

# Exploring the Impact of Virtual Reality on Destination Images, Attitudes, and Visit Intention: A Comparative Analysis with Traditional

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#### Abstract

Virtual Reality (VR) technology has gained prominence in tourism marketing due to its ability to deliver immersive destination experiences. However, limited research explores the impact of VR on destination image, attitudes, and travel decision-making compared to traditional media formats like 2D videos. This study investigates the role of telepresence in influencing destination image and attitude changes within the context of VR tourism. It aims to examine the mediating effect of destination image on the relationship between telepresence and destination attitudes and assess the comparative effectiveness of VR versus 2D video. A single-factor between-subject experimental design was used, randomly assigning 88 participants to either VR or 2D video conditions. Participants experienced virtual tours of Rome and Paris using an HTC VIVE Pro for the VR group and a widescreen monitor for the 2D group. Telepresence, destination image, and destination attitudes were measured using validated scales. Data were analyzed using t-tests, MANOVA, and mediation analysis through Hayes' PROCESS macro. Participants in the VR condition reported significantly higher levels of telepresence than those in the 2D condition. Telepresence positively affected destination image across physical attraction, value, and infrastructure dimensions. Mediation analysis indicated that destination image fully mediated the relationship between telepresence and destination attitudes, while destination attitude significantly predicted intent to visit. This study demonstrates that VR generates greater telepresence than 2D video, leading to enhanced destination image and attitudes. The findings offer significant theoretical and practical contributions, suggesting that VR is a powerful tool for tourism marketers aiming to influence destination perceptions and travel intentions. These results deepen our understanding of the psychological mechanisms underpinning VR tourism experiences and highlight its potential for destination marketing.

#### Keywords: Virtual Reality, Telepresence, Destination Image, Attitude Formation, Mediation

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#### **1. Introduction**

The rapid advancement of virtual reality (VR) technology has transformed the delivery of tourism experiences, offering immersive and interactive environments that allow potential tourists to explore destinations without physically visiting them (Cheong, 1995; Guttentag, 2010; Williams & Hobson, 1995). Virtual tourism experiences (VTEs) have become increasingly relevant in both tourism marketing and consumer behavior research, with telepresence—the extent to which a user feels present in a virtual environment—identified as a critical factor in determining the effectiveness of these experiences (Heeter, 2000; Steuer, 1992).

Despite the growing body of literature on VR in tourism, previous research has largely focused on the technological aspects of VR and its general appeal, without sufficiently examining how VR influences destination image and attitude change (Jung et al., 2016; Tussyadiah et al., 2018). The cognitive and emotional processes driving these changes, particularly the mediating role of destination image, remain underexplored. Moreover, comparative studies between VR and traditional media formats (e.g., 2D videos) in enhancing or reinforcing destination perceptions are limited, restricting the field's understanding of VR's relative effectiveness (Guttentag, 2010; Pantano & Di Pietro, 2013).

This study aims to address these gaps by investigating the impact of telepresence on destination image and attitude change in the context of VR tourism, while also exploring the mediating role of destination image. By comparing VR experiences with traditional 2D video experiences, this study provides a comprehensive analysis of VR's unique contributions to influencing tourist perceptions and attitudes toward a destination. This research is motivated by the need to deepen our understanding of how immersive technologies influence mental models, such as destination image, and how these models drive attitudinal and behavioral outcomes (Tussyadiah et al., 2018).

The increasing reliance on digital media for tourism promotion, especially in a post-pandemic world where physical travel may be restricted, underscores the importance of understanding how VR can simulate authentic travel experiences (Jarratt, 2020). This study is essential for exploring the comparative advantages of VR over traditional media formats and for examining how telepresence in VR can foster positive perceptions of a destination. Accordingly, the primary objectives of this study are fourfold: (1) to compare the levels of telepresence resulting from VR versus 2D video experiences; (2) to examine the impact of telepresence on destination image change in the context of VR tourism; (3) to explore the relationship between telepresence and attitude change; and (4) to investigate the role of destination image in the relationship between telepresence and destination attitudes.

