Gamify, engage, build loyalty: exploring the benefits of gameful experience for branded sports apps

Salma Habachi, Jorge Matute and Ramon Palau-Saumell
Business Management Department, IQS School of Management, Universitat Ramon Llull, Barcelona, Spain

Abstract

Purpose – This study aims to examine the impact of the gameful experience on behavioural outcomes. Drawing from stimulus–organism–response theory, it proposes and tests a new model that investigates the relationship between the gameful experience, brand loyalty and intention to use gamified branded applications in the sports context. In addition, it explores the mediating role of customer–brand engagement (CBE) and the moderating role of self-image congruity (SIC).

Design/methodology/approach – A sample of 436 active users of sport-related branded gamified applications was used to test the model. Data was collected from online sports forums, brands' Facebook communities and during sporting events.

Findings – Results indicate that the gameful experience positively and directly impacts behavioural intentions but does not directly influence brand loyalty. This relationship becomes partially significant when mediated by CBE. In addition, results show that users with high levels of SIC are more likely to continue using the gamified application, whereas users with low levels are more likely to engage with the brand.

Originality/value – This study expands the gamification literature in the sports sector by revealing the importance of the gameful experience in driving loyalty, behavioural intentions and CBE. It proposes a new model that sheds light on the emotional aspect of the interaction between a user and a gamified system and the importance of exploring the effects of moderators, such as SIC, in these relationships.

Keywords Gameful experience, Brand engagement, Self-image congruity, Brand loyalty, Intention to use, Mobile apps, Simulation and gaming, PLS modelling

Paper type Research paper

1. Introduction

Amidst the evolution of the global acceptance of mobile applications, the sports and fitness industry is one of the fastest-growing areas in the app ecosystem (Grand View Research, 2021). Fitness apps are customarily designed to detect, track and analyse users' physical activity, providing them with an overview of their daily routes and customised training to help them keep physically fit (Edwards *et al.*, 2016). Presently, the popularisation of these apps is increasing because of the growing awareness about the importance of maintaining a healthy lifestyle (Siqi *et al.*, 2022). In 2021, the sports app market increased by 28% worldwide, reaching 385 million users (Curry, 2022); it is expected to achieve a market volume of US$8.03bn by 2030 (Grand View Research, 2023).

Given the popularity of these apps, many brands, intending to stay competitive and ahead in the market, have started developing and launching their own (e.g. Nike's Nike Run Club). Similarly, other brands have started to acquire popular fitness apps and convert them into branded ones, like Adidas

with Runtastic or Asics with RunKeeper. However, after initial excitement and interaction with these branded applications, users often start losing interest and find them boring. Stragier *et al.* (2016) reported that 74% of these apps' new clients stop using them within two weeks, creating disengagement and a persistency problem. For these reasons, many companies have started integrating game-like elements into their branded apps as a solution for their customers' low engagement. This strategy, known as gamification, refers to the use of gaming techniques and game-style elements in non-gaming contexts to make the customer's experience more enjoyable and engaging (Deterding *et al.*, 2011; Hamari, 2019). According to the literature, gamification has proven efficient in motivating users to take action and complete tasks in different contexts (Behl *et al.*, 2022). The increase in gamification has brought various benefits to

companies such as enhanced social, brand and system engagement (Hsu, 2023; Xi and Hamari, 2020; Xiao *et al.*, 2021) – along with greater customer satisfaction (Torres *et al.*, 2022) and loyalty (Hwang and Choi, 2020).

However, despite the presumed benefits of gamification, recent studies reveal conflicting findings regarding its effects on consumer behaviour. For example, Liu *et al.* (2017) showed that the integration of gamification elements does not automatically yield positive results; other studies have reported that gamification leads to negative effects such as addiction, intolerance, mood swings (Srivastava *et al.*, 2022), excessive participation (Hammedi *et al.*, 2017), contradicting interactions (Leclercq *et al.*, 2020) and even disengagement from the focal task (Leclercq *et al.*, 2018). These particular effects have cast doubt on gamification's efficiency and impelled scholars to set a supplemental research agenda that goes beyond the study of game elements. This study highlights the different research gaps that need to be addressed to respond to the fundamental questions of whether and how companies can benefit from gamification strategies.

Firstly, having ignored the perceived customer experience, previous studies have predominantly focused on measuring gamification on a mechanics level (e.g. tasks, rewards, badges and leaderboards) (Harwood and Garry, 2015); on a dynamics level, including immersion, achievement and social interactions (Xi and Hamari, 2020); or on a benefits level by exploring the role of epistemic, social integrative and personal benefits (Jang *et al.*, 2018). In response to this research, recent studies have started to emphasise the need to understand the roots of gamification, its underlying processes and potential drawbacks by primarily focusing on what the customer truly experiences (Bekk *et al.*, 2022; Eppmann *et al.*, 2018; Huotari and Hamari, 2017). These studies stress the importance of understanding the transition from the experience delivered by a gamified system, known as gameful experience (Huotari and Hamari, 2017), to the formation of an engaging relationship with the brand.

Secondly, little is known about how such perceived gamified experience shapes users' attitudes and behaviours in the context of branded applications. Indeed, few studies have considered users' perceived experiences as a part of their research, and anecdotal evidence suggests that gamified experiences may be an opportunity for brands to engage their customers with the company and obtain favourable brand-related outcomes, such as loyalty, positive attitudes about the brand, electronic word-of-mouth and intentions to use the application (Al-Zyoud, 2021; Hamari and Koivisto, 2015b; Mishra and Malhotra, 2021). In addition, to the best of our knowledge, there are no studies and few comprehensive models that evaluate the simultaneous effect of the gameful experience on different potential customer outcomes, such as brand engagement, loyalty to the branded app or intention to use the gamified app in the future. The inclusion of customer–brand engagement (CBE) and loyalty-related outcomes is pivotal as, on the one hand, brands pay more attention to the design of their branded apps as a strategy to gain more customers, whereas, on the other hand, these apps cannot achieve their full potential unless consumers continue to use them (Fang, 2019).

Thirdly, despite the recent increase in the literature on gamification, research aiming to understand the effect of

boundary conditions in the context of gamification and branded apps is still limited. For example, the role of personal factors in the connection between the gameful experience and marketing outcomes, such as users' self-image congruity (SIC) with a specific domain like sports, has been largely ignored. The self-congruity theory postulates that self-expressive motivations prompt consumers to have more preferences for a product if the fit between an object or activity's image and their selves is high (Kwak and Kang, 2009). SIC is believed to be a critical factor in generating favourable attitudes and purchase intentions (Kang *et al.*, 2011; Sirgy *et al.*, 2008), engaging consumers in brand communities (Islam *et al.*, 2018) and causing emotional experiences while shopping (Han *et al.*, 2019). Besides, in the context of online social networks and technology use, SIC is considered a potential regulator between users' experience and attitudinal and behavioural responses (Kourouthanassis *et al.*, 2015). Nonetheless, little attention has been paid to how SIC with a focal activity (e.g. sports) could affect the influence of gamification on users' reactions and, therefore, determine the failure or success of a gamified app across different types of users.

To address these gaps, drawing on the stimulus–organism–response (SOR) model, the current research seeks to explore how a gamified experience (stimulus) influences brand loyalty and a user's intention to continue using a branded gamified app (response) by enhancing engagement with the brand (organism). Previous research has consistently shown that consumers' gameful experiences with a technological device or app impacts their desire to keep using it and influences their preferences towards the company developing the related technology (Al-Zyoud, 2021; Xi and Hamari, 2020). The literature also suggests that gamification strategies lead to increased customer engagement and, more specifically, engagement with a brand (Berger *et al.*, 2018). Therefore, this study proposes that a gamified experience can directly determine these outcomes and, indirectly, affect outcomes through CBE. In addition, the model also explores how users' SIC with sports moderates the influence of the gameful experience on CBE, brand loyalty and intention to use the branded sports apps. Previous studies suggest that the match-up effect of consumer self-image and product/brand/activity user image can alter the influence of consumers' judgements and experiences on their preferences and intentions (Kleijnen *et al.*, 2005; Kourouthanassis *et al.*, 2015).

2. Literature review and research hypotheses

2.1 Theoretical framework
This study adopts the SOR model (Mehrabian and Russell, 1974) as the foundation for building the conceptual relationships between the investigated constructs. Essentially, the SOR model asserts that the environment – with all of its different attributes – acts as a stimulus (S) impacting individuals' psychological states and organisms (O) and, subsequently, their behaviours and attitudes (R). The gameful experience is the "stimulus" that occurs when a user interacts with a branded gamified application (Eppmann *et al.*, 2018; Huotari and Hamari, 2017). Gamification uses different game elements as stimuli to create experiences impacting customer states (e.g. CBE), which, in turn, leads to desired behavioural

outcomes (Gatautis *et al.*, 2016; Hamari and Koivisto, 2015a). The "organism" defines the internal states that take place in the process between the occurrence of the stimuli and customers' behavioural responses. The organism is defined as CBE and represented by three dimensions: cognitive, affective and activation (Hollebeek *et al.*, 2014). The "response" reflects the individuals' final behavioural outcomes as a reaction to the organism (Islam *et al.*, 2020) and/or to the stimulus (Xi *et al.*, 2021).

Furthermore, this study uses SIC as a moderator to investigate the extent to which identification with sports alters the relationship between the gameful experience and behavioural outcomes. The self-congruity theory (Sirgy, 1985), grounded in the theories about the self, refers to the self-concept as "the totality of the individual's thoughts and feelings having reference to himself as an object" (Rosenberg, 1979, p. 7). Thus, the self-concept is considered an overarching idea that explains how individuals perceive themselves on several levels (e.g. physical, emotional, social). Studies in the consumption context propose that individuals support their self-concept by choosing brands that are highly congruent with their perception of their selves or their self-image (Li *et al.*, 2022). In this regards, SIC reflects the state in which customers' images of their self-concept and a brand/experience's images match and remain consistent (Li *et al.*, 2022; Sirgy *et al.*, 2000). In this study, the self-congruity theory is explored in relation to a focal activity, such as playing sports.

2.2 Gamification and users' experience

Gamification refers to the technical process of incorporating, into a system, features that are characteristic of games (Hamari, 2019; Huotari and Hamari, 2017). Although games, by definition, are rule-based systems in which players must achieve different goals to obtain specific outcomes, gamified systems (e.g. a gamified application) are entities that include gamification elements that are not necessarily required for the system to fulfil its basic function (Deterding *et al.*, 2011). Thus, gamification is about taking the essence of games and applying it to real-world objectives and challenges rather than using it purely for entertainment (Palmer *et al.*, 2012). For example, branded sports apps typically include gamified elements in their function that try to motivate users to achieve specific goals. These features can include badges, awards for special milestones (such as completing a certain number of workouts, maintaining training frequency or achieving a distance run), progress bars, leaderboards, social media sharing options and so forth. Although the main function of the application is not primarily focused on providing enjoyable elements, the inclusion of all of these functions optimises the user experience as the application makes it more appealing and enjoyable (Eppmann *et al.*, 2018). Hence, gamification aims to magnify the interplay between the user and the gamified system by delivering an enjoyable experience that lasts beyond the game process and onto the after-game one (Högberg *et al.*, 2019).

Gamification has proven advantageous in creating gameful experiences that lead to the stimulation of the users' interests towards one specific domain and increase their engagement with the gamified system (Huotari and Hamari, 2017). The concept of gameful experiences emerged in the recent literature and refers to the psychological effects that result from using a gamified application. According to Eppmann *et al.* (2018, p. 100) and Deterding *et al.* (2011), the gameful experience in a non-game context refers to all of the different "positive emotional and involving qualities of using a gamified application". Therefore, on the one hand, the gameful experience entails different emotional states derived from the interaction with the system, including joy, pleasure, fun or the absence of negative emotions. On the other hand, it focuses on the different involvement elements characteristic of playing games (Mishra and Malhotra, 2021). Thus, the gameful experience is the natural consequence of the inclusion of gamification elements into a system and reflects the feelings that users experience as a result of interacting with it.

