

## Article

# The Impact of Virtual Reality (VR) Tour Experience on Tourists' Intention to Visit

Chourouk Ouerghemmi <sup>1,2</sup>, Myriam Ertz <sup>2,\*</sup>, Néji Bouslama <sup>1</sup> and Urvashi Tandon <sup>3</sup>

<sup>1</sup> Laboratoire de Recherche Entreprise et Recherche Marketing (ERMA), Marketing Department, Faculty of Economics Sciences and Management of Tunis, University of Tunis el Manar, Tunisia B.P. 94–Rommana, Tunis 1068, Tunisia; chourouk.ouergthemmi@etudiant-fsegt.utm.tn (C.O.); neji.bouslama@yahoo.fr (N.B.)

<sup>2</sup> Laboratory of Research on New Forms of Consumption (LaboNFC), Department of Economics and Administrative Sciences, University of Quebec at Chicoutimi, Saguenay, QC G7H 2B1, Canada

<sup>3</sup> Chitkara Business School, Chitkara University, Rajpura 140401, Punjab, India; urvashi.tandon@chitkara.edu.in

\* Correspondence: myriam\_ertz@uqac.ca

**Abstract:** Drawing on media richness theory, this study investigates the effect of rich media, such as virtual reality (VR), on visit intentions for a specific destination. Specifically, this research employs a mixed-method approach, using abductive theorization to explore and confirm the dimensions of the VR visit experience, notably those related to telepresence, a key concept in tourism through VR. Furthermore, the study aims to elucidate how telepresence influences mental imagery, attitudes towards tourist destinations, and actual visit intentions. To do this, qualitative data were gathered between February and June 2022 from 34 semi-structured interviews with respondents who viewed a VR video of the destination. A second study collected quantitative data from 400 participants through face-to-face questionnaires after a VR video view between June and August 2022. The findings reveal that telepresence comprises three dimensions: realism of the virtual environment, immersion, and the sense of presence in the virtual environment. Telepresence, in turn, both directly and indirectly affects actual visit intentions, with mental imagery and attitude toward tourist destinations partially mediating those relationships. This study provides methodological, theoretical, and tourism management implications to enhance our comprehension of telepresence's facets, its measurement, and the process by which VR influences real visit intentions.

**Keywords:** Media Richness Theory (MRT); travel and tourism marketing; immersive tourism; mixed methods; virtual tourism experience

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## 1. Introduction

In recent years, the tourism sector has been interested in immersive virtual reality (VR) experiences [1] to promote tourism products. Indeed, the integration of VR in this sector allows the user to dive into a virtual environment and offer the potential tourist a glimpse of his future trip through a virtual tour. The latter allows individuals to see and thus appreciate products before buying them [2] and future tourists to visit the destination remotely [3]. This enriches tourism experiences [4] and consequently influences the intention to visit the destination [5,6]. Similarly, Buhalis and Law [7] have pointed out that customer behavior in the tourism sector is impacted by new communication technologies because, first, they facilitate tourists' access to multiple experiences [8]. Second, they have changed the way tourism experiences are created [9], such as VR, which allows travel agencies to differentiate themselves from others by providing customers with a unique, satisfying, and pleasant virtual tour experience of a specific destination.

To promote the sale of a tourist product characterized by intangibility and immateriality, the utilization of mental imagery is pivotal. This practice affects memorization [10,11], individuals' emotional and cognitive responses, such as attitudes towards the product, brand, and advertisements [12,13], as well as information seeking intention [14]. Mental imagery, or imagery, is «a processing mode in which multisensory information is represented in a gestalt form in working memory» [15] (p. 473). The more realistic the elaborated mental images are, the more the sense of presence is reinforced [16]. This heightened sense of presence from a remote place, in turn, might generate enjoyable experiences that encourage individuals to travel more.

Communication technologies, particularly those underpinned by the internet (e.g., chat rooms, online communities, videos, virtual realities), enable the creation of this sense of presence. In fact, it is well known that tourism behavior is impacted by these technologies as they facilitate tourists' access to destination experiments [7,16] and alter the way of creating tourism experiences by offering customers a unique virtual tour experience of a specific destination [8]. Consequently, in addition to e-tourism, the tourism sector has developed marked interest in immersive VR experiences [9] to stimulate prospective tourists' mental imagery and foster positive attitudes towards a tourist destination.

VR can be defined in terms of telepresence as “a real or simulated environment in which a perceiver experiences telepresence” [17] (p. 76). Hence, VR is not only related to technological devices, but it is also interested in the perceptions of users [17]. In sum, VR can be defined as the set of devices using a computer with the aim of simulating a real environment in which the user is placed in an interactive and immersive experience where the simulation of the senses (e.g., vision, hearing, touch) allows him to interact with the world simulated in 3D.

As an advanced technology, VR could contribute substantially to the tourism industry, but differently than existing technologies. In fact, VR creates artificial environments like the real world, which are thus immersive virtual environments that are also more realistic [18]. These features might foster attraction and engagement from additional tourists [6,19] and improve their perceptions of different destinations [20,21] (e.g., theme parks [21], cultural heritage centers [22], or museums [20]).

However, little research has paid attention to the phenomenon of VR in the tourist context [23,24]. Past research has investigated the role and effect of mental imagery in the context of a 2D website on the behavioral, emotional, and attitudinal responses of consumers [13–25]. Yet, to our knowledge, very little research has addressed mental imagery and VR, especially in the context of domestic tourism.

While international tourists are more likely to visit new places, domestic tourists tend to visit friends and family. Hence, the importance of destination branding seems comparatively more critical for international tourists compared to domestic ones. Yet, we posit that a technology such as VR could precisely enhance the importance of domestic places, making them more salient and appealing. Consequently, domestic destinations could become equally attractive motives for travel as friends and family. This, in turn, could spur domestic tourism growth. This phenomenon needs to be investigated from a tourism management point of view to understand its contribution and its effect on the behavior of tourists and to propose recommendations to tourist companies that are required to adopt more innovative and creative strategies to sell tourism products.

Given that the understanding of the effect of VR on consumer behavior, especially in the context of domestic tourism, remains underdeveloped, the overarching study objective is to analyze how a visit to a tourist destination in VR can influence potential tourists' intention to visit that destination. The study thus enriches the emerging literature on the impact of VR by exploring the relationship between VR exposure and actual tourist behavior. It also tests whether mental imagery and attitude towards the tourist destination can explain the effect of the VR experience and the actual visit intent of potential tourists.

This research builds on previous research (e.g., [6,21–27]) to address the effect of the VR visitor experience on tourists' visit intent. The literature has explained the relationship

between VR and consumer behavior in the tourism context, but it is crucial to mention that gaps persist in the literature. First, previous studies have focused primarily on the effects of VR in terms of entertainment experience, and little research has explored the different dimensions of VR visit experience and addressed how VR influences actual visit intent [24]. Second, unlike international tourism, the application of VR as a tool to promote domestic tourism remains insufficiently studied, given that domestic tourism plays an important role in economic recovery. The third gap is the limited number of studies that have examined the potential of VR visitor experiences to create mental images and generate favorable attitudes towards the tourist destination. Fourth, little research has qualitatively explored the core of the VR visitor experience. Therefore, this research aims to fill these gaps by meeting the following specific objectives:

- (1) Modeling the concept of telepresence to identify its dimensions that are most likely to influence tourist responses in a domestic context;
- (2) Exploring the effect of a VR tour experience on customer behavior in a domestic tourist context, investigating how the virtual tour is able to create realistic mental images and generate favorable attitudes toward the tourist destination;
- (3) Examining the mediating role of mental imagery and attitudes towards the domestic tourist destination.

Consequently, the overall research question is: To what extent does visiting a domestic tourist site in VR influence individuals' domestic visit intentions?

