Avatar creation in the metaverse: A focus on event expectations

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ABSTRACT

The metaverse has revolutionized the way event experiences are virtualized, as this cutting-edge technology is especially capable of fostering dynamic interactivity among avatars. However, few empirical studies have explored the creation of avatars for virtual events in the metaverse. This research delves into the theme in a mixed-methods approach. The results of semi-structured interviews with participants in a conference held in the metaverse highlighted that they would create a single, unique avatar, whose style would be adapted to the characteristics of future events. These findings were assessed later in an online experiment, in which participants created their own avatars for a (utilitarian or hedonic) virtual event in the metaverse. The results confirmed that users would create avatars with formal/informal styles depending on the utilitarian/hedonic value they expected to derive from the event. In addition, the expectancy they feel about the metaverse experience prompts attendees to design avatars similar to themselves, which significantly increases their satisfaction with their digital personas. The technical capabilities of the platform (ease of use and customization) seem also to play an important role in enhancing satisfaction with the avatar. This research suggests specific actions that might be taken to ensure that attendees of virtual events in the metaverse are satisfied with their avatar designs.

1. Introduction

The virtualization of experiences is a growing trend, especially in the events industry (Yung et al., 2022). As a sub-field of the tourism industry, the events industry has certain idiosyncrasies that differentiate it from other tourism-related realms, in particular, events are held on specific occasions and with defined purposes and time frames (Getz & Page, 2016). Current projections suggest that, by the year 2031, the events industry will attain a value approaching US$3 trillion (Researchdive, 2023). Due to recent circumstances, the past years have witnessed the proliferation of virtual events (e.g., conferences, cultural festivals) on platforms such as Zoom, Microsoft Teams and Google Meet. These events have incorporated augmented virtuality (Flavián et al., 2019) (e.g., live streaming and webcams that allow users to visualize physical elements in the virtual environment) and interactive features (e.g., raising hands, chats, collaborative boards) that facilitate and encourage user participation and engagement (Wu et al., 2021). The virtualization of events makes it possible for attendees to take part irrespective of their actual locations, saving travel and accommodation costs; virtual events' providers can also benefit from hosting events at a lower cost (Kim, 2021).

The next step in this evolution is the metaverse, which is considered one of the technologies that will shape the future of human-computer interaction (Buhalis et al., 2023; Hennig-Thurau et al., 2023). The metaverse, in most discussions, is seen either as a fully crafted virtual environment (e.g., Chan et al., 2023) or as an augmented physical existence enhanced by immersive technologies (e.g., Rauschnabel et al., 2022). In this article, we align with the first perspective, that is, we regard the metaverse as a linked array of virtual spaces where multiple users can engage in different types of communication and interaction, in real-time, with other users and with digital artifacts. The metaverse has been defined as "a massively scaled and interoperable network of real-time rendered 3D virtual worlds which can be experienced synchronously and persistently by an effectively unlimited number of users with an individual sense of presence, and with continuity of data, such as identity, history, entitlements, objects, communications, and payment" (Ball, 2022). Among its other advantages, the metaverse has great potential for creating fully immersive and realistic environments, increases virtual social interactions in unprecedented ways (Dwivedi et al., 2022) and offers a vast array of opportunities for interactive experiences,

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enabling individuals to engage in immersive interactions that transcend the boundaries of the physical and virtual worlds. These are factors essential for making the metaverse into a platform suitable for the virtualization of social events.

In the metaverse, people are represented by avatars. This representation relates not only to the user's physical appearance, it also has symbolic meaning (Davis et al., 2009). Avatars are regarded as the digital, embodied versions of users (Miao et al., 2022). Avatars offer their users a vast number of possibilities, ranging from providing accurate representations of one's actual self, to providing more fantastic, or idealistic, representations (Belk, 2016). This plethora of options may allow users to meet their communication goals, for example, by conveying thought/ideas (Vasalou & Joinson, 2009) and/or serve different purposes, such as experimentation (Koles & Nagy, 2021) or the hiding of one's true identity to deceive others (Hooi & Cho, 2013). Despite the high level of speculation that has taken place, and the limited evidence available, it can be concluded that the metaverse offers individuals unprecedented ways to build and experiment with an extended self, a self different from that which exists in the real and other virtual worlds, but connected to them; this aspect of the user-avatar relationship merits further investigation (Szolin et al., 2022). From a business perspective, designers and service providers need to learn how to provide the tools that users need to create effective avatars, since these seem to be key for improving the customer experience in the metaverse. In addition, blockchain and non-fungible-token (NFT) technologies allow users to embellish and personalize their avatars in unique ways, offering opportunities for brands and specialized companies (Dwivedi et al., 2023; Forbes, 2022). Therefore, the creation of avatars has important implications for users, technology developers, brands and service providers.

Avatar creation has been studied over the past two decades, in parallel with the development of online videogames, virtual worlds and social media; this research has identified the psychological processes of, and implications for, users, and their interactions with virtual environments (e.g., Koles & Nagy, 2021; Sibilla & Mancini, 2018; Szolin et al., 2022, 2023; Vasalou & Joinson, 2009). In previous online videogames, or virtual worlds, avatars were usually considered manipulatable characters in the virtual worlds, with no bodily connections to users (Zhu & Yi, 2023). However, technological developments have made it possible to create realistic avatars by increasing the fidelity of their appearance and by synchronizing their motion with that of their users (Kasapakis & Dzardanova, 2021). For example, users' body movements and facial expressions are captured, in real time, and displayed at the same time by their avatars (Park & Kim, 2022). Consequently, these novel avatar-related features can be implemented in the metaverse, elevating avatars to even more crucial roles in the experience.

Technological advances, and the emergence of virtual events, particularly in the metaverse, present new opportunities and challenges for the further development of avatars in a full, mainstream, sense. Despite the remarkable growth and increasing success of event virtualizations in the metaverse (e.g., four Lil Nax X concerts in 2020 reached more than 33 million views; The Verge, 2020), little comprehensive empirical research has examined avatar creation in this context (Buhalis et al., 2023).

This present study aims to enhance our understanding of this emerging phenomenon by exploring: (1) the factors that influence the creation of avatars for social virtual events in the metaverse; (2) how these factors determine users' perceptions of their virtual representations; and (3) usera'satisfaction with the created avatar. Specifically, drawing on affect–expectations theory (Klaaren et al., 1994) and perceived value theory (Babin et al., 1994), we analyze whether users' expectations of the value of events held in the metaverse affect how they create their avatars, which may represent different self-extensions. In addition, the effect of the features offered by the metaverse on the avatar creation process is explored. Furthermore, following recent calls for research into the role of excitement and the "wow" effect in the

metaverse (Barta et al., 2023; Chirico & Gaggioli, 2023), this research analyzes how users' expectancy of a virtual event in the metaverse shapes their perceptions of, and satisfaction with, their avatars.

2. Theoretical development and research hypotheses

The tourism industry is often characterized by its fragmented and disjointed nature, given that it encompasses a diverse array of activities and experiences (McKercher, 2016). Among the existing tourism sub-fields, the events industry is distinguished from other tourism-based activities primarily due to its temporal specificity and its purpose-driven nature. Events are unique, one-off occurrences, with distinct start and end times, which provide participants with a concentrated, immersive, purpose-driven (e.g., entertainment, education, business networking) experience, setting them apart from the broader and more diverse range of recreational options associated with tourism (Getz & Page, 2016). Events, by their very nature, embody and foster social activities (Getz & Page, 2016; Yung et al., 2022). They serve as catalysts for interpersonal connections and shared experiences among attendees, who engage in conversations, create new connections and collectively immerse themselves in the unique atmosphere generated by the event (Li & Petrick, 2005). Thus, the social dimension is especially important for increasing the overall appeal of events and makes them opportunities for attendees to connect and interact with other individuals.

Similarly, a primary element of the metaverse is its provision of natural user-user interactivity (Hennig-Thurau et al., 2023). This is especially the case with virtual events (Buhalis et al., 2023). As users immerse themselves in virtual events in the metaverse, they find a unique platform to connect and interact with others, which transcends the boundaries of physical space. Consequently, the metaverse is especially aligned with the events' industry because it enables attendees to socialize with each other in a manner that transcends the limitations of traditional media (Buhalis et al., 2023; Yung et al., 2022). Specifically, the metaverse, in the context of events, fosters a more natural and immersive social environment, capturing the essence of face-to-face conversations and stimulating the randomness of real-world interactions, thus creating opportunities for networking, collaboration and the organic exchange of ideas. This dynamic social aspect adds a layer of authenticity to the event experience in the metaverse, where individuals shape their identities to interact with each other through their creation of avatars (Ball, 2022; Han et al., 2023; Kim et al., 2023). Furthermore, metaverse-based interactions can affect the real lives of participants, more so than can previously studied platforms where avatars could be created (e.g., video games). The real transactions that take place in the metaverse involve avatar actions that not only have consequences in the virtual world created, but also in real life. In addition, the metaverse's high social component, with its multiple opportunities for individual-individual interactions (e.g., event attendees, customers, shop assistants) has made the creation of one's digital persona a much more important element of the experience than in previous, less developed, virtual worlds.

An avatar has been defined as a user-created digital representation of a person that symbolizes the user's presence in a virtual environment, including the metaverse (Bailenson et al., 2005). Unlike previous conceptualizations that regarded avatars as any graphic representation, such as static pictures or dynamic 2D characters (Bélisle & Bodur, 2010), this research adopts the approach that avatars are interactive 3D models that represent users and are responsive to their actions in the metaverse. According to Koles and Nagy (2021), interactive 3D avatars represent the highest level of the digital object continuum: their creation requires a high level of complexity and control, they offer the user a high level of interactivity and durability, and utilitarian, hedonic, self-expressive and social value.

