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# From virtual to actual destinations: do interactions with others, emotional solidarity, and destination image in online games influence willingness to travel?

Shavneet Sharma <sup>a</sup>, Dimitrios Styliadis <sup>b</sup> and Kyle Maurice Woosnam <sup>c,d</sup>

<sup>a</sup>School of Business and Management, Laucala Campus, The University of the South Pacific, Suva, Fiji; <sup>b</sup>Department of Economics, Gallos, University of Crete, Rethumno, Greece; <sup>c</sup>University of Georgia, Park, Recreation and Tourism Management, Athens, Georgia USA; <sup>d</sup>School of Tourism and Hospitality Management, University of Johannesburg, Auckland Park, South Africa

## ABSTRACT

The line between fantasy and reality has become blurred in online gaming, whereby tourists are willing to visit associated real-world destinations they have experienced within virtual worlds (e.g. online games). This study investigates the impact of gamers' interactions with non-player characters (NPCs) and other gamers on their in-game emotional solidarity, destination image and willingness to visit associated real-world destinations. Data were collected from 538 Grand Theft Auto 5 gamers and analysed using covariance-based structural equation modelling (CB-SEM). Results reveal that both gamer-NPCs and gamer-gamer interactions were positively associated with emotional solidarity with NPCs and gamers, respectively. Also, emotional solidarity with NPCs and emotional solidarity with gamers were positively associated with in-game cognitive image. The in-game cognitive image was further confirmed to be positively associated with affective image and conative image. The in-game conative image was confirmed to be positively associated with the willingness to visit associated real-world destinations. These findings make a novel contribution to the literature on online gaming and tourism. Game developers need to develop activities that promote interactions between gamers while also designing NPCs that resemble locals and their customs to facilitate increased visitation to real-world destinations.

## ARTICLE HISTORY

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## KEYWORDS

Resident interaction; gamer; non-player characters; emotional solidarity; cognitive image; affective image; conative image; willingness to travel

## Introduction

Media-related tourism refers to tourists' visits to destinations associated with film, television, and books, among others (Dubois & Gibbs, 2018). This phenomenon has been extensively studied throughout recent decades (Iwashita, 2008; Lee et al., 2008; Mercille, 2005) as both researchers and practitioners are keen to understand factors influencing tourists' behaviour and their travel-related decision-making processes (Afshardoost & Eshaghi, 2020; Pan et al., 2021). However, most of these studies have focused on a limited range of media, such as television and films, with little emphasis on the fast-growing and multi-billion dollar gaming industry (Dubois et al., 2021; Dubois & Gibbs, 2018). With advancements in technology, the gaming industry has been transformed (Sharma et al., 2021b). The introduction of 3D graphics has allowed game developers to create virtual planets and cities that gamers can explore and interact with in-game objects (such as wildlife, artefacts, and vehicles) by computing and building realistic physical characteristics and

textures. For example, in the game 'Spider-Man: Miles Morales', gamers explore New York City, including its most iconic landmarks. Similarly, 'Assassin's Creed Unity' allows gamers to walk around Paris; 'Watch Dogs Legion' enables gamers to explore London, including its famous landmarks, while its previous versions familiarised gamers with Chicago and San Francisco. Online games, similar to other means of popular culture embedded in everyday life, can provide substantial information about a destination in a rather short period of time (Kim & Richardson, 2003). Such information is also perceived as unbiased and genuine, in contradistinction to induced image formation agents like brand advertising that suffer from lower levels of credibility (Govers et al., 2007). Travelling and gaming go hand-in-hand as both involve adventure, wonder, and exploration. Gamified locations in open-world games showcase the depth and breadth of real-world destinations while capturing its culture and essence.

The gaming industry, with 3.24 billion players globally, is expected to exceed \$200 billion in value by 2023 (Gardner, 2020). Revenue from gaming is expected to surpass the film and sports industry combined (Gilbert, 2020). Gaming is seen as a persuasive technology (Xu et al., 2017) that is an effective tool in influencing individuals' behaviour (Ghanbari et al., 2015) and attracting tourists (Hsiao & Tang, 2021; Wong & Lai, 2021). Tourism studies have acknowledged the role of location-based augmented reality (AR) games in this process (Tabacchi et al., 2017). Aluri (2017) revealed that most respondents in his study used mobile augmented reality (MAR) games like Pokémon Go as a travel guide to highlight points of interest such as landmarks, cultural, historical objects, and physical structures. Kuo et al. (2021) highlighted that the Pokémon Go Safari Zone event attracted tourists to many cities worldwide, which increased the use of the bike-share systems. Additionally, Lacka (2020) found that location-based AR games influence gamers' destination visit intentions due to the knowledge and familiarity acquired during gameplay. Another study conducted by An et al. (2021) highlighted that satisfaction with virtual reality (VR) travel experience influenced intention to visit the focal destination. Destination knowledge and familiarity as such are cultivated and facilitated via AR games, which, like other media, increase the volume of players' destination-related experiences, thereby determining tourist perceptions and behaviour (Terzidou et al., 2018). Notable is that individuals with higher levels of subjective knowledge of the destination, such as VR gamers, tend to depend more on their personal knowledge rather than on other information sources when selecting a tourist destination (Sharifpour et al., 2014).

Despite these studies conducted on gaming and tourism, the vast majority has focused on location-based AR games and VR. No prior studies appear to have examined how in-game destination image determines gamers' willingness to visit associated real-world destinations. Furthermore, although interactions between gamers themselves and between gamers and non-human characters of the video games (non-player characters, called NPCs) are prominent in such context, their role in shaping in and out of game destination image are little understood. Recent tourism research has established the positive effects of resident-tourist interactions and tourists' emotional solidarity with residents on tourists' destination image (Stylidis, 2020; Woosnam et al., 2020).