This research brings several theoretical and managerial contributions to the fore. From a theoretical point of view, our study first seeks to understand the role of VR by exploring its effects on the behavioral responses of potential tourists in the tourism context. Second, this research investigates the dimensions of the VR visitor experience in depth, which allows us to enrich the literature by highlighting these dimensions. Hultman et al. [28] reported that tourism relies heavily on visual imagery. So, our third contribution lies in studying mental imagery in the context of tourism. The tourism industry will benefit from this research, through which it can understand the potential of VR technology and change its promotional strategies to improve its services by offering immersive, unique, and personalized experiences that engage customers and elicit positive behavioral responses. In addition, the dimensions of the VR tour experience that will be identified and studied will guide tourism companies in the creation of VR content in a more effective way, thus maximizing their impact on potential tourists to optimize advertising investments, that is, to help tourism companies invest in a targeted manner in campaigns to promote tourist destinations. This research can also be helpful for policymakers by focusing on the importance of VR in the tourism sector, which will encourage governments to support technological innovation, in particular the development of VR technology, and by providing data related to the effectiveness of investments in the promotion of tourism destinations via VR. Indeed, the results of our research will encourage policymakers to promote sustainable tourism by highlighting the ecological and cultural aspects of destinations through VR experiences, which will allow better management of tourism flows.

This article is structured into seven main sections. First, the introduction sets out the context of the study, the research questions, the issue, and the expected contributions. Second, the following section presents the literature review on the effects of VR, discusses media richness theory, and defines key concepts. Third, we present the methodology of the qualitative study and the results used to develop the research hypotheses and the conceptual framework of this study. We also present the methodology for collecting quantitative data. The fourth section presents the statistical results of the quantitative study. The fifth section discusses the study results. Section six underscores the theoretical and managerial implications derived from the study findings. Finally, we examine the limitations of the research and suggest avenues for future research.

## 2. Literature Review

### 2.1. VR and Its Influence on Tourism

VR allows tourists to experience the atmosphere of the destination before the actual visit and to increase their visit intentions [29,30] thanks to a direct virtual experience, allowing tourists to visit destinations of interest, facilitate decision-making [31], and choose the destination that most satisfies their needs. Thus, Jung et al. [20] and Moura et al. [32] found that a well-groomed VR experience leads to stronger visit intentions compared to other means of communication. Indeed, this intention is explained by the potential of the feeling of telepresence, which can arouse the pleasure of customers and influence their intentions to visit [6,21].

In addition, Huang et al. [33] analyzed the effect of flow experiences on travel intention and found that virtual tours encourage customers to seek more information and positively influence the intention to visit the chosen destination. In another study, Huang et al. [34] indicate that hedonic experience, ease, and perceived usefulness positively influence tourists' behavioral intentions. Similarly, Prayag et al. [35] pointed out that emotional experiences motivate customers to visit the destination. In a subsequent study, Huang et al. [36] found that navigation on a 3D tourist site generates substantial autonomy that positively influences the joy experience and increases visit intentions.

Thus, the researchers [37] found that several factors can influence spatial presence during a VR tour of a tourist destination, such as the conformity of images stored with those presented in VR and external constraints preventing total immersion in the destination. So virtual visits must be improved by offering creative and pleasant representations of the destination to generate positive emotions. Jung et al. [20] agree with these researchers, indicating that the VR experience increases the intention to revisit if the content provides aesthetically pleasing images.

Tussyadiah et al. [5,6] used the sense of being in a virtual world and spatial presence to study how VR can influence attitudes and decision-making. They found that the attention given by individuals to VR environments contributes to spatial presence and that the latter positively influences the changing of post-VR attitudes towards the tourist destination. Studies have also revealed that VR increases the sense of presence in the tourist location, which in turn leads to stronger interest in the destination. This is also what Griffin et al. [38] showed through their comparative study of the effects of VR, 2D video, and websites on the emotional state of tourists. This research revealed that VR generates a feeling of presence in the destination and that, compared to 2D videos and websites, VR positively influences the intention to visit, search for, and share additional information. This technology also makes it possible to offer an immersive experience to customers [36–39], based on pleasure and sharing [40,41], with the aim of generating positive emotions towards the destination [38] and engaging tourists. Similarly, Moura et al. [32] pointed out that VR leads to higher travel intentions compared to brochures and websites. Yeh et al. [29] also found that VR (vs. 2D images) can attract tourists to the destination and motivate them to visit it. At the same time, Cowan and Ketron [42] have shown that, in a VR environment, the individual benefits from a unique and uncontrollable experience compared to 2D environments.

Jung et al. [22] conducted a case study of the virtual discovery of a Lake District National Park via a VR headset. The results indicate that an immersive virtual experience positively influences the intention to visit the destination and increases the engagement of tourists. In the same context, Wei et al. [21] concluded that the sense of presence in VR positively affects the experience and the intention to recommend the park theme. This result aligns with the recommendations by Tussyadiah et al. [37].

Moreover, Marasco et al. [43] examined the impact of a VR experience on the intention to visit a cultural heritage destination. They showed that there is a positive relationship between the perceived visual appeal of VR and the intention to visit and recommend the destination. This means that videos with positive images generate positive emotions,

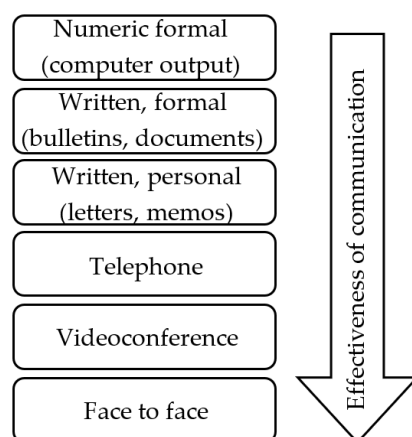
creating the desire to visit the destination [44]. Pasanen et al. [45] studied the effect of viewing a 360-degree tourist video while using a tablet and wearing VR glasses on the behavioral intentions of individuals. Their study showed that the tourist video viewing experience depends on the device used, and the tablet and VR glasses have the same effect on behavioral intentions. From these studies, we can deduce, first, that VR video content is quite important because it influences the attitudes and behavioral intentions of potential tourists [46,47] and creates emotional involvement [6]. This was also revealed by Chen and Chang [48] in their article. Indeed, they pointed out that 360-degree video and VR content help eliminate purchasing constraints and reduce disappointing experiences when making travel decisions. Second, VR hardware must be more efficient [38] to provide a more immersive [39], authentic [49], pleasant, and entertaining experience for customers [30].

## 2.2. Media Richness Theory

Daft and Lengel's [50] media richness theory (MRT) defines media richness as the ability of communication channels to transmit rich information. That is, their ability to facilitate the transmission and understanding of complex information [51]. A medium is considered rich if it improves the understanding of complex and ambiguous information. Hence, if they can convey concrete information to reduce the degree of uncertainty, which corresponds to the lack of necessary information, and of ambiguity, which is linked to the processing of signs in ambiguous situations. Therefore, MRT helps to choose the communication channel with the most appropriate characteristics depending on the ambiguity and complexity of the message to be transmitted.

According to the Media Richness Theory (MRT), media richness is determined by four criteria: (1) immediate feedback; (2) conveying multiple signs simultaneously through a single communication channel; (3) message personalization; and (4) linguistic variety, meaning that the medium is considered rich if it makes it possible to convey a linguistic variety [52]. This theory categorizes media from least to richest based on their ability to transmit complex and ambiguous messages (see Figure 1).

According to this hierarchy, videoconference and telephone communication are considered the richest before face-to-face conversations because they allow for personalized messages, linguistic variety, and multiple signs through the same communication channel with immediate feedback. Other means of communication require cognitive effort for interpretation and lack real-time communication, making them less rich. However, this classification is not absolute, as richness depends on the situation and the choice of communication method depends on message complexity. For instance, for conveying unambiguous messages, text-based media like email can be used.



**Figure 1.** Media hierarchy.

Highly immersive technologies such as VR provide a comparatively richer communication medium that combines visual and audio dimensions in 360° and allows users to interact with the virtual environment by looking around. By deduction, VR is a richer medium offering deeper immersion and accelerated communication [53], which helps to reinforce the sense of presence [54]. Therefore, tourist content in VR is considered rich thanks to the use of high-performance computing materials that allow users to interact immediately with the virtual environment and to live a multisensory experience, such as through the visualization of dynamic images or a 3D video and listening to music. In addition, this content can transmit a message adapted to the target and with linguistic variety. This wealth of content in VR contributes to the good understanding of the message, consequently to the increase of the interest of the users vis-à-vis the media used and to the generation of exploratory behavioral intentions [55].