This study contributes to both theoretical frameworks and practical applications in tourism marketing. From a theoretical perspective, the study will clarify the mechanisms through which telepresence affects destination image and attitudes (Jung et al., 2016). From a practical standpoint, it offers insights for tourism marketers and destination management organizations (DMOs) on how to effectively leverage VR technology to enhance destination branding, attract potential tourists, and influence their travel intentions (Williams & Hobson, 1995). The introduction should briefly place the study in a broad context and highlight why it is important. It should define the purpose of the work and its significance. The current state of the research field should be carefully reviewed and key publications cited. Please highlight controversial and diverging hypotheses when necessary. Finally, briefly mention the main aim of the work and highlight the principal conclusions. As far as possible, please keep the introduction comprehensible to scientists outside your particular field of research.

#### 2. Literature Review

### Telepresence in Virtual Reality Tourism

Telepresence, defined as the psychological state of "being there" in a mediated environment, is a key concept in virtual reality (VR) experiences. It refers to the extent to which individuals feel immersed in a virtual environment despite being physically located elsewhere (Steuer, 1992). This phenomenon is particularly relevant to VR tourism, where the goal is to simulate the sensation of being present at a destination without actual physical travel (Kim & Biocca, 1997). Telepresence is influenced by two primary factors: vividness and interactivity. Vividness refers to the richness of the sensory information presented in the virtual environment, while interactivity refers to the degree to which users can manipulate and engage with that environment (Hoffman & Novak, 1996; Steuer, 1992).

The application of telepresence in VR tourism is essential because it allows users to "mentally travel" to a destination, experiencing the sights and sounds of a place through immersive and interactive technologies (Tussyadiah et al., 2017). The heightened sense of presence created by VR can have significant psychological and emotional effects, including changes in destination perceptions and attitudes. As tourists engage with a destination virtually, the telepresence they experience can enhance their emotional connection to the location, potentially influencing their real-world travel intentions (Hyun & O'Keefe, 2012). Consequently, telepresence has emerged as a critical factor in the study of VR tourism experiences.

The relationship between telepresence and destination image is well-supported in the literature. Destination image refers to an individual's overall perception or mental representation of a destination, often shaped by direct or indirect experiences, such as personal visits, media exposure, or virtual experiences (Govers et al., 2007; Nicoletta & Servidio, 2012). In the context of VR tourism, telepresence can significantly influence destination image by creating an immersive, vivid, and interactive virtual experience that closely simulates reality (Tussyadiah et al., 2018).

Prior research suggests that VR's ability to generate telepresence can lead to substantial shifts in destination image from pre-experience to post-experience (Hopkins et al., 2002). The richer and more interactive the virtual environment, the more likely users are to perceive the destination positively, thereby enhancing their destination image (Suh & Chang, 2006). This suggests that individuals who experience high levels of telepresence in a VR environment are more likely to report a significant improvement in their perception of the destination. Hence, we propose the following hypothesis:

Hypothesis 1: The destination experience provided by VR will generate higher levels of telepresence compared to 2D video.

## *The Impact of Telepresence on Destination Image Change*

Telepresence not only influences how individuals perceive a destination but also facilitates cognitive and emotional changes regarding that destination. As individuals become immersed in the virtual environment, they develop a more profound connection to the destination, which can result in a more favorable post-experience destination image. This transformation occurs as the sensory and interactive elements of VR transport users into a virtual representation of the destination, allowing them to "feel" present at the location (Kim et al., 2021).

Given that telepresence enhances the vividness and interactivity of the VR experience, we expect that higher levels of telepresence will be associated with greater changes in destination image. In other words, participants who experience a stronger sense of telepresence will likely demonstrate a larger shift in their perception of the destination from pre- to post-experience. Based on this rationale, we propose the following hypothesis:

Hypothesis 2: Higher levels of telepresence will lead to a greater positive change in destination image from pre-experience to post-experience.