Given the heterogeneity of these feelings, the concept of gamified experience is, in essence, multidimensional. To capture this multidimensionality, Eppmann *et al.* (2018) developed the gameful experience scale (GAMEX). The authors' conceptualisation and measurement instrument is considered to be a reliable and valid tool for comprehensively capturing the customer's positive emotional and involvement-related qualities when interacting with a gamified system. According to Eppmann *et al.*, GAMEX is composed of enjoyment, absorption, creative thinking, activation, absence of negative affect and dominance. Enjoyment is the nature of positive emotions that a customer feels when interacting with an activity. Absorption refers to the feeling of disconnectedness from an actual environment and the level of concentration on a focal engagement object (Scholer and Higgins, 2009). The creative thinking dimension focuses on the explorative and imaginative features of the gameful experience. The fourth dimension, activation, is defined as the mental state of being alert, attentive and activated, which leads to the individual's assessment of the significance of a stimulus (Bakker *et al.*, 2014). Next, absence of negative affect refers to the exclusion of negative emotions and expressions such as sadness, fear, disgust and distress. Finally, dominance is associated with the level of control that an individual experiences when interacting with an environment and how autonomous and free the individual feels within that environment (Bakker *et al.*, 2014).

Overall, the gameful experience is a complex and multidimensional psychological construct that has been underexplored in the gamification and branding literature. The ability to fully understand the consequences of gameful experiences can be useful to determine the success of the inclusion of gamification elements into branded applications. By focusing on the perceived psychological outcomes resulting from a gamified experience rather than analysing its gamification mechanics, researchers can better predict the marketing outcomes derived from the interaction between the user and the branded app.

2.3 Effects of the gameful experience: brand loyalty and behavioural intentions towards the branded app

The inclusion of gamification elements can exert a positive effect on different consumer-related outcomes (Hamari, 2017; Feng *et al.*, 2020; Xi and Hamari, 2020). For this reason, many companies have started to include gamified features in their mobile apps to improve their users' experience, gain new customers and reinforce existing customers' positive attitudes towards the brand (Eisingerich *et al.*, 2019; Xi and Hamari,

2020). Nevertheless, as suggested by Fang (2019), an app cannot exert its total influence unless customers continue to use the branded app in the future. Therefore, companies must understand not only how loyalty towards a particular brand can be elicited by gamifying a branded app but ascertain whether the gameful experience determines customers' continuance intention towards the app. Thus, this study focuses particularly on investigating the direct effects of the gameful experience on customers' brand loyalty and their intention to continue using a branded app. By extending the gamification-loyalty link in our model, the study also hypothesises that CBE mediates the influence of gameful experience on brand loyalty and intention to use the app in the future (Abou-Shouk and Soliman, 2021; Bitrián *et al.*, 2021).

2.3.1 Effect of gameful experience on brand loyalty towards the brand

Brand loyalty refers to a customer's determination to continually repurchase or re-patronise a favoured good/service in the future despite external factors (e.g. situational influences or marketing efforts) that may lead to switching behaviours (Oliver, 1999). Brand loyalty, therefore, is the level of commitment and attachment customers have for a specific brand, as well as their intention to buy the focal brand as a primary choice (Yoo and Donthu, 2001). In the context of branded applications, brand loyalty is considered a specific behavioural outcome resulting from the interaction between the user and the app that signals a longstanding relationship between the customer and the brand (Fang, 2019). In this study, brand loyalty specifically refers to a user's behavioural intentions (e.g. rebuy or re-patronise) towards the specific brand that owns the fitness/sports application.

As previously noted, the gameful experience embodies the feelings users have when doing something engaging as a result of interaction with a gamified system (Domínguez *et al.*, 2013). Hence, in the context of branded apps, the gameful experience refers to the positive emotional and involvement-related characteristics resulting from the use of a gamified branded app. According to the interpersonal relationship theory (Fournier, 1998), in associations between consumers and companies, the brand is an active contributing actor in the relationship dyad and plays an important role in reinforcing such relationships. A positive experience resulting from the interaction with a brand may lead consumers to repeat these experiences and reciprocate with positive behaviours benefitting the brand (Ramaseshan and Stein, 2014). Therefore, in a gamified context, the gamified experience will not only affect customers' relationship judgements but will also increase brand loyalty because it leads to an experience of pleasant outcomes that reinforces the relationship between the user and the brand (Hwang and Choi, 2020). Generally, the literature on gamification acknowledges that the experience users have while interacting with a branded gamified application can have a positive effect on user preference towards a brand (Al-Zyoud, 2021; Li and Fang, 2020). Specifically, when a user undergoes a positive experience with a branded gamified app, this situation creates an emotional bond leading consumers to maintain their desire to sustain the relationship with the brand. This desire leads consumers to repurchase the brand's products/services

repetitively or advocate the brand (Al-Zyoud, 2021; Jang *et al.*, 2018). For example, Kim and Ah Yu (2016) found that the inclusion of interactive features in branded apps leads to the creation of one-of-a-kind customer experiences that reinforce loyalty towards the company (Kim and Ah Yu, 2016; Kim *et al.*, 2013). Similarly, in the context of e-commerce, Al-Zyoud (2021) showed that consumers tend to be more loyal to online stores when experiencing the emotional effects of gamification while interacting with retailer websites. Overall, consumers tend to engage in approach behaviours with a desire to maintain their relationship with the focal brand when they perceive the experiential benefits that derive from their interactions with a gamified application. Therefore, based on past evidence, it is proposed that:

H1. Users' gameful experience with a branded app directly and positively influences their loyalty towards the brand.

2.3.2 Effect of gameful experience on users' behavioural intentions towards the branded app

Behavioural intentions indicate how individuals exert themselves in performing a certain behaviour (Azjen, 1991). Therefore, these intentions reflect individuals' likelihood to engage in a specific act and are acknowledged as precursors to the real one (Oliver, 1997). Favourable behavioural intentions lead to an enhanced relationship between the individual and a product/service, which results in a lower tendency to switch to the competition and an increased willingness to making additional efforts to maintain this interaction (Kim, 2021). In terms of technology usage, intention is the individual's desire to perform, or to not perform, some specified future behaviour with such technology (Venkatesh and Davis, 2000); as it pertains to branded apps, intention refers to the future intent to keep using services through a specific branded app (Fang, 2019). In this study, behavioural intentions indicate the future intention of customers to use the branded gamified mobile application to perform their sports activities in the future.

It was previously suggested that the inclusion of gamification elements increases the probability that a user will want to use a particular technology in the future (Perez-Aranda *et al.*, 2023; Tu *et al.*, 2019). In this sense, the use of gamification enhances the services offered by the app. As a result, an emotional experience, also known as the gameful experience, occurs between the user and the app (Huotari and Hamari, 2017), leading to a higher intention of use in the future. According to the service-dominant logic (SDL) theory (Vargo and Lusch, 2004), customers should be regarded as active participants that supply the values that will best fit their needs, thus co-creating the interaction with the service. This process will lead to the creation of distinct and positive experiences that will affect customers' behavioural intentions (Wang *et al.*, 2014). Therefore, SDL focuses on the significance of understanding and providing unique customer experiences through the judging of customer roles in shaping future behavioural intentions. In this way, the use of gamification offers a customisable journey to every user, based on their backgrounds, needs, habits and acknowledgement of certain facts about them, which makes users' impression of their experience grow by leaps and bounds (Chen and Pu, 2014; Hamari and Koivisto, 2015b). As a result, consumers who use

fitness applications incorporating game elements may have higher intentions to continue using these apps (Tu *et al.*, 2019). Therefore, it is expected that a better-gamified experience with a branded app will enhance behavioural intentions to continue using such an app in the future, so it is hypothesised that:

H2. Users' gameful experience with a branded app directly and positively influences their behavioural intentions to use it in the future.

2.3.3 Mediating role of customer brand engagement

This study suggests that the influence of a gamified experience can also influence brand loyalty and behavioural intentions by eliciting the level of engagement that the user has with the brand. CBE is defined as the level of a customer's physical, cognitive and emotional state that leads to interaction, vigour, dedication and absorption, which, in turn, affect the individual's purchase intention, brand loyalty and preferences (Ahn and Back, 2018). With this in mind, Brodie *et al.* (2011) examined how CBE goes beyond the transactional relationship between customer and brand and signifies more of a motivational and emotional state. Consistent with this view, Hollebeek *et al.* (2014, p. 154) defined CBE as "a consumer's positively valanced brand-related cognitive, emotional and behavioural activity during or related to focal consumer/ brand interaction". Therefore, the present study uses this understanding of CBE and considers it a higher-order construct composed of cognitive processing, affection and activation. Firstly, cognitive processing refers to the amount of brand-related thought a person puts into the interaction with the brand (Hollebeek *et al.*, 2014). That is, cognitive processing reflects the level of interest that the person has for the brand engaged with (Vivek *et al.*, 2014). Secondly, affection indicates how positive the person feels about the interaction with the brand (Hollebeek *et al.*, 2014). Therefore, this concept is linked to customer feelings towards the brand. Thirdly, activation refers to customer effort spent interacting with the brand in terms of time and energy (Hollebeek *et al.*, 2014).

CBE can be one of the main mechanisms with which the gameful experience influences brand loyalty and intention to use the branded app. Previous studies have emphasised the significance of customer experiences in fostering brand engagement (Brodie *et al.*, 2011; Huotari and Hamari, 2017). Thus, providing customers with gameful experiences in their interactions with technology through gamified branded apps can help trigger the journey that leads to brand engagement. In this sense, the empirical research suggests a positive relationship between the inclusion of gamification elements and the level of engagement that a customer feels towards the brand (Jang *et al.*, 2018; Leclercq *et al.*, 2018; Xi and Hamari, 2019). This relationship occurs because the use of gamification mechanics facilitates the creation of positive and enjoyable customer experiences that help boost and maintain the momentum created between an app and its user. For instance, Abou-Shouk and Soliman (2021) found a positive relationship between the adoption of gamified applications and customer engagement in the tourism sector (Abou-Shouk and Soliman, 2021). In the sports context, Jang *et al.* (2018) established that gamifying the customer experience is beneficial as it leads to higher levels of engagement. Similarly, customer

benefits resulting from gamified packages were found to be related to consumer engagement with the brand (Syrjälä *et al.*, 2020).

It has also been suggested that when customers are more engaged, they may be more willing to reuse the gamified application in the future and exhibit a higher level of brand loyalty. On the one hand, past empirical studies suggest that CBE is positively related to brand loyalty (Hsu and Chen, 2018; Hwang and Choi, 2020; Jang *et al.*, 2018). When customers engage with a gamified app, interaction with its game elements leads to a positive user experience that significantly increases their brand loyalty. Hassan *et al.* (2019) concluded that customers' social interaction with a service positively impacts their loyalty to it. Similarly, Abou-Shouk and Soliman (2021) showed that the higher the customer engagement with a gamified application, the stronger their brand loyalty and the more they will want to learn about the brand. On the other hand, CBE can also increase users' intentions to continue using gamified technology. In this sense, engaged customers tend to use an application more than non-engaged users, investing their time, money and energy because they think more about the brand and show more of the positive emotions that lead to this behavioural intention (Qing and Haiying, 2021). A fulfilling user experience when interacting with a branded application results in a higher level of engagement, leading to an intention to use it in the future. In line with this notion, researchers have described the positive influence of engagement on users' intention to use mobile applications (Tarute *et al.*, 2017). For example, the positive effect of CBE on the continuance intention of using a branded app was found among Chinese users of this technology (Qing and Haiying, 2021) and users of the Fitbit app (Bitrián *et al.*, 2021).

