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A Whale of a Tale: Gaming Disorder and Spending and Their Associations With Ad Watching in Role-Playing and Loot-Box Gaming

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Abstract

Mobile games featuring the loot-box design are associated with gambling because of the uncertainty in the value of the purchase and the propensity for gamers to keep spending. Role-playing games (RPGs) have been associated with gaming disorders because of the addictiveness and immersion experienced by gamers. Advertisers have capitalized on this gaming trend by having gamers watch advertisements, often in return for earning in-game currency. In this study, we explored the intersection of role-playing and loot-box mobile gaming, in particular examining the association with gaming disorders and ad watching and the role of game spending. An online survey was conducted ($n = 595$) in which we recruited participants who play four popular loot-box RPGs on their mobile devices. In line with previous research, we found similarities between these players and those with disordered gaming and an association with increased game and gaming involvement. We found that different spending habits based on gamer classifications have unexpected associations with the willingness of gamers to watch ads. Our results have implications for loot-box gamers, game designers, and advertisers, as we believe that addicted loot-box gamers, because of the association between loot-box games and gambling, may be experiencing a form of morbidity and that these gamers may be more susceptible to such addictions.

Keywords: loot box, problematic gaming, addiction, gambling, advertising

Résumé

Les jeux mobiles comportant un coffre à butin sont associés à la pratique des jeux vidéo en raison de l'incertitude liée à la valeur de l'achat, et la propension des joueurs

à continuer de dépenser. Les jeux de rôle ont été liés au jeu compulsif en raison de la dépendance et de l'immersion des joueurs. Les annonceurs profitent de cette tendance au jeu en forçant les joueurs à regarder fréquemment des annonces afin d'obtenir de la monnaie du jeu en question. Cette recherche se penche sur le point d'intersection du jeu de rôle et du coffre à butin dans les jeux mobiles, et particulièrement sur l'association à des troubles liés au jeu, à la visualisation d'annonces et au rôle des dépenses en jeu. Un sondage en ligne a été mené ($n = 595$) en recrutant les participants parmi les personnes qui jouent sur leur appareil mobile à quatre jeux de rôle prisés offrant un coffre à butin. Tout comme dans les recherches précédentes, nous avons constaté des similarités avec le jeu compulsif et leur association à l'augmentation des jeux et de la pratique du jeu. Nous avons également constaté que différentes habitudes de dépenses fondées sur la classification des joueurs sont liées de manière inattendue au consentement des joueurs à regarder des annonces. Nos résultats comportent des implications pour les joueurs de jeux offrant un coffre à butin, les développeurs de jeux et les annonceurs, car nous sommes convaincus que les joueurs dépendants qui jouent à des jeux offrant un coffre à butin pourraient souffrir d'une forme de morbidité, et qu'ils pourraient être plus susceptibles à de telles dépendances.

Introduction

In 2017, a Reddit user *nothing024* posted a cautionary story about his experience playing the mobile video game *Final Fantasy: Brave Exvius*. As an adult with a demanding job and a family, he found that he could not play traditional video games much anymore and *Final Fantasy: Brave Exvius* seemed like the perfect solution—it allowed him to play on the go and, for a small price, he could try to “summon” or gamble nostalgically for his favourite characters from traditional *Final Fantasy* games.

Over the course of a year, those small amounts added up to \$16,000. In his Reddit post, he acknowledged that he had likely ruined his marriage, his relationship with his children, and his bank account. In one anecdote, he described being on a family vacation and spending the vacation glued to the phone, summoning wildly for a hotly anticipated unit and spending nearly \$2,500 that afternoon alone (Tim, 2017).

The loot-box design of video games has been linked to gambling addictions (Zendle & Bowden-Jones, 2019). The role-playing game (RPG) genre in particular often places the gamer in the role of a protagonist character; hence, the player ends up making an emotional investment in the character, which could lead to problematic use when games lack a definitive end (Yee, 2006). As little research has been done to investigate mobile RPGs and loot-box games (Britt & Britt, 2020), in our study, we tested the impact of how such engaging and gambling-designed games may have an

effect on those who have a gaming disorder. We also examined how gamers in such games may be more susceptible to advertising promotions for in-game currency to enrich their game play.