#### Mediating Role of Destination Image in Attitude Formation

As shown in Figure 1, destination image plays a crucial mediating role in the relationship between telepresence and destination attitude change. Attitude formation is a multifaceted process influenced by cognitive and affective components, both of which are shaped by an individual's perception of a destination (Baloglu & McCleary, 1999; Gartner, 1996). In VR tourism, telepresence enhances the cognitive (e.g., knowledge and beliefs about the destination) and affective (e.g., emotional responses to the destination) components of destination image, which subsequently influence an individual's overall attitude toward the destination (Fiore et al., 2005).

Previous research has shown that telepresence can enhance destination image, and a favorable



Figure 1. Theoretical Framework and Hypotheses

destination image can lead to positive attitude formation (Tussyadiah et al., 2018). Therefore, it is expected that changes in destination image, facilitated by telepresence, will mediate the relationship between telepresence and destination attitude change. Specifically, individuals who experience higher levels of telepresence will form more favorable destination images, which will, in turn, lead to more positive shifts in their attitudes toward the destination. Thus, we propose the following hypothesis:

Hypothesis 3: Destination image change will mediate the relationship between telepresence and destination attitude change.

#### Destination Attitude and Intent to Visit

Attitude is defined as "a learned predisposition to respond in a consistently favorable manner with respect to a given object" (Fishbein & Ajzen, 1975). Attitudes are typically measured along a continuum from positive to negative, or favorable to unfavorable (Cacioppo & Petty, 1981; Fishbein & Ajzen, 1975). In the context of VR tourism, attitudes toward a destination are formed by the immersive, vivid, and interactive experiences that VR technology provides, which allow users to explore and evaluate a destination virtually before making a decision to visit.

The tri- component attitude model offers a useful framework for understanding how attitudes toward a VR-mediated tourist destination are formed. According to this model, attitudes are composed of cognitive, affective, and conative responses (Solomon, 2007). In the VR tourism context, the cognitive, affective, and conative responses align with the constructs of destination image, attitude, and visit intention, respectively. A positive cognitive evaluation of the destination through VR leads to a favorable attitude, which in turn increases the intent to visit the destination (Pike & Ryan, 2004; Vincent & Thompson, 2002). Therefore, attitude serves as both an outcome of a VR-mediated destination image and a predictor of the intention to visit.

Previous research supports the influence of VR on destination attitudes and intentions. Deng and Li (2014) found that a positive change in destination image, induced by virtual experiences such as those used to promote large events like the World Expo, can enhance attitudes toward the destination. Similarly, Jalilvand et al. (2012) identified destination image as a key predictor of attitudes and travel intentions. In line with these findings, VR's ability to provide immersive, vivid, and interactive experiences strengthens destination attitudes and positively impacts travel intentions (Tussyadiah et al., 2018). In studies grounded in the theory of reasoned action, attitude is consistently highlighted as a significant determinant of behavioral intentions (Fishbein & Ajzen, 1975; Gorn, 1982; Lee et al., 2005). When applied to VR tourism, the theory suggests that positive attitudes formed through immersive virtual experiences will lead to stronger intentions to visit the destination in reality. Thus, Hypotheses 4 is proposed for empirical testing.

Hypothesis H4: Destination attitude will have positive influence on intent to visit the destination.

#### 3. Methodology

This study employed a single-factor betweensubject experimental design with random assignment to the two conditions: 2D or VR condition. The experiment was conducted in a research laboratory using a desktop computer with an HTC VIVE Pro headset. Participants completed online survey via the Qualtrics.com platform.

