RESEARCH PAPER

Telepresence in live-stream shopping: An experimental study comparing Instagram and the metaverse

Sergio Barta[1] · Raquel Gurrea[1] · Carlos Flavián[1]

Abstract

Advances in digital platforms allow influencers to use live shows to showcase products, which has given rise to live-stream shopping. Moreover, new communication forms have emerged, such as the metaverse. The social interactions that occur in these immersive environments foster influencer-follower interactions. This research compares the impact of live-stream shopping on followers' experiences and behaviors on two communication channels (live shows on Instagram and in the metaverse) and analyses the moderating role of content involvement in telepresence. Data were collected in a between-subjects quasi-field experiment. Two scenarios that differed in degree of telepresence were created, a live show on Instagram and a live show in the metaverse. The results showed that telepresence is an important part of the user experience and in the success of live shows. Telepresence was seen to have a major influence on experiential value, but not on instrumental value. Both values provided followers with satisfaction with the experience. This satisfaction generated stickiness intention and intention to recommend the influencers' live shows. The effect of telepresence on experiential value was greater for followers less involved with the influencer's content. This research is pioneering in comparing an established platform, Instagram, with the metaverse. Despite the greater experiential value provided by the metaverse, to increase its instrumental value metaverse spaces needs to be further developed.

Keywords Digital platform · Extended reality · Influencer · Instagram · Live-stream shopping · Metaverse · Telepresence

JEL Classification M3

Introduction

The advent of social networks such as Instagram, YouTube, and TikTok has significantly boosted the emergence of influencers. Influencers are essential sources of information for their followers; and they have been shown to influence their followers' behaviors (Rakuten Marketing, 2019). Recent research has shown that they exert more influence than traditional media, such as brand ads (Casaló et al., 2020; Lou & Yuan, 2019). Indeed, mirroring the growing importance of social networks, many consumers now seek the advice of these opinion leaders before making their purchase decisions (Audrezet et al., 2020).

In recent years, influencer live events have increased, providing a new channel for these influencers to communicate and interact with their followers (Olafson, 2021; Wise, 2022). On Instagram, the social network that features the most influencers (Statista, 2021), they organize live shows and save them to their profiles to allow their followers to view them later. Research into this social network has focused on analyzing the characteristics of influencers' posts that help them achieve the best results. These results include benefits for the influencer, such as improved credibility, enhanced opinion leadership and increased interactions (likes, comments), and benefits for the brands they promote, such

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as improved attitude towards the brand and/or purchase intentions for the products advertised (Casaló et al., 2020; Colliander & Marder, 2018; del Rocío Bonilla Quijada et al., 2021). Some characteristics of influencers' posts, such as originality, uniqueness, and where the products appear (e.g., foreground/background of the picture), have been shown to affect followers' behaviors (Casaló et al., 2020; Jin & Muqaddam, 2019). In addition to research that has taken place into the characteristics of influencers' posts, examinations have been made into the impact of aspects of influencers' profiles (e.g., number of followers) on followers' attitudes towards the influencers and their intentions to search for information about products (Jin & Muqaddam, 2019). In addition, recent literature has analyzed the main drivers of consumer outcomes, such as product purchases, on social media platforms (Herzallah et al., 2022; Vrontis et al., 2021). Simultaneously, some studies have emphasized the need to study other emerging platforms, and product categories other than fashion, to date the most researched category (Ahmadi & Ieamsom, 2022; Vrontis et al., 2021). Therefore, some aspects, such as the effect on followers of influencers' live shows, broadcast to support live-stream shopping, remain less explored. When influencers broadcast live shows to promote products, their followers can purchase the goods displayed with a single click. It should be noted that this is a two-way channel, as followers can interact with the influencers. Live-stream shopping shows increase engagement and are expected to generate a cumulative total of $26USD billion by 2023 (Coresight Research, 2022). These factors underline the importance for influencers/companies of identifying how to add value to the consumers' experience of these events, because this will progressively increase their viewership.

Recent advances in information and communication technologies (ICTs) have led to the emergence of the metaverse (Frenkel et al., 2022). The metaverse is a virtual space where people can "meet," represented through customizable avatars. In this virtual space, users interact with virtual objects (images, 3D objects, audio, videos) and can talk to other users (Carter, 2022). The spaces have been studied mainly in the educational context, where it has been demonstrated that sensory, information-rich learning experiences provide a much wider range of experiential learning and training (Suh & Ahn, 2022). However, the metaverse can be applied in multiple contexts, and its constituent characteristics and the opportunities where it might be exploited should be intensively researched. Furthermore, given the growing importance that live-stream shopping looks likely to have in the coming years, the benefits that it can provide should be explored. In this context, previous research has shown

that the greater social presence generated in virtual spaces increases followers' perceptions of an influencer's trustworthiness, leading to higher purchase intentions (Barta et al., 2021a). However, there is a need to understand the value that live shows on the metaverse provide to followers to gain a deeper knowledge of the factors that motivate followers to adopt and attend these events.

To bridge these research gaps, the present study aims to explain the value that live-stream shopping provides to influencers' followers, and the responses it evokes from them, from a dual perspective, experiential and instrumental value. Thereafter, based on this analysis, an examination is made into the role of the particular characteristics of the platform where the shows are presented. More specifically, we aim to explain the effect of telepresence by comparing two scenarios: (1) live-stream shopping on Instagram and (2) live-stream shopping in the metaverse. In addition, an exploration is made of the moderating role that followers' characteristics, such as the involvement they have with the influencers' content, may have in the relationship between telepresence and value creation. For these purposes, a quasi-field experiment, with two different live-stream shopping-based scenarios, was carried out, using the online platforms Instagram and the metaverse, which provide different degrees of telepresence.

The present study is a pioneer in the empirical analysis of live-stream shopping in the metaverse. It compares the value followers derive from live-stream shopping in the metaverse and from the most widely used social network, Instagram. In addition, it adds knowledge to the prior telepresence literature. It also extends the knowledge of the metaverse beyond previously examined contexts, such as e-commerce (Lim & Ayyagari, 2018). It also responds to the calls made in recent research by providing insights into how the metaverse can add value to influencer/follower interactions (Dwivedi et al., 2023). The research also provides valuable managerial implications. Specifically, the study analyses the role of telepresence in the value followers perceive they receive from influencer-led live-stream shopping, highlighting that the metaverse provides greater experiential value to this type of commerce. However, it also shows that the metaverse needs to be further developed, because it does not provide higher instrumental value than well-established platforms such as Instagram.

The remainder of this article is organized as follows. First, we review the literature on the three main research concepts examined (telepresence, influencers and live-stream shopping, and the metaverse). Then, a conceptual model is proposed and hypotheses are developed. Next, we present the study's methodology and findings, including the tests of the hypotheses, and propose theoretical and managerial implications based

on the results. Finally, the main limitations of the study are discussed.

Background

This section reviews the relevant literature to understand the effects of telepresence on the value provided to followers, and on their subsequent behaviors. Based on the literature review, a conceptual model is proposed that seeks to explain the effects of telepresence on the value users derive from their experiences and on their responses. The remainder of the section reviews the relevant literature to develop the hypothesized relationships.

Telepresence

The notion of telepresence emerged from virtual experiences (real or simulated environments in which the perceiver experiences other worlds). The telepresence concept is characterized in two ways in the literature. On the one hand, in a line more focused on context, Steuer (1992) defined telepresence as the experience of presence in an environment created through means of communication. On the other hand, in a line focused on the user, Biocca (1992) defined it as his/her ability to be psychologically transported to another place. The present study adopts this second approach because our focus is on the user's perceptions of the telepresence experienced. In line with the definition provided by Biocca (1992), the present research takes telepresence to be the perception of followers that they have been psychologically transported into a virtual environment (through an Instagram live, or a live show in the metaverse).

