

Escaping the Woes Through Flow? Examining the Relationship Between Escapism, Depression, and Flow Experience in Role-Playing and Platform Games

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Abstract

Playing video games to escape daily life is associated with problem video gaming and depression. Playing to escape is an especially common motive among players of role-playing games (RPGs). Given that RPGs are highly immersive, a possible source of positive affect for depressed escape players may be the rewarding aspects of flow or immersion. We aimed to ascertain whether players who report gaming to escape are more prone to experiencing flow while playing RPGs but not arcade-type platform games. In Experiment 1, we measured the depression symptoms and player motives of 56 participants while they played an RPG. We measured subjective arousal, flow, and positive affect after each condition of an ABBA design (A was a control condition featuring a simplified game, B the fully immersive game). In Experiment 2, we recruited 65 players to play a simple platform game (also measuring problem video gaming and mindfulness). In both studies, we contrasted those in the upper tercile of escape motivation scores with those in the lower tercile of these scores. Escape gamers ($n = 20$) had greater flow and positive affect while playing an RPG (Experiment 1) than did non-escape players ($n = 19$), but escape ($n = 22$) and non-escape ($n = 22$) gamers did not differ in flow and affect when playing a platform game (Experiment 2). Gaming to escape was significantly correlated with depression in Experiment 1. Experiment 2 showed that escape gaming was associated with problem video gaming and mindfulness problems. These findings suggest that escape gamers may find relief through the enjoyment of experiencing flow, but only in immersive games.

Keywords: flow, absorption, problem video gaming, motives

Résumé

La pratique des jeux vidéo comme moyen de s'évader de la vie quotidienne est associée au problème de la dépendance au jeu et à la dépression. Cette motivation

s'observe particulièrement chez les adeptes de jeux de rôle. Étant donné la nature fortement immersive de ces derniers, l'expérience gratifiante que procure la fluidité/l'immersion pourrait être une source possible d'affect positif pour les joueurs déprimés. Nous avons voulu savoir si les joueurs qui disent pratiquer les jeux vidéo par désir d'évasion font davantage l'expérience de la fluidité dans le cadre des jeux de rôle que dans les plateformes de jeux de type arcade. Dans la 1^{re} expérience, nous avons évalué la symptomatologie dépressive et les motivations chez 56 joueurs dans le cadre d'un jeu de rôle. Nous avons mesuré le degré d'excitation subjective, de fluidité et d'affect positif au terme de deux situations de jeu suivant un modèle ABBA (A correspondant à un jeu simplifié, B à un jeu pleinement immersif). Dans la 2^e expérience, 65 joueurs ont joué à un simple jeu de plateforme (tout en évaluant leur degré de dépendance aux jeux vidéo et leur capacité d'attention). Dans chaque cas, on a comparé les résultats des tertiles supérieur et inférieur relativement au désir d'évasion. Les joueurs en quête d'évasion (n=20) ont montré une fluidité et un affect positif supérieurs par rapport aux autres joueurs (n=19) dans le cadre du jeu de rôle (1^{re} expérience); toutefois, aucune différence n'a été relevée entre les deux groupes, ni sur le plan de la fluidité, ni sur le plan de l'affect, dans le cadre du jeu de plateforme (2^e expérience). La pratique des jeux vidéo comme moyen d'évasion est fortement corrélée avec la dépression dans la 1^{re} expérience; la 2^e montre qu'elle est associée à la dépendance au jeu et à des problèmes de capacité d'attention. Ces résultats laissent penser que le plaisir associé à l'expérience de la fluidité procure peut-être aux joueurs qui pratiquent les jeux vidéo un sentiment de soulagement, mais que cela se produirait uniquement dans les jeux immersifs.

Introduction

Video games have evolved to be one of the most prominent and lucrative forms of entertainment in the world. In fact, in 2018, approximately 23 million Canadians identified as gamers (Entertainment Software Association Canada [ESAC], 2019). Embedded in the rise in popularity of video games is how a subset of players struggle with problematic use. A study that examined problematic game play found that of the 1,178 individuals surveyed, nearly 8% exhibited problematic patterns of video game play, including dominating thoughts of video games, the need to play longer to achieve the same level of excitement, withdrawal when denied access to video games, and conflict within their life created by game play (Gentile, 2009).

Time spent gaming has historically been identified as a prominent risk factor for problematic game play, with the need to increase playing times seen as a form of tolerance within behavioural addiction frameworks (Petry et al., 2014; Tao et al., 2010). However, recent evidence suggests that time spent gaming is only a weak predictor of the development and maintenance of problematic game play (Hellstrom et al., 2012; King, Herd & Delfabbro., 2018; Király et al., 2017; Sanjamsai &

Phukao, 2018). For example, although time spent gaming increases the risk of negative consequences, it does not necessarily guarantee that players will struggle with problematic use or negative consequences. In fact, excessive play may even have healthy, positive outcomes for some players (Griffiths, 2010).

Whether problems are a consequence of game play may depend on why players choose to play a game in the first place. Such motives may dictate the types of game they wish to play and the emotional consequences they experience (Westwood & Griffiths, 2010; Yee, 2006). Players cite a variety of different reasons for game play, including entertainment, social interaction, challenge, and excitement (Kim & Ross, 2006; Wan & Chiou, 2006). In many games, players are faced with certain challenges. Surpassing these challenges (i.e., winning or “levelling up”) triggers high states of arousal. Such arousal is a major reinforcer of playing behaviour, and players may be drawn to play in order to experience this pleasant form of excitement (Brown & Anderson, 1984; Poels et al., 2012). Although arousal has been shown to contribute to the reason that a vast majority of players play (Poels et al., 2012), the motivation to play for fun or excitement in particular is not typically related to problematic video gaming (Hellstrom et al., 2012; Kardefelt-Winther, 2014a).

A far more problematic motive for game playing involves gaming to escape. Some gamers appear to engage in game play as a maladaptive means of coping with interpersonal, psychological, or emotionally negative aspects of their day-to-day lives. Gaming to escape is consistently associated with problematic video game play (Hellstrom et al., 2012; Kardefelt-Winther, 2014a, 2014b; Király et al., 2017; Petry et al., 2014). Moreover, in addition to problems related to gaming, video game players who game to escape typically report higher symptoms of depression (Laconi et al., 2017). These gamers appear to engage in game play to regulate their emotions: While gaming, they find relief from the depressing mentations that characterize their day-to-day lives. Thus, gaming for these players provides a form of negative reinforcement (Baker et al., 2004). Despite these consistent associations with problematic play, there is a paucity of research that investigates exactly how video games provide relief from negative affect for players.

