# Engaging With Avatar in Virtual Regenerative Tourism

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**Abstract**: This study explores the role of avatar tour guides in influencing travelers' environmental awareness and support for local communities within virtual regenerative tourism. Through three experimental studies, the findings reveal that avatars, strategically designed to vary in gender (female versus male),attire (naturalistic versus commercial), and communication styles (naturalistic versus commercial),play a pivotal role in cultivating rapport with tourists. This enhanced rapport not only amplifies engagement but also fosters a deeper environmental consciousness and support for local communities. The study integrates Communication Accommodation Theory and Theory of Engagement into tourism research, offering actionable insights for optimizing virtual regenerative tourism

**Keywords:** Regenerative tourism; avatar; virtual travel; rapport;engagement; environmental consciousness; community; gender; communication; sustainability

## Introduction

The advent of regenerative tourism marks a significant paradigm shift in the tourism industry, transcending the conventional practices of sustainable tourism. In the wake of the global crisis, there has been a pronounced reevaluation of tourism systems, propelling the need for an integrated approach that not only preserves but rejuvenates the environment and local communities (Bellato, Frantzeskaki, & Nygaard, 2023; Chhabra, 2021; Wang et al, 2022). Regenerative tourism, thus, prioritizes the harmonious integration of local communities and natural processes with tourism activities, with the overarching aim of enhancing both human and environmental well-being (Cheer, 2020). Its key principles encompass a dedication to sustainable practices (Becken & Kaur, 2021; Teruel, 2018), the revitalization of ecosystems and cultural heritage (Cheer, 2020; Duxbury et al., 2020), collaborative value creation among stakeholders and indigenous communities (Bellato et al., 2023; Zaman et al., 2023; Alahakoon, Pike, & Beatson, 2021), and the empowerment of local communities in tourism endeavors (Pollock, 2019), all within the context of economic viability. In this study, regenerative tourism is referred as an innovative approach that goes beyond conventional sustainability, focusing on actively revitalizing and improving destinations through a comprehensive framework that highlights restoring the environment, enriching culture, promoting overall well-being, creating value collaboratively, offering transformative experiences, and empowering communities. This concept is exemplified in various global contexts, such as the tree planting initiatives involving tourists in Maasai Mara, Kenya (Royds, 2022), and regenerative efforts in Costa Rica's Osa Peninsula (Heslinga, 2022), underscoring the practical implementation of regenerative tourism's

principles.

In this evolving landscape, virtual regenerative tourism has emerged as a novel approach to tackle the constraints posed by real-world limitations such as geographical barriers and the environmental impact of physical travel (Monaco & Sacchi, 2023). Virtual regenerative tourism refers to tourists embarking on regenerative journeys within a virtual setting. By leveraging digital technology, virtual regenerative tourism can offer immersive and interactive experiences that mimic physical travel, thereby reducing carbon emissions (S. Y. Chen et al., 2023) and extending the reach of regenerative practices to a wider audience (Shin & Jeong, 2022). This mode of tourism offers a platform for travelers to engage with diverse cultures and ecosystems virtually, mitigating the negative environmental impacts associated with physical travel (S. R. Chen et al., 2023). However, there is a discernible gap in the incorporation of avatars as a design element in virtual regenerative tourism. While virtual experiences present numerous opportunities, the potential of avatars to enhance user engagement and establish a deeper connection with regenerative tourism principles is yet to be fully explored.

Avatars, as digital embodiments in virtual regenerative tourism environments, present a unique opportunity to enhance user engagement and the efficacy of virtual experiences (de Brito Silva et al., 2022). Their interactive nature enables travelers to deeply immerse in virtual environments that reflect real-world tourism experiences (Cai, Li, & Law, 2022), playing a crucial role in educating and inspiring tourists about sustainable practices (de Brito Silva et al., 2022). However, the specific impact of avatar design elements, such as gender, clothing, and communication style, on user experience remains an underexplored area. Research has indicated the significance of these human-like attributes in shaping user-avatar relationships and overall engagement (Cai et al., 2022; Jones et al., 2022), but there is a gap in understanding their interactive effects. Wang et al. (2023) explored the interaction effects of dress and conversation style of avatar tour guide on consumers' intentions to continue using them, while ignoring the discussion of consumer different intentions in different tourism contexts, especially in virtual regenerative tourism contexts. Given the critical role of avatars as intermediaries in virtual tour contexts (Rabotić, 2010), exploring these attributes is essential for understanding how they shape tourists' attitudes and behaviors during their virtual travel experience.

This study aims to explore the influence of avatar characteristics in fostering rapport and engagement in virtual regenerative tourism, and how these factors subsequently shape tourists' environmental consciousness and their inclination to support local communities. Utilizing three between-subject experiments, the research is designed to answer pivotal questions: 1) How do avatar gender (female versus male) influence rapport building between avatar tour guides and tourists? 2) How do avatar dressing styles (naturalistic versus commercial) and communication styles

(naturalistic versus commercial) moderate the impact of gender on rapport building? 3) How does rapport building influence tourist engagement? 4) How does tourist engagement in regenerative tourism further influence tourists' environmental consciousness and support for local communities? Theoretically, this study integrates the Communication Accommodation Theory and the Theory of Engagement, offering a novel perspective that bridges technological innovation with sustainability in tourism research. This research provides practical insights for technology developers and service designers, presenting strategies to optimize design elements in order to effectively enhance virtual regenerative tourism experiences. Destination marketers can get inspirations to develop impactful campaigns that effectively promote sustainable practices, attract conscientious and supportive tourists, and encourage them to make commitments towards protecting and preserving tourism destinations.

## Literature Review

### *Regenerative tourism*

Regenerative tourism has garnered increasing attention in recent years, especially in the post-pandemic era, emerging as a critical concept in the evolution of the tourism industry (Bellato et al., 2023; Cave & Dredge, 2020). In contrast to sustainable tourism, which is well-defined in the academic literature as an approach that aims to minimize environmental and cultural impacts (Holden, 2008; Muhammad et al., 2023), regenerative tourism lacks a universally accepted definition. In academic discourse, regenerative tourism is conceptualized through several key principles (detailed in Table 1). Firstly, it is characterized by an ambition to go beyond sustainability, aiming to actively enhance and rejuvenate environmental and cultural aspects of a destination, as detailed by Becken and Kaur (2021) and Teruel (2018). Secondly, it adopts a systemic and holistic approach, recognizing the interconnectedness of ecological, cultural, economic, and social elements within a destination (Cheer, 2020; Duxbury et al., 2020). Thirdly, it emphasizes holistic well-being, extending beyond economic gains to encompass social, environmental, and cultural dimensions (Cave & Dredge, 2020; Duxbury et al., 2020). Additionally, regenerative tourism involves value co-creation with local communities and environments, promoting mutual learning and sharing among all stakeholders, and fostering tourists' self-development (Bellato et al., 2023; Zaman et al., 2023). Furthermore, it seeks to offer transformative experiences that deepen connections with nature, local cultures, and broader global issues (Teruel, 2018). Finally, it includes community engagement and empowerment, involving local communities in the development and management of tourism activities (Pollock, 2019).

