Böttger *et al.* (2017) showed that providing shoppers with ideas for recipes at a retail store (rather than just a regular promotion focusing on the product) resulted not only in substantially higher levels of self-reported inspiration but also in a higher purchase frequency of the advertised product. Similarly, Grewal *et al.* (2023) found that inspirational content that sparks ideas on how to use the product (as compared to deal-oriented, traditional promotions) activates a stronger motivation for consumption goal completion, resulting in increased spending at the store. These examples demonstrate the potential for inspirational content to influence consumer goals and behavior.

The contribution of our research is threefold. First, it adds to prior research on inspiration (Böttger *et al.*, 2017; Grewal *et al.*, 2023; Thrash and Elliot, 2003, 2004) by demonstrating the temporal robustness of consumer inspiration in an AR context using a time-lagged research design. Specifically, we measured the extent to which consumers were inspired to integrate AR into their lives ("inspired-to") approximately five days after assessing their level of inspiration by experimenting with AR headsets ("inspired-by").

Second, our research extends prior research on inspiration in a technology-focused context (Hinsch *et al.*, 2020; Rauschnabel *et al.*, 2019; Zanger *et al.*, 2022). Results show that factors related to the content of AR and the AR device influence how consumers feel inspired by AR applications, with implications for their intention to integrate AR into their lives. Adding to prior work on the antecedents of AR (Arghashi and Yuksel, 2022; tom Dieck *et al.*, 2025), we show that using an immersive 3D headset in an AR context, both utilitarian and hedonic benefits influence inspiration. Additionally, the device's wearable comfort has a positive impact on consumer inspiration, reinforcing conceptual work that calls for integrating hardware factors into AR consumer research (Barta *et al.*, 2025; Rauschnabel *et al.*, 2024a).

Third, whereas prior research on AR outcomes typically focuses on narrow, short-term consequences such as attitudes, brand perceptions, or purchase intentions (e.g. Barta *et al.*, 2023a; Rauschnabel *et al.*, 2024b; Schein *et al.*, 2025; von der Au *et al.*, 2023), this research investigates the influence of AR-triggered inspiration on three consequential "consumer lives" variables. Specifically, we explore how consumers, inspired by an immersive AR experience, intend to enhance reality in the future, substitute physical with virtual products, and engage in new communication practices through socialization in AR communities.

For managers, our findings offer actionable guidance on the key factors that inspire customers and thereby promote the broader adoption of AR technologies. While technical features of AR apps and devices are important and often prioritized, our research underscores the equal importance of AR content to deliver meaningful hedonic and/or utilitarian value to users. Thus, we demonstrate that effective AR implementation requires attention to both "high-tech" and "high-touch" elements (Wünderlich *et al.*, 2013).

2. The road toward ubiquitous and pervasive AR

2.1 xReality (XR)

AR and virtual reality (VR) represent two types of realities that are subsumed by XR in the literature, where the X is interpreted as a placeholder for any form of new reality (hence: xReality) rather than referring to extended reality (Rauschnabel *et al.*, 2022). In VR, consumers are disconnected from the real world by being embedded in a fully artificial, virtual environment. Hence, user experience in VR has been described as telepresence, which refers to a sensation of being transported to a different world or "being there" (Cowan and Ketron, 2019). In contrast, AR overlays the physical environment with virtual objects or information blending physical and virtual environments (Barta *et al.*, 2025). Consequently, users are not completely disconnected from their real, physical environment, and achieving a realistic and compelling experience for AR users requires anchoring virtual objects correctly in the physical environment. The main differentiator from VR is that, instead of generating *telepresence*, AR produces *local presence*, i.e., virtual content is perceived as being actually "here" (Schein *et al.*, 2025).

Currently, AR applications for mobile devices, such as smartphones and tablets, are the most common form of AR (Barta *et al.*, 2025). However, for AR experiences that lean toward highly immersive environments, traditional two-dimensional, screen-based mobile devices may prove insufficient (Hoyer *et al.*, 2020). In such cases, specialized head-mounted devices, such as AR headsets or smart glasses (ARSGs), become essential (Rauschnabel, 2018). These advanced AR headsets can be categorized into two types: optical see-through and video see-through (Ballestin *et al.*, 2018). Optical see-through headsets use projection surfaces (i.e., transparent screens) to display only virtual content, while the physical environment remains visible directly through the headsets. Thus, when the AR function of the headsets is turned off, users perceive only the real, physical environment directly. In contrast, video see-through AR captures the real world in a live video stream, augments it in real-time, and displays it on screens. Consequently, both virtual content and the physical environment are rendered as pixels. While optical and video see-through headsets differ in their underlying technology, they share certain common features. First, both are binocular systems, meaning virtual content is projected into both eyes rather than just one. This allows for immersive, three-dimensional AR experiences where users perceive depth, enabling them to distinguish near and far objects. Second, both systems incorporate advanced tracking technology. Unlike most of today's smartphones, AR headsets employ multiple tracking technologies, such as various depth sensors and multi-camera systems, enabling more precise and dynamic tracking of the physical environment.

Contrary to most prior research on AR (e.g. Fritz *et al.*, 2023; Hinsch *et al.*, 2020; Zanger *et al.*, 2022), this study makes use of more advanced optical see-through AR headsets. The methodology section elaborates on the technical characteristics of the optical see-through headset used in our experiments, the Microsoft HoloLens.