The concept of telepresence has been used to examine how media characteristics influence users' responses (Klein, 2003). The different media options vary widely in their potential to convey product information. For example, some media can communicate information only in one way (e.g. radio), and others can communicate it in more ways (e.g. television). Extensive communications' research has explored how to create telepresence in media (Coyle & Thorson, 2001; Kim & Biocca, 1997). The role of telepresence has also been investigated in other contexts, such as e-commerce. Previous studies have posited that the consumer's experience can be enhanced by the virtual reality associated with telepresence (e.g. Coyle & Thorson, 2001; Steuer, 1992). In e-commerce, immersive experiences create positive consumer attitudes towards products and sellers (Mollen & Wilson, 2010). However, the role that telepresence plays in the value users derive from live-stream shopping has not yet been explored.

Influencers and live-stream shopping

The growing importance of the opinions expressed on social networks, and the increasing influence that some people exert on others has motivated some users to devote themselves to create, and share, content about specific topics and/or their areas of expertise (e.g., fitness, video games) on social networks, such as YouTube, Twitter, and Instagram, professionally, semi-professionally, or altruistically (Weismueller et al., 2020). Consequently, individuals/consumers interested in particular areas can follow and interact with influencers to keep up with the latest news, trends, etc.

Influencer marketing is based on brands identifying and employing opinion leaders to influence potential customers through the presentation of sponsored content (Scott, 2015). The word "influencer" has been coined to describe people who exert a particularly strong influence on their followers. While the term is widely used in the social network context, academic definitions of the word are relatively scarce (Dhanesh & Duthler, 2019). Some authors have defined influencers as particular types of micro-celebrities (Senft, 2013) and self-made micro-celebrities (Evans et al., 2017). Social media influencers, like celebrities, use their ability to influence their followers to make suggestions/recommendations about products and/or services. While there are some similarities between influencers and celebrities, they are conceptually different (Dhanesh & Duthler, 2019). The specialist knowledge that followers believe influencers possess has greater persuasive power than that accorded to celebrities (Djafarova & Rushworth, 2017).

Influencers have become known through the social media that allow them to present their viewpoints, opinions, values and lifestyles (Sokolova & Perez, 2021). As a result, they have created personal brands that attract and engage many followers (Khamis et al., 2017). In the present study, we adopt the definition offered by Dhanesh and Duthler (2019), that is, a social media influencer is a person who, through a personal brand, builds and maintains relationships with multiple followers on social media, and can inform, entertain, and potentially influence the thoughts, attitudes, and behaviors of these followers. Extensive analyses have been undertaken into the behaviors exhibited by followers based on the influence these opinion formers exert on social networks, with a clear focus on Instagram (Rejeb et al., 2022; Ye et al., 2021). The Instagram-focused literature has examined how aspects of content (e.g., quantity, quality, originality, enjoyment) affect followers' intentions to adopt influencers' advice and purchase intentions (Ballester et al., 2021; Casaló et al., 2020). Much academic research has assessed how influencers are perceived and the efficacy of their posts. Most of these analyses into efficacy have been conducted in B2C contexts, focusing on the underlying mechanisms that

explain intention to buy sponsored products (Hudders et al., 2021). Other platforms, such as TikTok and the metaverse, are becoming more important. In this sense, it would be interesting to examine whether consumers' interactions with influencers encourage them to use and recommend these online platforms (Dwivedi et al., 2022).

Live-stream shopping is a relatively new kind of social commerce that combines commercial and social elements (Chen et al., 2022). It has been defined as the distribution by e-retailers of live event videos to increase sales by creating an intimate engagement atmosphere with potential customers (Zhang et al., 2020). It has many advantages, for example, potential consumers can view products in real-time, instead of looking at photographs, which helps them appreciate better the uniqueness of the goods on offer (Chen et al., 2018). The format also features a simultaneous text chatroom, so viewers can interact with the influencer and even other users. The platform allows users to ask questions about the product, which helps their decision-making processes (Wongkitrungrueng & Assarut, 2020). Live streaming gives sellers the opportunity to answer questions raised by viewers, thus providing the consumer with a more customized and targeted understanding of the product (Liao et al., 2022), which can impact on purchase intentions and engagement (Chen et al., 2017). In our case, that is, of an influencer that followers already know, the effects on intentions could be even higher.

Metaverse

The metaverse is an environment that merges physical reality with digital virtuality. It is based on the convergence of technologies, such as virtual reality (VR) and augmented reality (AR), that enable users to experience multisensory interactions with virtual environments, digital objects, and other people. The metaverse is, therefore, an interconnected network of immersive social environments, which enables its users to experience seamless real-time communication and dynamic interactions with digital objects (Mystakidis, 2022). Alt (2021) argued that the metaverse is an assistant platform because it is designed to provide services based on users' voice and text interactions. The metaverse has been shown to be particularly important in learning and training and to improve users' digital experiences. Sharing the same space virtually allows a true community of practice to develop and generates an online environment where collaboration-based learning is encouraged (Bronack et al., 2008). In e-learning contexts, some studies have suggested that sharing the same space increase social interaction. Unlike other platforms, the metaverse allows real-time audio and text-based conversations, which promotes inter-user closeness.

However, virtual technologies are used for much more than just education. Technological advances have provided various options, in other contexts, featuring different levels of interaction and immersion. The metaverse can be useful in various ways, for example, in fostering interpersonal interactions, because it simulates physical proximity and provides 3D showcases for product demonstrations. The greater immersion afforded by these spaces can create closer inter-participant proximity. This is because participants share the same physical space, even if only virtually. The representation of the participants in these spaces by avatars and the possibility of enjoying interpersonal "interactions" also encourage the feeling of social closeness (Latoschik et al., 2017). In turn, these spaces are ideal contexts for product presentations. New products can be represented through 3D models, which consumers can view in great detail, looking at their color, shape, etc. Therefore, in the same way that the advantages of the virtual worlds in learning and training have been demonstrated, it is now necessary to understand the impact that the features of new platforms (concretely, the metaverse) can have in other contexts, such as communication via influencers. Table 1 is a summary of the recent main studies into the metaverse and describes how the present study contributes to the topic.

Hypotheses development

Research proposal

The theoretical framework used in this research is in line with the technology adoption model (TAM, Davis, 1989). The TAM supports the proposed theoretical model because it can be used to explain the development of the consequences (in terms of the followers) of live shows broadcast on digital platforms. TAM posits that user evaluation of technology mediates relationships between technology attributes and resulting behaviors (Davis, 1989; Davis et al., 1989). In the present study, it is proposed that degree of telepresence is the attribute of the technology that affects followers' evaluations. Followers' evaluations are based on the experiential value, instrumental value, and satisfaction they derive from experiences. Positive evaluations create greater stickiness intentions and stronger recommendation intentions. Due to the social component of Instagram and the metaverse, and the influencer-follower interactions in these spaces, followers' characteristics are included in the theoretical framework. Specifically, we analyze the moderating role of followers' characteristics, such as their degree of involvement with the content shown. Figure 1 depicts the proposed research model.

