Tourism metaverse from the attribution theory lens: a metaverse behavioral map and future directions

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Abstract
Purpose – This study aims to highlight the importance of using attribution theory in metaverse tourism research. The study addresses the lack of clarity regarding the attribution theory’s dimensions (locus, stability, controllability) potential application in the metaverse tourism context.

Design/methodology/approach – This study uses a comprehensive exploration of the research gap by searching top-tier journals in Scopus and Web of Science databases about the relevant literature to analyze relevant data to provide a foundation for future transformative research. The study examines the relationship between attribution theory and metaverse tourism and explores how attribution theory can inform the understanding of tourists’ judgments and actions in the metaverse context.

Findings – The study shows that attribution theory has the potential to significantly improve the understanding of metaverse tourism by illuminating tourists’ decision-making processes and the factors contributing to those decisions. The study highlights the importance of applying attribution theory to generate more impactful and reliable implications for the tourism industry.

Originality/value – This study is transformative because it provides a foundational understanding of the application of attribution theory in metaverse tourism research. The study is significant because it sheds light on an underexplored area where the theoretical framework is necessary to inform and guide tourism technology research. The study’s originality lies in its contribution to tourism by identifying room for improvement in metaverse tourism research and highlighting the potential benefits of using attribution theory.

Keywords Virtual reality, Metaverse, Tourism experience, Tourism information, Attribution theory

Paper type Technical paper

Tourism metaverse from the attribution theory lens:元宇宙行为地图和未来方向

摘要

本研究通过在Scopus和Web of Science数据库中搜索相关文献的顶级期刊，对研究空白进行了全面探索。分析相关数据，为未来元宇宙研究提供基础。本研究考察了归因理论与元宇宙旅游之间的关系，并探讨了归因理论如何在元宇宙背景下为理解游客的判断和行为提供信息。

目的：本研究强调了归因理论在元宇宙旅游研究中的重要性。该研究解决了归因理论在元宇宙旅游背景下的潜在应用维度（稳定性、可控性）缺乏明确性的问题。

研究结果：研究表明，归因理论有可能通过阐明游客的决策过程和促进这些决策的因素，显著提升对元宇宙旅游的理解。该研究强调了应用归因理论对旅游业产生更具影响力和可靠性的影响的重要性。

创新/价值：本研究具有变革性，因为它为归因理论在元宇宙旅游研究中的应用提供了基础性的理解。这项研究意义重大，因为它揭示了一个研究不足的领域，在此领域，归因理论框架为旅游技术研究提供信息和指导所必需的。本研究的独创性在于它对旅游业的贡献。它确定了元宇宙旅游研究的改进空间，并强调了利用归因理论的潜在好处。

关键词 元宇宙、虚拟现实、旅游体验、旅游信息、归因理论
El Metaverso turístico desde la óptica de la Teoría de la Atribución: Un mapa comportamental del metaverso y futuras direcciones

Resumen
Diseño/metodología/enfoque: Este estudio se basa en una exploración exhaustiva de la brecha de investigación mediante la búsqueda de revistas de primer nivel en las bases de datos Scopus y Web of Science sobre la literatura relevante para analizar los datos relevantes con el fin de proporcionar una base para futuras investigaciones transformadoras. El estudio examina la relación entre la teoría de la atribución y el metaverso turístico y explora cómo la teoría de la atribución puede facilitar la comprensión de las evaluaciones y acciones de los turistas en el contexto metaverso.

Propósito: Este estudio pone de relieve la importancia de utilizar la teoría de la atribución en la investigación turística en metaverso. El estudio aborda la falta de claridad sobre las dimensiones de la teoría de la atribución (lugar de causalidad, estabilidad y, controlabilidad) y su posible aplicación en el contexto del turismo en metaverso.

Conclusiones: El estudio muestra que la teoría de la atribución tiene el potencial de mejorar de forma significativa la comprensión del metaverso turístico al esclarecer los procesos de toma de decisiones de los turistas y los factores que contribuyen a dichas decisiones. El estudio destaca la importancia de aplicar la teoría de la atribución para generar implicaciones más impactantes y fiables para la industria turística.

Originalidad/valor: Este estudio es transformador porque proporciona una comprensión fundamental de la aplicación de la teoría de la atribución en la investigación del metaverso turístico. El estudio es significativo porque arroja luz sobre un ámbito poco explorado cuyo marco teórico es necesario para informar y orientar la investigación sobre tecnología turística. La originalidad del estudio radica en su contribución al turismo al identificar las posibilidades de mejora en la investigación del metaverso turístico y destacar los beneficios potenciales de la utilización de la teoría de la atribución.

