Gamification: Influencing Value-Perception of Target Behaviors

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Abstract: Existing scholarship of gamification has covered the effectiveness of different types of game design elements in specific applications. There is a need to understand why gamification may be capable of fulfilling these applications' goals and how effective gamified experiences can be created or facilitated. This paper aims to fill a gap in gamification theory by focusing on the goal driving the implementation of gamification and highlighting the ways by which it affects the perception based psychological processes that influence user behavior. Gamification is conceptualized here as the use of game elements to influence users' value perceptions of a target behavior in order to motivate action. This study suggests new approaches to gamification implementations and hopefully opens new avenues for further theoretical development following this conceptualization are suggested.

Keywords: Perception, Construals, Gamification, Motivation, Persuasion

1. Introduction

Since the initial conceptualization of gamification in 2010, an increasing number of applications have utilized an infusion of game design techniques, game mechanics, and/or game style (Bouça, 2012) to motivate user behaviors in various non-game contexts. While its use has seen moderate successes in health, service marketing, education, and other fields (Hamari, Koivisto, & Sarsa, 2014), a strong theoretical foundation regarding the effects and effectiveness of gamification has not yet been established. Over the years, gamification has been labeled, explicated, and operationalized in a myriad of different ways. The current most prevalent conceptualization of gamification identifies it as the use of game design elements in non-game contexts (Deterding, Dixon, Khaled, & Nacke, 2011). Conceptualizations of gamification in industry and academia have tended towards examining the implementations of these game design elements. These studies focus on evaluating whether these elements are effective at influencing behavior. Such studies most commonly evaluated game elements such as leaderboards, achievements/badges, and levels in activities or applications (Hamari, Koivisto, & Sarsa, 2014).

However, the focus of existing studies on shallow interpretations of gamification—essentially utilizing simple incentive and customer loyalty systems presented as "gamy" applications—disregards "decades of research on the limited effectiveness and manifold unintended consequences of such systems" (Deterding, 2014, p. 306). Current studies unfortunately often do not go beyond examinations of whether or not a gamified application was a feasible influence of behavior in a specific context and how the specific application could be improved for greater effect. Furthermore, while modern studies of gamification do highlight the importance of a goal-centric approach to gamification (Deterding et al, 2011; Huotari & Hamari, 2012; Deterding, 2014), current gamification literature almost completely elides the role of perception (specifically value perception) in the process of gamification experience. This seems to be an unfortunate oversight given the goal of gamification ultimately being the influence of user behavior in the real world (Deterding, 2014) and the importance of perception in influencing behavior – particularly in relation to acceptance of new systems (Davis, 1993). A better understanding of the processes behind gamification's effectiveness thus seems necessary not only to further the theoretical development of the study of gamification but also to allow more effective implementation of gamification systems. This paper proposes a goal-oriented approach to conceptualizing gamification—highlighting the way gamification potentially affects users' value perception of target behavior in order to promote engagement with that behavior.

This study will therefore attempt to do three things: (1) Distinguish the goals of gamification from the goals of other applications that utilize game elements—such as serious games, and entertainment education. (2) Propose a theoretical framework accounting for the possible processes that facilitate gamification's effectiveness. (3) Introduce and explicate a definition and conceptualization of

gamification that reflects its underlying procedural bases and adapt a model explaining this process behind effective gamification. By doing so, this study aims to further our understanding of why and gamification can be effective, and hopefully provide insight as to how more effective gamification systems can be implemented.

2. From Games, Serious Games, and Entertainment Education to Gamification

Since the popularization of video games in the 1980s, an increasing number of applications and systems utilize video game elements in order to engage, entertain, and motivate users (Klug & Schell, 2006; Moyer-Guse, 2008; Deterding, 2011). Most prominent among these applications are entertainment games, serious games, edutainment games, and the use of gamification. A number of factors distinguish each of the above applications from the other, such as gameplay format (Denis & Jouvelot, 2005) and types of narratives used (Moyer-Guse, 2008). However, perhaps the most important distinction between these applications is the goalthat drives each of their game element implementations. Each application has a different objective and utilizes game elements in different ways in order to achieve these objectives. From entertainment to education, each application is designed to have a different effect on the user. As such, game elements are employed to different degrees and for different purposes and while there may be overlaps, it is important to keep in mind the distinctions between the various applications.

