Virtual reality video types (walking, driving, and aerial) and music genres influence on tourist immersion and visit intentions: destination marketing through a multisensory lens

Naci Buyukdag, Muhittin Cavusoglu and Cihan Cobanoglu

Abstract

Purpose – *This study aims to investigate how virtual reality (VR) video types (walking, driving and aerial) and background music genres (classical, Latin and country) shape tourist immersion and visit intentions. It also examines the mediating role of psychological and emotional factors, including immersion, curiosity and arousal, on visit intentions.*

Design/methodology/approach – *This study used a within-subjects experimental design with a 3 × 3 factorial structure, resulting in nine scenarios that paired three VR video types with three music genres.*

Findings – *Results indicated that VR video type significantly affects both immersion and visit intentions, with aerial VR videos producing higher levels of immersion and visit intentions than walking and driving VR videos. The relationship between aerial VR video and visit intention was mediated by psychological and emotional factors (immersion, curiosity and arousal). However, this indirect effect did not emerge in the walking or driving VR videos. Regarding music genres, a significant difference was found between Latin and classical music, but it occurred only in the walking VR video.*

Originality/value – *This study uniquely compares different VR video types and incorporates background music genres, a largely neglected area. Using a within-subjects design further controls for individual variability, enhancing the reliability of the results.*

Keywords *Visit intention, Curiosity, Immersion, Arousal, Experimental design*

Paper type *Research paper*

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虚拟现实视频类型（步行、驾驶与航拍）与音乐类型对游客沉浸感和访问意愿的影响：基于多感官视角的景区营销研究

摘要

研究目的: 本研究探讨不同虚拟现实（VR）视频类型（步行、驾驶与航拍）以及背景音乐类型（古典、拉丁与乡村）如何影响游客的沉浸感与访问意愿, 并进一步检验沉浸感、好奇心与唤醒度等心理与情绪因素在访问意愿中的中介作用。

研究设计/方法/途径: 本研究采用被试内实验设计, 构建了一个 3×3 的因子结构, 共形成九种实验情境, 将三种 VR 视频类型与三种音乐类型进行配对分析。

研究结果: 结果表明, VR 视频类型对沉浸感和访问意愿均具有显著影响。其中, 航拍类 VR 视频所产生的沉浸感和访问意愿显著高于步行类和驾驶类 VR 视频。心理与情绪因素（沉浸感、好奇心与唤醒度）在航拍 VR 视频与访问意愿的关系中发挥中介作用; 然而, 在步行类和驾驶类 VR 视频中并未发现这一间接效应。在音乐类型方面, 仅在步行类 VR 视频中发现拉丁音乐与古典音乐之间存在显著差异。

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研究创新性: 本研究首次系统比较了不同 VR 视频类型, 并将背景音乐类型纳入分析, 这一领域此前研究相对匮乏。同时, 采用被试内实验设计有效控制了个体差异, 提升了研究结果的可靠性。
关键词 ： 访问意愿, 好奇心, 沉浸感, 唤醒度, 实验设计
文章类型 研究型论文

Tipos de vídeos de realidad virtual (caminar, conducir y aéreos) e influencia de los géneros musicales en la inmersión turística y las intenciones de visita: marketing de destinos a través de una lente multisensorial

Resumen

Objetivo: *Este estudio investiga cómo los tipos de vídeos de realidad virtual (caminar, conducir y aéreos) y los géneros musicales de fondo (música clásica, latina y country) influyen en la inmersión turística y las intenciones de visita. También examina el papel mediador de los factores psicológicos y emocionales, como la inmersión, la curiosidad y la excitación, en las intenciones de visita.*

Diseño/metodología/enfoque: *El estudio utilizó un diseño experimental intrasujetos con una estructura factorial 3×3, lo que dio como resultado nueve escenarios que emparejaban tres tipos de vídeos de realidad virtual con tres géneros musicales.*

Resultados: *Los resultados indicaron que el tipo de vídeo de realidad virtual afecta significativamente tanto a la inmersión como a las intenciones de visita, y que los vídeos de realidad virtual aéreos producen mayores niveles de inmersión e intenciones de visita que los vídeos de realidad virtual de caminar y de conducir. La relación entre el vídeo de realidad virtual aéreo y la intención de visita estaba mediada por factores psicológicos y emocionales (inmersión, curiosidad y excitación). Sin embargo, este efecto indirecto no se produjo en los vídeos de realidad virtual de paseo o de conducción. En cuanto a los géneros musicales, se encontró una diferencia significativa entre la música latina y la clásica, pero solo en el vídeo de realidad virtual a pie.*

Originalidad: *Este estudio compara de forma única diferentes tipos de vídeos de realidad virtual e incorpora géneros musicales de fondo, un área muy descuidada. El uso de un diseño intrasujetos controla aún más la variabilidad individual, lo que mejora la fiabilidad de los resultados.*

Palabras clave *Intención de visita, Curiosidad, Inmersión, Excitación, Diseño, Experimental*

Tipo de papel *Trabajo de investigación*

Introduction

While social media has revolutionized travel behaviors and destination perceptions – primarily through sharing visual content (Iglesias-Sánchez *et al.*, 2020) – the core of tourism remains rooted in experiential engagement. Visual cues play a crucial role in shaping potential visitors' perceptions and helping them determine whether a destination aligns with their preferences and travel styles (Ye and Tussyadiah, 2011). Understanding the significance of visual and auditory elements, as well as the emotional factors that most influence tourists' behaviors, is crucial for enhancing the visitability of destinations. Consequently, modern tourists seek unique, innovative and creative experiences that cater to their desires and imagination. Recently, virtual reality (VR) has emerged as a powerful tourism marketing tool, allowing potential visitors to *try before they buy* through immersive destination previews (Tussyadiah *et al.*, 2018).

VR has rapidly emerged as a transformative technology capturing growing consumer interest, with approximately 84 million users in the USA by 2020 and projections exceeding 110 million users soon (Katatikarn, 2024; Alsop, 2023). Traditionally, destination marketing has relied on magazines, brochures, television and social media to influence traveler decisions (Deng and Liu, 2021). However, VR is increasingly integrated into travel planning, with surveys showing that 62% of Germans and 20% of Americans are interested in VR experiences for vacation research (Statista, 2021). Destination marketing organizations aim to craft persuasive messages that enhance tourists' intent to visit, and VR adds value to these messages by offering immersive, multisensory experiences that simulate real environments (Kim *et al.*, 2014; Kang, 2020). VR platforms engage the visual, auditory and kinesthetic senses, fostering deeper emotional connections and improving spatial and cultural understanding, which aid informed decision-making (Lin *et al.*, 2021; Flavián *et al.*, 2021).

Technological advancements have positioned VR as a powerful tool in tourism, enabling providers to create emotionally rich and interactive experiences that boost consumer

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engagement and travel intentions (Flavián *et al.*, 2021; Li and Chen, 2019). Empirical studies reveal that VR enhances tourists' attention, interest and desire, leading to an increased likelihood of actual visits and destination loyalty (Bogicevic *et al.*, 2021; An *et al.*, 2021). As VR technology evolves, its role in destination marketing is expected to expand, fundamentally reshaping how travelers explore and select their experiences. A key focus in VR research is not just on technologies that create virtual realism but on enhancing the immersion consumers experience during VR interactions, as this heightened immersion is crucial for engaging sensory elements that enable more authentic product evaluations (Song and Lu, 2024). Sensory elements play a vital role by enabling consumers to form both tangible and intangible evaluations of products before consumption. Multisensory stimuli – including smell, touch, hearing, vision and sound – have been demonstrated to significantly and positively influence consumer behavioral intentions (Kim *et al.*, 2024). Failure to engage consumers' senses can reduce the effectiveness of advertising, negatively impacting product evaluations and purchase intentions (Chen *et al.*, 2024). Multisensory cues, particularly visual and auditory, play a crucial role in shaping purchasing experiences (Pal and Srivastava, 2024). Consequently, understanding how both visual and auditory stimuli influence consumer responses is essential for optimizing experiences in VR environments.