Regenerative tourism, therefore, can be defined as *innovative approach that transcends traditional sustainability, focusing on actively rejuvenating and enhancing destinations through a holistic, interconnected framework that emphasizes environmental restoration, cultural enrichment,*

*holistic well-being, value co-creation, transformative experiences, and community empowerment* (visualized in Figure 1). Regenerative tourism transcends the foundational principles of sustainability by not only seeking to minimize negative impact, but actively endeavoring to maximize positive impact (Hussain & Haley, 2022). Moreover, regenerative tourism represents a more holistic and proactive approach to tourism, extending its focus beyond mere environmental conservation to encompass broader aspects such as culture, community, well-being, value, experience, and the overall enhancement of local ecosystems (Becken, 2021). Despite the increasing scholarly attention, there remains a gap in public understanding and awareness of regenerative tourism and its principles (Hui et al., 2023), which underscores the need for comprehensive education and awareness-raising efforts to facilitate informed and responsible tourist behavior, thereby ensuring long-lasting benefits for tourism destinations (Bellato et al., 2023).

Table 1: Key principles of regenerative tourism

| **Key principles** | **Explanations** | **Literature** |
|---|---|---|
| Beyond sustainability | Sustainable tourism aims to minimize environmental and cultural impacts, while regenerative tourism seeks to actively enhance and rejuvenate these aspects. | (Becken & Kaur, 2021; Teruel, 2018) |
| Systemic and holistic approach | The interconnectedness of all components within a destination – encompassing ecological, cultural, economic, and social elements. | (Cheer, 2020; Duxbury et al., 2020) |
| Holistic well-being | Promote a comprehensive understanding of well-being that goes beyond economic gains, encompassing social, environmental, and cultural dimensions. | (Becken, 2021; Cave & Dredge, 2020; Duxbury et al., 2020) |
| Value co-creation | Value co-creation with local communities and environments, mutual learning and sharing among all stakeholders, and promoting tourists' self-development | (Bellato et al., 2023; Zaman et al., 2023) |
| Transformational experiences | Offer transformative experiences that foster a deeper connection with nature, local cultures, and broader global issues | (Teruel, 2018) |
| Community engagement and empowerment | Involvement and empowerment of local communities in the development and management of tourism activities. | (Pollock, 2019) |

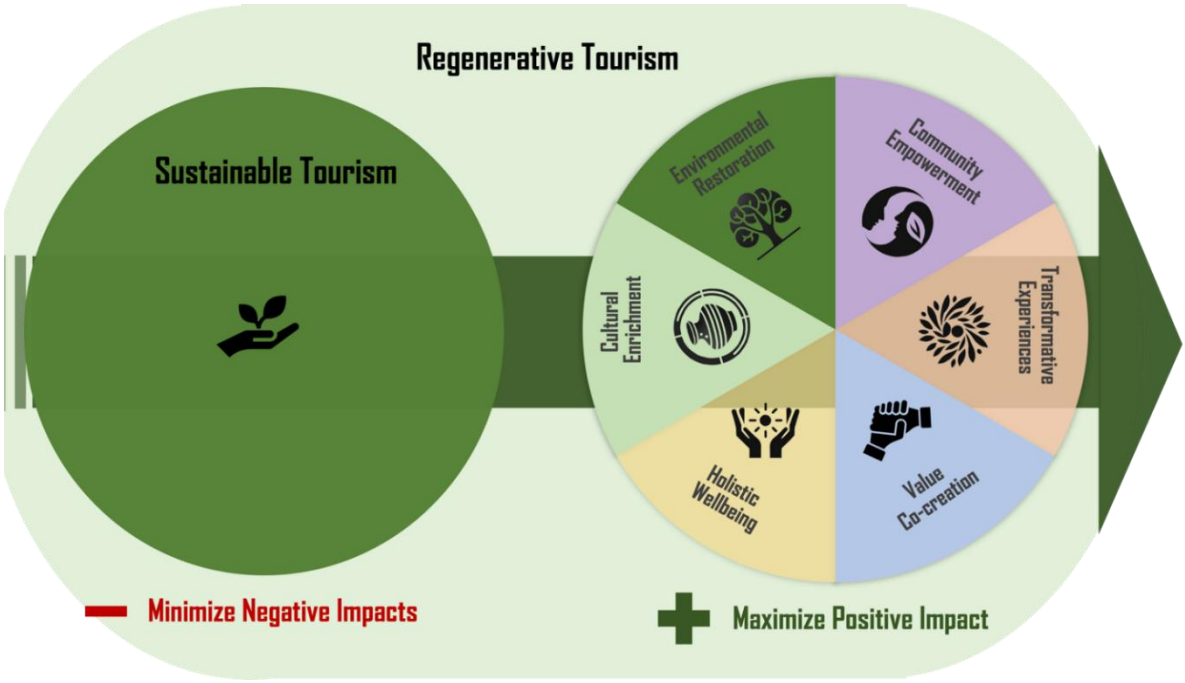


Figure 1. From sustainable tourism to regenerative tourism

*Rapport building with Avatars*

To enhance regenerative tourism and increase tourist awareness about their potential positive impacts on destinations, virtual travel and avatars offer a novel and effective approach (S. R. Chen et al., 2023). Virtual regenerative tourism has emerged as a novel approach to address the challenges posed by real-world limitations such as geographical barriers and the environmental impact of physical travel (Monaco & Sacchi, 2023). In this context, avatars, as digital representations in virtual environments, can serve as interactive tools, educating travelers about regenerative tourism practices (de Brito Silva et al., 2022). Through these avatars, tourists can visually comprehend the impact of their actions on the environment and local communities, thus encouraging responsible and sustainable decision-making (de Brito Silva et al., 2022). Moreover, avatars provide a personalized and transformational experience, potentially redefining sustainable tourism practices (Yung & Khoo-Lattimore, 2019).

Rapport building, essential for facilitating interactions and effective communication, is not only relevant between humans but also extends to interactions between humans and virtual entities (Gratch et al., 2007). In tourism, rapport building encompasses the development of a positive, harmonious connection between service providers, like tour guides, and clients, characterized by mutual understanding, trust, and shared objectives (Gremler & Gwinner, 2000; Joo & Woosnam,

2022). Establishing a strong relationship enables tour guides to better understand tourist interests and preferences, allowing them to personalize the guiding experience and create an environment that immerses visitors in the destination (Kuo et al., 2016). Therefore, rapport building plays a vital role in enhancing the quality of interactions between tour guides and tourists, resulting in more memorable and enriching travel experiences (Rabotić, 2010).

According to the Communication Accommodation Theory, individuals adjust their communication to align with their conversational partners, fostering social harmony and rapport (Giles & Ogay, 2007). Research across various fields indicates a propensity for individuals to establish rapport more easily with women, attributed to perceptions of warmth and approachability (Nowak & Rauh, 2005). In physician-patient interactions, Jefferson et al. (2013) noted gender-based differences in rapport-building, with women showing more inclination toward these behaviors. Similarly, Krämer et al. (2016) found a preference for female virtual agents in instructional settings. However, there is a gap in research examining the role of gender and the degree of intimacy in rapport building between tourists and virtual guides. To address this, the following hypothesis is proposed:

***H1***: The gender of avatars has a significant impact on tourists' rapport building, with tourists being more likely to build rapport with female avatars compared to male avatars.

*Engagement*

Engagement, as Kumar et al. (2019) define, is the extent of a customer's resource investment in interactions with an entity, characterized as a dynamic state specific to interactions and relationships. It includes various dimensions like customer engagement, behavior, and engagement marketing (Harmeling et al., 2017; Hollebeek et al., 2019). Seen as a key success indicator for businesses, customer engagement contributes to both direct outcomes, such as transactions, and indirect outcomes like brand loyalty (Kumar et al., 2019). Attributes like value co-creation and relationship building are vital for fostering engagement, crucial for forming long-term customer relationships (Hollebeek, 2011; Kumar et al., 2019; Sashi, 2012).