In summary, based on the above reasoning, we propose that CBE mediates the relationship between the gameful experience and brand loyalty and between the influence of the gameful experience on behavioural intentions to use gamified branded apps. Users of a gamified system are more likely to engage with it and do activities that lead to increased loyalty; they also generally use the service more actively and persistently (Hamari, 2017). Therefore, the following hypotheses are proposed:

H3. CBE mediates the positive influence of the users' gameful experience with a branded app on their loyalty towards the brand.

H4. CBE mediates the positive influence of the users' gameful experience with a branded app on their behavioural intentions to use it in the future.

2.4 Moderating role of self-image congruity

SIC is a process through which individuals reflect on source images and match these to their self-concepts (Sirgy, 1985). Following this conceptualisation, individuals attempt to display behaviours according to the image they have of themselves (Kourouthanassis *et al.*, 2015). Previous studies have identified SIC as composed of the actual, ideal, social and social ideal self (Sirgy, 1985). Actual SIC, used in this study in line with the previous research (Kang *et al.*, 2009), refers to how individuals see themselves (Sirgy, 1985). In this study, SIC specifically refers to the cognitive match between the individual's self-

image and the perceived image of sports as a leisure activity. For example, a person who sees him/herself as a runner (actual self-concept) is more likely to feel motivated to purchase running outfits and use a running application to be perceived as one. Therefore, SIC may play an influential role in behavioural intentions such as brand loyalty and intention to use a brand (Sirgy, 1985) because the symbolic meaning associated with consumption is often expressed through the use of branded products.

SIC was found to be positively associated with attitudinal and behavioural outcomes (Kleijnen *et al.*, 2005; Kourouthanassis *et al.*, 2015) and to contribute to the development of positive emotional experiences (Han *et al.*, 2019; Lee *et al.*, 2017). In addition, besides this direct influence, SIC can affect the intensity of relationships between a stimulus and an organism or response (Sirgy *et al.*, 2000). For instance, Kleijnen *et al.* (2005) found that SIC moderated the relationship between consumption and adoption behaviours in wireless service use that goes beyond the direct impact of SIC on consumers' adoption decisions. In line with this finding, Kourouthanassis *et al.* (2015) determined that individuals perceiving their social network services as aligned with their self-image are more likely to continue using these sites, regardless of whether or not they are satisfied with the service. Previous studies have also explored the moderating effect of SIC on customer experiences, brand loyalty and purchase intentions (Gabisch, 2011). Therefore, the inclusion of an experiential element like the gameful experience in a system can lead to benefits for users who demonstrate higher levels of SIC with the experience's contextual domain (e.g. sports). We hypothesise that these positive outcomes may happen because, for users with high SIC with sports, the experience with the app helps reinforce views about themselves, which will then be translated into higher levels of engagement with the brand and more favourable intentions towards the brand and the branded app. As it is both a brand and a product, a branded app can be used as a symbol defining the individual self as it helps the user reinforce his or her habits and lifestyle

around sports. Drawing on the above, it is expected that the effect of the gameful experience on CBE, brand loyalty and intention to use the gamified app in the future will be stronger for individuals with high SIC with sports than for those with low SIC. In other words, SIC reinforces the positive influence of the gameful experience on CBE, brand loyalty and continuance intentions. Therefore, the following hypotheses are proposed:

H5. SIC moderates the influence of the gameful experience on CBE, such that the higher the level of SIC, the greater the positive effect of the gameful experience on CBE.

H6. SIC moderates the influence of the gameful experience on brand loyalty, such that the higher the level of SIC, the greater the positive effect of the gameful experience on brand loyalty.

H7. SIC moderates the influence of the gameful experience on behavioural intentions to use the app, such that the higher the level of SIC, the greater the positive effect of the gameful experience on continuance intentions.
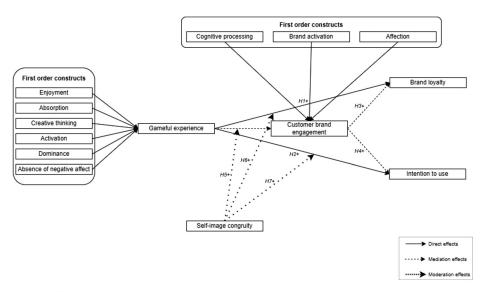
The hypotheses proposed above are presented in Figure 1.

3. Methodology

3.1 Research context

As the research model was tested in the context of the sports and fitness industry, branded gamified sports applications were selected as the target of this study. To select these apps, a filtering process was implemented. Firstly, the apps needed to be linked to the sports and fitness industry, so, to find them, the health and fitness sections of the Google Play Store and Apple Store were searched, resulting in over 50,000 applications. Only applications related to running or exercising were considered and every other type of mobile health apps was excluded. Secondly, the applications had to be branded. This prerequisite narrowed the list down to apps only developed or

Figure 1 Research model

Source: Created by authors

owned by brands. The third selection criterion was the inclusion of gamification elements in the apps to ensure that the gameful experience occurred when the user interacted with the system. For this, the presence of game elements, such as avatars, badges or progress bars, was investigated by downloading the apps and testing them. The last initiated filter was the number of downloads, resulting in a final selection of branded gamified applications. Following this process, the top 10 branded gamified applications were included as choices in the questionnaire, along with the addition of the option "others" to not limit answers. Of these apps, three were free of charge; users had to create an account, start their workout and monitor their progress. Only one of the proposed apps was a premium version; in this app, users had 14 free-trial days, and, after this, they needed to start paying a monthly subscription fee. The remaining apps were freemium versions in which basic services were provided for free but most advanced features required payment.

3.2 Procedure

The data was collected using an online survey targeting active users of gamified running and fitness branded applications, regardless of users' level of expertise. Data collection lasted from May to September 2021; data was gathered from online running forums (e.g. Let's Run, Runners Forum), Facebook groups for runners or for those who exercise in general (e.g. Copines de Running, Run in Montreal, Walking 4 Fitness, Women's Running Community) and specific communities found in the selected applications (e.g. Nike Run Club). Selection of these online communities was made by exploring the number of users beforehand, observing the level of daily engagement and activity and confirming that comments related to sports or running apps frequently came up in online conversations. The study aimed to target active online forums and communities made up of involved users likely to exhibit a good understanding of the usage of branded sports apps. To gather information, group owners or moderators were contacted to explain the research goals and asked for permission to post a link to the survey. In open groups, not requiring approval, the link was posted directly and requested the members' participation in the study. Additional survey responses were collected from participants in organised marathons in Barcelona between August and September 2021. The choice of Barcelona was deliberate because it is a prime location for organised races in Spain.

The questionnaire was developed in English, translated to Spanish and French by native English language academics, and back-translated to English by an independent native English language translator. The back-translation process (Craig and Douglas, 2000) ensured that all items were equivalent across the three languages. Permutation analysis following the Measurement Invariance Assessment in Composites routine (Henseler *et al.*, 2016) revealed no differences in the formation of the composites across groups. The questionnaire was initially piloted with a group of 30 international and national members of the Midnight Runners' community in Barcelona, which is made up of runners and athletes of varying socio-demographic profiles. After collecting the feedback, minor changes were made to the wording of several questions. A copy of the questionnaire is provided in Appendix.

To ensure that participants were using branded gamified applications and not confusing them with non-branded gamified versions such as Strava or Freeletics, the following control question was included in the survey: *Which sports app do you use more frequently? E.g. Nike Run Club, Fitbit, Adidas Run by Runtastic, etc.* After data screening, incomplete questionnaires, questionnaires from participants who responded about a non-branded application and those with answers exhibiting abnormal response patterns (e.g. inertia) were removed. As a result, a total of 436 answers were considered valid. Kurtosis and skewness values ranged from -1.444 to 0.905 and -1.370 to 0.995, respectively, and are both between $+3$ and -3. Statistical power analysis using G*Power 3.1 software was used to check the minimum sample size required (Faul *et al.*, 2009). For an exigent small-effect size of $f^2 = 0.050$, a statistical power level of 0.950, six predictors and an alpha level of 0.05, the minimum sample size was 218. Thus, the obtained sample size was acceptable to test the statistical significance of the proposed model. Of the respondents, 35.6% were between 36 and 45 years old, 56.4% were male and 61.3% were employed. The majority of respondents used Nike Run Club (35.6%) as the app for their regular physical activity. A more detailed overview of the characteristics of respondents appears in Table 1.

3.3 Questionnaire design and measurement

The study used a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree) based on instruments validated in previous studies. The questionnaire, inspired from Xi and Hamari's (2020) design, incorporated different blocks with the different latent variables included in the research model. The first block included questions about participants' socio-demographic status. The second covered questions related to the gamified branded app and about its brand. The third focused on users' history with the app (e.g. length of membership, frequency of app usage). The next two blocks contained questions about users' the gameful experience with the app, CBE, brand loyalty, behavioural intentions and brand-image congruity items. The items were adapted according to the specific branded app and brand that respondents chose in the second block of the survey, thanks to the functionality of the online survey design.

Regarding the constructs' specification, users' the gameful experience was conceptualised as a second-order mode B construct composed of six first-order reflective latent variables: enjoyment (ENJ), creative thinking (CT), dominance (DOM), absence of negative affect (ANA), app activation (APPACT) and absorption (AB). To measure this concept, the GAMEX scale proposed by Eppmann *et al.* (2018) was used by adapting it to the specific context of sports mobile apps. Specifically, ENJ was measured with three from the six original items reflecting the emotional positive valence derived from user's interaction with the app (e.g. "Using [app] is fun"). Activation was measured by four items and captured users' level of arousal and excitement while using the app (e.g. "While using [app] to practice sports, I feel activated"). ANA included three reversed items measuring users' potential negative affective states derived from GAMEX (e.g. "While using [app] to practice sports, I feel upset"). The AB dimension covered five of the six original items that included aspects such as loss of self-consciousness, attentive concentration or distorted sense of

Table 1 Sample description

Variable	%
Gender	
Male	56.4
Female	38.6
Non-binary/others	5
Experience with the app	
Less than 3 months	8.9
3–6 months	6.9
6–12 months	21.9
>12 months	62.3
Level of education	
None	2
Primary school	1
Secondary school	8.9
Professional training	13.8
Bachelor degree	35.7
Master or PhD. degree	38.6
Branded application	
Nike Run Club	35.6
Adidas running	9.9
RunKeeper by Asics	5
Fitbit	6
Under Armour Map my run	11
Nike training club	6
Adidas training by Runtastic	4
Asics studio	2
Garmin Connect	11.4
Others	9.1
Age	
18–24	5
25–35	13.8
36–45	35.6
46–55	34.6
56–66	10
Occupation	
Employed	61.3
Self-employed	12.9
Student	20.8
Unemployed	2
Retired	3
Frequency of usage	
Once per week	9.9
Twice per week	25.7
Three times per week	40.6
Four times per week	8.8
Five times per week	7
More than five times per week	8

Source: Created by authors

time (e.g. "While using [app], I lose track of time"). The DOM dimension, composed of four items, captured users' feelings about whether they felt influential and autonomous while using the app (e.g. "While using [app] to practice sports, I feel influential"). Finally, the CT element was

measured with four items covering aspects such as users' feelings of exploration or creativity while interacting with the app (e.g. "While using [app] to practice sports, I feel creative"). Two-tailed confirmatory tetrad analysis (Gudergan *et al.*, 2008) with 8,000 subsamples revealed that, from the potential nine tetrads, in four of them, the Bonferroni-adjusted confidence interval did not result in a value of zero. This suggests that the reflective measurement model should not be substantiated for GAMEX.

