Gameful experiences

The not so painful road to gainful behavior

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Faculty of Arts and Social Sciences

Psychology

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Abstract

The aim of this work is to *investigate the experiences that users make when using gamified services and the effect that such experiences have on the targeted behavioral outcomes*. Considerable attention is dedicated to the gameful experience, since this experience is necessary for gamification to affect the target behavior. Moreover, the effectiveness of gamification at triggering different motivational mechanisms and the role of engagement is investigated.

This dissertation contains three papers.[1] Paper 1 uses a mixed-methods approach to develop a model and a measure of the gameful experience. Paper 2 uses a field experimental approach to investigate the effect of gamification on a decision to use offers in a store, and the role of engagement for this effect to occur. Finally, Paper 3 uses a field experiment to investigate the contribution of gamification to value creation in stores and how such value creation relates to brand engagement.

The first main finding is a model of the gameful experience that includes the dimensions of accomplishment, challenge, competition, guided, immersion, playfulness, and social experience, and the instrument for measuring this experience. The second main finding is that challenge-based gamification can induce positive affect, which can influence evaluative judgments (thus utilizing the affective quality of System 1 to change the target behavior) and, ultimately, brand engagement. However, such challenge-based gamification does not seem to be effective when aiming to affect the biased System 1 through effort justification. The third main finding is the results that indicate that a user needs to be engaged in order for a gamified service to work properly.

[1] During the studies presented in this dissertation, the gameful experience construct emerged as central for gamification research. Therefore, even though Paper 1 was the last one to be completed, it is presented first in this dissertation.

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1 Introduction

The number of people who signed up for games of hide-and-seek at IKEA grew to the tens of thousands before the company banned these events, allegedly for security reasons (Harrison, 2015). Even though hide-and-seek is arguably a children's game, these events were mainly aimed at adults, showing why *homo ludens* (man the player) (Huizinga, 1949) seems to be a valid description of the human species. This willingness among adults to play is reinforced by the fact that the average age of players of digital games (in the United States) is 33 years. Moreover, given that 46 percent of players are women (*Essential facts about the computer and video game industry*, 2019), there are convincing demographic statistics that indicate that the stereotype of gamers as teenaged males no longer applies. The practice of playing games (beyond children's games) is not a new one. An indication of the long-lasting impact of games on human culture is records of board games that date back to the seventh millennium BCE (Sebbane, 2001). This, together with the growth of gaming into a US$100 billion business that has attracted money from all parts of the developed world (*Global Games Market Report*, 2017), showcases the attractiveness of games for people regardless of their age, gender, country of origin, or even the millennia they lived in. This attractiveness has been recognized as a possible means to promote behavior. In this dissertation I try to understand users' experiences of using services – mainly apps and software – in which elements of games have been implemented with the aim of promoting behavior; that is, gamified services. I also seek to understand the effect these experiences have on such promotion of behavior.

The practice of implementing elements of games in services to promote behavior has been termed gamification (Deterding, Dixon, Khaled, & Nacke, 2011; Huotari & Hamari, 2017). More specifically, Huotari and Hamari (2017) referred to inducing gameful experiences to achieve this effect; gameful experiences that are at the core of this dissertation. Generally, such gameful experiences are the positive and involving aspects of using a service that has been gamified (Eppmann, Bekk, & Klein, 2018). However, compared to the experience of playing a game proper – named, the game experience – which is hedonic (van der Heijden, 2004), the gameful experience can be both utilitarian and hedonic. Thus, while a game with its hedonic focus will provide the user with self-fulfilling value, the added utilitarian focus of gamified services means that such services will also provide instrumental value (Hamari & Keronen, 2017; Hamari & Koivisto, 2015; Högberg,

Hamari, & Wästlund, 2019). The gameful experience concept is substantially underdeveloped within the gamification literature, which means that large parts of the research presented in this dissertation is exploratory.

Gamification has been implemented in services from widely differing contexts, such as education, health, software development, social networks, crowdsourcing, environmental behavior, and business management (Koivisto & Hamari, 2019). For example, Pokémon Go is a health and wellness service that combats both physical and social inactivity in the general population (LeBlanc & Chaput, 2017). There are also anecdotal stories, such as the 21-year-old with borderline personality disorder and depression who subdued his social anxiety and started to hunt for Pokémons together with his fellow players (Shebani, 2016). However, gamification does not require such advanced game designs. A bathroom scale that includes elements often found in games, such as feedback and challenging goals, can suffice. Consequently, the ordinary task of using a bathroom scale can fill everyday life with gameful experiences.

As the trend of gamification has spread through the world of service and software design, it has also attracted the attention of marketers. In a 2015 survey, six percent of surveyed retailers said they had implemented gamification as part of their loyalty programs, and 87 percent predicted that they will have done so within five years (*CMR/Unified Commerce Survey*, 2015). These predictions, if they are accurate, show that the number of gamification implementations for marketing purposes is accelerating quickly. However, gamification for marketing purposes has been criticized. For instance, the research and advisory company Gartner predicted that 80 percent of such efforts would fail to meet their objectives (Gartner , 2012). Moreover, the usage of gamification for marketing purposes shows that gamification can be used to promote a target behavior that benefits someone other than the user of a gamified service. As such, both a user of a gamified service and the company providing the service might be stakeholders in the target behavior. A service provider might even be a state, as exemplified by the social credit system that rates the trust of citizens in China (Ramadan, 2018). This represents an implementation of gamification that might deserve the derogatory term “exploitationware”, introduced by Bogost (2011).

As Huotari and Hamari’s (2017) description of gamification indicated, the gameful experience is imperative for promoting target behavior when gamifying. In fact, it has been proposed that such experiences mediate the effect gamification have on the target behavior (*Figure 1*) (Huotari & Hamari, 2017; Landers et al.,

2019) and that a lack of success in creating such experiences means that the gamification efforts has failed (Huotari & Hamari, 2017). Consequently, if the creation of such experiences is not the aim when developing gamified services, there does not seem to be a reason to gamify at all.

Figure 1. The gameful experience mediates the effect of gamified service usage on the targeted behavior

Despite the importance of gameful experiences, there has been a lack of efforts to describe it within the gamification research community. Therefore, Research Question I in this dissertation is: *How can the gameful experience be understood and described?* The gameful experience is co-created (Huotari & Hamari, 2017), or, as McGonigal (2011) put it, "Gamers don't just play a good game. They make a good game" (p. 270). More specifically, the service provider provides resources for a user to create such experiences, while the user (while using the service) needs to actively participate in order for these experiences to be created (Huotari & Hamari, 2017). Consequently, it seems reasonable that a user of a gamified service needs to be engaged in using the service in order to create gameful experiences that will ultimately affect the target behavior. This reasoning leads to the Research Question II: *What is the role of engagement for the effect of gamification on the target behavior?* Arguably the most commonly proposed mechanism to drive the effect of gamification on a targeted behavioral outcome is its ability to create intrinsic motivation for a behavior (see, e.g., Hamari, Koivisto, & Sarsa, 2014; Huotari & Hamari, 2017; Mora, Riera, Gonzalez, & Arnedo-Moreno, 2015; Rigby, 2015; Seaborn & Fels, 2015), where being intrinsically motivated means doing something because of the joy of doing it (Ryan & Deci, 2000). In addition to this ability to create intrinsic motivation, some authors have proposed that gamification can utilize cognitive biases to steer users towards the target behavior (Hildebrand, Schlager, Herrmann, & Häubl, 2014; Müller-Stewens, Schlager, Häubl, & Herrmann, 2017). As such, these studies rest on a description of decisions as being instigated through two processes, where one is fast and one is slow (e.g., Kahneman, 2003; Stanovich & West, 2000). In response to these two proposed mechanisms, the third and final research question addressed in this

research is: *What motivational mechanisms is the gameful experience effective at triggering that lead to the targeted behavioral outcomes?* By addressing the three above-mentioned research questions, I tackle the overarching aim of this dissertation, which is: *To investigate the experiences that users make when using gamified services and the effect that such experiences have on the targeted behavioral outcomes*.

The thesis is organized as follows. Chapter 1 has introduced gamification and the studies presented in this dissertation. Chapter 2 describes gamification and the gameful experience in more detail and presents relevant theories of motivation and behavior. Chapter 2 concludes with a conceptual model describing gamification and its effect on behavior. Chapter 3 describes and discusses concerns and lessons learned regarding the research methods applied. In addition, since gamification can be used to manipulate people towards a behavior, I discuss ethical considerations regarding both gamification per se and the practice of conducting research on manipulative implementations of gamification. Chapter 4 summarizes the papers included in the dissertation and Chapter 5 offers a general discussion, which also includes limitations and suggestions for future research.

2 Conceptual framework

A keyword search for "gamification" on Scopus resulted in zero hits for papers published in 2010. Performing the same search for papers published in 2018 resulted in 836 hits.[2] This shows that gamification has received an accelerating degree of attention in recent years. However, because the concept is still young, it is unsurprising that gamification does not yet have an agreed-upon definition (Huotari & Hamari, 2017; Seaborn & Fels, 2015). The most cited definition is "the use of game design elements in non-game contexts" (Deterding et al., 2011, p. 10), but this definition is problematic. It is easy to imagine occurrences of using game design elements when the intention is not to gamify. In fact, since rewards are such elements (e.g., Hamari et al., 2014; Richter, Raban, & Rafaeli, 2015; Robinson & Bellotti, 2013), giving a dog a treat for sitting would be gamification according to Deterding et al.'s (2011) definition. This problem does not apply to the second most cited definition. Taking a service marketing perspective, Huotari and Hamari (2017) defined gamification as "a process of enhancing a service with affordances for gameful experiences in order to support users' overall value creation"(p. 25). In this context, affordances are elements and mechanics that can be found in games and aid in the creation of gameful experiences, such as points, levels, and storytelling (Koivisto & Hamari, 2019). Notably, this definition includes the mechanism behind the effect gamification have on the target behavior; that is, the gameful experience. Thus, while Deterding et al.'s (2011) definition focuses on game designs, Huotari and Hamari (2017) focused on the experience that is induced by such game designs. In this dissertation I adhere to the definition proposed by Huotari and Hamari (2017).

Within user adoption literature, systems have traditionally been divided into a utilitarian or a hedonic category (Hamari & Keronen, 2017; Hamari & Koivisto, 2015). Utilitarian systems are primarily used for the sake of attaining separable outcomes (Davis, 1989; Hamari & Koivisto, 2015; van der Heijden, 2004). In contrast, the motivation for use of hedonic systems comes from the usage per se (Hamari & Koivisto, 2015; van der Heijden, 2004), which means that hedonic systems must focus on enjoyable experiences for the user. Games are such hedonic systems and are therefore enjoyable to play (e.g., Deterding et al., 2011; Jennett et al., 2008; Poels, De Kort, & Ijsselsteijn, 2007; Sweetser & Wyeth, 2005). The enjoyment that people find in games is the reason for gamifying services.

[2] The search was conducted on 16 August 2019.

Therefore, like games, gamified services also aim to make the usage of the service enjoyable and, as such, intrinsically motivated. However, gamified services also aim to intrinsically motivate a target behavior (Hamari et al., 2014; Huotari & Hamari, 2017; Mora et al., 2015; Rigby, 2015; Seaborn & Fels, 2015). Therefore, while the primary purpose of games is enjoyment, gamified services also have functions and goals that serve a utilitarian purpose. This dual focus places gamified systems in-between the hedonic-utilitarian categorization (Hamari & Keronen, 2017; Hamari & Koivisto, 2015).

An additional type of system that has both utilitarian and hedonic purposes is serious games. Some scholars describe serious games and gamified systems as distinct types of services (e.g., Deterding et al., 2011; Richter et al., 2015). In this regard, gamification is described as merely implementing game design elements (such as adding points for running in a running app) to motivate behavior, while serious games are described as fully fledged games that motivate behavior (Deterding et al., 2011). Notably, this description seems to display these authors' perspective that gamification is the implementation of game design elements, rather than the creation of gameful experiences. In fact, Deterding et al. (2011) argued that gameful services – compared to fully fledged games – only afford a 'flicker' of gameful experiences (Deterding et al., 2011). I do not find the categorization into gamified services or fully fledged games useful. For both gamification and for serious games, game designs are used to create gameful experiences that motivate a target behavior, and it seems irrelevant if a sufficient number of game design elements is used to call something a fully-fledged game. Consequently, the research presented in this dissertation takes the perspective that any service-use-created gameful experience for behavior change is gamification.

2.1 The experience of gamified services and games

To the best of my knowledge, three peer-reviewed articles in addition to Huotari and Hamari (2017) and Deterding et al. (2011) have defined gamification. Seaborn and Fels (2015) and Eppmann, Klein, and Bekk (2018) included the gameful experience in their definitions, but Werbach (2014) did not. Therefore, three out of five definitions consider the gameful experience to be a defining part of gamification and two do not. However, both Werbach (2014) and Deterding et al. (2011) discussed the importance of the gameful experience; for example, Deterding et al. (2011) argued that the most likely goal of using game design

elements is a gameful experience. Consequently, notwithstanding the different emphasis, all of the above-mentioned researchers agree that the gameful experience is important for gamification. Despite this importance, the gameful experience is not a well-developed concept within gamification research and, consequently, the research in this dissertation – on this topic – is largely exploratory. However, due to the innate relationship between games and gamified services, much can be learned from games research on the game experience; that is, the experience of playing a game proper.