Mobile Gaming

The mobile app market recorded over \$60 billion in revenue in which mobile game apps single-handedly accounted for \$48.3 billion (82%) of the revenue (Nelson, 2018). The adoption of mobile games is thought to stem from social gratification (Wei & Lu, 2014) derived from the social connections made through an online gaming world. The revenue-generating models for mobile games are broken down into three broad categories: (1) downloads, (2) in-game purchases, and (3) advertising (Balakrishnan & Griffiths, 2018). In-game purchases have often been popular in mobile gaming, as a gamer can spend a dollar to purchase an extra life in a game or 10 dollars to purchase a cosmetic outfit or skin (Wardle, 2019).

In particular, free-to-play (F2P) games have been particularly profitable for developers. For F2P games, although the game is free to play, some areas, activities, or content may be inaccessible without micro-transactions. All the games examined in the present study are considered F2P. Yet it is worth noting that regardless of the success of the F2P financial model, the vast majority of such games receive little or no revenue (Pinchefsky, 2013). The model behind such games is that although the game is free to download and play, developers create areas in the game that are gated behind a paywall (Tom, 2015). Monetization strategies often occur through the loot boxes, which has associations with gambling and problematic gaming (Brooks & Clark, 2019).

F2P games tend to be structured to limit time and/or resources. This structure allows them to provide options to monetize (Hamari & Järvinen 2011; Hamari & Lehdonvirta 2010). Many such games include a stamina component, wherein players can attempt only a certain number of activities before having to wait minutes or hours before they can play again (Perreault & Perreault, 2020a). Conversely, the game typically offers opportunities to pay money in order to continue playing through micro-transactions.

Such games are typically designed with metrics in mind, using statistics to determine which content and features are most popular (Paavilainen et al., 2013). The player base is cultivated to optimize spending; fan communities are often seen as an avenue to cultivate that audience (Perreault & Perreault, 2020a), often with strategic communicators empathizing with players on everything from in-game drop rates (Perreault & Perreault, 2020a) to issues outside of the game (e.g., criticism of the gaming community; Perreault & Perreault, 2020b). One funding model, which is found in the games in this study, targets players who spend inordinate amounts of money. These are the high rollers, those who represent the “smaller than expected segment of the customer base” who “might be influencing how successful or profitable a gambling service is” (Tom et al., 2014, p. 94). These groups of gamers

are commonly referred to by using a fishing analogy: *Whales* are players who spend a significant amount of money in the game (Alha et al., 2014). These players typically spend what they can to achieve their desired outcome in the game. This analogy is extended in gaming parlance, so that those who have decreased spending habits use self-ascribed group terms such as *dolphins*, those who spend money but less than whales do, and *minnows*, those who spend almost nothing. These spending habits/characterizations are self-perceived as opposed to being rooted in actual numerical spending. In other words, a person who spends \$20 a month may consider himself a whale, given that \$20 is a substantial investment for him financially and this spending enables him to accomplish his goals. Yet others might consider their own investment of \$20 as more of a minnow spending habit, given that they can afford substantially more. These perceptions indicate that these spending habits are contextual—as are the dangers associated with them.

The monetization in games change depending on the customer base and player types (Civlek et al., 2018). Game companies are often aware of many copycat games in the market and attempt to design a game to keep their players playing regardless of their status as non-paying, minnows, dolphins, or whales by providing numerous activities so that they feel that they have accomplished something during their session, such as beating levels and earning skins—or outfits—for their characters (Wardle, 2019). Hence, developers introduce mechanics such as challenges, as they hope to keep the whales continually spending while enticing non-payers to play, and consider spending, through continual use of ad watching for in-game currency.

Gaming Disorder

Certain genres of games create more susceptibility to gaming disorders than others do (Lemmens & Hendriks, 2016). Gaming disorder shares roots with internet disorders whereby users do not regulate the amount of time that they spend online. However, in mobile games, such disorders manifest not only through the amount of time spent in a game, but also in other ways, such as changing habits and sleep patterns (Peracchia & Curcio, 2018) to accommodate gameplay. The World Health Organization recognizes gaming disorder as an International Classification of Disease, defining it as

a pattern of gaming behavior ... characterized by impaired control over gaming, increasing priority given to gaming over other activities to the extent that gaming takes precedence over other interests and daily activities, and continuation or escalation of gaming despite the occurrence of negative consequences. (2018)

However, gaming disorder can take different forms depending on the game itself. In the current study with mobile RPG loot-box gaming, disordered gamers revolve their life activities around the game, for example, having sleep scheduled around stamina refreshes: setting an alarm for 3 a.m. to ensure that their stamina points are not wasted, hence perpetuating the disorder in this manner. Gamers often describe being

motivated to play as a result of “socialization/friendships, the opportunity to exert control in their lives, enjoyment, inspiring creativity, discovering a sense of community, challenge, and relaxation” but also simply because they wanted to “fill idle time and ... were too tired/lazy/unable to do anything else” (Shi et al., 2019, p. 297).

