

Proposing a Research Model for Slot Machine Usage

Emergent Research Forum Paper

Claus-Peter H. Ernst

Frankfurt University of Applied Sciences
cernst@fb3.fra-uas.de

Christoph Hock

Johannes Gutenberg-Universität Mainz
chrihock@uni-mainz.de

Franz Rothlauf

Johannes Gutenberg-Universität Mainz
rothlauf@uni-mainz.de

Abstract

In this article, we combine the Technology Acceptance Model with social psychology research to propose a research model for slot machine usage. More specifically, we postulate positive influences of Perceived Usefulness, Perceived Enjoyment, Perceived Ease of Use, and Perceived Belonging on the Actual System Use of slot machines. Overall, we provide an interdisciplinary view on slot machine usage behavior that promises important practical implications for operators. Foremost, if confirmed, our hypotheses would suggest that operators need to focus on both utilitarian and hedonic aspects when designing/choosing their slot machines or gambling halls, and that they need to focus on factors driving people's Perceived Belonging, such as friendly waitpersons, in order to (indirectly) drive the usage of slot machines.

Keywords

Slot Machine, Technology Acceptance Model, Usage.

Introduction

In Germany, operators of slot machines, i.e., machines that enable users to bet on games of chance after inserting a certain amount money (also known as fruit machines, one-armed bandits, etc.), face increasing legal restrictions that threaten their businesses (e.g., SpielV 2013). We seek to identify potential influence factors of slot machine usage to provide the operators of slot machines with potential starting points for securing their businesses.

Despite numerous social psychology and medical studies researching general gambling behavior, addiction, etc., knowledge of the influence factors of slot machine usage behavior from a technology's point of view is still absent. Hence, we combine social psychology research and the *Technology Acceptance Model* (TAM) (Davis et al. 1989) in order to study these influence factors. By and large, we postulate that *Perceived Usefulness*, *Perceived Enjoyment*, *Perceived Ease of Use*, and *Perceived Belonging* have a positive influence on slot machine usage.

The next section presents the theoretical foundations of both the TAM and *Perceived Belonging*. Following this, we present our research model. Finally, we outline the planned empirical evaluation of our model as well as provide insights into the contribution of this study to the field, as well as the potential practical implications of our results.

Theoretical Background

The Technology Acceptance Model

The *Technology Acceptance Model* (TAM) (Davis et al. 1989) has been used in numerous research articles (Chang et al. 2010) and thus acquired a prominent status in IS literature. It postulates that two personal beliefs, *Perceived Usefulness* and *Perceived Ease of Use*, which are influenced by external factors and

system-specific factors, predict the *Actual System Use* of a technology (see Table 1 for classic definitions of TAM's initial constructs).

Construct	Definition
Actual System Use	Refers to a person's actual use of a technology (Straub et al. 1995).
Perceived Ease of Use	"[T]he degree to which a person believes that using a particular system would be free of effort" (Davis 1989, p. 320).
Perceived Usefulness	"[T]he degree to which a person believes that using a particular system would enhance his or her job [and task] performance" (Davis 1989, p. 320).

Table 1. Definitions of TAM's Constructs

The TAM was initially created to study information technologies designed for work environments, which naturally "aim to provide instrumental value to the user" (Van der Heijden 2004, p. 696) and are called utilitarian systems. Consistent with this utilitarian context, *Perceived Usefulness* centers on the motivations and benefits that are external to the system-user interaction itself, such as writing a text or winning money, referred to as extrinsic motivations (Brief and Aldag 1977; Van der Heijden 2004).

Despite this initial focus, the TAM was also used to study the usage of hedonic information technologies (e.g., video games) that "aim to provide self-fulfilling value to the user, ... [which] is a function of the degree to which the user experiences fun when using the system" (Van der Heijden 2004, p. 696). Hence, the initial TAM was extended to include a new construct called *Perceived Enjoyment*, reflecting the hedonic systems' intrinsic motivations such as fun, enjoyment, and other positive experiences, which stem directly from the system-user interaction (Brief and Aldag 1977; Van der Heijden 2004).