Palabras clave Metaverso, Realidad virtual, Experiencia turística, Información turística, Teoría de la atribución

Tipo de papel Documento técnico

1. Introduction

Attribution theory posits that individuals form causal explanations or “attributions” for events that influence judgments and behaviors (Kelley and Michela, 1980). A critical framework within social psychology, attribution theory, examines three primary dimensions along which individuals assess causality – the locus of causality, stability and controllability (Saleh, 2023; Choi and Cai, 2016). Attribution dimensions have been used to analyze how travel constraints influence destination choices (Zhang et al., 2021). First, locus of causality refers to whether the perceived cause of an event or outcome stems from internal versus external factors. Internal attributions – internal locus of causality – assign causality to forces within the individual, such as personality traits or abilities (Saleh, 2023). Conversely, external attributions – the external locus of causality – attribute causality to outside elements like other people or situational circumstances (Jackson, 2019). Second, stability denotes if the perceived cause is temporary versus permanent (Choi and Cai, 2016). The final dimension, controllability, concerns whether the assumed cause is changeable or unchangeable (Jackson, 2019). Together, these attribution dimensions comprise the cognitive framework tourists use to make sense of experiences (Saleh, 2023; Jackson, 2019). A substantial literature has used this theoretical lens to gain an understanding of tourists’ causal inferences and outcome judgments (Fu et al., 2021). A significant body of work demonstrates tourists’ attributions about past experiences shape salient outcomes such as satisfaction, loyalty and revisit intentions (Choi and Cai, 2010; Hsu and Chen, 2019; Orth et al., 2012). For instance, Zhang et al. (2021) found attributions for negative emotions during trips predicted overall satisfaction and loyalty ratings more so than positive emotion attributions.

Thus, tourism businesses have benefitted from understanding attribution processes, enabling practices to strengthen relationships and quality perceptions (Jackson, 2019; Fu et al., 2021). The growing literature elucidates attribution theory’s explanatory power regarding psychological drivers of tourist decision-making across contexts (Ali and Hassan, 2023).
Although attribution perspectives have informed offline tourism comprehension, a notable research void and gap exist regarding metaverse environments.

Major technology firms envision a novel virtual sphere for travel and work enabled by metaverse platforms (Yung et al., 2022; Koo et al., 2022). Novelist Neal Stephenson first coined the concept of a metaverse in his seminal science fiction work “Snow Crash” (Wei, 2022; Gursoy et al., 2022). Stephenson portrayed a virtual world where users are represented by customizable “avatars” interacting in artificial yet functionally equivalent spaces to the physical world. Within tourism, metaverse technologies centered on virtual reality (VR) and augmented reality (AR) facilitate virtual experiences (Buhalis et al., 2023; Cheng et al., 2023; Cheng et al., 2022). VR incorporates visual, audio and kinetic elements to simulate activities through headsets (Kim and Hall, 2019). In contrast, AR enhances real environments with overlayed computer imagery (Yung and Khoo-Lattimore, 2019). Together, VR and AR enable pseudo-interactions between tourists and suppliers in virtual spaces (Buhalis et al., 2023). Researchers have started examining how such virtual content shapes visit intentions and interactions (Kim et al., 2020; Wei, 2019; Kim and Hall, 2019; Yung and Khoo-Lattimore, 2019; Guttentag, 2010). Studies also explore influences on cognitive and affective responses (Kim et al., 2020; Huang et al., 2016). As tourism professionals aim to shape visitor profiles and personalize experiences, metaverse platforms provide a helpful tool (Wei, 2019). However, extant literature has not sufficiently assessed tourists’ psychological processes like attribution formation specific to this novel virtual context.

The current study aims to investigate attribution theory dimensions (e.g. how tourists make causal attributions regarding their metaverse experiences besides the stability and controllability dimensions) and how these attributions may influence consequential behaviors. Applying an attribution framework offers a novel approach to examining decision-making, perceptions and potential biases as tourism increasingly incorporates metaverse technologies. To address the identified research gap, this study poses two guiding questions:

**RQ1.** How do tourists attribute causes for positive and negative aspects encountered within metaverse tourism experiences?

**RQ2.** Do tourists’ attributions for metaverse tourism experiences vary significantly based on key attribution dimensions of locus of causality, stability and controllability as proposed by attribution theory?

2. Literature review

2.1 Metaverse concept

The term “Metaverse” refers to a digital simulation that combines AR, VR and other technologies to create an engaging virtual environment (Cheng et al., 2023; Cheng et al., 2022; Hollensen et al., 2022). While VR and the metaverse share similarities, they also have significant differences. VR immerses users in simulated 3D environments using VR headsets, but these environments are isolated, and real-time communication among users is not possible (Barrera and Shah, 2023). In contrast, the metaverse represents a shared virtual environment where multiple users can interact with each other and virtual representations of real objects (Hollensen et al., 2022). The metaverse aims to create a virtual environment that closely resembles the real world, enabling shared experiences, transactions and real-time interactions (Dwivedi et al., 2023). Unlike isolated VR simulations, the metaverse is connected and persistent, continuing to exist even after users log off (Barrera and Shah, 2023). It offers greater breadth, depth and longevity (Barrera and Shah, 2023; Sowmya et al., 2023; Dwivedi et al., 2022).