Gamers who experience problems with games are more likely to be found among those who play online RPGs (Kuss et al., 2012) because of the time investment and immersion of such games. In particular, immersion in the role-playing world has two distinctive features. First, such games often feature a distinct storyline that helps keep the gamer immersed. Second, the never-ending concept of the game helps create a sense of continuity, such that a gamer’s resources (e.g., characters, equipment, gold) are saved in the game’s server. Hence, each session is a continuation of their journey in the game with the resources and accomplishments that they have already earned. Thus, spending more money in the game helps build up the longevity of the possessions that the gamer has in the game.

Previous research has shown that problematic gamers spend less money when there are fewer loot boxes to buy in a game (Zendle, 2019); thus, having more opportunity to spend could be part of the problem. In addition, researchers have found that gamers who are more likely to pay money in loot boxes are often more susceptible to problematic gaming (Zendle, Cairns, et al., 2020). But problematic gaming is a behaviour that has a theoretical root in concerns regarding attitude and behaviour.

Attitudes and Behaviour

To better understand such problematic gaming and spending, we must first consider attitudes. Attitudes are often identified as a key indicator for predicting behavioural intentions and behaviour (Ajzen, 1985, 1991). An attitude can be defined as a “relatively stable tendency to respond to people, concepts, and events in an evaluative way” (American Psychological Association, 2017). One’s attitude is based on one’s belief regarding the outcome of a behaviour, whereby a positive attitude often results in a greater likelihood of the intent of performing the behaviour (Ajzen, 1991). In other words, attitudes are relevant for determining the ways in which a mobile game player might evaluate a loot-box game and act on it.

According to Katz (1960), attitudes serve functions in order to meet an individual’s psychological needs. The functions of attitudes can be broadly categorized into four areas: utilitarian, ego defensive, self-expressive, and knowledge. The utilitarian function of attitudes helps people evaluate the positive and negative benefits of a behaviour, the ego defensive function helps people articulate and focus on their core beliefs as persons, the value expressive function consists of attitudes that people hold that allow them to express themselves to others, and the knowledge function is often used to help people make sense of the world around them (Katz, 1960). The functions of attitudes vary from individual to individual, the three sources of variations attributed to attitude functions being personal characteristics, domain characteristics, and situation characteristics (Herek, 1987). Previous research on

mobile gaming has demonstrated the utility of considering the effects of attitude in conceptualizing mobile game play (Yang et al., 2014; Youm, 2017).

Loot-box Gaming and Gambling

Loot-box games essentially turn a micro-transaction purchase into gambling (Zendle & Bowden-Jones, 2019), preying on the psychological weaknesses of players (King & Delfabbro, 2018). Loot boxes are widely considered to be a form of gambling (Britt & Britt, 2020; Brooks & Clark, 2019), primarily because of the randomized items that gamers can acquire in a loot box. In 2017, legislators created rules that govern and legislate what they consider as gambling in such games (Good, 2018). The similarity to gambling in loot-box games revolves around gamers continually making loot-box purchases.

As Zendle Meyer, et al. (2020) note, the majority of top-grossing mobile games—59% of Android games and 59% of iPhone games—feature loot boxes. Hence, it is no surprise that a large portion of gamers—56% in one study—have purchased loot boxes (Kristiansen & Severin, 2020). A typical loot box purchase yields an assortment of in-game items that the gamer can use, with the most sought-after items often being more rarely acquired, with chances of 5% or less, depending on the game. Gamers seeking to obtain a particular item are forced to purchase loot box after loot box until they are lucky enough to acquire the item that they desire, thus potentially spending a lot of currency and/or money. In a sense, loot boxes could be considered a “gateway activity” for many that can be harmful and can “normalise gambling” (Wardle, 2019, p. 1110). Worth noting, however, is that some research indicates that it is not so much the gaming, but the loot box that is the problem. Macey and Hamari (2018) found that gaming habits had the least influence—among numerous other factors—on gambling. It could be that “video games are simply a vehicle, like many other activities, employed to fulfil particular needs derived from the activity of gambling” (Macey & Hamari, 2018, p. 351). Such needs include the need to satisfy social pressure within a community (Zendle et al., 2019). The factors that put one at risk include “having a lower income, being younger, not being married” and being employed (Turner et al., 2018, p. 106).