In virtual events in the metaverse, where human-human connections are paramount, avatars serve as the digital embodiment of the participants, shaping the way they perceive, and interact with, each other (Kim

et al., 2023). Due to the specific characteristics of virtual events, participants know that the actions performed by their avatars in the metaverse event can have real-life consequences, that is, they can affect their social relationships and reputation in the real world. Moreover, one-time virtual events in the metaverse raise a range of expectations and create added value which can transfer to future face-to-face events. This connection between the virtual and the physical realms distinguishes the metaverse from other contexts (video games and virtual worlds, e.g., 2nd Life), where users can create a "person" with independent characteristics and personality (Szolin et al., 2023). In these contexts, the actions performed by users with their avatars are aligned with activities in the video-game and the virtual worlds, with no consequences in the real world.[1] Thus, instead of a 'multichannel approach', where users create different, independent avatars which have no impact on their real world, the metaverse allows for an 'omnichannel approach', which creates seamless experiences with a high degree of virtual-physical integration (Hadi et al., 2023). Furthermore, the interoperability of the metaverse means that actions carried out by avatars in virtual events have repercussions for other virtual activities.

Avatars allow individuals to express their personal styles and identities through modified body styles and clothing (Davis et al., 2009). These choices are part of the avatar creation process, which requires a significant amount of attention and dedication (Guitton, 2010). If users achieve the desired result, they can become attached to their avatars and transfer their identity to them (Belk, 2016). Thus, due to the high levels of complexity and investment in the avatar-creation process (Miao et al., 2022), and the connection that users can achieve with their avatar if the outcome is satisfactory, it is expected that users will prefer to create just one avatar to represent them in all virtual events, rather than to create different avatars for different metaverse-based events.

However, different events may generate different types of value for participants (Getz et al., 2010). According to Babin et al. (1994), consumption of an object (i.e., good, service, or activity) leads to both instrumental and experiential outcomes and, therefore, is evaluated in terms of both utilitarian and hedonic value. Gursoy et al. (2006) validated these value dimensions for the events industry and found that people who attend festivals had stronger hedonic than utilitarian motivations. Recently, Zhan et al. (2023) identified functional (i.e., task related) and hedonic (e.g., relaxation, escape) values as the basic levels of the event experience. Yet the metaverse, as an interconnected digital realm, has unique dynamics and complexities that may make it not directly comparable to non-digital events or traditional gaming environments. Among the dynamics, the interoperability of the metaverse allows users to transfer elements (e.g., avatars, virtual assets) between its different constituent virtual spheres (Flavián et al., 2023; Richter & Richter, 2023). This transference is also reflected in the real world, given that users' actions in metaverse-based events have consequences in the real world, and vice versa. The metaverse also possesses a level of complexity that requires a deeper understanding of the specific context. At present, no technology guarantees the identity of the user who controls the avatar, giving rise to potential challenges and risks in identification, and associated activities (Kim et al., 2023). Moreover, the metaverse incorporates emerging technologies such as augmented reality, virtual reality, blockchain and artificial intelligence, which not only have the potential to reshape the way users interact within digital environments, but also have their own challenges (Dwivedi et al., 2023). Therefore, it is important to explore how the metaverse impacts on users' experiences and, particularly, how their expectations of the value of events held in the metaverse affect this experience.

Utilitarian events are often associated with professional or organizational contexts, where practicality and functional outcomes are very much expected. In these settings, individuals may place greater emphasis on the utilitarian aspects of an event, leading to higher expected utilitarian value. Conversely, hedonic events may be more prevalent in leisure contexts, where the focus is on personal enjoyment and entertainment, which generates higher expected hedonic value (Armbrecht & Andersson, 2020). Thus, the objectives pursued in different events can influence expected utilitarian and hedonic value (Sands et al., 2008).

Consequently, the context is important when creating avatars. Although users may prefer creating and using one single avatar, which they see as similar to themselves, they may also be influenced by the context for which the avatar is created and the purpose it is intended to serve (Schrader, 2019). Vasalou and Joinson (2009) examined avatar creation in three contexts (blogging, dating, gaming) and found different levels of self-representation corresponding to users' perceived expectations of the interaction. Schrader (2019) analyzed differences in avatar creation in two scenarios (a learning game and an entertainment game). The results showed that users associated different personality levels based on the context. Importantly, in both studies (Schrader, 2019; Vasalou & Joinson, 2009), the participants were led to believe they were going to take part in an interaction. Thus, rather than the context itself, what really matters seems to be the users' expectations of the context. Expectations relate to individuals' anticipation and preconceived notions about upcoming events (Carroll, 1978). Affect-expectations theory posits that people's subjective expectations about an event may determine their subsequent behaviors, their post-event evaluations and their behavioral intentions (Klaaren et al., 1994). Previous events-related studies have shown the influence of participants' pre-experience expectations on the actual experience (e.g., Chun et al., 2017), the evaluation of that experience (Koenig-Lewis & Palmer, 2014) and their memory or selective recollection of the event (e.g., Mitchell et al., 1997).

Attendees may anticipate not only the positive or negative emotions they will experience from an event, they are likely also to have varied levels of expectations about the value they will derive from the (virtual) event (Zhan et al., 2023), which, in turn, can influence their approach to avatar creation for that specific event. Due to the social nature of events (Getz & Page, 2016) and the metaverse (Dwivedi et al., 2022, 2023), the social value dimension, which has been defined as the interaction with, and recognition given by, other people (Sweeney & Soutar, 2001), is used as the baseline in the context of this study and, thus, it will not be subject to manipulation. Users who attend a virtual event in the metaverse will expect high social value, regardless of the type of event. However, we expect that the utilitarian or hedonic value expectations of a metaverse event, determined by the type of event, will affect attendees' plans for their self-representations. As the focus of this research is on the virtualization of events (i.e., the translation of a physical event to the metaverse; other fantastic, or cartoonish virtual worlds, are outside of the scope of this work), users may tend to create realistic, human-like and self-representative avatars. However, we propose that users' expectations of the perceived value they will derive from the event will lead them to adapt their creation according to the context. Specifically, this work examines the hedonic-utilitarian nature of events and how this affects the style of the created avatar.

Utilitarian expected value is regarded in this work as the anticipated practical benefits and outcomes associated with participating in an event (Gursoy et al., 2006). Individuals' utilitarian expected value shapes their decision-making processes regarding avatar customization. Specifically, when individuals have higher utilitarian expected value toward an event, they are more likely to dress their avatar in formal attire to be congruent with the expected functional requirements and social norms of such events (Triberti et al., 2017). The selection of a formal style for the avatar serves to establish credibility, competence and conformity with the expected norms of the utilitarian event (McCracken & Roth, 1989; Vasalou & Joinson, 2009). Consequently,

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[1] Previous research has shown that the perceived characteristics of the avatar may induce the user to change their in-game attitudes or behaviors to comply with these expectations, which can even transfer to the individual's self-concept, and affect their mental health (i.e., Proteus effect; Szolin et al., 2022; 2023).

when an event has higher utilitarian expected value it is likely to lead individuals to choose formal styles and clothing options for their avatars, such as suits, dresses or business attire, to project a professional, serious image.

Conversely, hedonic expected value is regarded in this work as being related to the anticipated pleasure, enjoyment and emotional satisfaction that users hope to derive from an event (Gursoy et al., 2006). In this case, when participants anticipate they will derive a greater sense of pleasure and enjoyment from a hedonic event, they will tend to dress their avatars informally, with a spirit that complements its anticipated enjoyable, easygoing ambiance (Triberti et al., 2017). By adopting an informal style (e.g., casual outfits, trendy fashion), users can portray a visually appealing and relaxed representation which fits with the hedonic nature of the virtual event (e.g., having fun, a carefree atmosphere; Martey & Consalvo, 2011).

Considering all the above, we propose that the virtual event type (utilitarian or hedonic) will lead users to anticipate they will derive event-related benefits, such as enhanced professional learning (in the case of utilitarian events) or enjoyment and escapism (in the case of hedonic events). This expected value will motivate users to represent themselves in a formal, or informal, manner, through adapting the styles of their avatars:

H1a. Due to a higher utilitarian expected value, a utilitarian (versus hedonic) event has a positive effect on the user's choice of a formal (versus informal) style for his/her avatar.

H1b. Due to a higher hedonic expected value, a hedonic (versus utilitarian) event has a positive effect on the user's choice of an informal (versus formal) style for his/her avatar.

Expectancy has been defined as the emotional response caused by anticipating an upcoming activity and is characterized by feelings such as excitement and amazement (Hinsch et al., 2020). The categorization of an event as utilitarian (focused on practical outcomes) or hedonic (focused on pleasure and enjoyment) can affect the levels of expectancy that individuals have of an event (Gursoy et al., 2006). Hedonic events are often designed to evoke emotions and create memorable experiences, which can contribute to higher levels of event expectancy (Ponsignon, 2023). These events may include entertainment shows, or adventure activities specifically designed to provide enjoyable and entertaining experiences. In addition, hedonic events tend to emphasize novelty, surprise and unique experiences (Kashdan & Silvia, 2009). Thus, the goal of hedonic events is to provide participants with extraordinary moments, which enhance the event expectancy associated with the excitement of the event. In contrast, utilitarian events, such as work meetings and academic conferences, may focus more on practical objectives. In addition, these types of events had important growth during COVID-19, and individuals may have already experienced these gatherings and, thus, developed a certain degree of familiarity with them. These factors can potentially lead to lower levels of event expectancy, compared to hedonic events:

H2. A hedonic event generates a higher degree of event expectancy than a utilitarian event.