Finally, TAM was used to explain the usage of dual technologies such as shopping websites (e.g., Chesney 2006). Consistent with the fact that these technologies are enjoyable to use and provide external benefits, both *Perceived Usefulness* and *Perceived Enjoyment* have been found to have an influence on the usage of such technologies (e.g., Childers et al. 2001). As an example, shopping websites like *Amazon.com* provide a utilitarian benefit to their users: indeed, they enable users to order goods. In addition, such websites also provide hedonic values through additional functionalities such as the possibility to pre-listen to music or to view movie trailers (Childers et al. 2001). Studies that consider the usage of dual technologies are nevertheless still sparse.

Perceived Belonging

Belonging to a group probably has an evolutionary basis: indeed, it once provided benefits in terms of survival and breeding (Baumeister and Leary 1995). For example, hunting large animals for food or defending against threats was a much easier and less dangerous task to accomplish as a group of individuals than as a single isolated individual. Similarly, people today depend on the establishment and maintenance of social relationships as potential support resources (Barrera 1986), providing them with practical benefits. Furthermore, as found in multiple studies, the feeling of belonging is positively linked to hedonic well-being, represented by the presence of positive hedonic feelings such as enjoyment, happiness, and pleasure, with socially isolated people suffering more from psychological problems and illnesses (Baumeister and Leary 1995; Berkman and Syme 1978; LaVeist et al. 1997; Rook 1984).

In summary, belonging to a group provides individuals with practical benefits as well as hedonic feelings. Consistently, it has been shown in a *Social Network Site* context that *Perceived Belonging*, the degree to which a person feels connected to and accepted by other individuals (Baumeister and Leary 1995; Ernst et al. 2013b; Maslow 1943; Sheldon et al. 2011; Watson and Johnson 1972), is able to exert a positive influence on the *Perceived Usefulness* and *Perceived Enjoyment* of technologies (Ernst et al. 2013b).

Research Model

In the following section, we will first present our research model in Figure 1 (cf. Ernst et al. 2013b) and then we will outline our corresponding hypotheses.

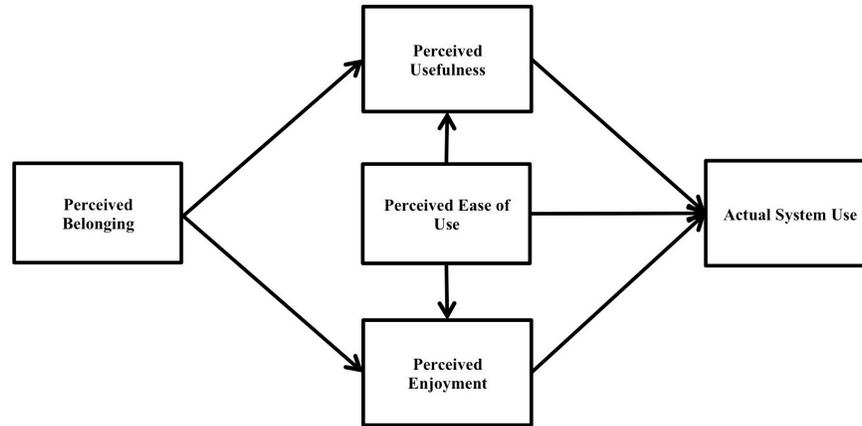


Figure 1. Research Model

Basic TAM Relationships

Perceived Usefulness

As described before, *Perceived Usefulness* centers on motivations and benefits that are external to the system-user interaction itself (Brief and Aldag 1977; Van der Heijden 2004); the potential external benefits of slot machines are monetary gains. However, on average, gamblers lose money while playing with slot machines since the expected value of gambling is always negative with the odds working for the slot machine operator. Hence, at first sight, slot machines do not provide any objective external benefits for rational players. Still, we argue that *Perceived Usefulness* is in fact an important influence factor of slot machine usage since it can be driven by erroneous beliefs and cognitive distortions regarding the true chance of winning (Clark 2010; Joukhador et al. 2004):