In the metaverse, concepts like extended reality (XR) and mixed reality (MR) play a fundamental role in shaping users’ experiences (Barrera and Shah, 2023). MR allows users
to view the physical world with virtual objects superimposed, bridging the gap between real and virtual elements (Dwivedi et al., 2023). VR and AR, which encompass a range of natural to virtual environments, are included in XR (Hollensen et al., 2022). Users of XR technologies can seamlessly transition between these environments, blurring their distinctions. The vision of the metaverse, aiming to merge real and VR into an immersive shared space, relies on MR and XR concepts (Barrera and Shah, 2023). MR and XR technologies facilitate user interactions, navigation within virtual environments and control over immersion, presence and realism levels (Barrera and Shah, 2023; Kim, 2021).

The devices and programs that constitute the metaverse play a crucial role in shaping user interactions within this virtual environment (Dwivedi et al., 2023). Users may also use nonfungible tokens to represent virtual assets and property, which contribute to the metaverse economy and the buying and selling possibilities within it (Barrera and Shah, 2023). Avatars, virtual representations of users, are used for interaction and navigation within the metaverse (Hollensen et al., 2022; Kim et al., 2023). The realism and adaptability of these avatars influence users’ feelings of immersion and presence (Hollensen et al., 2022). Furthermore, 3D environments serve as the framework for virtual interactions and transactions, replicating real-world settings, virtual marketplaces and social platforms (Dwivedi et al., 2023). Consequently, the concept of the metaverse has significant implications for the future development of tourism (Filimonau et al., 2022).

2.2 Tourism metaverse

The emergence of the metaverse is predicted to enable virtual travel experiences that closely resemble or even surpass real-world experiences (Buhalis et al., 2023). This has the potential to revolutionize travelers’ experiences and their consumption of tourism products (Gursoy et al., 2022). In the metaverse, visitors can use their avatars to explore digital representations of popular tourist destinations, offering new possibilities for tourism (Buhalis and Karatay, 2022; Ng, 2022). With advancements in MR and 3D imaging, these virtual locations may achieve photorealism and provide opportunities for location-based experiences (Buhalis et al., 2022). Tourists can interact with virtual guides, staff members and other tourists within virtual tourist attractions and destinations through their avatars (Wei, 2022). One of the key advantages of metaverse tourism is its accessibility. Virtual locations can be visited at any time and from anywhere, offering flexibility for tourists who may face time, mobility or financial constraints in physical travel (Wei, 2023). In addition, virtual substitutes can help alleviate the strain on actual locations, as they can accommodate a larger number of visitors without the limitations of physical space (Yang and Wang, 2023).

However, it is important to carefully consider the drawbacks of metaverse tourism. Currently, there is a shortage of literature exploring the full range of potential benefits and disadvantages for travelers and travel-related businesses in the context of metaverse tourism, particularly regarding tourist behavior (Buhalis et al., 2023). As a result, there is a need to investigate how attribution theory can be applied to understand tourist behavior in the metaverse context.

2.3 Attribution theory

The attribution theory, first put forth by Fritz Heider in 1958 and later developed by Bernard Weiner and others, has been extensively used in various industries (Kelley and Michela, 1980; Weiner and Weiner, 1985; Weiner, 1972). According to the theory, people try to understand why things happen and behave the way they do, attributing the causes to internal or external factors (Saleh, 2023). Individuals’ emotions, motivations and behaviors are affected by these attributions in turn. Aspects such as tourists’ perceptions of service quality, destination image and satisfaction have all been studied in the context of tourism.
using attribution theory (Choi and Cai, 2016; Jackson, 2019; Saleh, 2023). Attribution theory has delved deeper into the three facets: locus of control, stability and controllability, to provide a more solid theoretical framework for our research. Whether an event is thought to have an internal (e.g. personal abilities or effort) or external (e.g. luck or environmental) cause is referred to as the locus of causality (Jackson, 2019). While controllability refers to the degree to which a person believes they can influence the reason, stability is concerned with the perceived consistency of the cause over time (Choi and Cai, 2016). These dimensions have significantly influenced the evaluations of tourists’ experiences and subsequent behavioral intentions (Choi and Cai, 2016; Jackson, 2019).

The difference in the mode of experience between the metaverse and the real world provides virtual tourists with the potential for flexibility and implausibility in how they interpret virtual assets, events and spaces. In virtual environments, without physical embodiment, the usual anchors and constraints of objective reality are loosened. This makes it easier for individuals to suspend disbelief or exaggerate the impact of virtual experiences online, often for performative or social reasons. As a result, the attributions formed by virtual tourists may prioritize virtual social signaling over pragmatic accuracy. Furthermore, the lack of tangible output in virtual experiences means that the lingering effects of those experiences dissolve more quickly without real-world residues to solidify memories. Although the metaverse offers new opportunities for virtual travel, it also implies that the attribution of value and meaning by tourists is prone to different behavioral outcomes compared to physical reality. The mediated and performative nature of avatar-based virtual experiences facilitates attribution shifts that prioritize online social optics over objective impact appraisals. Achieving this malleability is much more challenging in interactions firmly anchored in the physical world.