Following Hollebeek *et al.* (2014), CBE was measured as a second-order mode B construct formed by the cognitive processing, activation and affection dimensions. Specifically, cognitive processing included three items covering users' level of cognitive load and interest stimulation when using the brand (e.g. "Using [brand's] products gets me to think about [brand]"). The activation element, measured with three items, captured individuals' level of usage of the brand (e.g. "I spend a lot of time using [brand's] products compared to other brands"). The affection factor, measured with four items, showed users' affective evaluations of brand usage (e.g. "I feel good when I use [brand's] products"). These first-order dimensions were measured in Mode A. Brand loyalty was measured using four items adapted from Chaudhuri and Holbrook (2001) and Hsieh *et al.* (2021). The scale included users' self-evaluations about their purchase intentions, affection towards the brand and willingness to recommend it (e.g. "I will not buy other brands if [brand] is available at the market"). The behavioural intention to use the application was measured with four items using Chiu and Cho's (2020) scale. This construct reflected individuals' future intentions to keep using and interacting with the branded app (e.g. "I will use [app] on a regular basis in the future"). Finally, to measure the SIC moderator, three items were adopted from Kourouthanassis *et al.* (2015) and Kang *et al.* (2009). These items captured individuals' perceptions on how the focal activity – practicing sports – helped them to build and portray their self-images (e.g. "Practicing sports helps reflect who I am"). As control variables, the model included age, education and frequency of use of the gamified sports app as potential predictors of the endogenous variables.

3.4 Common method bias assessment

Because the data originated from a one-time survey, common method bias was assessed to prevent this issue (Podsakoff *et al.*, 2003). Firstly, all participants were informed that participation in the study was voluntary and that the anonymity and confidentiality of the data were assured. Secondly, to avoid participant inference with the goal and causality of the model and its relationships, the order of the dependent and independent variables was presented randomly. Thirdly, the participants were able to add their email addresses at the end of the survey to participate in a raffle draw. The prize was a pair of shoes from the winner's favourite brand; only participants with valid answers could participate in the raffle. Fourthly, a full collinearity test based on variance inflation factors (VIFs) was used to discard any possible bias. The analysis showed that all VIF values ranged from 1.074 to 2.104, and all values were lower than 3.3, which indicates the absence of common method bias in this study (Kock, 2015). Finally, a complementary Harman's single-factor test was performed.

The results of this procedure confirmed that common method bias was not present in the study as the fit of the model, in which all individual indicators loaded on assigned latent variables, was larger than that of the competitive models that incorporated all items into a unique construct.

4. Results

This study applied the partial least squares structural equation modelling (PLS-SEM) technique with SmartPLS 3.0 software to test the proposed hypotheses. PLS-SEM was chosen for this study for the following reasons: Firstly, the nature of the latent variables is compatible with the composite constructs, especially multidimensional ones that use linear combinations of manifest variables as proxies of the conceptual variables. Secondly, our research model incorporated a combination of both first- and second-order constructs and direct, indirect and moderating relationships. Therefore, PLS-SEM is the proper tool to manage these numerous structural model relationships (Manley *et al.*, 2021). Thirdly, PLS-SEM is more appropriate for conceptual models that include simultaneous composites with formative (Mode B) and reflective (Mode A) indicators, which is the case in this study (Hair *et al.*, 2011).

4.1 Measurement model assessment

As previously noted, users' gameful experience and CBE were conceived as second-order constructs. A two-stage approach was applied to estimate these multidimensional constructs (Wetzels *et al.*, 2009). In the preliminary first-order estimation stage, all first-order latent variables were measured as reflective Mode A, and one item was removed from the APPACT dimension of the GAMEX scale because of its low individual reliability. In the second stage, the second-order final measurement model was estimated after obtaining the latent variable scores for the first-order constructs. Tables 2 and 3 show the results of the measurement model assessment. All the constructs were internally consistent, as their individual and composite reliability estimates exceeded the recommended threshold of 0.70 and the acceptable threshold of 0.60 (Hair *et al.*, 2022) (Table 2). The constructs' average variance extracted (AVE) values were above the critical threshold of 0.50. Therefore, the constructs presented convergent validity (Hair *et al.*, 2019) (Table 2). Moreover, the heterotrait-monotrait (HTMT) ratios were analysed to verify the constructs' discriminant validity. Results confirmed the existence of discriminant validity among all the constructs as the HTMT ratios were below the threshold of 0.85 (Henseler *et al.*, 2015) (Table 3).

Regarding the Mode B multidimensional constructs, the VIFs ranged from 1.360 to 3.817 (Table 2). This suggests that the formative indicators for the second-order constructs do not present critical levels of multicollinearity (Hair *et al.*, 2011). In addition, external validity was analysed by assessing the indicators' weights. Indicators have external validity when they have statistically significant weight. If an indicator's weight is not significant, but the corresponding loading is high (i.e. above 0.50), the indicator has external validity and should be retained (Hair *et al.*, 2017). In this study, the DOM, CT and ANA dimensions of the gameful experience construct presented non-significant weights. Following Hair *et al.* (2017)

recommendations, their outer loadings were assessed and were found to exceed the recommended threshold of 0.50, except for ANA, which was low, with a value of 0.390 (Table 2). The significance of ANA's outer loading was then assessed. A complementary bootstrapping analysis with 8,000 subsamples was conducted to confirm its significance ($p < 0.001$) (Hair *et al.*, 2017) (Table 2). Therefore, these dimensions were retained to preserve content validity and because they were not identified as problematic indicators causing collinearity issues.

4.2 Structural model assessment

After analysing the measurement model, the statistical significance of the standardised paths was examined with a bootstrapping procedure of 8,000 subsamples. The model explained 49.8% of the variation of the users' CBE, 46.5% of the variation of the users' intention to use the branded gamified app in the future and 67.7% of the variation of the users' loyalty towards the brand that owned the gamified app (Table 4). Furthermore, all Q^2 values for all endogenous constructs were positive, verifying the predictive accuracy of the model (Hair *et al.*, 2019). The estimated model had an acceptable fit as the standardised root mean square residual (SRMR) was 0.050 (Henseler *et al.*, 2014). Regarding the significance of the control variables, the education level increased behavioural intentions ($\beta = 0.098$, $t = 2.407$) but decreased CBE ($\beta = -0.097, t = 2.414$). Frequency of usage was positively and significantly connected to CBE ($\beta = 0.083$, $t = 2.065$), loyalty ($\beta = 0.074$, $t = 2.088$) and behavioural intentions ($\beta = 0.101$, $t = 2.250$), whereas age did not have a significant influence on these variables. The results of the structural model are summarised and presented in Table 4.

4.2.1 Hypotheses testing: direct effects

Contrary to our original expectations, the results revealed that the gameful experience had a positive but insignificant direct impact on the brand loyalty variable (LOY) ($\beta = 0.053$, $t = 0.993$), leading to a rejection of *H1*. However, the gameful experience positively and significantly impacted users' intentions to use the branded app (INT) ($\beta = 0.275, t = 3.859$), providing empirical support for *H2*.

4.2.2 Hypotheses testing: the mediating role of customer brand engagement

Firstly, mediation analysis was performed to estimate the relationship between GAMEX and LOY. The results indicated a mediating role of CBE between GAMEX and LOY ($\beta = 0.275$; *t*-value = 5.546). As the direct effect of GAMEX on LOY was not significant ($\beta = 0.053$; *t*-value = 0.993), this result showed that CBE fully mediates the influence of users' gamified experience on LOY. Secondly, regarding the mediated relationship between gamified experience and behavioural intentions through CBE, estimations also revealed that the indirect effect is positive and significant ($\beta = 0.056$; *t*-value = 1.985). In this sense, the direct effect of GAMEX on INT was still significant, which suggests that CBE partially mediated the relationship between GAMEX and INT. These results led us to accept both *H3* and *H4*.

Table 2 Measurement model

Construct/dimension/indicator	Outer loadings	Outer weights	VIF	CR	AVE
Gameful experience (MC)					
Enjoyment (ENJ)	*0.959**	*0.568**	3.512	0.955	0.876
ENJ1	0.947	0.366		–	
ENJ2	0.924	0.343			
ENJ3	0.937	0.359			
App activation (APPACT)	*0.899**	*0.241***	3.817	0.846	0.620
APPACT1	0.873	0.358		–	
APPACT3	0.905	0.369			
APPACT4	0.930	0.361			
Creative thinking (CT)	*0.826**	*0.035*	3.222	0.941	0.799
CT1	0.876	0.250		–	
CT2	0.916	0.290			
CT3	0.875	0.276			
CT4	0.906	0.302			
Absence of negative affect (ANA)	*0.340**	*0.059*	1.360	0.959	0.885
ANA1	0.952	0.366		–	
ANA2	0.934	0.383			
ANA3	0.937	0.313			
Absorption (AB)	*0.754**	*0.194**	2.250	0.906	0.662
AB1	0.672	0.248		–	
AB2	0.862	0.232			
AB3	0.862	0.239			
AB4	0.867	0.263			
AB5	0.787	0.253			
Dominance (DOM)	*0.580**	*0.075*	1.966	0.893	0.678
DOM1	0.726	0.468		–	
DOM2	0.831	0.239			
DOM3	0.883	0.290			
DOM4	0.845	0.243			
Customer brand engagement (MC)					
Cognitive processing (CP)	*0.844**	*0.292**	2.081	0.937	0.832
CP1	0.921	0.354		–	
CP2	0.904	0.334			
CP3	0.911	0.408			
Brand activation (ACT)	*0.878**	*0.308**	2.459	0.963	0.896
ACT1	0.937	0.341		–	
ACT2	0.951	0.348			
ACT3	0.951	0.367			
Affection (AFF)	*0.934**	*0.517**	2.384	0.963	0.868
AFF1	0.941	0.278		–	
AFF2	0.916	0.243			
AFF3	0.945	0.274			
AFF4	0.924	0.278			
Brand loyalty (LOY)			–	0.935	0.782
LOY1	*0.914*	*0.296*		–	
LOY2	0.894	0.303			
LOY3	0.830	0.240			
LOY4	0.896	0.290			

(*continued*)

Table 2

Construct/dimension/indicator	Outer loadings	Outer weights	VIF	CR	AVE
Intention to use (INT)			–	*0.966*	*0.876*
INT1	0.925	0.258		–	
INT2	0.947	0.307			
INT3	0.937	0.248			
INT4	0.935	0.255			
Self-image congruity (SIC)			–	*0.967*	*0.907*
SIC1	0.939	0.341		–	
SIC2	0.957	0.353			
SIC3	0.961	0.356			

Notes: MC = multidimensional construct; VIF = variance inflation factor; CR = composite reliability; AVE = average variance extracted
Source: Created by authors

Table 3 Discriminant validity analysis: heterotrait-monotrait ratios

	1	2	3	4	5	6	7	8	9	10	11
1. AB											
2. APPACT	0.731										
3. ACT	0.476	0.532									
4. AFF	0.478	0.616	0.763								
5. ANA	0.303	0.431	0.271	0.297							
6. CP	0.594	0.548	0.729	0.713	0.234						
7. CT	0.729	0.778	0.470	0.547	0.363	0.491					
8. DOM	0.571	0.476	0.294	0.331	0.406	0.364	0.493				
9. ENJ	0.676	0.850	0.517	0.600	0.295	0.503	0.801	0.475			
10. INT	0.397	0.679	0.416	0.466	0.088	0.406	0.471	0.281	0.641		
11. LOY	0.524	0.614	0.806	0.777	0.235	0.753	0.529	0.356	0.574	0.535	
12. SIC	0.267	0.381	0.288	0.283	0.109	0.309	0.266	0.205	0.454	0.612	0.594

Note: See acronyms in Table 2
Source: Created by authors

Table 4 Structural model results

Structural relationship	β	*t*-value	*p*-value	Hypothesis testing
H1: Gameful experience → LOY	0.053	0.993	0.160	Rejected
H2: Gameful experience → INT	0.275	3.859**	0.000	Accepted
H3: Gameful experience → CBE → LOY	0.275	5.546**	0.000	Accepted
H4: Gameful experience → CBE → INT	0.056	1.985*	0.024	Accepted
H5: SIC* Gameful experience → CBE	−0.137	4.486**	0.000	Rejected
H6: SIC* Gameful experience → LOY	0.024	1.033	0.151	Rejected
H7: SIC* Gameful experience → INT	0.130	4.025**	0.000	Accepted
R^2 (CBE) = 0.498; R^2 (INT) = 0.465; R^2 (LOY) = 0.677				
Q^2 (CBE) = 0.369; Q^2 (INT) = 0.391; Q^2 (LOY) = 0.518				

Notes: Brand loyalty (LOY), intention to use (INT), customer-brand engagement (CBE), self-image congruity (SIC). *$p < 0.05$, **$p < 0.01$. Analysis was run at 5% significance level
Source: Created by authors

4.2.3 Hypotheses testing: the moderating role of self-image congruity

A two-stage approach was used to calculate the moderating effects of SIC (Henseler and Chin, 2010). Contrary to our expectations, results showed that the interaction of SIC and GAMEX on CBE ($\beta = -0,137$; *t*-value = 4.486) was negative and significant. Thus, GAMEX had a stronger impact on CBE for users with low levels of SIC; therefore, *H5* is rejected. In addition, no significant interaction was found between SIC and GAMEX in explaining LOY ($\beta = 0.024$; *t*-value = 1.033). This

result led us to reject *H6*. However, the effect of GAMEX on INT was positively moderated by SIC. The interaction showed a positive and significant path ($\beta = 0.130$; *t*-value = 4.025). This suggests that the effect of GAMEX on behavioural intentions increased for users who present higher levels of SIC; therefore, *H7* is accepted.