A potential source of hedonic appeal for these escape players could be the state of psychological flow that video games are known to facilitate. Flow is classically characterized by feelings of deep, effortless concentration; a distortion of time; a merging of action and awareness; and loss of awareness (Csikszentmihályi & Csikszentmihályi, 1990). Crucially, flow is a highly enjoyable and rewarding state, which may be the key reinforcer for escape players (Csikszentmihályi & Csikszentmihályi, 1990). Although flow is typically considered to be a productive state with positive effects, flow researchers have recognized that it can also lead to intense persistence in activities that may cause more harm than good (Csikszentmihályi & Rathunde, 1993). Seen in this light, if flow during game play provides escape for players looking to cope with negative mood states, it may contribute to problematic forms of game play (Chou & Ting, 2003; Dixon et al., 2018; Dixon,

Gutierrez, Larche, et al., 2019; Dixon, Gutierrez, Stange, et al., 2019; Hu et al., 2019; Hull et al., 2013; Sanjamsai & Phukao, 2019; Schüler, 2012).

Hull et al. (2013) conducted an online study to examine the relationship between flow, depression, and problematic play. They assessed flow, levels of happiness, and problems related to video game play in players' preferred games and found that low levels of happiness outside of game play, time distortion within game play (a sequelae of flow), and the desire to socialize in games were strong predictors of problematic video game play (Hull et al., 2013). Although these findings are consistent with a putative relationship between flow and gaming to relieve symptoms of depression, a limitation of the study was that players possibly recalled in-game flow experiences long after the last game session.

Dixon et al. (2018) measured depression outside of the gaming context and flow among players immediately after playing a session on a slot machine. They showed that those with higher depression outside of the gambling context experienced deeper flow during multiline slots play than did less depressed players (Dixon et al., 2018). They used the term "dark flow" to denote the negative consequences of being absorbed in gambling games: spending more time and money than anticipated. Notably, this dark flow state significantly contributed to the level of positive affect that players experienced during play. Thus, flow could provide the elevation of mood that depressed players may seek. In a recent study, flow accounted for positive affect variance over and above a measure of how much players experienced excitement following rewarding events in the game (Dixon, Gutierrez, Stange, et al., 2019a). These results suggest that players with symptoms of depression may be using the flow state not only to improve their mood, but also to prevent themselves from ruminating on negative thoughts (Dixon et al., 2018; Dixon, Gutierrez, Larche, et al., 2019a; Dixon, Gutierrez, Stange, et al., 2019b).

Given the importance of flow and playing to escape in predicting problem gambling, we aimed to assess whether this relationship generalizes to other behavioural addictions, specifically, problem video gaming. Although there are surface similarities between the two contexts, there are profound differences as well. In slots, flow seems to be related to the frequency of rewarding feedback in the game; that is, players experience more flow in multiline games in which celebratory feedback can occur on almost every third spin than in single-line games in which rewards are larger but far less frequent. In role-playing games (RPGs), rewards would typically be encountered far less frequently than on a multiline slot machine. In this context, flow seems to be related to engaging in the immersive "other-world" environments. Furthermore, although there is no skill required for slots, skill is definitely involved in video games; indeed, such skill and control may be a necessary antecedent of achieving optimal flow (Fong et al., 2015). Thus, it remains to be established whether the propensity to use flow to escape seen in problem gamblers also occurs in the video gaming context. In addition, what has yet to be empirically determined is whether players who explicitly report playing video games to escape experience

greater flow than do players with different motivations for game play. This is what we sought to address in the current research.

The Role of Game Genre in Inducing Flow: The Case of RPGs

Video games may be an ideal medium for inducing flow because the level of difficulty adjusts to the player's skill to maintain a balance between challenge and skill that is known to promote flow. Some games, however, may be more conducive to flow than others. Indeed, certain genres of games may facilitate more enriched, profound experiences of immersion. Johnson et al. (2012) examined flow experiences across different game genres and found that role-playing/strategy and action-adventure games were associated with enhanced flow and immersion, unlike sport, racing, or fighting games. Furthermore, escapism as a motive is commonly cited among players of multiplayer online role-playing strategy games such as *World of Warcraft* (Dauriat et al., 2011; Hilgard et al., 2013), and players who primarily play games belonging to the genre of RPGs broadly have higher scores on disordered gaming scales (Eichenbaum et al., 2015; Kim et al., 2010; Na et al., 2017). Escape gamers may be more common in RPGs because of the immersive properties that these types of games possess. RPGs tend to feature extensive world building (e.g., narratives and storylines), as well as developed characters, details that allow players to feel fully involved and separated from reality. Our goal was to explore whether game genre has an impact on the depth of flow for all players and for escape gamers more specifically.

Taking an *in vivo* approach similar to that of Dixon et al. (2018); Dixon, Gutierrez, et al. (2019a); and Dixon, Gutierrez, et al. (2019b), we sought to examine whether players who indicate that they game to escape exhibit different experiences of flow, positive affect, and arousal during an RPG than do those who game solely for excitement. If flow provides relief to those who game to cope—and RPG games are designed to induce flow in such players—not only should escape gamers experience greater flow while playing an RPG game, but they may also experience greater positive affect while playing these games.

Experiment 1

Overview

Video games are all designed to be an exciting, enjoyable experience for players. Accordingly, one would expect to see general increases in players' subjective reports of arousal, positive affect, and flow during video game play (compared with a baseline) regardless of their motivation for playing. The central focus of this experiment was to explore more specific hypotheses involving the link between flow states and the positive affect associated with them and escape gaming. In particular, we contrasted those who strongly endorsed engaging in game play as a means of escaping negative thoughts to other players who lacked such escape motivations. If players game to escape, they should report greater symptoms of negative affect

(e.g., depression) outside of the game context. In addition, in accordance with previous studies of problem gamblers (Dixon et al., 2018, 2019a; 2019b), we predicted that escape gamers would experience deeper flow states during play than would those who play only for the excitement. Furthermore, since flow is known to be associated with positive affect, we predicted that not only would those who endorse gaming to escape experience more flow, but they would also experience more positive affect during game play than would those who play for the excitement of the game.

To test these hypotheses, we used the RPG game *The Elder Scrolls V: Skyrim*. This game allowed flexible in-game editing that enabled us to create in-game baseline conditions in which players simply walk down a corridor and in-game experimental conditions involving solving puzzles and interacting with other game characters. We used an ABBA design in which players completed a baseline, two consecutive game epochs, and then a second baseline epoch. We predicted that all players would experience increases in excitement during game play, but those who endorse gaming to escape would experience greater flow and positive affect during an RPG game than would players who less strongly endorse this motivation.

Method

Participants

Fifty-nine undergraduate students were recruited through the University of Waterloo's Research Experience Group online recruitment system for extra credit toward a psychology course. Prescreen questions ensured that the sample of participants (a) were recreational gamers who played video games at least once in the past 4 weeks, (b) had prior experience playing first-person shooter or RPGs, and (c) were not in treatment for problem gaming or gaming addiction. This study was reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee.