By examining how visitors attribute their experiences in virtual and AR settings, studies aim to expand the application of attribution theory in the context of the tourism metaverse. These investigations seek to understand the influence of attribution theory on tourists’ perceptions, emotions and behavioral intentions within the VR and AR domains. Consequently, this research aims to advance our knowledge of the psychological mechanisms underlying tourists’ interaction with cutting-edge technologies related to the travel and tourism sector.

2.4 Filling the conceptual gap

Although the theoretical grounding in attribution perspectives is robust, limitations exist due to the nascent nature of metaverse tourism research (Buhalis et al., 2023; Koo et al., 2022). As an emerging concept, empirical evidence directly applying attribution frameworks within virtual tourism contexts remains limited (Wei, 2022; Gursoy et al., 2022). However, this exploratory research provides a novel conceptual framing and outlines testable propositions to seed future empirical inquiry. Expanding the knowledge pool by introducing psychology-based models aligns with calls to develop a comprehensive, tourist-centered metaverse understanding (Kim et al., 2020; Buhalis et al., 2023). Metaverse platforms are projected to profoundly impact the tourism economy and business operations (Yung et al., 2022; Koo et al., 2022). Deeper insights into psychological drivers of tourist decision-making and behavior will serve strategic objectives, including experience customization, relationship management and demand stimulation (Wei, 2019; Jackson, 2019).

Although present implications could be reinforced with additional empirical support as the metaverse domain matures, initial conceptualizations provide a meaningful foundation for predictive modeling and evidence-based best practices (Kim and Hall, 2019; Huang et al., 2016). This study synthesizes literature at the intersection of attribution theory, tourism management and emerging technologies to address the research gap. Although primarily conceptual, it represents an essential first step toward a holistic metaverse tourism framework incorporating cognitive, experiential and economic dimensions (Kim et al., 2020; Buhalis et al., 2023; Yung et al., 2022). Continued theorizing is critical as metaverse
concepts evolve rapidly. This exploratory review aims to seed ongoing discourse and multidisciplinary perspectives vital for advancing strategic knowledge in virtual tourism contexts.

3. Methodology

We applied the PRISMA methodology to study theoretical novelty for the potential of tourism metaverse from an attribution theory perspective (Liberati et al., 2009). PRISMA provides a flow chart showing information flow through the various stages of theoretical studies; identification of records by searching databases and sources; screening of documents based on titles and abstracts; and assessment of full-text eligibility of articles/studies in the final synthesis (Sarkis-Onofre et al., 2021). Our overarching aim was to understand motivations and attributions of metaverse users in tourism contexts (Figure 1). To identify relevant papers, we searched three major databases – Scopus and Web of Science – using keywords related to “tourist” and virtual reality”; “tourist” and augmented reality”; “tourist and technology”; “Metaverse”; and “tourist” and attribution theory”.

The initial search yielded over 240 results, which we screened based on inclusion/exclusion criteria. Papers were eligible if discussing tourism and hospitality metaverse/virtual/AR applications and tourists’ attributions, perceptions, motivations or behavior. Papers on other aspects, such as marketing or technical design, were excluded. After title/abstract screening, 105 papers remained. During full-text assessment, another 50 articles were excluded for not meeting criteria (focusing solely on tourism VR and AR and tourists’ behavioral attributions). The reference lists of the remaining reference list manually searched to identify additional relevant documents, yielding 15 more. The resulting 65 papers formed the final sample for our review. Of these, 30 papers provided the most relevant and contextual insights aligned with our research aims. We extracted data from these 27 papers on study contexts of metaverse/virtual technologies used following Wu and Ho’s (2023) recommendations to generate reviews in the metaverse context. And critical findings related to tourists’ attributions, perceived control, causality and motivation.

![Figure 1](https://www.tourismreview.com/assets/images/figure1.png)

**Source:** Figure created by authors
4. Results

4.1 Metaverse in the tourism literature context

After we collected articles on attribution theory in the tourism context, we identified a gap in the current literature regarding how attribution theory can be applied to understanding consumers’ perceptions and behaviors in the emerging tourism metaverse. We also explored further research directions that could examine how attribution theory can explain tourists’ causal inferences of events and experiences in virtual worlds and AR (Table 1).