Table 1 Summary of research into the metaverse

| Authors	Study design	Contributions
Barta et al. (2021a)	Empirical experiments	The greater social presence provided by virtual worlds enhances followers' perceptions of influencers' trustworthiness. This trustworthiness enhances consumers' attitudes towards the product and intention to follow the influencer's advice, leading to higher purchase intentions
Egliston and Carter (2021)	Case study	The metaverse needs to address social and technical questions regarding how it is used. Regulatory intervention is needed as VR becomes more widely adopted
Dahan et al. (2022)	Conceptual	Discusses the technologies associated with the metaverse that should be used to improve E-learning and virtual learning. This study provides academics with a framework to improve E-learning based on the compatibility of the metaverse with any E-learning environment
Dwivedi et al. (2023)	Conceptual	Shows marketing implications of metaverse adoption. Based on insights offered by several authors, a framework provides a future research agenda on different topics (digital marketing, flow states, value creation, tourism marketing, consumer journey, branding…)
Dwivedi et al. (2022)	Conceptual	Describes opportunities provided to users, and complexities and challenges faced by users, organizations and institutions, from different perspectives. The study sheds light on the metaverse environment and its relationship with sustainability, security, privacy and cryptocurrencies. Provides an agenda for research into the metaverse
Gursoy et al. (2022)	Conceptual	Conceptualizes metaverse travel and tourism experiences based on two dimensions, interactivity and motives. Provides a research agenda for three categories: staging experiences, changes in consumer behaviors and marketing and operations strategies
Kozinets (2022)	Qualitative, netnography	Immersive netnography should be at the vanguard of phenomenological service experience studies into the metaverse. Companies may benefit from a new, holistically focused, ethically robust and culturally attuned market research method aimed at understanding service experiences in immersive technology contexts
Lee and Kim (2022)	Empirical, lab experiment	Performance expectancy, effort expectancy and social influence increase satisfaction, usage intention, purchase intention and word-of-mouth intention. Facilitating conditions do not have a significant impact on satisfaction
Park and Kim (2022)	Conceptual	Identifies the concepts and techniques underlying the creation/existence of the metaverse, based on three components, hardware, software and content. Analyses the possibilities of the metaverse from three perspectives, user interaction, implementation and application. Provides an overview of current problems faced by, and technologies that exist in, the metaverse
Rauschnabel et al. (2022)	Conceptual	Demonstrates the differences between augmented reality marketing and traditional digital marketing concepts. Redefines the reality concept (reduced reality, normal reality and augmented reality) in the metaverse context. Proposes the Bick Four framework (branding, inspiring, convincing and keeping) as a tool to organize goals
Riva & Wiederhold (2022)	Conceptual	Explains the metaverse concept and shows how it differs from other technologies, such as TV and social media. Discusses positive and negative applications of the metaverse, and offers guidelines for studying the metaverse and its consequences in a multidisciplinary and integrative approach
This study	Empirical, quasi-field experiment	The greater telepresence provided by the metaverse than provided in Instagram live shows increases experiential value, but not instrumental value. The effect of telepresence on experiential value is higher for followers who are less involved with the content posted by influencers

The role of telepresence in value creation

The metaverse is a computer-generated 3D space that, unlike other platforms, allows users to communicate with each other. The spatial characteristics of these environments simulate physical proximity, which encourages inter-user interactions, during which they undertake activities, using their virtual selves, represented by avatars (Kim, 2021). Klein (2003) defined telepresence as a sense of presence in a remote environment and argued that the particular characteristics of different online environments provide varied degrees of telepresence.

Fig. 1 Research model
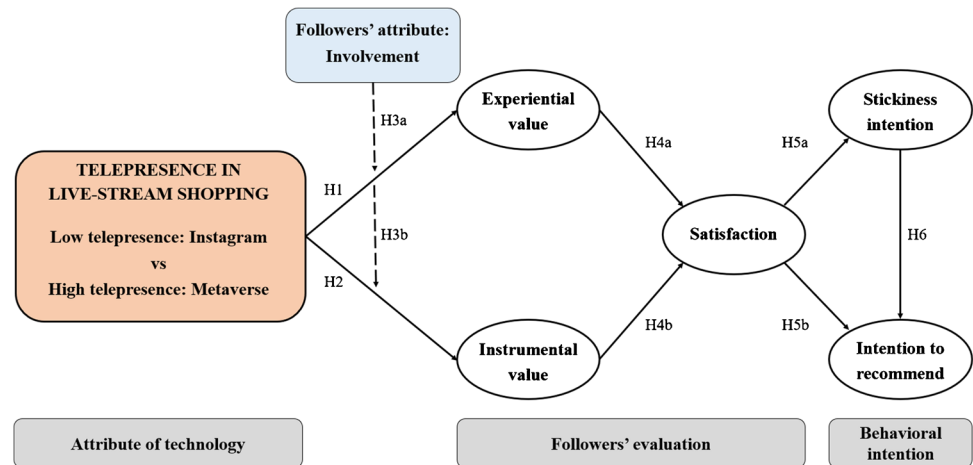
Instagram live shows scarcely generate any sense in the viewer that (s)he has travelled to another place. The follower understands that the influencer is elsewhere. However, this is not the case with the metaverse. Both the influencer and the follower may perceive that they are sharing the same physical space. Even if the space is virtual, the influencer and the follower see themselves represented through customizable avatars that share the same space. Furthermore, in line with the embodiment-presence-interactivity (EPI) cube proposed by Flavián et al. (2019), it is argued in the present study that the greater feeling of immersion provided by virtual environments evokes a higher sense of presence (of being in another world) than do other platforms, such as Instagram. Thus, we propose that the metaverse is a space with a high degree of telepresence and, in contrast, that Instagram is an environment with a low degree of telepresence.

Value is "an interactive, relativistic, preference experience" (Holbrook, 1986, pp. 32) that reflects users' perceptions about what they have gained from an experience. Product-based experiences can provide consumers with experiential value by giving pleasure to the senses, emotional satisfaction, enjoyment and fantasy, and instrumental value by providing the information needed to carry out goal-directed behaviors, such as making purchasing decisions (Holbrook & Hirschman, 1982).

Experiential value is derived from information that stimulates the senses or generates emotions such as enjoyment (Fiore et al., 2005). Telepresence provides experiential value through the pleasure individuals derive from the greater wealth of content afforded by virtual rooms; for example, they can view both images and 3D models of products. In addition, the greater possibilities for interpersonal interaction, and interaction with the products displayed in the metaverse, enrich experiential value. Virtual scenarios facilitate interpersonal interactions and,

for followers, bring greater closeness to someone they follow, and of whom they are probably a fan. While communications on Instagram live can only take place via written chat, telepresence allows users to be virtually present, and communicate, with other users in the same space (via written chat or voice), generating greater experiential value. Therefore, and in line with previous studies that have shown that telepresence causes an experience to develop more positive aspects, such as enjoyment (Kim et al., 2005; Li et al., 2001), we hypothesize that:

H1: High telepresence in live-stream shopping (versus low telepresence in live-stream shopping) has a positive effect on experiential value.

Instrumental value is derived from the information that helps individuals carry out goal-oriented behaviors, such as product choices and other purchase-related decisions (Fiore et al., 2005). Instrumental value may increase due to the individual's ability to view 3D models of products. Currently, virtual-modelling technologies do not provide all sensory information (e.g. touch-based data). However, in the context of the present study, it is proposed that the telepresence experienced in the metaverse provides a closer approximation to reality in terms of the consumer's ability to evaluate products than does an Instagram live show. On Instagram, the product is seen only in 2D, while in the metaverse, it is possible to view it in 3D, that is, from all angles. This facet provides more information, which can help viewers make product purchasing decisions (Li et al., 2001). Thus, we hypothesize that:

H2: High telepresence in live-stream shopping (versus low telepresence in live-stream shopping) has a positive effect on instrumental value.

Content involvement of followers

User involvement has been defined in the literature in various ways (e.g., Barki & Hartwick, 1994; Baroudi et al., 1986). Involvement refers to a person's sense of significance regarding an object, depending on his or her needs, values, and interests (Zaichkowsky, 1994). Barki and Hartwick, (1994) defined it as the psychological state of the individual user in terms of his or her attachment to a certain system or to information. This psychological state arises from intrinsic motivation and, thus, can affect individuals' interest in performing a specific task and/or interest in obtaining information about a topic or object (Plant & Ryan, 1985). Thus, people with more involvement are more attentive and/ or spend more time performing an activity (Celsi & Olson, 1988). Thus, an individual's involvement may affect the perceptions, evaluations, and behavior that arise from a given activity due to the different degrees of motivation they had during the performance of the activity (in this case, attending an influencer's live show).