### 2.3. Telepresence

The most interesting outcome of the richness conveyed by VR resides in telepresence occurrences. Telepresence has been center-stage since the development of VR because it presents a critical element of the definition of VR in terms of human experience [17] and the explanation of its effectiveness on behavioral responses to virtual stimuli [6]. It was first introduced by Minsky [56] and then addressed in marketing by Hoffman and Novak [57] to describe Internet browsing before being reexamined by Novak et al. [58].

#### 2.3.1. Definition

According to Steuer [17], telepresence is defined as experiencing a presence in an environment through a communication medium, distinguishing it from a natural presence. Telepresence can imply distant real environments or computer-generated virtual worlds [17]. This definition highlights the media characteristics of interactivity and liveliness rather than user-related factors. In addition, Bouvier [59] identified user-related factors by defining telepresence and including the idea that VR can induce a sense of presence [59]. Coyle and Thorson [60] characterized telepresence as the simulated perception of real experience. Likewise, Suh and Chang [61] pointed out that telepresence is the feeling of presence in a distant world compared to the physical environment. Thus, Keng and Lin [62] concluded that telepresence refers to the sense of being in a virtual environment created by the media. Interactivity and liveliness are all emphasized in these definitions as determinants of telepresence.

These definitions establish telepresence as a subjective experience, highlighting the sense of presence. So, it is essential to differentiate between presence and telepresence; presence is a psychological state [63] where the virtual and real worlds are perceived similarly. In contrast, telepresence refers to the experience of presence in a virtual environment via a communication medium, spatially or temporally distant from the real world [17]. Therefore, communication technology users generating telepresence perceive both physical and mediated virtual environments [17–64]. Indeed, two characteristics contribute most to the telepresence experience: liveliness and interactivity [62–65]. In conclusion, telepresence can be defined as a subjective experience influenced by technological and user factors that can generate the feeling of presence in a virtual world.

#### 2.3.2. Determinants

Previous research has identified two determinants of telepresence: liveliness and interactivity [17–66]. Despite extant research on these determinants, telepresence remains less explored in terms of its dimensions. Therefore, given the centrality of telepresence in explaining VR's impact on tourism intentions, a mixed-method methodology is used to first explore and confirm qualitatively the dimensionalities of telepresence and second to confirm quantitatively the conceptual model and the proposed relationships.

### 3. Materials and Methods

#### 3.1. Study 1: «Exploratory» Qualitative Study

The objective of Study 1 is to explore the dimensionalities of telepresence and, more broadly, tourists' VR visit experience and their discourse to understand the role of the VR visit experience in the creation of favorable mental images and the generation of positive attitudes towards the tourist destination and its effects on actual visit intentions.

##### 3.1.1. Methods

A first “exploratory” qualitative study aims at understanding the dimensions of telepresence and the contributions of VR tour experience to visit intention. Indeed, the VR tour experience is composed of several dimensions highlighted in the literature, notably telepresence. Therefore, exploring the virtual visit experience lived by the participants allows us to identify the dimensions of telepresence and the overall VR visit experience. This exploratory phase will then be used to conduct a more precise quantitative survey [67].

##### 3.1.2. The Choice of the Destination «Monastir»

Monastir is located in the center-east of Tunisia and the coastal Tunisian Sahel, bordered by the governorates of Sousse northward and Mahdia southward. It has a very important historical heritage, namely the Ribat of Monastir, which is the oldest defensive work, founded in the eighth century, around 796 A.D., by Arab conquerors on the Mediterranean Sea. Today, the Ribat hosts a museum exhibiting precious and rare objects such as ancient manuscripts in Kufic script, Abbasid pottery, Fatimid glassware from the 10th and 11th centuries, and an Arab astrolabe made in Cordoba in 927. The Ribat attracts most tourists and has become a filming location for several movies, such as *The Life of Brian/Jesus of Nazaret*. The second famous monument in Monastir is the sepulchral building, or mausoleum-museum, of Habib Bourguiba, the first president of the Tunisian Republic. This building was founded in 1963 and features impressive traditional architecture as well as a golden dome. We have chosen, in our study, the Ribat of Monastir and the mausoleum-museum of Habib Bourguiba as tourist destinations, given their historical, architectural, and cultural richness.

##### 3.1.3. Data Collection Mode

The data are collected by means of individual, face-to-face, in-depth, and semi-structured interviews. This mode of data collection allows us to guide the discussion by following an interview guide and obtaining as much information as possible from respondents so that they may most freely and accurately describe their virtual tour experience.

We have carefully prepared the interview guide to collect as much relevant information as possible. It is structured into 4 parts. The first part consists of presenting the research topic and ensuring the anonymization of the answers to establish a relationship of trust with the participant. It also garners respondents' consent for the audio recording of their responses. The second part consists of asking general questions about their past trips—including to the Monastic, if applicable—to learn about participants' perceptions of the destination, if applicable, and to encourage them to talk about their past experiences if appropriate. On the other hand, to prepare respondents to address the following topics, we asked them what they think of virtual tours and mental imagery. The latter was explained by a small simulation: We asked the participants to close their eyes and introduce us to a destination, for example, “Monastir”. Afterwards, we asked them to open their eyes and describe to us the mental images they created. In the third part, respondents realize the virtual tour experience of Monastir and then explain their reactions to the VR tour. The fourth part consisted of gathering profile information (i.e., sociodemographics) for each respondent.

It should be noted that the interview guide was created in French, considering the Tunisian context where the study was conducted. French is commonly spoken as a second language in Tunisia, facilitating communication with participants and ensuring optimal understanding of their answers. In addition, this linguistic approach simplifies the verbatim transcription step, eliminating the need to translate responses and minimizing the risk of wrong or false translations.

#### 3.1.4. Interviewing Process

The interviews (from February to June 2022) lasted 30 to 40 min and were recorded with the consent of the respondents, and then fully transcribed. Respondents were reassured that there are no “right or wrong answers”. The participants answered a few introductory questions and were then invited to virtually visit the Ribat of Monastir and the mausoleum-museum, through the viewing of a 360-degree promotional video using a VR headset. The video lasted 2 min and 21 s to retain participants’ attention. We chose an empty and quiet space to increase participants’ engagement and facilitate their movement in the room during the virtual visit. Then, respondents were asked to answer other questions. Finally, we collected the sociodemographics of each participant. Throughout the process, the interviewer maintained a neutral attitude, an attentive posture and showed interest in the discussion to create a climate of trust and to get closer to the respondents. The VR ELEGANT headset was used because it is easy to use, well-designed for comfort during use, and has the possibility of adjusting the lenses. In addition, this helmet is compatible with all types of smartphones with a screen between 4 and 6 inches while being suitable for 360-degree videos. Thus, there was no collaboration with other researchers for data collection. This approach ensured consistency in data collection by minimizing potential variations that might have been introduced by different interviewers in the way interviews were conducted.

#### 3.1.5. Study Sample

A “snowball” recruitment procedure where each respondent recruits themselves and two other respondents is enabled to quickly select people with the required profile. The sample size for our study was not fixed a priori because we sought semantic saturation instead. A total of 34 individuals were interviewed: 14 had never visited Monastir, and 20 had visited the city at least once before the virtual tour experience. The sample is composed of 17 women and 17 men, whose ages vary between 20 and 52 years. The average age for women (men) is around 35.57 (42.71). Furthermore, participants have heterogeneous occupations (e.g., doctor, employee, student, consultant). This diversification provided us with rich data to understand informants’ perceptions of the VR visit experience.

#### 3.1.6. The Method of Data Analysis and the Approach Followed for the Qualitative Analysis

We used a thematic analytical approach, which consists of the following three essential steps: (1) data transcription; (2) information coding; and (3) data processing. These steps concur to identify the most relevant themes emerging from the data. More specifically, a summary of the answers to each question was written for each respondent and enabled the comparative analysis of the informants’ responses.

#### 3.1.7. Results

The results suggest that telepresence is comprised of several dimensions that may influence tourist behavior (see Table 1). Two of those dimensions (i.e., immersion and the sense of presence in the virtual environment) overlap with past findings. In addition, five other components include the entertaining experience, the informative experience, the realism of the virtual environment, the discovery of new places, and the social factor. The rationale being that a high citation frequency signals importance and prominence, we



retain the realism of the virtual environment, immersion, and the sense of presence in the virtual environment.