In virtual environments, user-avatar engagement is gauged by the degree of user connection and involvement with avatars (Jones, et al. 2022). Successful virtual environments hinge on this engagement, measurable through user activity metrics like time spent, interaction frequency, and communication volume (Feldon & Kafai, 2008). Enhancing this engagement, particularly in virtual tourism, involves fostering rapport, as the lack of connection and willingness to engage can impede effective interaction. Therefore, we propose that:

***H2***: Rapport building has a positive impact on tourists' engagement.

*Environmental consciousness*

Environmental consciousness in tourism reflects tourists' awareness and concern for environmental issues, with a preference for eco-friendly destinations (Ashraf et al., 2020). Rooted in an individual's values, it influences decision-making and pro-environmental actions, affecting attitudes and behaviors towards sustainability (Ashraf et al., 2020; Liu, Zhao, & Jang, 2021; Schlegelmilch, Bohlen, & Diamantopoulos, 1996). Previous research indicates that environmental consciousness not only shapes perceptions of ecological issues but also guides practical behaviors like energy conservation and recycling (Wang et al., 2018).

Engagement is positively linked to environmental behaviors and attitudes. Engaged individuals are more inclined to assume responsibility and commit to environmental preservation, leading to sustainable actions (Nkoulou Mvondo et al., 2022). The Theory of Engagement emphasizes the role of positive attitudes and behaviors in fostering environmentally friendly practices, particularly pertinent in tourism where engagement can transform environmental awareness. Thus, the hypothesis is proposed that increased engagement enhances tourists' environmental consciousness, suggesting that a deeper engagement with environmental issues leads to stronger commitment to sustainable practices.

***H3***: Engagement has a positive impact on tourists' environmental consciousness.

*Support for local communities*

The concept of support for local communities in tourism, deeply embedded in community-based tourism principles, represents a holistic commitment by tourists towards the well-being of local communities. This commitment transcends mere financial assistance, embodying an active engagement in initiatives that foster economic growth, cultural preservation, social betterment, and environmental stewardship. As Bagri & Kala (2016) outline, this concept is not just about aligning with responsible tourism practices but also about making a purposeful contribution to the socio-economic enrichment of local communities. Engaging tourists with local enterprises and cultural traditions cultivates a symbiotic relationship with host communities, steering tourism towards a more sustainable and inclusive path as suggested by Boonratana (2010). This approach seeks to balance inclusivity and mitigate negative impacts such as environmental degradation, thereby redefining tourism as a force for positive change and focusing on holistic development that benefits all stakeholders (Walker, Lee, & Li, 2021).

In line with the Theory of Engagement, there is a documented correlation between increased engagement and positive behavioral outcomes, including a heightened sense of environmental responsibility (Ashraf et al., 2020; Lin & Niu, 2018). In the innovative context of virtual regenerative

travel with avatar guides, this research posits that heightened engagement in virtual interactions can catalyze sustainable actions. It also acknowledges a reciprocal relationship, where individuals with a pronounced environmental consciousness are more likely to actively contribute to local economic and community initiatives (Ashraf et al., 2020, Shin & Kang, 2021). This multifaceted understanding underpins the forthcoming hypotheses, which aim to dissect the complex interplay between virtual engagement, sustainable behavior, and community support within tourism:

***H4***: Engagement drives positive changes in support for local communities.

***H5***: Environmental consciousness fosters positive effects on support for local communities.

*Interaction between gender, clothing, and communication styles*

The interplay of gender, clothing, and communication styles in virtual environments presents a complex dynamic. Gender differences in communication, recognized universally across various cultures, often depict women as employing a more convergent and accommodating communication style (Tannen, 1991; Gallois & Pittam, 1996). Additionally, clothing serves as a potent nonverbal communicator, reflecting aspects of personality, status, and cultural background in social interactions (Johnson, Schofield, & Yurchisin, 2002). Although studies have investigated the effects of avatar gender and clothing, their combined impact remains underexplored. For example, Jones et al. (2022) found that female avatars in professional attire were deemed more authentic than those in casual attire, aligning with male avatars' clothing style.

Furthermore, the clothing style of robots has been shown to influence initial perceptions of their expertise and likability, even affecting the perceived gender of a robot and consequently the information inferred from it (Hindriks, Hagenaar, & Huckelba, 2022). In a virtual regenerative travel context with avatar tour guides, avatars in naturalistic attire may reinforce typical gender perceptions (e.g., female avatars seen as less psychologically distant). In contrast, commercially oriented attire, like business clothing, might disrupt these gender categorization effects and increase psychological distance, particularly with female avatars (Choi, Mehraliyev, & Kim, 2020). Given these insights, the following hypothesis is proposed:

***H6***: The effect of gender on rapport building is moderated by the clothing of the avatar, such that a female avatar dressed in naturalistic attire will have a more favorable impact on rapport building than a male avatar, and this effect will be reduced when the avatar is dressed in commercial attire.

Communication style and message framing are pivotal in establishing rapport in the travel industry (Zhao et al., 2023), especially in the context of pro-environmental travel (S. R. Chen et al.,

2023). Based on the Communication Accommodation Theory (Giles & Ogay, 2007), individuals tailor their communication to reflect their beliefs and goals in social interactions. When avatars employ a naturalistic communication style, it resonates with tourists' desires for local community connection and environmental engagement. Female avatars, often perceived as closer and more approachable due to stereotypes of warmth and nurturing, are likely to enhance rapport in these scenarios. Conversely, a commercial communication style, focusing on professional knowledge and agency objectives, might increase the psychological distance with female avatars, potentially hindering rapport building. Hence, the following hypothesis is framed, and the theoretical framework of this study is shown in Figure 2.

> ***H7***: The effect of gender on rapport building is moderated by the communication style of the avatar, such that a female avatar with a naturalistic style will have a more favorable impact on rapport building than a male avatar, and this effect will be reduced when the avatar communicates with commercial style.