Greater involvement causes the individual to be more attentive, which allows him/her to process information better. On the other hand, individuals with low involvement are often unwilling to make great efforts to process information (Belanche et al., 2020). Thus, when an individual has a high degree of content involvement, both the affective element of the experience and the utility of the experience are likely to be intensified. More involved individuals are more curious and pay more attention to the details of the experience. In addition, the greater interest they have in the content offered by the experience will cause them to consider it more valuable. On the other hand, these individuals will process more information from the influencer and, thus, gain more instrumental value from the experience.

> H3: The effect of high telepresence in live-stream shopping (versus low telepresence in live-stream shopping) on (a) experiential value and (b) instrumental value will be stronger for followers with high content involvement than for followers with low content involvement.

The effects of experiential and instrumental value

The increased value that followers perceive they derive from experiences positively affects their evaluations of the experiences. Satisfaction is the psychological or affective state resulting from the individual's cognitive assessment of confirmation between expectations and results (Oliver, 1980). To evaluate an experience, the individual considers its positive and negative aspects. Therefore, the individual's perceptions of the value of an experience affects his/her evaluation of the experience (Barta et al., 2022; Hu et al., 2015). Given that experiential and instrumental value are both positive

aspects in an experience, it is proposed when an individual perceives they are present in an experience (s)he will evaluate it more highly.

> H4a: Experiential value has a positive effect on satisfaction.
> H4b: Instrumental value has a positive effect on satisfaction.

Behavioral intentions

The theory of planned behavior (TPB) proposes that intentions are the main antecedents of behaviors (Ajzen, 1991). Behavioral intentions are, thus, crucial, as they represent a reliable signal of future user behavior (Casaló et al., 2011). Stickiness intention and intention to recommend an experience are two behavioral intentions that demonstrate that the individual involved enjoyed a positive experience. Satisfaction results when the benefits obtained from a product/service are at least equal to the consumer's expectations (Oliver, 1980). Hence, satisfaction is the primary motivation for continuance intention. Stickiness in this context is the ability of a website to attract and retain customers, that is, the amount of time consumers spend on a website, and how often they return to the website (Zott et al., 2000).

Therefore, and in line with expectation confirmation theory (Oliver, 1980), when individuals enjoy a satisfying experience, they will want to continue enjoying it into the future. Therefore, it is reasonable to conclude that the positive aspects of stickiness intention will motivate the individual to recommend the experience. In short, users might express their satisfaction with an experience by wishing to spend more time enjoying it, by wanting to repeat it (stickiness intention), by recommending it and/or by posting their positive opinions on social network sites (e.g. Instagram), and/ or by communicating them directly to family and friends. Thus, we propose:

> H5: Satisfaction has a positive effect on (a) stickiness intention and (b) intention to recommend.

There is a growing consensus among scholars and marketing professionals that improving the stickiness of websites leads to positive results, such as long-term loyalty, positive electronic word-of-mouth (eWOM), and higher revenues (Lin, 2007; Lin et al., 2010). However, little research has been carried out into the relationship between stickiness and eWOM specifically on social networks. In line with Racherla et al. (2012), the authors argue that stickiness intention for a website is formed when there are strong connections between the users and the experience. These strong connections increase the user's intention to spread positive eWOM. In addition, when users are strongly engaged with specific

experiences, they are more likely to talk about them in face-to-face interactions and on social networking sites such as Facebook and Twitter (Boujena et al., 2021). Moreover, it is reasonable to conclude that the positive aspects that underlie stickiness intention will motivate users to recommend experiences. Based on this line of argument, the following hypothesis is proposed:

H6: Stickiness intention has a positive effect on intention to recommend.

Method

Data collection and measurements

The data used to test the hypotheses were collected in a quasi-field experiment. It should be noted that, in both scenarios, the users were unaware that they were participating in a study until the live event ended. They were only notified when they were subsequently asked to fill out a questionnaire. The participants were followers of a professional cyclist's Instagram profile ($N = 95$; 87 male; mean age = 30.04). At the time of the first scenario data collection, he had 7569 followers.

The influencer performed a live show on Instagram (see the Appendix Fig. 4) for the first experimental group ($n = 54$); he had previously announced this would take place on his different social network profiles. In this live show, the cyclist demonstrated the sports equipment he uses when he rides his bike. He gave advice and recommendations about the choice of products. Subsequently, the influencer answered questions, and, thereafter, the followers who had watched the live show were asked to complete an online questionnaire. Finally, after the live show, the influencer posted an Instagram story with links to the online shops where the products he had shown were available.

A Mozilla Hubs virtual room was designed to collect data from the second experimental group (see the Appendix Fig. 4). This platform, which is adaptable to different devices (PCs, smartphones, Meta Quest), is considered the foundation of the free metaverse (Lang, 2020). It is an immersive platform that allows its users to create virtual spaces where they can interact with different types of objects (pictures, 3D objects, audio, videos). It is also a virtual meeting space, where "people" can meet and speak together. The people are represented by customizable avatars (Carter, 2022).

The participants had to register in advance by email to join the room on the platform. The relevant joining information was provided in the days just prior to the quasi-experiment, on the influencer's various social network profiles. The participants accessed the room via a desktop or laptop computer. To mitigate the potential wow effect that the metaverse may have on the participants, they were able, in advance, to explore a virtual room similar to the room where the meeting would take place. The participants in the metaverse scenario were presented with the same information as those who participated in the Instagram live scenario; in parallel, they were shown photographs of the various products. As in the first scenario, the participants could ask questions after they viewed the products. Finally, they were asked to complete an online questionnaire and were sent links to the online shops where the products shown were available for purchase. Some 43 participants responded, two of whom were eliminated because they reported sound problems during the meeting. Thus, 41 valid questionnaires were collected.

Therefore, a sample of 95 participants was finally obtained (54 in Instagram and 41 in the metaverse).[1] None of the 41 metaverse participants had attended the live-stream shopping on Instagram performed previously. Consequently, the quasi-experiment had a between-subjects design which avoided learning and order effects (Viglia & Dolnicar, 2020). To verify that the sample was sufficiently large statistically, a G*Power a priori analysis was conducted (Mayr et al., 2007). In a linear multiple regression statistical test, with a fixed model, R^2 deviation from zero a priori, and assuming an effect size measure of 0.15, a significance level of 5%, a statistical power of 80%, and three predictors, the software indicated that the minimum number of participants necessary to test the proposed model was 77. Thus, the sample is sufficiently large. As an incentive to participate, two pairs of glasses from the brand with which the influencer collaborates were raffled (one per scenario group).

The questionnaire posed questions about the variables under study, adapted from the previous literature to ensure content validity (see Table 2). These measures were collected on 7-point Likert scales (from strongly disagree to strongly agree). We also included a control variable about the length of the follower/influencer relationship (more or less than 1 month) and a sociodemographic factor (gender). To ensure that participants had paid attention to the presentations, they had to indicate at the beginning of the questionnaire which products, and in what order, the influencer had discussed. The scales were presented in the following order. First, the manipulation check was carried out, then we asked about the dependent variables, and then the mediating and moderating variables. Finally, sociodemographic and personal information was collected (Lietz, 2010; Morgan & Sonquist, 1963).

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[1] The data set of the study can be requested from the authors.