**Table 1.** Number of citations for each theme.

Themes Raised	Number of Citations <sup>a</sup>	Number of Citations <sup>b</sup>
<u>Theme: the VR visit experience</u>		
- Entertaining experience	13	4
- Informative experience	6	2
- The realism of the virtual environment	31	22
- Immersion	20	17
- Discovering new places	4	2
- The social factor	10	0
- The sense of presence in the virtual environment	19	19

<sup>a</sup> Number of citations by individuals who have never visited Monastir. <sup>b</sup> Number of citations by individuals who have visited Monastir at least once before our study.

*The realism of the virtual environment.* Realism refers to the degree of consistency between the virtual and real worlds. This concept has been treated in psychology [68] and in the design of virtual environments [69]. Some researchers have considered this variable as a factor allowing them to measure telepresence in the virtual world (e.g., the PQ questionnaire [70], the SUS scale [71], and the IPQ measurement scale [72]). Other researchers have identified this variable through qualitative studies. Such as the study by Jung et al. [22], through which they showed that the virtual experience resembles reality, which explains the realism of the virtual environment. This conclusion was confirmed by our qualitative study, which highlights that the realism of the virtual environment was cited first (see Table 1):

*“It was very real, an exact presentation of the real world” (P<sub>1</sub>);*

*“It is a very good experience, very identical to the real world” (P<sub>2</sub>);*

*“What attracted me to this experience was the effect of reality, I mean that the video describes the real world exactly” (P<sub>3</sub>);*

*“The virtual world is a world very close to the real world because it represents reality in the form of a 360-degree video” (P<sub>12</sub>);*

*“In my opinion, the main characteristic of this experience is reality, it was very real, very identical to a real visit” (P<sub>20</sub>);*

*“What caught my attention was the effect of reality: everything was real” (P<sub>24</sub>).*

Hence, VR enables exploring a place without moving and highlights the importance of realism because it makes it possible to create a convincing and irresistible experience [73] through the accurate and fine description of the real world.

*Immersion.* Immersion is defined as “a strong moment experienced by the consumer and resulting from a partial or complete process of appropriation on his part” [74] (p. 60). It also refers to the exposure of individuals to a digitally simulated environment in which they lose consciousness [75]. According to the data processing, the virtual environment visited can facilitate immersion, which subsequently leads to a detachment from the real world:

*“I was totally disconnected and isolated from the real world” (P<sub>5</sub>), “I was totally immersed and disconnected from the real world” (P<sub>9</sub>);*

*“The virtual world is a world very close to the real world, (...), which is why I felt a kind of immersion in the destination” (P<sub>12</sub>);*

*“During the virtual visit, I felt that I was immersed in the virtual environment” (P<sub>17</sub>).*

Nevertheless, immersion does not always lead to a total disconnection from the physical environment, as declared by the 8th participant:

*“Although I had the impression of really being in Monastir but still, I did not feel like I was 100% isolated from the real world. I lived this experience well, but I was always aware of the real world”.*

Likewise, the 10th respondent felt that the virtual experience does not allow them to move away from the real environment:

*“I was very connected with the virtual world but that does not mean that I did not feel total isolation of the real world”.*

*The sense of presence in the virtual environment.* The “sense of presence in the virtual environment” during the VR experience corresponds to the feeling of being in a virtual environment. This dimension has been identified and addressed in past research [21–76]. We note, according to the comments reported by the participants, that they have a sense of being present in Monastir during the virtual visit:

*“I felt as if I was really in this place” (P<sub>1</sub>),*

*“It’s a very nice experience, (...), which allowed me to have the impression of being there” (P<sub>2</sub>),*

*“I had the impression of really being in Monastir” (P<sub>8</sub>),*

*“I felt that I was really walking in Monastir” (P<sub>10</sub>),*

*“Even though I visited this place, I felt I was present while viewing the promotional video in virtual reality” (P<sub>15</sub>).*

The exploratory qualitative phase identified realism of the virtual environment, immersion, and the sense of presence in the virtual environment as the three key constitutive factors for measuring telepresence [72]. Therefore, we will treat telepresence as a first-order factor that encompasses these three dimensions.

### 3.2. Refining the Research Hypotheses and Elaborating the Conceptual Framework

#### 3.2.1. The Impact of Telepresence on Mental Imagery

VR presents a surreal environment through a computer to evoke mental imagery [77]. It is an interactive medium that provides visuospatial perspectives and immersive information, affecting the evaluation of products by customers [19–78] and leading to high levels of consumer mental imagery. Thus, in a tourist context, VR facilitates the creation of mental images of the attributes of the destination because it can make the experience tangible and concrete [79]. Similarly, Tussyadiah et al. [6] claimed that the individual can develop vivid mental images of the virtual world through VR, reinforcing the illusion of being immersed in the virtual world. We can then see that mental imagery is a central element in understanding virtual environments, in the absence of which tourists can only see what their senses perceive [80]. In the same vein, individuals who have created mental representations can interact with the virtual environment [81] and imagine their future experiences [13]. By deduction, VR improves and positively influences the mental imagery of tourists [19–82]. We found from our qualitative study that telepresence may stimulate tourists’ mental imagery:

*“I liked this experience because it allowed me to feel as if I were in Monastir, and this is what actually allowed me to create mental images of the destination” (P<sub>4</sub>).*

This generation of mental images is based on the feeling of presence:

*“When viewing the video in virtual reality, my brain creates mental images based on what I have seen and on my feeling of being present in the destination” (P<sub>8</sub>).*

Respondents also highlighted the impact of immersion on mental imagery:

*“The virtual world allows you to disconnect from the real world and therefore helps you to concentrate on creating mental images of the destination” (P<sub>5</sub>), “(...) I was totally immersed and disconnected from the real world. In my opinion, if I were not disconnected from my real environment, I could not create mental images” (P<sub>9</sub>).*

As for the realism of the virtual environment, we note that most of the respondents reported this notion:

*“What caught my attention was the effect of reality: everything was real” (P<sub>10</sub>),*

And highlighted its effect on mental imagery:

*“It was very real, an accurate presentation of the real world, and that’s what allowed me to create mental images” (P<sub>1</sub>);*

*“The realism of the virtual tour, the identical reproduction of the real world, allowed me to have images of the destination in my brain” (P<sub>5</sub>);*

*“In my opinion, the main characteristic of this experience is the reality, it was very real, very identical to a real visit. This effect of reality helped me build images in my brain about the destination” (P<sub>6</sub>);*

*“What attracted me was the effect of reality, the visit was very close to reality, and in my opinion, this is what made it possible to create mental images of the destination. I think I will use these images when organizing the actual visit” (P<sub>14</sub>).*

From the above, we can deduce that telepresence is an important element for the induction of mental imagery. We consider, then, that telepresence promotes the mental imagery of tourists. Therefore:

**H<sub>1</sub>:** *Telepresence positively influences tourists’ mental imagery.*

### 3.2.2. The Impact of Telepresence on Attitude

Van Kerrebroeck et al. [83] showed that VR leads to more positive attitudes towards a destination (e.g., a mall). As a source of pleasant [26] and realistic [49–84] experiences, VR positively influences customer attitudes [24]. Certain components of the VR visit experience, such as telepresence, also impacted attitudes. Some research has shown that an increased sense of presence in advertisements leads to positive attitudes towards the advertisement and the product/brand [64–76]. Other research has confirmed this finding and pointed out that telepresence and attitudes toward advertising and brands are positively correlated [64]. Fox et al. [85] also pointed out that the sense of presence can transform into an attitude in the real environment and guide customer behavior. In the tourism context, visualizing images of a travel destination in a mediated environment can arouse the interest of individuals and create an attitude toward the destination [86]. In the same study context, Bogicevic et al. [19] deduced that the sense of presence in the virtual environment determines attitudes towards this environment. Similarly, Tussyadiah et al. [6] and Al-yahya and McLean [87] showed that telepresence positively influences tourists’ attitudes toward the destination. Therefore, telepresence is central to generating favorable attitudes in the virtual environment [19–88]. The qualitative results further highlighted the positive effect of telepresence on the tourists’ attitude toward the destination:

*“The virtual visit and, more precisely, the feeling of presence that I felt in the destination allowed me to have a positive attitude about the destination before visiting it” (P<sub>9</sub>);*

*“Among the consequences of the virtual visit, the development of an attitude about this destination” (P<sub>11</sub>).*

Therefore:

**H<sub>2</sub>:** *Telepresence positively influences the attitude of tourists towards the tourist destination.*

### 3.2.3. The Impact of Mental Imagery on Visit Intentions

According to past research, mental imagery is considered a central element that can predict behavioral intentions [82] and behavioral results [89]. For example, Burns et al. [90] found that the mental imagery elicited by a concrete text in an advertising context positively influences purchase intention. A concrete photograph of an advertisement can

also favorably influence the intention to visit [91]. In the same vein, Lee and Gretzel [89] pointed out that the visual stimuli of a tourist destination website lead to mental imagery, which in turn positively influences visitors' behavior through strengthened attitudes. Similarly, Yoo and Kim [13] highlighted the role of imagery in understanding the impact of online product presentation on individuals' intention to revisit and purchase, while Gavi-lan et al. [92] show that vivid mental imagery can induce positive purchase intention. Liu et al. [93] thus suggested that, in the context of virtual product experiences, mental imagery improves the purchase intentions of Internet users. Therefore:

**H<sub>3</sub>:** *Mental imagery positively influences visit intentions.*

### 3.2.4. The Impact of Attitude on Visit Intentions

The relationship between attitude and behavioral intentions has been well established in Ajzen's [94] theory of planned behavior, as behavioral intentions mediate the link between an individual's behavior and attitude. This relationship has also been recurrently verified and confirmed in subsequent studies. Phillips et al. [95] highlighted the significant and positive link between the attitude towards consuming Korean cuisine and the intention to visit Korea. Jung et al. [96] showed that, in the context of virtual tourism, a positive attitude towards the use of virtual tourism increases customers' visit intentions. Other studies carried out in the context of VR have shown that the post-VR attitude towards the tourist destination positively influences the intention to visit this destination [6,97]. Therefore:

**H<sub>4</sub>:** *Favorable attitudes towards the tourist destination positively influence visit intentions.*

### 3.2.5. The Impact of Telepresence on Visit Intentions

The effect of experience on behavioral intentions has been discussed previously. For example, Pine and Gilmore [98] showed that a positive experience promotes favorable future visit intentions. VR research has supported this assertion. For example, Sussman and Vanhegan [99] show that the visit to the destination by a VR tool encourages individuals to organize their trips. Indeed, VR is a very powerful tool for increasing visit intentions [32]. Thus, Jung et al. [20] found that, in the context of museum visit experiences, positive technological experiences generate positive visit intentions. Other studies have shown that telepresence, as a dimension of the VR visit experience, influences actual visit intentions [49–100]. By deduction, VR experiences can influence individuals' behavioral intentions and behavior (pre-purchase, purchase, and post-purchase) [24–101]. Several participants supported this conclusion:

*"In my experience, I had a great desire to go there and visit Monastir" (P<sub>4</sub>);*

*"The virtual visit was quite like the real world, which made me feel like I was there. This feeling encouraged me to visit Monastir" (P<sub>1</sub>);*

*"To immerse myself and to feel present in the destination allows me to have an intention of actually visiting it" (P<sub>14</sub>);*

*"The virtual visit increased my intention to visit Monastir" (P<sub>5</sub>).*

Therefore:

**H<sub>5</sub>:** *Telepresence positively influences visit intentions.*

### 3.2.6. The Mediating Effects of Mental Imagery and Attitude towards the Tourist Destination in the Telepresence-Visit Intentions Relationship

#### The Mediating Effect of Mental Imagery

Our conceptual framework highlights mental imagery at the intersection of telepresence and actual visitation intent. In a VR context, some researchers have suggested

that VR results in a high level of creation of mental images of a destination [19–21] that increases user visit intention [6,24–100]. Skard et al. [82] showed that VR leads to high levels of mental imagery, which increases the intention to travel and visit the destination and positively influences the purchase decision. Therefore:

**H<sub>6</sub>:** *Mental imagery mediates the relationship between telepresence and visit intentions.*

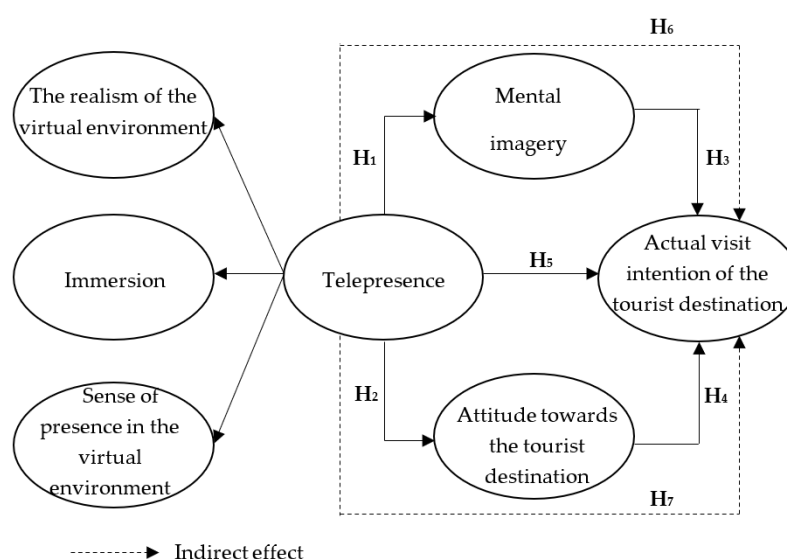
#### The Mediating Effect of Attitude towards the Tourist Destination

The immersive nature of the VR experience [5] helps to create favorable attitudes and, therefore, leads to positive behavior change. Other researchers have found that subjective experience in VR can be turned into attitude and lead to changes in customer behavior [85]. Tussyadiah et al. [6], as well as Bogicevic et al. [19], also concluded that the feeling of presence in a mediated environment leads to a favorable attitude towards the destination, which in turn increases the intention to visit by users. They found that the change in attitude following this type of experience generated starker visit intentions. Therefore:

**H<sub>7</sub>:** *Attitude toward the tourist destination mediates the relationship between telepresence and visit intentions.*

#### 3.2.7. The Conceptual Framework of the Study

The qualitative study, coupled with the literature review, allowed us to develop the conceptual framework shown in Figure 2.



**Figure 2.** The conceptual framework.

#### 3.3. Study 2: “Confirmatory” Quantitative Study

##### 3.3.1. Measurement

Since the objective is to quantitatively assess the impact of telepresence on mental imagery, attitude towards the tourist destination, and visit intentions, we used a structured method of data collection in the form of a questionnaire survey. This allows us to test the hypothesized relationships between the variables under study. We use Schubert et al.’s [72] 14-item Igroup Presence Questionnaire to measure the independent variable (telepresence). To measure tourists’ actual visit intentions, we opted for Tang and Jang’s [102] 3-item scale, which has been tested and validated in the context of tourism. Regarding the mediation variable, the measurement instrument used to assess mental imagery is a 3-item scale adapted from Lee et al. [103] and Schlosser et al. [104]. We use a 5-point Likert scale (1 “Strongly disagree” to 5 “Strongly agree”) to measure telepresence, actual

visit intention, and tourists' mental imagery. Spears and Singh's [105] 5-item and 5-point semantic differential scale (unattractive-attractive; bad-good; unpleasant-pleasant; unfavorable-favorable; unfriendly-friendly) is used to measure attitude towards the tourist destination. The questionnaire was in French. The first part contained multiple-choice questions to find out how often respondents travel for tourism purposes and if they have ever used a VR headset to visit a specific destination. Then, we invited participants to virtually visit Monastir. After the VR visit, participants were asked to complete the questionnaire. We carried out a pre-test with 10 people to ensure the consistency of the survey and their understanding of the questions proposed. Given the positive evaluation, we made no changes to the questionnaire.