Based on the above discussion, this study aims to explore the role of emotional solidarity with NPCs and other gamers; along with the role gamers' interactions with NPCs and other gamers collectively play in shaping gamers' cognitive, affective, and conative image and their intention to visit a physical destination first explored in the online game environment. This study offers a novel investigation of online gamer interactions, emotional solidarity, and in-game destination image together with gamers' willingness to visit corresponding real-world destinations. It further applies Vygotsky's (1978) 'more knowledgeable other' (MKO) concept in the virtual environment, exploring the role of interactions with NPCs (similar to locals in tourist destinations) on emotional solidarity and in-game destination image. Next, this research expands the generalisability and applicability of the interaction quality scale developed by Stylidis et al. (2021) in measuring gamer-NPC and gamer-gamer interaction quality in online games. Additionally, this study offers unique insights into the gamer-gamer interactions in an online game like tourist-tourist interactions in real-world interactions and its potential to enhance emotional solidarity and in-game destination image. Moreover, this study

contributes to the literature on destination image in the novel context of online games by investigating emotional solidarity with NPCs and other online gamers influencing in-game destination image formation. Lastly, the study is the first to apply destination image formation to an online open-world game. In doing so, it explores the importance of affective, conative, cognitive image factors in the virtual worlds of online games. All these offer tourism authorities and place marketers unique destination marketing opportunities, given the prominent role of video games and their penetration in modern culture.

## Literature review

### *Social interactions and emotional solidarity*

The role of social interaction in cognition and affective process development was highlighted in the seminal work by Vygotsky (1978). This study in the field of psychology and education examines the 'zone of proximal development' (or ZPD) that includes the notion of the 'more knowledgeable other' or MKO (Vygotsky, 1978). According to Vygotsky (1978), ZPD is characterised as the 'distance between the actual development level as determined by independent problem-solving and the level of potential development as determined through problem-solving under guidance or in collaboration with more capable peers.' The MKO plays a critical role by supporting the interaction through verbal communication as it has greater experience and knowledge than the learner relating to the concept, process, or task (Lave & Wenger, 1991). Tourism studies such as Stylidis et al. (2021) have utilised the ZPD to examine the destination knowledge tourists process on their own compared to the knowledge gained through interactions with other MKOs like local residents and tourism employees. Stylidis et al. (2021) further confirmed that visitors' engagement and interaction with key informants, such as local residents, positively affect their image, satisfaction and loyalty to the destination. Additionally, tourists have exemplified this through sharing images and perceptions gained from locals through interactions and creating novel perceptions of destinations (Tobach, 1995). During visits to destinations, locals play the role of ambassadors to the location (Hudson & Hawkins, 2006) and recommend facilities and attractions (Shani & Uriely, 2012). Vygotsky further supported the sociogenesis of mental functions (e.g. perceptions) (Eun, 2019). Knowledge is developed, in his terms, in daily interactions without always a systematic or formal instruction, such as those occurring between Gamer-NPC and Gamer-Gamer. Interaction is considered as one of the five key components of the tourist engagement model proposed by Rasoolimanesh et al. (2019), referring to the share and exchange of ideas, thoughts, and feelings about one's experiences with the destination (Taheri et al., 2014). Social interactions such as those between tourists with other tourists or locals give shape to tourist experience (Lin et al., 2019). Han et al. (2021) concluded that tourist-tourist social interaction contributed towards both co-creation and co-destruction of tourists' experiences among Chinese visitors in Japan.

Joo et al. (2018) further reported that frequency of interaction reduces the social distance between residents and tourists. That is, it increases affinity and decreases avoidance. Additionally, studies have shown that interaction influences emotional solidarity and social distance between residents and tourists (Joo et al., 2018). Emotional solidarity refers to an individual identifying with another (Jacobs & Allen, 2005). Based on the above discussion, this study assumes that when gamers interact with NPCs and other gamers (both considered MKOs) in the online game, they develop emotional bonds by forming friendships and relationships. Based on the above discussion, the following hypotheses are proposed.

**H<sub>1a</sub>:** Gamer-NPC in-game interaction will be positively related to the former's emotional solidarity with the latter.

**H<sub>1b</sub>:** Gamer-gamer in-game interaction will be positively related to the former's emotional solidarity with the latter.

### ***Emotional solidarity and destination image***

Emotional solidarity is derived from emotional closeness and trust, which marks the closeness between individuals (Bahr et al., 2004). The concept of emotional solidarity is distinct from place attachment which refers to the dependence of an individual to a location or how an individual identifies with it (Stylidis, 2018). This has been extensively applied in the tourism context with a focus on locals' relationships with tourists. Very few studies have been conducted from the perspective of tourists (Joo et al., 2017; Woosnam & Aleshinloye, 2013), while even fewer have examined the outcomes of this emotional solidarity (see (Ribeiro et al., 2018; Woosnam et al., 2015)). Woosnam et al. (2020) highlighted that more studies are required to examine tourists' emotional solidarity's impact on destination image.

Destination image is a subjective concept that includes peoples' feelings, impressions, ideas, and beliefs towards an area, city, or country (Baloglu & Brinberg, 1997). It refers to building a positive image towards a place by developing a consistent elemental mix to identify and distinguish a location (Cai, 2002). Gartner (1994) highlighted that it consists of three inter-relational and hierarchical components: cognitive, affective, and conative image. Cognitive image refers to evaluating the destinations' attributes by individuals who might have visited and not visited the destination (Papadimitriou et al., 2018). The attributes refer to the destinations' resources (Woosnam et al., 2020). Affective image refers to an individual's feelings and emotional response towards a destination (Hallmann et al., 2015). Studies have shown that these emotions develop during the span of the trip (Stokols & Altman, 1987) or the destination selection phase (Gartner, 1994). Lastly, the conative image is the action element of destination image.

