Transformative value and the role of involvement in gamification and serious games for well-being

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Purpose – This study investigates the use of gamification and serious games as transformative technologies that encourage health and well-being behaviors. The purpose of this paper is to investigate the transformative value that can be co-created by gamified apps and serious games, and the role involvement plays between transformative value and desired outcomes.

Design/Methodology – Four gamified apps/serious games were examined in the study, with data collected from $N=497$ participants. The data were analyzed using structural equation modeling.

Findings – Results revealed that gamified apps and serious games can create three transformative value dimensions – knowledge, distraction, and simulation – which can have direct and indirect effects on desired outcomes. Examination of competing models revealed involvement plays a mediating rather than moderating role for gamification and serious games for well-being.

Originality/Value – This research contributes to a greater understanding of how technology can be leveraged to deliver transformative gamification services. It demonstrates the multiple transformative value dimensions that can be created by gamified apps and serious games that assist the performance of well-being behaviors, and which have yet to be theorized or empirically examined. The study also establishes the mediating rather than moderating role of involvement in gamification and serious games, as called for in the literature.
Keywords transformative service research; gamification; serious games; transformative value; involvement; structural equation modeling.

Article classification Research paper

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Introduction

Health and well-being are serious business, with reports estimating the global cost of health care will rise to US$18.28 trillion in 2040 (Dieleman et al., 2016). So too is the booming gaming industry, which is expected to grow to a total worth of $US250 billion worldwide by 2020 (Batchelor, 2018). These two growing sectors have revolutionized services, leading to the emergence of transformative services – services that uplift (improve) consumer well-being (Anderson et al., 2013) – and serious games and gamification – technologies that use game design elements and gameful experiences for purposes beyond entertainment (Johnson et al., 2016). Recently, these two areas have intersected in service practice and research, whereby gamification and serious games are beginning to be used to provide transformative services that assist consumer well-being. This has led to the emergence of research into transformative gamification services. As suggested by Tanouri et al. (2019) and Mulcahy, Russell-Bennett, and Iacobucci (2018), transformative gamification services provide a potentially unique opportunity as mechanisms to foster users’ well-being behaviors, as mobile technology (which is often used to deliver such services) elevates the requirement for consumers to be physical present. Further, transformative gamification services can offer a more pleasurable (enjoyable) experience, which is often remarkably different from prior reported experiences (for instance, pain, fear, boredom in health care). Thus, both from a scholarly and practitioner perspective, it is timely to
understand the opportunity to provide an “arm’s length” delivery of transformative services via
gamification on mobile platforms, which consumers ultimately value.

Research has contributed to understanding perceived value in services (Kuo et al., 2009; Sweeney and Soutar, 2001) and behaviors (Gordon et al., 2018), yet there is limited research combining these streams together to understand how the emerging gamification and serious games create perceived value which assists well-being behavior (Leroi-Werelds, 2019). This has led to service scholars calling for greater research in these settings (Hammedi et al., 2017). Most frameworks in the literature suggest perceived value can be categorized according to hedonic, social, or utilitarian characteristics. This includes related research in health care (Zainuddin et al., 2016) and gamification (Hammedi et al., 2017). Given most prior studies have focused on value from a service functionality perspective (i.e., ease in using platform/technology and the usefulness the platform/technology has in serving a purpose), this paper argues that a different perspective is needed for gamification and serious games for well-being. Adopting a service functionality perspective does not align with the primary functional purpose of gamification and serious games designed for transformative purposes, which aim to improve users’ well-being. Instead, this paper theorizes and empirically demonstrates that frameworks for gamification and serious games for well-being should incorporate a range of value dimensions which capture the benefits that encourage or assist consumers in performing a well-being behavior. This is in line with the work by Blocker and Barrios (2015), who identify that value experienced in a service has transformative potential. Therefore, the first key aim of this research is to understand the impact of transformative value created1 by gamification and serious games and its impact upon desired outcomes.

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The concept of involvement is also an emerging concept of importance to the understanding of gamification and serious games for well-being, yet there are limited studies which have investigated its role in perceived value relationships in this setting – this is despite acknowledgments such research is needed (Vashisht and Royne, 2019; Tanouri et al., 2019). For example, Vashisht and Royne (2019) point out an important question that needs to be addressed by scholars is the impact game involvement has on relationships within gamification. The lack of investigation into involvement may be a result of the different roles the construct has been suggested to play in marketing and consumer research studies. For example, some studies suggest involvement plays a mediating role (see Olsen, 2007), whereas others suggest it plays a moderating role (see Suh and Youjae, 2006). What remains unanswered, therefore, is the role involvement plays in the perceived value relationships for gamification and serious games for well-being. Thus, this is the second aim of the current study.

The remainder of the paper is organized as follows. First, it provides a brief discussion of transformative services, gamification, and serious games to articulate their similarities and differences. Next, the paper provides an overview of the perceived value and involvement literature, followed by an outline of the research design employed. The results are then presented, followed by a discussion of the implications, and the paper concludes with directions for future research. Overall, this paper contributes to the literature by identifying and testing the impact of three transformative value dimensions yet to be explored. Further, this study addresses calls for research to investigate factors that mediate or moderate relationships – specifically involvement – with a gamification setting (e.g. Tanouri et al., 2019).
Transformative services, gamification, and serious games

Transformative service research (TSR) is still a developing area in the literature, focusing on the integration of consumer and service research to create improvements in individual well-being, communities, and ecosystems (Anderson et al., 2013). Gamification and serious games are also noted for having the potential to change consumer behavior (Vashisht and Royne, 2019) as well as improve well-being (see Johnson et al., 2016). Further, as suggested by Bolton and colleagues (2018), gamification can be a very attractive strategy for service practitioners in business-to-consumer markets.

A common difficulty is often distinguishing between gamification and serious games (Johnson et al., 2016; Xu et al., 2017). Xu et al. (2017) highlight this difficulty in differentiating gamification and serious games, suggesting other terms such as “game-based learning” and “persuasive games” can also add further complexities in differentiating these areas. This paper defines gamification as the use of game design elements in non-game contexts, and serious games as games designed for purposes beyond entertainment (Johnson, et al., 2016). What distinguishes the conceptual difference between gamification and serious games is where the consumer interacts and experiences game design elements (Mulcahy, Russell-Bennett, Zainuddin, and Kuhn, 2018). For example, in gamification, a consumer can interact with the game design element of challenge on Nike+ by running a certain distance for the week or in a certain time – a behavior which is performed outside of the platform. In the case of a serious game, however, a consumer interacts with game design elements within the digital platform. For instance, in the serious game Smash Your Food, consumers (children) interact with challenges and points by “smashing” food that has excessive sugars, salts, and fats within the mobile app, subsequently increasing understanding about nutrition and nutrition labels. Despite these noted
minor differences, both gamification and serious games share a commonality in that both can share the common goal of using game design elements and game-like experiences to improve consumer well-being (Johnson et al., 2016). This is also a noted area of focus for transformative services.

Currently, the service and marketing literature largely considers gamification to be a tool to enhance consumer engagement or loyalty in commercial settings. For instance, Harwood and Garry’s (2015) study shows gamification can enhance consumer engagement behavior and emotions with brands such as Samsung. Research by Wolf et al. (2019) and Hwang and Choi (2019) demonstrate gamification can be used as a tool for retention of consumers in loyalty programs or repeat purchases. More recently, there appears to be an evolving focus on the transformative potential of gamification and serious games to uplift well-being in several settings of central focus to TSR (Mulcahy, Russell-Bennett, and Iacobucci, 2018; Tanouri et al., 2019), including health (Johnson et al., 2016). However, research situated between these two areas is emergent, and greater research is needed to begin to uncover how these new technologies can improve well-being.

Leveraging upon the findings of prior commercial (Hwang and Choi, 2019; Wolf et al., 2019) and TSR studies (Mulcahy, Russell-Bennett, and Iacobucci, 2018; Tanouri et al., 2019), it is therefore plausible to suggest gamification and serious games can assist consumer well-being not only by encouraging consumers to use transformative services but also by repeatedly performing well-being behaviors. This study aims to contribute understanding to this important area by investigating the transformative value created by gamification and serious games, and the role of involvement as a mediator or moderator.
Value co-creation and Value Creation in Gamification

In gamification, much like the wider service literature there appears to be ambiguity attached to the expression or use of the term “value creation” or “value co-creation”, which are often used interchangeably (Grönroos & Ravald, 2011). However, it is important that the conceptual differences of value co-creation and value creation be determined, and correct terminology be used to clearly position studies application of these in gamification. When value co-creation is studied in gamification, this refers to the exploration or understanding of how gamified services assist in motivating or facilitating greater levels of interaction and collaboration between service providers and consumers (Leclerq, Hammedi & Poncin, 2018; Vargo & Lusch, 2016), which ultimately leads to greater levels of value being created. In this instance, the gamified service is a facilitating platform which connects both the service provider and the consumer to co-create value. For instance, Leclerq, Hammedi and Poncin (2018)’s study demonstrates how a gamified platform using competition and cooperation can increase or decrease engagement co-creation activity. On the other hand, when studies examine value creation in gamification, the focus is more on the value of using a gamified service, often referred to as “value-in-use” (Grönroos & Ravald, 2011). Studies which align with this perspective in gamification include Mulcahy, et al. (2018), which examine the benefits which are experienced by consumers using gamified services for sustainability. The current study aligns itself with value creation, as it focuses on uncovering the transformative value consumers experience from using a gamified app or serious game and as such this term is used for the remainder of the paper. Next, the perceived value literature is reviewed to set the conceptual foundation for the current study.
**Perceived value**

For many decades, marketing and service scholars have investigated perceived value (Gallarza, *et al.*, 2016; Sánchez-Fernández and Iniesta-Bonillo, 2007; Sweeney and Soutar, 2001). The basic concept is that it is important to understand from the consumer perspective what value consumers perceive in experiences from consuming goods and services (Sánchez-Fernández and Iniesta-Bonillo, 2007). Importantly, however, it is well-noted that perceived value is a difficult concept to conceptualize and measure, as its nature and structure often change between contexts (Sánchez-Fernández and Iniesta-Bonillo, 2007); indeed, there have been recent calls to study this concept in new technologies such as robotics, self-service technologies, and artificial intelligence (Leroi-Werelds, 2019). The difficulty in conceptualizing perceived value is evident in seminal frameworks putting forward different numbers of dimensions, and different terminologies used to identify and describe these dimensions. For example, Babin *et al.* (1994) propose the two value dimensions of hedonic and utilitarian, whereas Sweeney and Soutar (2001) propose four value dimensions: quality, emotional, price, and social. The inconsistency in the literature reflects the dynamic nature of value and exemplifies its changing nature from one setting to the next.