Music is a vital element that accompanies individuals throughout their lives, significantly influences consumer behavior (Pantoja and Borges, 2021) and can enhance purchasing decisions (Daunfeldt *et al.*, 2021). Music's tempo and rhythm shape cognitive and emotional responses, affecting information processing, mood and emotional involvement (Pantoja and Borges, 2021). In VR experiences, background music increases engagement by fostering greater immersion for potential tourists and highlights its nuanced role in shaping user experiences and increasing the likelihood of visiting a destination (Dinhopl and Gretzel, 2016). In a museum context, for instance, VR enriched with sound significantly enhanced both presence and enjoyment (Kaplan-Rakowski *et al.*, 2024). Similarly, VR games that allowed players to select their own music improved presence and emotional factors (Caserman *et al.*, 2023). Loureiro *et al.* (2021) showed that pairing VR with upbeat music amplified arousal-driven pleasure in a VR store context, while Kern *et al.* (2020) demonstrated that sound increased presence compared to silence in a VR park. Moreover, in highly immersive environments, background music has been shown to enhance memory retention (Fassbender *et al.*, 2012). Supporting these findings, Chen and Cui (2024) also reported that background music heightens immersion.

Previous research on VR in tourism has mainly focused on the effects of visual elements – such as photographs, traditional videos and VR itself – on tourist behavior (Flavián *et al.*, 2021; Chang, 2022; Bogicevic *et al.*, 2021; Orús *et al.*, 2021; Wen and Leung, 2021). However, a significant gap remains regarding the effectiveness of specific VR visual formats in engaging consumers. Moreover, there is a limited understanding of how these visual elements interact with musical components to enhance immersive experiences and influence tourist decision-making. To address this, the present study examines three distinct VR video types – walking, driving and aerial views – and their effects on tourists' immersion and visit intentions. Background music was also incorporated into these videos to assess its interplay with VR experiences. By doing so, the study aims to deepen understanding of the psychological and emotional processes underlying tourists' choices in VR-based destination marketing. Given the paucity of empirical research on VR's impact on tourism (Bogicevic *et al.*, 2021), these insights advance both theory and practice in consumer travel behavior and destination promotion.

Literature review

Theoretical framework

The stimulus-organism-response (S-O-R) framework consists of three core components: stimulus, organism and response (Liu and Huang, 2023). The model suggests that

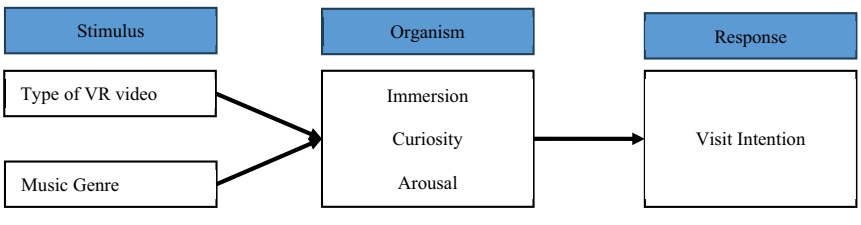
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environmental stimuli trigger internal processes within the organism, leading to behavioral responses (An *et al.*, 2021) and has been widely applied in marketing and VR research (Wu and Lai, 2022). Within the S-O-R framework, VR video types and music genres serve as external stimuli, activating consumers' internal psychological and emotional processes. The organism component captures the psychological and emotional processes triggered by the stimuli. The response component reflects the resulting behaviors. Specifically, in this study, VR video types and music genres serve as external stimuli; immersion, curiosity and arousal represent the organism stage; and visit intention serves as the key behavioral outcome in the response stage, as illustrated in Figure 1.

According to cognitive appraisal theory (CAT), emotions arise from the interaction between individuals and situations, yet their meanings can vary across individuals, underscoring the importance of understanding consumer emotions for effective marketing (Song and Lu, 2024). In this case, as in the S-O-R framework, VR video types and music genres serve as external stimuli that trigger psychological and emotional responses in participants. These responses then lead to visit intention. The CAT provides a valuable framework for exploring the psychological and emotional processes activated during VR experiences (Kim *et al.*, 2024; Song and Lu, 2024). Empirical research shows that emotional responses enhance travelers' memory, foster curiosity and encourage exploration, creating richer virtual experiences (Song and Lu, 2024). Additionally, understanding emotional responses to VR can offer insights into consumer attitudes and purchase intentions, supporting the development of more targeted and persuasive promotional strategies (Lee *et al.*, 2024; Song and Lu, 2024). This study examines how psychological and emotional responses elicited by different VR video experiences influence visit intentions, thereby enhancing its theoretical depth. Specifically, immersion, curiosity and arousal were included as psychological and emotional responses to better explain the relationship between VR video types/music genres and visit intention. Moreover, individuals are typically exposed to background music while watching VR videos. In this case, they simultaneously experience both verbal and non-verbal elements, creating an interactive environment. From a theoretical perspective, this can be explained using dual coding theory (DCT) (Zeng *et al.*, 2020; Wen and Leung, 2021; Chang, 2022).

As a result, this study adopts an integrated theoretical framework that combines the S-O-R, CAT and DCT to explain how VR video types and music genres influence visit intention through psychological and emotional processes. While each theory has been applied independently in prior research, their integration offers a more comprehensive understanding of how multisensory VR experiences shape consumer behavior, thereby advancing both theoretical and practical knowledge in virtual tourism marketing. Together, these three frameworks provide a cohesive theoretical foundation. The S-O-R paradigm establishes the overall structure (stimulus → organism → response); the CAT explains the psychological and emotional processes within the organism stage (appraisal → emotion → behavior); and the DCT clarifies why multimodal VR experiences generate powerful effects (dual-channel processing).

Figure 1 Theoretical framework: S-O-R



Source: Authors' own work

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Virtual reality video types

VR is increasingly used in the tourism industry to stimulate potential travelers' engagement and influence their intention to visit destinations (Flavián *et al.*, 2021; Li and Chen, 2019; Bogicevic *et al.*, 2021; An *et al.*, 2021). Through various virtual content, participants can have different virtual experiences (Wu and Lai, 2021). Recent findings indicate that different modalities of VR content visualization can further shape psychological and emotional responses such as immersion, curiosity and arousal (Di Dalmazi *et al.*, 2024). Within the S–O–R framework, different VR video types (walking, driving and aerial) serve as distinct stimuli that vary in how they elicit immersive experiences and visit intentions, and this is consistent with the S–O–R theory's effectiveness in explaining the linkages between the mediated environment, viewers' psychological and emotional processes and behavioral intentions (Wu and Lai, 2021). Wu and Lai (2022) also suggest that incorporating diverse visual elements (e.g. green trees, blooming flowers, clean water, sunrise, etc.), auditory cues (e.g. birds, flowing water, rain, fish, etc.) and other sensory stimuli can significantly enhance the engagement and immersion of VR walking videos. These claims are also supported by DCT, which integrates visual and auditory elements, meaning that individuals process verbal and nonverbal information separately yet simultaneously. This dual processing in a VR environment can deepen immersion, as synchronized cues reinforce each other and draw users more fully into the virtual experience (Zeng *et al.*, 2020). Consequently, even within a single VR video type – for example, a walking video – variations in elements such as the landscape or walking route can elicit different levels of immersion and influence users' intention to visit. Moreover, research supports a positive relationship between immersion and visit intention, showing that immersion can both directly influence visit intention and mediate the effect of VR stimuli on it (Anaya-Sánchez *et al.*, 2024). Therefore, it is expected that different VR video types (e.g. walking, driving or aerial) generate varying degrees of immersion and visit intention, and these differences in stimulus characteristics may lead to varied psychological and emotional responses – immersion, arousal and curiosity – which may act as mediators, influencing tourists' visit intention.

Music genre

Marketing research has extensively examined how musical elements, such as tempo, volume, selection and sensory alignment, affect consumer engagement, time spent and purchase behaviors. Studies have shown that music acts as a stimulus in the S-O-R framework, influencing emotional and behavioral responses such as immersive experience and purchase intention (Çiki *et al.*, 2025; Nicolau *et al.*, 2025; Liang *et al.*, 2024). For instance, Hsu *et al.* (2021) found that the characteristics of music streaming, when processed through consumers' emotions, directly impact satisfaction and purchase intention, demonstrating the role of music as a structured environmental cue within the S-O-R framework.

According to CAT, individuals interpret external stimuli (e.g. music) through appraisal processes that generate psychological and emotional responses (Song and Lu, 2024). Different genres are appraised in distinct ways: for example, slow classical music is often associated with relaxation, while upbeat pop or Latin music is typically linked to excitement and energy. These appraisals then guide subsequent behaviors. Evidence shows that consumers' enjoyment of background music enhances other sensory perceptions, such as taste intensity (Reinoso Carvalho *et al.*, 2016), suggesting that music-induced appraisals amplify experiential evaluations. Translating this to VR tourism videos, genres that align with the destination's intended experiential tone should foster more favorable psychological and emotional responses, thereby increasing visit intention (Nicolau *et al.*, 2025).