Moreover, Figure 2 provides a helpful overview of how research on virtual and AR applications in tourism evolved into the current focus on the tourism metaverse domain. Early studies in 2010–2016 explored VR’s role in tourism generally and marketing more specifically. Subsequently, as VR and AR technologies advanced, studies examined their integration into tourism and hospitality experiences from 2019 onward. Significant contributions analyzed tourist motivations for VR and how VR influenced tourist behaviors. Starting in 2021, the focus shifted to metaverse applications, exploring topics like advertising, trends and opportunities. Notably, 2022 saw several taxonomies and frameworks proposed to conceptualize the emerging tourism metaverse ecosystem and model interactions. Studies also assessed implications for different age cohorts. Although this pathway tracks advancing virtual technologies underpinning the metaverse, research on the tourism psychology within these virtual spaces still requires more depth. For example, further exploration is needed on how the metaverse may shape travel decision-making from behavioral theories. The current research, therefore, uses attribution theory to the metaverse context for the benefits of attribution theory to fathom the essence behind tourism metaverse behavioral outcomes.

4.2 Why attribution theory in the tourism metaverse context?

As metaverse technologies revolutionize travel simulations and commercialization, understanding tourist psychology within virtual worlds is imperative yet understudied (Buhalis et al., 2023). Attribution theory offers a valuable lens to characterize cognitive

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<th>Table 1</th>
<th>Journals that reflect metaverse dimensions (VR/AR) in the tourism context</th>
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<td>Journal name</td>
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<td>Tourism Management</td>
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<tr>
<td>International Journal of Contemporary Hospitality Management</td>
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<td>Psychology &amp; Marketing</td>
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<td>International Journal of Information Management</td>
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<td>Information Technology &amp; Tourism</td>
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<td>International Journal of Geoheritage and Parks</td>
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<td>Journal of Tourism Futures</td>
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<td>Journal of Travel Research</td>
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<td>Journal of Vacation Marketing</td>
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Source: Table created by authors
drivers of metaverse experience perceptions and behaviors. As referenced frameworks elucidate complex, real-world decision-making (Choi and Cai, 2016), they can provide baseline insights into the virtual tourism context lacking empirical evidence (Wei, 2022). Applying attribution theory lays the foundations for predictive models informing experience design, relationship cultivation and demand forecasts crucial to metaverse tourism economies (Yung et al., 2022; Kim et al., 2020). Identifying experience attributes eliciting favorable causal inferences aids systemic enhancements targeting positive satisfaction, loyalty and monetization (Jackson, 2019; Wei, 2019). Cross-dimensional attribution profiling further segments tourist needs for customized engagement (Saleh, 2023).

Similarly, attribution frameworks represent a psychologically grounded approach to conceptualizing metaverse tourism holistically. Their incorporation initiates progression toward a comprehensive framework synthesizing cognitive, experiential and economic aspects across technologies, tourism services and consumer behavior literature (Buhalis et al., 2023; Kim et al., 2020). Thus, the long-term realization of metaverse potentials necessitates centering human factors like tourist decision-making (Yung et al., 2022). Attribution theory fills this need through explanatory, predictive power and strategizing based on cognitive mechanisms. Its application cultivates a deeper anthropic understanding vital to leveraging emerging technologies responsibly and maximizing associated economic and societal values.

The current study classified the importance of attribution theory in the tourism metaverse context regarding the three main dimensions of attribution theory (locus of causality, controllability and stability); we first highlight the dimension in the tourism real world, then we argue where we should be heading in the VR “Metaverse”.

4.2.1 Locus of causality in tourism. Locus of causality refers to how tourists attribute responsibility for the outcomes of events. In the real world, when tourists attribute event outcomes to internal psychological causes such as their abilities or self-confidence, it is
referred to as an internal locus of causality. On the other hand, when tourists attribute event outcomes to external causes like luck, fate or the initiatives of service providers, it is called an external locus of causality (Jackson, 2019). According to the attribution self-bias theory, tourists are more likely to have positive behavioral outcomes when they attribute their positive experiences to themselves rather than others (Jackson, 2019). This is because individuals tend to attribute positive events to themselves and attribute negative outcomes to external causes (Harvey et al., 2014). However, there are cases where tourists may attribute negative event outcomes to themselves if they have loyalty toward tourism service providers (Choi and Cai, 2016). In addition, tourists may attribute positive events to service providers through “attribution shifting mechanisms” when service providers show initiatives toward host destinations (Saleh, 2023). Therefore, tourism managers often aim to cultivate loyalty among tourists and support host destinations through social initiatives to ensure that tourists have a favorable appraisal, regardless of the internal and external attributions of positive and negative event outcomes (Go and Kang, 2023; Jafar and Ahmad, 2023).