The anticipation and excitement surrounding an event can heighten users' engagement and involvement with the event (Li & Petrick, 2005). In addition, incorporating the latest technologies, such as virtual reality and augmented reality, into tourism, can introduce a sense of awe and excitement into the experiences (Hinsch et al., 2020). As previously stated, one of the most complex activities in the metaverse is the creation of avatars, given that this requires a series of decisions to be made that demand considerable attention, focus and commitment (Guitton, 2010). However, users perceive their avatars as extensions of their own identities in the metaverse (Miao et al., 2022). Thus, the excitement users feel about events held in the metaverse can lead them to feel involved with the virtual activity and, thus, invest effort in customizing their avatars to closely resemble their own physical attributes,

personality traits and behavioral characteristics; this may result in the user having a high degree of perceived similarity with the avatar (Mancini et al., 2019; Rahill & Sebrechts, 2021). Therefore, as users strive to strongly link their avatar and personal identities, they will become more certain they are creating a close representation of their own images, which will lead them to believe that their avatar will better be able to provide them with a higher sense of self-expression in the metaverse experience.

Event expectancy can create a priming effect (Molden, 2014), which may shape individuals' perceptions and interpretations of their avatars. When individuals have elevated expectancy for an event, their cognitive processes may be primed to focus on positive aspects. This priming can contribute to a more positive evaluation of the avatar's role in the event, leading to increased satisfaction. In the same way, event expectancy can lead to a positive emotional transfer from the event to the avatar-based experience (Parkinson, 2011). When individuals have high expectancy levels toward an event, the positive emotions associated with that event can transfer to their evaluation of their avatar's appearance and the satisfaction they feel toward the avatar they created.

H3a. Metaverse event expectancy has a positive effect on the perceived similarity of the avatar.

H3b. Metaverse event expectancy has a positive effect on satisfaction with the avatar.

Finally, an avatar's similarity to its creator plays an important role in inducing the creator to feel satisfaction toward their virtual counterpart (Machneva et al., 2022; Suh et al., 2011). When an avatar closely resembles the individual's own appearance and personal traits, it enhances his/her sense of self-identification and embodiment within the metaverse (Suk & Laine, 2023). As a result, this higher user-avatar similarity fosters a stronger sense of ownership, connection with the avatar and self-awareness, leading users to experience increased levels of satisfaction with their virtual representation (Trepte & Reinecke, 2010). The alignment between the avatar and the individual's self-image contributes to cognitive consistency, so that users' expectations and beliefs about themselves align with their avatar's appearance, thus they feel satisfied with the avatar.

H4. Perceived avatar similarity has a positive effect on the user's satisfaction with his/her avatar.

3. Overview of studies

A mixed-methods approach, combining qualitative and quantitative research techniques, was followed to test the hypotheses. This mixed methodology enables researchers to obtain a thorough understanding of a topic and enhances experimental validity by triangulating findings that can mutually support one another (Bryman, 2006). In a first, exploratory stage, a field study was carried out with participants in an academic conference held in the metaverse. Based on the SPEL Cube taxonomy (Yung et al., 2022) we conclude this event is virtually located, has a high degree of virtuality (as opposed to reality) and a high level of social presence; the implications for the events sector are high, given that this type of event has the potential to replace conventional video conferencing platforms (Yung et al., 2022).

In the second, confirmatory stage, a quantitative study, based on an experimental manipulation of event type (utilitarian or hedonic), was conducted. The online experiment was conducted to analyze the effect of event type on expected perceived value, expectancy and the avatar creation process. Interviews and self-administered questionnaires are the most common methods used in articles using multi-strategy research (Bryman, 2006).

In addition, the studies explored the potential influence of platform-based and personal characteristics on the variables under study. As for platform-based factors, perceived ease of use and customization have been identified as variables which affect the avatar creation process

(Butt et al., 2021; Kang & Kim, 2020). As for personal factors, socio-demographic variables have been found to influence the avatar creation process. Specifically, previous studies have found that the creator's gender and age may affect avatar characteristics (Sibilla & Mancini, 2018), such as the correspondence between the digital representation and the chosen name (Guitton, 2010), its physical features and its perceived similarity/discrepancy with the creator (Dunn & Guadagno, 2012). Thus, perceived ease of use and customization in the avatar creation process, and the user's gender and age, were used in the analyses as control variables to ensure maximum robustness in the results (Shiau et al., 2024).

4. Study 1: qualitative stage

4.1. Method

As previously stated, the participants in study 1 were attendees of a virtual academic conference held in the metaverse. The metaverse was designed by Virtway Events, a company specialized in the creation of virtual spaces for a wide variety of events (e.g., conferences, fairs, education, training). The conference took place in July 2022, and examined the impact of 4.0 technologies (e.g., artificial intelligence, immersive technologies, robots, internet of things) on the customer experience in service contexts. More than 100 participants, including keynote speakers, academic researchers and industry professionals, attended the sessions.

Data were collected from two information sources. First, an email was sent to participants' immediately after they registered in the conference, containing specific instructions for accessing the metaverse and creating their avatar, and inviting them to answer an online questionnaire after they created their avatar. The questionnaire included questions about the expected value of the metaverse conference (Nambisan & Baron, 2009) and the avatar-creation process (Teng, 2010; Venkatesh & Davis, 2000). The participants were also asked to rate their avatars based on a series of features (e.g., physical appearance). Finally, we gathered personal information (gender and age).

The second source of data collection was a semi-structured email interview (Hawkins, 2018) that was submitted at the end of the conference. The script of the interview was multipartite. After a welcome, and brief instructions on how to complete the interview, questions were posed about the avatar creation process. The next parts addressed aspects such as the appearance of the avatars, how the participants perceived their avatars, the emotions they felt during the avatar creation process and whether they would design their avatars differently for other event types. Then, questions were asked about the specific event the participants were attending (i.e., their expectations of the event and fulfillment of those expectations). The interview concluded with an acknowledgement of the subjects' participation and farewell remarks.

The aim was to obtain the attendees' impressions and perceptions about the avatar-creation process and their experience in the metaverse conference. We obtained 44 pre-conference questionnaires and undertook 36 post-conference email interviews. A matching process yielded a total of 22 participants with complete data, which is an acceptable response rate (Goyder, 1985). Of the 22 participants, 11 were male, 5 were between 18 and 35 years old, 11 were 36–45 years old and the rest were older than 45.

4.2. Results

The information gathered during the semi-structured interviews was analyzed from different perspectives. The following subsections describe the analysis of the statements made by the participants, as well as how the concepts are related through a co-occurrence analysis. The last section of this part of the work illustrates, through word clouds, the differences between participants based on their expectations of the event.

4.2.1. Content analysis

The analysis of the 36 post-conference email interviews highlighted the importance of ease of use during the creation of, and interaction with, the avatar: "*I liked the experience. It was very simple to command my avatar and I think his functionalities were sufficient for the conference*" (man, 18–35 years old). "*I enjoyed it a lot. It was quite funny. The software was easy to use, and I did not have to read instructions. It was very intuitive. The process was engaging*" (male, 18–35 years old). The importance of ease of use was also stressed by participants who had problems at the beginning of the creation process, until they fully understood how to customize all the features of their avatar: "*I had some trouble personalizing my avatar initially (especially skin color and height). In the end, I managed to create my avatar*" (woman, 18–35 years old). "*I had a feeling that I was in control, but only after I learned how to use the system effectively and efficiently (before that I was challenged by some functions)*" (man, 36–45 years old).

Most of the participants tried to make their avatars similar to how they themselves look in reality. Customization options were considered essential for this purpose: *The limited options for clothing and features made my life easy but, also, I was thinking whether a lot of avatars would look exactly the same*" (woman, 36–45 years). "*I also didn't like the limitation when choosing accessories and clothes, in the case of the female character the clothes and some features (e.g., there were many tops that showed one's belly button) were not comfortable and I didn't identify with them for a conference*" (woman, 18–35 years old). "*I perceived my avatar as not so realistic due to the lack of options available during the configuration process*" (woman, 18–35 years old).

Furthermore, several differences arose concerning the style and accessories used, based on the type of value expected from the event: "*I would definitely vary my avatar based on the situation. For example, for an academic conference, I felt that the avatar still needed to project a professional image, so I created the avatar in a similar way as to how I would actually dress for a conference. But, in the same way that we adapt our clothing in real life for different occasions, I feel that the avatar would also need to do the same*" (woman, 18–35 years old). "*I would be more inclined to use the same avatar for a different context. Because I would like to maintain my identity. Though my clothing and external appearance may change, however, the individual remains the same, just like in real like*" (man, 46–65 years old). "*I think I would use the same avatar (in physical terms) but, just like in the real world, I would adjust the style and the clothes to the circumstances*" (woman, 18–35 years old). These statements are in line with H1.

The utilitarian and hedonic expected values of the event were high. From the 22 participants from whom we obtained complete data, high expected scores of utilitarian and hedonic value were reported ($M_{utilitarian}$ = 5.30; $M_{hedonic}$ = 5.49). Conversely, expectancy toward the metaverse was high, with 20 respondents indicating they had no previous experience. This expectancy toward the event is influenced by event type, as some participants mentioned: "*As a conference, my expectations for this event in the metaverse were not higher than those I may have for other types of conferences. I think that if it had been an activity in which you are more relaxed, talking constantly with other people, my expectations toward the event in the metaverse would be higher*" (man, 36–45 years old). "*It was my first time creating an avatar for the metaverse. Since it was a conference, I didn't have high expectations for the value that the metaverse can provide in these events. If it was a more social event, like attending a concert, probably my expectations of the event would have been much higher*" (woman, 18–35 years old). These statements support H2.

In general, people would not create different avatars for each event they attended in the metaverse. Regardless of the context, users seek to create a replica of themselves in the virtual world, trying to make the avatar easily recognizable for other users: "*I tried to create a replica, or a similar look, to my look. It was not an idealized version. I did this because I wanted to be easily identified in the conference*" (man, 36–45 years old). "*His physical features will not change across different contexts or platforms […]. I do not see the necessity to create different avatars, because my avatar*

will be my 'digital self'" (man, 18–35 years old). These statements are in line with H3.