Studies, in particular, have explored tourists' emotional solidarity with residents and its relation to destination image (see (Stylidis, 2020; Stylidis et al., 2021). Ribeiro et al. (2018), for example, offered support for the link between emotional solidarity and loyalty, neglecting however, the imperative role cognitive and affective image play in this process. Recently, Woosnam et al. (2020) confirmed that emotional solidarity positively influences the cognitive, affective, and conative destination image. Arguably, it would be hard to comprehend a place and its image without acknowledging the role residents play in image development based on interactions and relationships that ensue between hosts and guests. Based on the above discussion, the following hypotheses are proposed.

**H<sub>2a</sub>:** Gamers' emotional solidarity with NPCs will be positively related to in-game cognitive image.

**H<sub>2b</sub>:** Gamers' emotional solidarity with NPCs will be positively related to in-game affective image.

**H<sub>2c</sub>:** Gamers' emotional solidarity with other gamers will be positively related to in-game cognitive image.

**H<sub>2d</sub>:** Gamers' emotional solidarity with other gamers will be positively related to in-game affective image.

### ***Cognitive image, affective image, conative image and intention to visit***

Gartner (1994) was perhaps the first to propose a hierarchical relationship between tourism's cognitive, affective and conative image. The relationship between cognitive and affective images has been established, with many studies confirming that the former explains the latter, while others claim the reverse (Woosnam et al., 2020). Affective image sometimes serves as the initial response to a destination, leading to actions from an individual towards a destination (Walmsley & Young, 1998). Studies, for example, have highlighted the positive association between affection towards a place and cognitive evaluation of the destinations' attributes (Billig, 2006; Rollero & De Piccoli, 2010). However, other researchers have shown that destination knowledge influences destinations' affective perceptions (Baloglu & McCleary, 1999; Boo & Busser, 2006). Studies such as Lin et al. (2007) and Li et al. (2010) have supported that tourists initially cognitively assess a destination before developing feelings towards it. Recently, Woosnam et al. (2020) recently confirmed the

positive association between cognitive and affective image in the context of repeat visitation. Qu et al. (2011) and Styliadis et al. (2017) further concluded that both cognitive and affective image shape the conative image of a destination, while this structure was also evidenced in Zhang et al. (2014) meta-analysis of 66 studies on destination image. Recently, Lee and Jan (2021) also confirmed that the affective image is positively associated with conative image among Taiwan festival attendees. Prior studies though have not examined these associations in the context of in-game virtual destinations. Based on the above discussion, we assert that in-game cognitive image is positively associated with the in-game affective image; while both cognitive and affective give shape to in-game conative image. Therefore, the following hypotheses are proposed:

**H3:** Gamers' in-game cognitive image will be positively related to their in-game conative image.

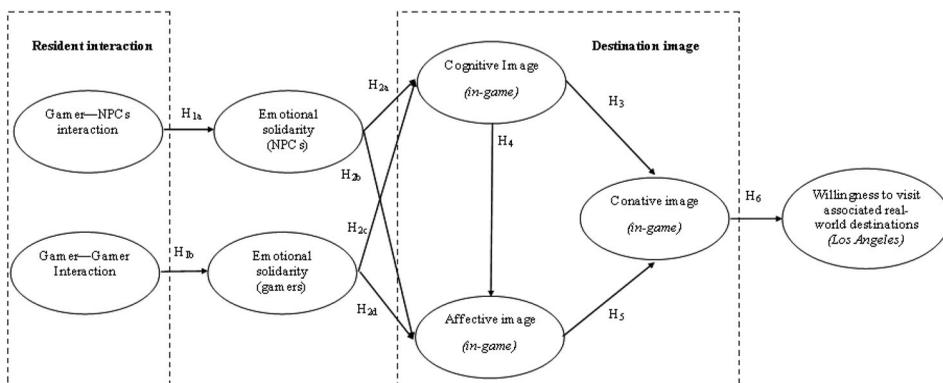
**H4:** Gamers' in-game cognitive image will be positively related to their in-game affective image.

**H5:** Gamers' in-game affective image will be positively related to their in-game conative image.

Prior studies have used behavioural intention and conative destination image interchangeably (King et al., 2015; Prayag, 2009); however, evidence was provided by studies relating to the differences between the two constructs (Perugini & Bagozzi, 2004; White, 2014). Loureiro and Jesus (2019) who investigated tourist visitation behaviour to Rio de Janeiro confirmed that conative image positively influenced revisit intention. The conative image was also found to impact revisit intention and willingness to recommend among Mazandaran tourists (Taghipourian et al., 2019). Similar results were reported by Stylos et al. (2016) on the association between conative image and visit intention. Considering the latter, virtual reality is known to reconceptualise the idea of space and time, real and imaginary (Mura et al., 2017), a new way of perceiving imaginary space and determining decision making (Williams & Hobson, 1995). Virtual reality thus provides informational support, facilitating the destination selection process (Caciora et al., 2021). This study claims that conative image from in-game images would influence gamers to visit the real-world destination depicted in the game. Therefore, it is hypothesised that:

**H6:** Gamers' in-game conative image will be positively related to their willingness to visit associated real-world destinations.

Based on the ten hypothesised relationships outlined above, a conceptual framework is developed to illustrate the relationships between the study's variables. These relationships are presented in Figure 1.



**Figure 1.** Conceptual framework.

## Research methods

### Data collection

This study examined online gamers' interactions, emotional solidarity, destination image and behavioural intentions towards an in-game destination and their willingness to visit an associated real-world destination. The target population consisted of Grand Theft Auto (GTA) 5 gamers in Fiji. GTA 5 is an open-world action-adventure game developed and published by Rockstar. The game takes place in the City of Los Santos, which represents real-world Los Angeles. The game was selected based on its popularity – it is considered one of the best open-world games ever created (Horti, 2021). The survey was open to online GTA 5 gamers on all gaming platforms, including PC, Xbox, and Play Station, to enhance the finding's generalizability across the major gaming platforms (Liao et al., 2020). According to Yang et al. (2017) and Liao et al. (2020), studies can best examine gaming's social aspects by studying online gamers.