In the virtual reality “Metaverse”, future research should focus on determining how to incorporate locus of causality theory into VR applications. The impact of locus of causality theory in predicting tourists’ attribution toward events should be further investigated by exploring factors conducing to tourists forming positive virtual perceptions toward destinations. In the real world, we found that tourism service providers could entail challenges in guaranteeing tourists positive behavioral outcomes if they cannot understand factors affecting their internal and external locus of causality in the positive pathways. Therefore, understanding the scenarios that may occur to tourists while experiencing the tourism metaverse is vital; we provide four scenarios that may occur to tourists’ locus of causality when experiencing the tourism metaverse:

1. Tourists could experience a positive virtual metaverse experience because of their internal locus of causality when they explore unique virtual architecture, modern art installations and novel game mechanics.
2. Tourists could experience a positive virtual metaverse experience due to their external locus of causality when interacting with friendly nonplayer characters and collaborating with other players on their journey.
3. Tourists could experience a negative virtual metaverse experience due to their internal locus of causality when the game mechanics become too tedious, and the exploration environment becomes too confusing and overwhelming.
4. Tourists could experience a negative virtual metaverse experience due to their external locus of causality when they see too many advertisements, poorly designed virtual spaces or too much pushy tourism marketing.

The previous scenarios demonstrate that tourists’ behavior in virtual events may be predicted by their internal and external locus of causality. Consequently, tourism metaverse developers and researchers must elucidate the answers to the questions outlined.

Also, given that the immersive level of VR could affect how tourists attribute different virtual events to different causes, further research is recommended on studying tourists’ internal and external locus of causality in varying levels of VR immersive. Immersive VR is the easy-to-use and motion-based controllers while using stimulation. In addition, VR immersion bridges emotion, cyberpsychology and intentions for destination visits. These studies about the VR immersive and locus of causality will be valuable in informing VR developers and tourism policymakers in developing virtual presence-quality models. Finally, researchers should examine the interrelationships between the factors of VR applications, the locus of causality and their influence on tourists’ virtual experiences.

4.2.2 Event stability and controllability dimensions. The second and third dimensions of attribution theory are stability and controllability. Stability refers to whether the event outcome is
repeatable (stable event) or not repeatable (unstable event) (Chang, 2008). Controllability refers to whether the event is under the service provider’s control (controllable) or beyond their control (uncontrollable) (Harvey et al., 2014). Regarding the stability and controllability dimensions of attribution theory, in the real world, tourists have positive behavioral outcomes when the positive events are stable and controllable (Jackson, 2019). In contrast, in negative experiences, when negative events are stable and controllable, tourists have adverse behavioral outcomes (Choi and Cai, 2016). However, tourists do not intend to behave negatively if the outcomes of the negative events are beyond service providers’ control (e.g. bad weather) (Jackson, 2019).

In the virtual reality “Metaverse”, applying the controllability and stability dimensions to predict tourists’ behavioral outcomes when they experience a VR experience is essential because it helps to understand how tourists perceive control and make their virtual experience stable influence their attitudes, perceptions and behaviors. Controllability and stability help explain why tourists may experience anxiety and reduce the likelihood of risk in a metaverse event. For instance, tourists may experience higher uncertainty and be less likely to explore whether they believe the virtual environment around them is unstable and uncontrollable. For example, suppose a traveler enters an entirely new, evolving virtual environment while in an unknown location. In that case, they may feel frightened and be less willing to take advantage of the environment’s features (Buhalis et al., 2023) until they feel that the virtual events are stable and can control their features.

Moreover, we argue that tourists may have a variety of stable and controllable experiences scenarios, both positive and negative, during their tourism metaverse experiences. For instance:

- controllable tourism metaverse positive experience: taking a comprehensive virtual tour of a destination to gain insight into its attractions;
- uncontrollable tourism metaverse positive experience: inspecting aesthetically appealing advertisements within the virtual destination;
- uncontrollable tourism metaverse negative experiences: experiencing long wait times to interact with objects in the VR destination due to algorithm issues within the VR environment;
- controllable tourism metaverse negative experience: risk of contracting malicious software, such as viruses or spam when accessing free tourism attractions online;
- unstable tourism metaverse positive experience: keeping track of ever-changing events and virtual offerings;
- stable tourism metaverse positive experience: gaining consistent familiarity with the VR tourism environment with every logon;
- unstable tourism metaverse negative experience: addressing frequent changes in the landscape layout of specific attractions with each subsequent login in the metaverse; and
- stable tourism metaverse negative experience: the inability to access higher-quality tourism metaverse experiences due to budgetary constraints.

Given the previous scenarios regarding the stability and controllability in the tourism metaverse context and according to Harvey et al. (2014) that individuals’ effort in events is usually addressed as internal, unstable and controllable. In contrast, event difficulty is addressed as external, stable and uncontrollable. Therefore, further research questions are needed to ensure positive tourist behavioral outcomes in the tourism metaverse environment considering the stability and controllability dimensions of the attribution theory (Table 2).

Asking these types of questions in Table 2 is crucial because it provides insight into key factors that influence the overall experience and well-being of tourists in the metaverse. Designing virtual tourism experiences requires an understanding of psychological concepts like locus of causality, stability, controllability and consistency. The questions also address practical considerations like security, enjoyment, budget and strategies to monitor the
environment. Answering these questions can guide best practices for developing safe, immersive and fulfilling metaverse tourism platforms. Based on the previous argument and the future research questions, the study has some theoretical propositions that it should be investigated in the future research:

**P1.** Tourists will form internal attributions (locus of causality) more for positive aspects of metaverse tourism experiences than negative ones, eliciting more external attributions.