Despite the nature and type of perceived value being contextually bound, the frameworks investigated in the emerging areas of transformative services, gamification, and serious games share similarities. For example, research into transformative services by Zainuddin *et al.* (2016) suggests that there are three dimensions of value – emotional, functional, and social; this leverages on the framework developed by Sweeney and Soutar (2001). In comparison, gamification research by Hamari and Kвисito (2015a) also suggests three value dimensions; however, they use different terminology and label them hedonic (which shares commonalities
with emotional), utilitarian (which shares commonalities with functional), and social. Yet, whilst these studies have found the existence of perceived value, some aspects of value co-created by gamification and serious games for well-being remain undiscovered and untested; that is, the value co-created by gamification and serious games that encourages and or improves the consumer’s well-being. This is particularly important given well-being is central to the purpose of gamification and serious games in this setting, and scholars note that aspects of value can be transformative in nature (Black and Gallan, 2015; Blocker and Barrios, 2015). Despite this, there is little to no research which examines the transformative value of gamification and serious games for well-being and their impact on desired outcomes, as shown in Table 1. Consequently, it could be suggested that such studies potentially do not explain other possible transformative value dimensions that are being created. This study therefore sets out to contribute to current understanding by testing dimensions consistent with the literature (enjoyment and social value) as well as by uncovering and testing dimensions of value which are transformative. Next, the dimensions of enjoyment and social value are defined and discussed, followed by transformative value dimensions which are unique to the current study.

**Table 1.**
Chronological overview of related gamification and serious game studies

| Author(s) year | Other Value Dimensions | Transformative Value Dimensions | Mediator/Moderator | Desired Outcomes |
|----------------|------------------------|---------------------------------|--------------------|-----------------|
|                | Enjoyment | Social | Knowledge | Distraction | Simulation | Involvement | Satisfaction | Well-being  |
| Hamari and Kvisito (2015a) | Y | Y | | | | | | Y |
| Hamari and Kvisito (2015b) | | | Y | | | | | |
| Mulcahy et al. (2015) | | | | Y | | | | |
| Harwood and Garry (2015) | Y | | | | | Y | | |
| Hammedi et al. (2017) | | Y | | | | | | Y |
| Eppman et al. (2018) | Y | | | | | | Y | |
| Mulcahy, Russell-Bennett, Zainuddin, and Kuhn (2018) | | Y | | | | | | |
| Mulcahy, Russell-Bennett, and Iaccobucci (2018) | Y | | | | | | | |
| Tanouri et al. (2019) | Y | | | | | | | |
| Wolf et al. (2019) | | | | | | | | Y |
Enjoyment and social value

Enjoyment is defined in the current study as the positive emotional state a consumer experiences from using a serious game or gamified app without care for its practical concerns (Mathwick et al., 2001). The current study includes enjoyment as it has been put forward by recent studies as being an important and valuable aspect of the gamification and serious game experiences (Eppman et al., 2018; Mulcahy, Russell-Bennett and Iacobucci, 2018). For example, Eppman et al. (2018) point out that enjoyment represents “a vital part of the experience of playing games or using gamified applications” (p. 100). Further, whilst not specifically using the term enjoyment, other gamification studies such as Hammeci et al.’s (2017) measure similar emotions such as entertainment. Enjoyment is also an important inclusion, as research demonstrates that it can predict outcomes (Mulcahy, Russell-Bennett and Iacobucci 2018).

Social value can be conceptualized as the appreciation and admiration of connection with others that users experience when using a serious game or gamified app (Pura, 2005). Like enjoyment, the inclusion of social value is also supported by the literature. Hofacker et al. (2016) suggest that mobile gamification has the potential to create social value through users experiencing appreciation, compliments, or social exchange with others. This is supported by Hamari and Kojisito’s (2015b) study, which demonstrates that subjective norms, recognition, and reciprocal benefits can be key social aspects of a gamified application. Again, similar to enjoyment, social value has been somewhat examined in other gamification studies with
different terms, such as social dynamics (Hammed et al., 2017); however, for the purposes of this study, the term “social value” is used as it aligns with Hofacker et al. (2016) as well as with other value studies in the service literature (e.g. Zainuddin et al., 2016). Next, the study turns to discussing the transformative value dimensions which are unique to the current study.

Transformative value dimensions

In the literature, transformative value has been defined as dimensions of value creation that generate uplifting change for greater well-being among individuals and society (Blocker and Barrios, 2015). The literature on gamification and serious games has hinted at the transformative value that can be co-created by gamification and serious games for well-being. For example, studies suggest that gamification and serious games can enhance knowledge of pro-social behaviors, provide a distraction from performing undesired behaviors which detract from the individual’s well-being, and create experiences whereby consumers can practice or enact behaviors prior to their real-world performance (Johnson et al., 2016; Hilken et al., 2017). These studies provide evidence suggesting that gamification and serious games can create transformative value, impacting on well-being; however, none have explicitly examined this.

Using this evidence from the literature as a foundation, this paper suggests conceptualizing three transformative value dimensions for gamification and serious games for well-being: knowledge, distraction, and simulation. Specifically, this study focuses its attention on knowledge, distraction, and simulation as transformative value co-created by gamified apps and serious games for two central reasons. First, as previously mentioned, there are growing calls for the research to understand value from a transformative perspective (Blocker and Barrios,
Second, the three dimensions of knowledge, distraction, and simulation appear to be benefits provided by gamified apps and serious games for users, as discussed in the literature (see Johnson et al., 2016). Thus, drawing from these two points, this study focuses on exploring the transformative potential of knowledge, simulation, and distraction value for gamified apps and serious games. Next, each of the three transformative value dimensions is defined and supported.

The first transformative value dimension proposed is knowledge. Studies have suggested gamification and serious games can be used for educational purposes (Fu, et al., 2009). This thinking into gamification and serious games for well-being is extended here by suggesting knowledge can be transformative and can assist consumers in performing well-being behaviors. Knowledge value is defined as the information, facts, or data provided to users which increase their awareness of how to perform a well-being behavior. For instance, gamified smart technologies such as FitBit and Nike+ provide users with information, facts, and training tips regarding physical activity. Users can view the number of steps they have walked/run in a day, their progressive weight loss and heart rate during exercise. It is therefore suggested that these benefits create the transformative value of knowledge.

The second transformative value dimension proposed is distraction. Studies have suggested that a key benefit of serious games is their ability to distract individuals from undesirable states, such as the pain patients may experience when receiving dentistry services or the cravings to smoke (Nilsson et al., 2013; Bidarra et al., 2013). Distraction value can be defined as the benefit of using a gamified service or serious game which diverts a user’s attention from pain, discomfort, or the urge to perform an undesired behavior. For example, individuals
benefiting from using a gamified service or serious game to overcome urges to use or consume goods or services which are detrimental to their well-being, such as drugs and alcohol.

Finally, the third transformative value dimension proposed is simulation. Simulation value is defined in this paper as the experiences provided by gamified services and serious games that allow users to observe the cause-and-effect linkage of their behavior. For example, research demonstrates that virtual reality and augmented reality technology enables consumers to enact and practice well-being behaviors, which they can then replicate in the real world (Cheng and Wang, 2011). This conceptualization of simulation value is further supported by Orji et al. (2014), who suggest serious games can assist the simulated training of individuals to perform desired behaviors.

**The role of involvement for transformative value**

In the literature, involvement broadly refers to a person’s perceived personal relevance and the significance of an attitude object to their inherent needs, values, and interests (Zaichkowsky, 1985). Based on these prior conceptualizations of involvement, in the current study, involvement is defined as the consumer’s level of interest with a gamified app or serious game. Involvement is a well-researched construct as it is useful for explaining consumer behavior in product and service settings, as shown in Table 2. However, involvement has not been extensively studied in gamification and serious games for well-being – despite its relevance to this area of research and practice. Understanding involvement in gamification is important as its impact is likely to differ. As acknowledged by Hofacker et al. (2016) aspects such as genre or other characteristics may affect consumers involvement in mobile gamification. Whereas, Huotari and Hamari (2017) point out that a common aspect of defining games and gamification is human [consumer]
involvement. Yet to date, there is little research on the concept of involvement, which could provide greater insights into gamification and serious games.

Gamification and serious games create a unique context that is differentiated from the traditional areas of consumption research in which involvement has been investigated (e.g. advertising, product class, purchase decisions); gamification and serious games combine enjoyment, a feature that is typically associated with frivolity, with instead a serious focus on the improvement of well-being. This integration of enjoyment is expected to create added relevance of the gamified app/serious game to individuals, increasing their interest in the gamified app/serious game, therefore motivating them to continue using the gamified app/serious game and, consequently, perform the relevant well-being behavior.