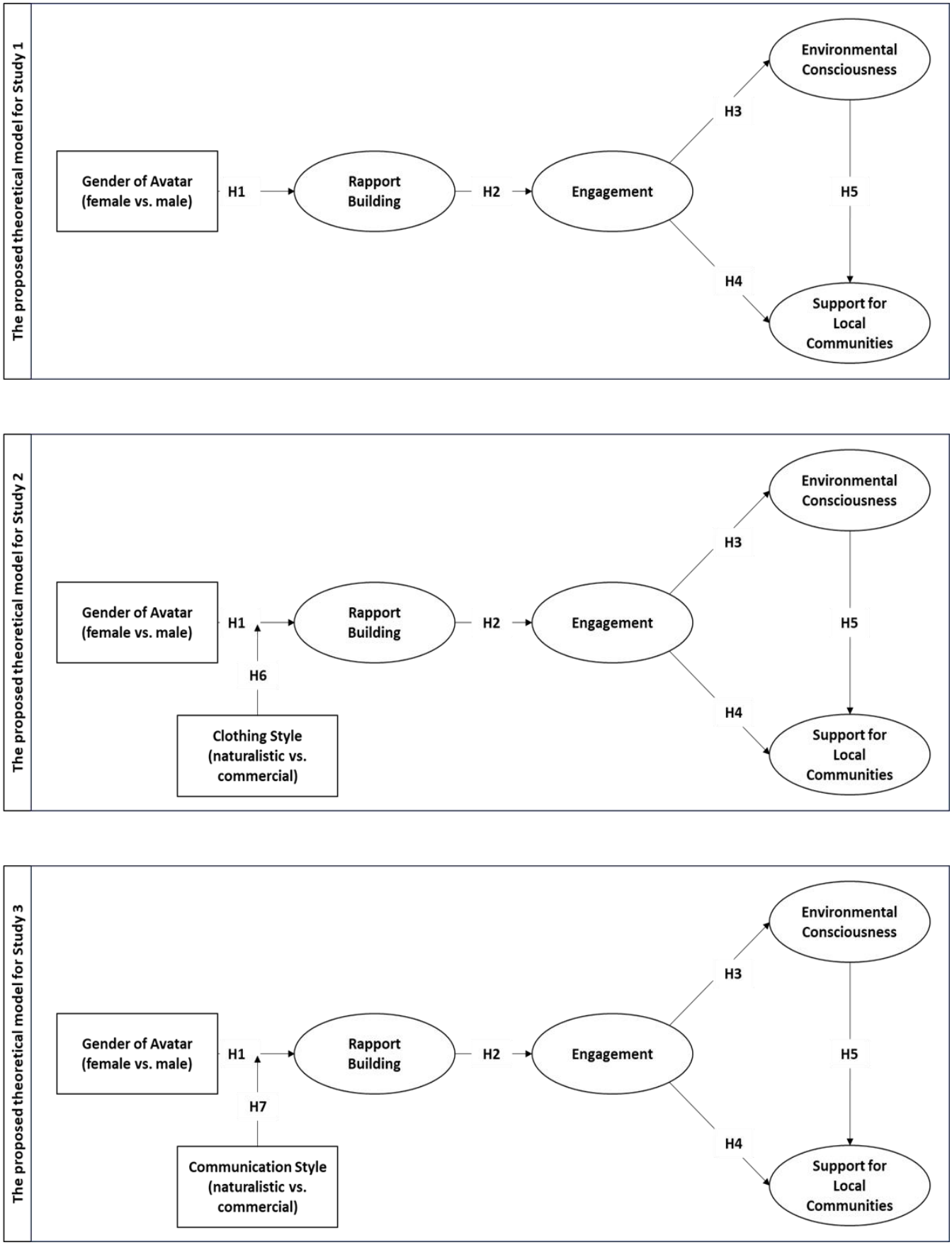


Figure 2: Conceptual framework of three studies

## Method

This study adopts an experimental design to investigate the causal effects of avatars and their characteristics, utilizing three between-subject experiments to test the proposed theoretical model. To ensure a diverse and representative participant pool, we used Prolific, a US-based platform, recognized for providing reliable data sources for social scientific experiments (Palan & Schitter, 2018). Utilizing Prolific for online surveys is advantageous due to its robust participant targeting features and high-quality data collection, ensuring a diverse and reliable respondent pool for accurate and insightful research outcomes (Palan & Schitter, 2018). Ethical considerations are a top priority, with all necessary steps being taken to secure approval from the Institutional Review Board (IRB).

Data analysis was conducted using the Partial Least Squares (PLS) method in SmartPLS4. PLS is particularly suited for this study due to its capability to analyze complex models with multiple latent variables and observed indicators. Additionally, PLS is resilient to common statistical issues such as non-normality and small sample sizes, making it an apt choice for studies with diverse data distributions. Importantly, PLS facilitates a comprehensive analysis through both measurement model and structural model evaluation, thus allowing for an in-depth examination of the theoretical model. Details of the participant demographics across the three studies are presented in Table 2.

Table 2: Demographic variables

| **Variable** | **Category** | ***Frequency (percentage)*** | | |
|---|---|---|---|---|
| | | **Study 1 (n=115)** | **Study 2 (n=246)** | **Study 3 (n=314)** |
| **Gender** | Male | 50 (43.48%) | 126 (51.22%) | 163 (51.91%) |
| | Female | 65 (56.52%) | 120 (48.78%) | 151 (48.09%) |
| **Age** | 18-44 | 115 (100%) | 203 (82.52%) | 270 (85.99%) |
| | >45 | 0 (0%) | 43 (17.48%) | 44 (14.01%) |
| **Occupation** | Employed full time | 109 (94.78%) | 238 (96.75%) | 305 (97.13%) |
| | Employed part time | 5 (4.35%) | 6 (2.44%) | 3 (0.96%) |
| | Unemployed looking for work | 1 (0.87%) | 2 (0.81%) | 6 (1.91%) |
| **Education** | High school graduate | 9 (7.83%) | 12 (4.88%) | 40 (12.74%) |
| | 4-year degree | 91 (79.13%) | 184 (74.80%) | 219 (69.75%) |
| | Some college | 3 (2.61%) | 9 (3.66%) | 6 (1.91%) |
| | Professional degree | 12 (10.43%) | 41 (16.67%) | 49 (15.61%) |

## Study 1

Study 1 focuses on exploring the impact of avatar gender (female vs. male) on rapport building and engagement within regenerative tourism. It tests hypotheses H1-H5, with H1 suggesting a preference for rapport building with female avatars, H2 hypothesizing a positive link between rapport building and engagement, H3 associating increased engagement with enhanced environmental consciousness, H4 connecting heightened environmental consciousness with greater willingness to support local communities, and H5 positing that enhanced environmental consciousness leads to increased support for local communities.

*Procedure*

In this study, 115 participants, all meeting the criteria of being above 18, proficient in English, and above high school education or equivalent, completed the survey. After a comprehensive overview and consent process, they were randomly assigned to scenarios featuring either a female or male avatar. To enhance immersion, two demo videos were crafted, each showcasing interactions with an avatar guide on a regenerative trip encompassing real-world landscapes such as local community interactions, nature, and beneficial activities. Before the study, a preliminary survey involving 60 participants ensured no significant differences in the perceived age and attractiveness between the male and female avatars, aiming to negate potential biases.

Screenshots of the avatar guides and complete demo videos are available in the online Appendix and illustrated in Figure 3. Handley et al. (2018) outlined various methods from quasi-experimental designs that enhance experiment external validity, such as analyzing the varying levels of acceptance and reach among diverse subgroups, delineating fidelity of implementation measures, and modifying the external environment. In our three studies, we utilized different avatar appearances to bolster external validity. Participants were asked to rate the realism of the experimental setting on a 7-point Likert scale (Mean=5.689, SD=0.363). The survey incorporated five attention-check questions to ensure participant engagement and data accuracy, with incorrect responses leading to data exclusion. To ensure the accuracy of the manipulation, participants underwent a manipulation check question regarding the gender of the avatar, and responses with incorrect answers were excluded from the study.

The study's measurements, adopted from established scales (detailed in Table 3), involved assessments of rapport building, engagement, environmental consciousness, and support for local communities. Rapport building was evaluated using Gremler and Gwinner's (2000) criteria, focusing on enjoyment and relatability in interactions with the avatar. Engagement was gauged through Lin et al.'s (2019) items, emphasizing the perception of immersion during avatar interactions. Environmental consciousness was measured via Huang et al.'s (2014) items, assessing concern for the environment. Lastly, willingness to support local communities was evaluated using customized items from Lee, Jan, & Yang (2013), examining readiness to contribute to local community

development.