#### Limitations

A few limitations were identified in this study

that may have affected the study results. The study's first limitation being the limited space in the area of study. While participants were in the VR destination, the physical environment was not large enough for participants to walk around like they would in the destination, this could have had effects on the immersion in the telepresence. Limitations also could be considered in assessing the quality of the VR technology and software, while the effects of this limitation were not directly assessed, it may have had slight implications on the quality of immersion and telepresence viewers felt. It is important to note that sampling bias could have also affected the study results, the study aimed at understanding an age group of 19-24, and may not accurately represent a population as a whole.

These study limitations are important to note for further research. In further research, using VR technology the space identified as the study space should be large enough for participants to walk around freely to increase the level of immersion and increase telepresence of the participant. It should also be noted that the quality of the VR headset should be assessed and carefully chosen as it may have limitations on the quality of the telepresence or vividness of the participant. In further research, it is important to understand the implications that age has on the study results.

#### Data Collection and Participants

Participants for this study were recruited from business and sport management courses at a university, located in the Pennsylvania region of the United States. A total of 88 participants were successfully recruited from the university, using class announcement. The participants were college students aged 19 to 24, with an average age of 21.6 years (SD = 2.5). In terms of ethnicity, the majority of participants identified as white/Caucasian, comprising 76.1% of the sample. Hispanic participants made up 11.4%, while 5.7% identified as Black/African American. The remaining participants identified as Asian or Pacific Islander, Caucasian/Asian, or multiracial. The gender distribution was relatively balanced, with males representing 54.5% of the participants.

### Research Procedure

Before arriving for the study, participants were asked to complete pre-surveys, which included questions about their previous tourism experiences and demographic information. Participants were then randomly assigned to one of two experimental conditions, based on different viewing mediums: Virtual Reality (VR) or 2D. Each condition featured two destinations—Rome and Paris—and each participant experienced both destinations using one of the two mediums. The order of the viewing methods was randomized to mitigate potential sequencing effects.

Upon arrival, participants were provided with an overview of the study and asked to read and sign a consent form. Once consent was obtained, participants were informed about the measurement tools that would be used during the study and the content they would be exposed to. After agreeing with research participation, participants viewed their assigned destination videos. Depending on the condition they were in, they either viewed the 2D or VR version of the destination. Both Rome and Paris videos were obtained from the same source to ensure consistency, and each video depicted a one-day tour of the destination, lasting four minutes. After each video, participants completed a post-survey related to their experience with the destination.

Once both videos had been shown, participants were given an opportunity to ask questions about the tourism experiences they had encountered. They were then asked to complete a final exit survey, in which they were required to choose the destination they would prefer to visit based on the virtual experiences and provide a brief explanation for their choice. At the conclusion of the study, participants were given a chance to ask any remaining questions before the data collection process was completed.

#### Stimuli Development

In this study, the tourism destinations of Rome and Paris were selected as experimental stimuli due to their popularity among Gen Z and millennial travelers (Travel Weekly Asia, 2024). Both cities are highly sought-after destinations, offering rich visual and cultural contexts that are ideal for testing different media types in tourism experiences. The experiment was designed to compare two modes of media presentation: virtual reality (VR) and 2D video. To ensure consistency, identical visual and verbal content was used across both conditions, with the only manipulated variable being the media type (VR vs. 2D).

To enhance realism and maintain consistency between conditions, 360-degree tourism videos were used in both formats. In the VR condition, participants viewed the 360-degree video using a VR headset, allowing them to move their heads and explore the destination as if they were physically present, thus maximizing immersion and interactivity. In contrast, participants in the 2D condition watched the same 360-degree video on a 24inch widescreen flat-panel LCD monitor with a 1080p resolution. Unlike the VR experience, participants in the 2D condition did not interact with the video by clicking or dragging to explore the view.

The videos used in the study were 360-degree tour videos that were filmed to show the chosen

destinations in an immersive experience replicating a typical day in each city, showing all of the most popular tourist destinations and monuments. The videos spoke on history, activities, and attractions in the destinations. The videos shown to the participants did not intend to influence decisionmaking but were more informative. These specific videos were chosen due to their 360-degree compatibility with our VR headset to study the difference in VR and 2-dimensional immersion levels. The same videos were then shown on a 2D screen. The videos of the different destinations were filmed in the same format, with the same theme and information so the videos were comparable.