Prior to the main data collection, a pilot study with 20 GTA 5 gamers was undertaken to ensure the relevance and clarity of the survey instrument. A cross-sectional survey design using an online survey was conducted on Facebook as this social media platform is the most popular within Fiji (Sharma et al., 2020b). Fiji is an island country located in the South Pacific (Singh et al., 2021a; Singh et al., 2021b). The link to the online survey was distributed to 'PSxPCGamers Club - Fiji' members. 'PSxPC Gamers Club - Fiji' is the largest online gaming group on Facebook for this study population, with approximately 7,200 members. Random sampling was performed by obtaining a list of all group members, with permission from the group administrators to send the survey link to its members randomly. Two thousand members were randomly selected from the list, and a link to the survey instrument was sent via Facebook. Other studies on gaming have used this data collection approach (e.g. (Sharma et al., 2021a; Sharma et al., 2021b)). Screening questions were included to ensure only current GTA 5 games in Fiji participated in the survey. The data collection was conducted between October and November of 2021. Kline (2015) suggested that the minimum sample size be determined by multiplying the number of study items by 10. As such, based on 52 items in the survey instrument, the sample size ought to be more than 520. This sample size determination method was also employed by Kumar et al. (2021). A total of 547 responses were received from the 2,000 potential participants that were invited, yielding a response rate of 27.35%, which is above the suggested 20% threshold (Malhotra & Grover, 1998; O'Leary-Kelly & Vokurka, 1998) (see Appendix B).

### Measures

Pre-validated scales measuring each model construct were utilised in the questionnaire. To ensure that the measures were robust, three expert academics in information systems, marketing, and tourism were invited to assess the questionnaire and make suggestions for improvements. Minor changes were proposed, which were incorporated to enhance the face validity of the items. All items and measures are presented in Appendix A. Interactions with NPCs consisted of three items that were adapted from Styliadis et al. (2021). Interactions with gamers consisted of three items that were adapted from Styliadis et al. (2021). Six items were used to measure gamers' emotional solidarity with NPCs (three items) and other gamers (three items), adapted from Tasci et al. (2021). Cognitive image was a multidimensional scale consisting of 17 items adopted from Styliadis et al. (2017). The dimensions included social environment (e.g. friendly local people, good value for money, a clean environment, personal safety and security), accessibility (e.g. convenient transportation, easily accessible), attractions (e.g. good nightlife, interesting historical sites, interesting festivals, variety of tourist activities), amenities (e.g. quality hotels, appealing cuisine, service quality, variety of shops), and natural characteristics (e.g. scenic beauty, pleasant weather, nice beaches). The affective image consisted of four items adapted from Woosnam et al. (2020), while the conative image consisted of three items adapted from Woosnam et al. (2020). Willingness to visit destination

(Los Angeles) consisted of three items that were adapted from (Nah et al., 2011). Responses across all construct items were recorded using a 7-point Likert scale ('1' denoting 'strongly disagree' to '7' denoting 'strongly agree.')

### **Control variables**

Prior studies (see (Molinillo et al., 2021; Rather & Hollebeek, 2021; Untaru & Han, 2021) have shown that consumer behaviour is often influenced by education, income, age, and gender. These measures were considered control variables in this study to ensure that the findings were not dependent on differences resulting from these constructs.

### **Results**

A two-stage CB-SEM was performed using SPSS (version 26) and AMOS (version 26). This involved assessing the appropriateness of the measurement model using confirmatory factor analysis (CFA), followed by CB-SEM used to test the proposed hypotheses.

The data screening process was thoroughly performed to highlight incomplete, unengaged responses and check for normality of distribution and multicollinearity. This resulted in the removal of six responses. Kurtosis and skewness values were used to assess the normality of distribution. Results presented in Table 1 confirmed that the results were within the suggested threshold (Hair et al., 2013). Variance inflation factors and tolerance values were also within the recommended threshold (VIF values < 3 and tolerance values > 0.1), which confirmed the absence of multicollinearity issues.

### **Results**

#### **Demographic profile**

Eighty-two percent of the respondents identified as males. A preponderance (59%) of individuals were between the ages of 18 and 21. In the way of education, a large percentage (48%) had at least a bachelor's degree. The detailed demographic profile is presented in Table 2.

#### **Common method bias**

As this study used a cross-sectional design, common method bias (CMB) is a possibility (Podsakoff et al., 2012). To examine CMB, Harman's one-factor test revealed a variance of 32.84%. This is within the threshold of 50%, confirming that CMB does not influence the study's result.

#### **Measurement model**

Prior to assessing the measurement model, validity and reliability estimates were examined for each construct scale. Internal consistency of the study's variables was confirmed using the composite

**Table 1.** Skewness and kurtosis.

Construct	Skewness	Kurtosis
IWN	-0.14	0.56
IWG	-0.15	0.07
ESN	0.04	-0.17
ESG	0.2	0.81
CGN	-0.17	0.72
AFT	-0.16	0.05
CNT	0.64	0.03
WVD	0.03	-0.16