2.1.1 The game experience

The game experience has been defined as "an ensemble made up of the player's sensations, thoughts, feelings, actions and meaning-making in a gameplay setting" (Ermi & Mäyrä, 2005, p. 2). Unfortunately, it is quite unhelpful to claim that a construct is affect, sensations, cognitions and behavior related to something (exchange something for anything and a new definition has been developed), and beyond this one, there seems to be a lack of formal definitions of the game experience. This could be explained by the diversity of games, which make it hard to pinpoint exactly what experience is elicited while using such games. The games can be open-ended roleplaying games (setting few boundaries on what the player can do) that are played on large TV screens (or even virtual reality goggles) using earphones and force-feedback game controllers. Games can also be app-based board games played on the subway while traveling to work, with rules setting strict boundaries on user control and flexibility. These dissimilarities will create a great diversity in the experience elicited while playing these games (Cairns, Cox, & Nordin, 2014; Ijsselsteijn, De Kort, Poels, Jurgelionis, & Bellotti, 2007). One could even argue that there is drive among game developers to continuously offer new experiences to gamers (Cairns et al., 2014), making a description of such an experience a moving target. This seems equally applicable to gamification. It is surely a challenge to describe the gameful experience in general terms when considering that a description needs to incorporate diverse activities such as a quiz played once in a shopping mall and a yearlong engagement with a team of co-players for control of gyms in Pokémon Go.

A user can experience a game during three phases: (a) the pregame phase, (b) the game phase, while playing, and (c) the postgame phase, which includes both short- and long-term effects of playing (Elson, Breuer, & Quandt, 2014). The

pregame phase can be described using variables such as demographics, personality traits, and skill, while the game phase can be described using variables such as enjoyment, and flow. Regarding the postgame phase, the short-term effects can be described by such means as temporary changes in affect, cognition, and behavior directly after playing. Long-term effects are more focused on what happens with repeated play over time on, for example, behavior or the social environment of the player (Elson et al., 2014). From a gamification point of view, these phases are applicable, but with one notable difference. It seems reasonable to see the game phase as most important for the success of games. After all, a game needs to be enjoyable to use if it is to be played repeatedly (Sweetser & Wyeth, 2005). For gamified services, the game phase is also, preferably, enjoyable.[3] However, the goal of these services is to motivate a target behavior, which might occur in the post-game phase (for example, when using a gamified app for registering runs that is not used while running). Therefore, it seems reasonable that this phase is of greater importance for the gamified services where the interaction with this service is dissociated from the target behavior.

The game experience is often depicted as multidimensional (e.g, Ijsselsteijn et al., 2007; Poels et al., 2007; Takatalo, Häkkinen, Kaistinen, & Nyman, 2010), and many different dimensions have been discussed within games research as being part of this experience. Such dimensions include enjoyment (Mekler, Bopp, Tuch, & Opwis, 2014; Sweetser & Wyeth, 2005), flow (Brockmyer et al., 2009; Cowley, Charles, Black, & Hickey, 2008; Poels et al., 2007; Sweetser & Wyeth, 2005), immersion (Brockmyer et al., 2009; Brown & Cairns, 2004; Cairns et al., 2014; Calleja, 2007; Ijsselsteijn et al., 2007; Jennett et al., 2008; Poels et al., 2007), presence (Ermi & Mäyrä, 2005; Lombard & Ditton, 1997), challenge (Ijsselsteijn et al., 2008; Malone, 1981; Sherry, Greenberg, Lucas, & Lachlan, 2006; Vorderer, Hartmann, & Klimmt, 2003), competition (Sherry et al., 2006; Yee, 2006), skill (Poels et al., 2007; Przybylski, Rigby, & Ryan, 2010; Rogers, 2017; Ryan, Rigby, & Przybylski, 2006), social experience (Calleja, 2007; Lee, 2004; Przybylski et al., 2010; Rogers, 2017; Ryan et al., 2006; Vorderer et al., 2003; Yee, 2006), playfulness (Lucero, Holopainen, Ollila, Suomela, & Karapanos, 2013; Salen & Zimmerman, 2004; Takatalo et al., 2010), affect (Brown & Cairns, 2004; Calleja, 2007; Ijsselsteijn et al., 2008; Poels et al., 2007), and sensory experience (Calvillo-Gámez, Cairns, & Cox, 2010; El Saddik, 2007; Ermi & Mäyrä, 2005;

[3] Game-phase could be considered a misnomer since this implies that a game is actually played and this might not be the case for gamified services. However, this denomination is retained for the sake of clarity.

Wiebe, Lamb, Hardy, & Sharek, 2014; Witmer & Singer, 1998; Vorderer et al., 2003). This diversity of dimensions is an indication of a lack of agreement about which constructs should be used to depict this experience. In addition, there does not appear to be any consensus regarding how to use some of the dimensions, even when they share the same name. For example, some authors describe immersion as a dimension of flow (Sweetser & Wyeth, 2005), some describe immersion and flow as different sub-dimension of the game experience (Poels et al., 2007), and others describe immersion and flow as different levels of engagement (Brockmyer et al., 2009). A multidimensional approach has also been adopted in what I believe is the only existing model (Eppmann, Bekk, et al., 2018) of the gameful experience.

Users are actively taking part in the construction of the game experience (Ermi & Mäyrä, 2005; Huotari & Hamari, 2017; McGonigal, 2011). The same sentiment is also present in the description that the active participation from players is an experiential condition for games, and that the value of games is co-created (Huotari & Hamari, 2017). Thus, it is reasonable that no game experience will emerge if a player is not engaged when playing a game, and it seems equally reasonable that the same also applies for gamified services.

In sum, there are still many uncertainties regarding which dimensions constitute the game experience, and there are several possible reasons for these uncertainties. These include the difficult and complex task of conducting research on the game experience (e.g., Elson et al., 2014; Ijsselsteijn et al., 2008) and the above-mentioned diversity of games and genres of games (Cairns et al., 2014; Ijsselsteijn et al., 2007), which makes the game experience a complex construct. It could even be argued that the difficulty of defining games is the cause (Stenros, 2017), as how could a mutually agreed-upon description be achieved if there is no agreement on what a game is? Notwithstanding these difficulties, much can be learned from this field due to the inherent relationship between the game and the gameful experience. In fact, several of these constructs are already in use within the gamification literature, albeit often without explicitly describing them as a gameful experience.

2.1.2 The gameful experience

On a general level, the gameful experience is a psychological state that refers to “the positive emotional and involving qualities of using a gamified application” (Eppmann, Bekk, et al., 2018, p. 100), and has been described as being the result

of: (a) experiencing conflict or being challenged because of goals, which are perceived as achievable and non-trivial; (b) motivation to pursue these goals under rules that are imposed by the service; and (c) perceiving participation as voluntary (Landers et al., 2019). However, the construct remains underdeveloped in the gamification literature, and one gap that is relevant for this dissertation is that until very recently there has only (to my knowledge) been one attempt to describe a full model of the gameful experience (i.e., Eppmann, Bekk, et al., 2018).

One way to address this gap could be to use models and constructs of the game experience to describe the gameful experience. However, since games are hedonic (van der Heijden, 2004) and gamified services are both hedonic and utilitarian (Hamari & Keronen, 2017; Hamari & Koivisto, 2015), this approach can be considered questionable. For a game, which is a hedonic system, the goal of using it is enjoyment. However, a gamified service must also support utilitarian goals that are related to the target behavior. Consequently, some dimensions of the gameful experience might support a goal of gamified services while not supporting the goal of games. In addition, the focus on a target behavior for gamified services has other consequences that need elaboration. Skill is part of the game experience (e.g., Brockmyer et al., 2009; Cowley et al., 2008; Poels et al., 2007; Przybylski et al., 2010; Rogers, 2017; Ryan et al., 2006; Sweetser & Wyeth, 2005). For a game, this skill is related to using the game. However, for a gamified service this skill is also related to the skill of the target behavior. Furthermore, since users are not always interacting with some gamified services while performing the target behavior, such services must affect the user during the post-game phase. In fact, since gamified services aim for behavior change, it seems reasonable to assume that the post-game phase is more important for the gameful experience than it is for the game experience. A final difference that needs mentioning is that gamified services often do not have the same resources as games to create vivid sensory experiences (Hamari & Koivisto, 2014). This reasonably renders an experience such as presence – whereby the user feels that he or she resides in the computer-generated world, rather than having a sense of using the computer (Ermi & Mäyrä, 2005; Lombard & Ditton, 1997) – unfeasible for gamified services.

Despite the differences between the game and the gameful experience, the close relationship between games and gamified services makes the game experience valid for creating an understanding of gameful experiences. Therefore, from the review of the game experience, its dimensions, and the description of gamification, I see the gameful experience as "*co-created and multidimensional.*

The gameful experience may occur, but does not have to, when a user of a service interacts or has interacted with intentionally or unintentionally implemented motivational affordances (for gameful experiences). The goal of creating such gameful experiences is to spur motivation for both continued service use and for a targeted behavior. Therefore, the intended effect of a gamified service stretches beyond the game phase and into the postgame phase" (Högberg et al., 2019, p. 629). This is a tentative description, and one of the main aims of this dissertation is to further explore and describe this construct.

2.2 Decision-making processes and motivation

2.2.1 System 1 and System 2

Dual-process theory is a general name for theories that divide thinking into two modes. Among the best known of the many names for these two modes are System 1 and System 2, introduced by Stanovich and West (2000). System 1 handles mental activities that are fast, effortless, automatic, and emotional, while System 2 is slow and involves mental activities that are conscious and demand effort. These systems are interdependent since System 1 generates impressions that System 2 can use as the foundation for judgment (Kahneman, 2003). System 1 is biased and can generate decisions that might seem irrational. Such biases can be used to nudge people towards certain choices (Thaler & Sunstein, 2008) and have been suggested to be mechanisms that gamified services can apply to steer users toward a target behavior (Hildebrand et al., 2014; Müller-Stewens et al., 2017).

One such bias is cognitive dissonance, the unpleasant experience originating from inconsistencies among knowledge, opinions, or beliefs regarding oneself, one's behavior, or the environment (Festinger, 1957). A person will attempt to restore consistency by rationalizing such inconsistencies. For example, a person who undergoes harsh initiation rites to become a member of a group will like this group better (Aronson & Mills, 1959). Therefore, the effort of getting into the group is justified (and, as such, rationalized) by the higher value given to the group membership. Such justification of effort has also been shown in more recent studies, where rewards are more valued in response to greater effort compared to obtaining the same reward for free (e.g., Loewenstein & Issacharoff, 1994), an effect that has been found both in humans and in animals (Zentall, 2010). Within

gamification research, this specific bias was studied by Hildebrand et al. (2014), who showed that a challenge could steer decisions towards utilizing an offer received as a reward. Hildebrand et al. (2014) explained their results as an effect of challenge-induced effort, where the added effort increased participants' preferences for this reward. As such, they could be seen as rationalizing this extra effort by valuing the reward more highly, which makes Hildebrand et al. (2014) an example of gamification utilizing the biased System 1 in the form of effort justification to steer a decision maker towards a target behavior.

System 1 is also affective (Kahneman, 2003) and can, as such, precede cognition and decision-making (e.g., Slovic, Finucane, Peters, & MacGregor, 2007; Zajonc, 1980). One explanation for the influence of affect on decision making can be found in the feelings-as-information mechanism, which postulates that affective responses can be seen as carrying information about a target of evaluation (Schwarz, 1990). This information is partly based on affective responses towards a specific target of evaluation. Such affective responses have been termed integral affect (Lerner & Keltner, 2000; Loewenstein & Lerner, 2003). An example is affective responses to blood donations, which have been found to affect decision-making regarding future blood donations (Allen, Machleit, & Kleine, 1992). However, it is difficult to separate affective responses towards different objects. Therefore, this information can also be based on affect that is unconnected to the target of evaluation. For example, a person in a good mood, or a person who experiences positive affect will make a more positive evaluation of an unconnected target. Such affective responses have been termed incidental affect (Lerner & Keltner, 2000; Loewenstein & Lerner, 2003). For instance, Schwarz and Clore (1983) found that people use momentary affect when making judgments about their general life satisfaction. Incidental affect might stem from both current mood and from affect elicited in response to the context at the time of decision making (Cohen, Pham, & Andrade, 2008). Since gamified services may instigate affective responses (Eppmann, Bekk, et al., 2018), it seems reasonable that both integral and incidental affective responses could be utilized to promote both future service use and the target behavior.