Materials

Reasons for Gaming Scale (RGS). This scale was developed for the purpose of the current experiment. The scale items were adapted from descriptions of escape and excitement motives identified in our literature review, as well as from an assessment of existing subscales tapping into these two motives. The scale comprised six items that were answered on a 7-point Likert scale from 1 (*completely disagree*) to 7 (*completely agree*) and a single binary forced-choice question. The Likert scale questions were as follows:

1. Some people describe gaming to escape. They play video games to distract themselves from day-to-day issues.
2. Some people describe gaming for excitement. They play video games for the arousal high.

3. I like playing video games mostly because they take my mind off of my everyday worries.
4. I like playing video games mostly because I find them very entertaining and exciting.
5. I like playing video games because they provide a break from reality.
6. I like playing video games because they are thrilling.

The forced-choice question was “Please choose the phrase which best describes your reasons for gaming,” to which they could choose either “Gaming for excitement” or “Gaming for distraction.” The six Likert scale items were used to calculate an “escape gamer” subscale (sum of Items 1, 3, and 5) and an “excitement gamer” subscale (sum of Items 2, 4, and 6).^{1,2}

Flow and positive affect. Participants were asked to complete the flow and positive affect subscales (five items per subscale) of the Game Experience Questionnaire (GEQ; IJsselsteijn, de Kort, & Poels., 2013). An example of a flow item was “I was fully occupied with the game” and for positive affect “I felt good.” All GEQ items were scored on a 5-point Likert scale from 0 (*not at all*) to 4 (*extremely*).

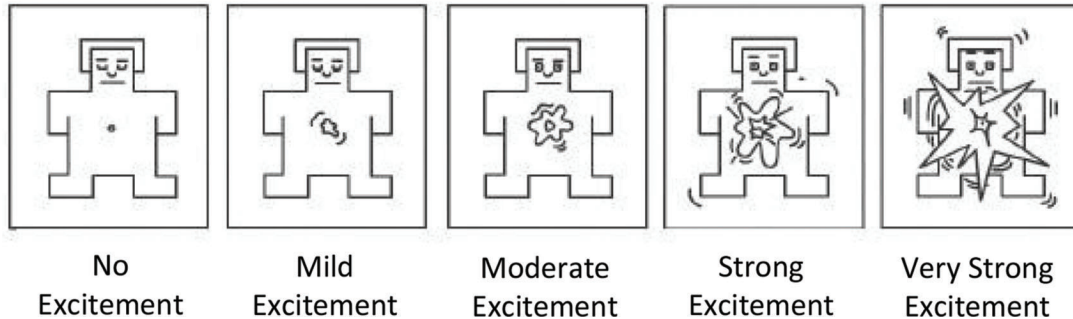
Depression outside of the gaming context. The 21-item Depression Anxiety Stress Scale (DASS-21; Lovibond & Lovibond, 1995) is a self-report instrument designed to measure the three related negative emotional states of depression, anxiety, and tension/stress. Although all three scales were administered, only the depression subscale is reported here. Examples of the seven items of this subscale included “I felt that I had nothing to look forward to,” “I found it hard to wind down,” and “I experienced trembling (e.g. in the hands).” Responses were scored on a 4-point Likert scale from 0 (*Did not apply to me at all*) to 3 (*Applied to me very much or most of the time*).

Arousal/excitement. Bradley and Lang’s (1994) Self-Assessment Manikins (SAMs) were used to gauge subjective reports of arousal (Figure 1). Ratings were

¹A factor analysis that applied a varimax rotation procedure was conducted by using data from the present research and showed that the six items constituted two distinct subfactors. Factor 1 comprised Items 1, 3, and 5, explaining 51.32% of the variance, with factor values ranging from .816 to .923. Factor 2 comprised Items 2, 4, 5, and 6, explaining 20.29% of the variance. Although Item 5 cross-loaded on both subfactors, this item was more strongly associated with Factor 1 (factor value of .816) than with Factor 2 (factor value of .142, which is below the critical threshold of .4 for significant factor loadings; Matsunaga, 2010). With Item 5 omitted, factor values for Factor 2 ranged from .559 to .862.

²For the present research, a reliability analysis was conducted for both the “escape gamer” and “excitement gamer” subscales of the RGS. The escape gamer subscale yielded acceptable internal consistency (sum of Items 1, 3, and 5; $\alpha = .841$). The “excitement gamer” subscale yielded moderate internal consistency (sum of Items 2, 4, and 6; $\alpha = .641$).

Figure 1
Self-Assessment Manikins Indexing Subjective Arousal From Low Arousal (Left) to High Arousal (Right).



obtained after each epoch (Control 1, Game 1, Game 2, Control 2). For the purposes of the current experiment, labels were added to each manikin for clarification. The labels were, from left to right, as follows: *No Excitement*, *Mild Excitement*, *Moderate Excitement*, *Strong Excitement*, *Very Strong Excitement*.

Apparatus

The Elder Scrolls V: Skyrim. Participants played a modified version of an open-world action RPG played on high video settings with a resolution of 1280×1050 . The game play experience was limited to predetermined sections of the game's main storyline (called Dungeon levels), as well as modified sections of the game world.

Game platform. The game was played on a laboratory PC (Intel i7-3820 quad core 3.60 GHz CPU, 8 GB of RAM, AMD Radeon HD 6570 GPU with 2 GB of video RAM) running Windows 10 Professional (64 bit). The monitor was an LG W2242 22-inch (56-cm) screen with a resolution of 1280×1050 . The controls were operated through a generic plug-and-play keyboard and mouse.

Survey platform. All questionnaires were administered via a Samsung Galaxy Tab Pro 10.1 tablet in order to access Qualtrics, an online survey platform.

Experimental Design

In the ABBA design, the A epochs were the control epochs and the B epochs involved game play (see Figure 2). In the 5-min control epochs, players were asked to navigate through a pre-prepared dungeon that was stripped down to remove all puzzles and other avatars. Players could not deviate beyond the dungeon or interact with anything but this stripped-down environment.

For the experimental epochs, each participant played two game sessions of equal length and difficulty. Game difficulty was set to "normal" for most players but

Figure 2
Depiction of Procedure.