**P2.** Temporary/unstable attributions (stability dimension) will be assigned more to negative experience aspects in the metaverse than permanent/stable attributions.

**P3.** Controllable attributions will be assigned more to positive experience aspects in the metaverse, whereas uncontrollable attributions will be dominant for harmful elements.

**P4.** Internal/controllable attributions in the metaverse will positively influence tourist satisfaction and behavioral intentions compared to external/uncontrollable attributions.

**P5.** Temporary/unstable attributions in the metaverse will positively influence tourist satisfaction and behavioral intentions compared to permanent/stable attributions.

**P6.** Tourists with higher levels of metaverse familiarity will form more nuanced attributions differing across attribution dimensions than less experienced metaverse users.

**P7.** Attributions formed in the metaverse will mirror/correlate with attributions for analogous real-world tourism experiences based on attribution dimensions. However, some variances may exist due to unique metaverse experience characteristics.

### Table 2
Future research direction of attribution theory dimensions in the tourism metaverse context

<table>
<thead>
<tr>
<th>Attribution theory dimension</th>
<th>The future research question</th>
<th>Measurements and metaverse factors each question aims to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus of causality</td>
<td>To what extent do variables such as storytelling, visuals, sound design, etc., affect tourists’ locus of causality when exploring virtual metaverse experiences? How do virtual avatars, clothes and the customization of tourists’ experiences influence their internal and external locus of causality regarding their emotions and engagement in the metaverse? How can integrating virtual architecture, art installations and game mechanics create immersive environments for tourists that consider their internal and external locus of causality?</td>
<td>Locus of causality (internal vs external control), immersion (engagement with narrative/sensory elements) Locus of causality, customization/personalization, expression of identity, emotional response Locus of causality, immersion, navigation/wayfinding, achievements and rewards</td>
</tr>
<tr>
<td>Controllability</td>
<td>How can metaverse tourism developers create controllable virtual tourism experiences that promote positive outcomes for tourists?</td>
<td>Control/interactivity, well-being, motivation, learning and knowledge acquisition Control, stress and frustration, safety, trust Security, privacy, hacking and data theft, technical performance Adaptability, new experiences, popularity trends, data-driven improvements Reliability, cost-effectiveness, scalability, tech resources Usability, disorientation, interruptions, system demands Predictability, standards, accessibility, quality assurance</td>
</tr>
<tr>
<td>Stability</td>
<td>What strategies can reduce uncontrollable negative experiences within the virtual tourism environment? What techniques metaverse tourism developers can use to minimize the risk of contracting malicious software during tourism metaverse activities? What are the benefits of tracking unstable events and offerings in the tourism metaverse? How can metaverse tourism developers create stable positive experiences with the metaverse while managing budget constraints? What challenges may arise when addressing frequent changes (unstable) in the VR environment? How can metaverse tourism developers ensure consistency when creating virtual experiences for metaverse tourists? What strategies are available to ensure a secure and enjoyable virtual tourism experience given both stable and controllable virtual events?</td>
<td>All of the above factors coupled with security, enjoyment and positive user outcomes</td>
</tr>
</tbody>
</table>

Source: Table created by authors
Tourists’ metaverse attributions will significantly predict their postexperience evaluations, including satisfaction, patronage intentions and word-of-mouth behaviors. The strategic attraction of favorable attributions can optimize these outcomes.

5. Conclusion and implications

The study of attribution dimensions in the context of tourism metaverse experiences has important theoretical implications for understanding virtual tourists’ behaviors and perceptions. Attribution theory posits that individuals make causal attributions to explain events and behaviors, influencing their emotions, motivations and actions. By examining the locus, stability and controllability of attributions made by virtual tourists, we gain valuable theoretical contributions and managerial implication insights into how and why they choose to participate in tourism metaverse activities.

Examining the different types of attributions that virtual tourists form based on internal/external, stable/unstable and controllable/uncontrollable dimensions provides a rich theoretical understanding of their metaverse experience perceptions. This enhanced comprehension aids strategic experience customization and relationship optimization efforts. Overall, applying attribution theory frameworks cultivates explanatory and predictive power crucial for maximizing metaverse opportunities responsibly from an anthropocentric viewpoint.