Table 2.
Chronological overview of related involvement studies

| Author(s)/Year   | Antecedents                                      | Mediator | Moderator | Outcome                      |
|------------------|--------------------------------------------------|----------|-----------|------------------------------|
| Suh and Youjae (2006) | Brand attitudes, Corporate Image                  |          | Y         | Satisfaction, loyalty        |
| Baker et al. (2009) | Employee customer orientation                     |          | Y         | Service quality, satisfaction |
| Sanchez-Franco (2009) | Trust, Satisfaction                              |          | Y         | Commitment                   |
| Wang and Wu (2011) | Alternative attractiveness, disconfirmation, self-image congruity |          | Y         | Behavioral intentions        |
| Dagger and David (2012) | Satisfaction, Benefits, Switching                |          | Y         | Loyalty                      |
| Inoue et al. (2017) | Perceived CSR                                    |          | Y         | Commitment, Loyalty          |
| Wang and Lin (2018) | Job meaningfulness, Job responsibility, Results knowledge |          | Y         | Work-family conflict         |
| Current Study    | Transformative value                              | Y        | Y         | Satisfaction, Behavioral intention for well-being |

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Examining the role of involvement in gamification and serious games is important, as consumers have consistently been found to respond differently in varying contexts and situations, depending on the nature of involvement (e.g. Krishnamurthy and Kumar, 2018). In some contexts, involvement has been found to play a moderating role in the relationships between antecedents and outcomes. For example, involvement has been found to moderate the relationship between service quality and satisfaction (Baker et al., 2009). However, in other studies, involvement has instead been found to play a mediating role in the relationships between antecedents and outcomes. For example, involvement was found to mediate the satisfaction–loyalty relationship at the product category level in the context of purchasing meals, whereas its role as a moderator in this context was not supported (Olsen, 2007). This evidence suggests that the precise nature of the role of involvement appears to change between contexts and the outcomes under investigation. Indeed, little is known about its nature in gamification and serious games. Therefore, the current study aims to address this gap by examining the nature of involvement in gamification and serious games, specifically by exploring potential mediating and moderating effects of involvement on the relationship between transformative value (i.e. knowledge, simulation, distraction) and satisfaction and behavioral intentions. This responds to calls for further research in this area by other scholars (see Tanouri et al., 2019; Vashisht and Royne, 2019). Indeed, evidence exists to suggest that satisfaction and behavioral intentions can also be impacted in different ways by involvement with studies suggesting it can be a moderator and a mediator, as shown in Table 2. For example, Inoue et al.’s (2017) study suggests involvement mediates loyalty relationships, whereas Dagger and David's (2012) study shows involvement to moderate the satisfaction–loyalty relationship. Therefore, investigating these
constructs (satisfaction and behavioral intention) will enable us to understand the critical role involvement plays in gamification and serious games for well-being.

**Transformative value outcomes**

In the current study, satisfaction with the gamified app/serious game and intentions to perform a well-being behavior are conceptualized as the outcome variables of transformative value. Satisfaction was chosen due to being identified as an important outcome in both gamification and transformative service research. For example, Hsu and Chen’s (2018) gamification study shows satisfaction as being important for understanding consumers perceptions of a brand and loyalty. Whereas, Zainuddin and colleagues (2016), findings demonstrate satisfaction is important in transformative service studies. Hence, it is anticipated that satisfaction with a gamified app/serious game will be generated when transformative value, comprising the dimensions of knowledge, simulation, and distraction, are realized.

It is also anticipated that satisfaction will lead to intentions to perform a well-being behavior. Satisfaction is a widely accepted predictor for behavioral variables; hence, it is expected that when gamified app/serious game users experience satisfaction with their games as a result of transformative value creation (through the realization of knowledge, simulation, and distraction), they are likely to develop intentions to perform the well-being behavior that the relevant game seeks to achieve (e.g. quit smoking). This is an important outcome variable as it is indicative of the transformative power of gamified apps/serious games. Further, there is a considerable amount of support for loyalty (or intentions to perform a behavior) being included in models for gamification and transformative service research (e.g. Mulcahy, Russell-Bennett, and Iacobucci, 2018; Zainuddin, et al., 2016). Thus, based upon the prior rationale, intentions to
perform a well-being behavior was deemed an important inclusion as a transformative outcome in the current study.

**Conceptual model and hypothesis development**

Based on the conceptualization in this study, it is expected that transformative value (knowledge, simulation, distraction) will lead to satisfaction with a gamified app/serious game, which will, in turn, lead to behavioral intentions to perform the well-being behavior relevant to the app/game. It is also expected that users’ level of involvement with the app/game will influence these relationships. However, the precise nature and influence of involvement in this context are unknown; involvement can either have a mediating (full or partial) or moderating effect on these relationships. Hence, to examine the role of involvement in transformative value creation by gamified apps and serious games, this study seeks to develop and examine three different models, given that an agreed practice for structural models is to compare a proposed model with a rival model (structure) (Bagozzi and Yi, 1988). The first model (Model 1) is based upon involvement as a full mediator between the perceived value and satisfaction relationship. The second model (Model 2) is less restrictive and is only partially mediated by involvement, allowing for direct relationships from perceived value onto both involvement and satisfaction. The third model (Model 3) includes involvement as a moderator and examines the differences between perceived value and satisfaction relationships for high- and low-involvement consumers. Thus, each model presented in Figure 1 represents a competing theory relating to the role of involvement in transformative value co-created by gamified apps and serious games.

<Insert Figure 1 about here>
Next, support is provided for the proposed set of relationships presented in Figure 1. First, the enjoyment and social value direct and indirect relationships (H1–H2) in Models 1 and 2 are justified. This is followed by the transformative value direct and indirect relationships (H3–H5) in Models 1 and 2. Following this, the involvement relationships (H6) in Models 1, 2, and 3 are then supported.

**Enjoyment and social value relationships (H1–H2)**

It is anticipated that enjoyment will have a positive direct effect on involvement (H1a) and satisfaction (H1b), as well as indirect effects on behavioral intention (H1c–d). Consider a user who experiences enjoyment whilst using a gamified app or serious game, subsequently, from the feelings of enjoyment, they become more interested in different aspects of the app (involvement) and are satisfied with the experiences of using it. Literature shows enjoyment is one of the key value dimensions for games or gamified experiences (e.g. Ghazali et al., 2019) as well as for transformative services, such as health care (e.g. Zainuddin et al., 2016), as it influences desired outcomes such as satisfaction and behavioral intentions. For example, Ghazali and colleagues’ (2019) study of Pokémon Go users suggests enjoyment can significantly increase behavioral intentions. Research also suggests a link exists between enjoyment and involvement. Antón and colleagues’ (2013) findings, for example, show a significant positive relationship between enjoyment and involvement in e-book technology users. Using the empirical evidence, combined with prior literature as well as the previous discussion, the current study sets out to test the following hypotheses:

- **H1a. Enjoyment will have a positive direct effect on involvement (Model 1 and Model 2).**
- **H1b. Enjoyment will have a positive direct effect on satisfaction (Model 2).**
$H1c$. Enjoyment will have a positive indirect effect on behavioral intentions via involvement (Model 2).

$H1d$. Enjoyment will have a positive indirect effect on behavioral intentions via satisfaction (Model 2).

H2 suggests that social value will have positive direct effects on involvement (H2a) and satisfaction (H2b), and an indirect effect on behavioral intentions (H2c–d). With the enhancement of technologies such as the internet, gaming and gamified apps have a heightened ability to connect users and allow them to interact socially. For instance, users of the gamified app *Waze* contribute social value by interacting with each other and sharing information to improve the quality of everyday driving by reporting traffic, accidents and police traps, and quicker routes to a destination. Other mobile apps such as *Words with Friends* allows users to connect and play scrabble with other players around the world whilst also allowing chat conversations. These social capabilities of gamified apps and serious games can serve as motivating factors for users to become more interested (involved) and gratified (satisfied) with their continued use. Recent literature supports this proposition, demonstrating that social value is a key benefit sought by users of gamified platforms (Hamari and Kovisito, 2015b). For instance, Hamari and Kovisito (2015b) demonstrate that the social benefits of using a gamified exercise platform can improve consumers' attitudes towards the platform as well as directly and indirectly encourage exercise behavior. This is additionally supported by other studies in other service settings outside of gamification, such as online commerce services (Gan and Wang, 2017), which also demonstrate that social value can be directly associated with satisfaction and indirectly with
behavioral intentions. Given the prior practical discussion and previous empirical research findings, the following hypotheses are proposed:

\textit{H2a. Social value will have a positive direct effect on involvement (Model 1 and Model 2).}

\textit{H2b. Social value will have a positive direct effect on satisfaction (Model 2).}

\textit{H2c. Social value will have a positive indirect effect on behavioral intentions via involvement (Model 1).}

\textit{H2d. Social value will have a positive indirect effect on behavioral intentions via satisfaction (Model 2).}

\textit{Transformative value relationships (H3–H4)}

In H3 it is proposed that the transformative value dimension of knowledge will have a direct effect on involvement and satisfaction (H3a–b) and an indirect effect on behavioral intentions (H3c–d). One of the central aims of well-being behavior change or performance begins by increasing a user’s understanding of how they contribute to positive outcomes, which then motivates behavior performance. In recent gamification research, knowledge has been shown to be a significant contributing factor to increasing desired outcomes (Johnson \textit{et al.}, 2016; Mulcahy, Russell-Bennett, and Iacobucci, 2018). The current study seeks to extend these findings to suggest that knowledge will increase consumers' involvement and satisfaction with the app/game and, subsequently, their intention to perform a well-being behavior. This is due to the apps/games portraying and communicating new knowledge, which is valuable to users and which in turn should manifest in greater interest (involvement) and appreciation of the game/app (satisfaction). Further, this knowledge is specifically targeted towards how to perform well-being
behaviors; thus, its effect should be sustained to also influence behavioral intentions. Based upon prior support from the literature and the above discussion, the following relationships are proposed:

\[ H3a. \text{Knowledge will have a positive direct effect on involvement (Model 1 and Model 2).} \]
\[ H3b. \text{Knowledge will have a positive direct effect on satisfaction (Model 2).} \]
\[ H3c. \text{Knowledge will have a positive indirect effect on behavioral intentions via involvement (Model 2).} \]
\[ H3d. \text{Knowledge will have a positive indirect effect on behavioral intentions via satisfaction (Model 2).} \]

H4 proposes that simulation value will positively influence involvement and satisfaction (H4a–b) and indirectly influence behavioral intentions (H4c–d) to perform a well-being behavior. Many apps and serious games attempt to create realistic environments that mirror real-world situations which capture the interest of users. Further, Lindberg and Østergaard (2015) argue simulated (immersive) states create a deep state of involvement that blur consumers’ awareness of time and self-consciousness during consumption, thus suggesting a link between simulation value and involvement. Hilken and colleagues’ (2017) study of augmented reality provides support for the proposed simulation–behavioral intentions indirect relationships. They found that simulated control experiences generated by augmented reality could create value, which in turn influenced consumers’ behavioral intentions. Based on the prior evidence, it appears the literature suggests simulation strength should be strong enough that it still has an indirect effect through mediators such as involvement and satisfaction:

\[ H4a. \text{Simulation will have a positive direct effect on involvement (Model 1 and Model 2).} \]
H4b. Simulation will have a positive direct effect on satisfaction (Model 2).