First, due to the *Illusion of Control* [the “expectancy of a personal success probability inappropriately higher than the objective probability would warrant” (Langer 1975, p. 311)], many gamblers believe in the chance of influencing the gambling outcome, even in games of pure chance (Walker and Phil. 1992). For example, Henslin (1967) found that dice players in Las Vegas acted as if their particular behavior could control the outcome of the toss such as carefully throwing the dice if lower numbers were required. Furthermore, external factors such as using a particular slot machine or playing a preferred game foster the *Illusion of Control* (Griffiths 1994; Walker and Phil. 1992).

Second, *Near Misses* (failures that are close to being successful) lead slot machine gamblers to believe that they are “not persistently losing but constantly [nearly] winning” (Griffiths 1990, p. 203). These occur, for example, if the slot machine’s pay line displays two identical symbols with the third identical symbol coming into view but not aligning with the other two. In a game of skill such as archery, a *Near Miss* usually provides useful feedback, indicating that success is within touching distance and, hence, encouraging the player to continue playing. However, a *Near Miss* in games of pure chance provides absolutely no information about the future likelihood of success. Still, people become encouraged to continue gambling (Reid 1986), since they interpret a *Near Miss* as evidence that they are mastering the game (Clark 2010).

Finally, the gambling environment can foster false beliefs regarding winning chances. Within a gambling hall that holds multiple slot machines, the sound that indicates wins occurs regularly and everybody notices it (in contrast, losing a game is usually not indicated by an accompanying sound). As a result, a gambler’s perception becomes significantly influenced by the delusion that winning money is common (Parke and Griffiths 2006).

In summary, although the expected value of gambling is always negative, gamblers can hold a set of false beliefs with regards to slot machine gambling that makes them believe they might actually win money. Hence, from a TAM’s point of view, people can potentially attribute an external benefit to slot machines, i.e., monetary gains, making the machines at least partly utilitarian technologies. Drawing from Davis et al. (1989) and numerous subsequent TAM studies, we hypothesize that:

H1: *There is a positive relationship between the Perceived Usefulness of a slot machine and its Actual System Use.*

Perceived Enjoyment

Gambling machines are also designed to entertain people, making them also partly hedonic technologies (Van der Heijden 2004). More specifically, sound, light and color effects, game naming, as well as the atmosphere and design of gambling halls give the impression of a fun and exciting environment (e.g., Johnson et al. 2004; Parke and Griffiths 2006):

Once a gambler has chosen a slot machine and starts to play, sounds underline each and every move (except in the case of a loss). The sound of success is addictive and the music of slot machines may act as a reinforcer. Also, slot machines employ light and color effects with red as the predominant color being used, due to its *stimulating* and *exciting* effect. These light and color effects influence gamblers' performances and arousal levels and reinforce their attention towards the game. Another stimulating factor originates in the *psychology of naming*. The names of games are mostly money related (e.g., *Gold of Persia*, *Dazzling Diamonds*, *Cash Fruits*, *Dragon's Treasure*); other titles mediate fancy impressions (e.g., *Ultra Hot Deluxe*, *Blazing Stars*, *Rainbow King*, *Hollywood Star*). Finally, the atmosphere and design of gambling halls are intended to support the enjoyment of the overall gambling experience: seating comfort, cleanliness, lighting, decoration and the serving of free drinks and snacks are common.