Finally, in line with the above, creating an avatar with physical features similar to their own was a goal of the participants. Achieving this similarity generates a pleasant experience during the creation process, leading the users to feel satisfaction with their avatars: *"I tried to create something that resembled me, but the results was not satisfying (not similar at all)"* (woman, 46–65 years old). *"I was curious when trying to create my avatar and I was searching for the right option to customize it. So, I explored the wardrobe as well as the different options to customize the avatar's body appearance. I tried different sets of clothes. I was happy with the final results"* (man, 18–35 years old). This supports the idea that achieving a high similarity with one's avatar is an important factor for the user, which is in line with the identified factors that determine users' satisfaction with their avatars. These arguments support H4.

4.2.2. Co-occurrence networks

The relationships established between the different concepts addressed in the information collected from the semi-structured interviews were analyzed using KH Coder software. This software supports content analysis/text mining. It has been previously used in research aimed at clarifying the relationships between different concepts through co-occurrence analysis (Barta et al., 2022; Marine-Roig, 2022). Fig. 1 shows the co-occurrence networks obtained, which is based on the data from the 36 post-conference interviews.

Several themes and relationships were identified. First, regarding the avatar creation process, through the words "create" and "avatar" the analysis again showed that the participants tried to create an avatar that was a replica of themselves. In the avatar creation process, clothing and

appearance shape the avatar's style. In these groups, the relationship between color (perhaps related to skin color) and some customizable elements of the avatar, such as clothing or hair, were observed. Furthermore, the strongest relationship with the style of the avatar was also observed with words that showed the participants tried to recreate, physically, avatars similar to themselves, and appropriate for the real world. Another group focused on the avatar's appearance based on event type. The co-occurrence among terms showed that participants would use different avatars based on context. Finally, smaller co-occurrence networks showed the participants' interest in adopting a formal image and style, and the importance of the social aspect of the metaverse. In this sense, there was interest in creating avatars recognizable by other event attendees.

4.2.3. Word clouds

To analyze the differences in the avatar creation experience and the resulting avatar characteristics, the participants' responses in the interviews were analyzed based on their perceived expected value and on their individual characteristics (gender and age). The analyses were undertaken using the complete 22 participant data collected (pre-conference questionnaire and post-conference email interview). Sphinx software was employed to create word clouds for the different groups. This software is a suitable tool for analyzing semi-structured interviews, supporting lexical, semantic and statistical analyses (Boughzala et al., 2014).

As to the analysis of the participants' expectations of the value they would derive from the events, two groups were formed. First, participants with an average utilitarian expected value higher than 5 (out of 7) were included in a group termed "high utilitarian expected value". The
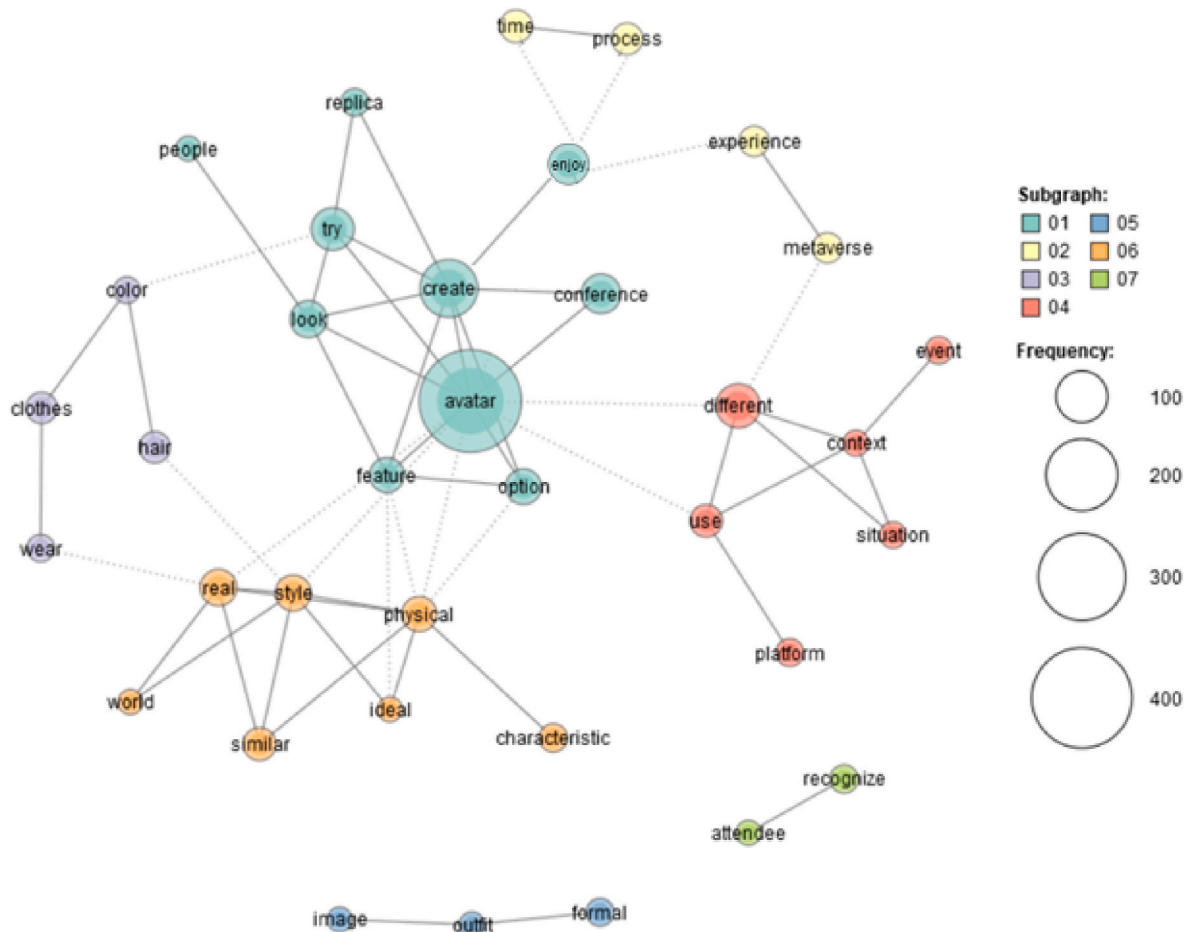

Fig. 1. Co-occurrences network. **Note:** Solid lines represent strong co-occurrences; dotted lines represent weak co-occurrences.

second group was formed in the same way, using the participants' responses to hedonic expected value. It should be noted that both groups are not necessarily mutually exclusive. The word clouds are shown in Fig. 2.

Several differences can be appreciated in Fig. 2. First, participants with high utilitarian expected value emphasized aspects such as the importance of looking real and recognizable. This is observed in words such as real, resemble and recognize. Likewise, they also highlighted the importance of the time spent on the avatar creation process and their intention to create a formal avatar, with a professional appearance. To a much lesser degree, words related to the appearance and customization of the avatar (e.g., hair, body, facial, skin, shoes) featured. Second, participants with high hedonic expected value mostly emphasized the creation process in terms of appearance, style and customization options; words like physical, look, image, options in the process and fashion style are prominent in the word cloud. Likewise, specific elements of appearance, such as dress, hair and skin also played an important role. Finally, the idealization of the avatar, and hedonic elements (e.g., fun) were also mentioned.

Gender- and age-based differences were also analyzed. Fig. 3 displays the word clouds for female and male participants. In general, women emphasized the need to have customization options for their avatars that showed a realistic appearance, replicating themselves. Clothing elements (e.g., dress, shoes) and physical aspects (e.g., skin, hair) were highlighted. On the contrary, men stressed the avatar creation process and the interaction with the platform (e.g., create, process, platform, software). As with the female participants, appearance-related elements were also addressed (e.g., formal, style, image, face). Finally, no observable age-based differences were identified.

4.3. Discussion

Overall, the qualitative study showed that users tended to create a single, unique avatar, similar to themselves. In this study, we explored the process of avatar creation in virtual environments, identifying the significant time and effort investment required. During the avatar creation process a careful balance between various design elements needs to be achieved to obtain the desired level of realism and/or functionality. The success of this balance lies in users perceiving that the software is easy to use, and that it provides sufficient customization options (Kang & Kim, 2020; Liao et al., 2019). As in any optimization process, users seek to reduce the costs and increase the gains when creating their avatars. Costs can be reduced by improving the ease with which users can design their avatar, while benefits can be expanded by increasing customization options. Technology acceptance models have widely acknowledged that users prefer easy-to-use platforms that do not require high levels of mental effort (Venkatesh & Davis, 2000). In addition, customization options are an important factor when creating an avatar for a virtual event held in the metaverse (Lee et al., 2023). The metaverse can increase the gains for users by offering a wide range of customization options (e.g., physical appearance, clothing, accessories).

Furthermore, this study highlights a clear preference for creating avatars that are unique and versatile, and being able to tailor them to specific events, activities and social interactions. This approach allows individuals to maintain a sense of identity while accommodating the ever-changing demands of virtual experiences (Teng, 2019). The option to customize avatars according to context not only provides users with a sense of agency, but also enhances their immersion and engagement within the virtual space (Kyrlitsias & Michael-Grigoriou, 2022). This finding emphasizes the importance of flexible avatar creation tools and systems that allow users to express themselves and adapt to various scenarios, ultimately enriching their virtual experiences.

In addition, the participants' choices in creating their avatars are closely linked to their specific expectations and anticipations for the event in which they are participating. Based on the desire to fit into a particular virtual community, or to stand out at a social gathering,

participants intentionally shape their avatars to fit their preconceived notions and the perceived norms of the event. This relation between avatar customization and event expectations supports the idea that avatars serve not just as virtual representations, but as extensions, of individuals' identities and aspirations within the metaverse (Lee et al., 2023). Users design their avatars influenced by the expected value they anticipate to derive from their interactions within the virtual event. Therefore, expectations (both expectancy and expected value) play an important role in the avatar design and creation process.