Entertainment games, as the category suggests, provides users with experiences that fulfil player gratifications, both hedonic and eudemonic (Przybylski, Rigby, & Ryan, 2010; Klug & Schell, 2012; Oliver, Bowman, Woolley, Rogers, Sherrick, & Chung, 2015). Entertainment games primarily attempt to influence play behavior—motivating users to continue playing and engaging with the game—through competition (Vorderer, Hartmann, & Klimmt, 2003), transportation (Lee, 2004; Ermi & Mäyrä, 2005), and many other gameplay effects. The goal of these games is to entertain and engage users by utitlizing various aspects of game design such as narrative, pacing, and game mechanic elements (Pinelle, Wong, & Stach, 2008).

These entertainment games make up the majority of video games and are not created to fulfil a purpose beyond the players' involvement with the world of the game (Mitgutsch & Alvarado, 2012). Entertainment education—specifically serious games—on the other hand attempt to fulfill a goal beyond the self-contained aims of the game in itself (Mitgutsch & Alvarado, 2012). Entertainment education refers to a broad strategy of utilizing entertainment media as a vehicle for educational messages with the goal of influencing knowledge, attitudes, and behavior (Moyer-Guse, 2008). In entertainment education literature, focus is placed on the role of entertainment narratives on the effectiveness of popular media for persuasion and influence (Slater & Rouner, 2002; Moyer-Guse, 2008). In contrast, serious games—while being a term that has not been clearly defined (Breuer & Bente, 2010)—focus on the use of game elements for the purpose of informing and persuading. Drawing from Clark Abt's 19765 conceptualization of serious games, Breuer and Bente propound that serious games have an explicit and planned educational purpose are not intended to be played primarily for amusement (2010). Serious games' primary goal is to engage with players for instructional and influential purposes—influencing values, convey ideas, or persuading players in a manner that affects their real world actions or beliefs (Mitgutsch & Alvarado, 2012 ; Arnab et al. 2015).

Besides the use of "full-fledged games" (Deterding et al., 2011) for entertainment and non-entertainment purposes, there are applications that do not create a complete game for entertainment or persuasion and influence. Gamification extracts and implements game elements for use in a non-game context (Deterding, et al., 2011). Gamification creates game-like experiences are experiences that are structured by rules and are goal-oriented (Deterding et al., 2011). The goal of gamification is to facilitate gameful experiences in non-gaming contexts in order to motivate users to engage with targeted behavior (Deterding, 2014; Deterding et al., 2011). In order to achieve this goal, effective gamification implements game design elements in a manner that influences the targeted behavior within the non-gaming context. In the non-gaming context of education and learning, for example, the purpose of gamifying a system might be to get students to turn in work on time. Gamification of the system by which students turn in work should aim at fulfilling the purpose of the system and create a work submission experience that motivates students to submit work punctually. Utilizing the game design element of a leaderboard to track and display student submission timings and providing rewards accordingly might motivate punctual submission behavior. If it successfully motivates targeted behavior, a gamified experience can be considered effective, and its goal is achieved.

Existing scholarship of gamification has covered the effectiveness of different types of game design elements in specific applications and empirically tested their effectiveness in influencing target behaviors (See Hamari, Koivisto, & Sarsa, 2014 for a review). Although the literature largely empirically validates the effectiveness of gamification for fulfilling behavior motivational goals, there remains a need understand why gamification may be capable of fulfilling these goals and how effective gamified experiences can be created or facilitated (Bouça, 2012; Hamari, Koivisto, Sarsa, 2014; Deterding, 2014).

3. Effective Gamification and Gamification Effects

This study argues that the goal of gamification is to enable users to perceive that behaviors within non-game contexts bring valuable and fulfilling experiences in the gamified context. Effective gamified experiences influence how users perceive the value of engaging with or carrying out targeted behavior/activity in non-game contexts. This value perception in turn motivates users to engage with the target behavior or activity. By altering perception of the targeted behavior or activity's value to having concrete and intrinsic value or benefit, gamification increases users' motivation to voluntarily seek and repeat said behavior. In other words, gamification is the use of game design elements to influence users' evaluative perception of engaging with a behavior or activity in order to motivate action.