In summary, slot machines and the gambling environment are intended to provide gamblers with a fun and fascinating gambling experience. Drawing from Van der Heijden (2004) and numerous other TAM studies, we hypothesize that:

H2: *There is a positive relationship between the Perceived Enjoyment of a slot machine and its Actual System Use.*

Perceived Ease of Use

Although many different games are available, the handling and rules of different slot machines are almost identical, with differences being mostly limited to their name, layout and design (cf. Griffiths 1990). Generally, users only have to insert money and start a game; payouts are fulfilled automatically. In line with the initial TAM and multiple extensions and modifications, the *Perceived Ease of Use* of a technology is commonly accepted to be an important antecedent of *Perceived Usefulness* and *Actual System Use* (e.g., Davis et al. 1989). Also, multiple studies confirm that *Perceived Ease of Use* has a significant positive influence on *Perceived Enjoyment* since an easy-to-use system saves time for the user, thus allowing him/her to spend more time enjoying the experience of it (e.g., Van der Heijden 2004). We hypothesize that:

H3: *There is a positive relationship between the Perceived Ease of Use of a slot machine and its Actual System Use.*

H4: *There is a positive relationship between the Perceived Ease of Use of a slot machine and its Perceived Usefulness.*

H5: *There is a positive relationship between the Perceived Ease of Use of a slot machine and its Perceived Enjoyment.*

The Influence of Perceived Belonging

Social rewards are known as a primary motivation for gambling (Griffiths 1999). For example, Griffiths (1990) found in a sample of fifty slot machine players that 82 percent viewed the game as a social activity, with 30 percent naming *to meet friends* as their reason for gambling. Consistently, Clark (2010) argues that gambling is a form of socializing, which is able to help people feel that they belong and to help them deal with loneliness.

In line with these findings, we argue that playing slot machines is capable of making people feel that they belong: First, the physical environment of slot machines (i.e., the gambling hall) is able to give gamblers a feeling of belongingness due to the presence of other visitors as well as the waitpersons.

Second, consistent with the concept of *parasocial human-computer interaction* (Nass et al. 1996; Parke and Griffiths 2006), gamblers can become emotionally attached to the slot machine itself, seeing it as an *electronic friend* or *teammate* due to a humanization of the machine, and, hence, responding to it in much the same way that individuals respond to other human beings. Indeed, Walker and Phil. (1992) found that many gamblers frequently talked to their slot machines to “persuade” them to provide a beneficial outcome (e.g., “C'mon baby!”, “You owe me!”). Furthermore, they found that many slot machine gamblers have their favorite machine, whose performance is perceived as being better, friendlier, and more cooperative (Nass et al. 1996).

As discussed before, belonging to a group generally provides individuals with practical benefits as well as hedonic feelings. Consistently with this, it has been shown that *Perceived Belonging* can exert a positive influence on the *Perceived Usefulness* and *Perceived Enjoyment* of technologies (Ernst et al. 2013b). We hypothesize that:

H6: *There is a positive relationship between the Perceived Belonging within a slot machine’s context and the Perceived Usefulness of the machine.*

H7: *There is a positive relationship between the Perceived Belonging within a slot machine’s context and the Perceived Enjoyment of the machine.*

Outlook

In this article, we combined insights from social psychology research with those of the TAM in order to provide an interdisciplinary research model addressing slot machine usage. More specifically, we postulated an (indirect) positive influence of *Perceived Belonging* on slot machine usage and also contributed to the field by arguing that slot machines are dual technologies, i.e., technologies that provide people with utilitarian as well as hedonic benefits (cf. Ernst et al. 2013a) that, consequently, are also driven by both *Perceived Usefulness* and *Perceived Enjoyment* (as well as *Perceived Ease of Use*).

This interdisciplinary view on slot machine usage behavior promises important practical implications for operators. For example, if confirmed, our hypotheses would suggest that they need to focus on both utilitarian and hedonic factors when designing/choosing their slot machines as well as their gambling halls. Also, the confirmation of a positive influence of *Perceived Belonging* on slot machine usage would emphasize that operators need to focus on factors driving people’s belonging, such as the presence of friendly waitpersons in order to (indirectly) drive the usage of slot machines.

We plan to empirically evaluate our research model by using quantitative questionnaires based on proven scales and analyzing the collected data through a *structural equation modeling* approach. More specifically, we are in the process of talking with one of Germany’s leading slot machine operators in order to survey regular, occasional and first-time gamblers; for further variance within our dataset, we also plan to survey non-gamblers.

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