2.2 Ubiquity of AR

With continuous advances in technology, computing power, and information processing, AR headsets are predicted to become lighter, more efficient, and increasingly user-friendly, resembling an unassuming pair of glasses or contact lenses mirroring an unobtrusive small screen that is folded in front of one's eye. As such, AR is becoming an essential building block of spatial computing (Deloitte, 2024) and a future metaverse (Chen *et al.*, 2024). Such ubiquitous and pervasive integration of AR into consumers' lives has recently been conceptualized as the AR Cloud, defined as persistent, location-anchored AR experiences with high levels of interoperability and accessibility across various devices and users (Alimamy and Jung, 2025). Consequently, as outlined by Regenbrecht *et al.* (2024), AR will likely revolutionize the way users interact with technology as much as smartphones did over the last 15 years. Given the substantial impact that AR will have on consumers' lives, surprisingly, prior research has not yet investigated consumers' anticipated life consequences and future AR adoption plans upon being exposed to an immersive 3D AR experience for the first time. The current research addresses this gap in the literature and builds on insights from inspiration in AR (Hinsch *et al.*, 2020; Rauschnabel *et al.*, 2019) investigating how consumers plan to integrate AR into their lives through, e.g., actively seeking out AR experiences, replacing physical with virtual objects, and socializing through AR platforms.

3. Inspiration as a theoretical lens

3.1 Inspiration as a process

In their seminal work on inspiration, Thrash and Elliot (2003, p. 871) adopted the Oxford English Dictionary's definition of "a breathing in or infusion of some idea, purpose, etc. Into the mind; the suggestion, awakening, or creation of some feeling or impulse, especially of an exalted kind." In the marketing literature, inspiration is commonly conceptualized as a "motivational state that compels individuals to bring ideas into fruition" (Oleynick *et al.*, 2014, p. 1). However, inspiration is not the same as motivation. Rather, inspiration can be seen as a particular case of the more general concept of motivation (Thrash and Elliot, 2003, 2004). For example, prior research has emphasized that motivation is the force that drives goal-directed behaviors (Ryan and Deci, 2000), and it can be either intrinsic (i.e. driven by the enjoyment of the task itself) or extrinsic (e.g. driven by external needs). In contrast, inspiration is highly intrinsic yet evoked through external stimuli, such as AR content (Arghashi, 2022; Arghashi and Yuksel, 2022; Hinsch *et al.*, 2020; Rauschnabel *et al.*, 2019; Zanger *et al.*, 2022). Moreover, inspiration "bridges the gap between the deliberation phase (i.e. goal setting) and the implementation phase (i.e. goal striving) of goal pursuit" (Böttger *et al.*, 2017, p. 117).

This bridging function is manifested in conceptualizations of inspiration. For instance, Thrash and Elliot (2004, p. 958) argued that "inspiration is a hybrid construct that emerges from the juxtaposition of two component processes, one involving an appreciation of and accommodation to an evocative object (hereafter referred to as being inspired-by), the other involving motivation to extend the qualities exemplified in the evocative object (hereafter referred to as being inspired-to)". In the marketing literature, Böttger *et al.* (2017) conducted a scale development study and generated a two-dimensional inspiration scale: First, an activational "inspired-by" component, i.e. "the reception of a marketing-induced new idea (i.e., evocation) and the shift in customer awareness toward new possibilities (i.e. transcendence)" (p. 118). Second, the inspired-to component, i.e., "the intrinsic pursuit of a consumption-related goal" where consumers "urge to actualize the new idea (e.g., by purchasing and using a product)" (p. 119). Thus, inspired-to represents an intention that frequently leads to actual behaviors.

Although the concept of inspiration has been studied across disciplines, there is a need for domain-specific conceptualizations. For instance, in a marketing context, Böttger *et al.* (2017) used general items such as "My imagination was stimulated" or "I was intrigued by a new idea" to measure inspired-by, but then employ very purchase-specific items (e.g., "I was inspired to buy something" or "My interest to buy something was increased") to measure inspired-to. Hence, we concur with Böttger *et al.* (2017) that domain-specific adoptions of the inspiration construct are necessary. Our work substantially extends prior research on inspiration and AR by exploring how AR can affect consumers' lives as a whole, rather than focusing only on attitudes, purchase intentions, or similarly narrow outcome variables, as in previous studies. Furthermore, we measure inspired-by and inspired-to with a time lag, which adds temporal stability to our findings, and we ask subjects to reveal past behaviors since they can be more accurate and informative than intentions (Sheeran *et al.*, 1999).

3.2 Inspiration in prior AR research

Inspiration is highly relevant in explaining a variety of behaviors; however, inspiration research in an AR context remains scarce even though the medium is ideally suited to inspire users through its unique ability to combine diverse and imaginative content with the real world (Zanger *et al.*, 2022). This ability of AR to generate high levels of inspiration builds on the unique characteristics of AR, including immersion, presence, and interactivity (Schein *et al.*, 2025). For instance, AR experiences, especially wearable 3D devices, can evoke high levels of local presence, defined as the sensation that virtual content is actually "here" (that is, in the physical surroundings of the viewer) (Schein *et al.*, 2025; von der Au *et al.*, 2023). Finally, AR applications usually provide a high level of interactivity, which in turn leads to positive consumer outcomes (Huang and Liao, 2017; Yim *et al.*, 2017).

Based on a literature search in popular databases with the keywords "inspiration" and "augmented reality", we identified eight relevant studies. These studies are mostly grounded in marketing and consumer research, and, in some cases, the authors did not explicitly indicate whether their inspiration measure referred to the inspired-by or inspired-to component of the inspiration process. In these cases, we further analyzed the wording of the items as well as any explanations provided by the authors, and then made a decision regarding whether the measure was more representative of inspired-by or inspired-to based on the meaning of the items.

The findings suggest that inspiration not only directly influences relevant consumer outcomes but also produces indirect effects. Moreover, inspiration outperforms well-established marketing constructs, such as app evaluations (Rauschnabel *et al.*, 2019) and the wow-effect (Arghasi, 2022; Hinsch *et al.*, 2020), in explaining consumer behavior. Furthermore, prior research has shown significant short-term effects of inspiration (i.e. typically by measuring inspired-by and inspired-to in one questionnaire). Thus, the current study is designed to investigate the temporal robustness of the inspiration process by measuring inspired-by and inspired-to at different points in time. Table 1 shows the objectives, research design, AR type, main findings on inspiration, and temporal dimension (short-term vs time-lagged) for each publication.