Note. The experiment adhered to an ABBA design, with A representing the control conditions and B representing the experiment conditions. Participants started with the first control condition, in which they navigated a stripped-down dungeon environment for 5 min, followed by the experimental condition, in which they played versions of the enriched dungeons in Skyrim. Participants completed the Game Experience Questionnaire (GEQ) and Self-Assessment Manikin (SAM) surveys following each epoch.

changed to “easy” if participants indicated that they were inexperienced with the game or to “hard” for those with more than 25 hr of game experience. Experimental epochs involved preselected dungeons, consisting of tasks and puzzles to solve. Dungeons were chosen that could be navigated within 15 min. The two dungeons of the experimental epochs were similar in design, puzzle structure (i.e., both symbol matching puzzles), puzzle difficulty, “enemy” structure, and enemy difficulty. The dungeons were accessed via saved game states to ensure a consistent starting point and game progression.

Avatar Characteristics

In RPGs, the game play experience is strongly dependent on the abilities of the game avatar. To maximize consistency across participants and across sessions, we preset

and locked these abilities. The character was a “fighter” (a character who does not use magic) with the following abilities: one-handed sword skill, shield skill, and light armour skill. The experimenters created a male and a female avatar with identical equipment, weapons, and armour in their inventory. Participants chose the gender of the avatar that they wished to play.

Procedure

After they signed the consent form, participants were provided with instructions, and the first control dungeon was loaded for participants to navigate. After 5 min, participants were interrupted to complete the GEQ questions and SAMs. The experimenter then loaded the first (enriched) game dungeon. Participants were then instructed to play through the dungeon for as long as instructed. After 15 min of game play, the experimenter readministered the GEQ and SAMs. The second enriched dungeon was loaded and participants played for 15 min and then completed the GEQ and SAM items. Participants then walked through the final stripped-down control dungeon for 5 min and completed the final GEQ and SAM items.

Participants then completed the DASS-21 and RGS on Qualtrics, were given a debriefing letter explaining the nature of the experiment, and were assigned their credit.

Results

Of the 59 participants, two asked to withdraw from the experiment and all of their data were excluded from the analysis. One participant had incomplete data and therefore was also excluded from the analysis, leaving a total of 56 participants.

Negative Affect (Depression) and Game Play Motivation

To quantify players’ reasons for game play, we totalled the three escape-related items (the odd-numbered items on the RGS) to create an “escape score” and totalled the three “excitement” items (the even-numbered items in the RGS) to create an “excitement score.”

To assess whether there were any relationships between depression-related symptoms and game play motivation, we conducted correlations between escape and excitement scores and depression scores on the DASS-21. There was a significant positive correlation between escape scores and depression, $r(55) = .296, p = .027$, but no correlation between excitement scores and depression, $r(55) = .015, p = .915$.

Data Reduction and Analysis Strategy for Arousal, Positive Affect, and Flow

To test the hypotheses concerning game play motivation, we ranked players on the basis of their total escape scores. We then divided the sample into terciles from these totals. We compared the participants who fell into the upper tercile of escape scores

(presumably the escape gamers; $n = 19$) with those who fell into the lower tercile of escape scores (presumably those who game for reasons other than to escape; $n = 20$). We used a tercile analysis rather than, for example, a median split because for participants in the middle third of escape scores, those just above the median and those just below the median would likely be more similar to one another than to those sampled from more extreme ends of the escape score continuum. Thus, the smaller power incurred by analysing fewer subjects would theoretically be offset by an increased effect size caused by greater group differences between the upper and lower terciles.

Table 1 contrasts 19 participants in the lower tercile and 20 participants in the upper tercile (the upper tercile had one extra participant because of tied scores). It shows the average escape scores and the average excitement scores in these upper and lower terciles. Consistent with the notion that all players are drawn to video games because of their exciting properties, both the lower and upper terciles show equivalent excitement scores, $t(37) = 1.21$, $p = .234$.

Table 1 shows that for those in the lower tercile, their excitement scores were significantly higher than their escape scores. For the escape gamers in the upper tercile, the converse was true: Their escape gaming scores were significantly higher than their excitement gaming scores.

In the lower tercile, 17 of the 19 players answered “gaming for excitement” in response to the forced-choice item, and two players answered “gaming for distraction.” In the upper tercile, 12 players answered “gaming for distraction” and eight players indicated “gaming for excitement” as their primary motivation.

The arousal (using the SAMs), positive affect, and flow items were analysed by using mixed factorial analyses of variance (ANOVAs) with block (A1, B1, B2, A2) as the within factor and tercile as the between factor. In addition to the main effects of block and tercile (and their interaction), because of their theoretical importance, we conducted six planned comparisons in this ABBA design. We contrasted the first control condition with the first game condition (A1 vs. B1) and the second game condition with the second control condition (B2 vs. A2). We also contrasted the upper and lower terciles in each block. Because there were six contrasts, we used a

Table 1

Mean Escape and Excitement Scores (Standard Deviations in Parentheses) of the Upper and Lower Terciles of Participants Based on Their Escape Scores in Experiment 1

Tercile	Escape score	Excitement score	t Test	Significance
Lower ($n = 19$)	11.26 (2.684)	16.63 (1.707)	$t(18) = 7.195$	$p < .001$
Upper ($n = 20$)	19 (1.076)	17.35 (1.981)	$t(19) = 3.943$	$p = .001$

Bonferroni correction to assess the significance of each of these contrasts (setting alpha at .006). Greenhouse-Geisser corrections were applied to instances in which violations of sphericity were found.

Gaming Motivation, Arousal, Flow, and Positive Affect

Arousal and excitement ratings (using the SAMs) for those in the upper and lower terciles of excitement scores across the ABBA blocks are shown in Figure 3A. For arousal, there was a main effect of block, $F(3, 111) = 48.437, p < .001, \eta_p^2 = .567$; no effect of tercile, $F(1, 37) = 1.308, p = .260, \eta_p^2 = .034$; and no tercile-by-block interaction, $F(3, 111) = 1.193, p = .315, \eta_p^2 = .031$. In terms of our a priori contrasts dictated by the ABBA design, arousal rose significantly from Control 1 ($M = 2.43, SD = .871$) to Game 1 ($M = 3.30, SD = .784$), $t(55) = 9.157, p < .001$, and fell significantly from Game 2 ($M = 3.46, SD = .762$) to Control 2 ($M = 2.18, SD = .917$), $t(55) = 9.104, p < .001$. There were no differences between terciles in any of the four blocks (all p values $> .059$).