### 3.3.2. Research Procedure

Participants were recruited by phone to participate in the study. We specified the objectives of the study, the place, and the date of the interview. Participants were also informed that they would be compensated for their participation. We then used a face-to-face data collection procedure through directed interviews. In fact, this data collection mode allows for better control over respondents who first had to perform the virtual visit via the VR headset prior to filling out the questionnaire. Out of the initial 471 phone invitations, 66 were canceled. The survey then spanned approximately one month and 20 days, from 28 June 2022 to 16 August 2022. During the interview, participants were exposed to the same VR visit experience as during the qualitative phase (i.e., a 360-degree promotional video of the Monastir region via a head-mounted VR ELEGANT tool). This allowed participants to immerse themselves in the destination. Afterward, each participant answered the questionnaire. Finally, they were thanked and compensated. Before entering the data analysis process, we checked the surveys and discarded five of them as invalid due to missing information ( $n = 400$ ).

## 4. Results and Findings

### 4.1. Initial Data Screening

Several preliminary statistical tests were performed to determine the accuracy of the data acquired for this study. The data were initially examined for any missing responses. Careful screening ascertained that missing data comprised less than 2% of total responses and was substituted with arithmetic means, as suggested by Byrne [106]. We also checked for the normality of the data using skewness and Kurtosis values. Table 2 indicates that the data are normally distributed, as the skewness and kurtosis values ranged between  $\pm 2$  and marginally close to that value, indicating normally distributed data [107].

**Table 2.** Descriptive statistics, Skewness, and Kurtosis values.

Constructs	Mean	St. Deviation	Skewness	Kurtosis
Presence	3.9606	0.84303	−1.631	1.631
Immersion	4.0350	0.85963	−1.472	1.605
Realism	4.1869	0.75255	−1.478	2.018
Mental imagery	3.4525	1.21256	−0.683	−0.934
Attitude	3.6075	0.49592	−0.558	2.452
Actual visit intention	3.9550	0.95989	−1.301	0.533

Non-response bias was controlled for by comparing early and late respondents. The mean differences on key constructs were tabulated across early ( $n = 275$ ) and late ( $n = 125$ ) respondents (Table 3). No significant differences were found between the two groups, indicating the absence of nonresponse bias. Thus, the final sample of 400 participants was considered valid. By voluntarily participating in the survey and not requesting any

personal information, we were able to confirm the anonymity of the responses and reduce the bias introduced by non-probability sampling approaches.

**Table 3.** Non-response bias.

	Presence	Immersion	Realism	Mental Imagery	Attitude	Actual Visit Intention
<b>Early respondents</b>						
Mean	3.915	3.993	4.248	4.119	3.567	3.902
Std. Deviation	0.810	0.880	0.774	0.803	0.461	0.988
<b>Late respondents</b>						
Mean	4.060	4.108	4.272	4.123	3.696	4.072
Std. Deviation	0.787	0.832	0.734	0.778	0.553	0.882

#### 4.2. Common Method Bias

Harman's single-factor test was performed to detect common method bias (CMB) issues by "constraining all the scale items into a single unrotated factor in exploratory factor analysis, with the assumption that the presence of CMB is indicated by the emergence of either a single factor or a general factor accounting for the majority of covariance among measures" [108,109] (p. 889). The suggested value for a single-factor solution needs to be lower than 50% of the explained variance [108]. The unrotated factor solution showed a single component to have a variance of 33%, ruling out CMB.

#### 4.3. Demographic Profile

Table 4 shows the demographic details of the respondents.

**Table 4.** Demographic profile.

Demographic Characteristics (N = 400)	Frequency	Percentage
<b>Gender</b>		
Male	163	40.8
Female	237	59.2
<b>Age</b>		
18–25	30	7.5
26–35	152	38.0
36–45	178	44.5
45–55	37	9.3
More than 55	3	.8
<b>Status</b>		
Single	154	38.5
Widowed	4	1.0
Divorced	18	4.5
Married with children	128	32.0
Married without children	96	24.0
<b>Profession</b>		
Farmer	17	4.3
Intermediary occupation	16	4.0
Employee	278	69.5
Worker	56	14.0
Jobseeker	33	8.3
<b>Income (in Tunisian Dinars [TND], TND 1 = USD 0.33)</b>		
Without income	33	8.3
500–1000 TND	84	21.0

1000–1500 TND	251	62.8
1500–2000 TND	32	8.0
<b>How often do you travel for tourism purposes?</b>		
Once a year	214	53.5
Twice a year	143	35.75
More than twice a year	43	10.75
<b>Have you visited a tourist destination using VR technology?</b>		
Yes	39	9.75
No	361	90.25

#### 4.4. Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) was conducted to ensure the fit between the observed data and the conceptual model [110]. Table 5 indicates that the standardized item loadings vary between 0.676 and 0.934, which are above the recommended threshold value of 0.60 [111]. The values for the critical ratio of all items exceeded 1.96, indicating that each item is normally distributed [112]. Furthermore, each construct's AVE is above the 0.50 cut-off value [113]. Collectively, these results support the convergent validity of all studied constructs. Further, the composite reliabilities (Cronbach's alphas) of the constructs lie between 0.806 and 0.931 (0.796 and 0.927), all above the acceptable value of 0.7, indicating good internal consistency of the studied factors [114].

**Table 5.** Measurement model.

	Items	Std. Estimate	Std. Error	Critical Ratio	AVE	CR	Cronbach's Alpha
Presence	PRS1	0.851					
	PRS2	0.829	0.045	21.09	0.731	0.916	0.915
	PRS5	0.872	0.047	23.056			
	PRS6	0.867	0.045	22.817			
Immersion	IMM1	0.859					
	IMM2	0.862	0.038	22.602	0.754	0.897	0.892
	IMM4	0.868	0.037	22.862			
Realism	REL1	0.879					
	REL2	0.835	0.042	21.543	0.635	0.873	0.851
	REL3	0.768	0.045	18.63			
	REL4	0.692	0.047	15.972			
Mental Imagery	IMG1	0.913					
	IMG2	0.876	0.04	26.145	0.818	0.931	0.927
	IMG3	0.924	0.043	29.143			
Attitude	ATT1	0.813					
	ATT2	0.692	0.073	13.165			
	ATT3	0.682	0.08	10.98	0.515	0.806	0.796
	ATT4	0.676	0.078	9.849			
Visit intentions	ITV1	0.832					
	ITV2	0.934	0.05	24.272	0.776	0.912	0.906
	ITV3	0.874	0.056	21.931			

CMIN/DF = 4.963, GFI = 0.901, NFI = 0.898, IFI = 0.913, TLI = 0.897, CFI = 0.912, RMSEA = 0.08

*Note:* AVE—average variance extracted; CR—composite reliability; Presence—sense of presence in the virtual environment; Realism—realism of the virtual environment; Attitude—attitude toward the tourist destination.



To ensure the discriminant validity of the scale items, the values of the square root of the AVE should be greater than inter-item correlations, as suggested by Hair et al. [114]. Table 6 indicates that the AVE square root of any given construct is larger than any correlation of that construct with other constructs, thus indicating discriminant validity [113,114]. Finally, the bottom of Table 5 also shows acceptable fit indices for the measurement model. Therefore, the extracted factors are reliable and valid, and the observed data fit the theoretical model well, so the model is ready for structural testing.

**Table 6.** Correlation matrix.

	Presence	Immersion	Realism	Mental Imagery	Attitude	Visit Intentions
Presence	<b>0.854</b>					
Immersion	0.704 <sup>a</sup>	<b>0.868</b>				
Realism	0.713 <sup>a</sup>	0.672 <sup>a</sup>	<b>0.796</b>			
Mental imagery	0.533 <sup>a</sup>	0.464 <sup>a</sup>	0.470 <sup>a</sup>	<b>0.904</b>		
Attitude	0.550 <sup>a</sup>	0.558 <sup>a</sup>	0.619 <sup>a</sup>	0.328 <sup>a</sup>	<b>0.717</b>	
Visit intentions	0.703 <sup>a</sup>	0.652 <sup>a</sup>	0.704 <sup>a</sup>	0.532 <sup>a</sup>	0.568 <sup>a</sup>	<b>0.880</b>

Note: <sup>a</sup> Correlation significant at the 0.01 level (2-tailed). Items in bold italics indicate the square root of the AVE.