2.2.2 Intrinsic and extrinsic motivation

Although it has been suggested that affecting the biased System 1 could be a motivational mechanism for gamified services to use, it is more common for such

services to be claimed to induce intrinsic motivation for a targeted behavior (Hamari et al., 2014; Huotari & Hamari, 2017; Mora et al., 2015; Rigby, 2015; Seaborn & Fels, 2015). In addition, extrinsic motivators such as rewards, badges, and points are commonly used when gamifying (Hamari et al., 2014). In so doing, the focus is on creating sustained engagement rather than unconsciously steering the decision maker towards the target behavior.

Self-Determination Theory (Deci & Ryan, 1985) is the most commonly used theory when discussing intrinsic and extrinsic motivation within the gamification literature. In fact, it is the most commonly used theoretical framework within gamification research overall (Bozkurt & Durak, 2018). According to Self-Determination Theory, someone who is energized or activated to reach a specific end is considered to be motivated (Ryan & Deci, 2000). However, people can have different kinds of motivation. On the most abstract level, this theory divides motivation into intrinsic and extrinsic. Intrinsic motivation has been defined as "the doing of an activity for its inherent satisfactions rather than for some separable consequence" (Ryan & Deci, 2000); thus, a person is moved to do something for the joy of doing it. Extrinsic motivation, by contrast, refers to "doing something because it leads to a separable outcome" (Ryan & Deci, 2000); thus, a person does something in order to receive a reward or to avoid something unpleasant.

The effects of extrinsic motivation in the form of rewards have been thoroughly investigated and acknowledged, especially considering behaviorism and the operant conditioning paradigm (Skinner, 1953). However, if a person is intrinsically motivated, being exposed to extrinsic rewards can actually thwart this intrinsic motivator. Consequently, the behavior that is supposed to be motivated might be even less prevalent than it was before a reward was introduced (Deci, Ryan, & Koestner, 1999; Gneezy, Meier, & Rey-Biel, 2011). Despite this potential problem, extrinsic rewards are often an integral part of many gamification initiatives (see, e.g., Hamari et al., 2014; Koivisto & Hamari, 2019). In fact, many gamification initiatives have focused solely on such rewards – a practice that has attracted criticism and led to the derogatory term pointsification (Robertson, 2010; Seaborn & Fels, 2015). Consequently, there are reasons to consider changing the focus from using rewards that induce extrinsic motivation towards enjoyable experiences that induce intrinsic motivation instead. Considering that gamified services take their inspiration from games, which are hedonic systems (van der Heijden, 2004), this should be achievable.

2.3 A model of gamification and its effect on behavior

Building on this review, I have developed a conceptual model of how gamification can be used to influence the target behavior (*Figure 2*). This model underlies and reflects on the overarching aim of this dissertation, which is: *To investigate the experiences that users make when using gamified services and the effect that such experiences have on the targeted behavioral outcomes.* On the most basic level, the model depicts how interactions with affordances for gameful experiences invoke a gameful experience, which in turn affects the target behavior (Huotari & Hamari, 2017; Landers et al., 2019). In addition, the gamified service also motivates continued service use. Otherwise, the user would stop using the service and the gamification-induced motivation towards the target behavior would eventually be lost.

In the model, the gameful experience is depicted as multidimensional (Eppmann, Bekk, et al., 2018). These dimensions are initially left blank due to the exploratory nature of the research presented in this dissertation. However, this knowledge is developed in this dissertation and reflects the research question: *How can the gameful experience be understood and described?* Moreover, building on games research that has depicted the game experience as co-created (Ermi & Mäyrä, 2005; Huotari & Hamari, 2017; McGonigal, 2011), the gameful experience is also depicted as such. Therefore, it should only emerge when the user is engaged in the usage of the gamified service. The inclusion of engagement in the model reflects the research question: *What is the role of engagement for the effect of gamification on the target behavior?* Finally, the model uses dual-process theory to show that gamification can utilize the biased System 1 to steer users towards the target behavior (e.g., Kahneman, 2003). These biases can be both cognitive and affective (Slovic et al., 2007). The model also clarifies that System 1 and System 2 interact such that decisions made through a System 2 process will be affected by System 1 (Gawronski & Creighton, 2013; Kahneman, 2003). In addition, affordances for gameful experiences can be used to create both extrinsic and intrinsic motivation for the targeted behavior (e.g., Hamari et al., 2014; Huotari & Hamari, 2017; Mora et al., 2015; Rigby, 2015; Seaborn & Fels, 2015). This focus on creating a conscious engagement towards a behavior means that a System 2 process also is targeted. Focusing on such mechanisms that ultimately drive the target behavior reflects on the research question: *What motivational mechanisms is the gameful experience effective at triggering that lead to the targeted behavioral outcomes?*

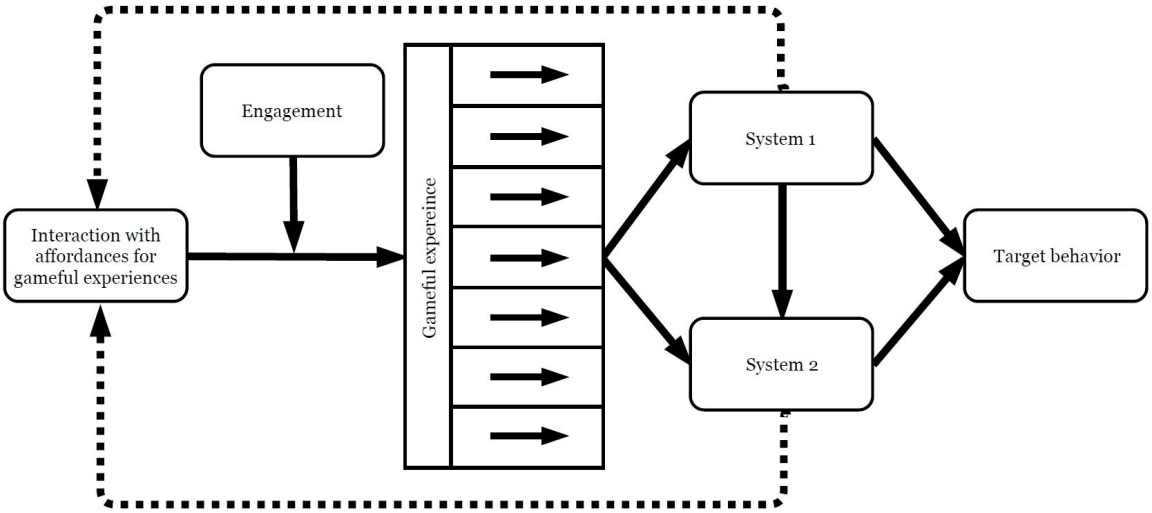

Figure 2. Conceptual model

3 Method and ethical considerations

In Paper 1, we used a mixed-methods approach to develop an instrument for measuring the gameful experience. In an initial qualitative survey with open-ended items, we developed a model of the gameful experience using a crowdsourcing sample. In two subsequent quantitative surveys, the instrument was developed and verified using Internet samples. This development was guided by an instrument-development process described by DeVellis (2012). Papers 2 and 3 are based on field experiments, where the methods for measuring dependent variables include eye tracking, behavior logging, choice, and subjective survey variables. Apparatus had to be constructed to perform these experiments.

This section presents considerations regarding the methods employed in these studies. Moreover, since service providers (in addition to users) can be stakeholders in the target behavior of the gamified service, this section also includes a discussion on ethical considerations.

3.1 Scale development and surveys

The goal of Paper 1 was to develop an instrument that could be used to measure the gameful experience. A common approach to such development is to use exploratory factor analysis to find latent variables among randomly displayed items that describe the concept of interest (see, e.g., DeVellis, 2012). We chose a somewhat different approach. In a first qualitative study, we developed a model of the gameful experience consisting of seven dimensions. In two subsequent quantitative studies, we aimed to verify the dimensionality of this specific theoretical model. We did this by utilizing the expected improvement of both clarity of factor structure and reliability that is the result of clustering items according to dimensions (Goldberg, 1992) when collecting the data. I believe that this leaves more room for qualitatively found dimensions to influence the results of an exploratory factor analysis than analyzing data from randomly displayed items. For example, compare the development of the Game Experience Questionnaire where the developing research group qualitatively described the game experience with a model (Poels et al., 2007) that did not hold for the final questionnaire (see, Ijsselsteijn et al., 2008). On the other hand, some of the dimensions in our model are highly correlated and close to not show discriminant validity, and there is a risk that such dimensions will emerge as one dimension if

all items are presented randomly in a survey. It seems likely that these issues might originate, at least partly, from clustering items according to dimensions.

There are also alternatives to qualitative approaches for scale development. One example is Eppmann, Bekk, et al. (2018), who developed GAMEX, a first incarnation of an instrument for measuring the gameful experience. Eppmann, Bekk, et al. (2018) extracted an item pool from game experience instruments in addition to instruments for measuring other constructs they thought relevant. Subsequently, they utilized exploratory factor analysis to extract factors from these items. This approach resulted in an instrument that includes three dimensions that can be traced back to models of affect (e.g., Mehrabian & Russell, 1974; Russell, 1980) and one dimension to enjoyment. This meant that four (out of six) dimensions were general psychological constructs. In fact, it could be argued that they are too general to be truly meaningful for understanding the gameful experience (see, e.g., Cairns et al., 2014). This general nature could make it more suitable to describe them as outcomes of – rather than constituting – the gameful experience. Consequently, they could be measured using established instruments such as Intrinsic Motivation Inventory (enjoyment) (McAuley, Duncan, & Tammen, 1989) or PAD (affect) (Mehrabian & Russell, 1974). This highlights the importance of which constructs to include items from when applying the scale-development approach utilized by Eppmann, Bekk, et al. (2018).

The introduction to Paper 1 and Section 2.1.1 of this dissertation highlight how the game experience construct have been conceptualized and measured using a plethora of different constructs and instruments. This plethora makes it hard to get a general understanding what the game experience actually is and, as such, to understand the outcome of such experiences. When we developed our instrument, we used former game experience dimensions deductively when suitable, although we were also open to new dimensions since our focus was to create a model of the gameful experience. Therefore, we integrated game experience research by combining a deductive and an inductive approach. This approach created a model that honors previous game experience research, while also opening the way for facets that are unique to the gameful experience. In my judgment, it is crucial for future research on the gameful experience to build on and improve existing models and measures of the gameful experience, instead of routinely creating new ones; otherwise, the gameful experience field will eventually turn out just as fragmented as the game experience field.

In Paper 1, we recruited participants on Internet forums and via crowdsourcing sites. In the following two sections, I discuss some specific issues regarding the use of samples from crowdsourcing sites and the Internet.

3.1.1 Crowdsourcing research

In recent years, crowdsourcing sampling has emerged as a way of recruiting participants by paying workers to finish tasks that are limited in scope, such as filling out questionnaires. Researchers have started to address concerns regarding the validity of studies that use this type of sampling, mostly on the crowdsourcing service MTurk. Crowdsourcing sampling was used for the qualitative study in Paper 1, for which a convenience sample was recruited at Microworkers.com, a competitor to MTurk.

More generally, there have been concerns about the reliability of research based on crowdsourcing samples; for instance, Rouse (2015) showed that responses from an MTurk sample had significantly lower reliability than those from a community sample. However, other studies have found the reliability of MTurk studies to be adequate (e.g., Buhrmester, Kwang, & Gosling, 2011; Shapiro, Chandler, & Mueller, 2013). A more specific concern is the motif to participate among workers, and whether research that uses paid participants can be considered valid. However, several studies have reported that the compensation level does not affect the reliability or quality of data (Buhrmester et al., 2011; Mason & Watts, 2009; Rouse, 2015). In addition, other studies have shown that workers are intrinsically motivated to participate in studies (Buhrmester et al., 2011; Paolacci, Chandler, & Ipeirotis, 2010), which indicates that they are on these sites not only to make money, but also because they enjoy it.

Another concern regards the honesty of the workers; for example, Shapiro et al. (2013) found that MTurk participants reported too many rare clinical symptoms, indicating that such participants cannot be trusted. However, Shapiro et al. (2013) and other studies (e.g Holden, Dennie, & Hicks, 2013; Mason & Suri, 2012; Rand, 2012; Shapiro et al., 2013) display consistency when answering questions – both on demographics and personality – which is an indication of honesty. Therefore, there is no compelling evidence that workers are generally dishonest. However, our study was among the best-paid jobs when it was published on Microworkers.com, and we demanded that participants had at least moderate experience with the services; this meant we had to consider the risk that

there were workers who wanted to participate without such experience. To mitigate this risk, participants had to indicate how much experience they had with the specific service; otherwise, they were not allowed to participate and were blocked from participating again from the same device by the on-line survey tool. We also verified that the same worker did not participate in the same survey twice by using a unique ID specific to Microworker.com.[4] In this way, we took action to mitigate the possible problem of paying better than other jobs.