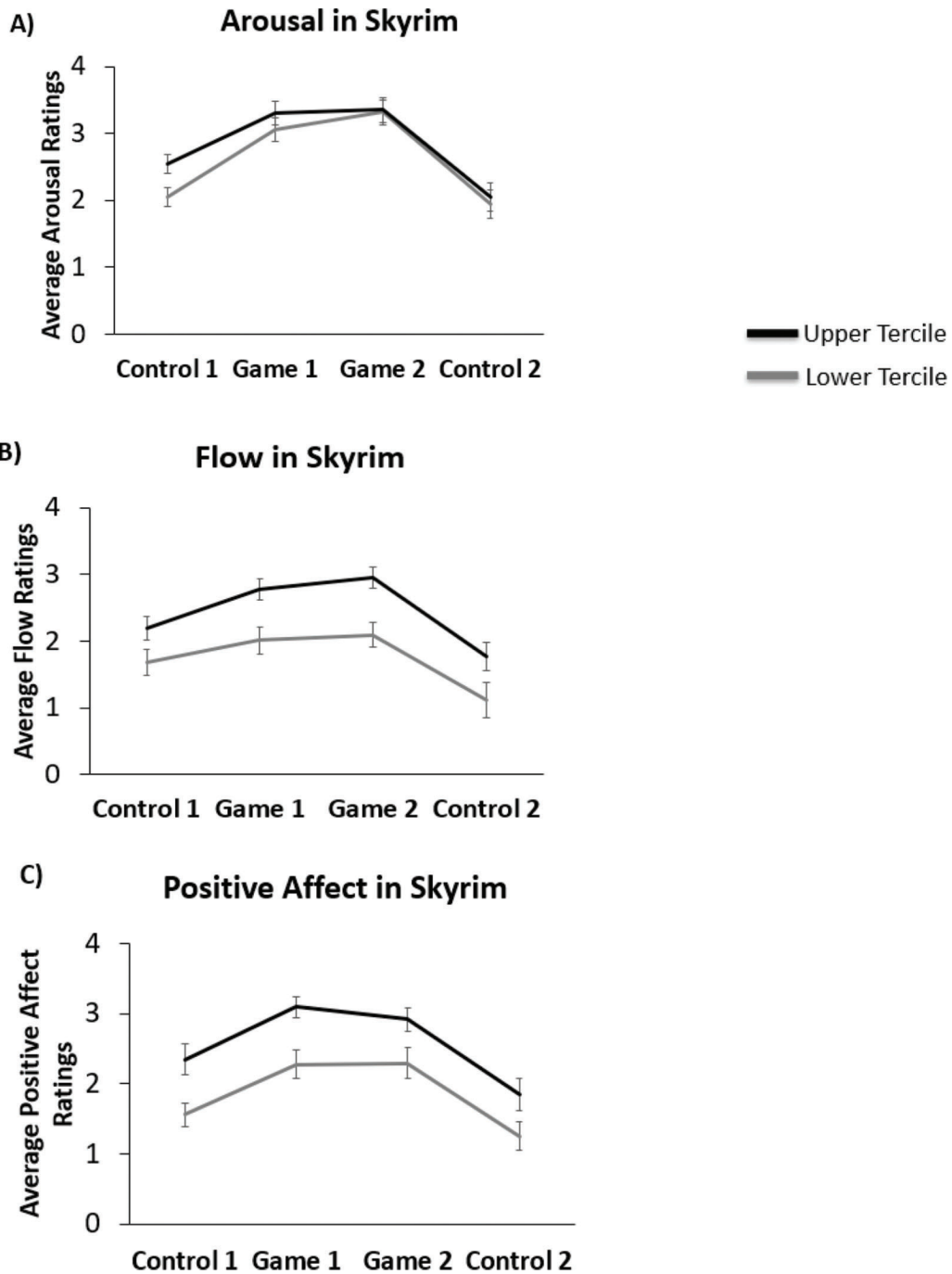
For the next set of results, it is important to note that the central predictions regarding motivation to escape involve greater flow and positive affect during game play (demonstrated by a tercile \times block interaction).

Figure 3B depicts the means of flow for those in the upper and lower terciles of escape scores across the four blocks. There was a main effect of block, $F(2.32, 87.03) = 29.681, p < .001, \eta_p^2 = .445$, and a main effect of tercile, $F(1, 37) = 9.091, p = .005, \eta_p^2 = .197$, but no tercile-by-block interaction, $F(2.35, 87.03) = .707, p = .518$. As expected, a priori contrasts dictated by the ABBA design showed that flow significantly increased from Control 1 ($M = 1.98, SD = .884$) to Game 1 ($M = 2.43, SD = .899$), $t(55) = 4.881, p < .001$, and fell from Game 2 ($M = 2.65, SD = .829$) to Control 2 ($M = 1.56, SD = 1.169$), $t(55) = 8.08, p < .001$. Those in the upper tercile of escape scores had significantly greater flow scores than did those in the lower tercile, but only in the game epochs, $t(37) = 2.971, p = .005$, for Game 1; $t(37) = 3.566, p = .001$, for Game 2. For the control epochs, these contrasts were not significant: $t(37) = 1.89, p = .066$, for Control 1; $t(37) = 1.93, p = .061$, for Control 2.

Figure 3C depicts the means of positive affect for those in the upper and lower terciles of escape scores across the four blocks. There was a main effect of block, $F(2.53, 93.67) = 35.664, p < .001, \eta_p^2 = .491$, and a main effect of tercile, $F(1, 37) = 9.813, p = .003, \eta_p^2 = .210$, but no tercile-by-block interaction, $F(2.53, 93.67) = .405, p = .716, \eta_p^2 = .011$. As expected, a priori contrasts dictated by the ABBA design showed that positive affect significantly increased from Control 1 ($M = 2.05, SD = .952$) to Game 1 ($M = 2.70, SD = .877$), $t(55) = 6.639, p < .001$, and fell from Game 2 ($M = 2.69, SD = .903$) to Control 2 ($M = 1.71, SD = .1060$), $t(55) = 7.732, p < .001$. Those in the upper tercile of escape scores had significantly greater positive affect scores than did those in the lower tercile, but only in Game 1, $t(37) = 3.31, p = .002$. For Control 1, $t(37) = 2.844, p = .007$; Game 2, $t(37) = 2.28, p = .028$; and

Figure 3

Experiment 1: Subjective Responses Following Each Epoch in the ABBA Design (Control 1, Game 1, Game 2, and Control 2) by Upper and Lower Tercile of Escape Scores.



Note. Panel A: Average subjective ratings of arousal. Panel B: Average flow ratings. Panel C: Average positive affect ratings. Error bars represent ± 1 SE.

Control 2, $t(37) = 1.991$, $p = .054$, these contrasts failed to exceed the Bonferroni correction ($\alpha = .006$).

The patterns shown in Figure 3 that contrast those in the upper and lower terciles of escape scores were verified by using correlations conducted on the entire sample. Because the key tercile findings involved differences during game play, we restricted the correlations to the first and second game blocks of the ABBA design. First, escape and arousal during game play in Skyrim was not significantly correlated in Game 1, $r(54) = .199$, $p = .141$, nor in Game 2, $r(54) = .046$, $p = .739$. Next, escape and flow scores were positively correlated in both Game 1, $r(54) = .409$, $p < .001$, and Game 2, $r(54) = .444$, $p < .001$. Finally, like the tercile analysis, escape and positive affect were correlated in Game 1, $r(54) = .348$, $p = .009$, but not in Game 2, $r(54) = .218$, $p = .106$.