**Table 2.** Respondent's demographic profile.

Characteristics	N	%
<b>Gender</b>		
Female	95	18.0
Male	441	82.0
Did not wish to answer	2	0.01
<b>Age</b>		
18 – 21 years	317	58.92
22 – 31 years	156	29.0
32 – 41 years	64	11.9
42 – 51 years	–	–
52 – 61 years	–	–
62 years and above	–	–
Did not wish to answer	1	0.19
<b>Qualification</b>		
Secondary School	161	30.0
Diploma/Certificate	38	7.0
Bachelor's Education	259	48.0
Postgraduate education	62	12.0
Others	18	3.0

reliability test. Results indicated that all estimates were in excess of 0.80, which is considered acceptable according to Hair et al. (2013). The CR values ranged between 0.85–0.95, higher than the suggested 0.70 threshold. As such, convergent validity is confirmed. Discriminant validity was also confirmed as the factor loadings were in excess of 0.70 and AVE were greater than 0.50, as suggested by Fornell and Larcker (1981). Details of these results are provided in Table 3. The inter-construct correlations are presented in Table 4 as off-diagonal elements with the square roots of AVE in the diagonal position. Discriminant validity criteria was met as the square root of each construct's AVE was greater than the correlation coefficient with the other constructs, as shown in the diagonal (in bold font) in Table 4.

The CFA for the measurement model was assessed based on the Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA), the goodness of fit index (GFI), comparative fit index (CFI), and the ratio of the chi-square ( $\chi^2$ ) to the degree of freedom ( $df$ ). The result revealed good model fit ( $\chi^2/df = \chi^2 (659) = 1364 = 2.07$ ,  $CFI = 0.92$ ;  $GFI = 0.92$ ;  $TLI = 0.92$ ;  $RMSEA = 0.03$ ).

### Structural model

The structural model also demonstrated good model fit (Chi-square ratio degrees of freedom ( $\chi^2/df$ )  $\chi^2 (1147) = 2511.94 = 2.19$ , comparative fit index ( $CFI$ ) = 0.94; Goodness-of-Fit Index ( $GFI$ ) = 0.91; Tucker-Lewis index ( $TLI$ ) = 0.93; root mean square error of approximation ( $RMSEA$ ) = 0.04). Following this confirmation, the hypotheses for this study were tested (Table 5). Gamer – NPCs interaction was found to be positively associated with emotional solidarity (NPCs) ( $H_{1a}$ :  $\beta = 0.21$ ,  $p < 0.001$ ). Gamer – Gamer interaction was found to be positively associated with emotional solidarity (gamers) ( $H_{1b}$ :  $\beta = 0.29$ ,  $p < 0.001$ ). Additionally, emotional solidarity (NPCs) ( $H_{2a}$ :  $\beta = 0.23$ ,  $p < 0.001$ ) and emotional solidarity (gamers) ( $H_{2b}$ :  $\beta = 0.28$ ,  $p < 0.001$ ) was found to be positively associated with the in-game cognitive image. Emotional solidarity (NPCs) ( $H_{2c}$ :  $\beta = 0.43$ ,  $p < 0.001$ ) and emotional solidarity (gamers) ( $H_{2d}$ :  $\beta = 0.30$ ,  $p < 0.001$ ) was found to be positively associated with the in-game affective image. Also, the in-game cognitive image was found to be positively associated with conative image ( $H_3$ :  $\beta = 0.31$ ,  $p < 0.001$ ). The in-game affective image was found to be positively associated with the conative image ( $H_5$ :  $\beta = 0.41$ ,  $p < 0.001$ ). The in-game conative image was found to be positively associated with willingness to visit associated real-world destinations ( $H_6$ :  $\beta = 0.24$ ,  $p < 0.001$ ). However, the proposed relationship between in-game cognitive image and affective image was not supported ( $H_4$ ).

**Table 3.** Confirmatory factor analysis.

Factor and item description		Model and item indices			
		Std Loadings	SMC	CR	AVE
<b>Interactions with NPCs</b>	IWN1	0.91	0.828	0.914	0.781
	IWN2	0.86	0.74		
	IWN3	0.88	0.774		
<b>Interactions with Gamers</b>	IWG1	0.82	0.672	0.913	0.677
	IWG2	0.86	0.74		
	IWG3	0.78	0.608		
	IWG4	0.77	0.593		
	IWG5	0.88	0.774		
<b>Emotional solidarity (NPCs)</b>	ESN1	0.86	0.74	0.961	0.734
	ESN2	0.78	0.608		
	ESN3	0.92	0.846		
	ESN4	0.84	0.706		
	ESN5	0.89	0.792		
	ESN6	0.84	0.706		
	ESN7	0.88	0.774		
	ESN8	0.88	0.774		
	ESN9	0.81	0.656		
<b>Emotional solidarity (Gamers)</b>	ESG1	0.85	0.723	0.95	0.682
	ESG2	0.74	0.548		
	ESG3	0.88	0.774		
	ESG4	0.84	0.706		
	ESG5	0.72	0.518		
	ESG6	0.86	0.74		
	ESG7	0.91	0.828		
	ESG8	0.84	0.706		
	ESG9	0.77	0.593		
<b>Cognitive Image Environment</b>	ENV1	0.87	0.757	0.914	0.781
	ENV2	0.92	0.846		
	ENV3	0.86	0.74		
<b>Amenities</b>	AMN1	0.88	0.774	0.887	0.723
	AMN2	0.84	0.706		
	AMN3	0.83	0.689		
<b>Attractions</b>	ATT1	0.81	0.656	0.881	0.712
	ATT2	0.83	0.689		
	ATT3	0.89	0.792		
<b>Accessibility</b>	ASB1	0.87	0.757	0.875	0.701
	ASB2	0.85	0.723		
	ASB3	0.79	0.624		
<b>Social Environment</b>	SEN1	0.86	0.74	0.852	0.657
	SEN2	0.78	0.608		
	SEN3	0.79	0.624		
<b>Affective Image</b>	AFT1	0.76	0.578	0.89	0.672
	AFT2	0.85	0.723		
	AFT3	0.77	0.593		
	AFT4	0.89	0.792		
<b>Conative Image</b>	CNT1	0.84	0.706	0.859	0.67
	CNT2	0.74	0.548		
	CNT3	0.87	0.757		
<b>Willingness to visit associated real-world destinations</b>	WVD1	0.86	0.26	0.878	0.706
	WVD2	0.84	0.294		
	WVD3	0.82	0.328		

Note: Std Loadings = Standardised loadings; SMC = squared multiple correlations.; CR = Composite reliability; AVE = Average variance extracted.