4.2.4 Post hoc analysis: estimation of an alternative complementary model

To further explore the model's implications, post hoc analysis of an alternative complementary model was performed. This model included the dimensions of GAMEX as first-order constructs and retained CBE as a second-order construct. Therefore, the individual effects of the GAMEX dimensions on CBE, LOY and INT could be further explored. Consistent with the results of the baseline model, only APPACT significantly influenced LOY at $p < 0.10$ ($\beta = 0.104$; $p < 0.10$). ANA ($\beta = 0.162$; $p < 0.01$) and particularly ENJ directly, positively and significantly increased INT ($\beta = 0.456$; $p < 0.01$). In addition, the estimation of the specific indirect effect showed that CBE mediated the influence of AB ($\beta = 0.114$; $p < 0.05$), DOM ($\beta = 0.061$; $p < 0.10$), ANA ($\beta = 0.074$; $p < 0.05$) and ENJ ($\beta = 0.130$; $p < 0.05$) on LOY ($\beta = 0.012$, $p < 0.5$). In predicting INT, CBE significantly mediated the influence of ANA ($\beta = 0.032$; $p < 0.05$), ENJ ($\beta = 0.038$; $p < 0.05$) and AB ($\beta = 0.034$; $p < 0.05$).

Regarding the moderating effects, the estimations revealed that the interactive effect between SIC and APPACT on CBE was negative and significant ($\beta = -0.198$; $p < 0.05$) and that the interactive effect of SIC and AB on INT was positive and significant ($\beta = 0.149$; $p < 0.01$). These results are in line with those found in the baseline model but were able to further specify which specific elements of GAMEX were moderated by SIC.

Overall, the estimation of this complementary model reinforces the findings of the baseline model and provides additional insights into which particular dimensions of GAMEX determine the dependent variables. However, the interpretation should be taken with caution as the fit of the model is close to the critical suggested thresholds, given the large number of constructs and relationships in the model (SRMR = 0.083).

5. Discussion

5.1 Theoretical implications

This study contributes to a better understanding of the gamification and technology literature by proposing a novel model that explores the impact of gamification on loyalty in the context of branded applications. The findings reveal a positive chain of connection between gamification, CBE, brand loyalty and intentions to use the gamified app. Furthermore, the impact of these relationships appears to be influenced by users' levels of SIC related to the focal activity of sports. The results yield significant theoretical insights.

Firstly, this study draws on the SOR model and validates the role of the gameful experience as an external stimulus that influences customer brand loyalty and behavioural intentions to use the app (response) through CBE (organism). As a result, this research extends the applicability of the SOR model to the fitness and sports-gamified apps. In addition, the study contributes to

the existing body of technology literature by providing further evidence of the significant impact of education levels on technology adoption and usage. The findings demonstrate that higher education levels are associated with increased behavioural intentions, indicating that individuals with higher education are more likely to engage with the branded gamified app and continue using it. This finding aligns with previous literature (Billon *et al.*, 2021; Riddell and Song, 2017).

Secondly, a critical contribution of this study lies in the non-significant direct influence of the gameful experience on brand loyalty, challenging initial expectations. The findings suggest that users require more than a successful and enjoyable interaction with the gamified system to develop loyalty towards the brand. As indicated in prior research, the use of game mechanics helps deliver a customisable journey to users (Tu *et al.*, 2019), which may increase their continuance intentions but does not necessarily foster brand loyalty. Although it was expected that the gameful experience would have a positive influence on brand loyalty (Al-Zyoud, 2021), this finding could also imply that consumers in the fitness and sports sector may expect additional game elements integrated into their journey to establish loyalty, rather than solely relying on the presence of an enjoyable gamified experience.

Furthermore, a post hoc analysis reveals that only the APPACT dimension of the GAMEX scale demonstrates a significant direct influence on brand loyalty. This finding can be attributed to the co-creative nature of the gameful experience (Huotari and Hamari, 2017). When a gamified branded application offers users an intuitive journey with personalised communication, enabling them to schedule, track activities and set goals, it fosters a sense of participation in creating the experience and a sensation of activation within the branded app. This emotional connection enhances the relation between the user and the brand, and in turn, their loyalty to it. Therefore, aspects such as value co-creation resulting from the experience with branded applications positively influence brand loyalty (Fang, 2019) and contribute to its enhancement (Adhikari and Panda, 2019).

Thirdly, another key contribution of this study is the direct impact of users' gameful experiences with a branded application on their intentions to continue using it in the future. Consistent with previous research (Bitrián *et al.*, 2021; Tu *et al.*, 2019), the gameful experience enhances users' willingness to engage with the system on a regular basis. Interestingly, the post hoc analyses highlight the crucial role of the ENJ and ANA dimensions in predicting continuance intentions. Specifically, enjoyment represents the fun, playful and entertaining interactions users have with the app, which are essential for bringing them back to the app. When users experience positive emotions while interacting with the app, it generates a sense of delight and reduces anxiety and concern, significantly influencing their acceptance and adoption of the branded app (Faqih, 2022; Hsieh *et al.*, 2021). Similarly, when users do not encounter negative emotions during their interactions, they are more inclined to continue using the app in the future. Therefore, these two emotional dimensions of the gameful experience serve as critical and direct predictors of users' behavioural intentions.

Fourthly, a significant contribution of this study is the identification of CBE as a key mediator in the relationships

between the gameful experience and user responses in branded gamified apps. This finding aligns with previous research in various application contexts, such as online banking (Islam *et al.*, 2020), brand communities (Duong *et al.*, 2020; Islam and Rahman, 2017) and travel (Ali *et al.*, 2021). The study demonstrates that CBE fully mediates the relationship between the gameful experience and brand loyalty and partially mediates the relationship between the gameful experience and behavioural intentions. These results reinforce the notion that gamification in mobile applications plays a crucial role in engaging users with the brand (Abou-Shouk and Soliman, 2021; Bitrián *et al.*, 2021; Xi and Hamari, 2020). The use of gamified features can trigger individuals' affective, cognitive and behavioural engagement with the brand, fostering stronger brand ties and motivating continued app usage. On the one hand, total mediation on brand loyalty, as initially suggested, indicates that a gamified experience requires that customers be engaged with the brand to eventually create brand loyalty. On the other hand, partial mediation suggests that beyond its direct effect, CBE explains how the gamified experience influences users' behavioural intention. Furthermore, the analysis of the first-order constructs reveals that aspects such as AB, ANA and DOM influence CBE, which, in turn, drives brand loyalty. At the same time, AB, ANA and ENJ contribute to enhancing the intention to use the branded app in the future through CBE.

The aspect of dominance allows users to exert active control and autonomy when using the branded application (Hsieh *et al.*, 2021). This enables them to take full ownership of their interactions with the app and brand-related content. This sense of ownership, in turn, enhances users' level of engagement with the brand, fostering a closer connection and leading to higher levels of brand loyalty and a stronger intention to use the app in the future. In addition, the immersive nature of the gameful experience helps users escape reality and minimise distractions, keeping their attention and engagement focused on the app (Ryan *et al.*, 2006). This, combined with the absence of negative emotions, empowers users and cultivates a higher level of brand engagement, leading to more loyalty.

Fifthly, this study contributes to the gamification and branding literature by expanding the scope of the SOR model to include the role of SIC. Surprisingly, the results reveal that the gameful experience leads to weaker engagement for users with high levels of SIC in sports. This could be attributed to the fact that individuals with low SIC become more interested in sports and curious about the brand during a successful gameful experience. This means that when users understand how the brand fits their image, and how it reflects who they are, they are more likely to engage with it (Chen and Pu, 2014). In addition, we speculate that to users for whom sports do not play a crucial role in forming their self-image, elements like the thrill of discovering a new passion for the first time keep them active and engaged in a more pronounced way than for those who already deeply care about sports and consider them part of their lives. Moreover, contrary to our expectations, the moderating effect of SIC on the gameful experience and brand loyalty was found to be non-significant. This result suggests that brand loyalty requires more than just interactions with gameful experiences, whether the users identify with sports or not! Finally, the study demonstrates that the impact of the gameful experience on the intention to use a gamified branded application in the future is stronger for individuals with high SIC, particularly in terms of the absorption dimension of the branded app. For these users, and considering what sports represent to them, the gamification elements are more easily accepted as it allows them to efficiently achieve their personal goals and reinforce their image (Lim *et al.*, 2016). Thus, gamification will keep these users more motivated to continue their exercise regimen and, therefore, this drive reinforces their self-concept. Individuals with high SIC are interested in sports because they help them maintain their image and character and one way of showcasing this to others is by continually using their branded gamified application. This result is also in line with recent studies that found that the inclusion of gamification features, focused on fostering utilitarian values, can exert a stronger influence on consumer responses than social or emotional elements in the context of branded apps (Torres *et al.*, 2022).

5.2 Managerial implications

This study carries significant implications for app designers and marketing managers seeking to implement gamification strategies in branded apps. Firstly, this research highlights the importance of shifting the focus from thinking only about gamification in terms of game elements to focusing more on the significance of the experience-centred approach. In this sense, marketers should recognise the value of co-creating gameful experiences with their customers, involving them in the design process and encouraging their contributions to the development of interactions and touchpoints. By establishing a partnership with customers throughout the design phase, rather than solely involving them in testing, marketers can gain novel perspectives and valuable feedback. Consequently, this collaborative approach will not only save time and money for managers before product launch but it will also ensure the ultimate success of the gameful experience by making it customer-centred.

Secondly, this study provides valuable insights for managers seeking to understand how gamification can boost loyalty towards their brands in the sports and fitness sectors and encourage continuous use of their branded gamified apps in the future. Although many organisations have successfully used gamification to enhance customer engagement, retention and loyalty (Eisingerich *et al.*, 2019), other firms have struggled and failed to deliver effective gameful experiences. To address this challenge, organisations require deeper insights into the factors that drive customer engagement with gamified systems. Therefore, the findings of this study serve as a comprehensive guide for gamification and gameful experience designers, shedding light on the key determinants of user behaviours and attitudes in the sports and fitness industry.