Advertising in Mobile Games

In-game advertising (IGA) has for many years run into problems because of the difficulty in strategically placing content without interrupting the user’s enjoyment of the game; it has been a model of failure by game users. Reports have shown that mobile in-game video ads for rewards have been preferred by developers, as they also provide a significant portion of revenue for mobile games (Tran, 2017). In addition, 70% of users would rather watch ads than pay for content in the games they play (Shaul, 2016).

Mobile game advertising can be broadly defined by three distinct categories: (1) IGA, (2) advergaming, and (3) advertising in social network games (Terlutter &

Capella, 2013). For IGA, advertising elements are found in the construct of the game, whereas advergames are often games that comprise sponsored content developed by an advertiser, and advertising in social network games often incorporates real-world brand companies that sponsor certain aspects of a social game to have their brand name displayed. Unlike traditional mobile advertising, which has high annoyance factors leading to users seeking to hit the “X” and close the ad, the premise of mobile game ads is to reduce intrusiveness and to help the players in their gaming experience (eMarketer, 2015).

Compared with traditional advertising, video games as a vehicle of advertising have been more effective in implicit memory, leading to better brand recall (Yang et al., 2006). As a result of the rise in video advertising—33% of revenue in the mobile app industry (Koestier, 2017)—advertising has shifted the way that companies reach an audience via mobile gaming because of more powerful cell networks and devices. An increasingly popular model is to offer ads that can be watched in exchange for in-game currency in mobile gaming.

No previous research has been done on the role of advertising in mobile game purchasing habits that we could identify. Considering that in-game currency increases at a fixed rate in the game, we would expect players who do not spend as much money to be more willing to spend more time watching ads as an alternative way to earn currency. Conversely, we would expect players who spend money to purchase currency to be less likely to watch ads. With all of this in mind, we posed the following hypotheses and research questions:

H1: Gamers with higher spending habits in the game will show a more positive attitude towards the game.

H2: Higher spending habits in the game will predict a greater amount of time spent in the game.

H3: Gamers with higher spending habits in the game will show less willingness to watch ads for in-game currency.

H4: Gamers with higher spending habits in the game will show greater involvement in the game.

H5: Gamers with higher spending habits in the game will show a greater level of gaming disorder.

H6a: A more positive attitude towards the game will result in ad watching for in-game currency.

H6b: A more positive attitude towards advertising will result in ad watching for in-game currency.

H6c: Higher involvement in the game will result in ad watching for in-game currency.

H6d: Higher gaming disorder will result in ad watching for in-game currency.

RQ1a: Is there a difference in time spent between the four RPG mobile games?

RQ1b: Is there a difference in willingness to watch ads in the four RPG mobile games?

Method

Data Collection and Participants

Data collection was conducted via an online survey with Qualtrics. Respondents were recruited online from the subreddits of four mobile games that featured the loot-box system: *Brave Frontier*, *Final Fantasy Record Keeper*, *Fire Emblem Heroes*, and *Fire Fantasy Brave Exvius*. A new thread was created in each of the subreddits to invite players from these games to complete the survey. No incentives were offered.

Given that the mechanics of each game differ slightly because of the game objectives and play style, the games were selected to capture the similarities between user experiences in this genre of mobile games. These games revolve around the mechanics whereby most of the collectible items/units in the game are locked behind loot boxes. To acquire an item, a gamer needs to spend currency or money to purchase a loot box in the game. The items in this loot box vary in rarity (common, uncommon, rare, ultra rare), making acquiring rare items in the game a function of luck or spending a large amount of currency.

Overall, 595 participants from the United States answered the survey from the four subreddits. Of these, 90.6% were men, 80.7% were single, and 47.6% were students. The dominantly male response rate is more representative of Reddit's userbase than of gaming itself, which has become increasingly heterogeneous. The mean income of the participants was \$50,000 to \$54,999. The mean age group was 18–25 years, which accounted for 49.7% of the respondents.

The survey first inquired about the amount of time and money that the respondents spend in the game they play before asking several questions about their attitude towards the game, followed by gaming disorder and involvement measures. Respondents were also asked about how much time they were willing to spend watching ads in the game. Finally, they were asked several questions about advertising attitudes, followed by demographic questions.

Measures

Game Involvement

Game involvement was measured with an index of six items. Participants were asked to characterize their involvement based on a 7-point bipolar scale. The six dimensions that were included in this index were “Unimportant-Important,”

“Irrelevant-Relevant,” “Means nothing – Means a lot,” “Worthless-Valuable,” “Doesn’t matter-Matters,” and “Undesirable-Desirable” (Cronbach’s $\alpha = .88$).