4. Conceptual framework

Our conceptual framework (Figure 1) is based on the premise that users' expectations regarding how AR will influence their lives (the outcome variables in our model) are shaped by their perceptions of AR content (perceived hedonic and utilitarian benefits) as well as their evaluations of key AR device characteristics (wearable comfort and device design). These relationships are mediated by the inspiration process. Drawing on Thrash and Elliot's (2004) inspiration theory, we posit that inspiration as a process consists of two stages: inspired-by and inspired-to. Contrary to prior AR work on inspiration (Arghashi, 2022; Hinsch *et al.*, 2020; Rauschnabel *et al.*, 2019), we measured inspired-by and inspired-to at two different points in time, thus providing evidence for the temporal stability of our effects.

4.1 Antecedents to inspiration

Recent research has argued that "good" AR experiences emerge when several factors, particularly those related to the consumer (who), the context (where), the content (what), and

Table 1. Key studies of inspiration in AR

Study	Objective	Research design	AR	Inspired-by	Inspired-to	Stability of the effects[a]	Main findings on inspiration
Rauschnabel *et al.* (2019)	Exploring how AR can improve brand attitudes	Survey	Mobile AR (smartphone)	✓	–	Cross-sectional	Inspiration increases brand attitudes
Hinsch *et al.* (2020)	Understanding how AR can generate the intention to engage with branded products	Survey	Mobile AR (tablet)	✓	✓ Building with Lego	Cross-sectional	Inspiration process is mediated by nostalgia but not the wow-effect
Nikhashemi *et al.* (2021)	Examining how AR interaction increases customer benefits, engagement and behavioral consequences	Survey	Mobile AR (smartphone or tablet)	✓	✓ Continuous intention, willingness to pay price premium	Cross-sectional	Psychological inspiration's impact on willingness to pay a premium is non-linear. AR personalization moderates the link between utilitarian and hedonic benefits and inspiration
Arghashi (2022)	Analyzing purchasing drivers in AR shopping	Experimental study (AR vs non-AR)	Mobile AR (smartphone)	✓	✓ Hedonic shopping motivation and purchase intention	Cross-sectional	Novelty drives inspiration; inspiration leads to hedonic shopping motivations and purchase intention
Arghashi and Yuksel (2022)	Understanding how inspiration drives flow (and further downstream consequences) in AR marketing	Survey	Mobile AR (smartphone)	✓	–	Cross-sectional	Inspiration drives flow, which increases engagement
Zanger *et al.* (2022)	Exploring how inspirational AR content can turn affect into cognition and behavior	Experimental studies (AR vs non-AR)	Mobile AR (tablet)	✓	✓ Purchase intention, WoM intentions	Cross-sectional	Inspiration mediates the effect of enjoyment on cognitive constructs, drives behavioral responses and increases brand attitude

(*continued*)

Table 1. Continued

Study	Objective	Research design	AR	Inspired-by	Inspired-to	Stability of the effects[a]	Main findings on inspiration
Kumar and Agarwal (2025)	Assessing the effect of AR filters on social media users' self-concept and well-being	In-depth interviews	Mobile AR (AR filters on Snapchat and Instagram)	✓	✓ Reducing ideal actual gap, well-being	Cross-sectional	AR filters can inspire users by enhancing their appearance and encouraging experimentation and self-expression. However, they may also reinforce unrealistic beauty standards, widening the gap between ideal and actual self-perception
Tang and Zhou (2025)	Evaluating AR's role in heritage tourism, emphasizing its source of the inspiration experienced by visitors	Experimental studies (AR vs non-AR)	Pictures, videos, mobile AR (tablet)	✓	✓ Satisfaction	Cross-sectional	Inspiration acts as a mediator in the relationship between intertemporal connectedness and visitor satisfaction
This study	Understanding the anticipated life impact of AR	Survey (antecedents and outcomes of inspiration when using AR HoloLens)	wearable AR (Microsoft HoloLens)	✓	✓ Anticipated impact on life	Time-lagged	First-time exposure to AR can trigger an immediate inspiration, which drives inspired-to constructs even a week later

Note(s): [a]Time-lagged in our study refers to the measurement of inspired-by at t1 and inspired-to at t2 (on average about five days later)

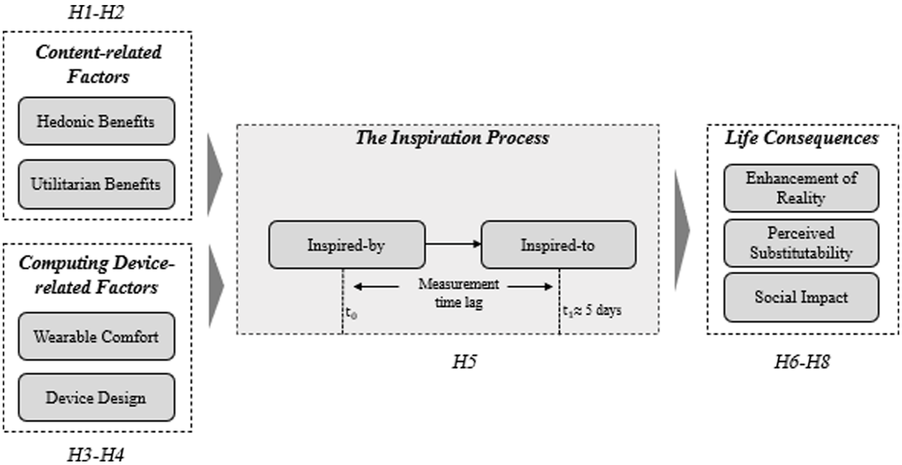

Figure 1. Conceptual framework: augmented reality and life consequences

the computing device (how), are well aligned (see the 4C framework; Rauschnabel *et al.*, 2024a). Here, we particularly focus on two factors related to the content (consumer perceptions of entertainment and usefulness) and the computing device (consumer perceptions of design and ergonomics).