Additionally, interest in the topic and personal identity were included as control variables, consistent across all three studies. Interest in the topic (the extent of participants' level of interest in the subject matter of the tour) was measured with four items adopted from Schiefele (1991): "I am interested in the topic of this tour," "I often seek out information on this topic," "This topic is relevant to my hobbies/interests," and "I am excited to learn more about this topic." Personal identity (the extent to which individuals perceive themselves) was measured with four items adopted from Giebelhausen et al. (2017): "Helpful," "Sympathetic," "Warm," and "Compassionate."

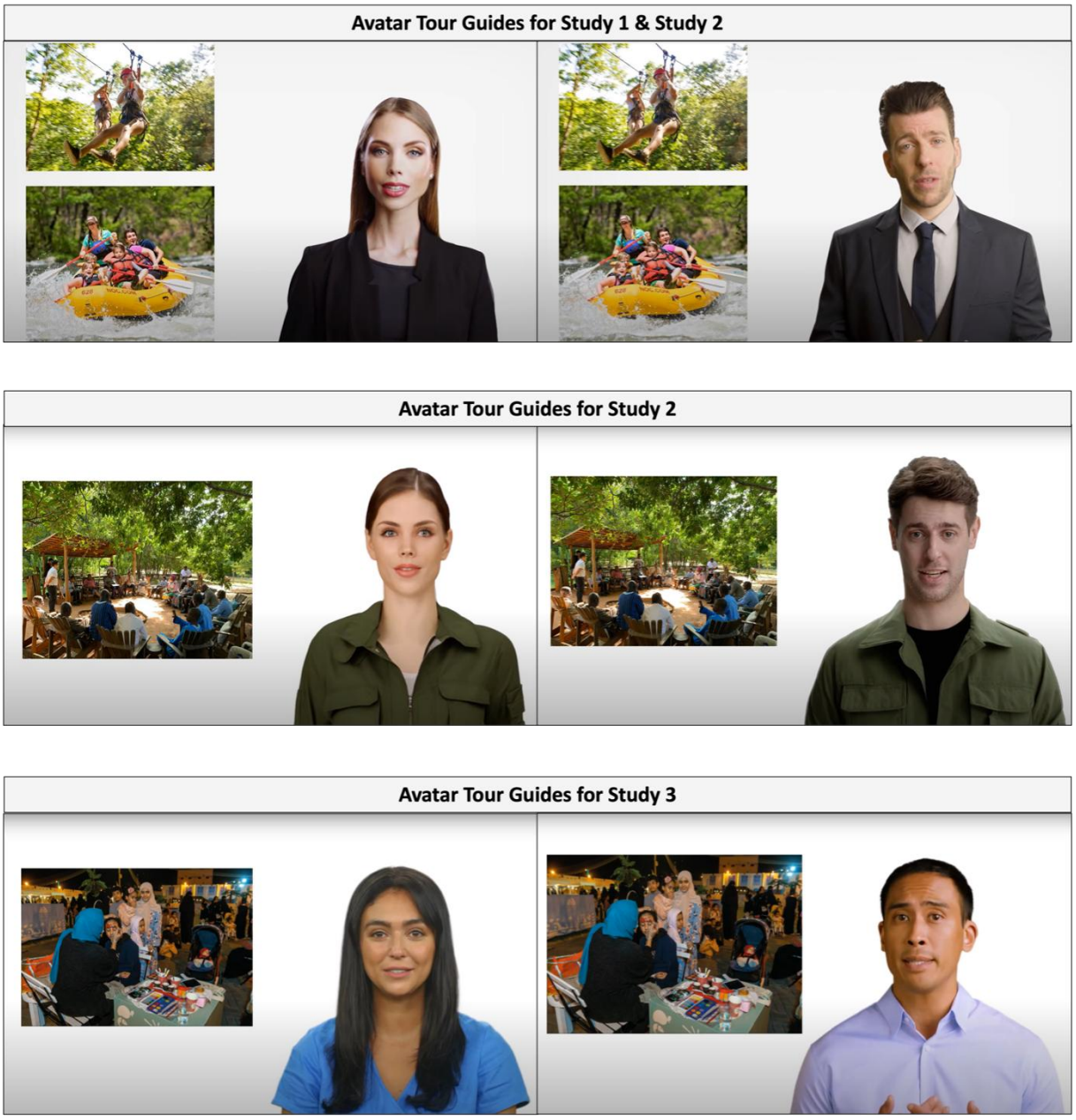


Figure 3: Avatar tour guides for three studies

Table 3: Constructs, items, and reliabilities[1]

| **Constructs and indicators** | **Outer loadings** | | |
|---|---|---|---|
| *Cronbach's alpha (AVE) Study 1/2/3* | Study1 | Study2 | Study3 |
| **Rapport building** (Gremler & Gwinner, 2000) | | | |
| *0.808 (0.679)/ 0.790 (0.557)/ 0.828 (0.616)* | | | |
| • In thinking about my relationship with the avatar, I enjoy interacting with this avatar. | 0.898 | 0.740 | 0.784 |
| • The avatar relates well to me. | 0.743 | 0.717 | 0.796 |
| • I am comfortable interacting with the avatar. | Removed | 0.780 | 0.775 |
| **Engagement** (Lin et al., 2019) | | | |
| *0.826 (0.612)/ 0.803 (0.576)/ 0.861 (0.674)* | | | |
| • Time flies when I am interacting with the avatar. | 0.783 | 0.778 | 0.855 |
| • When I am interacting with the avatar, I get carried away. | 0.8 | 0.722 | 0.765 |
| • When I am interacting with the avatar, I feel happy. | 0.765 | 0.775 | 0.840 |
| **Environmental consciousness** (Huang et al., 2014) | | | |
| *0.820 (0.604)/ 0.811 (0.589)/ 0.850 (0.654)* | | | |
| • I am aware of environmental issues. | 0.711 | 0.776 | 0.842 |
| • Environmental conservation is important to me. | 0.826 | 0.763 | 0.799 |
| • I believe in the importance of regenerative tourism. | 0.79 | 0.763 | 0.785 |
| **Support for local communities** (Lee et al., 2013) | | | |
| *0.823 (0.700)/ 0.825 (0.610)/ 0.823 (0.607)* | | | |
| • I prefer to stay in locally owned accommodations. | Removed | 0.799 | 0.776 |
| • I believe in supporting local artisans. | 0.84 | 0.779 | 0.782 |
| • I actively seek out opportunities to contribute to community projects during my travels. | 0.833 | 0.765 | 0.780 |

[1] All items measured on a 1-7 Likert type scale.

*Results*

To ensure the reliability and validity of the constructs, Composite reliability (rho_c) was employed, adhering to a threshold of 0.7 as recommended by Efendi et al. (2023). The measurement items exhibited satisfactory factor loadings, indicating a robust relationship between the observed indicators and their respective constructs, as per Fornell and Larcker (1981). We also utilized the Fornell-Larcker Criterion for assessing discriminant validity, confirming that each construct is distinct and not merely a reflection of another. This criterion checks whether the square root of the Average Variance Extracted (AVE) for each construct exceeds its correlation with any other construct (refer to Table 3). Our analysis verified the Fornell-Larcker Criterion, demonstrating strong discriminant validity among the constructs.