#### Measurement

Telepresence. Telepresence was measured using three items adapted from the established [tele]presence literature (Kim & Biocca, 1997; Novak et al., 2000). The items were designed to capture the extent to which participants felt a sense of "being there" within the virtual environment. Specifically, the scale assessed participants' feelings of immersion, involvement, and the realism of the experience during the virtual tour. Each item was rated on a 7-point Likert-type scale, ranging from 1 (Strongly Disagree) to 7 (Strongly Agree), with higher scores indicating greater levels of telepresence.

Destination Images. Destination images were evaluated using a multidimensional scale developed by Papadimitriou et al. (2015), which has been validated in various contexts (Kim et al., 2019). The scale consists of 17 items, representing four factors: physical attraction (history, nature, climate), appealing activities (cultural, shopping, leisure activities), value (people, food, safety), and infrastructure (quality, hygiene, convenience). Participants responded on a 7-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (7).

Destination Attitudes. Participants' attitudes toward the destination were measured using a 4item, 7-point semantic differential scale. They rated their overall feelings about the host country on dimensions such as "favorable-unfavorable," "positive-negative," "like-dislike," and "goodbad." These measures are commonly applied in consumer research (Peterson et al., 1992; Zhang & Zinkhan, 2006).

Intention to Visit. Intent to visit the destination was measured using a 3-item, 7-point semantic differential scale, with questions like "In the next 5 years, how likely are you to visit the destination for tourism?" The scale included the items "likelyunlikely," "probable-improbable," and "possibleimpossible." These measures are widely used in tourism behavior research (Batra & Ray, 1986; Machleit & Wilson, 1988; Peterson et al., 1992; Zhang & Zinkhan, 2006).

#### Analytical Procedures

The information from the completed surveys was entered into a computer database and analyzed using IBM SPSS. An independent samples t-test was conducted to compare telepresence levels between two experimental conditions: Virtual Reality (VR) and 2D video. A Multivariate Analysis of Variance (MANOVA) was performed to examine the effect of telepresence (high vs. low) on changes in multiple dimensions of destination image. Follow-up univariate ANOVAs were then used to explore the effect of telepresence on each individual dimension. To evaluate whether changes in destination image mediate the relationship between telepresence and destination attitude (H3), a mediation analysis was conducted using Hayes's PROCESS macro (Model 4) in SPSS. Lastly, to test H4, a simple linear regression was performed to test whether Destination Attitude predicts Intent to Visit.

#### 4. Results

# Impact of VR experience on Telepresence

To test H1, an independent samples t-test was conducted to compare telepresence scores between the VR and 2D video conditions. The results indicated a statistically significant difference in telepresence between the two conditions, t(87) = -4.53, p < .001. Participants in the VR condition (M = 6.0, SD = 1.04) reported significantly higher levels of telepresence compared to those in the 2D condition (M = 4.67, SD = 1.69).

The results support the hypothesis that the destination experience provided by VR has a greater influence on telepresence than the experience provided by 2D video. This suggests that the immersive nature of VR contributes to a stronger sense of presence in the destination, compared to traditional media formats.

# Impact of Telepresence on Destination Image Change

To test H2, a Multivariate Analysis of Variance (MANOVA) was conducted to assess the effect of telepresence (high vs. low) on the four dimensions of destination image: Physical attraction, Value, Appealing activities, and Infrastructure. The independent variable was telepresence, categorized into high and low groups based on a median split, and the dependent variables were the changes in significance level the four destination image dimensions (the difference between pre- and postexperience scores).