4.1.1 Hedonic benefits. Prior research on technology consumption has suggested that technology use produces both hedonic and utilitarian benefits (Hilken *et al.*, 2017). In the context of AR applications, hedonic benefits refer to the extent to which consumers expect to gain emotional rewards (e.g. enjoyment, entertainment, and sensory pleasure) from using AR apps (Hilken *et al.*, 2017). Immersive technologies can provide hedonic benefits, which can lead to inspiration (because they provide a sense of well-being and happiness that can be a source of motivation to pursue new ideas and opportunities (Hinsch *et al.*, 2020; Thrash and Elliot, 2004). Being relaxed and enjoying an activity can allow our minds to be more receptive and open to new ideas (Davis, 2009). Drawing on these insights, we predict that inspiration increases when consumers perceive emotional gratification through hedonic benefits (Rauschnabel *et al.*, 2019).

H1. Hedonic benefits lead to an initial inspired-by state.

4.1.2 Utilitarian benefits. Utilitarian benefits are functional and goal-oriented (Hilken *et al.*, 2017). They reflect the extent to which consumers believe that using a mixed reality device increases their productivity. Finding useful solutions can inspire new ways of dealing with current problems, generating inspiration for new ideas. Utilitarian benefits can generate inspiration by providing a practical, individual-oriented approach to the creation of new ideas and solutions (Zanger *et al.*, 2022). By focusing on individuals' specific problems and needs, new paths can be found to address and improve a consumer's situation. In this sense, consumers of immersive experiences can better understand problems and benefits that other individuals may face in these domains (Rauschnabel, 2018). Consequently, we posit that increased understanding and usefulness of information provided by immersive experiences leads to the generation of new ideas.

H2. Utilitarian benefits lead to an initial inspired-by state.

4.1.3 Wearable comfort. In general, research has discussed the term "fashnology," a combination of fashion and technology, as an overarching concept in the study of wearables (Rauschnabel, 2018). A comfortable device can inspire consumers to use it more often, which increases the chance of being exposed to new ideas and opportunities. For any wearable device, sufficient comfort is essential for users not to be distracted from their tasks or negatively affected by their immersive experience. High levels of device comfort can facilitate inspiration by providing a pleasant physical and tactile environment for the user, enhancing (and not impeding) their experience and encouraging them to look for new ideas and opportunities (Resnick and Rosenbaum, 2013). Moreover, comfortable devices to hold and use can reduce user fatigue and stress, which in turn affects the user's concentration (Fuentes and Svingstedt, 2017). Accordingly, the following hypothesis is proposed:

H3. Wearable comfort leads to an initial inspired-by state.

4.1.4 Device design. Product design is a crucial factor in the user experience process (Bloch, 2011). An attractive and well-thought-out design can suggest new functions or ways of using the device. A device that is easy to use and understand can also inspire people to explore its possibilities and discover new features. In addition, the esthetic appeal of wearable devices affects their usage intention, as they are a mixture of technology and fashion (Pal *et al.*, 2020). Therefore, beyond the idea that comfort enhances inspiration by promoting prolonged usage, the device's design can similarly foster inspiration. Consequently, we propose:

H4. The device's design leads to an initial inspired-by state.

4.2 The inspiration process

We conceptualize inspiration as a two-stage process consisting of an activational inspired-by construct that drives a goal-oriented inspired-to motivation (Böttger *et al.*, 2017; Oleynick *et al.*, 2014). The inspired-by component refers to the reception of new ideas and possibilities, whereas the inspired-to component reflects consumers' goal-oriented intentions to engage in a specific behavior (Böttger *et al.*, 2017). Prior research has demonstrated that immersive technologies, such as AR, can substantially enhance consumer inspiration (Rauschnabel *et al.*, 2019). For example, consumers may be *inspired by* experiencing how different pieces of furniture or different wall colors affect the visual appearance of a home in an AR environment, and may then be *inspired to* change the interior of their own home. Importantly, inspired-by and inspired-to are causally linked, implying that when consumers feel inspired-by through the exposure to activating stimuli, they are usually inspired to act in a goal-oriented way (Winterich *et al.*, 2019). Thus, we hypothesize that:

H5. Inspired-by leads to inspired-to.

4.3 Inspiration's effects on AR-enabled life consequences

Both academics and industry experts have pointed out the potential of AR to substantially change how people live. For example, prior research has suggested that consumers may become increasingly interested in integrating AR into their lives by enhancing reality with virtual objects (Rauschnabel *et al.*, 2022), substituting physical objects with virtual ones (Flavián and Barta, 2022), and redefining or rediscovering their self-concept through AR technology (Ambika *et al.*, 2023). Industry experts also agree that AR will affect how people live, work, and shop in quite substantial ways (Anderson and Rainie, 2022). The theory of sociotechnological imaginaries explores how societies imagine and organize their desired futures through science and technology, and has been successfully used in contexts related to XR and the metaverse. It therefore provides a highly relevant theoretical lens for our hypotheses regarding the AR-enabled life consequences of our conceptual model. Therefore, drawing on Jasanoff and Kim's (2015) theory of sociotechnological imaginaries, we predict that inspiration, triggered by truly immersive 3D AR technology, sparks consumers' imagination regarding the integration of AR into multiple facets of their lives.