With respect to this, the significant finding that the gameful experience did not have a direct effect on brand loyalty, except for its activation dimension that was found to be significant, may be of particular interest to marketers is with only activation demonstrating significance. Therefore, gamified applications should be designed to stimulate users' activation and excitement during the app interactions. This can be achieved by incorporating gamification elements that provide users with a sense of progress (e.g. progress bars, points, badges) and offer brand-related rewards upon reaching specific milestones or attaining specific status within the app. For example, marketers

can incentivise users' daily check-ins through a points system, and once users reach a certain milestone, they can receive promotional offers or exclusive discounts to use for brand-related purchases. Furthermore, the results of this study align with previous research (Eppmann *et al.*, 2018) in demonstrating that enjoyment and the absence of negative affect directly influence users' intentions to continue using the branded app in the future. Therefore, gamified app designers should prioritise creating pleasurable and emotionally engaging experiences by improving the app's design and enhancing its hedonic value. This can be achieved by enhancing visual attractiveness through the use of colours, shapes and animations, as well as integrating game elements such as avatars that reflect different emotional states based on the user's activity (e.g. a happy avatar if the individual has been using the app regularly). In addition, brands can leverage the power of narratives and storylines to further enhance user enjoyment.

Thirdly, it is crucial to design gamified applications that foster user engagement with the brand. This study uncovers the mediating role of CBE in the relationship between gamification and customer loyalty. Therefore, marketers should emphasise the importance of designing gameful experiences that cultivate a sense of connectedness between the users and the brands. This connection can be established by incorporating engaging stories and immersive environments that position the brand and the user as central characters within the narrative. Furthermore, app designers should integrate gamified elements that empower users to enhance their feelings of dominance and control. One approach is to invite users to co-create their journeys within the branded gamified application. For instance, enabling personalisation options may provide users with a sense of increased dominance perception and encourage frequent interactions with the app. In addition, incorporating a social platform within the gamified app, where users can share their feedback on challenges, propose workouts or provide reviews on the brands' products and services, can enhance users' perceived freedom to act, leading to a heightened sense of dominance. Considering these reasons and that users may encounter the gamified branded app as their first interaction with the brand before moving towards the consumption stage, it is crucial to deliver a positive and enjoyable initial experience. This will foster positive emotions that can ultimately drive brand engagement and favourable outcomes. In summary, CBE plays a central role in this research, particularly in a time when delivering value and quality alone is considered the bare minimum for companies to thrive. Therefore, marketers should explore ways to sustain the interaction between the user and the brand, beyond usefulness and utility. Accordingly, gamification serves as a solution and catalyst, enabling increased brand value through insights, innovation and successful user experiences, ultimately leading to breakthrough performance results.

Finally, it is essential for marketers and app designers to develop gamification strategies that actively promote consumer engagement, not only through the gameful experience itself but also in alignment with the individuals' SIC. Based on the findings of this study, marketers and brand managers should design gamified apps that evoke emotional, cognitive and activation-related responses from customers while also catering to their psychological needs. However, it is worth noting that

higher levels of SIC with a particular activity can diminish the impact of the gameful experience on CBE. Hence, it is crucial for marketers and designers to explore options to better tailor gamification based on users' profiles, taking into consideration their level of SIC with the focal activity. By doing so, they can ensure that brand engagement is not compromised for users who possess a higher level of SIC.

5.3 Limitations and further research

This study is not free of limitations that could lead to future research opportunities for scholars. Firstly, this study tested the proposed model using data from several applications focused only on the running and/or working out disciplines. Future studies can apply the proposed model to other types of sports to understand whether the delivered gameful experience changes depending on the practiced activity or whether it is individual or collective – and to comprehend better what drives brand loyalty and behavioural intentions, to expand the literature on branded applications. Another possible research endeavour can be to investigate whether the level of expertise (beginner to advanced) of the sports and fitness app users impacts their engagement and behavioural outcomes. This type of research will contribute to understanding the various factors that can impact the gameful experience based on the environment where it occurs and the sports expertise of its users. Secondly, the target sample of this paper included active users of branded fitness and sports applications. Therefore, future studies could examine the impact of the gameful experience on marketing and behavioural outcomes in non-branded apps (e.g. Strava, Zombies, Run!) to understand better the dimensions and variables that drive these outcomes within these communities.

In addition, exploring the differences in user goals for using these branded gamified apps can provide future guidelines for academics, brand owners and managers to help determine the triggers of the gameful experience and behavioural intentions. Furthermore, a comparative study of branded and non-branded applications regarding the delivered gameful experience and behavioural outcomes could be a particularly interesting research project. Thirdly, the current research used convenience sampling to collect data. Therefore, to generalise this study's findings to the overall population of interest, future research will find it interesting to replicate the same model using probability sampling to select their participants. Fourthly, the data was obtained using a self-administered questionnaire. Therefore, measuring the gameful experience's impact using subjective and objective measures could be worthwhile. Future studies could also combine this methodology with data gathered directly from applications' mechanisms to deepen the understanding of the users' perception of the gameful experience. Finally, although this study applied the GAMEX scale from Eppmann *et al.* (2018) to analyse the gameful experience derived from gamification, future studies could use alternative frameworks and scales to strengthen understanding of the gameful experience's behavioural effects in the sports and fitness industry. For example, recent studies have suggested looking into the disaggregated elements of the GAMEX scale and their heterogeneous paths of influence on consumer engagement and behaviour. The utilitarian value of an app, frequently connected to its core functional elements (task completion or challenge achievement), may not always elicit emotional responses from

app users. In contrast, hedonic values induce strong emotional reactions that precede brand loyalty (Torres *et al.*, 2022) and continuance intention to use (Luo *et al.*, 2023). Finally, this study is based on the premise that the experience with a gamified technology can elicit favourable outcomes also at the brand level. Future studies should expand this connection by further considering the impact of the gameful experience on the users' engagement with the branded gamified app. The causal connections between the gamified experience and the users' engagement at the technology level should also be considered as an alternative source to generate technology and brand-based positive outcomes. This study would clarify how customers could be more engaged with a brand as a result of interacting with a gamified branded app via technology engagement.

References

Abou-Shouk, M. and Soliman, M. (2021), "The impact of gamification adoption intention on brand awareness and loyalty in tourism: the mediating effect of customer engagement", *Journal of Destination Marketing & Management*, Vol. 20 Article 100559.

Adhikari, K. and Panda, R.K. (2019), "The role of consumer-brand engagement towards driving brand loyalty: mediating effect of relationship quality", *Journal of Modelling in Management*, Vol. 14 No. 4, pp. 987-1005.

Ahn, J. and Back, K.J. (2018), "Antecedents and consequences of customer brand engagement in integrated resorts", *International Journal of Hospitality Management*, Vol. 75, pp. 144-152.

Ali, F., Terrah, A., Wu, C., Ali, L. and Wu, H. (2021), "Antecedents and consequences of user engagement in smartphone", *Journal of Hospitality and Tourism Technology*, Vol. 12 No. 2, pp. 355-371.

Al-Zyoud, M.F. (2021), "The impact of gamification on consumer loyalty, electronic word-of mouth sharing and purchase behavior", *Journal of Public Affairs*, Vol. 21 No. 3, p. e2263.

Azjen, I. (1991), "The theory of planned behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50, pp. 179-211.

Bakker, I., Van Der Voordt, T., Vink, P. and De Boon, J. (2014), "Pleasure, arousal, dominance: Mehrabian and Russell revisited", *Current Psychology*, Vol. 33 No. 3, pp. 405-421.

Behl, A., Jayawardena, N., Ishizaka, A., Gupta, M. and Shankar, A. (2022), "Gamification and gigification: a multidimensional theoretical approach", *Journal of Business Research*, Vol. 139, pp. 1378-1393.

Bekk, M., Eppmann, R., Klein, K. and Völckner, F. (2022), "All that glitters is not gold: an investigation into the undesired effects of gamification and how to mitigate them through gamification design", *International Journal of Research in Marketing*, Vol. 39 No. 4, pp. 1059-1081.

Berger, A., Schlager, T., Sprott, D.E. and Herrmann, A. (2018), "Gamified interactions: whether, when, and how games facilitate self–brand connections", *Journal of the Academy of Marketing Science*, Vol. 46 No. 4, pp. 652-673.

Billon, M., Crespo, J. and Lera-Lopez, F. (2021), "Do educational inequalities affect internet use? An analysis for developed and developing countries", *Telematics and Informatics*, Vol. 58.

Bitrián, P., Buil, I. and Catalán, S. (2021), "Enhancing user engagement: the role of gamification in mobile apps", *Journal of Business Research*, Vol. 132, pp. 170-185.

Brodie, R.J., Hollebeek, L.D., Jurić, B. and Ilić, A. (2011), "Customer engagement: conceptual domain, fundamental propositions, and implications for research", *Journal of Service Research*, Vol. 14 No. 3, pp. 252-271.

Chaudhuri, A. and Holbrook, M.B. (2001), "The chain of effects from brand trust and brand affect to brand performance: the role of brand loyalty", *Journal of Marketing*, Vol. 65 No. 2, pp. 81-93.

Chen, Y. and Pu, P. (2014), "HealthyTogether: exploring social incentives for mobile fitness applications", *Proceedings of the second international symposium of Chinese chi, Toronto, April*, pp. 25-34.

Chiu, W. and Cho, H. (2020), "The role of technology readiness in individuals' intention to use health and fitness applications: a comparison between users and non-users", *Asia Pacific Journal of Marketing and Logistics*, Vol. 33 No. 3, pp. 807-825.

Craig, C.S. and Douglas, S.P. (2000), *International Marketing Research*, John Wiley & Sons, Chichester.

Curry, D. (2022), "Fitness app revenue and usage statistics (2022)", available at: www.businessofapps.com/data/fitness-app-market/ (accessed 3 October 2022).

Deterding, S., Dixon, D., Khaled, R. and Nacke, L. (2011), "From game design elements to gamefulness: defining 'gamification'", in Lugmayr, A. (Ed.), *Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments, Tampere, Finland, Association for Computing Machinery*, New York, NY, pp. 9-15.

Domínguez, A., Saenz-de-Navarrete, J., De-Marcos, L., Fernández-Sanz, L., Pagés, C. and Martínez-Herráiz, J.J. (2013), "Gamifying learning experiences: practical implications and outcomes", *Computers & Education*, Vol. 63, pp. 380-392.

Duong, G.H., Wu, W.-Y. and Le, L.H. (2020), "The effects of brand page characteristics on customer brand engagement: moderating roles of community involvement and comedy production contents", *Journal of Brand Management*, Vol. 27 No. 5, pp. 531-545.

Edwards, E.A., Lumsden, J., Rivas, C., Steed, L., Edwards, L. A., Thiyagarajan, A., Sohanpal, R., Caton, H., Griffiths, C. J., Munafò, M.R., Taylor, S. and Walton, R.T. (2016), "Gamification for health promotion: systematic review of behaviour change techniques in smartphone apps", *BMJ Open*, Vol. 6 No. 10, p. e012447.

Eisingerich, A.B., Marchand, A., Fritze, M.P. and Dong, L. (2019), "Hook vs. hope: how to enhance customer engagement through gamification", *International Journal of Research in Marketing*, Vol. 36 No. 2, pp. 200-215.

Eppmann, R., Bekk, M. and Klein, K. (2018), "Gameful experience in gamification: construction and validation of a gameful experience scale [GAMEX]", *Journal of Interactive Marketing*, Vol. 43, pp. 98-115.

Fang, Y.H. (2019), "An app a day keeps a customer connected: explicating loyalty to brands and branded applications through the lens of affordance and service-dominant logic", *Information & Management*, Vol. 56 No. 3, pp. 377-391.

Faqih, K.M. (2022), "Factors influencing the behavioral intention to adopt a technological innovation from a developing country context: the case of mobile augmented reality games", *Technology in Society*, Vol. 69.

Faul, F., Erdfelder, E., Buchner, A. and Lang, A.G. (2009), "Statistical power analyses using G*power 3.1: test for correlation and regression analyses", *Behavior Research Methods*, Vol. 41 No. 4, pp. 1149-1160.