## Discussion and conclusion

This study investigated the impact of gamers' interactions with other gamers and NPCs on their emotional solidarity towards gamers and NPCs, which in turn was hypothesised to affect their cognitive, affective and conative image of in game destinations; and their willingness to visit associated

**Table 4.** Validity and reliability analysis.

	CR	IWN	IWG	ESN	ESG	CGN	AFT	CNT	WVD
<b>IWN</b>	0.91	<b>0.82</b>							
<b>IWG</b>	0.91	0.28	<b>0.78</b>						
<b>ESN</b>	0.96	0.12	0.28	<b>0.75</b>					
<b>ESG</b>	0.85	0.19	0.08	0.18	<b>0.77</b>				
<b>CGN</b>	0.86	0.13	0.39	0.27	0.33	<b>0.85</b>			
<b>AFT</b>	0.9	0.15	0.14	0.51	0.16	0.29	<b>0.84</b>		
<b>CNT</b>	0.86	0.09	0.22	0.35	0.45	0.21	0.24	<b>0.73</b>	
<b>WVD</b>	0.88	0.26	0.39	0.23	0.01	0.07	0.02	0.41	<b>0.79</b>

Note: The boldfaced diagonal elements are the square root of the variance shared between the constructs and their measures. Off-diagonal elements are the correlations between constructs. \*\*\*  $p < 0.001$ . IWN = Interactions with NPCs; IWG = Interactions with Gamers; ESN = Emotional solidarity (NPCs); CGN = Cognitive Image; AFT = Affective Image; CNT = Conative Image; WVD = Willingness to visit associated real-world destinations.

**Table 5.** Hypotheses testing results.

Hypothesis	Path	$\beta$	$p$	Supported
H <sub>1a</sub>	IWN→ESN	0.21	<0.001	Yes
H <sub>1b</sub>	IWG→ESG	0.29	<0.001	Yes
H <sub>2a</sub>	ESN→COG	0.23	<0.001	Yes
H <sub>2b</sub>	ESG→COG	0.28	<0.001	Yes
H <sub>2c</sub>	IWN→AFT	0.43	<0.001	Yes
H <sub>2d</sub>	IWG→AFT	0.3	<0.001	Yes
H <sub>3</sub>	COG→CNT	0.31	<0.001	Yes
H <sub>4</sub>	COG→AFT	-0.21	<0.001	No
H <sub>5</sub>	AFT→CNT	0.41	<0.001	Yes
H <sub>6</sub>	CNT→WVD	0.24	<0.001	Yes

real-world destinations. Results revealed a positive association between gamer-NPCs interaction and emotional solidarity with NPCs. This implies that NPCs in online games play a similar role to residents in tourist destinations assisting gamers to form emotional relationships. Additionally, gamer-gamer interaction was reported to positively affect emotional solidarity with gamers. This implies that, via interactions, gamers also form relationships with other gamers in online games. Previous research has thus far not established such a relationship between interaction and emotional solidarity. These findings are consistent with the ZPD theory proposed by Vygotsky (1978). According to Vygotsky (1978), tourists' interaction with MKOs, which are other gamers and NPCs in an online game, provides guidance and knowledge, leading to cognition and affective process development (i.e. emotional solidarity here)

Second, emotional solidarity with NPCs and emotional solidarity with gamers was found to be positively associated with in-game cognitive and affective image. These findings indicate that gamers' emotional solidarity with NPCs and other gamers in an online game enhance destination image in the context of video games, a finding consistent with Woosnam et al. (2020), who also found in a non-game context that emotional solidarity influences cognitive, affective, and conative destination image.

Third, the in-game cognitive image was found to be positively associated with the conative image, denoting that gamers with a positive cognitive image related to the in-game destination would be more likely to speak positively about and recommend the game to others. Similar results have been found by Agapito et al. (2013) and Woosnam et al. (2020) in the context of tourists' destination image. Fourth, in-game cognitive image was not found to be positively associated with affective image. This result contradicts the findings by Lin et al. (2007) and Li et al. (2010). The interaction between cognitive image and affective image has been previously established, with many studies confirming the association between cognitive and affective image (Woosnam et al., 2020). A tenable reason for this could be that the reverse-relationship holds true (affective image to cognitive image, not explored here) in the context of in-game destinations. Fifth, in-game affective

image was found to be positively associated with conative image. This implies that gamers who develop feelings towards in-game destinations are more likely to recommend and talk positively about the in-game destination to others. Similar results were found by Woosnam et al. (2020) concerning Greece. Sixth, in-game conative image was found to be positively associated with willingness to visit associated real-world destinations. This implies that gamers who had a positive conative image towards the in-game destination in the online game intended to visit the depicted destination in the real life. A similar relationship was supported by Loureiro and Jesus (2019), confirming that conative image positively influenced revisit intention to Rio de Janeiro.

### ***Theoretical implications***

This study makes theoretical contributions by amalgamating the tourism and online gaming literature. While prior studies have investigated destinations' attractiveness attributed to game activities like casinos (Wong & Lai, 2021) or location-based AR games like Pokémon Go (Hsiao & Tang, 2021; Lacka, 2020; Williams & Slak-Valek, 2019); no study has jointly explored the impact of gamer interactions, emotional solidarity and in-game destination image on willingness to visit associated real-world destinations. Next, the study verifies the application of Vygotsky's concept of the 'more knowledgeable others' to in-game destinations in online games, revealing the role of NPCs as being similar to locals in destinations, shaping gamers' perceptions towards the in-game destination. This study also extends the research on interaction and destination image (Stylidis, 2020; Stylidis et al., 2021) by confirming that gamer-NPCs interaction in a video game context helps also to shape emotional solidarity apart from the destination image.