The MANOVA revealed a statistically significant multivariate effect of telepresence on the combined four destination image dimensions, Wilks' Lambda = .826, F(4, 84) = 4.44, p < .01,  $\eta^2 = 1.74$ . This indicates that there is a significant difference in destination image change between participants in the high and low telepresence groups across the dimensions. Follow-up univariate ANOVAs were con-



Figure 2. Results of Hypotheses Testing at the .05

Note: \_\_\_\_\_ Significant (p < .05), \_ ----- Insignificant (p > .05),

ducted to examine the effect of telepresence on each of the four destination image dimensions individually (see Table 1). The MANOVA results demonstrate that telepresence has a significant multivariate effect on changes in destination image across all four dimensions (physical attraction, appealing activities, value, and infrastructure). The follow-up univariate ANOVAs confirm that high telepresence leads to significantly greater positive changes in each individual dimension compared to low telepresence. These findings suggest that higher levels of telepresence during virtual tourism experiences are associated with more favorable shifts in destination image.

#### Meditating Role of Destination Image Change

To test the mediating role of destination image change in the relationship between telepresence

Destination Im- ages	High Presence	Low Presence	F-value (p-value)
Physical Attraction	M = 1.45, SD = .77	M = 1.50, SD = 1.44 .0	<i>F</i> (1,87) = 15.43, <i>p</i> < 01
Value	M = 2.13, SD = 1.26	M = 1.00, SD = 1.67 .0	F(1,87) = 13.10, p < 01
Appealing Activi- ties	M = 1.85, SD = 1.06	M = 1.24, SD = 1.64 .0	F(1,87) = 4.49, p = 37
Infrastructure	<i>M</i> = 1.96, <i>SD</i> = 1.38	M = 1.00, SD = 1.48	<i>F</i> (1,87) = 9.94, <i>p</i> < .01

Table 1. Mean (M) and Standard Deviation (SD) of Destination Image across Level of Presence

destination attitude change, Hayes's PROCESS macro (Model 4) was used in SPSS. The analysis revealed both direct and indirect effects of telepresence on destination attitude change, with destination image change serving as a mediator. To address potential limitations associated with small sample sizes, bootstrapping was employed for mediation analysis.

In this model, we investigated the direct effect of telepresence and the mediating effects of destination image change on destination attitude. The results showed that the direct effect of telepresence on destination attitude is not statistically significant, Effect = .14, SE = .10, t = 1.37, p = .17. In addition, the indirect effects of telepresence on destination attitude through destination image change is significant, as the 95% bootstrap confidence interval does not include zero: Physical attraction (*Effect* = .14, *SE* = .07, 95% CI[.02, .27]), Infrastructure (Effect = .17, SE = .09, 95% CI[.04, .37]), and value(*Effect* = .11, SE = .06, 95% CI[.02, .25]). However, Appealing activities did not mediate the relationship between destination image and attitudes (*Effect* = -.02, *SE* = .04, 95% CI[-.11, .04]). This indicates that destination image change fully mediates the relationship between telepresence and destination attitude.

#### Destination Attitude and Intent to Visit

To test H4, a simple linear regression was conducted to determine the effect of Destination Attitude on Intent to Visit. The results indicated that Destination Attitude significantly predicted Intent to Visit, F(1, 87) = 41.17, p < .001, accounting for 32.1% of the variance ( $R^2 = .321$ ). This suggests that a positive attitude toward the destination is a significant predictor of participants' likelihood to visit.

#### 5. Discussion

#### Impact of VR Experience on Telepresence

The study results demonstrate that participants in the VR condition reported significantly higher levels of telepresence compared to those in the 2D video condition. This aligns with prior research from Heeter (2000) and Li et al. (2003), which emphasize that virtual experiences, particularly through VR technology, offer higher levels of immersion and interactivity compared to traditional media formats like photographs or 2D videos. The significant difference in telepresence found in this study supports the notion that VR provides a richer, more immersive experience that enhances the sense of "being there" in the destination.

