

Exploring the value delivered in virtual reality pre-experiences: a comparative analysis between destinations and accommodations

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Abstract

The COVID-19 pandemic has placed tourism into a critical situation. The digitalization of tourism experiences is key to its recovery. Virtual reality can be of relevance for enhancing the tourism experience. Despite the growing literature on this subject, there are no studies that simultaneously compare the effectiveness of virtual reality with different tourism products. Specifically, this research analyzes the impact of implementing virtual reality in tourism pre-experiences on the utilitarian and the hedonic value perceived by potential tourists. Considering the wide variety of tourism products, it is also proposed that the influence of virtual reality on the dimensions of perceived value will depend on whether the product is evaluated on an attribute basis (hotels) or holistically (destinations). Psychological presence is regarded as a mediating variable in the proposed relationships. A lab experiment is conducted to test the proposed hypotheses. The results will be of interest in order to better understand and to generate valuable VR tourism experiences.

Keywords: virtual reality, VR, perceived value, hedonic, utilitarian.

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1. Introduction

Over the last few years, we are witnessing how virtual reality (VR) technologies are gradually changing the way consumers interact with digital environments (Hollebeek et al., 2020). VR is based on the immersion of users in a computer-generated environment, in which they can navigate and possibly interact, generating a stimulation of their senses in real time, making them feel present in the virtual environment displayed (Guttentag, 2010). Its potential is reflected in recent predictions, which state that the VR industry will grow from the current 5 billion dollars to more than 12 billion in 2024 (Statista, 2021). Among the sectors that can benefit from its application, tourism is of particular relevance as VR can be employed to generate more tangible experiences (Flavián et al., 2019). This fact is important as tourism encompasses a wide variety of products with a strong intangible and experiential character (e.g., destinations, transportation, accommodations; Guttentag, 2010). The digitization of the tourism industry may be reinforced due to the pandemic caused by COVID-19. In this sense, VR can be of special interest as it can be used to redesign the tourist's journey in an attempt to overcome the current restrictions, as well as capture their attention and increase their desire to visit the tourist attraction after the pandemic (Kwok & Koh, 2020). These data highlight the existing interest in studying how VR can be applied, particularly in the field of tourism, to generate more higher added value experiences for consumers.

Previous research on VR in tourism has analyzed its impact on different tourism products individually (e.g., hotels as Bogicevic et al., 2019; destinations as Tussyadiah et al., 2018) proving its positive effect on both cognitive (e.g., Kim et al., 2020) and affective (e.g., Flavián et al., 2021) variables. However, there are no studies that have compared the effectiveness of VR considering the characteristics of tourism products, trying to determine whether its use is more important in one context or another (Guttentag, 2010). Therefore, the present ongoing work has three objectives: (1) to analyze the influence of VR on the perceived value delivered during tourism pre-experiences, adopting a utilitarian-hedonic perspective (Babin, Darden, & Griffin, 1994), as well as on behavioral intentions; (2) to examine the role of psychological presence, defined as the perception of being transported to an environment different from the one in which the individual is located (Flavián et al., 2019), as the mechanism explaining these effects; (3) to determine the moderating role of the type of tourism product, considering pre-experiences with destinations (more experiential products whose evaluations are made in a more holistic way; Tussyadiah et al., 2018) and accommodations (more concrete products whose evaluations are based on attributes and factual information; Flavián et al., 2021). The results of the study aim to shed light on the effectiveness of VR in presenting tourism experiences and to understand how and what kind of value can be generated in this type of experiences.