Finally, the qualitative study identified some sociodemographic variable-related trends. Overall, the results of the studies showed that, in line with Sibilla and Mancini (2018), women and men emphasized different aspects when creating their avatars. Specifically, women tended to highlight aspects related to customization affordances (e.g., clothing, appearance), while men stressed platform-related factors (e.g., interaction with the platform). However, the user's age seemed not to determine how (s)he created his/her avatar.

It should be noted that the qualitative study focused on a specific event (an academic conference), which produced high expectations (in terms of expected value and expectancy), which prevented us from examining differences based on event type. The study was also conducted with a specific population (i.e., academic researchers). To increase our understanding of the role played by expectations in the avatar creation process, in study 2 we experimentally manipulated event type to examine different expectations (expected value and expectancy) and broadened the sample's scope to a more general population. Study 2 confirmed the results obtained in the qualitative study. In this online experiment, two empirical models were tested. The first model assessed how the type of event (utilitarian vs. hedonic) affects the style (formal or informal) of the attendees' digital personas. The second model analyzes the attendees' experiences during the avatar creation process by examining how event type (utilitarian vs. hedonic) influenced user satisfaction with the avatar, based on their event expectancy and their perceptions of the similarity to themselves of their digital self-representations. The results of the qualitative study led us to decide to control the effects of the platform aspects related to ease of use and customization, and of users' characteristics (i.e., gender, age). A visual summary of the studies and their linkages are displayed in Fig. 4.

5. Study 2: quantitative stage

5.1. Method

An online, metaverse-based, experiment was conducted to test the proposed hypotheses and validate the results of the qualitative study. The experiment followed a between-subjects factorial design, with two conditions based on event type. Data were collected through an online survey designed with Qualtrics. A market research agency was hired to recruit the participants, who were financially rewarded. They were required to have attended an event (e.g., a conference, trade fair, training course, workshop) in the previous year (either online or on-site) because of their studies or occupation.[2] This requirement was set to ensure that participants were familiar with the nature of these types of event.

Before the experiment, the participants were advised of the study's objectives, and explanations were given to ensure they understood the methodology being used and that they needed to download a specific software (Virtway Events) to create the avatar. In addition, the participants gave their informed consent through the statement "*I am aware that my responses are confidential, and I agree to participate in this*

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[2] The participants were required to answer the following question in the affirmative to quality for the study: "H*ave you attended an event (e.g., a conference, trade fair, training course, workshop) in the last year, either online or on-site, because of your occupation (work, study)?*"

Fig. 2. Word clouds of participants with high utilitarian and hedonic expected value.

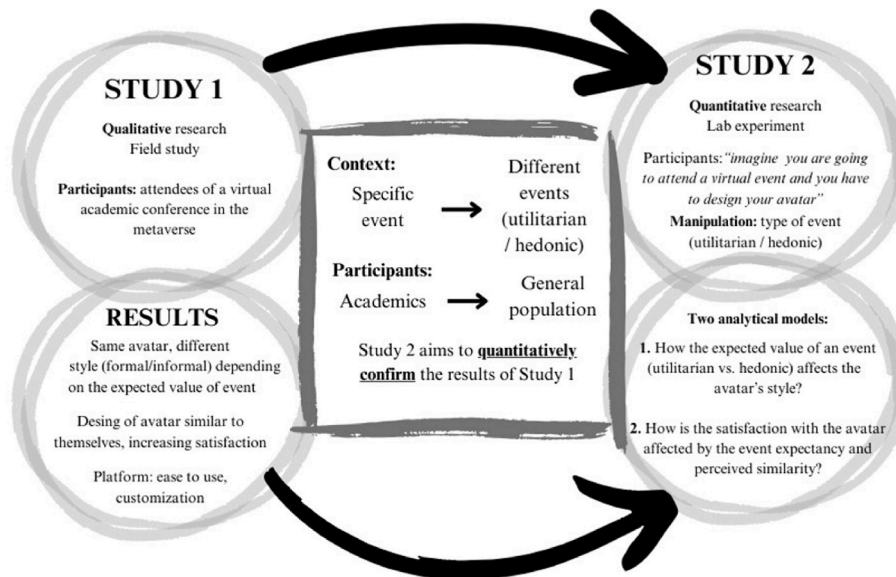**Fig. 3.** Word clouds of female and male participants.


Fig. 4. Overview of studies.

experiment." They had the freedom to withdraw from the experiment, at any point, without being obliged to provide a reason or to feel any discomfort.

In the experiment, the participants were told to imagine that they were going to attend an event in the metaverse, and that they had to design a unique avatar for the event. As noted above, avatar creation is fundamental in metaverse-based virtual events, as the avatar shapes the way individuals are perceived and interact with other attendees (Ball, 2022; Han et al., 2023). At this point, the experimental manipulation was introduced: one group of participants was randomly assigned to a utilitarian event (a work/educational workshop), while the other was

assigned to a hedonic event (a music festival). The experimental instructions were illustrated with several images of the event to provide the participants with some context (Fig. 5). Next, the participants were asked about their expectations of the event. Specifically, the participants indicated, on 7-point Likert scales adapted from previous literature, their perceived expected utilitarian and hedonic value of the event (Oh et al., 2007). In addition, they reported their perceived expectancy toward the event (Belanche et al., 2017; Hinsch et al., 2020).

In the next step, the participants downloaded the indicated software to create their avatars. The platform provided several tools to modify almost every aspect of the physical appearance of the avatar, and there

Utilitarian event (workshop)
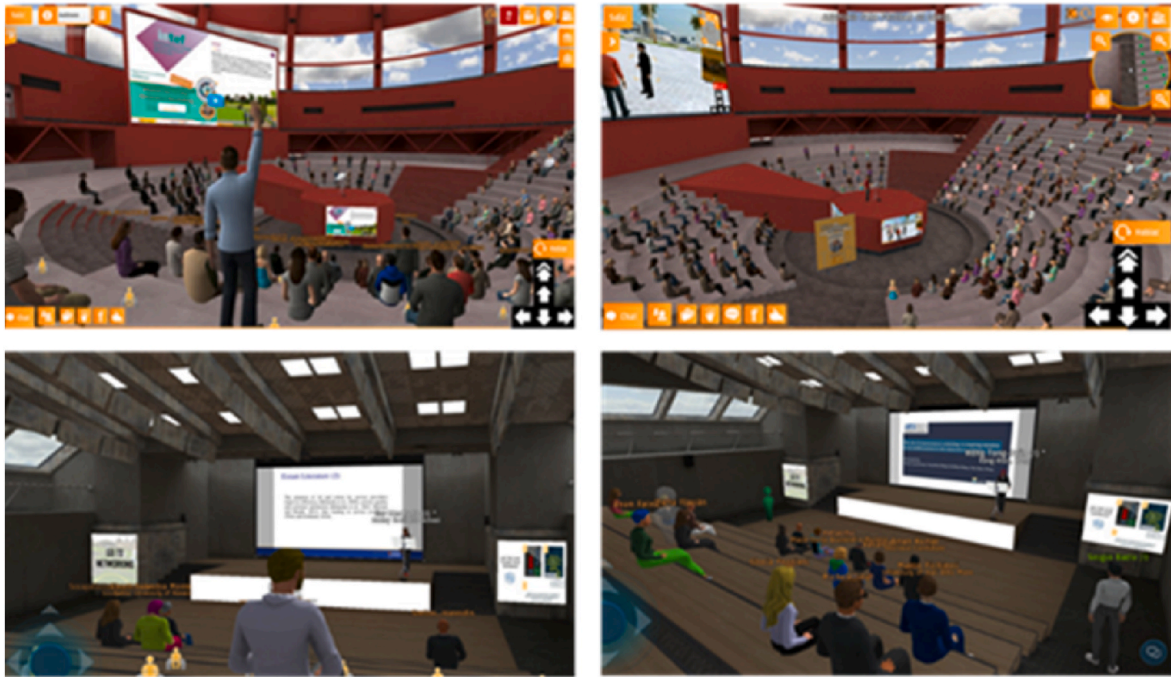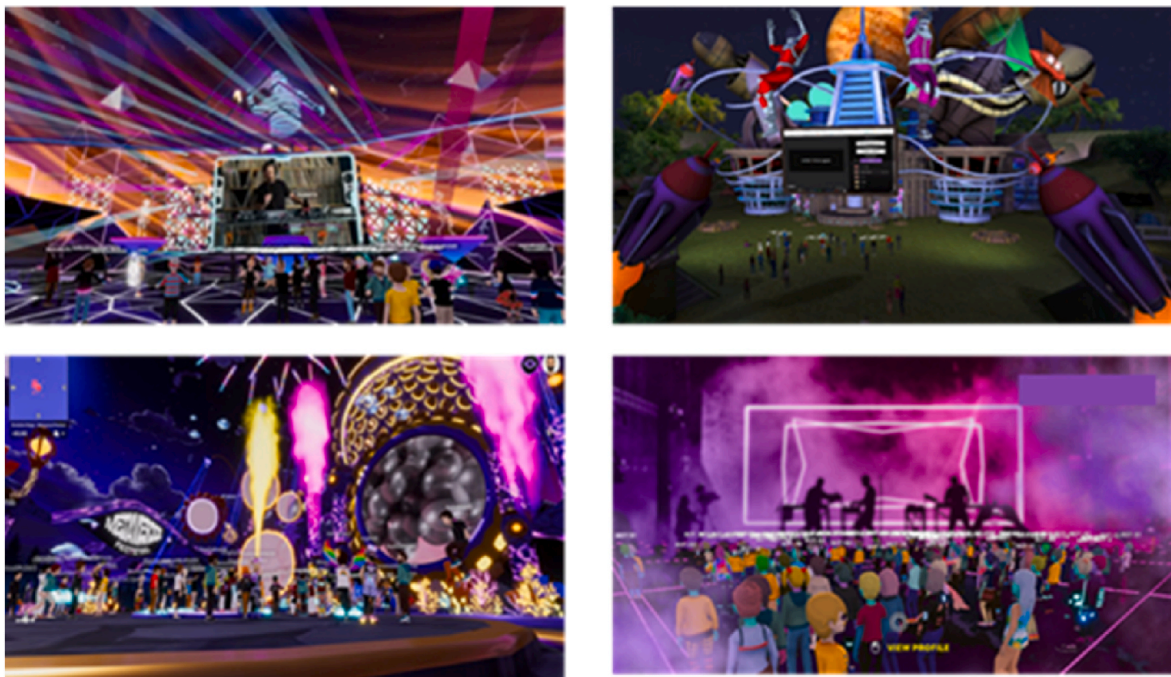