Further, prior studies have measured interaction quality based on interaction frequency (Aleshinloye et al., 2020), with researchers highlighting the need for interaction quality between residents and tourists to be guided by theory-based measures (Aleshinloye et al., 2020). The study by Stylidis et al. (2021) addressed this gap in the literature by employing various measures that included the sense of safety for tourists, information in the forms of tips and recommendations provided by locals, and friendship with locals to measure tourist-resident interaction quality. This study used the interaction scale by Stylidis et al. (2021) in measuring gamer-NPC intersection quality and gamer-gamer interaction quality in online games. In doing so, it advances the generalisability and applicability of the interaction quality scale in different contexts, with such insights being crucial to game developers in enhancing the role of NPCs in online games and fostering quality interaction between gamers.

This study also offers unique insights into gamer-gamer interactions in online games and their potential to enhance emotional solidarity. While prior studies have shown that social interaction influences players' attitudes towards online games (Kokkinakis et al., 2016; Merhi, 2016), studies into interaction quality between online games remain limited. Customer behaviour studies (Kim & Choi, 2016) have shown the potential of customer-to-customer interaction quality on experience quality (Slack et al., 2020). This study extends these studies and the work by Stylidis et al. (2021) that investigated resident-tourist interaction on destination image by confirming gamer-gamer interaction on emotional solidarity, which ultimately influences in-game destination image. As studies in tourism have primarily focused on resident-tourist interaction, this study provides opportunities for future studies to examine tourist-tourist interaction in destination image formation.

Additionally, destination image formation is a topic that has received much attention from researchers and destination marketers (Afshardoost & Eshaghi, 2020; Lalicic et al., 2021; Lojo et al., 2020); this study offers novel insights by applying the notion of destination image to an online open-world game. Doing so confirms the importance of affective, conative, cognitive image factors in online games' virtual world. This enables a better understanding of increasing the attractiveness of in-game destinations for gamers. The findings show that in-game destinations can be considered similar to real-world destinations, with gamers acting similar to tourists in those

destinations. The study also confirms that in-game destination image in online games translates to gamers' willingness to visit associated real-world destinations.

### ***Practical implications***

Important implications for practice are derived from this study's findings for game developers and destination marketers in developing data-driven marketing strategies to increase the attractiveness of real-world destinations through the virtual world of online games.

First, the results of this study highlight that engaging with NPCs provides essential information to gamers while making the in-game destinations more pleasant and realistic. Game developers need to ensure that NPCs become an important aspect of the game for gamers. This can be accomplished by fostering a sense of immersion within the game, allowing gamers to have interesting communications with NPCs or having the NPC provide useful information to gamers. For example, the NPC acting as the local tavern keeper dressed up like a local with a funny accent can enhance the experience for gamers. It would also enhance their likeability and enable players to develop emotions towards them while realising their importance to the game. For example, NPCs giving clues about a lost treasure nearby could allow gamers opportunities to interact with NPCs to acquire valuable information.

Second, the findings from this study reveal the importance of gamer-gamer interaction in online games. The social aspect of online games has led to exponential growth in popularity (Sharma et al., 2021b). Other gamers can act as information providers to enhance the experience and destination image for online gamers. Such interactions and engagements with gamers would increase appreciation of the in-game destination. Game developers need to ensure that activities require online gamers to come together to facilitate interaction and build a relationship with other online gamers. Such in-game activities should offer better rewards than playing the game solo. Allowing ways for online gamers to interact with each other through chat messages and audio can enhance interaction. Game developers can also enable gamers with social networking accounts like Facebook to identify other friends in their network playing the games. In-game activities can be made more interesting and authentic to the local setting of the open-world games by working closely with destination markers to develop team activities similar to what a tourist can engage in while visiting the actual destination. For instance, getting online gamers to explore the open-world maps together like climbing up or diving into the ocean.

Third, findings highlight the influence of interactions between gamers and NPCs on their in-game destination images. Destination marketers need to work closely with game developers to ensure that the NPCs closely resemble the locals in terms of uniqueness, culture, and way of life of the associated real-world destination. This can include NPCs' attire, language, accent closely resembling actual locals. For example, the game allows interaction with gym obsessed NPCs at Vespucci Beach (Based on Venice Beach), street performers, or riding a bike along the beach. Such interaction between gamers and NPCs that are authentic to the real-world setting would go a long way in making the in-game destinations more attractive to gamers and foster a better understanding of the local culture through NPCs. Enhancing the emotional solidarity of gamers with NPCs would also lead to a lasting impression of the in-game destination. Therefore, game developers and destination marketers should ensure that NPCs are empowered and meticulously designed to accomplish this objective.

Fourth, developing relationships among online gamers also play a crucial role in enhancing the in-game destination image in an online game. Game developers and destination marketers need to create in-game activities that closely resemble activities in real-world destinations. For example, open-world games like GTA 5 should allow gamers to interact and form relationships with other online gamers by engaging in fun activities that they would expect to do with others in similar real-world locations like engaging in fishing challenges at the Del Perro Pier in GTA (Based on the Santa Monica Pier). This would contribute to enhancing the in-game destination image of games.

Fifth, this study has highlighted that the in-game environment consisting of other players, NPCs, and the destination image impacts gamers' willingness to visit associated real-world destinations. This offers opportunities for game developers and destination marketers to work together to enhance the attractiveness of the games' destination while also creating tourism opportunities for associated real-world locations. With recent advancements in graphics chipsets and multi-core processors, game developers can create stunning and realistic games with buildings, roads, and in-game characteristics looking realistic, authentic, and resembling the actual location. However, it is essential that in-game locations appropriately capture the essence and atmosphere a gamer might expect when they visit similar real-world destinations.