Gaming Disorder

Gaming disorder was measured with an adaptation of constructs from the Internet Gaming Disorder scale (Lemmens et al., 2015), as well as with sleep regulation questions (Perrachia & Curcio, 2018). Sample questions included, “This game is addictive,” “I feel I can get away from this game at any time,” “This game regulates my sleep cycle,” and “I hate missing out on resources in this game” (Cronbach’s $\alpha = .60$).

Spending Habits (Gamer Classification)

Spending habits (gamer classification) were calculated with the item, “Thinking about the last 30 days, how much money do you think you have spent in this game?” As a gaming classification scale has not been established, a 5-point scale was used to capture estimated spending, with responses including (1) Not at all, (2) A little, (3) A moderate amount, (4) A lot, and (5) A great deal. The following categories were assigned to the participants on the basis of their responses: Minnow = (1), Dolphin = (2 and 3), Whale = (4 and 5). It is worth noting that the characterizations that this scale points to—minnow, dolphin, whale—are self-ascribed identities. Although the participants were not asked about the terms minnows, dolphins, and whales directly, this question and its responses were designed to correspond with the admittedly fluid but culturally engrained understanding of the terms. Hence, the classification of type of spending is based on self-perception for this survey as opposed to hard numbers. This is important because spending habits and characterizations are contextual anyway—one gamer may have the financial ability to spend \$1,000 a month, but it is a much smaller part of their salary than it is for someone with much less financial means. In other words, one person’s minnow may be another person’s whale, and given this reality, we decided to base the survey results on self-perception and context. From this classification, we had 276 minnows, 226 dolphins, and 92 whales, which fits the inverted pyramid structure of games that have mostly minnows and a smaller group of whales (Bilas, 2015). It is worth noting that these spending habit measures are self-perceived, given that (1) we were unable to confirm the participants’ spending and (2) the nature of spending has different implications depending on a person’s financial context.

Attitude Towards the Game

Attitude towards the game was measured by using an index of seven items. Participants were asked about their attitude towards the game and presented with seven pairs of items based on a semantic differential 7-point scale: “Bad-good,” “Unfavorable-favorable,” “Dislike-like,” “Boring-interesting,” “Unpleasant-pleasant,” “Unappealing-appealing,” and “Unattractive-attractive” (Cronbach’s $\alpha = .91$).

Attitudes Towards Advertising

Attitudes towards advertising were measured with an index of 12 item, the last three of which were reverse coded: “We can depend on getting truth in most advertising,” “Advertising’s aim is to inform the consumer,” “I believe advertising is informative,” “Advertising is generally truthful,” “Advertising is a reliable source of information about the quality and performance of products,” “Advertising is truth well told,” “In general, advertising presents a true picture of the product being advertised,” “I feel I’ve accurately informed after viewing most advertisements,” “Most advertising provides consumers with essential information,” “Advertising is a nuisance,” “I do not get any information from advertising,” and “Advertising interrupts what I am doing.” This was measured on a 5-point scale from 1 = *Strongly disagree* to 5 = *Strongly agree* (Cronbach’s $\alpha = .90$).

Time Spent Playing the Game

Time spent playing the game was measured by a single item: “Thinking about the last 30 days, how much time have you spent daily (on average) in the game?” This was measured on a 5-point scale, with responses including (1) Not at all, (2) A little, (3) A moderate amount, (4) A lot, and (5) A great deal. As with money spent, this question was put in a contextual frame to allow players to self-assess their commitment level: 10 hours a week may be a small commitment for someone with few other time commitments, but a substantial commitment for others.

Watching Ads for Currency

Watching ads for currency was measured by a single item. The question was how long the respondent would be willing to watch an ad in order to obtain in-game currency, and the scale was from 0 to 20 min.

Results

The first step of this study was to determine whether there were significant differences in our three dependent variables of interest: amount of time spent in the game (Table 1) willingness to watch ads (Table 2), and differences in these variables in the

Table 1

Descriptive Statistics of Time Spent in Game for the Last 30 Days by Game

Game	N	Mean	SD
<i>Brave Frontier</i>	95	3.32	.11
<i>Final Fantasy Record Keeper</i>	102	3.09	.11
<i>Final Fantasy: Brave Exvius</i>	155	3.21	.09
<i>Fire Emblem Heroes</i>	234	3.32	.07
All games (total)	595	3.25	1.10

Table 2

Descriptive Statistics of Willingness to Watch Advertisements for In-Game Currency by Game