Visit intention. The immersive nature of VR creates enjoyable experiences that significantly influence behavioral intentions (Zeng *et al.*, 2020). For example, extant research demonstrated that VR impacts purchase decisions (Li and Chen, 2019; Tussyadiah *et al.*,

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2018) and increases visit intentions when the experience is satisfying (An *et al.*, 2021). In addition, VR advertisements generate higher consumer engagement, further enhancing purchase intention (Lyu *et al.*, 2021). Wen and Leung (2021) found that a VR wine tour elicited stronger purchase intentions and a greater willingness to pay than traditional video formats.

Bogicevic *et al.* (2021) showed that VR glasses had a stronger, significant effect on visit intentions than traditional photos or 360° videos. Orús *et al.* (2021) extended these findings by comparing VR experiences using glasses and smartphones in both real and digital settings. Their study revealed that VR experiences significantly enhanced presence, imagination and visual appeal and led to increased booking intentions (Orús *et al.*, 2021). Overall, VR effectively engages consumers, enriches sensory experiences and strongly influences decision-making in tourism marketing. Moreover, distinct types of VR videos provide different sensory and visual experiences, which can meaningfully influence users' intentions to visit (Wu and Lai, 2021; Di Dalmazi *et al.*, 2024; Anaya-Sánchez *et al.*, 2024). For example, Rhiu *et al.* (2020) found that head-mounted displays are better suited for VR walking videos than for VR driving videos, indicating that even within the same VR medium, various video formats can produce unique experiential outcomes that primarily shape users' visit intentions. Hence, the following hypotheses are proposed:

H1. The type of VR video positively affects visit intention.

H2. Visit intention differs across VR video types.

Music plays an important role in daily life, often accompanying various activities as a background element (Pantoja and Borges, 2021). As an atmospheric factor, music can shape consumer behavior in diverse ways (Daunfeldt *et al.*, 2021). Yin *et al.* (2025) confirmed the relationship between musical content and behavioral intention. In VR contexts, combining visuals with real auditory elements creates a multisensory environment that enhances spatial and experiential understanding (Wu and Lai, 2022). According to DCT, this dual-sensory engagement deepens immersion and can influence potential tourists' behavioral intentions (Dinhopl and Gretzel, 2016). Also, perceptions of music or songs associated with the destination positively affect travel intention (Wei *et al.*, 2023). This suggests that how individuals interpret music, as well as differences across music genres, can influence their attitudes and behavioral intentions in distinct ways. Therefore, the demonstrated influence of music on behavioral responses within VR environments provides a logical foundation for the following hypotheses:

H3. Music genre positively affects visit intention.

H4. Visit intention differs across different music genres.

Immersion. VR offers both physical immersion and psychological presence by stimulating one or more senses. The more senses engaged, the deeper the immersive experience becomes (Wen and Leung, 2021). Given that tourism is an experiential product, VR enhances realism by activating at least two senses, providing a more authentic experience (Bogicevic *et al.*, 2021). Immersion is a multidimensional concept that involves both physical and mental engagement, enabling users to feel *immersed in* a real or virtual environment while temporarily detaching from daily life (Hudson *et al.*, 2019). VR's ability to create a sense of *being there*, allowing users to verify presented information more confidently, supports stronger decision-making (Zeng *et al.*, 2020). Beyond simply providing information, VR enables consumers to actively engage with simulated environments, thereby enhancing immersion (Willems *et al.*, 2019). Higher levels of interactivity enhance and lead to stronger visit intention (Wu and Lai, 2021). However, there is still limited understanding of which type of VR videos are most effective for tourism marketing (Huang *et al.*, 2021), as immersion may vary depending on how users interact with different VR video content. For example, Cummings and Bailenson (2016) stated that

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wider fields of view and improvements in visual and auditory fidelity exert a stronger influence on immersion, leading us to propose the following hypotheses:

H5. The type of VR video positively affects immersion.

H6. Immersion levels differ by VR video type.

VR's strength in tourism lies in its ability to deliver rich sensory information (Chang, 2022). The persuasive power of VR has been emphasized in promoting consumer behaviors and supporting marketing strategies (Tussyadiah *et al.*, 2018). Unlike traditional media, VR offers interactive, engaging content that not only heightens consumer involvement but also amplifies immersion by making users feel fully present in the virtual environment. (Chang, 2022). Previous research comparing media formats suggests that VR can strongly impact immersion (Spielmann and Mantonakis, 2018; Willems *et al.*, 2019; Kang, 2020) leading to heightened visit intention. Moreover, different VR video types evoke unique sensations that strongly influence visit intentions (Wu and Lai, 2021; Di Dalmazi *et al.*, 2024; Anaya-Sánchez *et al.*, 2024). In addition, Tussyadiah *et al.* (2018) stated that a heightened sense of presence in virtual environments enhances the enjoyment of VR experiences and that feeling *as if being there* (immersion) can generate stronger liking and preference for the destination, which, in turn, influences visit intentions and behaviors through attitudinal pathways. Hence, the following hypotheses are proposed:

H7. Immersion positively affects visit intention.

H8. Immersion mediates the relationship between VR video type and visit intention.

Music enhances visual experiences by enriching sensory depth, conveying emotional tone and fostering greater viewer immersion when integrated into videos (Dinhopl and Gretzel, 2016). Within the S-O-R framework, immersion represents the organism's state through which sensory stimuli shape behavioral responses (Fiore and Kim, 2007; Wei, 2025). According to DCT, information is better processed and remembered when presented through multiple modalities – such as auditory (music) and visual (VR video) (Kim *et al.*, 2024). As a result, music can make videos more engaging and effective in maintaining consumer attention. Music genre may not only influence visit intention directly but also indirectly by fostering immersion (Fiore and Kim, 2007; Wei, 2025; Tong *et al.*, 2023). Thus, immersion acts as a mediating mechanism that explains how and why music influences tourism behavior, leading to the following hypotheses:

H9. Music genre positively affects immersion.

H10. Immersion mediates the relationship between music genre and visit intention.

Music enhances the depth of visual experiences by adding emotional tone, narrative coherence and sensory richness (Dinhopl and Gretzel, 2016). For example, pairing breathtaking landscapes with country music may enhance immersion, while pairing fast-paced music with adventure content may evoke excitement (Tong *et al.*, 2023). These affective and cognitive reinforcements create a stronger sense of *being there*, thereby increasing immersion. Given that genres vary in rhythm, tempo and affective associations, they should differentially influence immersion levels. Hence, the following hypothesis is proposed:

H11. Immersion levels differ among different music genres.

The impact of music genre depends on how well it aligns with the visual narrative. DCT emphasizes that congruence between auditory and visual codes enhances cognitive integration and memory (Juslin and Västfjäll, 2008). Similarly, CAT suggests that congruent multisensory cues lead to more positive emotional evaluations (Kim *et al.*, 2024). For instance, classical music may enhance the sense of tranquility in a VR beach video,

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whereas the same music might feel incongruent in a VR city nightlife video. Thus, the effectiveness of music genre in driving immersion and visit intention should depend on its interaction with the type of VR video presented (Tong *et al.*, 2023). Based on these insights, the following hypotheses are proposed:

H12. The interaction between VR video type and music genre positively affects visit intention.

H13. The interaction between types of VR video and music genres positively affects immersion.

Curiosity. People's behavioral intentions are shaped by emotions, highlighting the importance of examining emotional factors in travel decision-making (Li and Chen, 2019). Curiosity, in particular, has been identified as a key emotional factor influencing behavioral intentions. In line with the S-O-R framework, curiosity is an organism's state triggered by external stimuli (e.g. VR video type and music genre), which subsequently influences visit intention as a behavioral response. According to CAT, curiosity emerges when individuals encounter novel, complex or uncertain stimuli that require further exploration (Song and Lu, 2024). The VR tourism videos, which simulate unfamiliar environments and immersive experiences, provide such stimuli and can thus elicit curiosity through the appraisal of novelty and informational gaps (Dutta and Dixit, 2025; Fiore and Kim, 2007). This appraisal-based curiosity motivates consumers to seek additional experiences, translating into stronger visit intentions (Dutta and Dixit, 2025). According to Chekembayeva and Garaus (2024), curiosity mediates the relationship between users' intention to engage with virtual tours and their intention to visit. Media formats, including VR, smartphones and videos, elicit varying levels of psychological and emotional responses (Flavián *et al.*, 2021; Leung *et al.*, 2022). Therefore, we hypothesized that:

H14. Curiosity mediates the relationship between VR video type and visit intention.