### **Limitations and future research directions**

Despite the study being conducted using a sound methodological design that leads to important theoretical and practical implications, this research, like any other, has limitations that need to be highlighted. These limitations provide a fertile ground for future studies. First, the data for this study was collected via Facebook. Despite this method being successfully used in prior studies (Sharma et al., 2021a; Sharma et al., 2021b) and allowing for random sampling techniques, it is not reasonable to expect all GTA 5 gamers to have a Facebook account. Therefore, caution should be exercised when generalising the results. Future studies can explore other research designs that overcome this limitation. Second, data for this study was collected from a single country perspective. Studies have highlighted that an individual's behaviour and attitude can vary from one country to another (Sharma et al., 2020a; Sharma et al., 2020c). Therefore, future studies can adopt a cross-national design to gain insights into differences in perceptions and behaviours of games across distinct countries. Third, this study only examined gamers' willingness to visit associated real-world destinations. While prior studies have highlighted that intention is positively associated with actual behaviour (Frank & Brock, 2018; Sultan et al., 2020), future studies can measure the actual visit behaviour of gamers to visit game associated real-world destinations. Fourth, this study is one of the first to examine gamers' visit intention to real-world destinations based on in-game interactions and in-game destination image. While this study has specifically explored GTA 5 gamers, an open-world game, future studies should explore other in-game factors and types of games that could influence behaviour.

### **Disclosure statement**

No potential conflict of interest was reported by the author(s).

### **ORCID**

Shavneet Sharma  <http://orcid.org/0000-0001-5523-5091>

Dimitrios Styliadis  <http://orcid.org/0000-0002-9488-3160>

Kyle Maurice Woosnam  <http://orcid.org/0000-0001-6674-7578>

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## Appendix A

Construct	Items
<b>Interactions with NPCs</b>	My interactions with NPCs in GTA 5 are pleasant. My interactions with NPCs in GTA 5 are informative/useful. My interactions with NPCs in GTA 5 are realistic.
<b>Interactions with Gamers</b>	I have developed friendships with other online gamers in GTA 5. Other online gamers in GTA 5 give me tips relating to the game. Other online gamers in GTA 5 give recommendations relating to the game. Other online gamers in GTA 5 help explain the game dynamic. Other online gamers in GTA 5 give me a sense of protection.
<b>Emotional solidarity (NPCs)</b>	I feel I can trust GTA 5 residents (NPCs). I have a lot in common with GTA 5 residents (NPCs). I share similar views with GTA 5 residents (NPCs) that I have encountered. I identify with GTA 5 residents (NPCs). I am proud to be welcomed by GTA 5 residents (NPCs). I treat GTA 5 residents (NPCs) fairly. I feel GTA 5 residents (NPCs) appreciate the benefits associated with me coming to the online game. I feel close to some GTA 5 residents (NPCs) I have met in Izmir. I make friends with some GTA 5 residents (NPCs).
<b>Emotional solidarity (Gamers)</b>	I feel I can trust GTA 5 residents (gamers). I have a lot in common with GTA 5 residents (gamers). I share similar views with GTA 5 residents (gamers) that I have encountered. I identify with GTA 5 residents (gamers). I am proud to be welcomed by GTA 5 residents (gamers). I treat GTA 5 residents (gamers) fairly. I feel GTA 5 residents (gamers) appreciate the benefits associated with me coming to the online game. I feel close to some GTA 5 residents (gamers) I have met in Izmir. I make friends with some GTA 5 residents (gamers).
<b>Cognitive Image Environment</b>	Los Santos in GTA 5 has scenic beauty. Los Santos in GTA 5 has pleasant weather.
<b>Amenities</b>	Los Santos in GTA 5 has nice beaches. Los Santos in GTA 5 has quality safehouses. Los Santos in GTA 5 has quality garage.
<b>Attractions</b>	Los Santos in GTA 5 has quality stores. Los Santos in GTA 5 has variety of activities. Los Santos in GTA 5 has interesting culture/events.
<b>Accessibility</b>	Los Santos in GTA 5 has interesting sites. Los Santos in GTA 5 has convenient transportation. Los Santos in GTA 5 can be easily accessible.
<b>Social Environment</b>	Los Santos in GTA 5 has fast-travel options. Los Santos in GTA 5 has safe locations. Los Santos in GTA 5 has friendly online gamers.
<b>Affective Image</b>	Los Santos in GTA 5 has value for money. Los Santos in GTA 5 is unpleasant–pleasant. Los Santos in GTA 5 is boring–exciting. Los Santos in GTA 5 is sleepy–lively.
<b>Conative Image</b>	Los Santos in GTA 5 is distressing–relaxing. I intend to keep Los Santos in GTA 5. I say positive things about Los Santos in GTA 5. I encourage friends to visit Los Santos in GTA 5.
<b>Willingness to visit associated real-world destinations (Los Angeles)</b>	I would be willing to visit Los Angeles sometime in the future.  The likelihood that I would visit Los Angeles in the next 5 year. I would recommend Los Angeles to my friends.

## ***Appendix***

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**Population:** Grand Theft Auto (GTA) 5 gamers in Fiji in all platforms: PC, Xbox, and Play Station

**Sampling Frame:** 7200 members of the online gaming group 'PSxPCGamers Club - Fiji' on Facebook

**Pilot Test:** 20 GTA5 gamers

**Random Sampling:** random selection of 2000 members

**Data Collection Tool:** online survey distributed via Facebook

**Data Collection Period:** October-November 2001

**Response Rate:** 547/2000 responses, 27.35%

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