2. Literature review

2.1. *The Impact of VR on Perceived Value*

The use of VR represents a new touchpoint with consumers that aims to provide more value in their experiences (Flavián et al., 2019). In this sense, viewing of 360-degree videos, which are recorded in the real environments, is gaining more and more popularity among consumer experiences with VR, and are being the subject of numerous academic works (e.g., Martínez-Navarro et al., 2019; Wagler & Hanus, 2018). This type of content can be viewed with devices which can vary in their level of technological embodiment. Technological

embodiment is an inherent characteristic of technology and is defined as the degree of integration of technology with the human body (Flavián et al., 2019). The use of integrated devices, such as VR headsets, turns technology into an extension of the senses, and facilitates the interpretation, perception and interaction with the environment surrounding the user (Ihde, 1990). Thus, viewing content with embodied devices allows users to achieve a greater degree of immersion in the experience and generate greater value during the experience (Flavián et al., 2019).

For tourism, VR has been identified as a tool that positively influences factors of a utilitarian nature, such as the usefulness of the technology (Israel et al., 2019), attention during the experience (Tussyadiah et al., 2017), or knowledge and interest in the product displayed (Kim et al., 2020); as well as factors of a hedonic nature, such as enjoyment (Tussyadiah et al., 2018) or positive emotions (Flavián et al., 2021). This brief review allows us to identify that VR influences the two fundamental dimensions of perceived value in an experience: utilitarian and hedonic (Babin et al., 1994). For the present research, utilitarian value is studied through the reduction of uncertainty, defined as the evaluation of the chances that a certain negative event may unfold and generate unknown outcomes (Karl, 2018). Meanwhile, hedonic value is analyzed based on the value derived from the experience, considered as a connection to the experience that produces rewarding and interesting experiences and leads to positive emotional responses (O'Brien et al., 2018). In this sense, viewing a tourism product in VR with embodied devices is expected to generate higher perceived value, in both utilitarian and hedonic terms, compared to less embodied devices:

Hypothesis 1: Tourist pre-experiences with 360-degree videos on devices with a high (versus low) level of technological embodiment positively influence (a) perceived utilitarian value and (b) perceived hedonic value.

2.2. The mediating role of presence

Presence is an essential perception in VR experiences, and it is defined as the state of the user in which he/she feels in a different place with respect to the physical environment in which he/she is actually located (Biocca, 1997). Therefore, it is a psychological state in which the technology is the tool that allows transporting the individual's consciousness to that alternative place shown in the virtual environment (Flavián et al., 2019). Previous studies have noted the mediating role of presence in VR tourism experiences (e.g., Bogicevic et al., 2019; Tussyadiah et al., 2018). Specifically, reaching a state of presence is relevant for potential tourists, as it allows them to overcome the intangibility that characterizes this industry and make a more reliable assessment of the tourist attraction displayed, reporting a higher value to them (Guttentag, 2010). Moreover, once users feel present in the virtual environment shown, they are more willing to perform positive behaviors towards the tourism product (Bogicevic et al., 2019). Therefore, the mediating role of presence in tourism pre-experiences is proposed for the elicitation of higher utilitarian and hedonic value, as well as a fostering of behavioral intentions:

Hypothesis 2: Psychological presence mediates the impact of the level of technological embodiment of the technology on (a) perceived utilitarian value, (b) perceived hedonic value, and (c) behavioral intentions toward the tourism product.

2.3. The moderating role of product type: destination vs. accommodation

Previous literature has noted the existence of positive effects of VR in both destinations (e.g., Tussyadiah et al., 2018) and accommodations (e.g., Bogicevic et al., 2019). However, there is no research comparing both products simultaneously, which is interesting due to their different defining characteristics. The travel decision is complex and is composed of a series of sub-decisions (e.g., destination, accommodation, duration, transportation, attractions, and

activities) that are hierarchical and sequenced, producing differences in information processing and evaluation of alternatives (Jeng & Fesenmaier, 2002). In this sense, the destination decision is made in the early stages of planning. Destinations are evaluated more holistically, with an important emotional and hedonic component (Goossens, 2000). On the other hand, the accommodation decision is made later in the process, and the potential tourist carries out a more analytical and utilitarian processing of the information, making an evaluation of the attributes of the different alternatives (Kim & Park, 2017). The Construal Level Theory (Trope & Liberman, 2010) could explain these differences: by being taken further in advance, the decision about the destination is represented in a more abstract and distant way in the mind of the consumer, who would make a more projective and experiential evaluation; on the contrary, the decision about the accommodation, by being taken closer to the actual realization of the trip, would be represented more closely in the mind of the traveler, who would make a concrete evaluation of the attributes of the alternatives. Therefore, in a destination decision context, consumers are expected to derive greater hedonic value from VR experiences, and this component of the experience is expected to have a greater weight in their behavioral intentions; in contrast, in an accommodation decision, the perceived utilitarian value will be particularly benefited from VR experiences and will determine behavioral intentions:

Hypothesis 3: For tourism pre-experiences with 360-degree videos about destinations (versus accommodations), the impact of devices with a high (versus low) level of technological embodiment on the perceived hedonic value is (a) greater and (b) more determinant of behavioral intentions.

Hypothesis 4: For tourism pre-experiences with 360-degree videos about accommodations (versus destinations), the impact of devices with a high (versus low) level of technological embodiment on the perceived utilitarian value is (a) greater and (b) more determinant of behavioral intentions.

3. Methodology and expected results

A laboratory experiment was performed to test the hypotheses. A between-subjects factorial design of 2 (device with high vs. low level of technological embodiment: VR headset vs. desktop computer) x 2 (decision context: destination vs. accommodation) conditions was followed. Non-probability convenience sampling was employed, in which participants (n = 140; university students) were asked to imagine they were going on a trip, placing them in a simulated shopping situation.

The procedure was as follows. First, a brief introduction was given to the participants, indicating certain general guidelines to be followed during the experiment, and they were randomly assigned to the experimental conditions. Next, they were given the questionnaire to answer a set of control questions (previous experience with the technologies, with the destination, assessment of hotel attributes). Once this part of the questionnaire was completed, participants were directed to their corresponding room where they viewed a 360-degree video of a destination/accommodation with a VR headset/computer. After the experience, participants completed the next part of the questionnaire which included measures of technological embodiment (Flavián et al., 2021), psychological presence (Slater et al., 1994), uncertainty reduction (Rainoldi et al., 2018; Shim & Lee, 2011), experience value (O'Brien et al., 2018), and behavioral intentions (Bigné et al., 2001). Seven-point Likert scales were used, ranging from "1 = strongly disagree", to "7 = strongly agree".

4. Expected results and discussion

The expected results will offer interesting implications, as they will reveal how VR increases consumers' perceived value of these experiences, as well as the mechanisms that help to understand this process and determine the individual's behavioral intentions. The consideration of the tourism product characteristics in these relationships represents a novel contribution to the specialized literature, given the scarcity of works that analyze the comparative effect of VR on the user experience with different products and decision contexts. On a practical level, the results may help professionals to understand the effect of VR in the generation of pre-experiences with higher added value, which favor behavioral intentions. These results may be useful to recover the tourism industry after this delicate period.