To mitigate common method bias, Harman's one-factor test was conducted. The results indicated no significant bias, as the variance explained by a single factor fell below the 50% threshold (Podsakoff et al., 2003). The hypotheses H1-H5 were analyzed using SmartPLS 4.0 with 5000 bootstrap samples, setting a significance level at 0.05 and a minimum t-value of 1.96 for statistical significance (refer to Table 4; Hair et al., 2017). The control variable 'interest in the topic' significantly affected rapport building (β=0.457, t=4.351, p<.001), support for local communities (β=0.153, t=2.753, p=.006<.05), while not significantly affecting environmental consciousness (β=0.148, t=1.935, p=.053>.05) and engagement (β=0.147, t=1.942, p=.052>.05). 'Personal identity' did not significantly affect engagement (β=0.149, t=1.52, p=.129>.05), rapport building (β=0.11, t=1.29, p=0.197>.05), and support for local communities (β=0.032, t=0.379, p=.705>.05), while only significantly affected environmental consciousness (β=0.242, t=2.634, p=.008<.05).

H1, predicting a preference for rapport building with a female avatar, was supported by a significant effect of avatar gender on rapport building (β=0.563, t=3.558, p<.001). H2's prediction of a positive relationship between rapport building and engagement was confirmed by a significant effect (β=0.627, t=7.427, p<.001). H3, associating engagement with enhanced environmental consciousness, also found support (β=0.570, t=5.404, p<.001).

Contrary to H4, which predicted a negative relationship between engagement and willingness to support local communities, no significant direct effect was observed (β=0.138, t=1.086, p=0.277>0.05). However, H5, which posited a positive relationship between environmental consciousness and support for local communities, was validated (β=0.584, t=8.318, p<.001), indicating mediation through environmental consciousness.

Table 4: Structural model hypotheses testing

| **Hypotheses** | **Structural Relationship** | **Path coefficient** | | |
|---|---|---|---|---|
| | | **Study 1** | **Study 2** | **Study 3** |
| **H1** | Avatar gender > rapport building | 0.563** | 0.346** | 0.414* |
| **H2** | Rapport building > engagement | 0.627** | 0.657** | 0.765** |
| **H3** | Engagement > environmental consciousness | 0.570** | 0.605** | 0.678** |
| **H4** | Engagement > support for local communities | $0.138^{N}$ | 0.398** | 0.158* |
| **H5** | Environmental consciousness > support for local communities | 0.584** | 0.442** | 0.657** |
| **H6a** | Clothing > rapport building | N/A | $-0.116^{N}$ | N/A |
| **H6b** | Clothing x gender > rapport building | N/A | 0.658** | N/A |
| **H7a** | Communication > rapport building | N/A | N/A | -0.776** |
| **H6b** | Communication x gender> rapport building | N/A | N/A | 0.793** |

Note: **Statistical significance is below 1% level; *Statistical significance is below 5% level; [N] Statistical significance is not significant.

A mediation analysis showed that environmental consciousness acted as a significant mediator between engagement and support for local communities (total effect $\beta = 0.471$, $t = 4.236$, $p < 0.001$; indirect effect $\beta = 0.332$, $t = 2.810$, $p=0.005< 0.05$). The Variance Accounted For (VAF) value of 72.82% signified a strong mediation effect, as per Hair et al. (2014), suggesting that engagement influences support for local communities primarily through environmental consciousness.

**Study 2**

*Procedure*

Study 2 broadens the scope of Study 1 by incorporating avatar attire—categorized as either naturalistic or commercial—as an additional variable. This extension is designed to explore how such attire, in conjunction with avatar gender (female vs. male), influences rapport building. The inclusion of this variable enriches the investigation, allowing for an in-depth analysis of the cultural and social subtleties impacting avatar-user interactions and providing a more nuanced understanding of the factors driving engagement. The study engaged 246 participants, of which 48.78% were female. Following a brief overview and consent process, participants received instructions similar to Study 1 and responded to identical questions based on the provided scenario and video.

Employing a 2x2 between-subject design, Study 2 examined the interplay of avatar gender and attire. Four distinct demo videos were produced for this purpose: Condition 1 with a male avatar in naturalistic attire (62 participants), Condition 2 with a male avatar in commercial attire (64 participants), Condition 3 with a female avatar in naturalistic attire (64 participants), and Condition 4 with a female avatar in commercial attire (56 participants). Prior to Study 2, a preliminary survey was conducted with 50 participants to ascertain the absence of notable variations in the perceived age and attractiveness attributes of both male and female avatars, aiming to negate potential biases. Participants were also required to select clothes of naturalistic style with five choices such as a dark green cargo shirt with multiple pockets and woven fabrics, adorned with vibrant colors and patterns. Dark green cargo shirt with multiple pockets was chosen representing naturalistic style. Despite differing in dress style—with the naturalistic style represented by a dark green cargo shirt with multiple pockets, emblematic of British military uniforms from the 1940s, and the commercial style by business attire—each condition conveyed identical information. The choice of cargo shirts reflects their cultural significance as a symbol among outdoor enthusiasts, aligning with the regenerative tourism imagery where such attire is often portrayed. To ensure the accuracy of the manipulation, participants underwent a manipulation check question regarding the gender the avatar ($M=1.484$, $SD=0.5$), and perception of attire style of the avatar with 7-likert Scale ($M=5.902$,

SD=0.896). Responses with incorrect answers were excluded from the study.

To mitigate potential biases, the avatars were consistently depicted as equally attractive and of similar age across all conditions. This careful standardization focused the analysis squarely on the variables of dress and gender, thus enhancing the study's reliability. Following the video viewing, participants answered questions on rapport building, engagement, environmental consciousness, and community support. The reliability of these measurements was verified via satisfactory composite reliability values (rho_c), and discriminant validity was confirmed to ensure the independence of the measures. Additionally, participants underwent a manipulation check regarding the avatar's gender, further validating the experimental conditions.

*Results*

The analysis of the data was conducted using SmartPLS 4.0 to evaluate hypotheses H1-H6. In the model, two covariates were included: interest in the topic only did not significantly affect support for local communities ($\beta$=0.242, t=1.92, p=0.055>.05), and personal identity only did not demonstrate significant effect on environmental consciousness ($\beta$=0.059, t=0.591, p=0.554>.05).

H1, positing that female avatars would be more effective in rapport building, was supported with a significant effect ($\beta$=0.346, t=2.753, p=.006<.01). H2's prediction of a positive relationship between rapport building and engagement was also confirmed ($\beta$=0.657, t=14.324, p<.001), as was H3's suggestion of a positive link between engagement and environmental consciousness ($\beta$=0.605, t=13.658, p<.001). H4, predicting a positive correlation between engagement and support for local communities, was validated ($\beta$=0.398, t=5.236, p<.001), and H5, regarding a positive relationship between environmental consciousness and support for local communities, was similarly supported ($\beta$=0.442, t=5.844, p<.001).

The study further examined the mediation effect of environmental consciousness. The total effect of engagement on support for local communities was significant ($\beta$=0.665, t=15.265, P<.001), and analysis including both the indirect effect ($\beta$=0.267 t=5.170, P<.001) and the direct effect ($\beta$=0.398, t=5.236, P<.001) revealed a partial mediation. The VAF value of 40.15% indicates a partial mediation effect between engagement and support for local communities, suggesting other contributing factors in this relationship.