H4c. Simulation will have a positive indirect effect on behavioral intentions via involvement (Model 2).

H4d. Simulation will have a positive indirect effect on behavioral intentions via satisfaction (Model 2).

H5 propositions that distraction value will have a positive direct effect on involvement satisfaction (H5a–b) and indirectly on behavioral intentions (H5c–d). When the gamified app or serious game allows the user to successfully distract themselves, they will become more interested (involved) in and satisfied with the benefits it provides (satisfaction). Subsequently, due to the distraction of the gamified app/serious game, this should help consumers avoid the performance of behaviors that detract from their well-being, thus increasing their behavioral intentions to perform the opposite (the positive well-being behavior). Previous studies provide further support for the link between distraction and involvement (Lord and Burnkrant, 1993; Nelson, Duncan and Kiecker, 1993). Park and Young (1986) studied the impact of distraction on persuasion with involvement playing a moderating role. Their findings showed strong support for distraction and attitude relationships particularly for those among highly involved consumers. In further support for the distraction and involvement relationship, Lord and Burnkrant (1993) also note that the distraction potential combined with high levels of involvement allow consumers to more easily elaborate on an advertisement. This is further enhanced by the findings of Nelson and colleagues (1993) who note that distraction effects are likely to manifest when consumers involvement increases. Therefore, based upon the prior practical explanation and support from the literature, the following relationships are proposed:
H5a. Distraction will have a positive direct effect on involvement (Model 1 and Model 2).

H5b. Distraction will have a positive direct effect on satisfaction (Model 2).

H5c. Distraction will have a positive indirect effect on behavioral intentions via involvement (Model 1).

H5d. Distraction will have a positive indirect effect on behavioral intentions via satisfaction (Model 2).

Involvement relationships (H6)

H6 proposes involvement will impact satisfaction and behavioral intentions, as well as moderate the value–satisfaction relationships. As previously noted, there is strong evidence in the literature to support the impact of involvement on satisfaction and behavioral intentions, with multiple studies establishing that interrelationships exist in alternative settings to gamification and serious games (Baker et al., 2009; Wang and Wu, 2011; Dagger and David 2012; Inoue et al., 2017).

Several studies suggest users with increasing levels of involvement should experience higher levels of satisfaction and behavioral intentions. For example, Inoue and colleagues (2017) both show involvement can have a positive direct and indirect influence on outcomes. These prior studies therefore suggest that involvement should increase satisfaction and behavioral intentions. Therefore, it is posited:

H6a. Involvement will have a positive direct effect on satisfaction (Model 1 and Model 2).

H6b. Involvement will have a positive direct effect on behavioral intentions (Model 2).

H6c. Involvement will have a positive indirect effect on behavioral intentions via satisfaction (Model 1 and Model 2).
However, if suggestions of other involvement studies are accounted for, then involvement should also be considered as a moderator. This is because studies such as Suh and Youjae’s (2006) and Dagger and David’s (2012) find support for involvement as a moderator of relationships that consider satisfaction. It is therefore appropriate to also speculate that involvement plays a moderating role. As such, the following is proposed:

*H6d. Involvement will moderate the value–satisfaction relationships (Model 3).*

**Method**

The current study used judgment sampling as it allowed the selection of information-rich respondents. Ethical considerations and approval were also sought and attained prior to commencing data collection through <name withheld to protect double blind per review process> university’s Human Research Ethics Committee (ethics approval number: 1500000008).

Furthermore, as the researchers were at an “arm’s length” to participants, the serious games and gamified apps selected (described in more detail shortly) did not target overly-sensitive issues, such as mental health or domestic violence, to protect participants. The selection criteria included participants 18–35 years of age and owning/using a smartphone. These criteria were used as this aligned with the target audiences designed for each gamified app and serious game chosen to operationalize this study and ensured participants had smartphones to use the serious games and gamified apps. Furthermore, gamification studies, such as those by Hamari and Kovišito (2015a) and Mulcahy, Russell-Bennett and Iacobucci (2018), show a large skew towards this market segment.

Four gamified apps/serious games were chosen to test the proposed framework for four reasons. First, the gamified app and serious games were relevant for a young adult audience,
which represented the target sample. Second, the objectives of the app/game were on behaviors that contributed positively to the well-being of the user, which aligns with the transformative focus of the current study. Third, the app/game was freely available to download on Apple iTunes and Google Store to mitigate any potential financial burden on participants to partake in the study. Fourth, all four stimuli included a number of game design features, including challenges, character, feedback, and points, as shown in Table 3, which was important to ensure they incorporated key characteristics representative of gamification and serious games. The first serious game selected was *Dumb Ways to Die* – developed to promote safety and well-being around train stations. The second was *CityGT* – a serious game developed to demonstrate the dangers of using a mobile phone whilst driving. The third was *Quit for You Quit for Two*, which was a gamified app rather than a serious game as it had features including mini-games but also other functions, such as behavior tracking, to assist mothers or mothers-to-be to quit smoking. Finally, *My Quit Buddy* was also a gamified app, which included mini-games and other features to assist users to track their smoking behavior as well as tips to manage cravings.

| Table 3. Overview of game design elements included in stimuli |
|---------------------------------------------------------------|
| **Game Design Element (Johnson et al., 2016)**               | **Dumb Ways to Die** | **My Quit Buddy** | **Quit 4 Your Quit 4 Two** | **CityGT** |
| Gamified App/Serious Game                                   | Serious game        | Gamified app      | Gamified app                | Serious game |
| Challenge                                                   | Yes (perform safe behaviors in a timely manner) | Yes (amount of cigarettes smoked per day) | Yes (number of cigarettes smoked per day) | Yes (drive safely without answering phone or crashing) |
| Character                                                   | Yes (a range of controllable characters) | No                | Yes (personalized baby characters with names) | Yes (controllable car) |
| Feedback                                                    | Yes (positive reinforcement statements) | Yes (positive reinforcement statements) | Yes (positive reinforcement statements) | Yes (negative reinforcement statements) |
| Points/Trophies/Badges                                      | Yes                | Yes               | Yes                         | Yes            |
Data collection procedure

A quantitative online survey method was used, with survey participants recruited through a commercial online survey panel provider. The largest segment of participants (33.3%) were aged 30–33 years, while 59.0% of the overall sample were female, and 53.3% were employed full-time (Table 4). Participants also reported on the nature of their experiences with the gamified apps and serious games. Concerning app/game session length, the majority of the sample (36.8%) reported their session times were an estimated 5 minutes in duration. Over the week of use, the majority, 47.9%, reported that used/played 2-3 times followed by 30.6% who reported they used their allocated app/game for 4 or more times over the week. Participants completed three stages of participation in this study: a pre-survey, gameplay period, and a post-survey. The pre-survey stage involved collecting demographic information and allocating participants to an appropriate gamified app/serious game based on their responses to behavior-related questions (e.g. “Do you smoke or have you smoked in the past?” and “Do you use trains for public transport?”). This ensured participants were given a serious game or gamified app relevant to them. Check questions were also provided to ensure participants had not used the gamified app or serious games previously. Instructions to download the allocated serious game or gamified app were provided, and respondents were directed to use their allocated serious game or gamified app for one week. Respondents were then requested to complete the post-survey at the end of the week, which comprised questions regarding the perceived value, involvement, satisfaction, and intentions to perform a health and well-being behavior.

Table 4.
Demographic characteristics of sample (%)

| Characteristic | Response | Percent |
|----------------|----------|---------|
| Age            | 18–21    | 13.1%   |
|                | 22–25    | 15.9%   |
|                | 26–29    | 24.9%   |
|                | 30–33    | 33.4%   |
Independent variables. Five independent variables were used in this study: enjoyment, social value, knowledge, simulation, and distraction. To measure enjoyment, two items were adapted from Mathwick et al.’s (2001) experiential value scale. To measure social value, four items were adapted from Pura’s (2005) social value scale. The transformative value dimensions of knowledge, distraction, and simulation had not previously been examined in prior studies; therefore, to measure these value dimensions, the current study drew from prior related research to develop items to measure each construct. For knowledge, five items from Fu and colleagues (2009) were adopted. Distraction was measured using five items adopted from Reynolds and Wells (1999). The six simulation items were adapted from Ribben’s (2013) scale. For involvement, four items from Zaichswosky’s (1985) involvement scale were used.

Dependent variables. Consistent with prior research (e.g. Zainuddin et al., 2016), satisfaction and behavioral intentions for transformative services were measured using scales originally used by Dagger et al. (2007) and adapted to the current study context and measured on a 5-point Likert scale (1= “strongly disagree” and 5= “strongly agree”). It is important to note that the objective of behavioral intentions is to perform a well-being behavior rather than reuse a service, as per prior studies (e.g. Tanouri et al., 2019). Furthermore, actual behavior is not measured in the current study; however, the use of behavioral intentions to infer actual behavior is an appropriate approach that has been adopted in previous studies that have similarly explored the use of transformative services for the improvement of individual well-being (e.g. Zainuddin
Measuring behavioral intentions rather than actual behavior also allowed for the protection of study participants’ privacy. Some of the chosen games had the potential to involve the disclosure of sensitive or potentially taboo behaviors had actual behavior been measured. For example, *Quit for You Quit for Two*, focuses on smoking during pregnancy or when planning to become pregnant. Disclosure of such information, such as smoking during pregnancy, has the potential to cause distress for some participants or subject them to perceptions of judgment. Finally, it is also important to note that the study did not seek to measure actual well-being of the study participants or assess any changes in their well-being as a result of game play. However, it can be inferred that an individual’s well-being is likely to improve if they perform well-being behaviors.