Using crowdsourcing sampling also has some advantages. For instance, crowdsourcing samples seem to be demographically more diverse than both American college samples and Internet samples (Buhrmester et al., 2011; Casler, Bickel, & Hackett, 2013). However, this does not mean that crowdsourcing samples can be equated to the general population. For example, MTurk workers are more educated (Berinsky, Huber, & Lenz, 2012; Paolacci et al., 2010; Shapiro et al., 2013), have a higher unemployment level (Shapiro et al., 2013), are younger (Berinsky et al., 2012; Shapiro et al., 2013), more liberal and less religious (Berinsky et al., 2012), and earn less money than the general population (Casler et al., 2013). There are also differences that are more related to personality; for example, workers on MTurk are less extroverted, less emotionally stable (Goodman, Cryder, & Cheema, 2013; Kosara & Ziemkiewicz, 2010), have lower self-esteem, and value money and material possession more than a community sample (Goodman et al., 2013). MTurk samples have also been found to score higher on social desirability compared to college samples (Behrend, Sharek, Meade, & Wiebe, 2011), and score higher on levels of social anxiety compared to the general population (Shapiro et al., 2013). At face value, none of these differences seems to have any real potential to affect the research that we conducted using a crowdsourcing sample for developing the gameful experience model.

Concluding from this review, even though there are studies that have found problems with using crowdsourcing services to sample participants, other studies are often contradictory. In addition, when researchers have found problems, they have often described remedies for these problems. For example, Rouse (2015) reported low reliability in an MTurk sample, but this was mitigated by asking the participants if they had been attentive and honest. Therefore, no consensus exists

[4] This solution could be regarded as inserting problems with anonymity. However, at no time did we have knowledge of the real identity of the participants. In addition, these IDs were discarded after the data collection ended and the payment was made.

that crowdsourcing research is invalid. In fact, crowdsourcing samples might even have advantages; for example, they can potentially reduce the reliance on WEIRD (Western, educated, industrialized, rich, and democratic) (Henrich, Heine, & Norenzayan, 2010) participants (Casler et al., 2013).

3.1.2 Internet survey sampling

Item pools were sent to development samples in Studies 2 and 3 of Paper 1 as part of the instrument development process. Specifically, we sampled participants on the Internet by sending item pools to followers of a specific Twitter account and to members of relevant Internet forums. Generally, survey errors can be categorized as stemming from four sources: coverage error, sampling error, nonresponse error, and measurement error (Groves, 2004).

Coverage error occurs when the sampling frame does not allow the full target population to be included in the sample (Fricker, 2017). One problem regarding coverage error that is specific to Internet research is that not all people have Internet access (Vehovar & Manfreda, 2017). This was not an issue for us since we can safely assume that users of the investigated type of gamified services are also Internet users. A more pressing coverage error was that only followers of a specific Twitter account and members of specific Internet forums were approached. This coverage error probably caused the overly positive attitude towards the investigated service in Study 2. This specific problem regarding attitude was mitigated in Study 3, where we deliberately included forums that we expected to harness former users of the service. We assumed that such users would be more negative towards the service. However, this did not mitigate all possible coverage errors; it was still only Internet forum users who received the invitation to participate in the study and this subgroup might be different from the population of interest.

Sampling error is the result of heterogeneity in the population leading to a difference between the sample and the target population (Fricker, 2017). Sampling can be either probability-based (random sampling) or non-probability-based. In probability samples, participants are selected through a probabilistic method and the probability of including a person from the sampling frame is known (Fricker, 2017). The surveys of Studies 2 and 3 were reached on the Internet by following unrestricted links, which meant they were open for anyone who saw them to participate. This means that the samples were based on self-selection and were

therefore non-probability samples (Vehovar & Manfreda, 2017). With this type of sampling, results cannot be generalized to a wider population. In fact, probability sampling is needed for generalization from the sample to the population (Rasmussen, 2017). To be able to get a probability sample based on a quality-sampling frame, it would be preferable to cooperate with a service developer that contributed with such a sampling frame. This would make it possible to implement a probabilistic sampling method and would also help mitigate some coverage error. However, such a sample would still not cover the targeted population in full; it would still only cover those people who use a specific service.

Nonresponse error is the failure to gather responses from the full sample (Fricker, 2017). Nonresponse error might occur when data is not collected for specific items or for specific respondents (Groves et al., 2009). On the item level, this should not be a problem for Internet research, since the researcher can choose a survey tool that prevents non-responses for items. In our studies, we set up the survey tool to prevent such non-responses. On the respondent level, Internet surveys generally have lower response rates than other survey modes, meaning that nonresponse might be of greater concern for Internet surveys (Manfreda, Bosnjak, Berzelak, Haas, & Vehovar, 2008). Such nonresponse might bias the results systematically (Rasmussen, 2017). It is not possible to evaluate such bias for surveys based on self-selection, such as those presented in Paper 1. Because there is no way of knowing who opted out of the survey, there is no way to evaluate whether they have characteristics that might bias our results (Fricker, 2017).

Measurement error is inaccuracies in responses due to the used instrument (Fricker, 2017). Several considerations regarding measurement error might require attention when conducting Internet surveys (see, Toepoel (2017) for an extensive list). For example, paging can improve inter-item correlations (Couper, Traugott, & Lamias, 2001; Tourangeau, Couper, & Conrad, 2004), and such paging was used in our studies. The initial qualitative survey described in Paper 1 identified a number of predicted dimensions. In the subsequent quantitative studies, paging was used to cluster the items by these predicted dimensions. A possible increase of inter-item correlations originating from this practice can have had a positive impact on dimensionality and Cronbach's alpha for our measure (see, Goldberg, 1992). In addition, the Internet-based approach makes it easy to randomize the order in which these pages and the items occur within these pages. In all studies in Paper 1, both of these types of randomizations were used in order to avoid order-effect bias (Perreault, 1975).

Finally, it is important to reflect on one of the common alternatives to Internet sampling. Compared with more traditional sampling, such as among college students, data collected via the Internet might reduce bias (Gosling, Vazire, Srivastava, & John, 2004). Thus, this type of sampling – like crowdsourcing sampling (Casler et al., 2013) – has the potential to reduce biases due to WEIRD (Henrich et al., 2010) participants (Gosling, Sandy, John, & Potter, 2010). Nonetheless, there are threats to the generalizability of our results that originate from our internet sampling approach; in particular, these regard coverage error, sampling error, and non-response error. Regarding measurement error, however, in addition to using the Internet-based service to handle some possible errors, we used some possible measurement-error issues to our advantage.

3.2 The field experiments

Research on the game experience can be conducted (a) offline, before or after a game is played; (b) online, while the user is playing the game; or (c) quasi-online, while the user is playing. However, compared to online, the user might be interrupted when measuring quasi-online (Elson et al., 2014). The same categorization of phases also holds for gamified services. During the scale development process, research was only conducted offline. During the field experiments, we also used offline survey data. In addition, we collected data online, including eye tracking, behavioural logging, and choice.

3.2.1 Online measurement of the gameful experience

For the experiment in Paper 3, we only used subjective measures in the post-game phase. However, this approach is not always suitable. For example, if research is done on flow, answering the questionnaire disrupts the state, so it will not be possible to answer the questionnaire while being in this state (Elson et al., 2014). This issue also holds for other methods that are commonly used within game experience research, such as interviews and focus groups. However, there is an alternative to such disruptive methods: the behavior of the player might be observed. For game experiences, behavior in front of the device and behavior inside the game can both be observed (Elson et al., 2014). Inside the game, game metrics can be used to observe the behavior; for example, engagement can be measured using methods such as click-through rates, page views (Lehmann,

Lalmas, Yom-Tov, & Dupret, 2012) and mouse clicks (Martey et al., 2014). These metrics are based on data that is automatically collected by the software and will, therefore not disrupt the user. In addition, behavior and physiological measures (such as eye tracking) can also be used online and does not interrupt the user (Elson et al., 2014). Due to the inherent relationship between the game and the gameful experiences, these aspects of research on the game experience are equally applicable to the gameful experience.

In the Paper 2 study, we used behavior logging to assess the engagement level of users. In this case, a click-through rate to an offer was logged by the smartphone app; thus, this click-through rate was used as an operationalization of engagement in the activity that was gamified (see, Lehmann et al., 2012). In addition, choice and eye tracking were used to track the targeted decision and to understand the process that led to this decision. Therefore, this study only used online measures based on observation that did not interrupt the participants.

Visual attention is commonly conceptualized as a precursor to choice within product choice research; therefore, eye tracking can be used to understand this choice process (e.g., Chandon, Hutchinson, Bradlow, & Young, 2009; Otterbring, Wästlund, Gustafsson, & Shams, 2014; Pieters & Warlop, 1999; Wästlund, Shams, & Otterbring, 2018). In the Paper 2 study, eye tracking was used to understand such a choice process. It also seemed reasonable that eye tracking could have been used to measure visual attention towards a smartphone. For instance, it could have been used as an alternative measure of user-engagement (see, Lehmann et al., 2012). We explored this possibility during a pre-study, albeit with disappointing results. The eye-tracker we used is similar to normal glasses that allow participants to look under the lenses. This prevents these lenses from recording fixations and, when using eye tracking, visual attention is commonly operationalized as the number of such fixations (Holmqvist, 2011). In our pre-study, this commonly occurred when participants attended to the smartphone, with the result that the eye-tracker did not recorded a large proportion of the fixations. In my estimation, this problem needs to be mitigated if eye tracking is to be used as a reliable method of tracking visual attention towards smartphones.

3.2.2 Apparatus

To execute the two field experiments we needed software that reacted to the location of the participants. For this purpose, apps were developed for iPhones

using the programming language Swift. IBeacons were used to implement the location-based functionality, but several shortcomings of these iBeacons were identified that need to be considered when using this technology for research. These issues are generally related to precision regarding the range and reaction time of this technology.

IBeacons use Bluetooth technology for distance measuring; the app receives a signal from the iBeacon and the strength of this signal is used to make an approximation of the distance between the iBeacon and the smartphone. However, this signal is hampered by fluids; the distance will be assessed as larger if there are fluids between the iBeacon and the smartphone. Consequently, experiments need to be set up in such a way that fluids do not occur between an iBeacon and participants at locations where such approximations are done. In addition, the signal can be disrupted by people (Deepesh, Rao, Rath, Kanakalata, & Tiwary, 2016), perhaps due to disturbances from WiFi-enabled devices they carry, such as smartphones (Faragher & Harle, 2014; Paek, Ko, & Shin, 2016). The disruption may even be explained by the fact that people are largely made of water. Regardless of the reason, we observed much larger approximated distances when many people resided at the location of the experiment.

In the study described in Paper 2, we had to mitigate these approximation issues. The study rested on our ability to identify when a customer had entered a specific area (roughly 10 x 10 meters). The problem was successfully mitigated by clustering four iBeacons on the locations of interest. By doing so, the area in which the iBeacon triggered the smartphone was increased without increasing signal strength, which was not an option since this would trigger the software to far away under low distortion circumstances. In the study presented in Paper 3, there was no need for such mitigation. In this case, the iBeacon was placed on a sign and the participants were instructed to put the smartphone close to the sign (approximately 20 cm) and wait for it to react. Due to this short range between the iBeacon and the smartphone, the distortion was negligent. In addition, since the app was set to react to iBeacons in its close vicinity, the signal strength could be significantly increased since the margin effect of such an increase on the approximated range under low distortion circumstances was small. Finally, the participants were instructed to wait for the software to react, so it became less sensitive when there were disturbances.

Concluding from these studies, when participants are expected to place the phone in the absolute vicinity of an iBeacon and wait for it to react, range

approximation issues will not be important. Also, in studies relying on tracking the location of moving participants, issues with variations in range approximation can be mitigated with clustered iBeacons. It is also worth noting that the iBeacon-technology is in use today; therefore, practical implementations will face these same issues. Consequently, these method issues can be seen as part of reaching ecological validity.

3.3 Ethical considerations

The practice of gamifying has been discussed and criticized on moral grounds (e.g., Bogost, 2011; Bogost, 2015; Rey, 2015; Selinger, Sadowski, & Seager, 2015; Thorpe & Roper, 2019). For example, Bogost (2011, 2015) named gamification exploitationware, which he criticized for being a tool for consultants and marketers to exploit. However, the criticism is often unspecific and does not consider different types of implementations and contexts (Kim & Werbach, 2016). The goal of gamification is to motivate a target behavior (e.g., Hamari et al., 2014; Huotari & Hamari, 2017; Mora et al., 2015; Rigby, 2015; Seaborn & Fels, 2015), and the user of a gamified service is often the main stakeholder in this target behavior. For instance, a user uses the gamified service Duolingo to find motivation to study. In such cases, it is naïve to automatically regard gamification as ethically problematic. However, when the main stakeholder in the target behavior is someone other than the user, gamification can be more easily criticized on moral grounds. One example is the rating system in China that aims to score the trust level of its population (Ramadan, 2018), where a government is the stakeholder. In this dissertation, Papers 2 and 3 both provide examples of cases when a company is the main beneficiary of the target behavior – at the expense of customers.