#### 4.5. Structural Model

The bottom of Table 7 shows that the fit indices indicate good model fit as per the recommendations of Byrne [112]. Further, among the sub-constructs of telepresence, the sense of presence in the virtual environment and immersion had the highest loadings of 0.944 and 0.907, respectively. This was followed by the realism of the virtual environment, which emerged as less important (0.867) (see Table 7 and Figure 3). This suggests that presence and immersion help telepresence deliver a substitute experience that potential tourists may use to travel to a tourist site. Moving further, telepresence significantly and positively influences mental imagery ( $\beta = 0.555$ ,  $p < 0.001$ ) and attitude ( $\beta = 0.623$ ,  $p < 0.001$ ), thereby lending support to H1 and H2, respectively. Further, H3 and H4, which postulate, respectively, that mental imagery ( $\beta = 0.388$ ,  $p < 0.001$ ) and attitude ( $\beta = 0.568$ ,  $p < 0.001$ ) positively impact actual visit intention, are also supported. It is worth mentioning that telepresence has a stronger impact on attitude compared to mental imagery, thus reflecting the significance of telepresence in inculcating a positive attitude about a destination. Moving ahead, telepresence strongly impacted actual visit intentions, indicating the significance of telepresence in enhancing actual visit intention ( $\beta = 0.845$ ,  $p < 0.001$ ), thereby validating H5.

**Table 7.** Structural model showing the hypothesized relationships.

Hypothesized Relationships	Estimate	S.E.	C.R.	p-Value	Result
Presence → Telepresence	0.944*				
Immersion → Telepresence	0.907	0.03	32.161	***	
Realism → Telepresence	0.867	0.029	28.148	***	
Telepresence → Mental imagery	0.555	0.067	12.599	***	Support
Telepresence → Attitude	0.623	0.026	14.871	***	Support
Mental imagery → Visit intentions	0.388	0.031	9.935	***	Support
Attitude → visit intentions	0.568	0.080	13.795	***	Support
Telepresence → Visit intentions	0.845	0.039	26.355	***	Support

CMIN/DF = 4.682, GFI = 0.961, NFI = 0.957, IFI = 0.983, TLI = 0.967, CFI = 0.985, RMSEA = 0.068

\*\*\*  $p < 0.001$ .

#### 4.6. Model after Mediation

Table 8 reports the mediation effect of attitude and mental imagery between telepresence and visit intentions using Hayes' bootstrapping procedure in AMOS. We considered the effectiveness of the direct, indirect, and total effects using the standardized beta ( $\beta$ ) [114]. A bootstrapping procedure with 2000 bootstrapped samples was used to test the significance of both the total and specific indirect mediating effects [115]. The results indicated the emergence of a significant direct effect between telepresence and actual visit intention while controlling the mediating variables ( $\beta = 0.845$ ,  $p < 0.001$ ). As displayed in Figure 3 and Table 7, telepresence has a significant impact on attitude ( $\beta = 0.589$ ,  $p < 0.001$ ) and mental imagery ( $\beta = 0.544$ ,  $p < 0.001$ ). The results also suggest that mental imagery ( $\beta = 0.11$ ,  $p < 0.001$ ) and attitude ( $\beta = 0.12$ ,  $p < 0.001$ ) have a direct and positive effect on actual visit intention. Further, the indirect effect through attitude and mental imagery is also significant ( $\beta = 0.130$ , CI: [0.182, 0.236]). The indirect effect is significant since the confidence interval does not encompass zero [116]. The direct effect of telepresence on visit intentions in the presence of mediating variables is significant ( $\beta = 0.707$ ,  $p < 0.001$ ), suggesting a partial mediation of mental imagery and attitude.

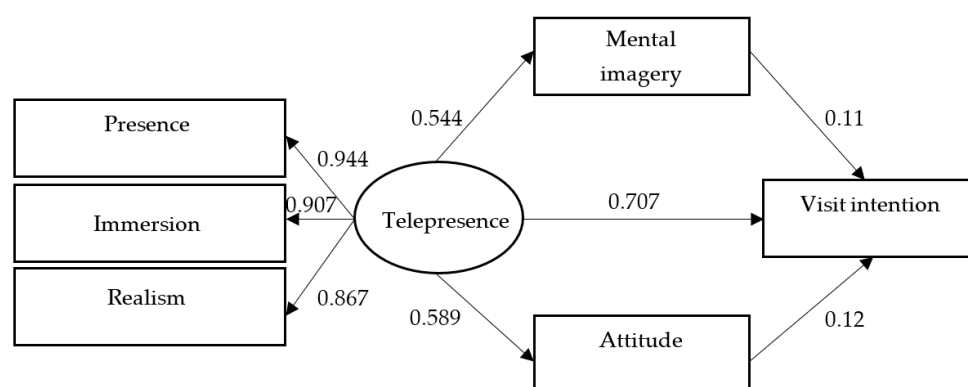


Figure 3. Structural model.

Table 8. Mediation effects.

Bootstrapping Bias Corrected 95% Confidence Interval N = 2000					
No.	Hypotheses	Direct Effect $\beta$	Indirect Effect $\beta$	p-Value	Mediation Type
H6	Telepresence $\rightarrow$ Mental imagery $\rightarrow$ Visit intentions	0.544	0.0594	0.001	Partial mediation
H7	Telepresence $\rightarrow$ Attitude $\rightarrow$ Visit intention.	0.589	0.0708	0.001	Partial mediation
CMIN/DF = 1.741, GFI = 0.971, NFI = 0.994, IFI = 0.986, TLI = 0.974, CFI = 0.978, RMSEA = 0.048					

## 5. Discussion

The results of the factor analysis showed that telepresence has a positive impact on mental imagery, as postulated by our first hypothesis ( $H_1$ ). Indeed, VR and mental imagery are based on two similar criteria, namely interactivity with the virtual world [104] and vividness of images [15], which means that VR makes it possible to provoke the process of mental imagery, that is to say, the video presented by VR technology makes it possible to induce the feeling of presence in the virtual environment in the user, which facilitates, in turn, the creation of mental images, since VR is able to make experiences more concrete [83] in order to process the information exposed to them. This result is consistent with some past research, such as that of Skard et al. [82], which explores how VR (vs. 2D presentation) influences the behavioral responses of individuals. These researchers

pointed out that, compared to traditional channels, VR experiences generate high levels of mental imagery among consumers. Similarly, Bogicevic et al. [19], who analyzed the ability of VR to offer tourism experiences, found that virtual tour experiences (vs. static images) can improve tourists' mental imagery. An older study found that after a VR experience, the user will be able to form mental images of the virtual environment they have visualized [6]. Although mental imagery helps to understand the virtual world through the representation of mental images in the mind of the individual, little research has studied mental imagery in the context of VR.

In line with past research [6,83–87], our findings have shown that the feeling of telepresence resulting from the VR tour experience positively affects tourists' attitudes towards the destination ( $H_2$ ). This finding is similar to Alyahya and McLean [87], who indicated that the VR experience can positively enhance and influence customer attitudes towards a tourist destination. Even sensory information from the VR experience can drive favorable attitudes toward the destination [87]. Moreover, the feeling of telepresence is considered a crucial element in generating positive attitudes [19]. Thus, Tussyadiah et al. [6] stated that the feeling of presence in the virtual environment helps to encourage positive attitudes towards the tourist destination. However, these researchers did not analyze attitudes upstream and downstream of the VR experience.

The following finding from this research concerns the positive effect of (1) mental imagery ( $H_3$ ) and (2) attitudes towards the tourist destination ( $H_4$ ) on tourists' actual visit intention. Our results confirmed those of other studies, such as Park and Yoo [117], indicating that mental imagery improves individuals' behavioral intentions. Liu et al. [97] also noted that it leads to positive purchasing and consumption intentions. Therefore, mental imagery can predict the behavioral intent of clients [82]. Thus, our fourth hypothesis that attitudes towards the tourist destination positively influence tourists' actual visit intention has been validated. This result aligns with past research [6,61–102]. They confirmed that positive attitudes towards the tourist destination led to a positive intention to visit it. The relationship between these two variables has also been analyzed in the context of virtual tourism, and it is accepted that a positive attitude toward using virtual tourism increases customers' intention to visit [96].