Discussion

In support of our hypothesis involving gaming to escape, we showed a significant correlation between depression scores on the DASS-21 and the degree to which players endorsed the escape items in the RGS. In contrast, there was no relation between excitement scores on the RGS and depression. These findings suggest that although all types of gamers are motivated in part by excitement, those gamers who play RPGs to escape may do so to avoid the depression that characterizes their everyday lives.

A somewhat surprising finding was the less-than-perfect correspondence between the upper and lower terciles in escape scores and players' answers to the forced-choice question involving their primary reason for game play. Although almost all (17 of 19) players in the lower tercile indicated that they gamed for the excitement, almost half (8 of 20) of the players in the upper tercile indicated that they, too, gamed for excitement, with only a slight majority indicating that they gamed for distraction. One possible reason is that it is difficult and artificial for players to choose only a single reason for game play. A second possibility is that the term "gaming for distraction" was seen by some players as somewhat pejorative and possibly indicative of a "problem." Thus, by polling both excitement and escape gaming with multiple Likert-style items, we derived a more sensitive measure of those who preferentially game to escape than could be found with the single forced-choice item.

Having multiple items on the escape component caused escape scores to fall on a continuum with reasonable variability between escape scores across participants. This in turn allowed us to compare those on the upper end of this continuum (escape gamers) with those on the low end of these scores. From our tercile analyses, we showed no difference in escape versus non-escape gamers in arousal/excitement but strong differences in flow and positive affect. These patterns were verified by using correlations involving the entire sample. Playing Skyrim led to heightened arousal and excitement compared with simply moving around in the stripped-down dungeon (the control conditions). Consistent with the notion that all players are attracted to video games for their excitement, there were no differences between escape players

and non-escape players on their excitement during game play. The more important findings involve the contrast between escape gamers and non-escape players in flow and positive affect during game play. In Experiment 1, we found that escape gamers experienced greater flow and (at least in the first game epoch) greater positive affect than non-escape gamers did, a pattern that we also verified by using correlations on the entire sample.

Such findings are consistent with the notion that some players may use the flow state to escape depression. In Experiment 1, those with higher depression scores more strongly endorsed gaming to escape, and those in the upper tercile of escape gaming scores experienced greater flow and greater positive affect than did non-escape gamers. Taken together, these findings suggest that escape gamers may be using video games as a form of negative reinforcement. While not gaming, their thoughts may be characterized by depression. While gaming, the immersive flow experiences of the games stop them from ruminating on depressive thoughts, and game play leads to positive affect via the flow experience.

Experiment 2

Overview

Our intriguing findings in Experiment 1 showed greater flow and positive affect among those with high escape motivations during Skyrim game play. Such findings raise the question of whether this effect is generalizable to other games, or whether it is facilitated only by the unique structural characteristics of RPGs. Specifically, if there is something about the immersive properties of RPGs that preferentially promote flow and positive affect, then we might not expect to see differences between escape gamers and non-escape gamers in different types of video games. One goal of Experiment 2 was to test this possibility. We chose an “arcade” style desktop game called Winterbells as a contrast to Skyrim. In this game, rather than solving puzzles, navigating elaborate dungeons, and interacting with other avatars in an immersive fantasy world, players simply cause a rabbit to jump from one bell-shaped platform to another. Each successive jump causes the rabbit to jump higher and earns points for the player.

Another aim of this experiment was to gain a more comprehensive understanding of escapism as it relates to problematic game play. In Experiment 1, we showed that those who endorse playing to escape also showed higher depression scores outside of the gaming context. Such a finding is conceptually similar to research with depressed problem gamblers. In a recent experiment, Dixon et al. (2019b) proposed that depressed slot machine players may have problems with mind wandering in everyday life and that the thoughts of these players would gravitate to depressing thoughts. The investigators proposed that such players may find relief from these dark thoughts when playing multiline slot machines because the intermittent celebratory feedback of the slot machine may serve to rein in the attention of players and prevent their minds from wandering to dark places. In support of their contentions, they

showed that those with high depression ratings in everyday life also experienced mindfulness problems, but slot machines seemed to rein in the wandering minds of these players, leading to flow and positive affect. One goal of Experiment 2 was to assess whether those who strongly endorse escape gaming, might, like their gambling counterparts, also show mindfulness problems in everyday life. If so, then they, too, might find relief from negative thoughts when playing video games. Such negative reinforcement may lead to problematic forms of video game play.

In sum, we sought to show that those video gamers who report high levels of depression would also show mindfulness problems in everyday life. If these players find relief through game play, they might also endorse gaming to escape as a key motivator for their game play. Given that this is a maladaptive means of coping with depressing thoughts, we predicted that endorsing escape as motivation for game play would lead to higher scores on a scale of problematic play than would endorsing excitement as a motivation for game play.

Method

Participants

A total of 65 participants were recruited from the SONA pool at the University of Waterloo. Prescreen questions ensured that the sample of participants (a) were recreational gamers who played video games at least once in the past 4 weeks and (2) were not in treatment for disordered video gaming.

Apparatus

Winterbells game. We selected an arcade platform game called Winterbells developed by Orisinal Games. In this game, players interact with the computer mouse to make a rabbit move and jump. The goal is to persistently climb up the vertical game map by jumping on a series of platforms that look like bells. Players make the rabbit jump by clicking on the mouse and move the mouse side to side to land on horizontally spaced bells that appear to be falling slowly to the bottom of the game board. For each successful landing on a bell platform, players accumulate points. If a player misses one of the bell platforms, the cartoon rabbit falls to the bottom of the game board, losing all progress and forcing the player to start at the beginning of the game.

Game platform. The Winterbells game was played on a Macintosh computer (iMac 20 inch [51 cm], early 2009) running on OS X version 10.11.6. The controls for the game required a mouse for movement and direction.

Materials

Reasons for Gaming Scale. Administration and scoring of the RGS was identical to that in Experiment 1.

Flow and positive affect. Measures for flow and positive affect were identical to those in Experiment 1.

Depression outside of the gaming context. Administration and scoring of the depression subscale of the DASS-21 was unchanged from that in Experiment 1.

Arousal/excitement. Measures for arousal were identical to those in Experiment 1.

Mindfulness and attention in everyday life. The Mindfulness Attention and Awareness Scale (MAAS; Carlson & Brown, 2005) assesses attentional problems that participants may encounter in everyday life. The scale features 15 items consisting of statements such as “It seems I am ‘running on automatic’, without much awareness of what I’m doing.” Participants indicate the degree to which the statements resonate with them on a 6-point Likert scale from 1 (*almost always*) to 6 (*almost never*). Total scores on this scale are summed and averaged, with lower scores indicating less mindfulness and attentional focus on tasks in everyday life.