4.3.1 Desired enhancement of reality. Inspiration toward an activity or desire has been conceptualized as a mental process to reach higher knowledge or wisdom (Milyavskaya *et al.*, 2012). In other words, it refers to a stimulus that facilitates a way to turn a creative idea into something concrete. Drawing on cognitive reframing (Mukherjee *et al.*, 2020), defined as a deliberate change in the way individuals or organizations perceive and interpret a situation, we posit that inspiration leads to specific ideas or actions that can change reality (Thrash *et al.*, 2010), whether that reality is real or virtual. Previous research on immersive technologies has already shown that inspiration generates consequences, such as changes in brand attitudes when users interact with AR apps (Rauschnabel *et al.*, 2019). Moreover, inspiration is closely linked to the emergence of insights (Böttger *et al.*, 2017). This inspiration can facilitate concrete ideas that emerge during the process. Consequently, based on the previous arguments, the insights generated by inspiration will motivate individuals to change their situation, context, or perception of reality.

H6. Inspired-to has a positive effect on the desired enhancement of reality.

4.3.2 Intended substitution of physical products. In the same way that QR codes have already replaced some restaurant menus after the COVID-19 pandemic, user behavior can shift almost instantly through AR use. For instance, less obtrusive AR headsets like ARSGs (Windhausen *et al.*, 2024) may facilitate the replacement of physical art, which indeed is prone to damage and theft, with virtual or non-fungible token (NFT) artwork (Sung *et al.*, 2023). AR-enhanced museum visits have demonstrated that consumers see value in the esthetic augmentation of reality (He *et al.*, 2018). Hence, cognitive reframing (Mukherjee *et al.*, 2020) may facilitate how individuals mentally switch between value perceptions of virtual versus physical objects. Therefore, we expect that the visualization of application examples in which virtual elements are fully integrated into the real-world environment will spur the intention of substituting virtual or augmented products in other use cases.

H7. Inspired-to has a positive effect on the intention to substitute virtual products for physical ones.

4.3.3 Social impact. Finally, inspiration may also generate a positive social impact for users by motivating them to communicate with other AR users and expand their social networks. For example, the potential for individuals to be represented through avatars sharing the same virtual space may encourage users to explore AR communities and communicate with other AR users due to the high degree of social presence (Barta *et al.*, 2023b, 2024). Moreover, the ease of performing collaborative tasks in a shared environment can also motivate the adoption of communication between AR users, driven by the enhanced benefits AR offers for work-related tasks (Piumsomboon *et al.*, 2019). Hence, we posit that the "inspired-to" dimension may evoke transcendence motivation (Böttger *et al.*, 2017; Thrash and Elliot, 2003, 2004). Specifically, users see immersive technology not only as a tool for utility or pleasure, but as a means to achieve broader personal or social goals that go beyond the mundane and convey a sense of greater meaning or purpose (e.g. connecting with others, self-expression). We argue that similar to the development of social media networks, communication through AR communities and the expansion of AR networks will gain momentum as current technologies develop, ultimately resulting in an AR-enabled spatial computing environment.

H8. Inspired-to has a positive effect on social impact.

5. Methodology and research design

Participants experienced AR content through an AR headset, the Microsoft HoloLens. This device offers a holographic resolution with two high-definition 16:9 light engines producing 2.3M total light points, with automatic pupillary distance calibration. To understand the actions of users and the environment, it uses gaze tracking, gesture input, voice support, and sound (Microsoft, 2024). Since data collection requires time-consuming one-on-one sessions with the researchers, we recruited students from a public university in North America to participate in a laboratory study in exchange for partial course credit. Students were suitable for this study since they are common consumers of AR content (Rauschnabel *et al.*, 2019). Data collection occurred at two different points in time with a lag of approximately five days for each participant. We selected a five-day interval between survey waves to balance methodological rigor with practical constraints. This gap is long enough to assess whether effects persist beyond the immediate experience, while short enough to minimize participant attrition and memory decay—both of which are concerns with longer lags. To attenuate potential demand effects (i.e., situations where participants alter their behavior, responses, or attitudes because they believe they understand the purpose of the study and want to "help" confirm the hypotheses), we did not reveal our specific hypotheses or key constructs of interest to participants and instead framed the study broadly as research on "new experiences with digital technology." Furthermore, the variety of AR applications used also helped mask the study's focus on inspiration and anticipated life consequences.

In stage 1, participants first provided demographic information and indicated their familiarity with AR headsets. None of the respondents reported having previous experiences with AR headsets. After completing the survey, participants underwent a short training session with the HoloLens device placing and moving around virtual objects in the room. To generate variance, participants were then randomly assigned to one of three AR application types that differed in usage context (creative [$N = 52$; AR Rails], learning [$N = 46$; Galaxy Explorer], and gaming [$N = 50$; RoboRaid, Actiongram, Young Conquer, Fragments, Exercise Trainer]) and used the AR app for an average of five minutes (example visuals are available on request). Next, participants responded to questions related to hedonic benefits, utilitarian benefits, wearable comfort, device design, and inspired-by. The entire process for stage 1 took about 25–30 min per respondent. For stage 2, respondents were contacted again approximately five days later and were asked to answer questions pertaining to the three outcome variables and the "inspired-to" construct.

Whenever possible, measurement items were based on established scales from the literature and formulated on Likert scales ranging from 1 ("strongly disagree") to 7 ("strongly agree"). Consistent with our definitions, we adopted existing scales to the study context, in particular hedonic benefits (Venkatesh *et al.*, 2012), utilitarian benefits (Davis, 1989), wearable comfort (Rauschnabel, 2018), computing device's design (Gilal *et al.*, 2018), inspired-by (Thrash and Elliot, 2004), inspired-to (Böttger *et al.*, 2017), desired enhancement of reality (Rauschnabel, 2018), perceived substitutability (Rauschnabel, 2021), social impact (Kreijns *et al.*, 2007) and familiarity with AR headsets (Yang *et al.*, 2020).