In addition, telepresence exerts a direct and positive effect on the actual visit intention of potential tourists ( $H_5$ ), which means that VR plays an important role in generating favorable visit and travel intentions. Indeed, Zeng et al. [1] pointed out that in a tourism context, the use of VR technology significantly affects users' behavioral intentions. Preliminary studies have shown that there is indeed a strong relationship between these two variables [21–118]. For example, Wei et al.'s [21] research investigating the role of VR in enhancing the experience and behaviors of theme park visitors has shown that visiting theme park visitors or a destination through VR technology results in a strong intention to visit the destination or theme park. Similarly, for the museum experience, the VR tour generates a high intention to visit the museum [20–30]. By inference, VR technological tools [45] and rich content [38] make it possible to increase individuals' visit or travel intention because certain components of the VR visit experience, including telepresence, lead to a visit intention [49]. Other researchers have emphasized the important role of the aesthetic aspect of the virtual world in generating visit intentions [20]. So, the 360-degree video on the city of Monastir that we presented to the participants increased the intention of an actual visit thanks to the attractiveness of the images presented. These results align with those of Marasco et al. [43], who found that the attractiveness of VR experiences of the Fontanelle cemetery has a positive effect on intentions to visit that destination. However, Li and Chen [24] criticized this finding by pointing out that VR can discourage potential tourists from traveling in some other situations. As for Lee et al. [30], they showed that the museum experience can lead to an intention to visit the museum.

On the other hand, the effect of telepresence on actual visit intention can be manifested by tourists creating realistic mental images ( $H_6$ ) ( $EI_1 = 0.0774$ ). It has already been mentioned in some studies that VR can create mental images [19,20], which will increase

future tourists' intentions to visit [6,24–49]. In the same vein, Skard et al. [82] suggested that VR leads to high levels of mental imagery and, consequently, favorable visit intent and a positive travel decision. Another positive indirect effect of telepresence on actual visit intention was found through attitudes towards the tourist destination ( $H_7$ ) ( $El_2 = 0.767$ ). Indeed, VR experiences generate favorable attitudes that generate positive behavioral responses [14]. Other researchers have argued that changing attitudes through immersive experiences leads to a favorable intention to visit the tourist destination [19–97].

## 6. Implications

### 6.1. Theoretical Implications

From a theoretical point of view, our research provides a solid theoretical basis for the impact of VR on tourist visit intentions from a multidisciplinary approach, that is, starting from studies in cognitive psychology, VR, psychology, marketing, and tourism. In addition, very little research carried out in the tourist context has used VR technology [119], and ours is one of the few studies that has qualitatively explored the lived VR visit experience by potential tourists by offering a 360-degree promotional video shot using a VR headset in the domestic tourism context. To analyze the effect of the virtual visit experience on tourists' visit intentions, we have identified the most important dimension, which is telepresence. This variable remains a little-treated field since there is not yet an exact definition, and it is confused with the concept of immersion. After analyzing the literature and empirically exploring its dimensions, we contribute to the theoretical foundations of that concept by defining it more specifically and by distinguishing its key constitutive dimensions.

Furthermore, most of the research dealing with the concept of mental imagery falls within the stream of research that pertains to the effect of mental imagery on memorization. Our research is part of another stream of research that deals with the relationship between mental imagery and the consumer's attitudinal and behavioral responses, which is little treated in the tourism context. Thus, research dealing with VR has paid attention to the study of mental imagery as an information processing mechanism, while our research has presented its importance in predicting visit intention in the tourism context. Another theoretical implication of this work lies, first, in the proposal of a conceptual model intended to understand the effect of the VR experience on the mental imagery and the behavior of the users, which is a little exploited. Secondly, our research has studied the experiential approach in the context of the consumption of a tourist product, i.e., we have highlighted the link between virtual worlds and experiential marketing, which makes it possible to explain how customers can experience the consumption of a service through immersing themselves in the virtual environment. Then, we chose a real Tunisian destination rather than a hypothetical one for the studies carried out.

Importantly, research focusing on domestic tourism is rare [120] despite its important economic effects. Therefore, this study contributes uniquely to showing how the relationship between VR, mental imagery, and the behavior of potential tourists in the tourist context contributes to domestic tourism.

### 6.2. Managerial Implications

The research highlights the rising importance of technology in tourism [121], especially the relationship between VR technology and tourist behavior. By so doing, it underscores the rising influence of novel technologies to ensure service quality and also contributes to the service quality literature (e.g., [122]). The study indicates that telepresence is not based solely on immersion but also on other important variables to consider when developing the communication strategy, particularly the degree of realism of the virtual environment and the sense of presence in it. In fact, these dimensions contribute to the improvement of the virtual visit, through which tourism companies can create a competitive advantage by offering customers rich and interactive environments as well as

immersive and informative experiences to encourage customers to travel. Moreover, our results revealed that the presentation of tourist attractions in VR can generate positive real-visit intention, which means that VR can effectively promote tourist destinations. Moreover, according to the results obtained, we can confirm the effectiveness of adopting VR technology because it allows tourists to be transported into a virtual world that they visualize using a VR headset. This technology also helps clients create favorable mental images. Therefore, the customer becomes a consumer actor and can live an anticipated experience of his trip. Consequently, tourism professionals must go beyond the traditional model of presenting tourism products (e.g., 2D images, descriptive posters) and adopt VR devices to create an immersive virtual visit experience that is differentiated and original to arouse the feeling of belonging to the virtual world and generate favorable emotional, attitudinal, and behavioral responses.

## 7. Limitation and Future Research Avenues

Our first limitation is conceptual. It refers to the number of variables taken into consideration in our research. In fact, we have followed the law of parsimony, which makes it possible to measure a phenomenon in more detail. However, future research can integrate other interesting variables to improve the proposed conceptual framework, such as the formation of imaginary creation, which corresponds to the description of mental images enhanced by imaginary representations, the emotional responses generated during the experience of a virtual tour, and other dimensions of the VR tour experience, such as “entertaining experience.” The latter makes it easier for tourism companies to establish lasting customer relationships. Moreover, our conceptual framework does not contain any moderating variables. Therefore, other studies can, for example, study the moderating effect of gender to understand the difference between men and women in terms of creating mental images resulting from the VR visit experience.

Our research also highlights methodological limitations. The technical capabilities of the VR headset used in our study are limited, given the unavailability of more developed VR headsets in the Tunisian market. It would be relevant to redo the qualitative study carried out by choosing another VR headset based on its level of media richness, such as the Oculus Quest 2 headset, which offers users a great immersion in the virtual environment thanks to Oculus Touch controllers, which detect hand movements in real-time and reproduce them in the virtual world. In addition, this headset has a very high screen resolution ( $3664 \times 1920$  pixels), which increases the degree of precision and realism and improves the quality of the immersive experience. Researchers can also use a 360-degree video containing a precise account of the history of the chosen destination to analyze its impact on the tourist's purchase decision.

Furthermore, although conducted in the aftermath of the COVID-19 crisis, this study did not take into account some specificities of the pandemic, notably that consumers could not travel and often not go outside, which induced a form of deconsumption and corresponding coping strategies [123]. Future research could delve deeper into how VR visualization compensates for actual travel experiences and thus assists consumers in coping with forced deconsumption. Besides, given the cruciality of satisfaction in consumer behavior [124,125], future research could also explore under which conditions consumers' satisfaction with VR visits could surpass actual tourist visits.

Finally, the study is limited to Tunisia, which may limit the generalization of the research results. Therefore, to overcome this limitation, future research can focus on other countries and consider cultural differences to determine if the latter can influence the contribution of VR in terms of experience. On the other hand, most respondents have never tried VR technology ( $n = 361$ ), which may bias our results because the degree of enthusiasm generated by this technology may influence stakeholders' perceptions due to a novelty effect. Future research may use Yeh et al.'s [29] variable to identify the impact of the novelty effect on behavioral intentions. Interestingly, further research can replicate our structural model in a metaverse context. Finally, we grouped the main dimensions of the

VR visit experience into a single variable (telepresence), so it would be interesting to analyze the effect of each dimension on the behavior of potential tourists separately.

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