Game	<i>N</i>	Mean	<i>SD</i>
<i>Brave Frontier</i>	91	6.25	7.03
<i>Final Fantasy Record Keeper</i>	87	6.19	6.78
<i>Final Fantasy: Brave Exvius</i>	142	5.28	6.90
<i>Fire Emblem Heroes</i>	220	5.70	6.87
All games (total)	540	5.77	6.89

four games (RQ1a and RQ1b). A one-way analysis of variance was conducted for each of these variables. For time spent in the game over the last 30 days, no significant difference was found, $F(3, 591) = 1.28, p > .05$, between all four games, for which most players described their commitment as “moderate.” For amount of time spent watching ads for in-game currency, no significant difference was found, $F(3, 536) = .50, p > .05$, between all four games, with players answering 5 to 6 min on average as the maximum amount of time that they would watch an ad for currency.

Therefore, despite the four independent mobile games having different themes, we can generalize that the characteristics of the players of these RPG loot-box games, in terms of spending habits and propensity for ad watching, were fairly consistent. This finding also allowed us to proceed with the collapsed data from these mobile games, knowing that they are representative of all four player types. For the first five hypotheses, a one-way analysis of variance was computed to compare the relevant variables. Tukey’s HSD was used for significant results of the group comparisons that followed. A p -value of 0.5 was used to determine significance.

H1 predicted that the gamers with higher spending habits would be more likely to hold a more positive attitude towards the game in general. A significant difference was found among spending habits, $F(2, 587) = 3.74, p < .05$. This analysis revealed that minnows ($M = 5.67, SD = .92$) held a significantly less positive attitude towards the game than dolphins did ($M = 5.86, SD = .83$). There were no significant differences between whales ($M = 5.64, SD = .94$) with either of the other groups. Therefore, H1 was partially supported.

H2 predicted that the higher spending habits gamers have in the game, the more likely they will spend more time playing the game. A significant difference was found among spending habits, $F(2, 591) = 17.89, p < .001$. Whales ($M = 3.72, SD = .99$) were significantly more likely to spend more time playing the game than were minnows ($M = 2.94, SD = .12$) and dolphins ($M = 3.1, SD = 1.02$). There was no significant difference between minnows and dolphins. Therefore, H2 was partially supported.

H3 predicted that the more substantial a gamer’s spending habit, the less likely they would be to watch advertisements for in-game currency. A significant difference was

found among spending habits, $F(2, 536) = 6.46, p < .01$. This analysis revealed that minnows were in fact less likely to spend time watching ads ($M = 4.68, SD = 6.2$) than were dolphins ($M = 6.52, SD = 7.15$) or whales ($M = 7.27, SD = 7.71$). There was no significant difference between dolphins and whales in terms of their watching habits. Therefore, H3 was not supported, as the opposite was found: Whales and dolphins were more likely than minnows to spend time watching ads for in-game currency.

H4 predicted that the more substantial a gamer's spending habit, the more likely they would be to describe having a gaming disorder. A significant difference was found among spending habits, $F(2, 590) = 5.84, p < .01$. This analysis revealed that minnows ($M = 2.96, SD = .76$) had significantly less gaming disorder than whales did ($M = 3.26, SD = .75$). Dolphins ($M = 3.05, SD = .66$) also had significantly less gaming disorder than whales did ($M = 3.26, SD = .75$). There were no significant differences between minnows and dolphins. Therefore, H4 was supported.

H5 predicted that the more substantial a gamer's spending habit, the more likely they would be to have greater involvement in the game. A significant difference was found among spending habits, $F(2, 575) = 8.83, p < .001$. This analysis revealed that minnows ($M = 4.22, SD = 1.08$) had significantly less involvement in the game than whales did ($M = 4.61, SD = 1.09$). Dolphins ($M = 4.22, SD = 1.08$) also had significantly less involvement in the game than whales did ($M = 4.61, SD = 1.12$). There were no significant differences between dolphins and whales. Therefore, H5 was supported.

H6 considered how attitudes towards the game, attitudes towards advertising, involvement, and gaming disorder would sequentially predict in-game ad watching. A hierarchical regression analysis was conducted (Table 3), with the first block controlling for the effects of demographics: gender, age, income, and marital status. No significance was found. For the second block, attitudes were used as the next predictor because of the traditionally strong attitude on the behaviour continuum. We found that stronger attitudes towards the game did not result in greater ad watching for in-game currency. We found the same for attitudes towards advertising. Hence H6a and H6b were not supported. Finally, in Block 3, we used the predictors of involvement and gaming disorder and found that gaming disorder predicted ad watching for in-game currency, whereas involvement in the game did not. Thus, H6c was not supported but H6d was.