Hedonic event (music festival)

Fig. 5. Images for the utilitarian (workshop) and hedonic (music festival) event.

were plenty of outfits to choose from. After creating their avatars, the participants answered questions about the main variables of the study. We used 7-point Likert scales (from 1 = "strongly disagree", to 7 = "strongly agree") adapted from previous literature to the study context. Regarding the platform itself, the participants gave their opinions of its perceived ease of use (Venkatesh & Davis, 2000) and customization capabilities for (Teng, 2010) creating the avatar. As to the avatar-related

variables, the participants were asked about its style (formal/informal; Wang et al., 2021), their perceived similarity with the avatar (Van Looy, Courtois, & De Vocht, 2010, September) and their satisfaction with the avatar (Jung et al., 2015). The Appendix shows the items used in the questionnaire. Finally, sociodemographic information was collected.

Several procedures were followed to verify that the participants had correctly performed the experiment. Qualtrics software can check that

participants have the appropriate equipment to use the application (e.g., operating system). Second, it can validate that participants spend an appropriate amount of time in the different steps of a questionnaire (app installation, avatar creation process, responses). Third, the subjects were required to upload a picture of their avatar to receive payment for their participation in the study. In these ways, the research team was able to verify that the participants followed the process correctly.

After the screening process, the final study sample was 184. The sample was reasonably balanced in terms of gender, with a higher proportion of males (59.30%), and was relatively young (mean age = 28.96, std. dev. = 6.02). As to educational levels, most of the participants had completed a college/university degree (50.50%).

5.2. Results

Before testing the hypotheses, the scales were validated in a multivariate analysis (Hair et al., 2010). Specifically, reliability and uni-dimensionality analyses were carried out. The Appendix contains the results of the analysis. Once the scales were validated, the average values of the items were calculated to create the measures used in the analysis.

First, ANCOVA analyses were performed to test the influence of event type on the event- and avatar-related variables. In these analyses, ease of use, avatar customization, age and gender were included as covariates. The analyses showed that event type had a direct impact on the expected value of the event (Table 1). Specifically, the utilitarian event produced significantly higher utilitarian expected value than did the hedonic event; on the other hand, the hedonic event was associated significantly more hedonic expected value and expectancy than the utilitarian event. The hedonic event had also a significant direct impact on the informal style of the avatar (Table 1).

PROCESS macro (model 4) for SPSS was used to test the mediating role of expected value in the relationship between event type and the clothing style of the avatar (H1) (see Fig. 6, upper path). Two models were conducted, corresponding to the formal and informal style of the avatar. The ease of use and the customization options of the platform, and the participants' gender and age, were included as control variables. Specifically, the effects of the participants' sociodemographic characteristics were controlled for both expected value and style, whereas the effects of the platform characteristics were controlled only for the style of the avatar.

The results are at Table 2. Utilitarian expected value had a significant positive effect on the formal style, and a significant negative effect on informal style; the opposite was the case with hedonic expected value. The significance of the indirect effects indicates that the utilitarian (hedonic) event affected the formal (informal) style of the avatar through the expected value of the event (Table 2). Altogether, these results confirm H1. Regarding the control variables (Tables 1 and 2), we observed a significant positive effect of the participants' ages on both the utilitarian and the hedonic expected value of the event. In addition, perceived customization had a significant, positive impact on the

informal style of the avatar (Table 2).

In line with H2, the hedonic event produced a significantly higher level of expectancy than the utilitarian event (Table 1). To test H3 and H4, examinations were undertaken into the participants' perceived satisfaction with the avatar (as a function of event type), their expectancy and their perceived similarity to the avatar. In this customized model, the effects of the covariates were controlled in the same way as in the previous model. Table 3 shows the results of the model. Replicating the results of the ANCOVA, the effect of event type on expectancy was significant. Moreover, the expectancy felt toward the event significantly increased both the perceived similarity of, and satisfaction with, the avatar created, supporting H3a and H3b. In line with H4, perceived similarity had a positive, significant effect on avatar satisfaction (Table 3). Regarding the control variables, male participants had a significantly higher level of expectancy toward the event than did females, ease of use significantly enhanced satisfaction and perceived customization positively affected both users' perceptions of avatar similarity and their satisfaction levels (Table 3).

5.3. Discussion

The results of the quantitative study revealed that virtual event type raises different expectations among attendees. First, in line with Gursoy et al. (2006), people who attend events derive utilitarian and hedonic value from their experiences (Babin et al., 1994), and this value depends on the type of event (e.g., Zhan et al., 2023). The present study confirms the results of previous literature in a different context (i.e., metaverse events), and extends it by examining users' expected value of an event before they attend the event. As in the physical realm, for utilitarian virtual events in the metaverse, formal styles are adopted to convey professionalism and credibility. In contrast, informal styles are more suitable for hedonic events, allowing users to exist in a relaxed atmosphere conducive to enjoyment and escapism. Overall, these results align with previous research on avatar creation in online environments and social media (Triberti et al., 2017; Vasalou & Joinson, 2009), and extend them to virtual events in the metaverse.

Second, this study concurs with previous research which showed that hedonic events produce a higher level of expectancy than do utilitarian events (Gursoy et al., 2006; Kashdan & Silvia, 2009; Ponsignon, 2023). Furthermore, being excited about attending an event in the metaverse also increases users' perceived similarity with their avatars. This may be explained by an increased level of involvement with the event, which makes users invest time and effort in preparing a sophisticated avatar with characteristics similar to their own (Mancini et al., 2019; Rahill & Sebrechts, 2021). Expectancy level also has a positive effect on users' satisfaction with their avatars, as they seem to feel more represented by, and connected to, the avatars (Trepte & Reinecke, 2010).

Third, the results of the qualitative study stressed the importance of ease of use and customization in the avatar creation experience. The results of the present study reinforce this notion. Given that creating an avatar is time-consuming, users appreciate that the system provides

Table 1
Univariate ANCOVAs for direct effects of the type of event.

	Utilitarian expected value		Hedonic expected value		Formal style		Informal style		Event expectancy		Avatar similarity		Avatar satisfaction	
Event	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Utilitarian	5.01	1.19	4.44	1.51	3.61	1.82	4.23	1.94	3.91	1.66	4.02	1.70	4.45	1.69
Hedonic	4.44	1.71	5.21	1.52	3.23	1.84	4.78	1.74	4.53	1.64	4.20	1.86	4.51	1.89
Variable	$F_{(5, 176)}$	η^2	$F_{(5, 176)}$	η^2	$F_{(5,176)}$	η^2	$F_{(5, 176)}$	η^2	$F_{(5, 176)}$	η^2	$F_{(5, 176)}$	η^2	$F_{(5, 176)}$	η^2
Event type	5.71*	0.03	15.71*	0.08	2.73	0.02	6.24*	0.03	7.10*	0.04	2.18	0.01	1.88	0.01
Ease of use	0.82	0.01	1.77	0.01	0.22	<0.01	0.12	<0.01	2.34	0.01	4.63*	0.03	63.31*	0.27
Customization	3.01	0.02	1.50	0.01	0.28	<0.01	4.85*	0.03	0.65	<0.01	26.74*	0.13	39.97*	0.19
Gender	0.46	<0.01	0.83	0.01	3.59	0.02	1.51	0.01	3.83	0.02	0.14	<0.01	3.89	0.02
Age	10.32*	0.06	5.74*	0.03	0.14	<0.01	1.80	0.01	3.15	0.02	1.74	0.01	3.24	0.02

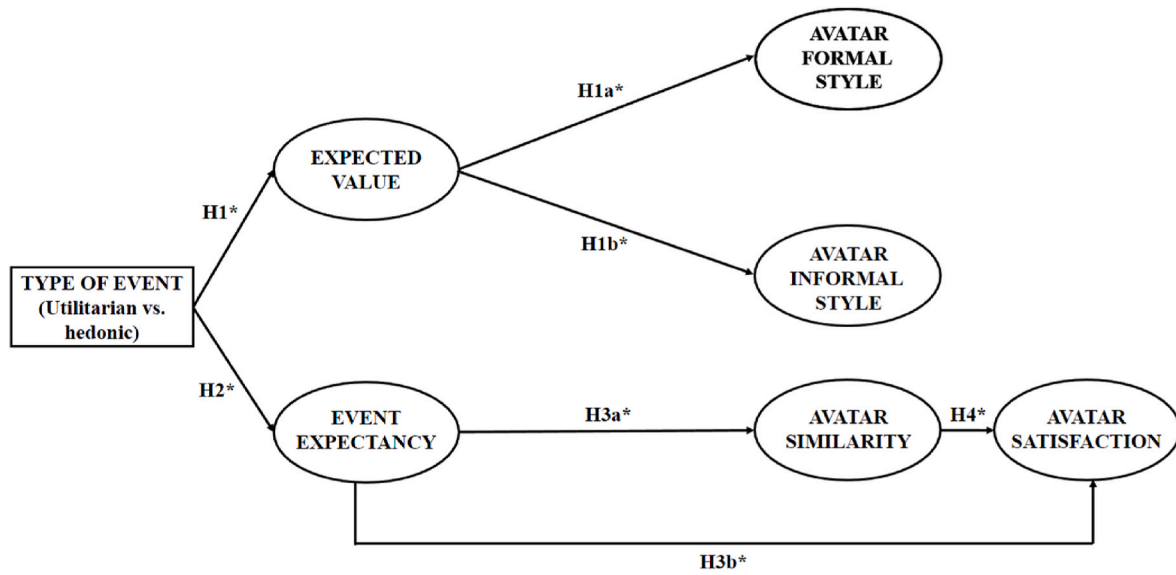Note: * = statistic significant at 0.05 level.