The final usable sample size consisted of 148 students (business majors). Table 2 shows the scale items as well as the sample characteristics and descriptive statistics. Since we were interested in generalizable effects of AR use across different usage types and not in the specific effects of app type, we pooled the data from the three apps in the subsequent analyses.

6. Results

We used SmartPLS version 4.1.0.9 to conduct a partial least squares structural equation modeling (PLS-SEM) to test our hypotheses (Ringle *et al.*, 2024). We applied bootstrapping using 5,000 re-samples (Sarstedt *et al.*, 2022).

6.1 Measurement model assessment

We assessed the psychometric characteristics of our latent constructs using established criteria (Table 2 and Table A1 in the Web Appendix). Established tests for discriminant validity and common method variance did not indicate any concerns.

Table 2. Measures

Construct	Time when measured	Measures	M	SD	Factor loadings	Cronbach alpha	CR	AVE
Independent variables								
Hedonic Benefits	Stage 1 (After using)	Using HoloLens can be fun	6.49	0.82	0.95	0.96	0.97	0.93
		Using HoloLens can be enjoyable			0.97			
		Using HoloLens can be very entertaining			0.97			
Utilitarian Benefits	Stage 1 (After using)	I find HoloLens can be useful in my daily life	4.75	1.54	0.91	0.92	0.95	0.87
		Using HoloLens can help me accomplish things more quickly			0.95			
		Using HoloLens can increase my productivity			0.93			
Wearable Comfort	Stage 1 (After using)	Using HoloLens is comfortable	3.07	1.66	0.93	0.92	0.94	0.86
		Wearing HoloLens does not cause discomfort while wearing			0.93			
		Having the HoloLens on my head does not feel uncomfortable			0.91			
Design	Stage 1 (After using)	I like the design of HoloLens	3.67	1.63	0.95	0.88	0.94	0.89
		HoloLens looks good			0.94			
Mediators								
Inspired-by	Stage 1 (After using)	Using HoloLens is inspiring	5.53	1.19	0.92	0.75	0.90	0.81
		Using HoloLens is stimulating			0.88			
Inspired-to	Stage 2	*Question text: How did using the HoloLens impact you after trying it?*	3.37	1.90		0.92	0.95	0.87
		I developed ideas about how HoloLens can change the way I live			0.93			
		I developed ideas about how HoloLens can change the way I work			0.93			
		I developed ideas about how HoloLens can change the way I communicate			0.94			

(*continued*)

Table 2. Continued

Construct	Time when measured	Measures	M	SD	Factor loadings	Cronbach alpha	CR	AVE
Dependent Variables		*Question text: "Now think of HoloLens in general. Based on discussions with you and other participants, we created a list of how consumers could benefit from HoloLens. We would like to know what you think of this. If I had HoloLens, I would use it to/for/because . . ."*						
Enhancement of Reality	Stage 2	. . . experience reality in a better way	4.32	1.65	0.94	0.90	0.94	0.84
		. . . augment my perception of reality in a positive way			0.89			
		. . . influence the perception of reality in a better way			0.92			
Perceived Substitutability	Stage 2	. . . replace certain physical things (e.g. devices) with holograms	4.00	2.06	0.97	0.95	0.97	0.95
		. . . digitally substitute for several of my physical objects			0.97			
Social Impact	Stage 2	. . . get to know other HoloLens users	3.83	1.77	0.95	0.93	0.95	0.88
		. . . expand my social network			0.91			
		. . . become part of the HoloLens community			0.95			
Control variables								
Familiarity with AR headsets	Stage 1 (Before using)	I am familiar with smart glasses	3.78	1.53	0.96	0.84	0.92	0.86
		I know a lot about smart glasses			0.88			
Type of the app	Stage 1 (Before using)	App used (creative, learning or gaming)	n/a	n/a	n/a	n/a	n/a	n/a
Age	Stage 1 (Before using)	How old are you? (please enter number in years)	22.44	4.87	n/a	n/a	n/a	n/a
Gender (0 = female)	Stage 1 (Before using)	What's your gender? [49% males]	n/a	n/a	n/a	n/a	n/a	n/a
Time difference	Stage 2	Number of days from stage 1 to stage 2	4.92	2.91	n/a	n/a	n/a	n/a

Note(s): n/a: not applicable

6.2 Structural model assessment

As predicted, hedonic (β = 0.332, $p < 0.001$) and utilitarian (β = 0.420, $p < 0.001$) benefits were positively related to inspired-by, supporting H1 and H2, respectively. Likewise, wearable comfort was positively related to inspired-by (β = 0.156, $p = 0.019$), supporting H3. However, contrary to our expectations, the design aspects of the device were not related to inspired-by (β = 0.003, $p = 0.973$), and hence H4 was not supported. As predicted, inspired-by (measured at stage 1) had a positive influence on inspired-to (measured about five days later; β = 0.509, $p < 0.001$), supporting H5. The time lag in the measurements between inspired-by and inspired-to provided evidence for the temporal stability of the inspiration process. Finally, inspired-to was positively related to the enhancement of reality (β = 0.564, $p < 0.001$), substitutability (β = 0.430, $p < 0.001$), and social impact (β = 0.523, $p < 0.001$), supporting H6, H7, and H8, respectively. All effects are visualized in Figure 2.

In addition, we examined the relationship between our control variables and the dependent variables of the research model. Prior familiarity with AR headsets, age, and time-lapse between surveys did not significantly affect the three dependent variables (p-values > 0.05). Gender was positively associated with perceived substitutability (β = 0.341, $p = 0.026$), with no effect on the other dependent variables (p-values > 0.05). Specifically, male participants showed a higher willingness to substitute real objects with virtual ones than female participants.