3.1 Value Perception

Current gamification literature focuses on user perception of the application involved or its game elements, that is, how users perceive the experience of using the gamified application or service (i.e., how fun or usable it is). A study by Chen, Burton, Mihaela, and Whittinghill (2015) analyzed a gamified platform called Cogent to evaluate the effectiveness of gamification in educational contexts. The Cogent system was designed to encourage undergraduate engagement in educational activities in and outside of classrooms, utilizing a virtual currency as incentives (Chen et al., 2015). The system allowed users to create businesses and essentially simulated a virtual economy in which users could learn more about business management and economics. Through thematic analyses of focus group discussions, they highlighted certain benefits and weaknesses of the system. There was no explanation for why any aspect of the gamified system was successful or unsuccessful in influencing its users in an educational context. Most of the current literature address perception in gamification are concerned with how users' perception and evaluation of the game design elements implemented in a system or service, and not in relation to how gamification could potentially affect user perception in order to achieve targeted behavior.

Perception, however, potentially plays a pivotal role in the effectiveness of any gamified experience and serves as the gateway to motivate behaviors in non-game contexts. When users perceive a behavior in the gamified context as having positive and immediate effect, value, or feedback, this perception could help cultivate users' motivation to carry out desired behavior. The use of game design elements as of themselves do not facilitate any form of motivation or behavioral influence. However, these game design elements do effectively capture and center user attention by making the value of actions more easily perceptible to users. Experience point systems, for example, present clear value for actions with otherwise abstract rewards—actions that may otherwise hold no visible or immediate value to the user. Live achievement tracking likewise provides feedback for user engagement with behaviors that may otherwise have no immediate effect in order to shape user perception of progress and their evaluations of target behavior benefits.

Cafazzo et al.'s study of gamified health applications effect on self-management for adolescent diabetics utilized experience point systems in their app design in order to incentivize the practice of blood glucose testing (2012). For the users in Cafazzo et al.'s study, blood-glucose tests were a necessary behavior. The users involved had type 1 diabetes mellitus, a chronic condition that necessitates a lifetime of self-management—specifically measuring their blood-glucose levels at least 3 times a day. The study highlighted that worldwide data indicated that adolescents do not hit the required levels of self-management behavior and so developed a system that could facilitate adolescents' engagement with proper blood-glucose management behavior. Users would gain experience based on each test performed and could "level-up" after accumulating a specific number of points and exchange those for real world rewards (Cafazzo et al., 2012). The study highlighted that

users engaged readily and frequently with the point system and that accumulated significant numbers of points but did not choose to claim rewards (iTunes music and apps). This demonstrated that in some cases, the extrinsic rewards that came with leveling up were not the primary motivator (Cafazzo et al., 2012) and possibly that the gamified experience was in itself a motivator of action. The gamified application provided users with a system to receive and track virtual value accrued through engagement with the target behavior of blood-glucose self-management. This accumulation of virtual value through gameplay served to inform user perception of target behavior and provided a means to influence the way that users perceived targeted behavior in order to intrinsically motivate engagement with the target behavior in a non-game context. Gamification therefore is potentially effective because of the way it provides users with an immediate and easily perceptible value system for behavior or actions that otherwise would have only abstract or future value.

3.2 From Perception to Construed Values

The process behind how gamification's influences users' value perception and why it can be effective for behavioral influence is currently unexplored and undeveloped. This potentially key role of perception influence in motivating engagement with target behavior needs to be explored theoretically. This study will draw from existing theories on perception and behavior to posit a perception and motivation oriented approach to understanding the effectiveness of gamification.