Music can also act as a curiosity-inducing stimulus (Omigie and Ricci, 2022). Genres vary in rhythm, mood and symbolic meaning, potentially triggering cognitive appraisals of novelty, incongruity, or emotional resonance (Sihvonen and Turunen, 2022; Tong *et al.*, 2023). DCT suggests that when auditory stimuli (music) are paired with VR visuals, the dual-channel encoding enhances sensory richness and increases the likelihood of evoking curiosity (Omigie and Ricci, 2022; Schutte, 2020). This highlights the underexplored role of music genre in shaping curiosity as an emotional factor (Omigie and Ricci, 2022). Because different music genres may stimulate different degrees of novelty and cognitive appraisal, and because curiosity subsequently shapes visit intention, curiosity is expected to mediate the effect of music genre on visit intention. Based on these insights, the following hypotheses were developed:

H15. Curiosity mediates the relationship between music genre and visit intention.

Arousal. Arousal refers to a physiological or psychological state of feeling of being activated, stimulated and excited (Zheng *et al.*, 2021). Research indicates that arousing content is more memorable than neutral information (Kim *et al.*, 2014). In destination marketing, stimulating arousal through promotional materials can effectively enhance tourists' intentions to visit (Kim *et al.*, 2014). Because emotions strongly influence consumer behavior, marketing strategies that activate mental engagement are essential (Liu and Huang, 2023). VR uniquely contributes to this process by engaging multiple senses, thereby amplifying arousal. Within the S-O-R framework, arousal reflects an organism's state that is stimulated by external sensory inputs such as VR videos, which then influences the behavioral response of visit intention (Fiore and Kim, 2007; Sekeroglu, 2025). Unlike static or traditional promotional media, VR experiences are inherently immersive and multisensory, making them particularly effective in eliciting arousal (Wei, 2025). Because

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different VR video types can evoke varying levels of arousal, and because arousal is a known driver of visit intention, it logically functions as a mediating mechanism linking VR video type to visit intention:

H16. Arousal mediates the relationship between VR video type and visit intention.

Music also represents a powerful stimulus capable of triggering arousal through variations in rhythm, tempo and emotional tone (Dela Cruz and Lacap, 2023; Sekeroglu, 2025). For example, fast-paced or high-tempo music can heighten arousal, whereas softer, slower music may evoke calmer states (Tong *et al.*, 2023). Sun *et al.* (2023) further demonstrate that fast-tempo music heightens arousal, which, in turn, increases consumers' behavioral responses, showing that tempo-induced arousal plays a key mediating role. DCT further explains that when auditory (music) and visual (VR video) cues are presented simultaneously, the dual-channel processing enhances arousal by strengthening psychological and emotional responses (Wei, 2025). This positions the music genre as more than a mere background element; it actively contributes to emotional activation, which, in turn, drives intentions to visit a destination (Dela Cruz and Lacap, 2023). Because different music genres generate varying levels of arousal – and arousal subsequently influences visit intention – it is expected to mediate the relationship between music genre and visit intention. Based on these findings, the following hypothesis is developed:

H17. Arousal mediates the relationship between music genre and visit intention.

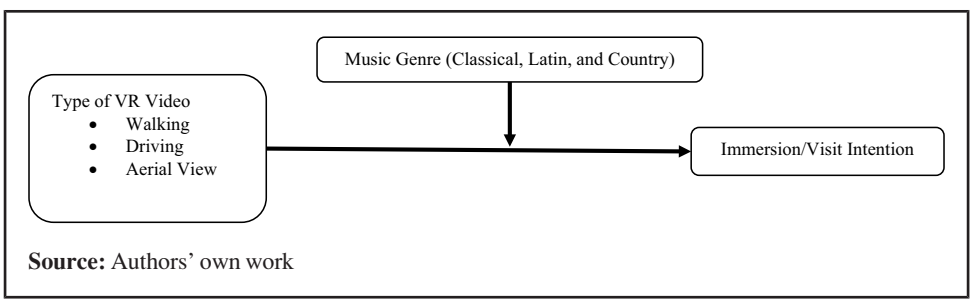
As a result, all hypothesis relationships are illustrated in Figures 2 and 3.

Methods

Study design

Previous studies in tourism marketing have primarily focused on comparing promotional formats, such as photos, videos and VR, often emphasizing group differences rather than exploring causal relationships. While many studies have examined how media formats differ in their effects, few have investigated the interaction between VR and background music. Addressing this gap, the present study offers a contemporary perspective by incorporating realistic VR video scenarios that simulate authentic travel experiences. Specifically, destinations were presented through three types of VR videos – walking, driving and aerial views – that closely mirror real-world tourism contexts. These VR videos were paired with different music genres (classical, Latin and country) to create a more immersive, multisensory environment, reflecting the common practice of combining music and video in real-world promotional messages, particularly on social media. This multisensory approach enhances message memorability and consumer engagement by appealing to multiple senses.

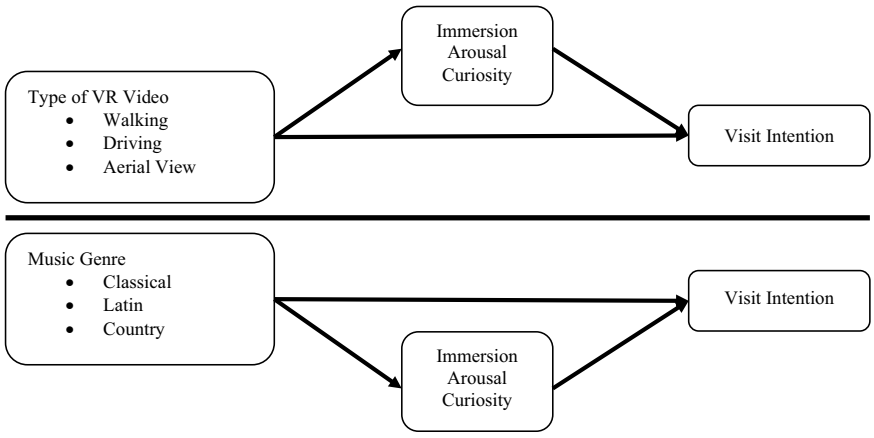
Figure 2 Conceptual framework



Source: Authors' own work

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Figure 3 Conceptual framework: mediation analysis framework



Source: Authors' own work

Online streaming platforms such as Spotify, Pandora and Last.fm use recommender systems to provide music suggestions aligned with individual user preferences (Kowald *et al.*, 2021; Schedl *et al.*, 2015). Prior research indicates that popularity cues strongly influence listeners' musical choices (Berns *et al.*, 2010). To account for cultural and regional relevance, this study identified the 50 most frequently searched songs by both residents and tourists in Florida using the Shazam application. These 50 songs were categorized by genres, with Latin and country ranking as the most prominent. From these dominant categories, the most highly searched songs were selected. Although the use of Shazam as a data source reflects the researchers' methodological decisions, the chosen songs are widely played in Florida's entertainment venues and on local radio stations.

To mitigate potential selection bias, a within-subjects design was used. Within-subjects designs offer two main advantages: requiring fewer participants and lower costs (Walters *et al.*, 2025). For example, because each participant also serves as their own control group, these designs allow researchers to work with smaller sample sizes (Ryan, 2007; Abdi *et al.*, 2009). While a between-subjects design may require 40 participants to compare two conditions, a within-subjects design can achieve the same comparison with only 20 participants (Sani and Todman, 2006). In other words, a within-subjects study involving 22 participants and 9 repeated measures is statistically equivalent to a between-subjects design with 198 participants ($22 \times 9 = 198$). Furthermore, because all participants are exposed to every scenario, variability between individuals poses less of a threat to the validity of the findings (Ryan, 2007). Another key advantage of repeated-measures (within-subjects) designs is their greater sensitivity compared to independent-measures (between-subjects) designs. Because individual differences and external error sources are minimized, the probability of correctly accepting or rejecting a hypothesis is increased (Abdi *et al.*, 2009). Within-subjects designs provide greater statistical power, enabling researchers to obtain meaningful results even with relatively small samples. This increases the likelihood of detecting true differences across conditions, primarily by reducing individual variability and decreasing the need for additional control variables (Stoner *et al.*, 2023). As a result, a within-subjects experimental design was used, and Montoya (2018)'s repeated mediation analysis macros were used to test mediation effects across conditions.

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Sampling

One key factor in determining sample size is the effect size. Even though the effect size has not been reported in most tourism publications (Fong *et al.*, 2016), a recent meta-analysis on smart tourism technologies found an average effect size of 0.482, which, according to Cohen's benchmarks, indicates a medium-sized effect (Sustacha *et al.*, 2023). When similar studies do not provide an effect size or sufficient information to estimate one, researchers may use Cohen's guidelines for small, medium, or large effects (Keskin, 2020). In reporting effect size and interpreting internal structures, values of 0.75, 0.50 and 0.25 are considered high, medium and low, respectively (Nunkoo *et al.*, 2013).