Table 2 Scale items

Experiential value (adapted from Fiore et al., 2005)
The live show…
aroused my curiosity
was interesting
was novel
helped me to explore new worlds
Instrumental value (adapted from Fiore et al., 2005)
Live shows like this…
help me to evaluate cycling products better
help me to make better decisions when buying cycling products
help me to buy the right product
Satisfaction (adapted from Flavián et al., 2006)
I think I made a good decision connecting to the live show
It has been a good experience
In general, I am satisfied with the experience
Stickiness intention (adapted from Hsu & Lin, 2016)
I will connect to these live shows as often as I can
I would like to have spent more time on the live show
I hope to spend more time in this kind of live show
Intention to recommend (adapted from Casaló et al., 2017a)
I will probably make positive comments about this experience
I will recommend these experiences to those of my family and friends who are interested in cycling
I would seldom miss a chance to tell others interested in cycling about these experiences
Content involvement (adapted from Mittal, 1989)
The information shown is relevant to me
The information shown is important to me
Account relationship time
How long have you been following the sportsperson on social media?
One month or less
More than a month
Perceived telepresence (adapted from Algharabat et al., 2018)
While I was on the live show, I felt like I was in another world
While I was on the live show, my body and my mind were in different worlds
When the live show finished, I felt like my mind went back to the real world after a trip

Procedures

A protocol was implemented to ensure that the procedure represented a true quasi-experimental, between-groups design. That is, to ensure that no participant in the metaverse scenario had previously attended the Instagram live show, a two-way check was performed. First, as there was a raffle of glasses for each group, the participants indicated their social network user in the surveys. This allowed us to verify that no participants in the metaverse group had previously attended the Instagram live event. Second, the questionnaire aimed at those who participated in the metaverse scenario asked if they had attended the Instagram live event ran by the influencer the previous week. After verifying the information provided by the participants, it was determined that the quasi-experiment had a between-groups design.

As the participants were unaware that they were taking part in a study until they were presented with the surveys, they behaved in a realistic way during the shows, that is, their behaviors were unconditioned by the knowledge they were part of an experiment. The participants accessed the surveys through a link posted by the influencer in one of his stories, given out at the end of the live event. The metaverse scenario participants had to have previously registered via email to attend the event; thus, the link to the survey was sent to them via email at the end of the live event.

Most of the participants were men, with an average age of around 30. None of the metaverse participants had previously experienced live-stream shopping on the platform. Table 3 shows the participants' profiles, by group.

Table 3 Participants' profiles

Characteristic	Instagram ($n=54$)	Metaverse ($n=41$)
Gender	Male = 49	Male = 38
	Female = 5	Female = 3
Age	M = 31.28	M = 28.41
	SD = 11.09	Max = 43
	Max = 56	SD = 7.33
	Min = 18	Min = 18
Origin	Spanish = 52	Spanish = 30
	Latin American = 2	Latin American = 11
Followers for more than a month	47	31

Notes: *M*, median; *N*, sample size; *SD*, standard deviation; *Max*, maximum; *Min*, minimum

Common-method bias (CMB)

As the data were collected using a single web-based survey, and the self-reported answers related to each construct were conceptual, common-method bias could be a problem in the study. To minimize the potential for common-method bias, the respondents were assured of anonymity before they took part, and it was highlighted that there were no right or wrong answers to the questions (Podsakoff et al., 2012). We also tested methodologically for the presence of CMB. An unrotated principal axis factoring analysis was conducted (Podsakoff et al., 2003). The results revealed that five factors emerged from the data set. The first factor accounted for 37.34% of the variance, indicating that common-method bias is unlikely to be a significant problem in this study.

Results

Confirmatory factor analysis

To assess the measurement scales, a confirmatory factor analysis was conducted using SEM, with EQS statistical software. A confirmatory factor analysis corroborated the initial factor structure (Jöreskog & Sörbom, 1993). The Cronbach's alpha values exceeded the recommended minimum of 0.70 (Nunnally, 1978). Convergent validity was evaluated through average variance extracted (see Table 4); the values exceeded the recommended 0.50 threshold (Fornell & Larcker, 1981). Finally, the model's discriminant validity was assessed by verifying that the inter-construct correlations were lower than the square roots of the AVEs of each variable (Fornell & Larcker, 1981). Table 2 shows the values. As all pairs of constructs met the criterion, it can be concluded that the model has discriminant validity. The results also showed satisfactory values for the structural model: ($\chi^2 = 349.147$, 207 d.f., χ^2/d.f. < 3; RLS $\chi^2 = 308.397$; TLI $= 0.898$; CFI $= 0.908$; SRMR $= 0.080$). The 90% confidence interval of the RMSEA was [0.069, 0.100]. These values indicate the model has adequate goodness of fit.

Hypothesis tests

To test for normality in the variables, a Kolmogorov–Smirnov test was performed. The results of the test showed that the null hypothesis was supported (all ps < 0.05). Therefore, a normal distribution in the variables could not be assumed. We conducted a manipulation check to confirm whether the metaverse was perceived to have a higher degree

Table 4 Composite reliability, average variance extracted and discriminant validity

Variable	α	CR	AVE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) TP	N.A	N.A	N.A	**N.A**								
(2) EXPVAL	0.908	0.908	0.712	0.319	**0.844**							
(3) INSTVAL	0.890	0.893	0.735	0.003	0.604	**0.857**						
(4) SAT	0.915	0.917	0.788	0.001	0.615	0.637	**0.888**					
(5) STICK	0.782	0.799	0.573	0.017	0.500	0.396	0.743	**0.757**				
(6) REC	0.772	0.799	0.583	0.258	0.623	0.489	0.560	0.526	**0.764**			
(7) INV	0.887	0.890	0.803	-0.119	0.122	0.402	0.227	0.205	0.217	**0.896**		
(8) PTP	0.913	0.911	0.776	0.851	0.386	0.059	0.102	0.059	0.331	-0.014	**0.881**	
(9) GEND	N.A	N.A	N.A	-0.035	-0.223	-0.091	-0.077	-0.061	-0.188	0.279	-0.094	**0.421**
(10) RELAT	N.A	N.A	N.A	0.081	-0.007	-0.042	-0.211	-0.162	-0.112	0.087	-0.071	0.161

Notes: *EXPVAL*, experiential value; *GEND*, gender; *INSTVAL*, instrumental value; *INV*, content involvement; *N.A*, not applicable; *PTP*, perceived telepresence; *REC*, intention to recommend the experience; *RELAT*, length of relationship; *SAT*, satisfaction; *STICK*, stickiness intention; *TP*, telepresence

α, Cronbach's alpha; *CR*, composite reliability; *AVE*, average variance extracted. The diagonal elements (in bold) are the square roots of the AVEs (variance shared between the constructs and their measures). Values below the diagonal elements are the inter-construct correlations

of telepresence. We carried out a Mann–Whitney U test, with the two platforms as the independent factors (average rank Instagram = 29.00, average rank metaverse = 73.02). The test supported the prediction ($M_{Instagram} = 2.38$; $SD_{Instagram} = 1.25$; $M_{Metaverse} = 5.11$; $SD_{Metaverse} = 0.644$; $U = 81.000$; $p < 0.001$). This result demonstrates that the metaverse has higher telepresence than does an Instagram live show; consequently, the scenarios have a different level of telepresence, as proposed.

Lineal regressions and PROCESS macro for SPSS were used to test the hypotheses. The PROCESS software uses OLS regression procedures and is suitable for analyzing direct, indirect, and moderation effects with small samples (Hayes, 2018). In these analyses, the length of the relationship and gender were included as control variables. First, H1 and H2 were tested through linear regressions, without interaction terms, following a step wise approach. The results show that using the metaverse (high telepresence) has a statistically significant effect on the experiential value ($B = 0.650$, $p = 0.006$) compared to using Instagram (low telepresence), supporting H1. However, they also showed that the metaverse (high telepresence) did not provide statistically significantly higher instrumental value ($B = 0.014$, $p = 0.941$) than Instagram (low telepresence), not supporting H2.