Construal level theory (CLT) suggests that the construal level of an object or event influences the perceived psychological distance of the object or event (Liberman & Trope, 1998; Bar-Anan, Liberman, & Trope, 2006). Construal levels are the subjective levels of concreteness/abstraction ascribed to an object, behavior, or event by an individual (Bar-Anan, Liberman, & Trope, 2006). Psychological distance is the conceptual distance of an object or behavior from a person's self (Bar-Anan, Liberman, & Trope, 2006). Construal levels range from concrete to abstract and psychological distance can be divided into four categories: spatial, temporal, social, and hypothetical. Each of the other categories potentially plays an important a perhaps interrelated role in influencing perception in gamification. However because of its exploratory scope, this study will only address hypothetical psychological distance.

Hypothetical psychological distance refers to how likely a person perceives something will come to pass and become reality. CLT posits that the more an object, event, or action is conceived of as abstract, the more psychologically distant the object, event, or action is perceived as being. This suggests that when the value of an action or behavior is construed as being abstract, it is also perceived as being more psychologically distant (low hypotheticality), and associated with unlikeliness (Bar-Anan, Liberman, & Trope, 2006). In the case of diabetic adolescents (Cafazzo et al., 2012), it is very possible that the value of testing blood-glucose levels and managing these levels is construed as being abstract, as the testing itself would not lead to any immediate effects or feelings of well-being or achievement. As such, the benefit (or consequence) of the action itself may be perceived as unlikely (low hypotheticality). By utilizing game design elements that imbue targeted behavior with easily perceptible value and feedback, actions or behaviors that are construed to have abstract value can be ascribed concrete values that can influence user perception not only of their inherent value, but also their hypotheticality—the possibility of the user being able to carry out the action or behavior. If users construe the value of target behavior as concrete and possible to achieve, they could potentially be motivated to carry out these target actions.

3.3 Perceived Behavioral Control and Self-Efficacy

So far, this study has identified two possible perception-based effects of gamification: concrete value of performing target behavior, and increased perception of hypotheticality/possibility of carrying out target behavior (as a result of the concrete construal level attribution). Each of these gamification effects on user perception potentially drives engagement with target behaviors. Perceived concrete value as of itself is useful in influencing behavior because it is likely that an individual with a favorable evaluation of a behavior will carry out a behavior (Ajzen, 1991). When gamification facilitates users' perception of a behaviors value, users become more likely to engage with that behavior. Aside from this obvious effect, increased perception of higher hypotheticality potentially influences behavior in a number of different ways through more subtle effects.

Perceived hypotheticality can influence behavior through its effect on perceived behavioral control (Ajzen, 1991; 2002) and perceived self-efficacy (Bandura, 1991). Perceived behavioral control (PBC) refers to a person's perceived control over the performance of behavior (Ajzen, 1991; 2002) while perceived self-efficacy is the belief in one's ability to control a tasks outcome (Bandura, 1991). Both terms are conceptually similar (Ajzen, 2002) but there have been studies that have distinguished their foci as being perceived controllability (PBC) and perceived difficulty and confidence in performing a behavior (self-efficacy)(Manstead & Eekelen 1998; Ajzen, 2002; Pertl, Hevey, Thomas, Craig, Chuinneagáin, & Maher, 2010). Studies focusing on each of these two concepts utilize different items in their measurements, and studies have observed how a mixture of items addressing controllability and difficulty has resulted in poor reliability (Pertl et al., 2010). We believe these concepts have separate (but potentially cumulative) impacts on user behavior in gamification: Users are influenced by the changes to their perception of control over the performance of a behavior, and the intrinsic motivation to carry out target behavior facilitated by the feeling of self-efficacy.

Perceived behavioral control plays an important role in determining performance of a behavior. As mentioned earlier, one aspect of this psychological distance is hypotheticality, the possibility of something happening, or in the case of gamification, the possibility for a user to perform (essentially the user's control over) a behavior. In gamification, the use of game design elements to imbue target behavior with concrete value should influence the perceived hypotheticality of carrying out the behavior, a la construal level theory. Therefore, using game elements such as difficulty levels to denote different segments of a target behavior should influence player perceptions of control over the behavior. In the case of a gamified application that aims to help curb smoking behavior, different extents to which the habit is removed from a user's daily routine would fall under different difficulty levels (i.e., level 1 – cut down intake by 70%, level 2 – cut down intake by 50% etc.). This imbues the abstract and psychologically distal behavior of quitting smoking with smaller and concrete construal levels that can influence a user's perceived control over the behavior. The gamified application gives the user a concrete objective to be achieved that is tiered to appear more easily controlled and thus sees their control over engaging with the target behavior as higher. If an individual perceives that they have higher levels of control over the performance of a behavior, they are more likely to carry out the behavior (Ajzen, 1991; 2002). By influencing a user's perceived behavioral control, gamification potentially motivates engagement with a target behavior.