References

- Babin, B. J., Darden, W. R., & Griffin, M. (1994). Work and/or fun: measuring hedonic and utilitarian shopping value. *Journal of Consumer Research*, *20*(4), 644-656.
- Bigne, J. E., Sanchez, M. I., & Sanchez, J. (2001). Tourism image, evaluation variables and after purchase behaviour: inter-relationship. *Tourism Management*, *22*(6), 607-616.
- Biocca, F. (1997). The cyborg's dilemma: Progressive embodiment in virtual environments. *Journal of Computer Mediated Communication*, *3*(2). Retrieved from <http://dx.doi.org/10.1111/j.1083-6101.1997.tb00070.x>.
- Bogicevic, V., Seo, S., Kandampully, J. A., Liu, S. Q., & Rudd, N. A. (2019). Virtual reality presence as a preamble of tourism experience: The role of mental imagery. *Tourism Management*, *74*, 55-64.
- Flavián, C., Ibáñez-Sánchez, S., & Orús, C. (2019). The impact of virtual, augmented and mixed reality technologies on the customer experience. *Journal of Business Research*, *100*, 547-560.
- Flavián, C., Ibáñez-Sánchez, S., & Orús, C. (2021). Impacts of technological embodiment through virtual reality on potential guests' emotions and engagement. *Journal of Hospitality Marketing & Management*, *30*(1), 1-20.
- Goossens, C. (2000). Tourism information and pleasure motivation. *Annals of Tourism Research*, *27*(2), 301-321.
- Guttentag, D. A. (2010). Virtual reality: Applications and implications for tourism. *Tourism Management*, *31*(5), 637- 651.
- Hollebeek, L. D., Clark, M. K., Andreassen, T. W., Sigurdsson, V., & Smith, D. (2020). Virtual reality through the customer journey: Framework and propositions. *Journal of Retailing and Consumer Services*, *55*. Article in press.
- Ihde, D. (1990). *Technology and the lifeworld: From garden to earth*. Indiana, IN: Indiana University Press.
- Israel, K., Zerres, C., & Tscheulin, D. K. (2019). Presenting hotels in virtual reality: does it influence the booking intention?. *Journal of Hospitality and Tourism Technology*, *10*(3), 443-463.
- Jeng, J., & Fesenmaier, D. R. (2002). Conceptualizing the travel decision-making hierarchy: A review of recent developments. *Tourism Analysis*, *7*(1), 15-32.

- Karl, M. (2018). Risk and uncertainty in travel decision-making: Tourist and destination perspective. *Journal of Travel Research*, 57(1), 129-146.
- Kim, M. J., Lee, C. K., & Jung, T. (2020). Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model. *Journal of Travel Research*, 59(1), 69-89.
- Kim, D., & Park, B. J. R. (2017). The moderating role of context in the effects of choice attributes on hotel choice: A discrete choice experiment. *Tourism Management*, 63, 439-451.
- Kwok, A. O., & Koh, S. G. (2020). COVID-19 and extended reality (XR). *Current Issues in Tourism*, 24(14), 1935-1940.
- Mathwick, C., Malhotra, N., & Rigdon, E. (2001). Experiential value: conceptualization, measurement and application in the catalog and Internet shopping environment. *Journal of Retailing*, 77(1), 39-56.
- O'Brien, H. L., Cairns, P., & Hall, M. (2018). A practical approach to measuring user engagement with the refined user engagement scale (UES) and new UES short form. *International Journal of Human-Computer Studies*, 112, 28- 39.
- Rainoldi, M., Driescher, V., Lisnevskaya, A., Zvereva, D., Stavinska, A., Relota, J., & Egger, R. (2018). Virtual reality: an innovative tool in destinations' marketing. *The Gaze: Journal of Tourism and Hospitality*, 9, 53-68.
- Shim, S. I., & Lee, Y. (2011). Consumer's perceived risk reduction by 3D virtual model. *International Journal of Retail & Distribution Management*, 39(12), 945-959.
- Slater, M., Usoh, M., & Steed, A. (1994). Depth of presence in virtual environments. *Presence: Teleoperators & Virtual Environments*, 3(2), 130-144.
- Statista (2021). Virtual Reality (VR) - statistics & facts. Retrieved from bit.ly/3dY4OTQ (accessed 24 September 2021).
- Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review*, 117(2), 440.
- Tussyadiah, I. P., Wang, D., & Jia, C. H. (2017). Virtual reality and attitudes toward tourism destinations. In I. Tussyadiah, D. Wang, & C. H. Jia (Eds.), *Information and communication technologies in tourism 2017* (pp. 229- 239). Cham: Springer.
- Tussyadiah, I. P., Wang, D., Jung, T. H., & tom Dieck, M. C. (2018). Virtual reality, presence, and attitude change: Empirical evidence from tourism. *Tourism Management*, 66, 140-154.
- Wagler, A., & Hanus, M. D. (2018). Comparing virtual reality tourism to real-life experience: Effects of presence and engagement on attitude and enjoyment. *Communication Research Reports*, 35(5), 456-464.