A priori power analysis using G*Power was conducted to determine the required sample size before data collection. Based on an effect size of 0.482 reported in related literature, with an alpha level of 0.05 and a desired power of 0.95 (Faul *et al.*, 2009), a minimum of 7 participants was sufficient. To adopt a more conservative approach, a smaller effect size of 0.25 was used, which increased the required sample size to 22 participants (22 participants × 9 conditions = 198 observations), thereby strengthening the study's validity. Supporting our justification, a recent systematic literature review on experimental design in hospitality and tourism found that the majority of studies report a moderate effect size, with most research samples comprising 21–40 participants (Walters *et al.*, 2025). Additionally, a sensitivity analysis conducted using G*Power showed that with an effect size of 0.30, a sample of 16 participants would provide an actual power of .963. In contrast, an effect size of 0.40 would require only 9 participants to achieve a power of .952. Taken together, these analyses support the adequacy of the chosen sample size for ensuring reliable and valid results.

Participants, procedure and measures

Participants were eligible if they were 18 years or older and had normal or corrected-to-normal vision and normal hearing or corrected-to-normal hearing (self-reported). A total of 22 participants experienced 9 different VR videos (198 observations), combining 3 VR video types with 3 music genres. Participants were recruited through convenience sampling. To minimize variability, all VR videos were standardized to an identical duration, with matching resolution, bitrate and frame rate. In addition, background music tracks were normalized to RMS loudness and mixed in an identical stereo format, without additional effects. Stimuli were delivered on the same VR headset model for all participants and calibrated before each session.

Sessions were conducted in a quiet, light and temperature-controlled room. After providing informed consent and completing demographic questionnaires, participants completed a brief headset-familiarization task using a neutral practice clip to reduce novelty effects. Each trial began with a 3-s fixation screen, followed by the randomized presentation of one of the 9 video–music combinations. To prevent potential order and learning effects from threatening the study's validity, sufficient time intervals were provided between scenarios, and the presentation of VR videos was conducted using randomly assigned numbers. Nine different random numbers were generated for the videos, and participants were asked to select one. The VR video and background music corresponding to the selected random number were then presented during the experiment. This process continued until all VR videos had been viewed. This approach helped eliminate the effect order problem.

Immediately after each stimulus, participants completed a brief manipulation check, such as the type of video they watched and a genre recognition question. They then completed validated self-report measures. Short, validated scales were selected to minimize fatigue. The study used a four-item immersion scale borrowed from Hudson *et al.* (2019), a four-item arousal scale adapted from Bin Kim and Jung Choo (2023), a three-item curiosity scale adapted from Israel *et al.* (2019) and a three-item visit intention scale taken from Zhu *et al.*

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(2023). All items were rated on a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). In addition, after each video, participants rated both the music and the harmony between the video and the music on a scale from 1 to 10. The average ratings for the music ranged from 7.3 to 9.1, indicating that participants generally liked the music. Similarly, the average ratings for the harmony between video and music ranged from 7.0 to 9.1, showing that participants also appreciated how well the music and videos complemented each other. These procedures, combined with stimulus standardization, controlled environmental conditions and a randomized order of exposure, were designed to strengthen the study's internal validity.

Among participants, 72.7% were female. Educational backgrounds were closely distributed, with participants holding high school (22.7%), bachelor's (22.7%), master's (27.3%) or doctoral degrees (27.3%). Most participants were single (77.3%) and had varied income levels; 27.3% earned less than $20,000 annually, while 4.5% earned over $100,000. The average participant age was 32.09 years. Participant demographics are presented in Table 1.

Results

Study 1

In this study, factor analyses were conducted to assess the validity and reliability of the measurement constructs used in the repeated-measures mediation analysis. For the immersion and visit intention constructs, the Kaiser–Meyer–Olkin (KMO) value was 0.86 ($p = 0.000$). For the visit intention construct, the eigenvalue was 4.29 with an explained variance of 61.28%, and the factor loadings were 0.92, 0.93 and 0.91 with a Cronbach's alpha of 0.91. For the immersion construct, the eigenvalue was 1.24 with an explained variance of 17.71%, and the factor loadings were 0.89, 0.85, 0.81 and 0.87 with a Cronbach's alpha of 0.89.

For curiosity and visit intention constructs, the KMO value was 0.78 ($p = 0.000$). For the visit intention construct, the eigenvalue was 3.95 with an explained variance of 65.77%, and the factor loadings were 0.96, 0.93 and 0.85 with a Cronbach's alpha of 0.91. For the curiosity construct, the eigenvalue was 1.10 with an explained variance of 18.29%, and the factor loadings were 0.98, 0.84 and 0.89 with a Cronbach's alpha of 0.90.

For arousal and visit intention constructs, the KMO value was 0.86 ($p = 0.000$). For the visit intention construct, the eigenvalue was 4.17 with an explained variance of 59.50%, and the factor loadings were 0.93, 0.92 and 0.93 with a Cronbach's alpha of 0.91. For the arousal construct, the eigenvalue was 1.20 with an explained variance of 17.07%, and the factor

Table 1 Demographic profile of participants

Category	n *(%)*	*Category*	n *(%)*
Gender		*Annual income*	
Female	16 (72.7)	Less than $20,000	6 (27.3)
Male	6 (27.3)	$20.001–$29,999	5 (22.7)
Education level		$30.000–$39,999	3 (13.6)
High school degree or equivalent	5 (22.7)	$40.000–$49,999	2 (9.1)
Bachelor's degree	5 (22.7)	$50.000–$59,999	2 (9.1)
Master	6 (27.3)	$60.000–$84,999	2 (9.1)
Doctorate	6 (27.3)	$85.000–$1,000,000	1 (4.5)
Marital status		More than $100,000	1 (4.5)
Single	17 (77.3)	*Age*	
Married	5 (22.7)	Age (mean) 32.09	

Source(s): Authors' own work

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loadings were 0.79, 0.67, 0.72 and 0.95 with a Cronbach's alpha of 0.83. In conclusion, for all constructs, adequate sampling adequacy, both convergent and discriminant validity, and high reliability indices were established, confirming their suitability for use in both experimental and mediation analyses.

Subsequently, a 3 × 3 factorial design was tested to examine the effect of video types and music genres on visit intention. This design included three VR video types – walking, driving and aerial – and three music genres – classical, Latin and country (see Table 2). Results showed that the aerial VR video elicited the highest visit intention scores (μ = 6.40), indicating a stronger intention to visit. Among the music genres, country music produced slightly higher scores (μ = 5.80) than other genres, though the difference was minimal.

Mauchly's test of sphericity (0.76, p = 0.067) indicated that the sphericity assumption was met for VR video types. The subsequent Greenhouse–Geisser test (Type III sum of squares = 49.11, df = 1.62, F = 9.99, p = 0.001) demonstrated a significant difference among VR video types. However, for music genres, Mauchly's test (0.62, p = 0.009) showed that the sphericity assumption was violated. After applying the Greenhouse–Geisser correction, no significant difference was found among music genres (Type III sum of squares = 2.26, df = 1.45, F = 2.87, p = 0.086). The interaction effect between VR video types and music genres was also tested (Mauchly's test = 0.25, p = 0.001; Greenhouse–Geisser Type III sum of squares = 1.94, df = 2.58, F = 1.16, p = 0.331), and the results were insignificant. Because of the violation of sphericity for the interaction term, multivariate tests were conducted for further analysis.

Multivariate results showed that VR video types significantly influenced visit intention (Wilks' Lambda = 0.58, F = 7.12, df = 2, p = 0.005, observed power = 0.89, effect size = 0.42), confirming significant differences among VR video types, supporting *H1*. Similarly, background music had a significant effect on visit intention (Wilks' Lambda = 0.64, F = 5.58, df = 2, p = 0.012, observed power = 0.80, effect size = 0.36), supporting *H3*.

Post hoc analyses (Table 3) showed that aerial VR videos generated higher visit intention than walking and driving VR videos, supporting *H2*. Among music genres, a significant difference was observed between classical and Latin music, supporting *H4*.

The interaction between VR video types and music genres was not significant (Wilks' Lambda = 0.83, F = 0.93, df = 4, p = 0.172, observed power = 0.24), indicating that *H12* was not supported. However, despite the insignificant multivariate interaction, further detailed analyses may reveal meaningful differences within specific subgroups of VR video and music genre pairings, such as between walking VR video*classical music and walking VR video*Latin music, regarding visit intention.