Self-efficacy—the belief in one's ability to fulfil a task or perform a behavior—is important to satisfying a person's need for competency which in turn drives intrinsic motivation for engaging with a behavior (Ryan & Deci, 2000). Cognitive evaluation theory (CET), a subtheory within self-determination theory, argues that social-contextual events such as feedback or rewards that facilitate feelings of competence during performance of behaviors can enhance intrinsic motivation for that behavior (Ryan & Deci, 2000). In gamification, game elements replace or facilitate the role of social contexts by providing immediate and constant feedback and rewards for a user's engagement with target behavior. For example, Simões, Redondo, and Vilas' study applied and integrated gamification to an extant online learning platform for 6-12 year olds (2012). A key and important objective of the project was to help students develop social learning skills through their use of the gamified system (2012). The platform developed in conjunction with the study allowed teachers and parents to customize feedback and implement point systems that provided students with performance reports tagged alongside badges and rewards based off how often and how well they participated in social learning activities (i.e., communal video watching and quiz taking). While the activities themselves were not made easier or altered by the integration of game elements, the gamified system provided a platform that allowed users to receive immediate feedback on their performance of the behavior—important factors in enhancing an individual's feelings of competence and confidence in carrying out an action (Ryan & Deci, 2000). Gamification's influence on perceived ease and competence therefore potentially creates the conducive conditions that "can enhance intrinsic motivation" to perform target behaviors or actions (Ran & Deci, 2000, p. 70).

3.4 Other Perception Based Effects

Aside from the above mentioned effects on user perception that gamification may have and their capacity to influence behavior, there are numerous other theoretical frameworks that highlight the role of perception in influencing behavior and so support a perception based approach to gamification. The basic components of the health belief model for example, stem from established psychological and behavioral theories that hypothesize that behavior depends mainly on perceived value on a goal and

perceived likelihood that a particular behavior will achieve that goal (Janz & Becker, 1984). The health belief model consists of four dimensions: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers, each contributing to an individual's perception and evaluation of health actions and the likelihood that these actions will result in prevention of illnesses. In the technology acceptance model, perceived ease of use and perceived usefulness have been highlighted as important in determining individual's use of internet technology (Venkatesh & Davis, 2000; Moon & Kim, 2001). In both of these behavioral models it is the individual's perception that serves as the gateway to influencing evaluation of and engagement with important behaviors. With perception having well documented and studied effects on user behavior, it should therefore be useful to utilize a perception based approach to understanding how gamification can be effective in achieving its goals.

4. Perception Effects Oriented Definition and Model of Gamification

This study therefore proposes a new definition that accounts for the goal of gamification and a useful approach to its effectiveness: gamification is the use of game elements to influence users' value perceptions of a target behavior in order to motivate action. The use of game elements is a key feature of gamification, as established in prior gamification literature. However, in specifying a key goal for gamification, this proposed definition highlights the purposeful design that should be behind the employment of game elements in a non-game context. The use of game elements in a non-game context becomes gamification specifically when it is employed in order to motivate engagement with a target behavior.