Discussion

In this study, we examined gamers who play RPG mobile games with a loot-box system in terms of their spending habits and advertising attitudes. In general, in all four games, players' time and money spent and their willingness to watch advertising for in-game currency remained consistent throughout, allowing us to demonstrate that there is a level of generalizability in the way that players of RPG loot-box mobile games respond and behave.

Table 3

Regression Analysis of Predictors for Amount of Time Willing to Spend Watching Ads for In-Game Currency

Variable	Model 1 Standard beta	Model 2 Standard beta	Model 3 Standard beta
Block 1: Demographics			
Gender: Female	-.02	-.01	-.02
Marital status: Married	.08	.07	.08
Income	.02	.02	.03
Age	-.10	-.09	-.10
Block 2: Attitudes			
Attitude towards game	---	.06	.05
Attitude towards advertising	---	.05	.02
Block 3: Gaming tendencies			
Involvement	---	---	.02
Gaming disorder	---	---	.13*
Incremental change in R^2 (%)	---	0.7	1.7*
R^2 (%)	1.0	1.7	3.4
Total adjusted R^2 (%)	0.1	0.0	1.2
$N = 365$			

A key finding of this study is that players who see themselves as the highest spenders—whales—are also the most likely to watch advertising for in-game currency. This expands what was reflected in the study by Tom et al. (2014): Heavy spenders not only make the game more profitable through their own spending, but they also help monetize advertising. This denotes that players who are willing to describe their financial investment in a game as “a great deal” are the sorts of players who are most invested in every aspect of the game. It is likely that the currency that they receive through IGA is minor in comparison with the currency that they receive through their pocketbook, but in a sense, these players have paid for the game and are thus committed to the game play—whatever that may entail.

Concerning player spending (minnows, dolphins, and whales), we were able to establish that players who spend more in the game typically hold a more positive attitude towards the game and spend more time playing the game. We anticipated that players with little spending in the game (minnows) were more likely to spend time watching ads to obtain game currency. Instead, we unexpectedly found that players who spend more in the game (dolphins and whales) were in fact more likely to watch advertisements for in-game currency. Players do not necessarily want to watch ads for free currency, but are more willing to do so if they are more invested in the game.

We see this demonstrated in the way that game spending affects their involvement in the game and self-reported gaming disorder. Players who spend more in the game are

typically more likely to report gaming disorder and are more highly involved in the game. Those who spend the most money in the game (whales) are mostly like to report gaming disorder and being involved players.

However, there were several unexpected findings related to advertising. Unlike previous research that describes the attitude-behaviour continuum in response to advertising and gaming inducements, in our study, attitudes towards advertising and towards the game were not at all predictive of whether people were willing to spend time watching advertising. This suggests that attitude alone may not always be the best predictor of ad watching. In addition, we found that the involvement of gamers was not predictive of how likely they are to watch ads for currency. It could be that—as Turner et al. (2018) reported—the risk factors of gambling such as being unmarried, having a lower income, and, ironically, being employed—correspond to those who are most invested in ad watching. Whales may not, after all, be those with the most money, but those who perceive themselves as spending the most money and thus are most interested in supplementing it by whatever means necessary. They do so more willingly (1) if they lack dependents who might be jeopardized by their spending and (2) if it is only a small amount at a time.

This result also reflects the finding of Zendle et al. (2019) regarding the lack of motivation to profit from loot-box gaming. Rather, the potential of social pressure to promote both spending and ad watching seems likely, as gamers are motivated to keep up with the rest of their community.

That said, gaming disorder alone predicted how likely gamers were to watch ads. This finding implies an association between the nature of wanting to acquire more in-game currency and ad watching. Notably, in this genre of gaming, with such a strong association with gambling (Brooks & Clark, 2019; Turner et al., 2018), it is interesting to see the potential implications of advertisers targeting a vulnerable public, players with gaming disorders who are enjoying a game type that may constitute gambling. Because gambling addictions typically suggest a lack of volitional control, in order to earn the currency in the games that they are addicted to, gamers may be willing to engage in behaviour that may normally be considered annoying (e.g., ad watching).