Feng, W., Tu, R. and Hsieh, P. (2020), "Can gamification increases consumers' engagement in fitness apps? The moderating role of commensurability of the game elements", *Journal of Retailing and Consumer Services*, Vol. 57 Article 102229.

Fournier, S. (1998), "Consumers and their brands: developing relationship theory in consumer research", *Journal of Consumer Research*, Vol. 24 No. 4, pp. 343-373.

Gabisch, J.A. (2011), "Virtual world brand experience and its impact on real world purchasing behavior", *Journal of Brand Management*, Vol. 19 No. 1, pp. 18-32.

Gatautis, R., Vitkauskaitė, E., Gadeikiene, A. and Piligrimienė, Ž. (2016), "Gamification as a mean of driving online consumer behaviour: SOR model perspective", *Engineering Economics*, Vol. 27 No. 1, pp. 90-97.

Grand View Research (2021), "Fitness app market size, share & trends analysis report by type (exercise & weight loss, diet & nutrition, activity tracking), by platform (android, iOS), by device, by region, and segment forecasts, 2022 – 2030", available at: www.grandviewresearch.com/industry-analysis/fitness-app-market (accessed 30 June 2022).

Grand View Research (2023), "Sports app market to reach $8.03 billion by 2030 | CAGR doi: 10.9%", available at: www.grandviewresearch.com/press-release/global-sports-app-market (accessed 18 September 2023).

Gudergan, S.P., Ringle, C.M., Wende, S. and Will, A. (2008), "Confirmatory tetrad analysis in PLS path modeling", *Journal of Business Research*, Vol. 61 No. 12, pp. 1238-1249.

Hair, J.F., Ringle, C.M. and Sarstedt, M. (2011), "PLS-SEM: indeed a silver bullet", *Journal of Marketing Theory and Practice*, Vol. 19 No. 2, pp. 139-152.

Hair, J.F., Sarstedt, M., Ringle, C.M. and Gudergan, S.P. (2017), *Advanced Issues in Partial Least Squares Structural Equation Modelling*, Sage publications, Thousand Oaks, CA.

Hair, J.F., Risher, J.J., Sarstedt, M. and Ringle, C.M. (2019), "When to use and how to report the results of PLS-SEM", *European Business Review*, Vol. 31 No. 1, pp. 2-24.

Hair, J.F., Hult, G., Tomas, M., Sarstedt, M. and Ringle, C.M. (2022), *A Primer on Partial Least Squares Structural Equation Modelling (PLS-SEM)*, Sage College Publishing, Los Angeles, CA.

Hamari, J. (2017), "Do badges increase user activity? A field experiment on the effects of gamification", *Computers in Human Behavior*, Vol. 71, pp. 469-478.

Hamari, J. (2019), "Gamification", *The Blackwell Encyclopedia of Sociology*, John Wiley & Sons, Oxford, pp. 1-3.

Hamari, J. and Koivisto, J. (2015a), "Why do people use gamification services?" *International Journal of Information Management*, Vol. 35 No. 4, pp. 419-431.

Hamari, J. and Koivisto, J. (2015b), "Working out for likes': an empirical study on social influence in exercise gamification", *Computers in Human Behavior*, Vol. 50, pp. 333-347.

Hammedi, W., Leclerq, T. and Van Riel, A.C. (2017), "The use of gamification mechanics to increase employee and user engagement in participative healthcare services: a study of two cases", *Journal of Service Management*, Vol. 28 No. 4, pp. 640-661.

Han, H., Moon, H. and Kim, W. (2019), "The influence of international tourists' self-image congruity with a shopping place on their shopping experiences", *Journal of Hospitality and Tourism Management*, Vol. 41, pp. 101-109.

Harwood, T. and Garry, T. (2015), "An investigation into gamification as a customer engagement experience environment", *Journal of Services Marketing*, Vol. 29 Nos 6/7, pp. 533-546.

Hassan, L., Dias, A. and Hamari, J. (2019), "How motivational feedback increases user's benefits and continued use: a study on gamification, quantified-self and social networking", *International Journal of Information Management*, Vol. 46, pp. 151-162.

Henseler, J. and Chin, W.W. (2010), "A comparison of approaches for the analysis of interaction effects between latent variables using partial least squares path modelling", *Structural Equation Modeling: A Multidisciplinary Journal*, Vol. 17 No. 1, pp. 82-109.

Henseler, J., Ringle, C.M. and Sarstedt, M. (2015), "A new criterion for assessing discriminant validity in variance-based structural equation modelling", *Journal of the Academy of Marketing Science*, Vol. 43 No. 1, pp. 115-135.

Henseler, J., Ringle, C.M. and Sarstedt, M. (2016), "Testing measurement invariance of composites using partial least squares", *International Marketing Review*, Vol. 33 No. 3, pp. 405-431.

Henseler, J., Dijkstra, T.K., Sarstedt, M., Ringle, C.M., Diamantopoulos, A., Straub, D.W., Ketchen, D.J., Hair, J. F., Hult, G.T.M. and Calantone, R.J. (2014), "Common beliefs and reality about partial least squares: comments on Rönkkö & Evermann (2013)", *Organizational Research Methods*, Vol. 17 No. 2, pp. 182-209.

Högberg, J., Ramberg, M.O., Gustafsson, A. and Wästlund, E. (2019), "Creating brand engagement through in-store gamified customer experiences", *Journal of Retailing and Consumer Services*, Vol. 50, pp. 122-130.

Hollebeek, L.D., Glynn, M.S. and Brodie, R.J. (2014), "Consumer brand engagement in social media: conceptualization, scale development and validation", *Journal of Interactive Marketing*, Vol. 28 No. 2, pp. 149-165.

Hsieh, S.H., Lee, C.T. and Tseng, T.H. (2021), "Branded app atmospherics: examining the effect of pleasure–arousal–dominance in brand relationship building", *Journal of Retailing and Consumer Services*, Vol. 60 Article 102482.

Hsu, C.L. (2023), "Enhancing brand love, customer engagement, brand experience, and repurchase intention: focusing on the role of gamification in mobile apps", *Decision Support Systems*, Vol. 174 Article 114020.

Hsu, C.L. and Chen, M.C. (2018), "How gamification marketing activities motivate desirable consumer behaviors: focusing on the role of brand love", *Computers in Human Behavior*, Vol. 88, pp. 121-133.

Huotari, K. and Hamari, J. (2017), "A definition for gamification: anchoring gamification in the service marketing literature", *Electronic Markets*, Vol. 27 No. 1, pp. 21-31.

Hwang, J. and Choi, L. (2020), "Having fun while receiving rewards? Exploration of gamification in loyalty programs for consumer loyalty", *Journal of Business Research*, Vol. 106, pp. 365-376.

Islam, J.U. and Rahman, Z. (2017), "The impact of online brand community characteristics on customer engagement: an application of stimulus-organism-response paradigm", *Telematics and Informatics*, Vol. 34 No. 4, pp. 96-109.

Islam, J.U., Rahman, Z. and Hollebeek, L.D. (2018), "Consumer engagement in online brand communities: a solicitation of congruity theory", *Internet Research*, Vol. 28 No. 1, pp. 23-45.

Islam, J., Shadih, S., Rasool, A., Rahman, Z., Khan, I. and Rather, R. (2020), "Impact of website attributes on customer engagement in banking: a solicitation of stimulus-organism-response theory", *International Journal of Bank Marketing*, Vol. 38 No. 6, pp. 1279-1303.

Jang, S., Kitchen, P.J. and Kim, J. (2018), "The effects of gamified customer benefits and characteristics on behavioral engagement and purchase: evidence from mobile exercise application uses", *Journal of Business Research*, Vol. 92, pp. 250-259.

Kang, J.H., Bagozzi, R.P. and Oh, J. (2011), "Emotions as antecedents of participant sport consumption decisions: a model integrating emotive, self-based, and utilitarian evaluations", *Journal of Sport Management*, Vol. 25 No. 4, pp. 314-325.

Kang, Y.S., Hong, S. and Lee, H. (2009), "Exploring continued online service usage behavior: the roles of self-image congruity and regret", *Computers in Human Behavior*, Vol. 25 No. 1, pp. 111-122.

Kim, M. (2021), "Conceptualization of e-servicescapes in the fitness applications and wearable devices context: multi-dimensions, consumer satisfaction, and behavioral intention", *Journal of Retailing and Consumer Services*, Vol. 61.

Kim, J. and Ah Yu, E. (2016), "The holistic brand experience of branded mobile applications affects brand loyalty", *Social Behavior and Personality: An International Journal*, Vol. 44 No. 1, pp. 77-87.

Kim, Y.-H., Kim, D.J. and Wachter, K. (2013), "A study of mobile user engagement (MoEN): engagement motivations, perceived value, satisfaction, and continued engagement intention", *Decision Support Systems*, Vol. 56, pp. 361-370.

Kleijnen, M., De Ruyter, K. and Andreassen, T.W. (2005), "Image congruence and the adoption of service innovations", *Journal of Service Research*, Vol. 7 No. 4, pp. 343-359.

Kock, N. (2015), "Common method bias in PLS-SEM: a full collinearity assessment approach", *International Journal of e-Collaboration (Ijec)*, Vol. 11 No. 4, pp. 1-10.

Kourouthanassis, P., Lekakos, G. and Gerakis, V. (2015), "Should I stay or should I go? The moderating effect of self-image congruity and trust on social networking continued use", *Behaviour & Information Technology*, Vol. 34 No. 2, pp. 190-203.

Kwak, D.H. and Kang, J.H. (2009), "Symbolic purchase in sport: the roles of self-image congruence and perceived quality", *Management Decision*, Vol. 47 No. 1, pp. 85-99.

Leclercq, T., Hammedi, W. and Poncin, I. (2018), "The boundaries of gamification for engaging customers: effects of losing a contest in online co-creation communities", *Journal of Interactive Marketing*, Vol. 44, pp. 82-101.

Leclercq, T., Poncin, I. and Hammedi, W. (2020), "Opening the black box of gameful experience: implications for gamification process design", *Journal of Retailing and Consumer Services*, Vol. 52, Article 101882.

Lee, S., Chua, B.L., Kim, H.C. and Han, H. (2017), "Shaping and enhancing airport lounge experiences: the application of brand personality and image congruity theories", *International Journal of Contemporary Hospitality Management*, Vol. 29 No. 11, pp. 2901-2920.

Li, C.Y. and Fang, Y.H. (2020), "I searched, I collected, I experienced: exploring how mobile augmented reality makes the players go", *Journal of Retailing and Consumer Services*, Vol. 54 Article 102018.

Li, L., Wang, Z., Gong, Y. and Shan, L. (2022), "Self-image motives for electric vehicle adoption: evidence from China", *Transportation Research Part D: Transport and Environment*, Vol. 109.

Lim, C.H., Kim, K. and Cheong, Y. (2016), "Factors affecting sportswear buying behavior: a comparative analysis of luxury sportswear", *Journal of Business Research*, Vol. 69 No. 12, pp. 5793-5800.

Liu, D., Santhanam, R. and Webster, J. (2017), "Toward meaningful engagement: a framework for design and research of gamified information systems", *MIS Quarterly*, Vol. 41 No. 4, pp. 1011-1034.

Luo, Y., Yang, L., Ye, Q. and Liao, Q. (2023), "Effects of customization and personalization affordances on perceived value and continuance intention of smartwatch use", *Technological Forecasting and Social Change*, Vol. 194 Article 122752.

Manley, S.C., Hair, J.F., Williams, R.I. and McDowell, W.C. (2021), "Essential new PLS-SEM analysis methods for your entrepreneurship analytical toolbox", *International Entrepreneurship and Management Journal*, Vol. 17 No. 4, pp. 1805-1825.

Mehrabian, A. and Russell, J.A. (1974), *An Approach to Environmental Psychology*, The MIT Press, Cambridge.