According to Kim and Werbach (2016), exploitation is one dimension that must be considered when evaluating the ethics of gamification implementations, and as the derogatory term exploitationware indicates, some (e.g., Bogost, 2011; Bogost, 2015; Rey, 2015) view gamification as exploitative. However, it can be argued that for a person to be exploited, he or she must be unfairly taken advantage of (Wertheimer, 1996). Accordingly, for a gamified service to be exploitative, such a service needs to unfairly take advantage of the user (Kim & Werbach, 2016). According to Wertheimer (1996), a transaction is fair if two opposing parties would choose to act on an option in a hypothetical competitive market. Consequently, a

customer will not be exploited through gamified services in a competitive market since they can take their business to a competitor (Kim & Werbach, 2016). Moreover, since gamification is commonly distributed via apps or websites, users have the option not to use these services. This adds to the autonomy of the customer and it seems fair that as long as such autonomy exists, there should not be a general cause for ethical concerns regarding exploitative gamification. However, the concept of autonomy helps identify instances where gamification can become exploitative. Two examples of where autonomy is thwarted are the social credit system that rates the trust in Chinese citizens (Ramadan, 2018) or if a user becomes addicted; in these cases, gamification can be considered exploitative.

Kim and Werbach (2016) also discussed manipulation as an ethical dimension to consider when gamifying. When manipulating, a person intentionally causes another person to behave in a desired way, and this effect is achieved due to the manipulated person's unawareness of the steps taken to invoke this behavior (Strudler, 2005). Based on this description, gamification that does not clearly state what measures it applies to motivate the target behavior – or even state what the target behavior is – is manipulative and is therefore a cause for ethical concern. From this perspective, using gamification to tap into an unconscious and biased System 1 process to steer customers towards a target behavior is problematic. By doing so, a conscious evaluation of a proposition is eluded. In fact, this approach impairs the autonomy of the user by eluding such a conscious evaluation. Papers 2 and 3 investigated the implementation of gamification that aims to utilize the biased System 1; thus, both of these papers investigate services that can be considered manipulative by eluding a conscious decision from the user. As such, these implementations are ethically problematic. However, not all manipulations can be considered equal. Creating intrinsic motivation for a target behavior is an integral part of gamification (Hamari et al., 2014; Huotari & Hamari, 2017; Mora et al., 2015; Rigby, 2015; Seaborn & Fels, 2015). Therefore, when – for example – using gamification to make store visits more enjoyable, thus promoting customer retention, would be manipulation and ethically problematic if it was not specifically stated how this goal would be achieved. In addition, in this particular case, the company wants to use the propensity of customers who enjoy themselves in a store to spend more money (Donovan, Rossiter, Marcoolyn, & Nesdale, 1994), thus adding to possible ethical concerns due to manipulation. However, arguing that such marketing activities automatically would be ethically questionable would be like arguing that it is

ethically questionable for theaters to show enjoyable plays, given that this would cause customers to return and spend money on future plays.

Nevertheless, in sum, impairing the autonomy of customers by using the biased System 1 is cause for ethical concern. Therefore, conducting research on this subject could be considered a questionable practice. However, the knowledge resulting from this research must be considered before making such claims, since it can be used for purposes other than mere profit. For example, such knowledge can be used to steer people towards healthier (Adaji & Vassileva, 2017) or more sustainable consumption (Huber & Hilty, 2015). Thus, it seems reasonable that the possible generalizability to other contexts needs to be considered before questioning such research from an ethical perspective. Moreover, if the research community does not take responsibility for this type of research, companies will be the only ones with access to this type of knowledge – which they acquire from their day-to-day experiences. Consequently, it will not be possible, for instance, for journalists or public organizations to hold companies accountable for manipulative or exploitative marketing practices. Therefore, even though some types of gamification for marketing purposes can be criticized from an ethical perspective, this does not mean that research on the subject is ethically questionable.

4 The papers

4.1 Paper 1 – Gameful Experience Questionnaire (GAMEFULQUEST): An instrument for measuring the perceived gamefulness of system use

4.1.1 Brief background and research objective

When gamifying, a service is transformed to be more gamelike. The goal is to evoke similar positive gameful experiences as games do, with the aim of changing a target behavior. In fact, the effect of gamification on the target behavior rests on the creation of such gameful experiences (Huotari & Hamari, 2017; Landers et al., 2019; Seaborn & Fels, 2015; Werbach, 2014), which makes them essential when developing gamified services. Despite the importance of the gameful experience, it is not a well-developed concept.

With Paper 1, we aimed to rectify this lack of development. As such, in three studies using a mixed-methods approach – using the process for scale development described by DeVellis (2012) as foundation – we developed an instrument (GAMEFULQUEST) for measuring the gameful experience holistically and as a state. For this purpose, we also developed a model of the gameful experience. Consequently, in this paper we have addressed the following research question: *How can the gameful experience be understood and described?*

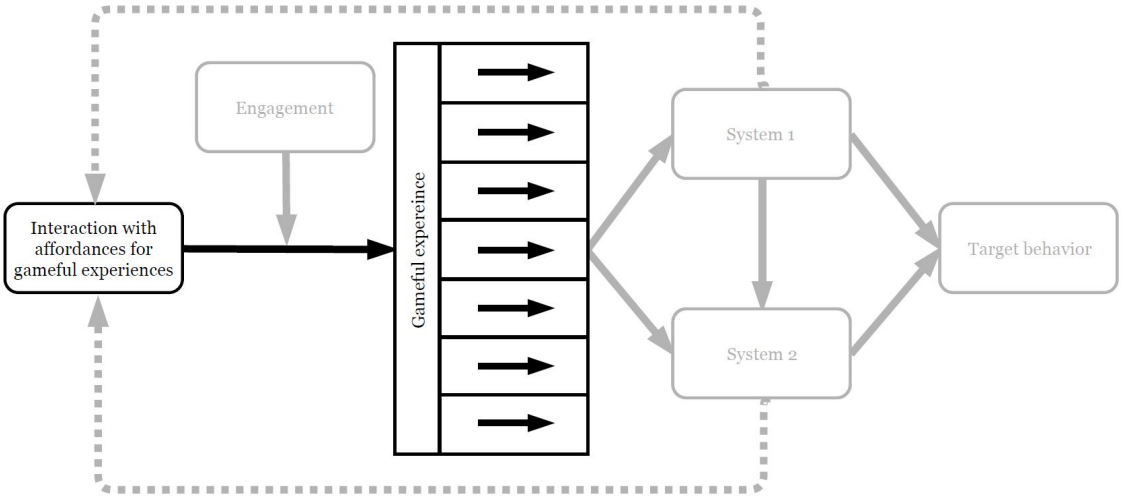

Figure 3. A model and an instrument for understanding and measuring the gameful experience was developed in Paper 1.

4.1.2 Study 1

4.1.2.1 Design and procedure

Study 1 was a qualitative study that aimed to determine what to measure with the instrument, which is the first step of the scale-development process described by DeVellis (2012). Specifically, we developed a model of the gameful experience by describing which dimensions constitute this experience (including defining these dimensions). In three surveys consisting of open-ended questions, we inquired about users' experiences regarding various affordances for gameful experiences used in the gamified services Zombies, Run!; Duolingo; and Nike+ Run Club. A link to the surveys were published on Microworkers.com on three separate occasions. Information about the specifics of the study, including information about a US$3 compensation for completing the survey, was also provided. The participants received this compensation through Microworkers.com after completing the survey.

4.1.2.2 Participants

A convenience sample was recruited from Microworkers.com. Since English language proficiency was deemed imperative in order to be able to answer open-ended survey questions, we only made the surveys accessible to respondents from English-speaking countries. In addition, a screening question was used to ensure that respondents had at least moderate experience of using the service. One hundred and eighty-seven respondents answered the questionnaire. One hundred and thirty of these (male: 58 percent; age: M=27) completed it, among which 59 completed a survey concerning Zombies, Run!; 31 concerning Duolingo; and 40 concerning Nike+ Run Club.

4.1.2.3 Measure development

The surveys inquired about the respondents' experiences regarding various affordances for gameful experience. In a review of past research on gamification, Hamari et al. (2014) found 10 different categories of such affordances. We inquired about specific implementations of these categories from the services Zombies, Run!; Duolingo; and Nike+ Run Club. These services were chosen since, together,

they include all 10 categories of these motivational affordances. An example of a question was, “When thinking of the feature [motivational affordance], what are your experiences if you would look at [service] as a game?” A picture of the motivational affordance was presented together with this question. In a pretest, we had experienced that the level of detail declined in later parts of the survey. To avoid this, and to also avoid order-effect bias (Perreault, 1975), the motivational affordances were presented in random order. SurveyMonkey was used to design and distribute the surveys. SurveyMonkey blocked attempts to complete the survey multiple times from the same device.

4.1.3 Study 2

4.1.3.1 Design and procedure

In a quantitative study, we aimed to create a tentative instrument based on the model of the gameful experience developed in Study 1, and to evaluate the instrument’s psychometric properties. Data was collected among users of Zombies, Run! who were followers of a Zombies, Run! Twitter account offered by the company that develops this service. A tweet informed these followers about the study and included a link to an Internet survey. Participants who finished the survey went into a prize draw for one of 25 $10 Amazon gift cards. This draw was conducted after the data collection had ended.

4.1.3.2 Participants

A convenience sample was recruited. A screening question was used to ensure that participants had adequate experience of using Zombies Run!. Three hundred and one respondents (female: 60 percent; undisclosed gender: 2 percent; age: M=38) completed the full survey (82 percent who started the survey finished it). The participants came from 30 different countries, with the United States being the most common country (50 percent of participants).

4.1.3.3 Measure development

We continued to follow the process described by DeVellis (2012) when developing the instrument. Initially, we generated a tentative pool of items for each

of the dimensions of the gameful experience found in Study 1. We used the qualitative data (on themes and underlying nodes) from Study 1 in addition to previous scales and theory from game experience research as inspiration for this generation. In addition, since the content validity of an instrument is dependent on how well its items reflect a construct's definition (DeVellis, 2012), items were continuously evaluated against the definitions for the dimensions developed in Study 1. We did not reverse-code items, since this can have a negative impact on their performance (DeVellis, 2012; Harvey, Billings, & Nilan, 1985; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This generation process resulted in 73 tentative items, 65 of which remained after being revised by an expert panel. These 65 items were tested for readability using Fry's readability graph (Fry, 1977), which indicated that reading difficulty was at a fifth-grade level; this is suitable for scales that are aimed at the general population (DeVellis, 2012).

When creating the survey, to improve reliability and the clarity of the factor structure, the items were clustered according to the dimensions predicted according to the model (see, Goldberg, 1992). In addition, both the predicted dimensions and the items within the dimensions were displayed randomly in order to avoid order-effect bias (Perreault, 1975). The measurement format used was a seven-point Likert-type of scale, ranging from "strongly disagree" to "strongly agree". SurveyMonkey was used to create and distribute the survey. Multiple completions of the survey from the same device were blocked.

4.1.4 Study 3

4.1.4.1 Design and procedure

In a second quantitative study, the aim was to improve the tentative instrument developed and tested during Study 2 in order to reach satisfactory psychometric properties. We utilized the results from Study 2 as the foundation for these improvements. The final instrument was tested on users of the gamified service Duolingo.

Data was collected among members of Internet forums that focused either on Duolingo or on general language learning. The survey was posted on these forums. The prize draw for participants who completed the study was repeated (25 Amazon gift cards, each worth US$10). The forum post included a link to the

survey and information about the study. The prize draw was initiated when the data collection had finished.

4.1.4.2 Participants

A convenience sample was used. In Study 2, we found that the used sample had an overly positive attitude toward the investigated service, so we changed the type of source for recruitment. We approached members of Duolingo forums and members of general language learning forums; in particular, the users of general language forums were expected to have more shifting attitudes towards the service we investigated. We used a screening question to verify whether participants had experience with the service. Five hundred and seven respondents (male: 61 percent; did not disclose gender: 4 percent; age: M=38) finished the survey (52 percent who started the survey finished it). These respondents originated from 52 countries, the most common of which was the United States (44 percent).

4.1.4.3 Measure development

In response to the issues identified in Study 2, we improved the instrument, still following the process described in DeVellis (2012). These issues included (a) a ninth unexpected factor emerged, (b) results regarding challenge as a factor was contradictory, (c) playfulness split into two dimensions, (d) there were cross-loading items, and (e) there were signs of roof effects, particularly for the playfulness dimension. We also wanted to reduce the scale length, even though the explanatory richness of the instrument had high priority; therefore, the number of items we considered for removal was limited. In all, we removed eight items to mitigate these issues. The reasons for doing this included (a) cross-loading items, (b) scale length, (c) low loadings, (d) loading high on the ninth factor, and (e) concern for the articulation of item. We also mitigated the roof effects by targeting participants who had a more varied attitude towards the investigated service.

In conformity with Study 2: (a) items were clustered according to the predicted dimensions for improved reliability and clearer factor structure (Goldberg, 1992); (b) dimensions and items within the dimensions were displayed randomly to avoid order-effect bias (Perreault, 1975); (c) SurveyMonkey was used to create and distribute the survey; (d) the measurement format was a seven-point

Likert-type of scale, ranging from “strongly disagree” to “strongly agree”; and (e) multiple attempts to complete the survey from the same device were blocked.