*Control variables.* In addition to measuring the independent and dependent variables, factors such as smartphone usage, smartphone skill, mobile game skill, gamification app/serious game used, age, and gender were controlled for. These factors were deemed important, as service usage, perceived skill, age, and gender have been shown to have an impact on results in similar research settings. Thus, the study controlled for these factors within the model to improve the reliability and ensure their impact did not confound the interpretation of the results. This was carried out by drawing a regression path from each control variable to each construct in the model.

*Common method bias.* The potential effect of common method bias was assessed by conducting a Harman’s one-factor test and common latent factor analysis. The Harman’s one-factor test revealed that one factor explained less than half of the variance (40.53%). The common latent factor analysis revealed that the latent factor accounted for less than the majority
of the variance (43.56%). It was, therefore, determined by these two consistent results that common method bias did not contaminate the results.

Analytical procedures

To test the proposed model, structural equation modeling (SEM) in AMOS 24.0 was undertaken. As suggested in the literature, SEM was undertaken using a two-step approach, whereby the measurement model was first assessed, followed by the structural model (Anderson and Gerbing, 1988). For each model, separate approaches were undertaken to examine the role of the newly proposed transformative value dimensions and involvement. To test for mediation, this study examined the indirect effects of perceived value dimensions via involvement. To test for the potential moderating effect of involvement, a multi-group analysis test of invariance was undertaken, which is consistent with prior studies (e.g. Olsen, 2007). The model fit indices were examined for each model, with acceptable fits indicated by the chi-square ratio being under 3, the CFI being above .90 and a RMSEA value below .06 (Iacobucci, 2010).

Results

The first step prior to testing the structural models was confirming that the scales for each construct demonstrated acceptable levels of reliability and validity. An analysis of the priori measurement model with all constructs resulted in an acceptable model fit, CMIN/DF=3.12, CFI=.95, RMSEA=.06. Convergent validity was established, with all individual item loadings on the constructs being statistically significant ($p<.000$). The average variance explained (AVE) for each construct was above the recommended threshold of .50. The AVE scores were also above the shared variances of the constructs, demonstrating discriminant validity (Table 5). Reliability
of the multi-item scales was established by examining the composite reliability coefficient for each construct, which was above the recommended threshold of .70 (Table 6) (Bagozzi and Yi, 1988). In sum, the measures used in the study demonstrated high levels of validity and reliability.

**Table 5.**
Construct means, AVE, correlations and shared variances

| Construct       | AVE | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    |
|-----------------|-----|------|------|------|------|------|------|------|------|
| Enjoyment       | .79 | .21  | .21  | .19  | .16  | .46  | .49  | .09  |      |
| Social          | .87 | .46**| .37  | .33  | .18  | .12  | .28  | .01  |      |
| Knowledge       | .66 | .46**| .61**| .47  | .08  | .23  | .46  | .05  |      |
| Simulation      | .70 | .44**| .58**| .69**| .07  | .23  | .43  | .07  |      |
| Distraction     | .92 | .41**| .43**| .29**| .27**| .12  | .21  | .01  |      |
| Involvement     | .78 | .68**| .36**| .48**| .35**| .46  | .11  |      |      |
| Satisfaction    | .77 | .70**| .53**| .68**| .46**| .68**| .14  |      |      |
| Behavioral Intentions | .70 | .31**| .10* | .24**| .28**| .10* | .34**| .38**|      |

*p<.05, **p<.01, shared variances shown in top half of the matrix.

**Table 6.**
Reliability and validity of items

| Construct/Item                                                                 | Loading |
|-------------------------------------------------------------------------------|---------|
| **Enjoyment**                                                                 |         |
| I enjoyed playing X for its own sake, not just for assisting me in changing my behavior | .93     |
| I play X for the pure enjoyment of it                                          | .85     |
| **Social**                                                                    |         |
| Using X helps me to feel accepted by others                                   | .90     |
| Using X makes a good impression on other people                               | .92     |
| Using X gives me social approval                                              | .96     |
| Using X improves the way I am perceived                                       | .95     |
| **Knowledge**                                                                 |         |
| X increased my knowledge about [behavior]                                    | .79     |
| I caught the basic ideas of the knowledge taught about [behavior]             | .80     |
| I tried to apply the knowledge in X                                           | .82     |
| X motivates the player to integrate the knowledge taught about [behavior]     | .86     |
| **Simulation**                                                                |         |
| The events in X had similarities with events in real life                     | .82     |
| Characters in X acted like people in real life                                 | .83     |
| In X, aspects from reality are woven in                                       | .86     |
| The characters in X had similarities with people in real life                 | .87     |
| The locations in X looked similar to places in real life                       | .84     |
| The developers of X spent great care to make sure that they had built a credible world | .80     |
| **Distraction**                                                               |         |
| Rather than [undesired behavior] I occupied myself with X                     | .97     |
| Rather than [undesired behavior] I kept myself busy with X                    | .98     |
| Rather than [undesired behavior] I played X instead                           | .98     |
| I focused on the game rather than [undesired behavior]                        | .97     |
### Construct/Item

**Loading**

| Construct/Item                                      | Loading |
|-----------------------------------------------------|---------|
| Rather than enjoying [undesired behavior] I enjoyed playing X | .96     |
| Rather than [undesired behavior] I thought about X    | .94     |
| **Involvement with gamified app/serious game**        |         |
| Matters to me/Doesn’t matter                        | .93     |
| Uninterested/Interested                              | .90     |
| Boring/Interesting                                  | .81     |
| Trivial/Fundamental                                  | .89     |

### Satisfaction with gamified app/serious game

|Construct/Item| Loading |
|--------------|---------|
|My feelings towards X are very positive              | .90     |
|I feel good about having played X                    | .91     |
|Overall, I am satisfied with X and the benefits it provides| .92     |
|I feel satisfied that the results playing X are the best that can be achieved | .85     |
|The extent to which playing X has produced the best possible outcome is satisfying | .82     |

### Behavioral intentions to well-being behavior

|Construct/Item| Loading |
|--------------|---------|
|I intend to continue [behavior]                       | .88     |
|I have no desire to not stop [bad behavior]           | .83     |
|I intend to follow any advice given to me about [behavior] | .81     |

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**Involvement as a mediator**

Table 6 details the results for testing involvement as a mediator between value and satisfaction.

**Perceived value and involvement (Model 1 and Model 2).** The results revealed that enjoyment (β=.66, p<.000) and simulation (β=.21, p<.000) significantly increased involvement in both the partially and fully mediated models. Results showed that social value significantly decreased involvement (β=−.16, p<.000). The results show that enjoyment had an indirect effect on satisfaction via enjoyment in the fully (β=.44, p<.000) and partially (β=.10, p<.01) mediated models. Simulation also had a significant indirect effect on satisfaction via involvement for the fully (β=.16, p<.01) and partially (β=.03, p<.05) mediated models.
Involvement and satisfaction (Model 1 and Model 2). Involvement had a significant direct effect on behavioral intentions via satisfaction in the fully mediated (β=.74, p<.000) and partially (β=.16, p<.01) mediated models. Involvement was also shown to have a significant indirect effect for the fully (β=.29, p<.01) and partially (β=.06, p<.01) mediated models. Satisfaction had a significant direct effect on behavioral intentions for the fully and partially mediated models (β=.40, p<.000).

Perceived value to satisfaction (Model 2 only). The results showed that enjoyment (β=.39, p<.000), knowledge (β=.28, p<.000), simulation (β=.22, p<.000), and distraction (β=.15, p<.000) had significant direct effects on satisfaction in the partially mediated model. Further, enjoyment (β=.14, p<.000), knowledge (β=.11, p<.01), and simulation (β=.08, p<.01) had significant indirect effects on behavioral intentions via satisfaction (see Table 7).

Table 7.
Full vs partial mediation (Model 1 and Model 2)

| Path | Fully Mediated (Model 1) | Partially Mediated (Model 2) |
|------|--------------------------|-----------------------------|
| Perceived value to Involvement (Model 1 & 2) | | |
| Enjoyment→Involvement | .66*** | .66*** |
| Social→Involvement | -.16*** | -.16*** |
| Knowledge→Involvement | .09ns | .06ns |
| Simulation→Involvement | .21*** | .21*** |
| Distraction→Involvement | .06ns | .06ns |
| Enjoyment→Involvement→Satisfaction | .44** | .10** |
| Social→Involvement→Satisfaction | -.12ns | -.02ns |
| Knowledge→Involvement→Satisfaction | .07ns | .01ns |
| Simulation→Involvement→Satisfaction | .16** | .03* |
| Distraction→Involvement→Satisfaction | .03ns | .01ns |
| Involvement to Satisfaction (Model 1 & 2) | | |
| Involvement→Satisfaction | .74*** | .16** |
| Involvement→Satisfaction→Behavioral intentions | .29** | .06** |
| Satisfaction→Behavioral intentions | .40*** | .40*** |
| Perceived value to Satisfaction (Model 2 only) | | |
| Enjoyment→Satisfaction | | .39*** |
| Social→Satisfaction | | -.07ns |
| Knowledge→Satisfaction | | .28*** |
| Simulation→Satisfaction | | .22*** |
| Distraction→Satisfaction | | .15*** |
| Enjoyment→Satisfaction→Behavioral intentions | | .14*** |
| Social→Satisfaction→Behavioral intentions | | -.02ns |
Knowledge $\rightarrow$ Satisfaction $\rightarrow$ Behavioral intentions $= .11^{**}$
Simulation $\rightarrow$ Satisfaction $\rightarrow$ Behavioral intentions $= .08^{**}$
Distraction $\rightarrow$ Satisfaction $\rightarrow$ Behavioral intentions $= .06^{ns}$

$R^2$
- Involvement $= .67$
- Satisfaction $= .58$
- Behavioral Intentions $= .19$

Model Fit
- CMIN/DF $= 3.26$ $\rightarrow$ $2.79$
- CFI $= .93$
- RMSEA $= .06$

* $p < .05$; ** $p < .01$; *** $p < .000$; ns = non-significant

**Involvement as a moderator**

The sample was split into high- and low-involvement user segments. This was done by conducting a median split on consumers’ involvement, with those above the median being classified as high-involvement and those below the median as low-involvement. Enjoyment, knowledge, and distraction had significant direct effects on satisfaction for high- and low-involvement groups. These relationships, however, did not significantly differ in strength between high- and low-involvement users. As seen in Table 8, the only relationship to significantly differ was the simulation–satisfaction relationship, which was stronger for the low-involvement group ($\beta = .38, p < .000$) than the high-involvement group ($\beta = .13, p < .05$).