Mishra, S. and Malhotra, G. (2021), "The gamification of in-game advertising: examining the role of psychological ownership and advertisement intrusiveness", *International Journal of Information Management*, Vol. 61 Article 102245.

Oliver, R.L. (1997), *Satisfaction: A Behavioral Perspective on the Consumer*, McGraw-Hill, New York, NY.

Oliver, R.L. (1999), "Whence consumer loyalty?" *Journal of Marketing*, Vol. 63 No. 4_suppl1, pp. 33-44.

Palmer, D., Lunceford, S. and Patton, A.J. (2012), "The engagement economy: how gamification is reshaping businesses", *Deloitte Review*, Vol. 11, pp. 52-69.

Perez-Aranda, J., Robles, E.M.G. and Urbistondo, P.A. (2023), "Understanding antecedents of continuance and revisit intentions: the case of sport apps", *Journal of Retailing and Consumer Services*, Vol. 72 Article 103288.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, p. 879.

Qing, T. and Haiying, D. (2021), "How to achieve consumer continuance intention toward branded apps—from the consumer–brand engagement perspective", *Journal of Retailing and Consumer Services*, Vol. 60 Article 102486.

Ramaseshan, B. and Stein, A. (2014), "Connecting the dots between brand experience and brand loyalty: the mediating role of brand personality and brand relationships", *Journal of Brand Management*, Vol. 21 Nos 7/8, pp. 664-683.

Riddell, W.C. and Song, X. (2017), "The role of education in technology use and adoption: evidence from the Canadian workplace and employee survey", *ILR Review*, Vol. 70 No. 5, pp. 1219-1253.

Rosenberg, M. (1979), *Conceiving the Self*, Basic Books, New York, NY.

Ryan, R.M., Rigby, C.S. and Przybylski, A. (2006), "The motivational pull of video games: a self-determination theory approach", *Motivation and Emotion*, Vol. 30 No. 4, pp. 347-363.

Scholer, A.A. and Higgins, E.T. (2009), "Exploring the complexities of value creation: the role of engagement strength", *Journal of Consumer Psychology*, Vol. 19 No. 2, pp. 137-143.

Siqi, Y., Xianling, C., Ziyang, W., Yuning, Z., Shenghui, L. and Jingdong, M. (2022), "Impact of gamification elements on user satisfaction in health and fitness applications: a comprehensive approach based on the Kano model", *Computers in Human Behavior*, Vol. 128 Article 107106.

Sirgy, M.J. (1985), "Using self-congruity and ideal congruity to predict purchase motivation", *Journal of Business Research*, Vol. 13 No. 3, pp. 195-206.

Sirgy, M.J., Grewal, D. and Mangleburg, T. (2000), "Retail environment, self-congruity, and retail patronage: an integrative model and a research agenda", *Journal of Business Research*, Vol. 49 No. 2, pp. 127-138.

Sirgy, M.J., Lee, D.J., Johar, J.Y. and Tidwell, J. (2008), "Effect of self-congruity with sponsorship on brand loyalty", *Journal of Business Research*, Vol. 61 No. 10, pp. 1091-1097.

Srivastava, G., Bag, S., Rahman, M.S., Pretorius, J.H.C. and Gani, M.O. (2022), "Examining the dark side of using gamification elements in online community engagement: an application of PLS-SEM and ANN modeling", *Benchmarking: An International Journal*, doi: 10.1108/BIJ-03-2022-0160.

Stragier, J., Abeele, M.V., Mechant, P. and De Marez, L. (2016), "Understanding persistence in the use of online fitness communities: comparing novice and experienced users", *Computers in Human Behavior*, Vol. 64, pp. 34-42.

Syrjälä, H., Kauppinen-Räisänen, H., Luomala, H.T., Joelsson, T.N., Könnölä, K. and Mäkilä, T. (2020), "Gamified package: consumer insights into multidimensional brand engagement", *Journal of Business Research*, Vol. 119, pp. 423-434.

Tarute, A., Nikou, S. and Gatautis, R. (2017), "Mobile application driven consumer engagement", *Telematics and Informatics*, Vol. 34 No. 4, pp. 145-156.

Torres, P., Augusto, M. and Neves, C. (2022), "Value dimensions of gamification and their influence on brand loyalty and word-of-mouth: relationships and combinations with satisfaction and brand love", *Psychology & Marketing*, Vol. 39 No. 1, pp. 59-75.

Tu, R., Hsieh, P. and Feng, W. (2019), "Walking for fun or for 'likes'? The impacts of different gamification orientations of fitness apps on consumers' physical activities", *Sport Management Review*, Vol. 22 No. 5, pp. 682-693.

Vargo, S.L. and Lusch, R.F. (2004), "Evolving to a new dominant logic for marketing", *Journal of Marketing*, Vol. 68 No. 1, pp. 1-17.

Venkatesh, V. and Davis, F.D. (2000), "A theoretical extension of the technology acceptance model: four longitudinal field studies", *Management Science*, Vol. 46 No. 2, pp. 186-204.

Vivek, S.D., Beatty, S.E., Dalela, V. and Morgan, R.M. (2014), "A generalized multidimensional scale for measuring customer engagement", *Journal of Marketing Theory and Practice*, Vol. 22 No. 4, pp. 401-420.

Wang, Z., Zhang, B. and Li, G. (2014), "Determinants of energy-saving behavioral intention among residents in Beijing: extending the theory of planned behavior", *Journal of Renewable and Sustainable Energy*, Vol. 6 No. 5.

Wetzels, M., Odekerken-Schröder, G. and Van Oppen, C. (2009), "Using PLS path modeling for assessing hierarchical construct models: guidelines and empirical illustration", *MIS Quarterly*, Vol. 33 No. 1, pp. 177-195.

Xi, N. and Hamari, J. (2019), "Does gamification satisfy needs? A study on the relationship between gamification features and intrinsic need satisfaction", *International Journal of Information Management*, Vol. 46, pp. 210-221.

Xi, N. and Hamari, J. (2020), "Does gamification affect brand engagement and equity? A study in online brand communities", *Journal of Business Research*, Vol. 109, pp. 449-460.

Xi, X., Zhong, Y. and Thompson, S.H.T. (2021), "Moral obligation in online social interaction: clicking the 'like' button", *Information & Management*, Vol. 57 No. 7.

Xiao, R., Wu, Z. and Hamari, J. (2021), "Internet-of-gamification: a review of literature on IoT-enabled gamification for user engagement", *International Journal of Human–Computer Interaction*, Vol. 38 No. 12, pp. 1113-1137.

Yoo, B. and Donthu, N. (2001), "Developing and validating a multidimensional consumer-based brand equity scale", *Journal of Business Research*, Vol. 52 No. 1, pp. 1-14.

Appendix. Measurement scales

Gameful experience

Enjoyment (mean = 5.23; standard deviation = 1.48).
 ENJ1. Using [app] is fun.
 ENJ2. I like using [app].
 ENJ3. I think using [app] is very entertaining.

App Activation (mean = 4.29; standard deviation = 1.15).
 APPACT1. While using [app] to practice sports, I feel activated.
 APPACT2. While using [app] to practice sports, I feel nervous.
 APPACT3. While using [app] to practice sports, I feel intensely excited.
 APPACT4. While using [app] to practice sports, I feel excited.

Absence of negative affect (reversed items) (mean = 3.51; standard deviation = 1.68).
 ANA1. While using [app] to practice sports, I feel upset.
 ANA2. While using [app] to practice sports, I feel hostile.
 ANA3. While using [app] to practice sports, I feel frustrated.

Absorption (mean = 3.98; standard deviation = 1.32).
 AB1. Using [app] made me forget where I am.

AB2. I forget about my immediate surroundings when I use [app].

AB3. Using [app] "got me away from it all".

AB4. While using [app], I am completely oblivious to everything around me.

AB5. While using [app], I lose track of time.

Dominance (mean = 2.99; standard deviation = 1.57).

DOM1. While using [app] to practice sports, I feel in charge.

DOM2. While using [app] to practice sports, I feel influential.

DOM3. While using [app] to practice sports, I feel autonomous.

DOM4. While using [app] to practice sports, I feel confident.

Creative thinking (mean = 4.52; standard deviation = 1.41).

CT1. While using [app] to practice sports, I feel that it sparks my imagination.

CT2. While using [app] to practice sports, I feel creative.

CT3. While using [app] to practice sports, I feel that I could explore things.

CT4. While using [app] to practice sports, I feel adventurous.

Customer brand engagement

Cognitive processing (mean = 4.42; standard deviation = 1.44).

CP1. Using [brand's] products gets me to think about [brand].

CP2. I think a lot about [brand] when using its products.

CP3. Using [brand's] products stimulates my interest to learn more about [brand].

Activation (mean = 4.54; standard deviation = 1.61).

ACT1. I spend a lot of time using [brand's] products compared to other brands.

ACT2. Whenever I do sports, I usually use [brand's] products.

ACT3. I use [brand's] products the most.

Affection (mean = 4.87; standard deviation = 1.22).

AFF1. I feel very positive when I use the [brand].

AFF2. Using [brand's] products makes me happy.

AFF3. I feel good when I use [brand's] products.

AFF4. I am proud to use [brand's] products.

Brand Loyalty (mean = 4.69; standard deviation = 1.38).

LOY1. I consider myself to be loyal to [brand].

LOY2. I enjoy purchasing from [brand].

LOY3. I will not buy other brands if [brand] is available at the market.

LOY4. I would advise other people to buy [brand].

Behavioural Intention to Use (mean = 5.65; standard deviation = 1.36).

INT1. I will use [app] on a regular basis in the future.

INT2. I will frequently use [app] in the future.

INT3. Assuming I have access to the mobile phone, I intend to use [app].

INT4. Given that I have access to the mobile phone, I predict that I would use [app].

Self-Image Congruity (mean = 5.73; standard deviation = 1.38).

SIC1. Practicing sports helps maintain my image and character.

SIC2. Practicing sports helps reflect who I am.

SIC3. Practicing sports fits well with my image.

About the authors

Salma Habachi is a third-year PhD student at IQS School of Management – Universitat Ramon Llull, Barcelona, Catalonia, Spain. Her doctoral work explores the impact of Gamification on consumers behaviours and her research interests include digital marketing, mobile marketing and sustainability. Since 2019, Salma has led/significantly contributed to the development, coordination, and integration of Gamification in several projects in Europe. She is currently working on a gamified application for global change makers with the purpose of educating them about sustainability and building a space where this community can meet-up with like-minded people that will contribute to their initiatives. Salma Habachi is the corresponding author and can be contacted at: salmahabachi@iqs.edu

Jorge Matute, PhD from University of Zaragoza, is currently Associate Professor of Marketing at IQS School of Management – Universitat Ramon Llull, Barcelona, Catalonia, Spain. His research interests include consumer behavior in services marketing, online and digital marketing, sustainability and tourism marketing. He has published papers in a number of journals, such as, for example, *Tourism Management, Journal of Business Ethics, International Journal of Hospitality Management, Journal of Cleaner Production, Journal of Services Marketing, Journal of Product & Brand Management, Journal of Marketing Management, Corporate Social Responsibility* and *Environmental Management, Business Strategy and the Environment.*

Ramon Palau-Saumell, PhD from Universitat Autònoma de Barcelona (UAB), is currently Professor of Marketing and Head of the Business Management Department at IQS School of Management, Universitat Ramon Llull, Barcelona, Catalonia, Spain. His research interest focuses on consumer behavior in digital and services marketing. He has published in international journals such as *Industrial Management & Data Systems, Online Information Review, Journal of Services Marketing, Journal of Vacation Marketing, Journal of Travel Research, Tourism Management, Journal of Travel and Tourism Marketing, International Journal of Tourism Research, Service Business, Journal of Air Transport Management, Management Decision* and *European Sport Management Quarterly.*