4.1.5 Main findings and conclusions

The main contributions of this paper were the model of the gameful experience – consisting of the seven dimensions of accomplishment, challenge, competition, guided, immersion, playfulness, and social experience – and the instrument GAMEFULQUEST, which can be used to measure this experience. In one qualitative study (using thematic analysis) and in two consecutive quantitative studies (using both exploratory factor analysis and a fully a priori specified confirmatory factor analysis) we arrived at an instrument with satisfactory psychometric properties. Some issues remained, however. Accomplishment was close to not show discriminant validity in relation to playfulness, challenge, and guided. In addition, several factors were highly correlated with playfulness and accomplishment. Both of these issues point toward a possible internal structure that would require further investigation.

The game experience and the gameful experience have much in common. By combining a deductive approach – resting on game experience research – and an inductive one when developing our model, we aimed to honor previous game experience research while still considering the uniqueness of the gameful experience. This has resulted in a model consisting of dimensions that have largely been discussed within the game experience research; in fact, the only dimension that, to the best of my knowledge, has not been described within previous game experience research is guided. However, the model also points to the uniqueness of the gameful experience through a combination of dimensions that has not been used previously within games research.

In sum, to address the research question of *how the gameful experience can be understood and described,* the instrument GAMEFULQUEST and a model of this experience were developed. Therefore, it is now possible to build an understanding of how such experiences – experiences upon which the effect of gamification rests (Huotari & Hamari, 2017; Landers et al., 2019; Seaborn & Fels, 2015; Werbach, 2014) – mediate the effect of affordances for gameful experiences on the target behavior. Based on the conceptual and exploratory nature of the research presented in Paper 1, an elaborated model underlying this dissertation is presented in *Figure 4*.

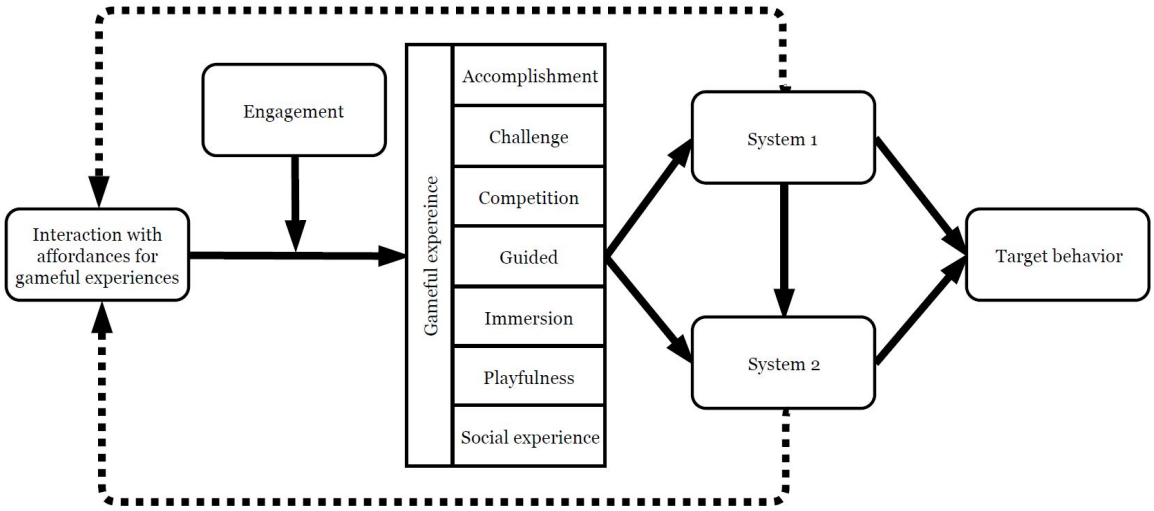

Figure 4. Elaborated conceptual model.

4.2 Paper 2 − Gamified in-store mobile marketing: The mixed effect of gamified point-of-purchase advertising

4.2.1 Brief background and research objective

The constant companionship of mobile devices and their owners makes such devices fitting supplementary marketing channels for physical stores. Historically, the paradigm has been that the customer is entering the retailer's environment. Mobile devices have the potential to change this paradigm into one where the retailer is entering the customer's environment anytime and anywhere (Shankar, Venkatesh, Hofacker, & Naik, 2010). This change is enabled by the location sensitivity of mobile devices, which can be used to develop functions that adapt to the location of its users (Shankar & Balasubramanian, 2009; Wilson, 2012). Since it has been suggested that gamification affects purchase decisions (Bittner & Shipper, 2014; Gatautis, Vitkauskaite, Gadeikiene, & Piligrimiene, 2016; Hofacker, de Ruyter, Lurie, Manchanda, & Donaldson, 2016; Ramadan & Farah, 2017), combining the location sensitivity of the smartphone and gamification could be a viable approach by which physical retailers could improve the effectiveness of their point-of-purchase marketing inside their stores.

The purpose of this research was to study the effect of gamification on smartphone-based in-store advertisement. This was done by investigating whether gamification in the form of a challenge (a quiz) used during a shopping task would increase the target behavior – to act on offers – due to justification of effort

(Hildebrand et al., 2014; Loewenstein & Issacharoff, 1994). This means that we investigated whether the biased System 1 (Kahneman, 2003) could be utilized to steer a user of a gamified service towards a specific decision. We also studied whether gamification would make the customer look at the offered products to a greater extent; as such, we investigated the process leading to this decision.

We also investigated the role of engagement when gamifying. Games require the active involvement of gamers (Huotari & Hamari, 2017), as highlighted by the co-creative (Normann & Ramírez, 1993; Vargo & Lusch, 2004, 2008) nature of the game experience (Ermi & Mäyrä, 2005; Huotari & Hamari, 2017). This co-creative nature indicates that there will be no such experiences if the gamer is not engaged. Following the same line of reasoning for gamified services, no gameful experiences will be created if the user is not engaged. Consequently, since the gameful experience drives the effect of gamification on the target behavior (Huotari & Hamari, 2017; Landers et al., 2019), it seems reasonable that the effect of the gamified activity on the inclination to act on an offer depends on the engagement level of the user. In sum, the aim of this study was to address the two research questions: *What motivational mechanisms is the gameful experience effective at triggering that lead to the targeted behavioral outcomes?* And *what is the role of engagement for the effect of gamification on the target behavior?*

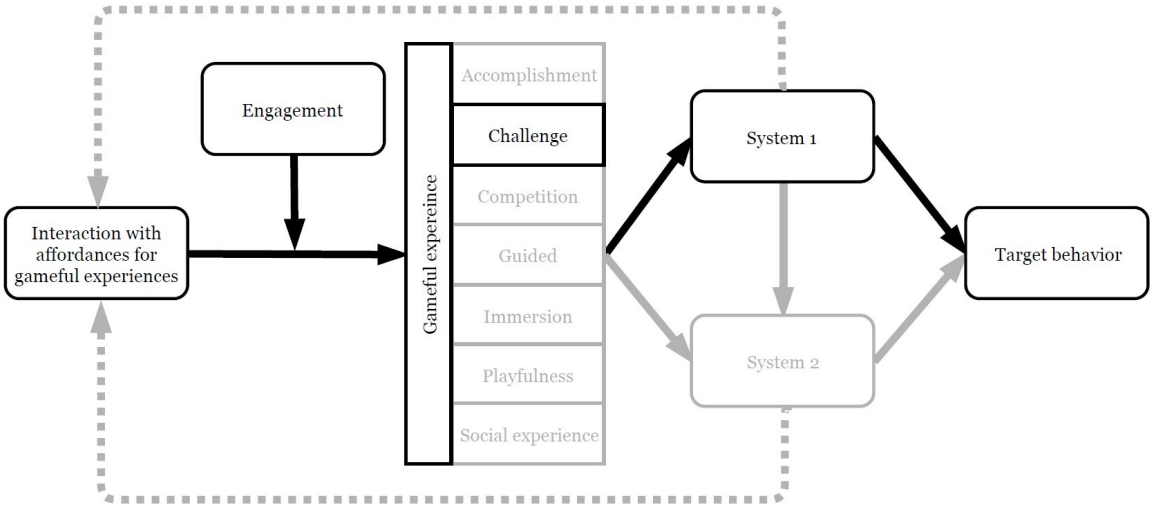

Figure 5. Paper 2 investigated: (a) the effect of gamifying, aiming to utilize a cognitive bias of System 1 to change the target behavior (act on an offer); and (b) the role of engagement for this effect to emerge.

4.2.2 Method

4.2.2.1 Design and procedure

Paper 2 presents a field experiment at a grocery store applying a 1 x 2 between-groups design. The participants were randomly assigned to either a control or a gamified condition. In the control condition, the participants completed a shopping task. In the gamified condition, the participants completed the same task while being exposed to a number of affordances for gameful experiences.

Participants were recruited as they entered the grocery store. The shopping task was implemented using a shopping list procedure that has been applied in previous research (e.g., Otterbring et al., 2014; Titus & Everett, 1996). The participants were asked to imagine themselves shopping for six products on a shopping list that was implemented in an app. The participants received a smartphone with this app installed. There were offers associated with four out of six items on the shopping list. However, in the gamified condition, the participant needed to answer a quiz question correctly to receive the offer, while the participants in the control condition received the offers just for participating.

4.2.2.2 Participants

A convenience sample was used. One hundred and six participants agreed to participate, 75 of whom (male: 57 percent; age: M=38) were included in the final analysis. The most common reason for exclusion was that the participants had not been exposed to all offers (n=23); this loss was expected. In the gamified condition, this occurred when a participant did not answer all four quiz questions correctly, and in the control condition when a participant chose not to look at all offers. In addition, participants were removed for (a) not following instructions (n=3), (b) technical issues with the eye-tracking recording (n=3), or (c) being outliers (n=2) using $z > 3.29$ as cut-off for fixations on targeted products (Tabachnick & Fidell, 2013).

4.2.2.3 Measurement

Engagement: User-actions such as click-through rates, page views, and mouse clicks can be used to indicate engagement in the usage of software (e.g., Lehmann et al., 2012; Martey et al., 2014). User actions can also be used as an indication of engagement in a task that is supported by software. For example, mouse clicks in a learning management system have been used as an indication of students' engagement in courses (Beer, Clark, & Jones, 2010). Following this notion of evaluating engagement through user actions in software, we operationalized the engagement in the shopping task as the click-through rate to the offer in the app; that is, the number of times the offer was viewed. This click-through rate was logged by the app.

Fixations on targeted products: Visual attention plays a role in choice-processes and has commonly been conceptualized as a precursor of choice. This makes eye tracking a tool for understanding product choice (e.g., Chandon et al., 2009; Otterbring et al., 2014; Pieters & Warlop, 1999; Wästlund et al., 2018). We used eye tracking to measure the number of participants' fixations (that is, when eyes rest on a specific area) on the products that were targeted by offers.

Choice of targeted products*:* We tracked whether participants chose products targeted by offers.

4.2.3 Main findings and conclusions

The purpose of this study was to investigate the effect that gamification has on smartphone-based in-store advertisement. At first glance, the results indicate that gamification is not a suitable approach for in-store advertisement. T-tests show that participants in the control condition looked at (process) and chose (the target behavior) the products targeted by an offer to a greater degree than did participants in the gamified condition. This finding indicates that utilizing the biased System 1 (Kahneman, 2003) by implementing a challenge in the form of a quiz to induce justification of effort (Hildebrand et al., 2014; Loewenstein & Issacharoff, 1994), might not be a viable approach to steer a customer towards using an offer. These results are contrary to those found by Hildebrand et al. (2014). However, when considering the second aim of this study – to investigate the role of engagement when gamifying – using regression analysis, we found that these negative effects were moderated by the engagement level of the participants. More specifically, using spotlight analysis, we could see that being in the gamified

condition had a negative effect on both fixations and choice for participants of low engagement (1 SD below mean), while for participants of moderate and high engagement (1 SD above mean) this negative effect was mitigated. In fact, being in the gamified condition caused an increase in the choice to act on an offer for the highly engaged customers.

In sum, in answer to the research question of *what motivational mechanisms the gameful experience is effective at triggering that lead to the targeted behavioral outcomes,* it may not be effective to utilize the biased System 1 through justification of effort to steer users towards the target behavior. However, engagement plays a role in such effectiveness. As such, one answer to the research question of *what the role of engagement is for the effect of gamification on the target behavior* is that users need to be engaged in a gamified activity in order for gamification to be effective.

4.3 Paper 3 − Creating brand engagement through in-store gamified customer experiences

4.3.1 Brief background and research objective

Paper 3 further investigates the use of gamification as a marketing tool in stores. Customers seek both hedonic and utilitarian experiences when shopping in physical stores (Cox, Cox, & Anderson, 2005; Hirschman & Holbrook, 1982). This enables retailers to focus on creating hedonic value, in addition to utilitarian value, to improve the customer experience for their visitors. Gameful experiences are enjoyable (Eppmann, Bekk, et al., 2018) and are therefore hedonic. In addition, gamified services create utilitarian value (Hamari & Keronen, 2017; Hamari & Koivisto, 2015). Consequently, since such services create both hedonic and utilitarian value, they should have the potential to improve the overall customer experience by creating both types of value that visitors seek in stores.