To analyze the moderating effect of followers' involvement with the influencer's content on the relationships between telepresence and value, PROCESS analyses (model 1), with experimental and instrumental values as the dependent variables, were conducted. In this step, the mean-centering for product construction was undertaken for the variables that defined the products. The results showed that followers' involvement with the influencer's content had a statistically significant effect on the relationship between telepresence and experiential value. However, this effect was contrary to our expectations ($B = -0.574$, $p = 0.024$, H3a not supported). When content involvement increases, the effect of telepresence on experiential value increases to a greater extent on Instagram (low telepresence) than it does in the metaverse (high telepresence). It is, indeed, noteworthy that, in the metaverse, greater content involvement even reduces the experiential value generated by telepresence. As to the other proposed moderating effect, the effect of telepresence on instrumental value was not statistically stronger for followers with higher content involvement ($B = -0.277$, $p = 0.145$, H3b not supported). The effect of content involvement on the relationship between telepresence and instrumental value was greater on Instagram (low telepresence) than it was in the metaverse (high telepresence), but the difference was not statistically significant. Table 5 shows the values and the adjusted R^2 of each independent variable for the model without interaction effects, and with interaction effects. Figure 2 shows the moderating effect of content involvement on the relationships between telepresence and experiential and instrumental value.

Two models based on PROCESS software were designed to analyze the direct effects of value on user satisfaction, stickiness intention, and intention to recommend the experience. The experiential and instrumental values were used as the independent variables in both models (X). Again, for both models, satisfaction and stickiness intention were the mediators (M), and intention to recommend was the dependent variable (Y). The models also included the length of the relationship and gender as covariables.

Table 6 shows the results of this analysis. Experiential value statistically significantly increased satisfaction with the experience ($B = 0.442$, $p < 0.001$), supporting H4a. Similarly, instrumental value also had a statistically positive effect on satisfaction ($B = 0.565$, $p < 0.001$), supporting H4b. Furthermore, satisfaction statistically positively influenced both stickiness intention ($b = 0.488$, $p < 0.001$) and intention to recommend the experience ($B = 0.264$, $p = 0.004$). Consequently, H5a and H5b are supported. Finally, stickiness intention had a statistically positive effect on intention to recommend the experience ($B = 0.315$, $p = 0.009$), supporting H6. Figure 3 shows the results of the structural model after performing the analyses with the standardized coefficients.

As to the control variables, the length of the influencer-follower relationship affected stickiness intention. Followers who had followed the influencer for longer were more willing to attend the next live show in a statistically marginally significant way ($B = 0.271$; $p = 0.051$). No statistically significant between-gender differences were observed for the dependent variables.

Finally, R^2 is the proportion of variance in the dependent variable which can be explained by the independent variables. The R^2 values are influenced by the model's complexity and the phenomena under study (Shmueli et al., 2019). In the proposed model, satisfaction ($R^2 = 0.382$), stickiness intention ($R^2 = 0.467$), and intention to recommend the experience ($R^2 = 0.357$) were shown to have substantial explanatory power (Cohen, 1988).

Discussion and conclusions

This research shows that the communication modes in those online environments used more often by influencers, such as Instagram, YouTube, and TikTok, provide significant advantages. New forms of ICTs, such as the metaverse, integrate users into virtual environments where they can move and explore their digital content. In addition, these virtual environments allow greater inter-user interactions and closer interactions with people who may be perceived as quite distant from the user, such as influencers. Holding audio-based conversations, not just exchanging written messages, allows greater interaction and may convey a greater feeling of closeness (Barta

Table 5 Linear regression models testing the effects of telepresence on experiential and instrumental value

	D only				D + I			
	B	95% CI		p	B	95% CI		p
DV: Experiential value								
Intersection/constant	5.731	4.407	7.055	<0.001	6.230	4.888	7.572	<0.001
Telepresence (metaverse)	0.650	0.188	1.112	0.006	0.735	0.283	1.186	0.002
Telepresence (metaverse)×content involvement					−0.574	−1.072	−0.076	0.024
Length of relationship (more than one month)	−0.065	−0.856	0.726	0.870	0.364	−0.197	0.926	0.201
Gender (male)	−0.818	−1.650	0.013	0.054	−1.112	−1.924	−0.300	0.008
Adj. R^2	0.090				0.215			
DV: Instrumental value								
Intersection/constant	6.389	5.330	7.449	<0.001	5.995	4.987	7.002	<0.001
Telepresence (metaverse)	0.014	−0.356	0.383	0.941	0.114	−0.225	0.453	0.504
Telepresence (metaverse)×content involvement					−0.277	−0.651	0.097	0.145
Length of relationship (more than one month)	−0.041	−0.674	0.591	0.897	0.411	−0.011	0.832	0.056
Gender (male)	−0.263	−0.929	0.402	0.434	−0.649	−1.258	−0.040	0.037
Adj. R^2	0.008				0.222			

Notes: sample size, 95; *DV*, dependent variable; *D only*, direct effects only; *D + I*, direct effects and interaction terms; *B*, unstandardized coefficient; *CI*, confidence interval
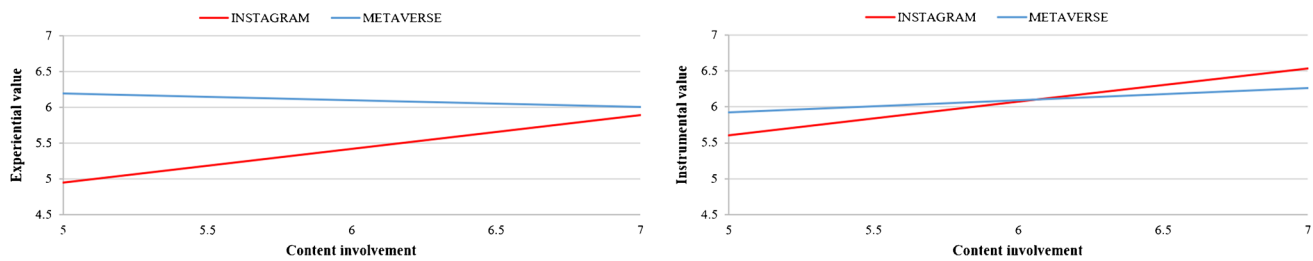
Fig. 2 Telepresence x content involvement on experiential and instrumental value

et al., 2021a). The enhanced experience provided by the metaverse influences followers' satisfaction, through the increased experiential value of the experience. This satisfaction provides various benefits, such as stickiness intention and intention to recommend the experience. The higher satisfaction of followers is provided directly through increased experiential and instrumental value. However, the metaverse, at least for the time being, does not similarly affect these values.

Table 7 summarizes the results. They show that live-stream shopping in the metaverse provides followers with more experiential value than live-stream shopping on Instagram. However, it does not statistically affect instrumental value. This may be because followers prefer to see real products on a screen, rather than just photographs. Displaying realistic 3D models of products in the metaverse may increase the instrumental value of experiences, as Li et al. (2001) proposed in the context of e-commerce. Using realistic 3D models, followers can view products more closely and assess their characteristics in more detail. Therefore, to influence instrumental value, platforms should provide realistic 3D representations of objects. To date, it does not seem that the increased telepresence provided by the metaverse strongly influences followers' preferences for viewing products as close-up 3D images/objects in the metaverse or viewing them for real through a live video on Instagram. Satisfaction with the metaverse-based experience is influenced by experiential value, which is an essential prerequisite for followers to adopt the metaverse and recommend experiences. Nonetheless, to increase satisfaction with the metaverse-based experience, instrumental value should also be enhanced.