In the literature review, Steuer (1992) highlights that telepresence is driven by the vividness and interactivity of the media. The findings from this study affirm this perspective, showing that the VR condition, which offers greater vividness (through high-definition visuals and spatial audio) and interactivity (through user control over the environment), leads to stronger feelings of telepresence than the less immersive 2D condition. This result is also consistent with the predictions of Ariely (2000) who notes that VR offers an abundance of telepresence based on user control making a VR experience unique as the interactive environment changes depending on the user's movements, enhancing decision-making and engagement.

# Impact of Telepresence on Destination Image Change

The MANOVA results indicate that teleprese nce has a significant effect on changes in destination image across three dimensions (physical attarction, value, and infrastructure), supporting H2. However, image changes in the dimension of appealing activities are not statistically significant. These findings align with previous literature that suggests virtual tourism experiences (VTEs), particularly those with high levels of telepresence, allow users to form and restructure mental associations with destinations. The literature review emphasizes that virtual experiences can or introduce positive nodes in the associative network of destination images (Anderson, 1983; Kim et al., 2014) This study's results build on that premise, showing that high telepresence leads to greater positive changes in destination image. This reinforces the idea that VR environments can enhance a user's knowledge of and confidence in a destination's scenic beauty, history, and other key attributes.

Furthermore, the findings are consistent with the view of Li et al. (2003), who noted that virtual environments enhance cognitive and emotional connections with a destination by simulating direct experiences. The significant changes in each destination image dimension indicate that telepresence enhances users' emotional and cognitive engagement, allowing them to perceive destinations more favorably across various dimensions.

#### Mediating Role of Destination Image Change

mediation analysis The using Hayes's PROCESS macro supports the hypothesis that destination image change partially mediates the relationship between telepresence and destination attitude change. This suggests that telepresence influences attitude indirectly through its impact on destination image. The literature review supports this result by highlighting that destination image is a critical determinant of attitude (Fishbein & Ajzen, 1975; Pike & Ryan, 2004), and that virtual tourism experiences can significantly alter destination image (Kim et al., 2014). The current study's findings confirm that as telepresence enhances destination image, it also positively influences attitudes toward the destination.

Interestingly, the study found that the direct effect of telepresence on destination attitude change became non-significant when destination image change was included as a mediator. This suggests that the effect of telepresence on destination attitude is primarily indirect, operating through its impact on destination image. This is consistent with Jalilv and et al. (2012), who identified destination image as a key predictor of both attitudes and visit intentions. The significant indirect effect of telepresence via destination image change supports the view that attitude formation in virtual tourism settings is largely shaped by the way users perceive and evaluate the destination through immersive experiences.

#### Directions for Future Research

Future research should aim to provide insights beyond one's visit intention. It should extend existing knowledge about the impact that virtual reality and telepresence have on one's visit intention to include data on the number of people who followed through on those intentions and did physically visit a particular destination as well as the impact their VR tourism experience had on their physical tourism experience. Further research should attempt to explain if VR tourism experiences play a significant role in one's decision to physically visit a destination, or if other factors such as money and time outweigh VR's impact. Researchers could survey participants after a certain number of years (e.g. 3, 5, and 10) as a followup to see if they ended up visiting the destination they virtually toured.

Not only can future research be done within tourism marketing, but additional research building upon this study's findings can be done using VR in sports marketing. Existing research extensively discusses the impact that VR has in terms of allowing customers to test products and services. However, knowledge of how VR can be used to simulate a sporting event is limited, as much of it is focused on augmented reality, which does not offer the same fully immersive experience as VR. Future research can build upon this study's results in the tourism aspect to analyze the impact that VR and telepresence have on a sports fan's attitudes towards a sporting event (e.g. Phillies game at Citizens Bank Park) and their intentions to attend that event.

#### Theoretical and Practical Implications

The findings of this study provide valuable insights into the role of telepresence in virtual tourism experiences (VTEs) and its impact on destination image and attitude change, offering significant implications for both scholars and practitioners in tourism marketing, media studies, and virtual reality (VR) technologies. The following sections delve into the theoretical contributions of this study and offer practical recommendations for tourism marketers and destination management organizations (DMOs).