Table 8.
Involvement as a moderator results

| Paths                          | High-Involvement  | Low-Involvement  | Chi-square difference $(\Delta df = 1)$ |
|--------------------------------|-------------------|------------------|----------------------------------------|
| Enjoyment $\rightarrow$ Satisfaction | $\beta$ | B | 1.22ns |
| Social $\rightarrow$ Satisfaction | -.03 | -.11 | 3.06ns |
| Knowledge $\rightarrow$ Satisfaction | .35*** | .30*** | .94ns |
| Simulation $\rightarrow$ Satisfaction | .13ns | .38*** | 8.75** |
| Distraction $\rightarrow$ Satisfaction | .18*** | .17*** | 2.36ns |
| Satisfaction $\rightarrow$ Behavioral intentions | .31*** | .28*** | .97ns |
| $R^2$ Satisfaction | .62 | .74 |
| Behavioral intentions | .13 | .12 |
Model Fit

|               | Model 1 Involvement as Full Mediator | Model 2 Involvement as Partial Mediator | Model 3 Involvement as Moderator |
|---------------|-------------------------------------|-----------------------------------------|---------------------------------|
| CFI           | .93                                 | .95                                     | .93                             |
| CMIN/DF       | 2.12                                | 2.79                                    | 2.12                            |
| RMSEA         | .05                                 | .06                                     | .05                             |
| **p<.01; ***p<.000**

Model comparison

For thoroughness in the testing and comparison of the models whereby the role of involvement differed, comparison of the model fits were undertaken. The comparison of the fit indices indicates that the partially mediated model (Model 2) is superior to the fully mediated model (Model 1) and the moderation model (Model 3). Further, a chi-square test was conducted to examine the difference between the models. The results revealed that Model 2 has a significantly superior fit to the data in comparison to Model 1 ($\chi^2=302.27$ (df=5), $p<.000$) but not Model 3 ($\chi^2=344.52$ (df=354), $ns$). However, whilst Model 2 and Model 3 are not statistically significant, it is important to note that the CFI for Model 3 does not reach the recommended threshold of .95 (Iacobucci, 2010). Further, the $R^2$ for satisfaction and behavioral intentions are higher for Model 2 in comparison to Model 3, as shown in Table 9. Thus, based on the results comparing the Models it can be concluded that the partial mediator model (Model 2) has a superior fit to the data and prediction of outcomes.

Table 9.
Model comparison

| Fit Indices               | Model 1 Involvement as Full Mediator | Model 2 Involvement as Partial Mediator | Model 3 Involvement as Moderator |
|---------------------------|-------------------------------------|-----------------------------------------|---------------------------------|
| Chi-square (df)           | 2008.58(615)                        | 1706.31(610)                            | 2050.83(964)                    |
| CMIN/DF                   | .3.26                               | 2.79                                    | 2.12                            |
| CFI                       | .93                                 | .95                                     | .93                             |
| RMSEA                     | .06                                 | .06                                     | .05                             |
| $R^2$ Satisfaction        | .58                                 | .81                                     | .62-.74                         |
| $R^2$ Behavioral Intentions| .19                                 | .19                                     | .13-.12                         |
Discussion

This study investigated gamification and serious games for well-being by examining the interrelationships between transformative value and desired outcomes, namely satisfaction and behavioral intentions to perform a well-being behavior, with a particular focus on the role of involvement as a mediator or moderator. The models in the current study perform consistently with those of other studies in and outside of gamification settings. This is indicated by $R^2$ values between .58 and .81 for satisfaction, which is consistent with (e.g. Gallarza et al., 2016), and even above some (e.g. Willems et al., 2016), prior value studies in non-gamification and transformative settings. The model did explain low–medium levels of behavioral intentions for well-being behaviors ($R^2 .19$), which is lower than the variance explained for behavioral intentions in other TSR technology-related studies (e.g. Schuster et al., 2015). However, there is an important difference to note. This study’s focus is on behavioral intentions regarding a well-being behavior, rather than the reuse or intention to adopt a TSR technology. Thus, it makes it difficult to draw comparisons between the $R^2$ in this study with others in the literature. It is well noted in the literature that measuring the predictability and performance of social and well-being behaviors can be difficult (e.g. Rundle-Thiele et al., 2019), and this, combined with the results of this study, suggest further extensions of the current study’s model may be required to explain higher levels of variance in behavioral intentions to well-being behaviors. The theoretical and practical implications of the findings will now be discussed.

Theoretical implications

Transformative value and loyalty to well-being. At present, gamification and serious games are becoming increasingly popular areas of study for service scholars. This research takes a novel
approach to investigating and theorizing gamification and serious games in three ways. First, recall in Table 1 that limited studies have taken a transformative focus to gamification and serious games and even fewer studies have taken a transformative perspective to the value they co-create; many instead focus on the platform's utilitarian functionality or hedonic benefit. The transformative value dimensions theorized in this study were empirically shown to have an impact on desired outcomes, which is an important contribution to the TSR and customer value literature. The pattern of the relationships for the knowledge, distraction, and simulation value dimensions were found to be consistent with theorizing relating to the value–satisfaction–loyalty chain (e.g. Gallarza et al., 2016). It is suggested that the consistency between the current study and prior value studies demonstrates the strength of the theorizing and empirical testing of transformative value dimensions. The findings of transformative value in this study therefore suggest that TSR and gamification scholars need to contemplate and theorize value dimensions beyond those previously conceptualized in the service literature to ensure they uncover the complexity and provide a holistic insight into the benefits created by such services. In providing these insights this paper also begins to address calls by Leroi-Werelds (2019) to take novel perspectives to customer value in emerging technologies such as gamification and serious games.

This study also examined the effect of enjoyment and social value, as prior literature suggests they would be important. Consistent with the theorizing in this study and prior literature (Hamari and Kovisto, 2015a; Suh et al., 2018), the affective value dimension of enjoyment played an important direct and indirect role in influencing desired outcomes. What is particularly interesting is the indirect effect enjoyment had upon behavioral intentions via satisfaction. This result suggests that enjoyment is not only important for the sole reason of creating a “good” or
satisfying gamification and serious game experience but also plays an important indirect role in influencing well-being behavior.

Contrary to what was predicted, social value was found to have a non-significant influence in this study. This finding contrasts prior research in gamification (Hamari and Koivisto, 2015b; Hsu, et al. 2017), which suggests social benefits are integral and significant for consumers. A notable difference to these studies is the focus of gamification on being on behaviors which are more pleasurable and social features being more integral to consumers usage of the gamified platform. The finding of the non-significant impact of social value in this study does align with some service studies outside of gamification (Williams, et al. 2017), including transformative services in healthcare (Zainuddin, et al. 2016). It could be interpreted that users do not perceive the social benefits achieved by enhancing one’s status amongst one’s peers as important or desirable for creating a satisfying experience or encouraging a well-being behavior in transformative gamification. Instead, given the nature of the sensitivity of behaviors and vulnerability of market segments targeted by transformative services, this could suggest that consumers wish the use of gamification for such purposes to be more inherently private than social (public). As value is known to be contextually bound, and it appears that the results of the current study confirm this evidencing that social value can be influential in some applications of gamifications (e.g. Hamari and Koivisto, 2015b), whilst in others not, as per the findings of the current study. This has important implications for service scholars investigating gamification demonstrating the need to be mindful of the important nuances in different settings where gamification is applied and market segments using them which may change the nature of relationships.
The third unique perspective from this research advances how transformative services are, and can be, delivered via gamification. The existing literature has established that gamification and serious games can increase the likelihood of consumer loyalty or repeat consumer behavior (Hwang and Choi, 2019; Wolf et al., 2019); the current research extends this applicability to increasingly the (continued) performance of well-being behaviors. Extending the perspective of gamification and serious games as a “loyalty tool” for transformative services furthers scholars’ thinking regarding the application of these technologies beyond a primarily commercial purpose to aims which affect consumer and societal well-being.

The role of involvement in transformative gamification. The results of this research indicate that the model with involvement as a partial mediator fits well and outperforms the competing models with involvement as a full mediator or moderator. The findings therefore support the heretofore under-examined role of involvement as a mediator (rather than moderator) in gamification and serious games for well-being (Vashisht and Royne, 2019). A survey of the literature (as shown in Table 2) demonstrated that there are two theoretical positions to the role of involvement as either a mediator (e.g. Inoue et al., 2017) or moderator (e.g. Dagger and David, 2012). This has resulted in an unclear theoretical understanding as to the role involvement plays in models for gamification and serious games – despite calls for research into this domain and emerging concepts which provide greater understanding (Vashisht and Royne, 2019; Tanouri et al., 2019). The results of this study support involvement being a mediator in gamification and serious games for well-being, which contrasts with scholars suggesting it primarily plays only a moderating role (recall Table 2). Shedding insight into the role of involvement as a mediator rather than a moderator therefore begins to provide important theoretical and empirical guidance.
to gamification and service scholars as to the placement of involvement within conceptual models, as called for in the literature. The results suggest that rather than being a factor which influences the strength between transformative value and desired outcomes (a moderator), it explains the relationship between transformative value and outcomes such as satisfaction and behavioral intentions for well-being behaviors (a mediator). In sum, involvement is central in explaining why or why not there is a relationship between transformative value and desired outcomes in transformative gamification services.

*Managerial implications*

This research demonstrates to practitioners and managers that gamification and serious games can assist in co-creating a diverse and multipurpose range of transformative value dimensions. The findings of the current study suggest the importance of incorporating experiences that assist in co-creating transformative value. Specifically, from the conceptualization of transformative value, the dimensions of knowledge, simulation, and distraction are encouraged to be considered when designing transformative gamification services. Next, recommendations for each dimension using practical current marketplace examples are provided.