Fig. 6. Research models tested in Study 2. **Note:** *: hypotheses supported at 0.05 level.

Table 2
Results of the analysis on the style of the avatar.

Predictor	Coeff.	SE	t	p	LLCI	ULCI
Utilitarian expected value						
Constant	4.189	0.665	6.303	<0.001	2.877	5.500
Event type*	−0.564	0.209	−2.691	0.008	−0.977	−0.150
Gender**	−0.139	0.178	−0.784	0.434	−0.490	0.211
Age	0.055	0.016	3.354	0.001	0.023	0.088
Model Summary	$R^2 = 0.098$; $F_{(3,178)} = 6.440$, p<0.001					
Hedonic expected value						
Constant	2.805	0.700	4.009	<0.001	1.424	4.186
Event type	0.791	0.221	3.584	<0.001	0.355	1.226
Gender	−0.192	0.187	−1.025	0.307	−0.561	0.178
Age	0.039	0.017	2.270	0.024	0.005	0.074
Model Summary	$R^2 = 0.103$; $F_{(3,178)} = 6.825$, p<0.001					
Formal style						
Constant	2.595	1.034	2.510	0.013	0.554	4.636
Event type	−0.010	0.304	−0.031	0.975	−0.610	0.591
Utilitarian expected value	0.481	0.126	3.809	<0.001	0.232	0.730
Hedonic expected value	−0.239	0.120	−1.996	0.047	−0.475	−0.003
Ease of use	0.049	0.121	0.406	0.685	−0.190	0.288
Customization	0.017	0.129	0.126	0.899	−0.240	0.273
Gender	−0.417	0.225	−1.860	0.065	−0.860	0.026
Age	−0.001	0.021	−0.067	0.948	−0.044	0.041
Model Summary	$R^2 = 0.120$; $F_{(7,174)} = 3.399$, p=0.002					
Informal style						
Constant	1.351	0.938	1.440	0.152	−0.501	3.202
Event type	0.254	0.307	0.828	0.409	−0.351	0.859
Utilitarian expected value	−0.333	0.127	−2.618	0.010	−0.584	−0.082
Hedonic expected value	0.287	0.121	2.377	0.019	0.049	0.524
Ease of use	0.041	0.122	0.337	0.737	−0.199	0.282
Customization	0.314	0.131	2.398	0.018	0.056	0.572
Gender	0.276	0.226	1.218	0.225	−0.171	0.722
Age	0.029	0.022	1.325	0.187	−0.014	0.071
Model Summary	$R^2 = 0.136$; $F_{(7,175)} = 3.904$, p<0.001					

Total indirect effects of X on Y	Effect	BootSE	BootLLCI	BootULCI
Event → Expected Value → Formal style	−0.460	0.173	−0.810	−0.128
Event → Expected Value → Informal style	0.414	0.173	0.095	0.776

Notes: LLCI: lower limit confidence interval; ULCI: upper limit confidence interval; * Utilitarian event = 0, Hedonic event = 1; ** Male = 0, Female = 1.

Table 3
Results of the analysis on the satisfaction with the avatar.

Predictor	Coeff.	SE	t	P	LLCI	ULCI
Event expectancy						
Constant	2.896	0.804	3.604	<0.001	1.310	4.482
Event type*	0.589	0.242	2.434	0.016	0.111	1.066
Gender**	−0.409	0.205	−1.990	0.048	−0.814	−0.003
Age	0.036	0.020	1.808	0.072	−0.003	0.076
Model Summary	$R^2 = 0.078$; $F_{(3,178)} = 5.036$, p=0.002					
Avatar similarity						
Constant	−1.284	0.729	−1.762	0.080	−2.723	0.154
Event expectancy	0.289	0.065	4.456	<0.001	0.161	0.417
Ease of use	0.168	0.096	1.758	0.081	−0.021	0.357
Customization	0.518	0.101	5.116	<0.001	0.318	0.718
Gender	0.027	0.178	0.149	0.881	−0.324	0.377
Age	0.013	0.017	0.754	0.452	−0.021	0.047
Model Summary	$R^2 = 0.412$; $F_{(5,176)} = 24.614$, p<0.001					
Avatar satisfaction						
Constant	−1.511	0.470	−3.223	0.002	−2.440	−0.587
Event expectancy	0.120	0.044	2.743	0.007	0.034	0.206
Avatar similarity	0.324	0.048	6.727	<0.001	0.229	0.419
Ease of use	0.479	0.062	7.787	<0.001	0.358	0.601
Customization	0.292	0.069	4.212	<0.001	0.155	0.428
Gender	−0.196	0.113	1.730	0.085	−0.420	0.028
Age	0.011	0.011	1.018	0.310	−0.011	0.033
Model Summary	$R^2 = 0.762$; $F_{(6,175)} = 93.435$, p<0.001					

Relative indirect effects of X on Y	Effect	BootSE	BootLLCI	BootULCI
Event → Expectancy → Avatar satisfaction	0.071	0.042	0.008	0.170
Event → Expectancy → Avatar similarity → Avatar satisfaction	0.055	0.027	0.008	0.115

Notes: LLCI: lower limit confidence interval; ULCI: upper limit confidence interval; * Utilitarian event = 0, Hedonic event = 1; ** Male = 0, Female = 1.

them with tools that make the process simple and intuitive. This concurs with previous literature addressing 3D virtual worlds in tourism (Huang et al., 2013). Perceived customization also affects the informal style of the avatar, perceived similarity and users' satisfaction with the avatar. These results are in line with research in gaming contexts, where being able to personalize aspects of their avatars satisfies users' needs to cultivate their characters (Teng, 2010), and extends it to virtual events in the metaverse. Regarding the participants' sociodemographic characteristics, men reported a higher level of expectancy than women, which might translate into them feeling greater satisfaction with their avatars. This may be because men are more enthusiastic with the

adoption of new technologies than are women (e.g., Shaouf & Altaqqi, 2018). In addition, older participants expected more utilitarian and hedonic value, and reported higher expectancy, than did younger participants. This aligns with the notion that the older population is becoming attracted to new technologies, such as the metaverse (Schnedier & Cazin, 2022).

6. Conclusions

Avatars serve as digital representations of individuals in the metaverse, acting as their conduit for engagement and interaction in this environment (Hennig-Thurau et al., 2023). Should virtual reality and the metaverse develop as expected, avatars will become our digital personas. A well-designed avatar enables users to express their identities, preferences and aspirations, allowing for self-presentation and self-representation (Miao et al., 2022). This aspect is particularly important in the metaverse, which is characterized by the high degree of interactivity that takes place among users (Dwivedi et al., 2023), and for virtual events, where creating interpersonal relationships and socializing are essential (Li & Petrick, 2005). However, avatar creation in the metaverse is novel, and little literature has empirically investigated the topic (Buhalis et al., 2023).

This research analyzes users' experiences of avatar creation for an event taking place in the metaverse. Due to the newness of virtual events in the metaverse, and the subsequent lack of previous experience among users, this research adopts a user expectations approach to understand the phenomenon. Event attendees derive utilitarian and hedonic value from their experiences (Gursoy et al., 2006). Before attending a virtual event in the metaverse, users may anticipate the value they will get from the event based on their previous experiences in the physical world and use this expected value to design their digital representations. In addition, the novelty of metaverse experiences creates a lot of hype, even awe, as the platform offers unprecedented opportunities for immersive interactions, limitless exploration possibilities and transformative digital engagements (Dwivedi et al., 2023).

Using a mixed-methods approach, this research showed that metaverse event attendees prefer to invest time and effort in creating a single, unique avatar that resembles how they look in real life, instead of creating different avatars for different events. Nonetheless, users would adapt the style of their avatar based on their expectations of the event. This reflects how people behave in the real world. Therefore, in this context, users may imagine the metaverse as a virtual replica, or extension, of the physical world. The highly interactive and social nature of both events, and the metaverse, encourages users to represent themselves in virtual events through their avatars as extensions of their physical identities. Users not only extend themselves in the virtual environment, but also expect the outcomes of virtual interactions to transfer to their physical realities. In addition, the level of expectancy produced by the virtual event (which is higher for hedonic than for utilitarian events) leads users to strongly engage in the avatar creation process, thus they perceive their digital self-representations to be very similar to themselves, which generates satisfaction.

Finally, this research controlled for the effects of platform-based (ease of use and customization) and user-based (gender and age) characteristics on the avatar creation process. As for the technological capabilities, the participants positively valued that the platform made it easy for them to create the avatar, and that it offered them a wide range of customizable options in terms of the avatar's style, which increased the perceived similarity of, and satisfaction with, their digital personas. In addition, women may especially value aspects related to customization affordances, while men stressed platform-related factors, and are more excited about virtual events in the metaverse, which may increase their satisfaction.