As summarized in Tables 4 and 5, additional analyses offered deeper insights into the interaction effects. Table 4 shows that, within each VR video type, a significant difference in visit intention emerged only in the walking VR video scenario, where it was higher for

Table 2 Descriptive statistics and sphericity test results for VR video type and music genre on visit intention

VR video type[a]	N	*Mean*	*SD*	*Music genre*[b]	N	*Mean*	*SD*
Walking	22	5.25	1.35	Classical	22	5.56	0.98
Driving	22	5.47	1.37	Latin	22	5.76	0.96
Aerial	22	6.40	0.65	Country	22	5.80	0.95

Note(s): [a]Mauchly's test of sphericity = 0.76, p = 0.067, Greenhouse–Geisser Type III sum of squares = 49.11, df = 1.62, F = 9.99, p = 0.001; [b]Mauchly's test of sphericity = 0.62, p = 0.009, Greenhouse–Geisser Type III sum of squares = 2.26, df = 1.45, F = 2.87, p = 0.086
Source(s): Authors' own work

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Table 3 Comparison of test results for VR video types and music genres on visit intention

Group 1	*Group 2*	*Mean difference*	p
VR video types on visit intention			
Walking	Driving	−0.212	0.878
Walking	Aerial	−1.146	*0.003***
Driving	Aerial	−0.934	*0.020**
Music genres on visit intention			
Classical	Latin	−0.207	*0.021**
Classical	Country	−0.242	0.164
Latin	Country	−0.035	1.00

Note(s): $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$
Source(s): Authors' own work

Table 4 Comparison of music genres across different VR video types in relation to visit intention

VR video type	*Music genre*	*Alternative music genre*	*Mean difference*	p
Walking	Classical	Latin	−0.212	0.344
	Classical	Country	*−0.515*	*0.013**
	Latin	Country	−0.303	0.432
Driving	Classical	Latin	−0.910	1.000
	Classical	Country	−0.910	1.000
	Latin	Country	−0.001	1.000
Aerial	Classical	Latin	−0.318	0.130
	Classical	Country	−0.121	1.000
	Latin	Country	0.197	1.000

Note(s): Bonferroni method was used to adjust multiple comparisons; $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$
Source(s): Authors' own work

Table 5 Comparison of VR video types across different music genres in relation to visit intention

Music genre	*VR video type*	*Alternative VR video type*	*Mean difference*	p
Classical	Walking	Driving	−0.394	0.540
	Walking	Aerial	*−1.242*	*0.001***
	Driving	Aerial	−0.848	0.064
Latin	Walking	Driving	−0.273	0.680
	Walking	Aerial	*−1.348*	*0.001***
	Driving	Aerial	*−1.076*	*0.002***
Country	Walking	Driving	0.030	1.000
	Walking	Aerial	−0.848	0.156
	Driving	Aerial	−0.879	0.162

Note(s): Bonferroni method was used to adjust multiple comparisons, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$
Source(s): Authors' own work

country music than for classical music ($p = 0.013$). No significant differences were found between music genres in the aerial or driving VR video scenarios. This suggests that any music genre can be effective for aerial or driving VR videos, as it elicits similar visit intentions. However, in the walking VR scenario, country music appears to be a more effective promotional element for enhancing tourists' visit intention.

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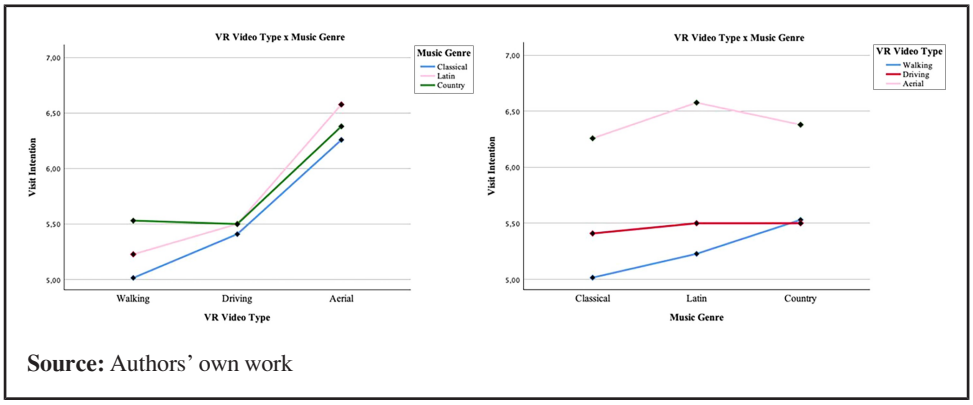
Table 5 shows the effect of VR video types paired with different music genres on visit intention. Among VR videos with classical music, the aerial VR video received the highest visit intention scores, significantly outperforming the walking VR video ($p = 0.001$). When Latin music accompanied the VR videos, the aerial video also showed a stronger influence on visit intention than the walking ($p = 0.001$) and driving ($p = 0.002$) VR video types. However, no significant differences were found among VR video types when country music was played, indicating that country music serves as a versatile background that enhances visit intention across all VR video experiences. In summary, although the overall interaction between VR video types and music genres was not significant, specific VR video and music genre pairings demonstrated meaningful effects. These results suggest that aligning music choice with the kind of VR video experience can optimize its influence on visit intention. Figure 4 visually summarizes these findings.

Study 2

Further analysis (Table 6) showed that the aerial VR video elicited the highest immersion. Among music genres, Latin music elicited the highest immersion, followed by country music, with significant differences between the groups.

The assumption of sphericity was met for VR video types and music genres, with the Greenhouse–Geisser correction producing consistent results. The interaction between VR video types and music genres was tested using the Greenhouse–Geisser Correction (Mauchly's test of sphericity = 0.44, $p = 0.070$; Type III sum of squares = 0.33, $df = 2.90$,

Figure 4 Interaction of the VR video types and music genres on visit intention



Source: Authors' own work

Table 6 Descriptive statistics and sphericity test results for VR video type and music genre on immersion

VR video type[a]	N	*Mean*	*SD*	*Music genre*[b]	N	*Mean*	*SD*
Walking	22	5.06	1.20	Classical	22	5.09	1.16
Driving	22	5.33	0.93	Latin	22	5.62	0.90
Aerial	22	5.90	0.78	Country	22	5.58	0.89

Note(s): [a]Mauchly's test of sphericity = 0.91, $p = 0.405$, Greenhouse–Geisser Type III sum of squares = 25.01, $df = 1.84$, $F = 15.65$, $p = 0.000$; [b]Mauchly's test of sphericity = 0.81, $p = 0.114$, Greenhouse–Geisser Type III sum of squares = 11.31, $df = 1.67$, $F = 6.74$, $p = 0.005$
Source(s): Authors' own work

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$F = 0.23$, $p = 0.869$), revealing an insignificant interaction effect. Because of a significant p-value in Mauchly's Test for the interaction term, multivariate tests were applied for further analysis.

Multivariate results indicated that VR video types significantly affect immersion (Wilks' Lambda = 0.46, $F = 11.63$, $df = 2$, $p < 0.001$, observed power = 0.99, effect size = 0.54), confirming differences among VR video types and supporting *H5*. Background music also significantly influenced immersion (Wilks' Lambda = 0.66, $F = 5.13$, $df = 2$, $p = 0.016$, observed power = 0.76, effect size = 0.34), showing differences among music genres and supporting *H9*.

Table 7 shows that aerial VR video elicited higher immersion than walking and driving VR videos, supporting *H6*, and highlights a significant difference between classical and Latin music genres, supporting *H11*.

The interaction between VR video types and music genres on immersion was not significant (Wilks' Lambda = 0.95, $F = 0.25$, $df = 4$, $p = 0.907$, observed power = 0.09); thus, *H13* was not supported. However, further analysis using advanced statistical techniques may identify significant differences in immersion across specific subgroup interactions (e.g. walking VR video*classical music vs walking VR video*Latin music). Table 8 shows a significant difference in immersion only between Latin and classical music within the walking VR video type. Insignificant differences were found among music genres in aerial or driving VR videos. This suggests that while all music genres pair well with aerial and driving VR videos,

Table 7 Comparison of test results for VR video types and music genres on immersion

Group 1	*Group 2*	*Mean difference*	p
VR video types on immersion			
Walking	Driving	−0.273	0.194
Walking	Aerial	*−0.852*	*0.000***
Driving	Aerial	*−0.580*	*0.002***
Music genres on immersion			
Classical	Latin	*−0.527*	*0.011**
Classical	Country	−0.485	0.051
Latin	Country	0.042	1.00

Note(s): *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$
Source(s): Authors' own work

Table 8 Comparison of music genres across different VR video types in relation to immersion

VR video type	*Music genre*	*Alternative music genre*	*Mean difference*	p
Walking	Classical	Latin	*−0.489*	*0.025**
	Classical	Country	−0.466	0.110
	Latin	Country	−0.023	1.000
Driving	Classical	Latin	−0.534	0.249
	Classical	Country	−0.386	0.396
	Latin	Country	−0.148	0.892
Aerial	Classical	Latin	−0.557	0.057
	Classical	Country	−0.602	0.135
	Latin	Country	0.045	1.000

Note(s): Bonferroni method was used to adjust multiple comparisons; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$
Source(s): Authors' own work

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Latin and country music may more effectively enhance immersion in walking VR video experiences.