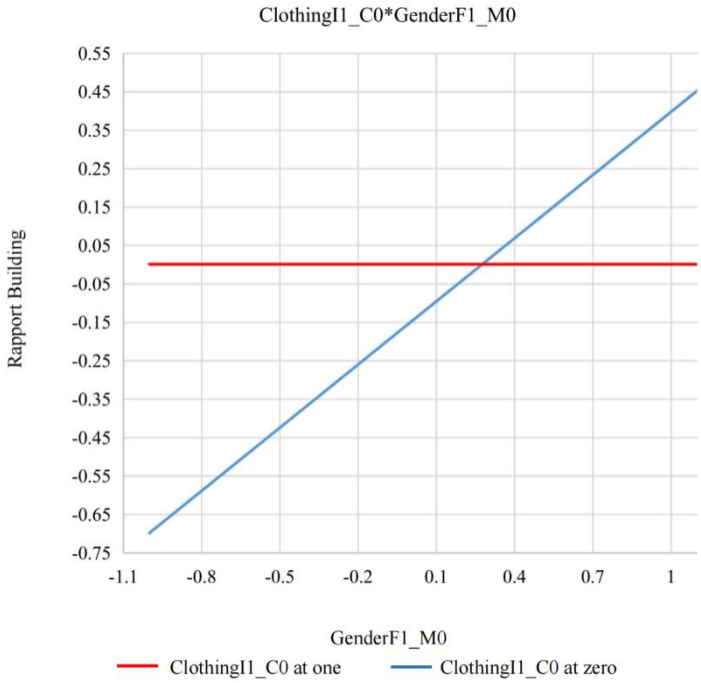


Figure 4: Slope Analysis of Clothing*Gender

Additionally, the study explored the moderating role of avatar clothing in the relationship between avatar gender and rapport building. A significant moderation effect was found (β=0.658, t=2.679, P=0.007<.01), supporting H6. This indicates that avatar clothing influences the relationship between avatar gender and rapport building. Slope analysis (Figure 4) further illustrated that the impact of avatar gender on rapport building is more marked with naturalistic attire than business attire, aligning with H6. Particularly, female avatars in naturalistic attire were more likely to foster rapport compared to male avatars, whereas no significant difference in rapport building was observed between genders when avatars wore business attire.

**Study 3**

*Procedure*

Study 3 investigates the combined effects of avatar gender (female vs. male) and communication style (naturalistic vs. commercial) on rapport building, and how this impacts individuals' engagement, environmental consciousness, and behaviors. The study enlisted 314 participants through Prolific, with 48.09% being female. After a brief introduction and consent process, participants followed instructions similar to Study 1 and answered questions based on a given scenario and video.

The study included two communication styles: commercial, emphasizing the role of a professional agency in delivering organized and informative experiences, and naturalistic, focusing

on the local community's involvement in sharing their culture and lifestyle. Both styles aimed to positively influence tourists, encouraging respect and care for the destination, albeit through different approaches reflective of their unique perspectives in the tourism experience.

A 2x2 between-subject experimental design was employed, analyzing the interplay of avatar gender and communication style. Four demo videos were produced: Condition 1 with a female avatar using a commercial style (79 participants), Condition 2 with a female avatar using a naturalistic style (78 participants), Condition 3 with a male avatar using a commercial style (78 participants), and Condition 4 with a male avatar using a naturalistic style (79 participants). The scripts for each condition are detailed in Appendix A, and visuals of the avatar guides are available in Figure 3.

Consistency in avatar attractiveness and age was maintained to control for potential biases. Participants responded to questions regarding rapport building (rho_c=0.828; Gremler & Gwinner, 2000), engagement (rho_c=0.861; Lin et al., 2019), environmental consciousness (rho_c=0.850; Huang et al., 2014), and support for local communities (rho_c=0.823; Lee et al., 2013). Discriminant validity of these measures was verified to ensure their distinctiveness. Additionally, a manipulation check was conducted by inquiring about the perceived gender of the avatar (M=1.487, SD=0.5), and perception of communication style of the avatar with 7-likert Scale (M=5.874, SD=0.990), thus validating the experimental setup.

*Results*

The data analysis in Study 3 was performed using SmartPLS 4.0 to evaluate hypotheses H1-H5 and H7. Included in the model were two covariates: interest in the topic significantly affect engagement (β=0.283, t=3.041, p<.001), rapport building (β=0.606, t=6.579, p<.001), environmental consciousness (β=0.721, t=7.465, p<.001), and support for local communities (β=0.457, t=4.44, p<.001). Personal identity significantly affects rapport building (β=0.447, t=6.545, p<.001) and environmental consciousness (β=0.133, t=1.861, p=0.554<.05).

H1, which anticipated a greater impact of female avatar gender (coded as 1) on rapport building compared to male avatars (coded as 0), found support with a significant effect (β=0.414, t=4.291, p=.012<.05). H2's prediction of a positive correlation between rapport building and engagement was confirmed (β=0.765, t=23.692, p<.001), as was H3's suggestion of a positive link between engagement and environmental consciousness (β=0.678, t=13.723, p<.001). H4, positing a positive relationship between engagement and support for local communities, was validated (β=0.158, t=2.525, p=.012<.05). H5, regarding a positive association between environmental consciousness and community support, also received support (β=0.657, t=11.252, p<.001).

The mediation effect of environmental consciousness between engagement and support for local communities was analyzed, revealing a significant total effect of engagement (β=0.603, t=10.801, P<.001). The presence of partial mediation was evident from the model, which included both the

indirect effect of engagement (β=0.445, t=8.778, P<.001) and the direct effect (β=0.158, t=2.525, p=.012<.05). The VAF, at 73.80%, indicated partial mediation.

Study 3 also explored the moderation effect of avatar communication style on the relationship between avatar gender and rapport building. This investigation found significant support for H7 (β=-0.776, t=4.199, P<0.001), indicating that the communication style of the avatar moderated the relationship between avatar gender and rapport building. Slope analysis (illustrated in Figure 5) revealed that the impact of avatar gender on rapport building is more pronounced with a commercial communication style as opposed to a naturalistic one. Specifically, female avatars in a naturalistic style and male avatars in a commercial style were more effective in building rapport, aligning with the findings supporting H7.

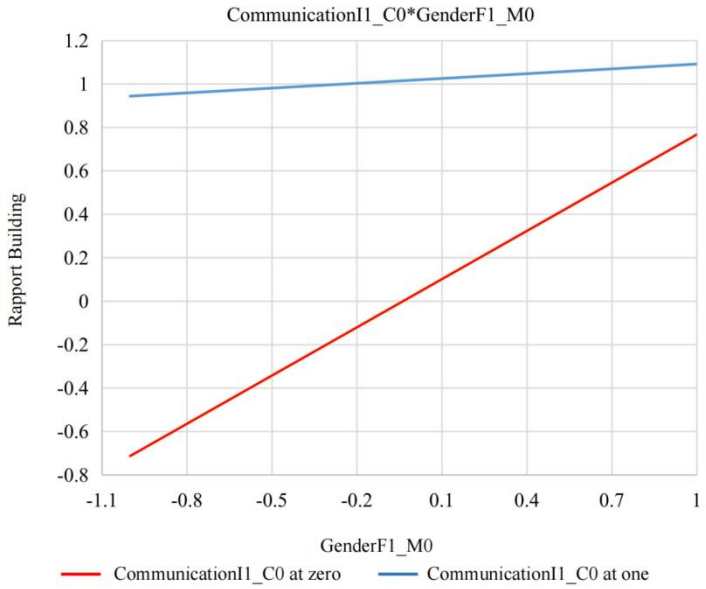


Figure 5: Slope Analysis of Communication Style*Gender

## Discussion

In conclusion, this article explored the role of avatar gender, clothing, and communication style in shaping user engagement, rapport building, environmental consciousness, and support for local communities within the context of regenerative tourism. Through three empirical studies, significant findings were obtained, providing valuable insights into the complex dynamics between avatars and individuals' attitudes and behaviors. The results consistently supported the hypotheses proposed in the study. The research revealed that individuals had a stronger inclination to establish a connection with avatars depicted as female, perceiving them as more approachable and authentic. This finding

aligns with previous research regarding how avatar gender affects people perceived authenticity and engagement (Jones et al., 2022). In addition, it was discovered that establishing a strong rapport has a positive impact on engagement, indicating that the level of connection significantly influences people's involvement with avatars during their regenerative journey. Weiler and Ham (2002) also emphasized the importance of establishing closer relationship between tour guide and tourist on enhancing travelers' engagement during their trips.