6.1. Theoretical implications

This research responds to recent calls in the metaverse-focused literature (Buhalis et al., 2023; Dwivedi et al., 2023) and provides theoretical contributions to advance our knowledge in this flourishing area. First, the results of the qualitative and quantitative studies improve our understanding of the avatar creation process. For virtual events in the metaverse, our study highlighted the pivotal role of avatars for achieving valuable experiences in the metaverse, given that they create a sense of connectedness with others in this virtual sphere (Yung et al., 2022). Overall, users would rather have a unique digital persona for their metaverse-based activities, which addresses questions about the metaverse ecosystem and avatars raised in previous research (Dwivedi et al., 2022). Thus, they are willing to invest resources to create an avatar that is as alike them as possible.

However, just as in real life, where individuals adapt their styles according to the type of event they are going to attend, this research shows that users may want to adapt their avatars based on event type. A contribution of this research is its combination of affect–expectations theory (Klaaren et al., 1994) and perceived value theory (Babin et al., 1994) to analyze how the expected value anticipated from different events is used to evaluate the avatar creation experience. For highly novel environments, such as metaverse events, people may anticipate not only how they might feel about an event, but also what they might gain from it, and ready their digital personas for that purpose. Matching the avatar's style to the nature of the event contributes to enjoying an engaging experience in the metaverse.

Furthermore, previous research has emphasized the need to consider how excitement and the wow effect might impact on users' perceptions and behaviors in the metaverse (Barta et al., 2023). This research advances this topic by revealing that high expectancy levels lead to enhanced perceptions of similarity between individuals and their digital representations, which increases satisfaction levels.

Finally, the results of this research contribute to the careful examination of control variables related to the system's (i.e., ease of use, customization) and the user's (i.e., gender, age) characteristics in the analysis of human-technology interactions (Shiau et al., 2024). Based on the evidence provided by study 1, these control variables were included in the analyses conducted in study 2, as they can impact on both avatar creation and satisfaction levels.

6.2. Managerial implications

The findings of this research allow us to offer recommendations for software developers and events' industry professionals. First, the results showed that most users prefer one unique avatar that they can adapt to different contexts/event type. However, events' professionals should take into account the nature of the event they are hosting (utilitarian or hedonic), given that this affects the outfits they should offer to attendees. For professional or functional events, a sense of professionalism and seriousness is usually required (McCracken & Roth, 1989; Vasalou & Joinson, 2009). The platform should, thus, provide a wide variety of accessories that can create a professional atmosphere (matching the specific cultural background/industry context in which the event takes place). For leisure/hedonic events, organizers should provide informal accessories that align with the relaxed and festive nature of the occasions (Triberti et al., 2017). Thus, the choice of outfit accessories to be offered in the metaverse should be driven by the professionals' clear understanding of the event's nature and the participants' expectations of the value they will derive from the event.

Second, events' professionals should take steps to increase the attendees' expectancy of metaverse-based events. Consequently, users might invest more time in creating avatars similar to themselves, resulting in higher satisfaction with their digital representations (Mancini et al., 2019; Rahill & Sebrechts, 2021). Several marketing techniques can be applied to generate expectancy of the event. For instance,

promotional videos might be issued prior to the event to showcase the unique experiences and activities that can be enjoyed in the metaverse. On social media, event promoters might create dedicated event hashtags, to encourage attendees to share their excitement and expectations of the event, or even run avatar customization-related contests or challenges.

Last, but not least, factors related to the ease of use of the software, and the multiple customization options, are of great importance (Lee et al., 2023; Venkatesh & Davis, 2000). It should be noted that there is ferocious competition between technological companies to develop THE metaverse, one that encompasses all the so far developed virtual worlds, and which allows avatars to move seamlessly between them. The results of the qualitative and quantitative studies suggest that ease of use and customization capabilities may be key to succeeding in this task. For instance, intuitive drag-and-drop features allow participants to effortlessly modify their avatar's appearance, such as choosing hairstyles, clothing options, facial features and accessories. In addition, incorporating a robust library of assets, styles and cultural representations will allow users to create avatars that reflect and strengthen their individuality (Chen & Chen, 2020). Therefore, by implementing user-friendly interfaces and extensive customization options, metaverse platforms can effectively cater to the diverse preferences of their users, ensuring a satisfying avatar creation experience in the event. Furthermore, events' professionals might examine the characteristics of the target audiences of metaverse events and offer design tools that allow them to create avatars with the styles they want, as well as to meet their expectations.

6.3. Limitations and future research lines

This research, while insightful, is not without limitations, but these open avenues for future investigation. First, although the qualitative study was conducted with real conference attendees, the quantitative study was an online experiment based on an artificially constructed scenario, which limits the external validity of the findings (Viglia & Dolnicar, 2020). Particularly, the quantitative study subjects were told to imagine they were going to participate in a "fictitious" utilitarian/hedonic event to be held in the metaverse (photographs were displayed to illustrate the situation; Fig. 5). They underwent a simulated experience (as in previous immersive technology studies, e.g., Batat, 2021). This artificially constructed situation served to contextualize the event used in the study, since the main objective was for participants to create an avatar for that particular event. While the research team carefully controlled the experimental details and ensured that all the participants met the requirements, some biases may arise as a consequence of the procedure, such as interpretation bias (i.e., participants may not imagine the scenario as intended by the researchers) and/or response bias (i.e., participants may not have been honest in their required responses to participate in the study; Bhattacherjee, 2012). Future studies should address these potential biases and conduct field experiments to delve into the avatar creation process in real virtual events in the metaverse.

Second, this research is based on the participants' experiences in a metaverse platform specialized in the organization of events (Virtway Events). Future research, to generalize the results, should consider a wider range of metaverse platforms (e.g., Horizon Worlds) that offer varying levels of customization and ease of use. In addition, the participants accessed the metaverse through a computer device. However, the influence of the technological embodiment of the device (virtual reality headset vs. computer; Flavián et al., 2019) should be analyzed.

Finally, the participants reported their perceptions of several avatar-related variables (e.g., perceived similarity). However, other types of measures to assess avatar similarity could be used to evaluate this more objectively. For example, AI-based image analysis tools could be used to assess the degree of similarity between the avatar and the user. Furthermore, this research has primarily focused on the esthetic aspects of the avatar. In future research, other features might be analyzed. The avatar's performance in the virtual space, its facial expressions and the dynamics of inter-avatar interactions in metaverse-based events could be explored to understand the importance of these attributes to perceived user-avatar similarity.

CRediT authorship contribution statement

Sergio Barta: Conceptualization, Formal analysis, Methodology, Validation, Writing – original draft, Writing – review & editing, Data curation, Investigation. **Sergio Ibáñez-Sánchez:** Conceptualization, Formal analysis, Methodology, Validation, Writing – original draft, Writing – review & editing. **Carlos Orús:** Conceptualization, Investigation, Methodology, Supervision, Visualization, Writing – original draft, Writing – review & editing. **Carlos Flavián:** Conceptualization, Project administration, Supervision, Writing – original draft, Writing – review & editing, Funding acquisition.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix. Scale items

	Item-total correlation	Factor loadings
Utilitarian expected value (α = 0.923; % variance explained = 86.75)		
I expect that in this event on the metaverse, I will …		
UTI1. gain knowledge of interesting things	0.866	0.943
UTI2. learn about useful things	0.851	0.936
		(continued on next page)

(continued)

	Item-total correlation	Factor loadings
UTI3. enhance my skills	0.814	0.916
Hedonic expected value (α = 0.958; % variance explained = 92.36)		
I expect that in this event on the metaverse, I will …		
HED1. spend some enjoyable time	0.920	0.931
HED2. derive fun and pleasure	0.915	0.927
HED3. entertain myself	0.901	0.913
Formal style (α = 0.875; % variance explained = 80.01)		
My avatar's clothing style is …		
FORM1. formal	0.785	0.909
FORM2. classic	0.712	0.867
FORM3. elegant	0.783	0.907
Informal style (α = 0.841; % variance explained = 86.37)		
My avatar's clothing style is …		
INFORM1. casual	0.727	0.929
INFORM2. streetwear	0.727	0.929
INFORM3. edgy		
Event expectancy (α = 0.968; % variance explained = 82.06)		
In anticipation of this event in the metaverse, I …		
EXPECT1. am excited to participate	0.884	0.916
EXPECT2. am aroused by my participation	0.808	0.852
EXPECT3. am stimulated to participate	0.896	0.924
EXPECT4. am looking forward to attending the event	0.890	0.922
EXPECT5. am eager to participate	0.910	0.937
EXPECT6. am amazed to participate	0.874	0.899
EXPECT7. thought "wow"	0.863	0.893
EXPECT8. am thrilled about my participation	0.875	0.902
Avatar similarity (α = 0.969; % variance explained = 86.61)		
SIM1. My avatar is like me in many ways	0.888	0.923
SIM2. My avatar resembles me	0.900	0.931
SIM3. I identify with my avatar	0.908	0.937
SIM4. My avatar is an extension of myself	0.859	0.901
SIM5. My avatar is similar to me	0.922	0.947
SIM6. I resemble my avatar	0.917	0.944
Avatar satisfaction (α = 0.961; % variance explained = 89.64)		
SAT1. I am satisfied with my avatar	0.904	0.948
SAT2. I am delighted with my avatar	0.933	0.963
SAT3. My avatar has exceeded my expectations	0.864	0.921
SAT4. Overall, I am satisfied with my avatar	0.916	0.955
Ease of use (α = 0.917; % variance explained = 80.36)		
The creation of the avatar …		
EASE1. has been clear and understandable	0.783	0.879
EASE2. has not required much mental effort	0.745	0.851
EASE3. has been intuitive	0.843	0.916
EASE4. has been easy	0.877	0.937
Avatar customization (α = 0.910; % variance explained = 85.14)		
I have been able to customize …		
CUST1. the appearance of my avatar	0.846	0.934
CUST2. the accessories and decorations of my avatar	0.828	0.926
CUST3. a wide range of the physical aspects of my avatar	0.795	0.907
Gender		
Age		

Note: item in italics was removed during the validation process.

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