Brand engagement is important for companies because it acknowledges the behavior and attitude of customers beyond purchases (Lemon & Verhoef, 2016). Brand engagement emerges from iterative customer experiences that are interactive and co-created (Brodie, Hollebeek, Jurić, & Ilić, 2011). The interactive and co-created nature of brand engagement corresponds well with the interactive and co-created nature of gameful experiences (Huotari & Hamari, 2017). As such, it seems reasonable for a customer experience that is created through interactive

and co-created gameful experience in a store to result in brand engagement. However, since brand engagement is created through iterative customer experiences (Brodie et al., 2011), repeated instances of such an experience are likely to be required. Several customer behaviors related to brand engagement are positive for companies (e.g., Hollebeek, Glynn, & Brodie, 2014; Lemon & Verhoef, 2016). Therefore, even though brand engagement is not a behavior per se, it can serve as a proxy for a target behavior.

The research in Paper 3 aimed to study the effect of gamification on customers' value creation in stores and to investigate how such value creation is related to brand engagement. To do this, gamification in the form of a challenge (a quiz) was implemented. Since challenges are one driver of game-related enjoyment (e.g., Abuhamdeh & Csikszentmihalyi, 2012; Ijsselsteijn et al., 2008; Malone, 1981; Sherry et al., 2006), we investigated the ability of a challenge to create hedonic value. We also investigated how such a challenge affects the satisfaction with a reward due to justification of effort (Hildebrand et al., 2014; Loewenstein & Issacharoff, 1994) – thus continuing to investigate the usage of the biased System 1 when gamifying.

We also took into account the affective aspects of System 1 (Kahneman, 2003). Affective responses carry information for the evaluation of objects (Schwarz, 1990; Schwarz & Clore, 2007). These affective responses can be incidental, which means that they are unconnected to the object of evaluation (Cohen et al., 2008; Lerner & Keltner, 2000; Loewenstein & Lerner, 2003). Therefore, since gameful experiences are partly affective (e.g., Brown & Cairns, 2004; Calleja, 2007; Eppmann, Bekk, et al., 2018; Poels et al., 2007), we investigated whether positive affect influences both hedonic value and the satisfaction with a reward. Finally, since brand engagement emerges due to interactive and co-created customer experiences (Brodie et al., 2011), we investigated whether gameful experiences made in a store lead to such brand engagement. We addressed the research question of *what motivational mechanisms the gameful experience is effective at triggering that lead to the targeted behavioral outcomes*.

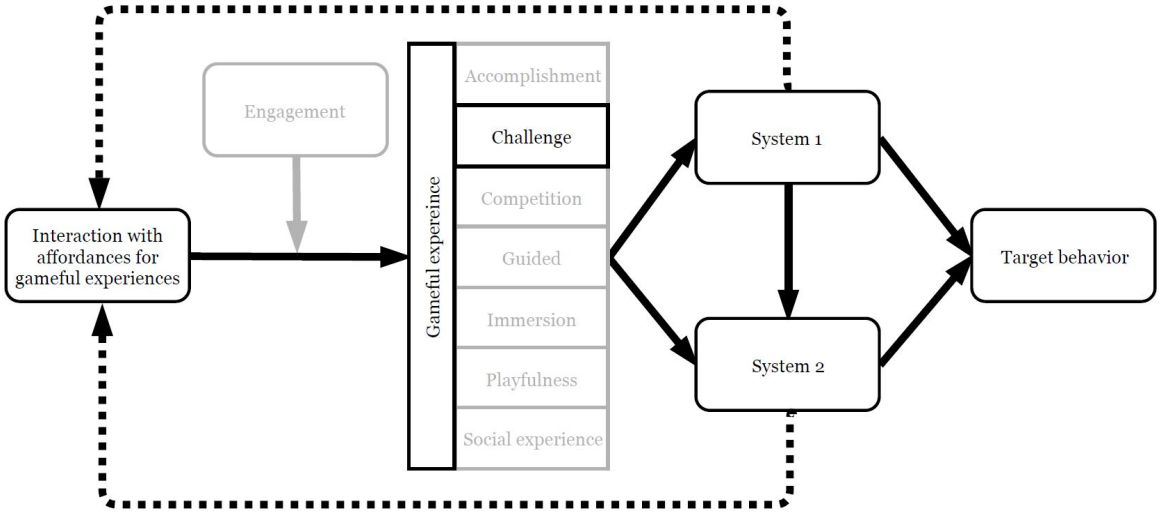

Figure 6. Paper 3 investigated the effect of gamification on customers' value creation and how this value creation leads to brand engagement.

4.3.2 Method

4.3.2.1 Design and procedure

Paper 3 presents a field experiment conducted at a sports goods store using a 1 x 2 between-groups design for which we applied random assignment. Participants were recruited at the entrance of the store. Participants in the control condition completed an activity in the store, while those in the gamified condition completed the same activity while being exposed to affordances for gameful experiences.

The main affordance for gameful experiences used in this study was a quiz, which was implemented in an app installed on a smartphone that was given to the participants. The activity included visiting six locations in the sports store. The participants in the control condition received an information text in the app at these locations. The participants in the gamified condition received the same information text, but also received a quiz question. After the activity, participants in the control condition received a 20 percent discount coupon that was valid for the current day. Those in the gamified condition received the same coupon only if they correctly answered at least four out of six questions. After the activity, all participants filled out a questionnaire.

4.3.2.2 Participants

A convenience sample was used. Three hundred and ninety-four individuals agreed to participate. Sixteen did not finish the study, either due to technical problems or because they chose to abort. Consequently, 378 participants (Female: 51 percent; age: M=42) completed the experiment. Ninety-five percent of the participants in the gamified condition finished the quiz successfully and received the discount coupon.

4.3.2.3 Measurement

Hedonic value: The interest/enjoyment scale from the intrinsic motivation inventory (McAuley et al., 1989) was used to measure the hedonic value of participating in the gamified activity; in other words, we considered interest and enjoyment as an indication of the hedonic value of doing the gamified activity. This scale is one of the most commonly used instruments with which to measure enjoyment within digital games research (Mekler et al., 2014).

Reward satisfaction: To measure the reward satisfaction, we used an adapted version of a coupon-proneness measure (Lichtenstein, Netemeyer, & Burton, 1990). This instrument originally measured the trait of being coupon-prone. For this study, the instrument was adapted to be situation-specific; that is, to measure the proneness to use the coupon received for participating in the gamified activity. This was seen as an indication of the perceived satisfaction with a coupon, and, as such, with a reward in the form of such a coupon.

Positive affect: The positive affect-dimension of I-PANAS-SF (a short version of PANAS) (Thompson, 2007) was used to measure positive affect.

Continued engagement intention: A measure constructed for the present study was used to measure engagement intentions; that is, to assess the willingness to participate in the same type of gamified activities in the future.

Brand engagement: We used the affection dimension of the brand engagement instrument developed by Hollebeek et al. (2014) to measure brand engagement.

4.3.3 Main findings and conclusions

The aim of this research was to study how gamification contributes to customers' value creation in stores and how such value creation leads to brand engagement. Using PLS-structural equation modeling, we found evidence that

gamified services seems suitable for creating hedonic value for customers in stores. We also saw a considerable difference in effect size between hedonic value and the satisfaction with a reward as a predictor of continued engagement intention. This highlights the importance of focusing on intrinsic motivators when gamifying; a finding that is particularly interesting considering the prevalence of extrinsic rewards in gamification implementations (see, e.g., Hamari et al., 2014; Koivisto & Hamari, 2019).

Furthermore, we can see how the gamified service causally influenced positive affect. This indicates that the emotional aspects that are often discussed within games research (Brown & Cairns, 2004; Calleja, 2007; Poels et al., 2007) are also relevant for gamified services, which corroborates the thoughts of Eppmann, Bekk, et al. (2018) and Olsson, Högberg, Wästlund, and Gustafsson (2016). In addition, positive affect mediated the effect on both hedonic value and on the satisfaction with a reward, which indicates that such positive affective responses carries information for evaluative judgments (Schwarz, 1990; Schwarz & Clore, 2007).

Moreover, we can see that continued engagement intention was associated with brand engagement, which indicates that the gameful experiences might be suitable for inducing brand engagement. This effect could be derived from descriptions of brand engagement as being created through interactive customer experiences with a service provider (Brodie et al., 2011); in this case, such customer experiences would be interactive and co-created gameful experiences. However, since brand engagement emerges iteratively (Brodie et al., 2011), repeated gameful experience will be needed for such enragement to be created. In the present study, we used the continued engagement construct as a proxy for such iterative experiences, although longitudinal data should have preferably been used instead. Finally, we did not find support for our hypotheses that gamification increases reward satisfaction due to justification of effort (Hildebrand et al., 2014; Loewenstein & Issacharoff, 1994).

In sum, Paper 3 offers answers regarding the research question of *what motivational mechanisms the gameful experience is effective at triggering that lead to the targeted behavioral outcomes*. The results indicate that the focus when gamifying should be on hedonic value creation, rather than steering customers towards a short-term purchase decision by utilizing a cognitive bias of System 1. Thus, this paper adds – in line with the results of Paper 2 – further evidence of an inability of quiz-based in-store gamification to trigger justification of effort to steer

users towards the target behavior. However, we did find evidence that System 1 could be utilized for this purpose, albeit through System 1's affective characteristics (Kahneman, 2003) that can act as an information source when evaluating objects (Schwarz, 1990; Schwarz & Clore, 2007).

5 General discussion

5.1 How can the gameful experience be understood and described?

When developing GAMEFULQUEST in Paper 1, we utilized a combined inductive and deductive approach, where the deductive part rested on game experience research. This means that while honoring previous games research on the game experience, we were still open to unique aspects of the gameful experience. One aspect that drives this difference is the utilitarian aspects of gamified services (Hamari & Koivisto, 2015). The most obvious representative of a utilitarian facet that we found was the dimension "guided", which we described as an experience of getting help to conduct and improve the target behavior. Our model also includes the dimension "social experience" (which we described as experiences emanating from the presence of people), which can be utilitarian. For example, it can be experienced as useful to belong to a social community (Hamari & Koivisto, 2013). Thus, our model depicts the gameful experience as partly utilitarian, which notably, distinguishes it from the game experience.

We described immersion as an experience of being absorbed in what one is doing. This type of experience seems to be one of the most – if not the most – commonly used constructs in the game experience literature, particularly if considering closely related dimensions such as flow, involvement, and psychological absorption. Therefore, it is unsurprising that we found support for including immersion to be part of our model of the gameful experience. Accomplishment is another dimension of our model that seems to complement immersion. While we conceptualized immersion primarily as an engagement in the moment, we viewed accomplishment as a demand or drive for successful performance, goal achievement, and progress, which seems more to reflect a long-term engagement. Thus, in contrast to the short-term focus of immersion – which takes place during the game phase – accomplishment focuses on a long-term effect that can extend into the postgame phase. This view of accomplishment seems to be in line with the primary aim of gamifying, which is to create intrinsic motivation for a target behavior (Hamari et al., 2014; Huotari & Hamari, 2017; Mora et al., 2015; Rigby, 2015; Seaborn & Fels, 2015) rather than creating intrinsic motivation for service use, which is more applicable to games. In my estimation, due to its importance for some gamified services, this makes accomplishment important in a gameful experience model, but not necessarily in a game experience model.

Even though social dimensions exist in the game experience literature (e.g., Rogers, 2017; Yee, 2006), they are also often missing (Gajadhar, De Kort, & Ijsselsteijn, 2008). This might be traced back to thoughts that social aspects might be considered secondary when playing games (Calvillo-Gámez et al., 2010). Contrary to this thought, our model includes both a social experience dimension and a competition dimension (which we have described as experiencing rivalry towards others). Consequently, we depict the gameful experience as a social one. Moreover, the qualitative data of Paper 1 indicated that these social aspects do not just stem from the service per se; they can also stem from social media and from the physical world. One example was a participant who posted on Facebook to boost motivation. Since such interactions in social media and the physical world can go beyond the use of the gamified service, this is another example of the need for a post-game focus of the gameful experience.

We found challenge to be part of the experience of using gamified services. This is in line with common descriptions of such a dimension in the game experience literature (e.g., Ijsselsteijn et al., 2008; Malone, 1981; Sherry et al., 2006). Games have even been defined as "the voluntary attempt to overcome unnecessary obstacles" (Suits, 1978, p. 41), which means that challenges are intrinsic to games. However, the existence of this dimension could be seen as a cause for concern for gamification implementations; one might argue that behavior change is difficult enough without the effort needed to take on unnecessary obstacles.