Mobile gamers must play more or spend more—or both—in order to reach certain objectives (Alha et al., 2016), and one can see how this gameplay system would be especially appealing to those who self-report gaming disorder. If likened to substance-related addictions as suggested by Kuss and Griffiths (2012), achieving objectives or gathering items or units is the “buzz” that keeps players motivated. Together, these observations indicate a rather complex relationship that loot-box gamers have in terms of mobile games, their involvement in these games, and the central nature of advertising in their gaming social circles (Zendle et al., 2019). The moderating effect of involvement indicates that attitudes alone may not be sufficient to predict behaviour in the traditional sense. Our findings not only undermine this traditional notion, but they also show that it may be the gambling nature of the game

that predicts behaviour, as playing it is equivalent to gambling for a chance to get something rare that players want in the game. The power of involvement as shown in our study may indicate that the gamers are more intent on playing for the gambling component of the game as opposed to other content that the game offers.

Although we expected to show that casual players would take advantage of ads to make up for money that they are not willing to spend in the game, we found the inverse: Those who spent the most money were in fact more involved in such games and were more willing to watch advertisements. This finding may suggest that because of their involvement in the game, disordered gamers will find alternative ways to get just “one more roll of the dice” to earn currency in order to open more loot boxes.

This leaves us to consider whether mobile games may be multidimensional in ways that can be explored. The strong association between involvement and gaming disorder in this study seems to suggest a lack of volitional behaviour. We wonder whether this in fact reveals that the different dimensions of the game design should be considered. These games have a component that involves adventure and goal-oriented themes like most other games. Gamers may derive satisfaction when finishing objectives. However, the role of gaming disorder in our study suggests the possibility that users are instead drawn to the gambling mechanism from which they derive their satisfaction with the game (Macey & Hamari, 2018). This offers a uniquely different proposition about how and why advertising may work in these games.

Limitations and Future Research

Although we feel that this study makes a substantial contribution to our understanding of both advertising and mobile gaming, it is worth noting a few limitations. First, as this was a survey study, responses related to gaming disorder, spending habits, and attitudes were all self-reported by respondents. That said, in the case of spending habits and time commitment, there are important reasons to root our research in self-report given that the characterizations of spending habits are self-ascribed anyway. Second, we used a 5-point scale to assess player perceptions of their spending with the expectation of discernible differences in the categories—hypothesizing initially, for example, that there might be a difference between major whales (“all-in” mentality) and minor whales (spending tied to a high-cost rationalization (e.g., “I’m paying for a video game a month”). This did not turn out to be the case. It could be that by having a scale that did not match the eventual categories, we delimited some of the thought processes of the participants. Third, as the respondents were 90.6% men, it would be difficult to generalize the findings to women or other genders for this form of gaming. Finally, as this survey was posted on Reddit, respondents who answered the survey would tend to be motivated to learn more about the game by communicating with other like-minded gamers by posting and sharing information on the message boards. Therefore, it is possible that the sample captured may not be entirely representative of the entire gaming

population. Casual players, for example, may be less likely to visit Reddit sub-threads on the game. Future research should examine these sub-threads for the themes indicated in this study: ad congruency, issues of gaming disorder, financial spending, and time commitment.

Implications

The implications of this research are multifold. The main theoretical implication is that it calls into question the idea that attitude can always be a strong predictor of behaviour. Gamers' attitudes towards advertisements were not fairly predictive of the way they approach advertising, which is interesting at best. This may also be for circumstantial reasons. Ducoffe (1995) identifies advertising as having value both in information and entertainment; there may be a new dimension that advertising provides: currency, or a trade-off of time for currency. In addition, watching ads has effectiveness and value as an alternative to IGA, which has lost authenticity and effectiveness over the years.

There are also some practical implications to consider. First, in a world where advertising has been dominated by ad blockers, multiscreens, and other avoidance behaviours, it is still possible to find individuals willing to trade their time to watch advertisements in return for perks. Our study shows a way that advertisers can reach people who have the willingness and desire to spend money, as paying players are more willing than non-paying players to watch ads. Second, the function of mobile games can likely determine the way in which ad watching is approached. This research outlines that the intensity of gaming disorder can create a halo effect regarding objects associated with the game. Games that create large gaming disorder measures could presumably serve as a gateway to creating "junkies" willing to watch ads to satisfy their desire to advance further in the game (Wardle, 2019). Although the propensity of ad watching is greater, we do not know if attention is greater in such instances. Third, it may be worth investigating whether advertisements are more persuasive for involved gamers than normal ads are.

It may be that video gaming is simply a vehicle in which such gambling practices can prey upon the vulnerable; hence, it is not inextricably connected to problematic gaming (Macey & Hamari, 2018). Nonetheless, this study showcases that, far from mediating the role of spending in loot-box games, advertising further encourages the highest-spending players.

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