Engagement with the avatar was found to have a positive impact on environmental consciousness, highlighting the potential of avatars in enhancing individuals' awareness and concern for the environment. Consequently, this increased consciousness was linked to a greater willingness among tourists to support local communities. This finding aligns with previous research regarding how tourists' consciousness influence their responsible behaviors towards local communities (Liu et al., 2021). It underscores how avatars can encourage travelers' environmentally responsible behaviors. Moreover, the study examined the moderation effects of avatar clothing and communication style. The results revealed that the clothing of avatars, specifically naturalistic attire and the commercial communication style employed by avatars had a significant impact on rapport building and engagement. These findings highlight the importance of considering the visual and communication elements of avatars in designing effective virtual guides for regenerative tourism experiences.

*Theoretical Implications*

Findings of this study contribute significantly to theories and literature. Firstly, this study significantly contributes to the understanding of the role of avatars in fostering individuals' environmental consciousness and behaviors within the context of regenerative tourism. By investigating the influence of avatar gender, clothing, and communication style on people's perceptions and engagement, the study sheds light on how avatars can effectively promote environmental consciousness and encourage sustainable behaviors among people. This finding holds significant relevance within the realm of regenerative tourism, where actively involving tourists in sustainable practices. The study's insights can inform the development of avatar-based interventions and virtual experiences that effectively cultivate environmental consciousness and promote sustainable behaviors within tourism settings.

Secondly, the study makes a notable contribution to the field of the Communication Accommodation Theory by exploring how avatars can accommodate users' preferences and cultural norms to facilitate effective communication and rapport building, which is in line with the finding of Nowak and Rauh (2005) indicating that individuals tend to establish a more profound connection with females, primarily due to the perception of their congeniality and accessibility. By considering avatar gender, clothing, and communication style as accommodation strategies, the study extends the understanding of how avatars can adapt to individuals' expectations and cultural contexts to enhance

communication outcomes. This theoretical contribution has implications beyond the specific context of regenerative tourism and can inform avatar design and implementation in communicative contexts where accommodation plays an important role in establishing rapport and effective communication.

Thirdly, the study also advances the Theory of Engagement. By investigating the relationship between rapport building and engagement, the study highlights the importance of establishing a strong interpersonal connection with avatars to enhance user engagement. This finding emphasizes the significance of social and emotional factors in virtual interactions and provides insights into the mechanisms through which avatars can effectively engage users, which further confirms Nkoulou Mvondo et al. (2022) finding that positive experience in the context of regenerative tourism leads to higher engagement, comprising intention of positive behaviors toward tourism destinations. Understanding the factors that influence engagement in avatar-mediated interactions contributes to the understanding of engagement processes and can guide the development of immersive and engaging virtual experiences.

Fourthly, one of the notable contributions of this study is the exploration of moderation effects. By examining how factors such as avatar clothing and communication style moderate the relationship between avatar gender and rapport building, the study uncovers nuanced insights into the complex dynamics of avatar-user interactions. This finding highlights the importance of considering multiple factors simultaneously and their combined effects on people's perceptions and engagement. The identification of moderation effects adds depth to the understanding of avatar-driven communication processes and provides valuable insights for designing more personalized and contextually appropriate avatar experiences (Jones et al., 2022). Additionally, the discovery of these moderation effects paves the way for future research to investigate other potential moderating variables, thereby further refining our understanding of effective avatar-based communication.

*Managerial Implications*

The findings of this study have significant managerial implications for various stakeholders in the field of regenerative tourism and avatar-mediated communication. Tourism organizations and service providers can benefit from this study by using the insights to design and implement avatar-based virtual experiences that promote environmental consciousness and sustainable behaviors among tourists. By strategically managing avatars' characteristics, such as gender, clothing, and communication style that align with people's preferences and cultural norms, organizations can enhance user engagement and foster positive environmental attitudes and actions. This, in turn, can make a contribution to the general sustainability goals of the tourism industry and differentiate their services in the marketplace. This study also provides valuable insights for destination marketers to fully utilize virtual platforms to create engaging campaigns, promoting sustainable practices, attracting a more conscious and supportive tourist base, and advocating tourists to make commitment to protect and preserve tourism destinations.

For avatar designers and developers, this study provides valuable guidance on creating avatars that effectively engage users and promote sustainable behaviors. By considering the gender, clothing, and communication style of avatars, designers can tailor their creations to accommodate people's expectations and cultural contexts, thereby facilitating rapport and effective communication. This can lead to more immersive and persuasive virtual experiences that drive environmental consciousness and encourage sustainable actions. This study presents advantages for both tourists and consumers who have interests in regenerative tourism experiences. Avatars can an effective marketing tool for destination marketers serving as knowledgeable and persuasive guides, facilitating interactions, and offering insights into local cultures, environmental initiatives, supporting the broader goals of sustainable destination development. By interacting with avatars in the virtual world, tourists can enjoy more enriching and impactful experiences that enhance their environmental awareness and encourage sustainable behaviors throughout their trips. Likewise, after gaining a deeper understanding of the practices and principles of regenerative tourism, it will spark their greater interest in experiencing regenerative tourism in the real world. Moreover, policymakers and destination managers can leverage the insights from this study to inform sustainable tourism development policies and strategies. By recognizing the role of avatars in fostering environmental consciousness and sustainable behaviors, avatar-mediated experiences can be incorporated into destination planning and management.

**Limitations**

Despite the valuable findings and implications, this study has certain limitations that point to opportunities for future research. The primary limitation is the reliance on self-reported willingness to support communities as a measure of green behavioral intentions. Future studies should expand their scope to include diverse sustainable tourism behaviors, such as preferences for eco-friendly accommodations and direct community support. Additionally, exploring how avatar engagement affects tourists' preferences for sustainable brands would deepen our understanding of avatars in shaping eco-conscious consumer behavior.

Further research could also explore additional avatar characteristics like facial expressions, voice modulation, or body language and their interactive effects on engagement and behavior. Another important aspect is the inclusion of a broader range of gender identities beyond the binary male and female options to ensure inclusivity in findings. Expanding avatar use to different tourism sectors, such as cultural or heritage tourism, and conducting longitudinal studies would provide a more comprehensive understanding of avatars' long-term impact on sustainable tourism practices. These future directions would enrich our knowledge of virtual representation in tourism and its role in promoting sustainable behaviors.

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