Table 9 further explores differences in immersion scores across VR video types paired with various background music genres. When classical music was played, the aerial VR video elicited significantly higher immersion than the walking VR video ($p = 0.015$). In contrast, no significant differences emerged between the driving and aerial or the walking and driving VR videos. With Latin music, the aerial VR video generated significantly greater immersion than both walking ($p < 0.001$) and driving ($p = 0.043$) VR videos. Similarly, country music paired with aerial VR video resulted in significantly higher immersion than walking ($p = 0.003$) and driving ($p = 0.014$) VR videos. Overall, the aerial VR video experiences consistently produced the highest immersion levels, with Latin and country music exerting the strongest effects. Although the overall interaction between VR video type and music genre was not statistically significant, specific combinations, such as Latin music with aerial VR video, significantly enhanced immersion. The results are graphically shown in Figure 5.

Study 3: mediation analysis using repeated measures

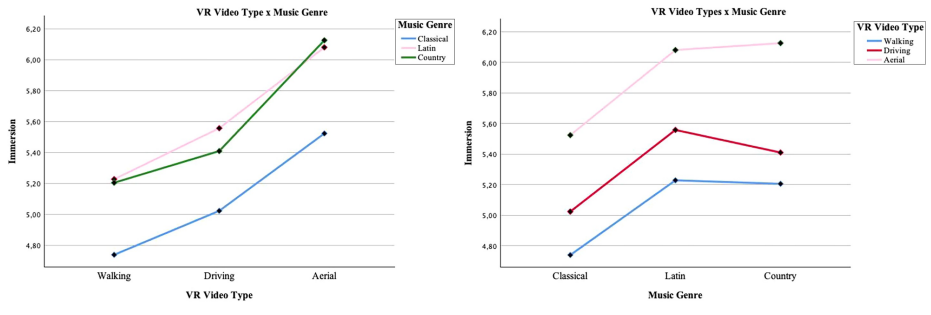
Mediation analysis using repeated measures was conducted with the MEMORE macro developed by Montoya and Hayes (2017). The goal was to uncover key insights for destination marketing by examining how VR video types and music genres influence visit

Table 9 Comparison of VR video types across different music genres in relation to immersion

Music genre	*VR video type*	*Alternative VR video type*	*Mean difference*	p
Classical	Walking	Driving	−0.284	0.462
	Walking	Aerial	*−0.784*	*0.015**
	Driving	Aerial	−0.500	0.155
Latin	Walking	Driving	−0.330	0.455
	Walking	Aerial	*−0.852*	*0.000****
	Driving	Aerial	*−0.523*	*0.043**
Country	Walking	Driving	−0.205	0.775
	Walking	Aerial	*−0.920*	*0.003***
	Driving	Aerial	*−0.716*	*0.014**

Note(s): Bonferroni method was used to adjust multiple comparisons; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$
Source(s): Authors' own work

Figure 5 Interaction of the VR video types and music genres on immersion



Source: Authors' own work

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intention, with immersion, curiosity and arousal as mediators. Montoya's Macro Model 1 was applied to assess pairwise comparisons among VR video types, analyzing mediation effects of the three psychological and emotional variables on visit intention.

Table 10 shows that differences in immersion scores between walking and driving VR videos were minimal, resulting in an insignificant indirect effect on visit intention. This suggests that immersion does not mediate the relationship between these VR video types (walking vs driving) and visit intention. However, aerial VR videos (aerial vs driving and aerial vs walking) generated significantly higher immersion, which positively affected visit intention (effect = 1.24, $SE = 0.38$, $t = 3.26$, $p = 0.004$). Also, immersion significantly and directly influenced the relationship between VR video types and visit intention (Mdiff [walking-driving] coefficient = 0.92, $t = 3.18$, $p < 0.05$, LLCI = 0.314 and ULCI = 1.520; Mdiff [walking-aerial] coefficient = 0.96, $t = 2.77$, $p < 0.05$, LLCI = 0.235 and ULCI = 1.692; Mdiff [aerial-driving] coefficient = 1.24, $t = 3.26$, $p < 0.05$, LLCI = 0.445 and ULCI = 2.044). Therefore, these findings supported *H7* and *H8*. Similar mediation effects were found for curiosity and arousal, as aerial VR videos elicited stronger responses, indirectly increasing visit intention, confirming *H14* and *H16*.

Conversely, mediation analyses involving music genres showed no significant indirect effects on visit intention through immersion, curiosity or arousal (Table 10). Thus, *H10*, *H15* and *H17* were not supported, indicating that these psychological and emotional factors do not mediate music's impact on visit intention. Although background music can generally enhance consumers' behavioral responses (Nicolau *et al.*, 2025), in VR tourism video contexts, visuals often dominate the sensory experience (Alyahya and McLean, 2022); therefore, the music genre may have functioned as a peripheral cue rather than a central immersive factor. The insignificant mediating effect of curiosity between music genres and visit intention may be attributed to the limited influence of music genres in eliciting curiosity. Finally, it is possible that the VR videos elicited stronger arousal than the accompanying music genre, thereby masking any potential genre-driven arousal effects.

Table 10 Mediation analysis results for repeated measures

Independent variable	*Mediator variable*	*Dependent variable*	*Effect*	*BootSE*	*BootLLCI*	*BootULCI*	p *(normal theory – Sobel test)*
A: In terms of VR video type							
VR (W-D)	Immersion	Visit intention	−0.2500	0.2090	−0.7724	0.0077	0.096
VR (W-A)	Immersion	Visit intention	*−0.8208*	*0.5000*	*−2.1186*	*−0.2073*	*0.016**
VR (D-A)	Immersion	Visit intention	*−0.7211*	*0.4424*	*−1.8946*	*−0.2023*	*0.012**
VR (W-D)	Curiosity	Visit intention	−0.0218	0.1486	−0.3364	0.2625	0.884
VR (W-A)	Curiosity	Visit intention	*−0.6398*	*0.3612*	*−1.4937*	*−0.1358*	*0.025**
VR (D-A)	Curiosity	Visit intention	*−0.5613*	*0.2226*	*−1.0270*	*−0.1562*	*0.034**
VR (W-D)	Arousal	Visit intention	−0.1489	0.1425	−0.4562	0.1066	0.306
VR (W-A)	Arousal	Visit intention	*−0.5973*	*0.3482*	*−1.4168*	*−0.0763*	*0.031**
VR (D-A)	Arousal	Visit intention	*−0.6011*	*0.2932*	*−1.3013*	*−0.1650*	*0.023**
B: In terms of music genre							
Music (Cl-L)	Immersion	Visit intention	−0.0697	0.0721	−0.2456	0.0274	0.225
Music (Cl-C)	Immersion	Visit intention	0.0726	0.1327	−0.0860	0.4349	0.350
Music (L-C)	Immersion	Visit intention	−0.0032	0.0381	−0.0697	0.0844	0.817
Music (Cl-L)	Curiosity	Visit intention	−0.0640	0.0777	−0.2301	0.0785	0.392
Music (Cl-C)	Curiosity	Visit intention	0.0302	0.0943	−0.0828	0.2888	0.606
Music (L-C)	Curiosity	Visit intention	0.0022	0.0303	−0.0816	0.0507	0.947
Music (Cl-L)	Arousal	Visit intention	−0.0207	0.0358	−0.1134	0.0253	0.621
Music (Cl-C)	Arousal	Visit intention	−0.0067	0.0637	−0.1392	0.1414	0.905
Music (L-C)	Arousal	Visit intention	0.0075	0.0320	−0.0784	0.0491	0.756

Note(s): W = walking; D = driving; A = aerial; Cl = classical music; L = Latin music; C = country music; $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$
Source(s): Authors' own work

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Discussion

Various promotional tools and technological advancements are vital for increasing tourists' visit intention to destinations. While much research has compared the effects of VR videos, photographs and traditional videos, little attention has been paid to distinctions among VR video types or to the role of background music in destination marketing. This study addresses this gap by comparing three VR video types – walking, driving and aerial views – and examining the impact of different music genres on visit intention. Furthermore, the interaction between VR video types and music genres has been scarcely explored, making this research a valuable contribution.