Finally, we also examined the explained variance (R^2) and the predictive relevance (Q^2) for all endogenous constructs. Following Hair *et al.* (2022), R^2 was moderate for inspired-to ($R^2 = 0.259$, $Q^2 = 0.198$), enhancement of reality ($R^2 = 0.342$, $Q^2 = 0.182$), substitutability ($R^2 = 0.291$, $Q^2 = 0.159$), and social impact ($R^2 = 0.279$, $Q^2 = 0.096$), and substantial for inspired-by ($R^2 = 0.471$, $Q^2 = 0.435$). All Q^2 values were above zero, indicating acceptable predictive relevance (Hair *et al.*, 2022). In addition, an analysis based on PLSpredict (Table C1 in the Web Appendix) revealed satisfying predictive power for our model (Shmueli *et al.*, 2019).

6.3 Robustness tests

To test whether our results were generalizable across the three different AR app types assigned to participants in our study (creative, learning, or gaming), we ran a multigroup analysis in SmartPLS. Pairwise comparisons of the three groups showed no statistically significant differences in the path coefficients between the groups. Hence, we concluded that our results were generalizable across different AR app types (Table B1 in the Web Appendix). Moreover, replications using simple regressions in SPSS led to similar conclusions.

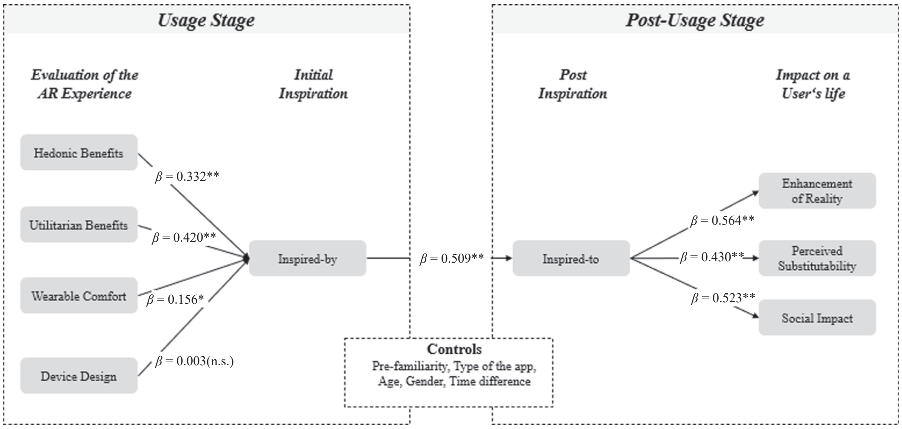

Figure 2. Structural model results. Notes: **: significant at the 0.01 level; *: significant at the 0.05 level; n.s.: not significant

6.4 Mediation analyses

Next, we formally assessed serial mediation. Specifically, we estimated a model that tested whether the inspiration process (inspired-by and inspired-to) serially mediates the relationship between the four antecedents and the three life consequence variables. We assessed the indirect effects using a bootstrapping procedure in SmartPLS using 10,000 re-samples (Hair *et al.*, 2022). Formal mediation was (partially) established for the three significant independent variables (Table D1 in the Web Appendix).

7. Discussion

7.1 Summary

The current study investigates the effect of highly realistic AR content via AR headsets on first-time users' expected life outcomes through the lens of inspiration theory. Specifically, findings confirm that hedonic and utilitarian benefits, as well as wearable comfort, influence consumers' initial inspiration. Interestingly, device design does not contribute to this state of inspiration. During the inspiration process, initial inspiration (i.e. inspired-by) impacts later inspiration (i.e. inspired-to), confirming continuous feelings of inspiration despite a five-day time lag. Furthermore, prolonged feelings of inspiration triggered by using AR headsets positively influence consumers' desire to experience enhanced reality, substitute physical products, and socializing in virtual spaces.

In contrast to previous studies, the current research assesses the prolonged effect of AR content by incorporating a temporal lag design. Specifically, sampling included immediate reaction to the AR content both upon exposure and five days later. This approach enables the assessment of the persistent effects of AR exposure rather than simply focusing on immediate reactions, as is the case in most previous studies. Overall, our study may serve as a basis for future research exploring the boundary conditions of our findings and their replication across cultures.

7.2 Theoretical contributions

This research empirically shows that the two stages of inspiration serve as a mediating force between consumers' evaluation of AR experiences (e.g. hedonic, utilitarian, and ergonomic factors) and their anticipated life consequences. To date, the inspiration concept has received little attention in the AR literature, but it is an important component in terms of innovation, consumption, and consumer behavior. Understanding how spatial computing can influence and inspire consumers will be critical to efforts to enhance society through both the production of spatial computing products that create value for consumers and the leveraging of these technologies to innovate in diverse arenas.

Second, most existing AR studies have evaluated the short-term effects of this technology on consumers. For example, common research designs examine AR versus non-AR experiences and administer a survey immediately following this experience. Only a few studies have incorporated data collection across different time points. For instance, some studies (e.g. Rauschnabel *et al.*, 2019; Zanger *et al.*, 2022) have looked at brand evaluations before and after using an app, yet the time lag was limited to a few minutes. As such, insights and generalizability remain limited to the short-term. The present study incorporates a time lag spanning multiple days, contributing to our understanding of the impact of AR on consumers over time. Specifically, this study is the first that places a temporal lag between the measurement of "inspired-by" and "inspired-to" within the context of AR. While prior research has focused on the novelty of inspiration (i.e., Hinsch *et al.*, 2020), the temporal lag of the two inspiration elements offers a deeper understanding of this key concept. As such, these new insights reinforce the primacy of inspiration over secondary concepts like awe, novelty, or the wow-effect as the preeminent driver of this effect.