Theoretically, this study advances telepresence literature within the context of tourism by confirming that higher levels of telepresence in VR tourism significantly enhance multiple dimensions of destination image. Previous research (Heeter, 2000; Li et al., 2003; Steuer, 1992) identified vividness and interactivity as key drivers of telepresence. The current findings extend these concepts into the tourism domain, showing how VR technology bridges the gap between indirect and direct experiences. Scholars studying virtual environments and tourism can build on these results to further explore how telepresence impacts consumer behavior in immersive settings.

Additionally, this study empirically supports the mediating role of destination image in the relationship between telepresence and destination attitude change. This aligns with the associative network memory model (Anderson, 1983), which suggests that destination image is formed through cognitive connections influenced by media experiences. These findings offer scholars a basis to further investigate how immersive media like VR can reshape tourists' perceptions and decisionmaking by influencing cognitive pathways.

The study also contributes to attitude-behavior models within tourism. It demonstrates that telepresence, mediated by destination image, significantly influences destination attitudes, which are critical predictors of visit intentions (Fishbein & Ajzen, 1975; Pike & Ryan, 2004). This insight can inform future research on how immersive experiences lead to positive attitudinal and behaverioral outcomes, particularly in consumer decisionmaking within the tourism sector and beyond.

For tourism marketers, the significant impact of telepresence on destination image highlights the potential of VR as a powerful tool for enhancing destination perceptions. DMOs and travel agencies should consider using VR to create immersive and engaging experiences that allow potential tourists to virtually explore a location, positively influencing their perceptions of its dimensions (physical attraction, value, and Infrastructure), which can lead to higher visit intentions.

Strategically, DMOs should focus on VR content that enhances key aspects of the destination image, such as cultural richness, natural beauty, and urban attractions. For instance, immersive VR experiences showcasing landmarks or cultural events can foster positive associations and improve overall perceptions of the destination. Given the importance of vividness and interactivity in generating telepresence, tourism marketers should invest in high-quality visual and auditory content and provide interactive features that allow users to control their journey through the virtual environment. These interactive elements, such as selecting viewpoints or engaging with virtual objects, can heighten users' sense of presence, making the experience more immersive and memorable.

In light of disruptions like the COVID-19 pandemic, VR can also be a crucial tool for maintaining interest in destinations that are remote or experiencing declines in visitor numbers. Offering virtual tours through VR technology allows DMOs to engage with global audiences and create lasting impressions that can lead to future travel once physical tourism becomes feasible again.

#### 6. Conclusion

The findings of this study align with existingliterature, emphasizing the critical role of telepresence in shaping both destination image and attitude in virtual tourism experiences. The significant impact of telepresence on destination image, along with the partial mediating role of destination image in the relationship between telepresence and attitude change, provides valuable insights into the cognitive mechanisms through which virtual reality (VR) enhances tourist perceptions. While telepresence directly influences destination image, destination image emerges as a key mediator linking immersive VR experiences to favorable changes in tourist attitudes. These insights have practical implications for tourism marketers, highlighting the potential of VR technology to strengthen destination branding and effectively influence tourist attitudes and behaviors. By leveraging VR's immersive and interactive qualities, marketers can create more compelling and engaging promotional strategies that resonate with potential tourists. However, the study did face a few limitations that may have influenced the results. The restricted physical space in which the study took place limited participants' ability to move freely, potentially reducing immersion and telepresence. Sampling bias is another limitation, as this study's focus on individuals aged 19-24 may not represent broader populations. Future research should address these limitations, while also exploring how VR tourism influences not only visit intentions, but follow-through rates in terms of physical travel experiences too. Long-term studies of up to ten years could determine whether virtual tourists eventually visit those same destinations. In addition, VR's applications in sports marketing warrant research, particularly its impact on fan attitudes and event attendance, building on its immersive potential demonstrated in tourism.

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