Prior studies suggest that greater realism in VR videos can alter attitudes and translate into real-world behaviors (Tussyadiah *et al.*, 2018). Consistent with this, the current study also found a significant effect on consumer behavior patterns among those who watched VR videos. However, the specific impact of different types of VR videos on consumer behavior had not been examined individually. Our findings reveal that aerial VR videos elicit higher immersion, curiosity and arousal than walking- or driving-based VR videos, leading to greater visit intention.

Regarding music, previous research has mainly focused on its effects in retail environments (Daunfeldt *et al.*, 2021; Reinoso Carvalho *et al.*, 2016), with limited attention to the VR research context. Our results indicate that background music significantly influences tourist behavior in VR tourism videos. Notably, aerial VR video paired with Latin music significantly increased visit intention, and both Latin and country music increased immersion more effectively than classical music. However, music's influence on visit intention was not mediated by immersion, curiosity, or arousal.

Song and Lu (2024) found an insignificant mediation effect between virtual tourism experiences and behavioral intentions. This aligns with our results for walking and driving VR videos but contrasts with the significant mediation observed for aerial VR videos. Thus, it should be noted that the mediation effect of psychological and emotional factors may vary depending on the VR video type used.

In addition, an important finding from this study was the provision of effect sizes as benchmarks for future studies. The effect sizes for VR video types (0.42) and for music genres (0.36) on visit intention were both medium-sized. In terms of immersion, the effect sizes for VR video types (0.54) and music genres (0.34) were also medium-sized, reflecting medium-sized effects.

Conclusion

This study shows that VR video types distinctly affect visit intention, with aerial VR videos being the most effective, followed by driving and walking VR videos. Music genre effectiveness varied by VR video type; for example, country music increased visit intention more than classical music in the walking VR video, whereas no significant differences emerged in other VR video types. Immersion plays a critical role in VR tourism marketing; aerial VR video elicited higher immersion than walking and driving VR videos, especially when paired with Latin music.

Finally, psychological and emotional factors – immersion, curiosity and arousal – mediated the effect of VR video type on visit intention, particularly differentiating aerial VR videos from others, but no mediation was observed for music genres. In conclusion, using VR videos for promotional purposes in the tourism industry influences potential tourists' decision-making; however, this effect does not hold uniformly across all types of VR videos. Participants responded differently to different VR video types. While music also plays a role in decision-making, its impact was not as strong as that of the VR video types. Among the various formats, the aerial VR video had the strongest effect on participants. This study advances

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understanding of multisensory VR marketing and guides more effective destination promotions.

Theoretical implications

From the S-O-R framework perspective, this study addresses a theoretical gap by extending the traditional S-O-R model to explicitly incorporate differentiated multimedia stimuli (VR video type and music genre) and their distinct psychological and emotional pathways. Specifically, the findings demonstrate that aerial VR videos function as high-arousal visual stimuli, while music genres (particularly Latin and country) serve as affective auditory stimuli that primarily influence immersion and curiosity rather than directly influencing behavioral intention. These results refine the S-O-R causal chain by empirically validating immersion, curiosity and arousal as key organism-level mediators linking VR-based stimuli to visit intention, thereby challenging prior assumptions that sensory cues such as music exert a direct effect on behavioral responses in tourism marketing contexts.

Furthermore, the study extends CAT by identifying how combined visual–auditory VR stimuli trigger differentiated emotional appraisals that shape behavioral intentions, addressing a gap in CAT research that has largely examined appraisal processes in isolation rather than in multisensory, immersive environments. In parallel, the findings refine DCT by proposing a boundary condition: while the simultaneous use of verbal (music) and non-verbal (VR visuals) cues enhances cognitive–emotional processing, their effects are asymmetrical across psychological and emotional outcomes. Together, these contributions reconcile mixed findings in prior VR and music research by clarifying when and how multisensory stimuli influence intention indirectly through organismic responses rather than through direct persuasive effects.

Managerial implications

This study offers valuable managerial insights for destination marketers by guiding strategic decisions related to the design, production and deployment of VR video content. For marketers, minimizing perceived risk and maximizing engagement are critical priorities. VR marketing is particularly effective because it allows tourists to virtually experience destinations safely and vividly, strengthening both cognitive and emotional confidence in travel decisions. Therefore, producing and showcasing VR videos should be a central component of destination promotional strategies.

The findings demonstrate that engaging VR content – especially videos that enhance immersion, curiosity and arousal – can significantly increase tourists' intentions to visit a destination. To ensure efficient resource allocation, marketers should evaluate the impact of specific VR videos on measurable outcomes and determine whether the required production investment is justified. For example, although aerial VR videos may entail higher production costs, they can also elicit stronger behavioral responses and yield a higher return on investment. Therefore, this study helps destination marketers select the appropriate VR video types and the devices needed to produce them (e.g. a drone is needed for an aerial video), ensuring that the benefits outweigh the costs and ultimately generating significant economic gains for the destination.

This study shows that aerial VR videos are particularly effective in eliciting immersion, curiosity and arousal, making them powerful tools for stimulating visit intentions. By emphasizing scenic landscapes or iconic landmarks from unique aerial perspectives, marketers can create aspirational imagery that strengthens psychological and emotional connections with potential tourists. Recognizing that not all VR formats perform equally, destination managers should tailor their strategies to capitalize on the strong persuasive power of aerial VR content. As a result, evidence-based approaches that integrate technology and sensory design can maximize marketing effectiveness. Policy initiatives,

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such as subsidies for VR video production, could further support destinations aiming to enhance competitiveness or attract visitors.

Although music exerts a smaller influence than VR videos, culturally familiar music genres can deepen engagement by reinforcing immersion. Music selection should therefore be treated as a strategic component of VR video campaigns rather than an afterthought. Marketers may segment consumers by cultural background or travel motivation and tailor music elements accordingly. Using traditional or regionally recognizable music can enhance emotional resonance and increase the overall effectiveness of promotional content, particularly when aligned with the target market's cultural norms.

The study also highlights that the impact of music varies depending on the type of VR video. It was found that, particularly in the presence of Latin music, the aerial VR video type generated a higher level of visit intention than both the walking VR video and the driving VR video types. Marketers can use these insights to optimize content by aligning specific music genres with desired immersive experiences. Testing various video–music combinations at tourism fairs or on online platforms and evaluating user responses regarding visit intentions can further refine promotional strategies and improve return on investment.

As a result, integrating tourism and VR technology enables individuals to experience destinations remotely, facilitating broader, more sustainable promotion. Effective use of VR and culturally attuned music can stimulate nationwide demand for destinations. Additionally, this study provides a valuable teaching resource for courses on sensory marketing and consumer psychology by illustrating how psychological and emotional factors shape tourist behavior and the effectiveness of experiential marketing strategies.

Limitations and future research directions

This study used a within-subjects experimental design, which, despite its strengths, has inherent limitations in terms of generalizability. Future research could enhance external validity by using between-subjects designs. The sample was drawn exclusively from Florida, which restricts the applicability of the results to other regions. Conducting similar studies across diverse geographic areas would improve the robustness of the results. Additionally, this study focused solely on VR as the technological medium. Future investigations could compare the effectiveness of VR and augmented reality (AR) in destination marketing, exploring how AR influences visit intention. Although music genres and VR videos were carefully selected, researcher bias may still have influenced these choices. Therefore, future research can conduct experiments with more diverse VR video scenarios and music selections to provide deeper insights.

Furthermore, the findings of this study were obtained only through scenario-based survey applications. However, future studies should use eye-tracking, heart rate monitoring or neuromarketing methods to verify the results in the literature and draw new conclusions. The number of mediating variables used in this study is limited. However, future studies should use different variables, such as flow experience and self-consistency, to better understand individuals' interactions with VR devices. Moreover, our study reveals that immersion does not mediate the relationship between walking and driving VR video types and visit intention. However, it plays a significant role in shaping visit intention within the aerial VR video scenario. Building on this, future studies could also examine how individual differences, such as user preferences and prior experiences, moderate the relationship between immersion and visit intention across different VR video contexts. Finally, this study did not use natural, cultural, or historical venues across different countries, which is a limitation. In the future, various destinations, including natural, cultural and historical centers, combined with varying genres of music (such as local music), could be examined.

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