Third, most AR and VR research has focused on specific interest groups that share many attributes. The current research is agnostic to demographics as it examines more broadly on individuals who are exposed to the technology for the first time. While respondents with this profile can still be found today, these technologies are diffusing into the market at a rapid pace, and the window to study individuals' initial exposure to this type of technology is closing quickly. Findings show that even as a first exposure, the technology has advanced to the point that neophytes can process and enjoy AR content. In addition, the two-stage process of inspiration holds even with neophyte subjects, new technology, and temporal lags between the measurement of inspiration.

Fourth, while existing AR studies have focused on specific disciplines, apps, or consumer outcomes (e.g., purchase intentions), this research offers insights into consumers' lives in general. Furthermore, the data shows that both hedonic and utilitarian factors drive the inspiration process in AR applications. These antecedents drive outcomes, mediated by inspiration, associated with consumer adoption of the technology, like the desired enhancement of reality, intent to substitute products, and evolving communication practices. These findings suggest that even for an individual who has no experience with these technologies, contemporary applications could inspire, and subsequently drive attitudes and intentions at least a week into the future.

Finally, our results suggest that wearable comfort significantly drives the inspiration process and that inspiration mediates the relationship between comfort and all three outcome variables. While AR researchers often focus on how different types of content affect user responses, our findings underscore the crucial role of hardware factors, largely beyond the control of developers. In particular, the comfort (or lack thereof) of a device can enhance or diminish the effectiveness of AR content. Accordingly, researchers studying AR should pay close attention to the devices used in their studies. In particular, when comparing AR headsets with non-AR devices such as tablets, differences in results may be due as much to user comfort as to the basic characteristics of the technology.

7.3 Managerial and societal implications

The present research offers several implications for managerial, political, and commercial decision-makers. First, even an initial exposure to AR content can trigger inspirational thinking and drive user intentions five days into the future. Companies can leverage this by piloting use cases in AR that could solve their specific business problems (e.g., in enterprise AR, marketing). For example, workshops in which employees and/or consumers can playfully explore AR in a way that could stimulate the generation of ideas may potentially lead to new use cases.

Furthermore, the results indicate that even an initial first-time exposure to AR can increase various disruptive and potentially life-changing consequences. Policymakers and managers alike should take such findings seriously: the spatial computing environment and persistent AR content can render certain physical products obsolete, change the way we communicate, and lead to a world where any consumer can alter the real world with virtual content. The variables discussed in this research, however, are still subject to related AR challenges such as privacy concerns, legal conflicts, and/or ethical challenges (e.g. Finnegan *et al.*, 2021), which in turn require policymakers' attention.

As utilitarian benefits are often the main driver of adoption, companies should highlight the functionality, efficiency, and added value of AR in performing specific tasks (e.g. for training, technical assistance, or remote collaboration). Marketing campaigns and corporate messages highlighting the practicality of these devices can significantly improve the perception of AR tools, their substitution for other tools, the social impact, and the ability of AR to enhance reality. In this sense, public, educational, and governmental institutions can create programs to educate the population and show them how AR can improve daily life. In addition, the mediation of inspiration, especially in collaborative contexts, can make a positive impact at the community and educational level: if people are inspired by the possibilities of technology, they could foster more creative solutions to social or professional problems.

We also acknowledge that the price points of the HoloLens, as well as those of competitors such as the Vision Pro and Quest Pro, remain above what most consumers are presently willing to pay for an AR/XR headset. However, we view our study as forward-looking and relevant for marketers, given that prices for even high-end headsets are expected to decline substantially in the coming years, while device performance will likely continue to improve.

7.4 Limitations and future research

The current research focuses predominantly on positive life outcomes for consumers, such as experiencing reality in a richer and more immersive way, replacing physical with virtual objects (with presumably positive effects on the natural environment), or expanding one's social network and engaging in AR communities. However, we acknowledge that a ubiquitous and pervasive use of AR may also lead to negative, undesired effects. For example, similar to consumers' addiction to the Internet, they may also become overly dependent on AR devices and applications. Initial research has begun to explore the negative side effects of AR use (Kumar and Agarwal, 2025; Regenbrecht *et al.*, 2022, 2024), and future research may continue this stream of research in the context of negative life consequences resulting from AR. In addition, recent research has linked AR to interactivity, perceptions, and attitudes, concepts connected to inspiration (Yim *et al.*, 2017). In the age of the attention economy, future research should explore how these components are related to inspiration.

Even though our research provides compelling support for the mediating effect of AR-enabled inspiration, alternative explanations may exist. For example, apart from feeling inspired, other emotional or cognitive pathways may be at play, such as awe, enjoyment, curiosity, perceived realism, perceived control, or perceived novelty. Even though some of these constructs may be either strongly related to inspiration, as is the case for curiosity, or have been tested previously in an AR context (e.g. awe in AR apps has been examined by Hinsch *et al.*, 2020), future research could examine these constructs as alternative mediators in the context of this study.

Organizations may aspire to establish brands that operate seamlessly across both the real and virtual worlds. Although the current study does not explore this issue, it is evident that unique challenges are likely to arise in navigating dual environments. Future research should explore how and if brands can coexist in both worlds. Certain types of products might be more adept at spanning the digital/virtual divide, while others must be either real or digital. Digital objects presented in virtual or augmented environments are often more affordable, on average, than their real-world counterparts. However, sophisticated and immersive AR applications typically require specialized hardware, which may exacerbate a new form of the digital divide, further limiting less privileged consumers in their ability to adopt this technology. Future research should investigate how modern cultures navigate this divide.

Finally, prior AR research has predominantly focused on vision as a primary sense, sometimes in combination with audio cues. However, recent work has investigated how haptics (such as specially enabled gloves or bodysuits) can complement and enhance immersion and perceptions of reality in AR environments (Bhatia *et al.*, 2024). This opens intriguing opportunities for future research to explore how comprehensive AR ecosystems, incorporating vision, audio, haptics, and even smell, might influence consumer inspiration and their anticipated life outcomes.

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Supplementary material

The supplementary material for this article can be found online.

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