People now rely more on visual representations of products through 3D models in their retail activities. An example of this is the increase in shopping using AR tools, which allow consumers to view 3D models of products integrated into the real world (eMarketer, 2020). Therefore, increasing the instrumental value of experiences could be key to increasing sales of influencer-promoted products. In addition, this will also increase the follower's overall satisfaction with the experience; it has been observed that instrumental value positively affects satisfaction.

One of the proposed moderating effects returned a result statistically opposite to expectations. This may be because followers with a high degree of content involvement do not highly value environment-related aspects (Zillmann, 2000). Highly involved followers attend live shows because they are interested in the information provided, relegating environmental aspects, more related to experiential value, to a secondary role. On the other hand, less involved followers may attend these events because they want to enjoy an experience that differs from traditional posts/stories, not because they want to obtain information from the influencer. This may mean that when they evaluate experiential value, environmental aspects are more important. In addition, it may be that low involvement followers have limited prior expectations for these live shows. Consequently, when they attend a live show with, to them, novel, unexpected features, the perceived value is much higher.

## Theoretical contributions

The present study extends the knowledge existing in the previous literature. First, it makes theoretical contributions to the telepresence literature. The effect of telepresence on experiential value was demonstrated. However, telepresence was not observed to have a statistically significant effect on instrumental value. These results only partially support previous telepresence-focused research in terms of its effects on value (Mollen & Wilson, 2010). The relationship between these two variables may be demonstrated in product experiences/evaluations where aspects such as shape and color are important, but not other aspects, such as weight (impossible to verify through the media). However, instrumental value may be increased by telepresence when other device types are used to access the metaverse. For example, VR glasses might allow objects in the metaverse to be seen in greater detail (Gabajová et al., 2021), in turn enhancing telepresence to the extent that its effect on instrumental value might become statistically significant. Furthermore, the continued development of the metaverse and its integrated functions may allow the relationship between telepresence and instrumental value to be definitively explained in future studies in this context.

Table 6 Results of the analysis

Predictor	B	95% CI		p
Model 1: Experiential value (X)				
Satisfaction				
Constant	2.619	1.435	3.804	< 0.001
Experiential value	0.442	0.313	0.571	< 0.001
Length of relationship (more than one month)	0.492	0.129	0.854	0.008
Gender (male)	0.124	−0.419	0.668	0.650
Model summary	$R^2 = 0.382; F_{(3,91)} = 18.784, p < 0.001$			
Model 2: Instrumental value (X)				
Satisfaction				
Constant	2.316	1.013	3.619	0.001
Instrumental value	0.565	0.389	0.741	< 0.001
Length of relationship (more than 1 month)	0.292	−0.087	0.671	0.129
Gender (male)	−0.089	−0.634	0.456	0.746
Model summary	$R^2 = 0.357; F_{(3,91)} = 16.834, p < 0.001$			
Stickiness intention				
Constant	2.748	1.838	3.657	< 0.001
Satisfaction	0.488	0.365	0.611	< 0.001
Length of relationship (more than 1 month)	0.271	−0.001	0.543	0.051
Gender (male)	−0.041	−0.427	0.346+	0.835
Model summary	$R^2 = 0.467; F_{(3,91)} = 26.561, p < 0.001$			
Intention to recommend				
Constant	2.880	1.679	4.082	< 0.001
Satisfaction	0.264	0.085	0.442	0.004
Stickiness intention	0.315	0.082	0.547	0.009
Length of relationship (more than 1 month)	−0.036	−0.346	0.274	0.817
Gender (male)	−0.253	−0.685	0.180	0.249
Model summary	$R^2 = 0.357; F_{(4,90)} = 12.471, p < 0.001$			

Notes: sample size, 95; *B*, unstandardized coefficient; *CI*, confidence interval

Fig. 3 Results of the model
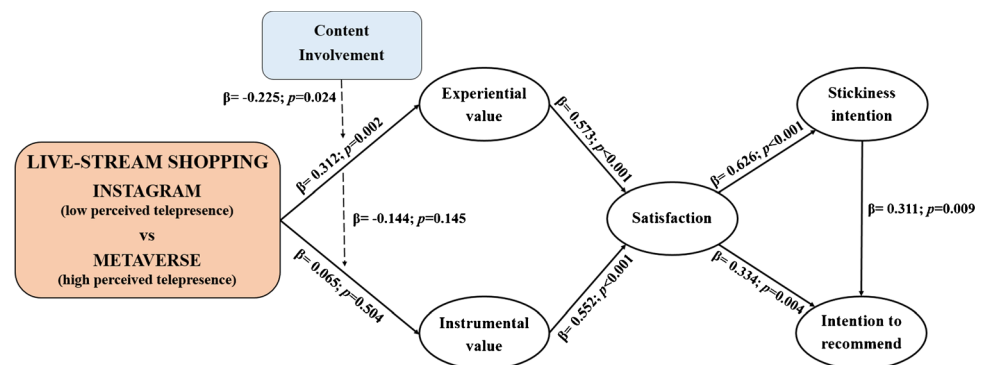
Note: β=Standardized coefficient

The research also contributes to influencer and live-stream shopping-related knowledge, given that our focus is on influencer-led live-stream shopping on different platforms, not on influencers' posts or profiles (Casaló et al., 2017b, 2020). This study is among the first to analyze the impact of live-stream shopping in the metaverse on the influencer-follower relationship. First, we demonstrated that the metaverse evokes higher telepresence than does Instagram live. The impact of telepresence on experiential value influences to a greater extent on low-content involvement followers. Therefore, it would seem that spaces that evoke a high degree of telepresence are suitable for engaging these followers. Previous research, in the

Table 7 Summary of findings and hypotheses tests

Hypotheses	Relationship	Result
H1	Telepresence→Experiential value	Supported
H2	Telepresence→Instrumental value	Not supported
H3a	Moderator effect. Content involvement on: Telepresence→Experiential value	Not supported
H3b	Moderator effect. Content involvement on: Telepresence→Instrumental value	Not supported
H4a	Experiential value→Satisfaction	Supported
H4b	Instrumental value→Satisfaction	Supported
H5a	Satisfaction→Stickiness intention	Supported
H5b	Satisfaction→Intention to recommend	Supported
H6	Stickiness intention→Intention to recommend	Supported

Instagram context, has shown that follower involvement with promoted products enhances influencer-product fit and, consequently, followers' intentions to interact with the influencer (Belanche et al., 2020). Therefore, the metaverse could help generate stronger influencer-follower interaction, particularly when content involvement is low.

We examined two mechanisms (experiential and instrumental value) that might enhance live-stream shopping. Our conclusions are that, to satisfy followers, influencer live shows must not only provide viewers with exciting experiences, they must also provide relevant information about the products under review. The platform where the influencer-follower interaction takes place plays a key role in increasing experiential value. The new, emerging platforms have in the last few years become the most popular, continually gaining users. For example, TikTok was the most downloaded application over 2020/2021 (Koetsier, 2021). Recent research has identified characteristics that differentiate it from other social networks, such as the degree of humor and fun featured in the content posted on the platform (Barta et al., 2023).