Problematic video gaming. Problematic video gaming was assessed by using the Problem Video Game Playing Questionnaire (PVPQ; Tejeiro & Moran, 2002). This scale was selected on the basis of its robust capacity to assess problem video gaming behaviour in both adolescents and adults (King et al., 2013; Tejeiro et al., 2016). This scale features nine items that measure behaviour related to video game playing and consists of items such as “When I am not playing with the video games, I keep thinking about them, i.e. remembering games, planning the next game, etc.” Players indicated “yes” or “no” for each of the items. In terms of scoring, the number of yes responses were summed into a single score, with higher scores indicating greater severity of problematic video game play.

Experimental Design

Similar to that used in Experiment 1, the experiment used an ABBA design with A representing the control epochs and B the experimental epochs. For control epochs, the player simply moved the mouse, but did not click it. Hence, the rabbit moved from side to side but it never “jumped.” The bell platforms simply fell to the bottom of the game board and no points were gained. The control epochs contained all the visual components of the game epochs, but had no element of game play. There was a minor difference in time length in Experiment 2, such that the experimental and control epochs were each 5 min in length (the experimental epochs were 5 min long as opposed to 15 min as in Experiment 1). The 15-min experimental epoch length for Experiment 1 was selected because of the time necessary to complete the Skyrim dungeon’s puzzles. Winterbells was simpler to grasp, thus having 5 min of play was deemed sufficient.

Procedure

The testing protocol was identical to that in Experiment 1. For the gaming portion of the experiment, participants were asked to play a few practice rounds of Winterbells

for approximately 3 min, followed by the four blocks in the ABBA design. At the end of each 5-min block, participants were interrupted by the researcher to complete the in-game measures of arousal, flow, and positive affect. Upon completing the final in-game survey for the second control block, participants completed a questionnaire containing the DASS-21, the RGS, the MAAS, and the PVPQ.

Analytical Strategy

In Experiment 2, we first examined the interrelations among game play motivation, depression, mindfulness, and problematic gaming. We then used the tercile analytical strategy to assess whether escape gamers experienced greater flow and positive affect for any type of video game. Finally, data from the RPG in Experiment 1 and the arcade game in Experiment 2 were directly compared.

Results

Negative Affect (Depression) and Game Play Motivation

To assess whether there were any relationships between depression and game play motivation, we conducted correlations between escape and excitement scores from the Reasons for Gaming Scale and depression scores on the DASS-21. Escape scores were marginally positively correlated with depression, $r(63) = .236, p = .059$. Excitement scores were significantly correlated with depression scores on the DASS-21, but the correlation was negative: Those with greater excitement ratings had *lower* depression scores, $r(63) = -.288, p = .020$.

Escape scores were positively correlated with severity of problematic video game play, $r(63) = .321, p = .009$, whereas there was no relationship between excitement scores and problematic game play, $r(63) = .135, p = .285$. Escape scores were negatively correlated with mindfulness in everyday life, $r(63) = -.332, p = .009$ (indicating that those who game to escape had more problems with mind wandering in everyday life), whereas there was no relation between excitement scores and mindfulness problems, $r(63) = .130, p = .303$.

Data Reduction and Analysis Strategy for Arousal, Positive Affect, and Flow

Terciles were created on the basis of escape scores in a manner similar to that in Experiment 1. In Experiment 2, there were 22 participants in the lower tercile (with escape scores that ranged from 3 to 12). In the upper tercile, there were 19 participants with scores of 17 and above. To have equal numbers of participants in both terciles, we had to select three participants who had escape scores of 16. Since there were six participants tied at 16, the three participants with the lowest excitement scores were selected.

Table 2 shows the average escape scores and the average excitement scores for those in the upper and lower terciles of escape scores. Consistent with the notion that all players are drawn to video games because of their exciting properties, both the lower

Table 2

Mean Escape and Excitement Scores (Standard Deviations in Parentheses) of the Upper and Lower Terciles of Participants Based on Their Escape Scores in Experiment 2

Tercile	Escape score	Excitement score	<i>t</i> Test	Significance
Lower (<i>n</i> = 22)	9.00 (3.06)	16.55 (2.74)	<i>t</i> (21) = 7.995	<i>p</i> < .001
Upper (<i>n</i> = 22)	18.41 (1.593)	17.18 (1.981)	<i>t</i> (21) = 2.247	<i>p</i> = .036

and upper terciles show equivalent excitement scores, $t(37) = .776$, $p = .442$. Those in the upper terciles had markedly higher escape scores than did those in lower terciles, $t(31.638) = 12.808$, $p < .001$.

In the lower tercile, 19 of the 22 players answered “gaming for excitement” in response to the forced-choice item, with only three players answering “gaming for distraction.” In the upper tercile, 12 players answered “gaming for distraction,” with 10 players indicating gaming for excitement.