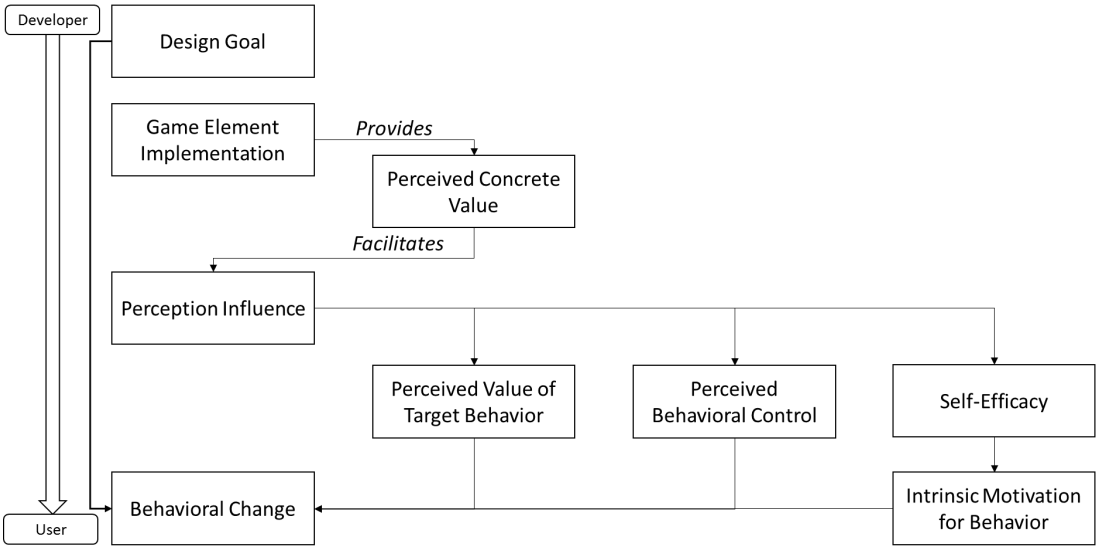

Figure 1. Exploratory and Explanatory Model of Gamification Effects.

The key process driving gamification's effectiveness has been argued for in this paper and is proposed as part of its theoretical definition presented here—that gamification influences users' perceptions of a target behavior or action in order to motivate engagement with that behavior/action. Game elements are used to provide users with concrete values in their engagement with the target behavior. This concrete value facilitates the influence of users' perception of the behavior by changing users' perceived value, perceived control of, and intrinsic motivation to carry out the behavior. These influences on users' perceptions potentially drive user engagement with the target behavior. Operationally, effective gamification would therefore occur when user perceptions of the value of engaging with target behavior become influenced, leading to an increase in the performance of target behavior.

5. Discussion and Conclusion

This paper has argued that gamification's effectiveness stems from its ability to influence users' perceptions of behavioral/activity value, and that the utilization of game design elements potentially motivates engagement with target behavior by influencing users' perception of the behavior. Through gamification, the effects of behaviors or activities appear immediate, and their value is perceptibly concrete to the user. By influencing perception of behavior, gamification therefore potentially creates

environments for self-motivated action. This approach and definition to gamification holds potential benefits both in theory development as well as in implementation of gamification.

In its current state, this concept is still in need of further development. Deeper analyses and testing will be necessary to investigate the validity of the suggestions laid out in this paper and to indicate its usefulness in gamification scholarship and its industrial application. For example, CET specifies that competence does not enhance intrinsic motivation unless accompanied by a sense of autonomy (Ryan & Deci, 2000). Would the use of gamification, which potentially creates a perceptibly external system of values to motivate action, reduce user feelings of autonomy—an internal perceived locus of causality? Future theoretical developments and implementations of gamification should take this into consideration. Future studies will also need to empirically test the premise that if users perceive the target behavior as possible and of concrete value, they should be more motivated to carry out these target actions. This can be carried out fairly simply through a pre-test questionnaire establishing users' base evaluations of a target behavior, having them undergo the gamification treatment, and then conducting a post-test that can be compared with users' pre-test attitudes and perceptions regarding the behavior. In addition, testing should be carried out to better understand the effects of influenced perceptions of hypotheticality. Further studies should be conducted to better understand whether the effects of perceived behavioral control and self-efficacy are additive or have separate and non-correlative effects, as well as to establish whether either of the two may be more effective.

While it perhaps raises more questions than answers, this paper's focus on perception influence in gamification practices and scholarship can serve as an important avenue for further discussion on gamification effects, and effective gamification. With the approaches and definitions set forth in this paper, perhaps more ground can be broken in order to better utilize the field that is gamification.

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