First, knowledge should focus on incorporating push notifications as well as “game/app scaffolds,” whereby facts, figures, or knowledge relating to a well-being behavior are provided to the user. Many gamified apps and serious games incorporate such features, and the results of this study support their inclusion. For example, many gamified apps provide design features such as push notifications, which include daily notices, facts, or statistics, which are useful to users' well-being, such as “remember to take the stairs rather than the lift to increase your physical activity.”
In a serious game setting, this could be the incorporation of information throughout gameplay, whereby during paused or loading-screen times targeted messages are communicated to users.

For distraction value, service practitioners should consider ways in which users can incorporate features that prompt or distract users at times when they may be vulnerable to performing negative behaviors. In the case of distraction, an app or serious game may have inbuilt alerts or alarms which remind the user of the need to play/use the app or lose points as a way to motivate usage and distract them from performing the negative behavior. Further, practitioners should ensure during testing that apps and serious games take a considerable cognitive load by users to ensure that they may facilitate enough distraction. This could be facilitated through the game design element of challenge, whereby increasingly difficult tasks are provided to users to ensure that the game/app requires greater concentration and effort.

For simulation, there are two ways practitioners could incorporate its use in gamified apps or serious games. From a serious game perspective, simulation could be incorporated by ensuring virtual scenarios provide realistic scenarios that allow consumers to trail, fail and improve the performance of well-being behaviors. An example of such serious game design can be seen in SPARX\(^2\), which aims to help adolescents (12–19 years) with mild to moderate depression and anxiety. In this serious game, simulation is provided by users controlling a realistic avatar to complete quests to defeat negative thoughts. For gamified apps, performing behaviors in the real world could be augmented by scenarios or activities which blend the virtual and real world. Examples of these practices can be seen in Zombie Run!, where running and walking (encouraging exercise) in the real world allows users to “run away” from virtual zombie

\(^2\) [https://www.sparx.org.nz/about](https://www.sparx.org.nz/about)
attacks. Therefore, using the results as a basis along with the prior practical marketplace examples, it could be suggested for gamified apps and serious games that allowing the creation of personalized avatars or scenarios (also referred to as storylines), which fit their user preferences or current circumstances, could assist in creating simulation value.

The findings also demonstrate the importance of enjoyment and involvement in influencing behaviors encouraged by gamified and serious games. With this result in mind, it is stressed to designers and programmers that caution be taken regarding the design and creation of gamified services and serious games that are too focused on transformative (well-being) benefits and outcomes. As the results showed, enjoyment and involvement still have a role to play in influencing consumers’ well-being behaviors; thus, it is imperative that their experiences with transformative gamified apps and serious games remain enjoyable, interesting, and motivating to use. Through the research and development stage, practitioners should therefore ensure that they undertake rigorous pilot and beta testing with users to ensure that enjoyment is still being maximized through the design of challenges and point systems within the gamified app or serious game, which have been shown to contribute to creating enjoyment (Mulcahy, Russell-Bennett, Iacobucci, 2018).

Practitioners should also take note of the non-significant impact of social value found in this study, and two suggestions are provided for consideration based upon this result. The results first suggest that the design of social features, such as “in app” chat and messaging or community leaderboards, in transformative gamified apps and serious games is not always necessary and such features could be excluded to save unnecessary budget expenditure in the development phase. Alternatively, practitioners could also consider, based upon the results, that segments of users may want a more private rather than social experience on transformative gamification and
serious games apps, and this should be taken into consideration in the design phase. This could be carried out by including “opt-in/opt-out” options for social features that connect users with other users. This may be a more favorable approach from practitioners and users as this will allow a greater personalization of their experience based upon user preferences.

Limitations and future research directions
The current study poses limitations which offer potential areas for future research. First, the data collected for this study via surveys were cross-sectional in nature, and thus the insights provided are only at one point in time. In line with the comments of Johnson and colleagues (2016) and Leclercq and colleagues (2020), future research should seek to examine the long-term effects of gamification and serious games. From the findings of this research, future studies could seek to examine the influence of the value co-created by transformative gamification services and serious games over time and determine whether and when (or if) their effect diminishes.

Technology and, in particular, games and gamification studies are known to skew towards a young demographic segment, which is reflective of the sample of this study. However, caution should be taken when generalizing the findings of this study to other market segments. Future research examining the current study’s framework in other market segments is likely to yield valuable insights into the generalizability of nuances of the research findings. Another important potential extension of this research is exploring additional value dimensions that may be co-created by gamification and serious games. For instance, this study only explored enjoyment as an emotionally created dimension of value consistent with prior studies (e.g. Hamari and Kovisito, 2015a; Mulcahy, Russell-Bennett, and Iacobucci, 2018). However, other emotional states, such as happiness, calmness, pride, or inspiration, could also be created by gamification
and serious games, and future studies could potentially explore these to extend the transformational understanding of co-created value. Whilst this study addressed an important gap in understanding emerging concepts of importance to gamification, specifically, transformative value and involvement, as per the suggestions of Tanouri and colleagues (2019), enhancing understanding through the inclusion of consumer engagement can also be useful. As shown by Hollebeek and colleagues (2014) consumer engagement can serve as an antecedent to involvement, and future studies could seek to explore the interrelationships between transformative value, consumer engagement and involvement and see whether this improves the prediction of the outcomes examined within the current study. Finally, whilst gamification studies have shown a link between behavioral intentions and actual behavioral outcomes (see Mulcahy, Russell-Bennett and Iacobucci, 2018), it is important to note the behavioral intentions and behavior link is not always consistent [often referred to as the intention-behavior gap] (Fennis, et al., 2011). As such, the measurement of behavioral intentions as an outcome in this study is a limitation, and caution should be taken when inferring behavior performance from the findings of this study. Future research should seek to confirm if indeed the proposed models in this study, predict behavioral performance or outcomes. Even with these open questions for future research, this study has taken a significant step forward in providing theoretical and practical insights for the field of gamification and transformative services.

Conclusion

This research contributes to understanding transformative value and involvement in transformative gamification services. Extending the view of value as being transformative, and the mediating (rather than moderating) role of involvement, can motivate service scholars to take new theoretical perspectives to service concepts which can assist in contributing new insights to
emerging areas such as gamification and TSR. As technology continues to evolve, and transformative service providers look to innovate their strategies, the findings of this research have important implications and suggest the need to think strategically as to how gamification and serious games can be designed in such a way that can combine both entertainment and transformative goals to uplift consumer well-being.

References

Anderson, J.C. and Gerbing, D.W. (1988), “Structural equation modeling in practice: a review and recommended two-step approach”, Psychological Bulletin, Vol. 103 No. 3, p. 411.
Anderson, L., Ostrom, A.L., Corus, C., Fisk, R.P., Gallan, A.S., Giraldo, M., Mende, M., Mulder, M., Rayburn, S.W., Rosenbaum, M.S. and Shirahada, K. (2013), “Transformative service research: an agenda for the future”, Journal of Business Research, Vol. 66 No. 8, pp. 1203-1210.
Antón, C., Camarero, C. and Rodríguez, J. (2013), “Usefulness, enjoyment, and self-image congruence: the adoption of e-book readers”, Psychology & Marketing, Vol. 30 No. 4, pp. 372-384.
Babin, B.J., Darden, W.R. and Griffin, M, (1994), “Work and/or fun: measuring hedonic and utilitarian shopping value”, Journal of Consumer Research, Vol. 20 No. 4, pp. 644-656.
Bagozzi, R. P. and Yi, Y. (1988), “On the evaluation of structural equation models”, Journal of the Academy of Marketing Science, Vol. 16 No.1, pp. 74-94.
Baker, T. L., Cronin Jr, J. J. and Hopkins, C. D. (2009), “The impact of involvement on key service relationships”, Journal of Services Marketing, Vol. 23 No. 2, pp. 114-123.
Batchelor, J. (2018), “Global games market value rising to $134.9bn in 2018”, available at: https://www.gamesindustry.biz/articles/2018-12-18-global-games-market-value-rose-to-usd134-9bn-in-2018
Bidarra, R., Gambon, D., Kooij, R., Nagel, D., Schutjes, M. and Tziouvara, I. (2013), “Gaming at the dentist’s–serious game design for pain and discomfort distraction”, Games for Health, pp. 207-215.
Black, H.G. and Gallan, A.S. (2015), “Transformative service networks: cocreated value as well-being”, The Service Industries Journal, Vol. 35 No. 15-16, pp. 826-845.
Blocker, C.P. and Barrios, A. (2015), “The transformative value of a service experience”, Journal of Service Research, Vol. 18 No. 3, pp. 265-283.
Bolton, R.N., McColl-Kennedy, J.R., Cheung, L., Gallan, A., Orsinher, C., Witell, L. and Zaki, M. (2018), “Customer experience challenges: bringing together digital, physical and social realms”, Journal of Service Management, Vol. 29 No. 5, pp. 776-808.
Cheng, Y. and Wang, S.H. (2011), “Applying a 3D virtual learning environment to facilitate student’s application ability – The case of marketing”, Computers in Human Behavior, Vol. 27 No. 1, pp. 576-584.
Dagger, T. S., Sweeney, J. C., and Johnson, L. W. (2007), “A hierarchical model of health service quality: scale development and investigation of an integrated model”, *Journal of Service Research*, Vol. 10 No.2, pp.123-142.

Dagger, T.S. and David, M.E. (2012), “Uncovering the real effect of switching costs on the satisfaction-loyalty association: the critical role of involvement and relationship benefits”, *European Journal of Marketing*, Vol. 46 No. 3/4, pp. 447-468.

Dieleman, J.L., Templin, T., Sadat, N., Reidy, P., Chapin, A., Foreman, K., ... and Kurowski, C. (2016), “National spending on health by source for 184 countries between 2013 and 2040”, *The Lancet*, Vol. 387 No. 10037, pp. 2521-2535.

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.

Fennis, B. M., Adriaanse, M. A., Stroebe, W., & Pol, B. (2011). Bridging the intention–behavior gap: Inducing implementation intentions through persuasive appeals. *Journal of Consumer Psychology, 21*(3), 302-311.

Fu, F.L., Su, R.C. and Yu, S.C. (2009), “EGameFlow: a scale to measure learners’ enjoyment of e-learning games”, *Computers & Education, Vol. 52* No. 1, pp. 101-112.