5.1 Theoretical contribution

Studying attribution dimensions in the context of tourism metaverse provides a more comprehensive understanding of the causes and effects involved in VR tourism events (Buhalis et al., 2023; Go and Kang, 2023; Jafar and Ahmad, 2023; Koohang et al., 2023; Wei, 2023; Buhalis and Karatay, 2022; Gursoy et al., 2022). Traditional tourism research has often overlooked the role of causal attributions in shaping tourists’ experiences (Saleh, 2023; Jackson, 2019; Choi and Cai, 2016). However, as the tourism metaverse continues to evolve, understanding the psychological processes underlying virtual tourists’ behaviors becomes increasingly important. Attribution theory, as a useful theoretical lens (Figure 3), can shed light on the factors that drive participation and engagement in tourism metaverse experiences. By considering attribution dimensions such as locus, stability and controllability, we can gain a more holistic view of virtual tourists as active meaning-makers who seek to make sense of their experiences through causal attributions (Barrera and Shah, 2023). This approach extends beyond previous studies that focused solely on the technological or design aspects of VR tourism (Gursoy et al., 2022; Tsai, 2022). The inclusion of attribution dimensions in tourism metaverse research has the potential to enrich the existing literature and generate novel insights. It contributes to a deeper understanding of virtual tourists’ behaviors and can have practical implications for the tourism industry’s management (Barrera and Shah, 2023). By studying the metaverse from the behavioral perspectives of consumers, researchers can provide valuable insights that can be applied to the tourism industry’s decision-making processes.

5.2 Managerial implications

The study of attribution dimensions has important implications for how tourism metaverse developers and managers design and market their virtual experiences. By understanding how virtual tourists attribute the causes of events and behaviors in the metaverse, developers can tailor their offerings to appeal to different attributorial tendencies. For example, locus of causality refers to internal or external attributions. Tourism metaverse businesses could target virtual tourists who tend to make internal attributions (e.g. believing their abilities led to a positive experience) by emphasizing personalization, customization and control over the experience. Meanwhile, those who make more external attributions
(e.g. believing luck or the environment led to the experience) could be targeted with marketing highlighting VR uniqueness and wonder.

For instance, a metaverse travel company could use attribution theory principles to shape user attitudes toward virtual tourism. They could design tours that allow users to experience highly realistic simulations of destinations, attributing positive sentiments like awe and excitement to the virtual experience. This could increase interest and demand for virtual tourism. Moreover, a social tourism platform in the metaverse could leverage attribution theory to encourage positive social interactions. For instance, they may design the interface to highlight common interests and values between users to foster connections. They could also have tutorials that attribute negative experiences like harassment to individual bad actors rather than the community. A metaverse training program for tourists also could apply attribution theory to improve their skills. The simulations could attribute workplace failures to fixable issues like poor communication rather than inherent flaws. This shapes tourists’ attributions in a way that encourages persistence and skills growth after setbacks in the metaverse environment rather than logging off.

Regarding stability, some virtual tourists may see the causes of events as stable and consistent over time, whereas others view them as unstable. Tourism metaverse businesses could design experiences that either build upon stable themes and narratives over time or regularly introduce new elements and variations, depending on the target segment’s attributional style. Controllability refers to the perceived ability to influence outcomes. Tourism metaverse businesses could provide virtual tourists with different levels of control and interactivity depending on their preferred level of controllability. More controllable experiences may appeal to those who want to actively shape their journey, whereas less controllable experiences allow for more passive participation. Therefore, digital tourism businesses can design and market their offerings in ways that resonate with different attributional tendencies, potentially improving engagement, satisfaction and loyalty among virtual tourists. Tailoring the metaverse experience based on locus, stability and controllability attributions may help businesses optimize their virtual offerings and benefit their business.
In summary, studying attribution theory in tourism metaverse experiences yields both theoretical and practical benefits. By exploring how virtual tourists attribute causes of events, we can enhance our conceptual understanding of their experiences and behaviors, thereby enriching the tourism literature. In addition, understanding the attributorial tendencies of virtual tourists in terms of locus, stability and controllability enables tourism businesses to design and market their offerings more effectively, catering to different attributional styles. This approach has the potential to improve engagement, satisfaction and loyalty among virtual tourists, ultimately benefiting business performance (Go and Kang, 2023; Jafar and Ahmad, 2023). Therefore, applying an attribution theory lens provides valuable insights for both tourism research and industry practice in the emerging field of the tourism metaverse.

6. Research limitation

Despite the study's significant contributions in highlighting the importance of applying attribution theory in metaverse tourism research, several limitations must be addressed to strengthen the theoretical and practical implications. First, the study focuses on the theoretical relationship between attribution theory and metaverse tourism but lacks empirical evidence to support the arguments. Future studies should incorporate experimental or survey designs to examine tourists’ attributions in the metaverse context and provide data to substantiate the theorized relationships. The study’s implications for industry practitioners may be limited without concrete evidence. Moreover, while the current study provides a valuable first step in highlighting the opportunities of applying attribution theory in metaverse tourism research, additional work is needed to address some critical limitations. Future research should incorporate empirical methodologies to examine the relationships proposed in the study and provide data to support theoretical arguments. Researchers must also specify how attribution theory’s dimensions can be measured and applied to the metaverse context to yield practical implications for industry professionals. Future research can build upon the current study to advance knowledge in this emerging area by addressing these limitations.

References


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Further reading


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