The literature contains discussions of the extent to which gamification provides a freeform and playful experience, or a structured and rule-driven one (Deterding et al., 2011; Hamari & Koivisto, 2015; Huotari & Hamari, 2017). Our model represents both of these experiences, at least to some extent. It does so explicitly in the former case by the playfulness dimension, which we describe as a pleasurable experience of exploration and imagination that is free from or under spontaneously created rules. In the latter case, it does so implicitly with the guided dimension, which includes such experiences as being told how to do something, which essentially means to employ rules. Consequently, our depiction of the gameful experience allows for both of these forms of experiences.

Although Paper 3 includes a study showing that affect is elicited when interacting with the investigated gamified service, affect is not part of our model of the gameful experience. In fact, this distinguish our model from the gameful experience model developed by Eppmann, Bekk, et al. (2018), which includes three

dimensions (out of six) that are related to affect. However, in my view, affect is better seen as an experience on a more general level compared to what is needed to understand the unique aspects of the gameful experience. This view can be derived from descriptions of emotions as superordinate programs that coordinate behavior, so that such behavior is functional from an evolutionary perspective (Cosmides & Tooby, 2000). As such, it could be said that emotions reflect a wisdom of ages (Lazarus, 1991). I argue that the consequence of accepting these types of descriptions of affect as a general construct means that it is better viewed as the outcome of the gameful experience rather than being a defining part of it.

In sum, in answer to the research question of *how the gameful experience can be understood and described,* the present research has depicted such experiences as: (a) utilitarian, for example through the guided and social experience dimensions; (b) social, through the competition and the social experience dimension; (c) engaging in the short term and the long term, through the dimensions of immersion and accomplishment; (d) demanding, due to the need to take on unnecessary obstacles, through the challenge dimension; and (e) freeform (through the playfulness dimension) and rule-driven (through the guided dimension).

5.2 What motivational mechanisms is the gameful experience effective at triggering that lead to the targeted behavioral outcomes?

The elaborated conceptual model (*Figure 4*) includes both System 1 and System 2 processes of decision-making (Stanovich & West, 2000) in order to clarify that gamification can specifically target the fast, automatic, and emotional System 1 decision process (Kahneman, 2003) to promote the target behavior. In Paper 1, we found that being challenged was part of the gameful experience. In line with this finding, the studies presented in Papers 2 and 3 implemented a challenge that we expected to influence a System 1 process in order to promote the target behavior.

In the Paper 3 study, we found that the implemented gamified solution – in the form of a quiz-based challenge conducted in a store – induced positive affect. This affective reaction is in line with both games research (Brown & Cairns, 2004; Calleja, 2007; Poels et al., 2007) and with the gamification literature – within which affect has been described to be part of the gameful experience (Eppmann, Bekk, et al., 2018; Olsson et al., 2016). Thus, the present study contributes by

showing that the investigated type of gamified solution can influence positive affect in a store, and as such, confirms that affective reactions can be an outcome of using some gamified services. Moreover, our results indicate that such affective reactions can create value by inducing hedonic value and satisfaction with a reward, both of which have potential to influence the target behavior. More generally, this suggests that such a service can utilize the biased System 1 through affective responses that are unconnected to the evaluated object – that is, incidental affective reactions (Kahneman, 2003; Lerner & Keltner, 2000; Loewenstein & Lerner, 2003) – that will convey information that is used for evaluative judgments (Schwarz, 1990). This finding is of particular interest for gamification because the main aim of gamifying a service is to motivate a target behavior; thus, affective reactions elicited in response to such services will always, at least partly, be incidental to their main aim.

Papers 2 and 3 present studies in which we investigated whether gamification in the form of a challenge could trigger the cognitive-bias effort justification (Aronson & Mills, 1959; Loewenstein & Issacharoff, 1994) to promote the target behavior, by inducing value to an offer or coupon. Despite conducting these studies in both a utilitarian and in a more hedonic setting, we did not find that the implemented challenges promoted the target behavior. In fact, in the experiment presented in Paper 2, the intervention even had the opposite effect, thus diminishing the target behavior. Therefore, both these studies indicate that affecting customers in a store by using challenge-based gamification to trigger effort justification might not be an effective approach. This also means that we did not find support for the findings made by Hildebrand et al. (2014) in a non-store context.

Gamification has not only been suggested to target the System 1 process of decision-making. Another suggested mechanism is to create intrinsic motivation for a target behavior; in fact, this is the most prevalent suggested mechanism for the effect of gamification in the literature (e.g., Hamari et al., 2014; Huotari & Hamari, 2017; Mora et al., 2015; Rigby, 2015; Seaborn & Fels, 2015). In addition, many gamification implementations are heavily invested in the usage of extrinsic motivators (Hamari et al., 2014; Seaborn & Fels, 2015). These approaches mean that the aim is to create conscious motivation rather than manipulating; as such, these approaches aim to also influence the conscious and deliberate System 2 process of decision-making (Kahneman, 2003). In Paper 3, we investigated the effect of hedonic value (operationalized as intrinsic motivation) created by a

gamified service in addition to extrinsic motivation in the form of the satisfaction with a reward. Both hedonic value and reward satisfaction were associated with continued engagement intention and, subsequently, the target behavior – which in this case was represented by brand engagement (see Section 4.1.1 for rationale). However, the effect size was considerably larger for hedonic value. This relative effectiveness of hedonic value is particularly interesting considering the prevalence of extrinsic motivators implemented in gamified services (Hamari et al., 2014; Seaborn & Fels, 2015) and the negative effect that such motivators can have on intrinsic motivation (Deci et al., 1999). Finally, it is important to point out that brand engagement is created iteratively (Brodie et al., 2011), therefore, theory suggests that several gameful experiences must be made to reach this indicated effect on brand engagement.

In sum, as an answer to the research question of *what motivational mechanisms the gameful experience is effective at triggering that lead to the targeted behavioral outcomes,* the present research: (a) found that both hedonic value and reward satisfaction was associated with continued engagement intention, although the intrinsic motivator was a more potent predictor; (b) indicated that the implemented gamified service in a store, was able to utilize the biased System 1 by inducing positive affect, which in turn affected hedonic value and reward satisfaction; and (c) did not find evidence that the implemented gamified service could utilize the biased System 1 to steer a person towards the target behavior by inducing effort justification. Thus, when aiming to utilize System 1, our research suggests that a gamifier should target its affective aspects. However, as is indicated in the ethical discussion (Section, 3.3), the approach of targeting System 1 processes can be ethically questionable, since it can be considered manipulative in its aim to elude conscious evaluation and to thwart autonomy. This concern seems particularly acute when the main stakeholder of the target behavior is someone other than the user, as is the case in the implementation of Papers 2 and 3. Thus, from an ethical perspective, there might be reasons to focus on gamified solutions that create hedonic value instead; a focus that, as our results indicate, have the potential to lead to brand engagement, rather than affecting a specific decision that leads to a short-term sale.

5.3 What is the role of engagement for the effect of gamification on the target behavior?

In Paper 2, we investigated a remedy for the lack of success to steer users towards the target behavior through challenge-based justification of effort. More specifically, we investigated the effect of users' engagement, showing that the negative effect of gamification might be mitigated at higher levels of engagement. Engagement is important for the creation of the gameful experience (Huotari & Hamari, 2017). For example, involvement (a concept closely related to engagement) is an experiential condition for all games (Huotari & Hamari, 2017). Consequently, since the gameful experience mediates the effect that the affordances for gameful experiences have on the target behavior (Huotari & Hamari, 2017; Landers et al., 2019), it seems reasonable that engagement is also necessary for such affordances to affect the target behavior. This could possibly be attributed to the co-creational aspects of the gameful experience (Huotari & Hamari, 2017) and, on a more general level, to the co-creational nature of the game experience (Ermi & Mäyrä, 2005) and of services in general (Normann & Ramírez, 1993; Vargo & Lusch, 2004, 2008). Therefore, it seems reasonable that if the user is not sufficiently engaged to participate in this co-creation, he or she will not have a gameful experience and the intended effect on the target behavior will not be achieved. It seems equally reasonable that this reasoning could be applicable for other types of motivational mechanism that are targeted. For instance, a gamified service will not be intrinsically motivating if the user is not engaged in the usage of this service. Therefore, our results and theory indicate that one answer to the research question – *what is the role of engagement for the effect of gamification on the target behavior?* – is that engagement is necessary for gamification to have the intended effect on the target behavior.

Finally, from an ethical perspective, even though I argued that exploitation (unlike manipulation) might not generally be an issue regarding gamified services (see Section 3.3), the engagement construct can exemplify when it might be. For instance, if the basis for the engagement is addiction for a user, a service can exploit such a user.

5.4 Limitations and future research

We used Internet surveys when developing GAMEFULQUEST. This research method is associated with several challenges, which are described in

Section 3.1. That section also includes a discussion on the impact that the choice of method has had. In sum, GAMEFULQUEST needs more research if it is to be generalizable to the population of interest. For improved generalization, it is imperative to find service providers who are willing to provide user directories that can form suitable sample frames. This would allow direct and random invitation to possible respondents, allowing for a probabilistic sampling method, which is necessary for generalization. In addition, by avoiding self-selection, it would be possible to make proper follow-ups to improve response rates and to analyze non-responses. Moreover, GAMEFULQUEST is only validated on two gamified services, so more studies are needed in order to establish generalizability to other services. Since a gamified service does not necessarily need to be perceived as a game and since experiments can incorporate a control condition using a non-gamified services, such studies should also include services that are not gamified. Such studies should also further investigate the high correlations we found between some of the dimensions of the model and the ones that were close to not showing discriminant validity.

Manipulation checks were not included in the field experiments described in Papers 2 and 3. In both of these experiments, the development of the hypotheses rests on the participants' experience of being challenged. Therefore, measuring this experience could have been used as a manipulation check, where the participants in the gamified condition should have measured higher on this dimension. By not doing so, we do not know whether the lack of results is the effect of a lack of a mechanism or a lack of an experimental condition that provided conditions for us to find this mechanism. Moreover, this relates to another limitation of these studies. When implementing challenges to unlock offers, this caters to a specific problem. If offers are received for passing a challenge, only successful participants will receive this offer. Such systematic attrition of participants might affect the results. In Paper 2, despite the simplicity of the quiz, some participants did not answer all of the quiz questions correctly. These participants were removed from the sample, meaning that a systematic attrition was prevalent in the gamified condition that might have caused bias.

In Paper 2, participants could unlock rewards, and some of the hypotheses in this paper were derived from the argument that effort justification would increase the value of these rewards (e.g., Aronson & Mills, 1959; Festinger, 1957; Loewenstein & Issacharoff, 1994). However, these were not real rewards and, as such, had no real value. This might have affected the results of this study, since

there was no real value to increase. On the other hand, in earlier research on effort justification, such rewards have not been particularly attractive; for example, Loewenstein and Issacharoff (1994) used mugs as rewards. In addition, we did mitigate this problem to some extent by using real rewards in Paper 3, and the results were similar to those in Paper 2.

Paper 2 indicates that engagement is needed for gamification to affect the target behavior. However, engagement was not experimentally manipulated, which means that no causal inference can be made since the found effect might be explained by confounding variables. The indicated importance of engagement warrants more studies that address these concerns. Moreover, many other possible psychological mechanisms could be investigated. For instance, one interesting mechanism that could explain the negative results in Paper 2 could be a suspicion of being manipulated by a marketing gimmick, which from the perspective of psychology could be explained by reactance – that influence attempts that threaten a person's freedom will make that person do the opposite (Miron & Brehm, 2006).

In addition, as our model of the gameful experience indicates, this experience has many dimensions that may play a role in how gamification works. In fact, regardless of which decision process, bias, or psychological mechanism is targeted, GAMEFULQUEST and its underlying model can be used as a quantitative tool and as inspiration for future gamification research. Therefore, this model and instrument is the main contribution of this dissertation and has, as such, had a great impact on answering to the main aim of this dissertation, which is *to investigate the experiences that users make when using gamified services and the effect that such experiences have on the targeted behavioral outcomes*. This aim deserves a great deal of future research because of the importance of the gameful experience for gamified services' ability to motivate behavior.

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Gameful experiences

In a series of studies, this dissertation investigates the experiences that users make when using gamified services and the effect that such experiences have on the targeted behavioral outcomes.

The motivational aspects of gamification rely on the creation of the gameful experience. Paper 1 in this dissertation investigates this experience and develops an instrument for its measurement. Paper 2 investigates the effects that gamification has on a decision to use offers in a store and the role of engagement for this effect to occur. Paper 3 investigates the contribution of gamification to value creation in stores and how such value creation relates to brand engagement.

The results of these studies indicate that the gameful experience can be described and measured using a model that includes the dimensions of accomplishment, challenge, competition, guided, immersion, playfulness, and social experience. The results also indicate that the implemented challenge-based gamification, in the form of a quiz, can induce positive affect, which can influence evaluative judgments and, ultimately, brand engagement. However, the results did not show that such gamification drove the target behavior through effort justification. Finally, the results display one of the conditions for such challenge-based gamification to be effective: the user needs to be engaged.

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