Gallarza, M.G., Arteaga-Moreno, F., Del Chiappa, G. and Gil-Saura, I. (2016), “Intrinsic value dimensions and the value-satisfaction-loyalty chain: a causal model for services”, *Journal of Services Marketing, Vol. 30* No. 2, pp. 165-185.

Gan, C. and Wang, W. (2017), “The influence of perceived value on purchase intention in social commerce context”, *Internet Research, Vol. 27* No. 4, pp. 772-785.

Ghazali, E. M., Mutum, D. S. and Woon, M. Y. (2019), “Multiple sequential mediation in an extended uses and gratifications model of augmented reality game Pokémon Go”, *Internet Research, Vol. 29* No. 3, pp. 504-528.

Gordon, R., Dibb, S., Magee, C., Cooper, P. and Waitt, G. (2018), “Empirically testing the concept of value-in-behavior and its relevance for social marketing”, *Journal of Business Research, Vol. 82*, pp. 56-67.

Grönroos, C., & Ravald, A. (2011). Service as business logic: implications for value creation and marketing. *Journal of Service Management, Vol. 22* No.1, pp. 5-22.

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.

Hammel, W., Leclercq, 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.

Harwood, T. and Garry, T. (2015), “An investigation into gamification as a customer engagement experience environment”, *Journal of Services Marketing, Vol. 29* No.6/7, pp. 533-546.

Hilken, T., de Ruyter, K., Chylinski, M., Mahr, D. and Keeling, D. I. (2017), “Augmenting the eye of the beholder: exploring the strategic potential of augmented reality to enhance online service experiences”, *Journal of the Academy of Marketing Science, Vol. 45* No. 6, pp. 884-905.
Hofacker, C. F., De Ruyter, K., Lurie, N. H., Manchanda, P., and Donaldson, J. (2016). “Gamification and mobile marketing effectiveness”. *Journal of Interactive Marketing*, Vol. 34, pp. 25-36.

Hsu, C. L., & Chen, M. C. (2018). How gamification marketing activities motivate desirable consumer behaviors: Focusing on the role of brand love. *Computers in Human Behavior*, 88, 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. (2019), “Having fun while receiving rewards?: Exploration of gamification in loyalty programs for consumer loyalty”, *Journal of Business Research*. doi.org/10.1016/j.jbusres.2019.01.031

Iacobucci, D. (2010), “Structural equations modeling: fit indices, sample size, and advanced topics”, *Journal of Consumer Psychology*, Vol. 20 No. 1, pp. 90-98.

Inoue, Y., Funk, D. C. and McDonald, H. (2017), “Predicting behavioral loyalty through corporate social responsibility: the mediating role of involvement and commitment”, *Journal of Business Research*, Vol. 75, pp. 46-56.

Johnson, D., Deterding, S., Kuhn, K.A., Staneva, A., Stoyanov, S. and Hides, L. (2016), “Gamification for health and wellbeing: a systematic review of the literature”, *Internet Interventions*, Vol. 6, pp. 89-106.

Krishnamurthy, A. and Kumar, S. R. (2018), “Electronic word-of-mouth and the brand image: exploring the moderating role of involvement through a consumer expectations lens”, *Journal of Retailing and Consumer Services*, Vol. 43, pp. 149-156.

Kuo, Y.F., Wu, C.M. and Deng, W.J. (2009), “The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services”, *Computers in Human Behavior*, Vol. 25 No. 4, pp. 887-896.

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, https://doi.org/10.1016/j.jretconser.2019.07.007

Leroi-Werelds, S. (2019), “An update on customer value: state of the art, revised typology, and research agenda”, *Journal of Service Management*, doi: 10.1108/JOSM-03-2019-0074

Lindberg, F. and Østergaard, P. (2015), “Extraordinary consumer experiences: why immersion and transformation cause trouble”, *Journal of Consumer Behaviour*, Vol. 14 No. 4, pp. 248-260

Mathwick, C., Malhotra, N. and Rigdon, E. (2001), “Experiential value: conceptualization, measurement and application in the catalog and Internet shopping environment”, *Journal of Retailing*, Vol. 77 No. 1, pp. 39-56.

Mulcahy, R. F., Russell-Bennett, R., Zainuddin, N. and Kuhn, K. A. (2018), “Designing gamified transformative and social marketing services: an investigation of serious m-games”, *Journal of Service Theory and Practice*, Vol. 28 No. 1, pp. 26-51.

Mulcahy, R., Russell-Bennett, R. and Iacobucci, D. (2018), “Designing gamified apps for sustainable consumption: a field study”, *Journal of Business Research*, doi: 10.1016/j.jbusres.2018.10.026.
Mulcahy, R., Russell-Bennett, R. and Rundle-Thiele, S. (2015), “Electronic games: can they create value for the moderate drinking brand?” *Journal of Social Marketing*, Vol. 5 No. 3, pp. 258-278.

Nilsson, S., Enskär, K., Hallqvist, C. and Kokinsky, E. (2013), “Active and passive distraction in children undergoing wound dressings” *Journal of Pediatric Nursing*, Vol. 28 No. 2, pp, 158-166.

Olsen, S.O. (2007), “Repurchase loyalty: the role of involvement and satisfaction”, *Psychology & Marketing*, Vol. 24 No. 4, pp. 315-341.

Orji, R., Vassileva, J. and Mandryk, R.L. (2014), “Modeling the efficacy of persuasive strategies for different gamer types in serious games for health”, *User Modeling and User-Adapted Interaction*, Vol. 24, pp. 453-498.

Pura, M. (2005), “Linking perceived value and loyalty in location-based mobile services”, *Managing Service Quality: An International Journal*, Vol. 15, pp. 509-538.

Reynolds, M. and Wells, A. (1999), “The Thought Control questionnaire – psychometric properties in a clinical sample, and relationships with PTSD and depression”, *Psychological Medicine*, Vol. 29, pp. 1089-1099.

Ribbens, W. (2013), “Perceived game realism: a test of three alternative models”, *Cyberpsychology, Behavior, and Social Networking*, Vol. 16 No. 1, pp. 31-36.

Rundle-Thiele, S., David, P., Willmott, T., Pang, B., Eagle, L. and Hay, R. (2019), “Social marketing theory development goals: an agenda to drive change”, *Journal of Marketing Management*, Vol. 35 No. 1-2, pp. 160-181.

Sánchez-Fernández, R. and Iniesta-Bonillo, M.Á. (2007), “The concept of perceived value: a systematic review of the research”, *Marketing Theory*, Vol. 7 No. 4, pp. 427-451.

Sanchez-Franco, M. J. (2009), “The moderating effects of involvement on the relationships between satisfaction, trust and commitment in e-banking”, *Journal of Interactive Marketing*, Vol. 23 No. 3, pp. 247-258.

Schuster, L., Drennan, J. and Lings, I. (2015), “Understanding consumers’ decisions to adopt technology-enabled transformative services”, *The Service Industries Journal*, Vol. 35 No. 15-16, pp. 846-864.

Suh, A., Wagner, C. and Liu, L. (2018), “Enhancing user engagement through gamification”, *Journal of Computer Information Systems*, Vol. 58 No. 3, pp. 204-213.

Suh, J.C. and Youjae, Y. (2006), “When brand attitudes affect the customer satisfaction-loyalty relation: the moderating role of product involvement”, *Journal of Consumer Psychology*, Vol. 16 No. 2, pp. 145-155.

Sweeney, J. C. and Soutar, G. N. (2001), “Consumer perceived value: the development of a multiple item scale”, *Journal of Retailing*, Vol. 77 No. 2, pp. 203-220.

Tanouri, A., Mulcahy, R. and Russell-Bennett, R. (2019), “Transformative gamification services for social behavior brand equity: a hierarchical model”, *Journal of Service Theory and Practice*, doi: 10.1108/JSTP-06-2018-0140

Vargo, S. and Lusch, R. (2016), “Institutions and Axioms: An Extension and Update of Service-dominant Logic,” *Journal of the Academy of Marketing Science*, Vol. 44, No. 1, pp. 5–23.

Vashisht, D. and Royne, M. B. (2019), “What we know and need to know about the gamification of advertising: a review and synthesis of the advergame studies”, *European Journal of Marketing*. https://doi.org/10.1108/EJM-01-2017-0070
Verhagen, T., Feldberg, F., van den Hooff, B., Meents, S., and Merikivi, J. (2011). “Satisfaction with virtual worlds: An integrated model of experiential value”. *Information & Management*, Vol. 48 No.6, pp. 201-207.

Wang, C. Y. and Wu, L. W. (2011), “Reference effects on revisit intention: involvement as a moderator”, *Journal of Travel & Tourism Marketing*, Vol. 28 No. 8, pp. 817-827.

Wang, E. S. and Lin, C. L. (2018), “How work design characteristics affect service employees’ work–family conflicts”, *The Service Industries Journal*, Vol. 38 No. 13-14, pp. 925-947.

Willems, K., Leroi-Werelds, S. and Swinnen, G. (2016), “The impact of customer value types on customer outcomes for different retail formats”, *Journal of Service Management*, Vol. 27 No. 4, pp. 591-618.

Williams, P., Soutar, G., Ashill, N. J., & Naumann, E. (2017). Value drivers and adventure tourism: A comparative analysis of Japanese and Western consumers. *Journal of Service Theory and Practice*, 27(1), 102-122.

Wolf, T., Weiger, W. H. and Hammerschmidt, M. (2019), “Experiences that matter? The motivational experiences and business outcomes of gamified services”, *Journal of Business Research*, [https://doi.org/10.1016/j.jbusres.2018.12.058](https://doi.org/10.1016/j.jbusres.2018.12.058)

Xu, F., Buhalis, D. and Weber, J. (2017), “Serious games and the gamification of tourism”, *Tourism Management*, Vol. 60, pp. 244-256.

Zaichkowsky, J.L. (1985), “Measuring the involvement construct”, *Journal of Consumer Research*, Vol. 12 No. 3, pp. 341-352.

Zainuddin, N., Tam, L. and McCosker, A. (2016), “Serving yourself: value self-creation in health care service”, *Journal of Services Marketing*, Vol. 30, p. 586-600.

**Figure 1.** Proposed mediating and moderating models