Managerial implications

Different aspects of platforms generate engagement (Iqbal Khan et al., 2020). Influencers should provide good experiences to satisfy their followers and maintain their interest in upcoming activities. This will also lead followers to recommend influencers' accounts. As is the case with bloggers, when influencers' activities generate positive comments, their social influence increases, which helps them reach a wider audience and, therefore, be more effective (Urrutikoetxea Arrieta et al., 2019). To achieve this, two complementary actions have been identified. On the one hand, providing followers with useful content is essential. Thus, influencers should understand their followers'

profiles, and their main, common characteristics (Barta et al., 2023; Kocak et al., 2020). This will allow them to develop content that fits their followers' interests and concerns, which will provide a high degree of instrumental value. On the other, is also essential to provide enjoyable experiences. It has been demonstrated in the present study that the experiential value generated by enjoyment positively influences followers. The type of online platform where the communication takes place affects experiential value. Therefore, new platforms, capable of producing much more immersive experiences, should be used. It is possible to design immersive spaces on these platforms that can increase satisfaction, thus enhancing their experiential value. In this regard, past research has shown the role that virtual worlds can play as advertising media and how brand value can be enhanced (Barnes & Mattsson, 2011). Previous studies examining virtual worlds have shown how these online environments (e.g., Second Life) can help satisfy human needs (Barnes, 2007). The financial and legal aspects of transactions carried out in virtual worlds have been discussed. Research has identified that, to make these transactions possible, enjoyment, trust, and social influence are essential prerequisites (Guo & Barnes, 2011). The new devices (e.g., VR glasses) that are emerging and their progressive reduction in price may lead users to gradually adopt these online worlds. Moreover, these devices allow their users to enjoy much more immersive and engaging environments, thereby enhancing their experiences (Flavián et al., 2019). Furthermore, expected increases in the purchase of VR devices (Statista, 2023), particularly by the younger population (DataProt, 2023), make metaverse adoption more likely, which will enhance the social experiences enjoyed by its users, a critical aspect of the metaverse that differentiates it from the virtual worlds that emerged some years ago.

The metaverse can play a key role in current and future communications as it possesses unique features that enhance users' experiences and affect their perceptions and

behaviors. This is particularly important in scenarios where a communicator seeks to influence an audience's behaviors. Influencers mainly operate on traditional social networks, such as Instagram, YouTube, Facebook, and Twitter. However, new digital platforms, such as TikTok, are becoming increasingly important (Influencer Marketing Hub, 2022). Furthermore, developments in telecommunications, and improvements in Internet connectivity (e.g. the widespread implementation of 5G), will permit many more people to chat, simultaneously, in virtual environments. These virtual environments have characteristics that increase telepresence. In addition, they provide other advantages, such as the possibility of displaying 3D models. This will allow followers to view products more closely, and in more detail, which will aid their evaluations. Thus, the metaverse can be an effective space in which to present new products. In these spaces, users can look at realistic representations of products and receive about their main characteristics.

The metaverse would seem to be especially useful for strengthening influencers' relationships with followers less involved with their content. Followers who are less engaged with influencers' content do not expect to undergo enhanced experiences or receive important information from them. Experiences with higher degrees of telepresence can arouse great interest and curiosity from less-involved followers, providing them with more valuable experiences than they expected, thus generating satisfaction. Similarly, the greater possibilities of inter-participant interaction afforded by the metaverse favor the development of closer influencer-follower links. This greater closeness could lead followers to respond in ways interesting to influencers and the brands that hire them. For example, higher degrees of influencer-follower closeness might enhance followers' perceptions' of influencers' opinion leadership and greater intention to follow advice offered, which may increase product purchase intentions (Aw & Chuah, 2021; Taillon et al., 2020).

Finally, it should be noted that the metaverse allows rapid customization of immersive experiences, that is, customization of any object in the environment. Therefore, using the metaverse/virtual rooms could provide followers with better experiences and valuable and relevant information. Furthermore, providing information by introducing images or videos into virtual rooms could increase the instrumental value of experiences; these could be used to provide followers with updated information related to their interests.

Limitations and future research lines

This study focuses on a specific sector of the population in the context of a specific sport, cycling. The research could be replicated in other contexts, with more participants, particularly where women have a more significant role, such as in fashion, to achieve greater generalization of its results. In addition, the study sample had little experience of the metaverse because the platform was very novel at the time of the data collection. The metaverse participants reported that they had had no previous experience of live-stream shopping in the context. Although attempts were made to control for the potential wow effect of the metaverse, by providing participants access to a virtual room similar to where the event would take place, the effect of previous metaverse experience could be investigated further. This would provide important insights for when the metaverse is more widely implemented in society. Furthermore, to further generalize the results, future studies could extend the analyses using new, larger samples.

In addition, new forms of commerce are emerging, such as live shopping (Alt & Zimmermann, 2019; Lehrer & Trenz, 2022; Lu & Chen, 2021). Future research might examine the impact (and possibilities) of new shopping channel platforms, such as the metaverse, on online shopping. The possibility of interacting with shoppers in real-time, even virtually, and applying technologies that address the main limitations of e-commerce, such as product testing, may result in the metaverse becoming the preferred channel for a large part of the population, especially the young. Other related aspects could be studied in this context. Purchase behavior-related variables, such as purchase intentions and willingness to buy products, could be explored to understand better how the metaverse and telepresence might affect live-stream shopping.

The proposed moderating effects of content involvement were not supported. In fact, an effect opposite to that expected was observed. Therefore, the role of content involvement in telepresence in live-stream shopping should be investigated in more depth. In addition to the fact that live-stream shopping generates greater engagement and higher sales conversion, it could be an important means of attracting potential consumers who are not initially very interested in the product. This effect might be statistically more significant in the metaverse, given the higher degree of telepresence it offers.

The metaverse's possibilities are immense (Mystakidis, 2022). However, while much research that has taken place in recent years into immersive technologies, the metaverse remains relatively underexplored (Flavián et al., 2019; Rauschnabel et al., 2022). The present study compares the degree of perceived telepresence in live-stream shopping on Instagram and in the metaverse. In this sense, it would be interesting to identify which factors in the design of virtual rooms provide higher degrees of telepresence (e.g., 3D models, 360° videos). This would help designers

understand which elements are more suitable for inclusion in immersive spaces. In addition, the effects on telepresence of technological devices other than computers, tablets, and smartphones might be assessed (Barta et al., 2021b). For example, platforms on which virtual meetings take place can be accessed through head-mounted displays (HMDs). HMDs provide more immersive and embodied experiences (Flavián et al., 2019), leading to more telepresence; thus, they might affect perceived value and enhance user satisfaction and behavioral responses. Future empirical studies might test this proposition. In addition, using other objects/devices that support multi-sensory experiences might also enhance metaverse-based experiences through both experiential and instrumental value. For example, gloves through which users perceive the texture of products displayed by influencers might enhance the experience by providing useful and valuable information (Velasco et al., 2021).

Appendix

Please see Fig. 4.

Fig. 4 Scenarios designed

Live-stream shopping on Instagram   **Live-stream shopping in the metaverse**
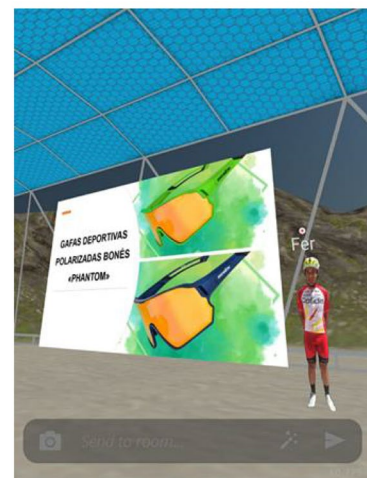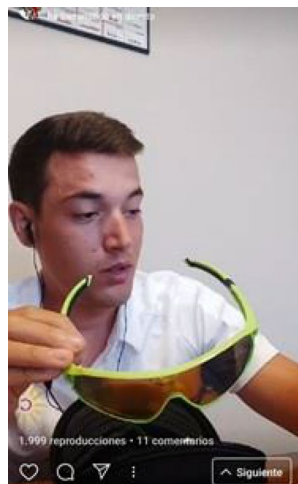
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