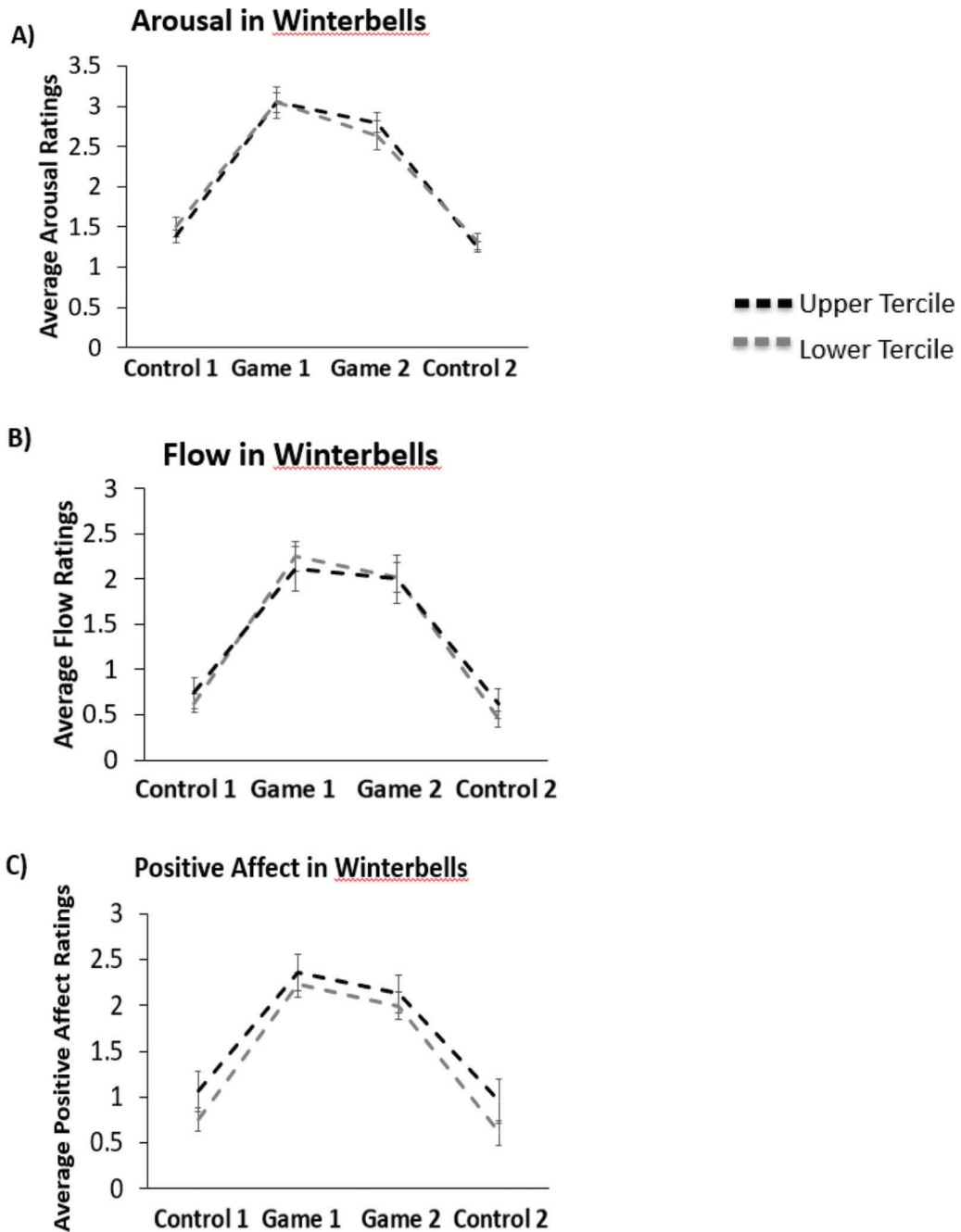
Arousal, positive affect, and flow data were analysed by using mixed factorial ANOVAs with block (A1, B1, B2, A2) as the within factor and tercile as the between factor. As in Experiment 1, we contrasted the first control condition with the first game condition (A1 vs. B1) and the second game condition with the second control condition (B2 vs. A2). We also contrasted the upper and lower terciles in each block. Since there were six contrasts, we used a Bonferroni correction to assess the significance of each of these contrasts (setting alpha at .006). Greenhouse-Geisser corrections were applied to instances in which violations of sphericity were found.

Gaming Motivation, Arousal, Flow, and Positive Affect

For arousal, there was a main effect of condition, $F(1.90, 80.002) = 126.41$, $p < .001$, $\eta_p^2 = .751$, but no effect of tercile, $F(1, 42) = .006$, $p = .937$, $\eta_p^2 = .000$, and no tercile-by-block interaction, $F(1.90, 80.002) = 2.072$, $p = .135$, $\eta_p^2 = .047$. In terms of our a priori contrasts dictated by the ABBA design, arousal rose significantly from Control 1 ($M = 1.46$, $SD = .533$) to Game 1 ($M = 3.12$, $SD = .820$), $t(64) = 15.38$, $p < .001$, and fell significantly from Game 2 ($M = 2.85$, $SD = .833$) to Control 2 ($M = 1.29$, $SD = .522$), $t(64) = 13.89$, $p < .001$. There were no differences between terciles in any of the four blocks (all p values $> .163$). The arousal responses for the escape and non-escape gamers across the ABBA blocks are shown in Figure 4A.

Figure 4B depicts the means of flow for those in the upper and lower terciles of escape scores across the four blocks. There was a main effect of block, $F(1.52, 64.086) = 87.511$, $p < .001$, $\eta_p^2 = .676$; no main effect of tercile, $F(1, 42) = .102$, $p = .751$, $\eta_p^2 = .002$; and no tercile-by-block interaction, $F(1.52, 64.086) = 1.976$, $p = .157$, $\eta_p^2 = .045$. As expected, a priori contrasts dictated by the ABBA design showed that flow significantly increased from Control 1 ($M = .62$, $SD = .606$) to

Figure 4
Comparison of Subjective Responses for Experiment 2 Following Each Epoch in the ABBA Design (Control 1, Game 1, Game 2, and Control 2) by Upper and Lower Tercile of Escape Scores.



Note. Panel A: Average subjective ratings of arousal. Panel B: Average flow ratings. Panel C: Average positive affect ratings. Error bars represent ± 1 SE.

Game 1 ($M = 2.26$, $SD = 1.058$), $t(64) = 13.008$, $p < .001$, and fell from Game 2 ($M = 2.06$, $SD = 1.099$) to Control 2 ($M = .44$, $SD = .562$), $t(64) = 12.332$, $p < .001$. There were no differences between terciles in any of the four blocks (all p values $> .061$).

Figure 4C depicts the means of positive affect for those in the upper and lower terciles of escape scores across the four blocks. There was a main effect of block, $F(1.486, 62.40) = 68.789$, $p < .001$, $\eta_p^2 = .621$, and a main effect of tercile, $F(1, 42) = 5.136$, $p = .029$, but no tercile-by-block interaction, $F(1.486, 62.40) = 1.289$, $p = .276$, $\eta_p^2 = .030$. As expected, a priori contrasts dictated by the ABBA design showed that positive affect significantly increased from Control 1 ($M = .70$, $SD = .809$) to Game 1 ($M = 2.19$, $SD = .907$), $t(64) = 11.973$, $p < .001$, and fell from Game 2 ($M = 2.04$, $SD = .990$) to Control 2 ($M = .56$, $SD = .831$), $t(64) = 10.79$, $p < .001$. Although those in the upper tercile of escape scores had greater positive affect scores than did those in the lower tercile in all four blocks, none of these contrasts exceeded the Bonferroni cut-off (smallest p value = .010 for the second control condition).

For Winterbells, where the upper and lower escape terciles showed similar averages for arousal, flow, and positive affect, the analysis on the entire sample showed that these scores were not significantly correlated with escape scores during game play. Specifically, there was no correlation between arousal and escape in Game 1, $r(63) = .051$, $p = .685$, or in Game 2, $r(63) = -.093$, $p = .463$. Next, flow was not significantly correlated with escape scores in Game 1, $r(63) = -.038$, $p = .766$, or in Game 2, $r(63) = .040$, $p = .754$. Finally, positive affect was not correlated with escape in Game 1, $r(63) = .098$, $p = .436$, or in Game 2, $r(63) = .117$, $p = .353$.

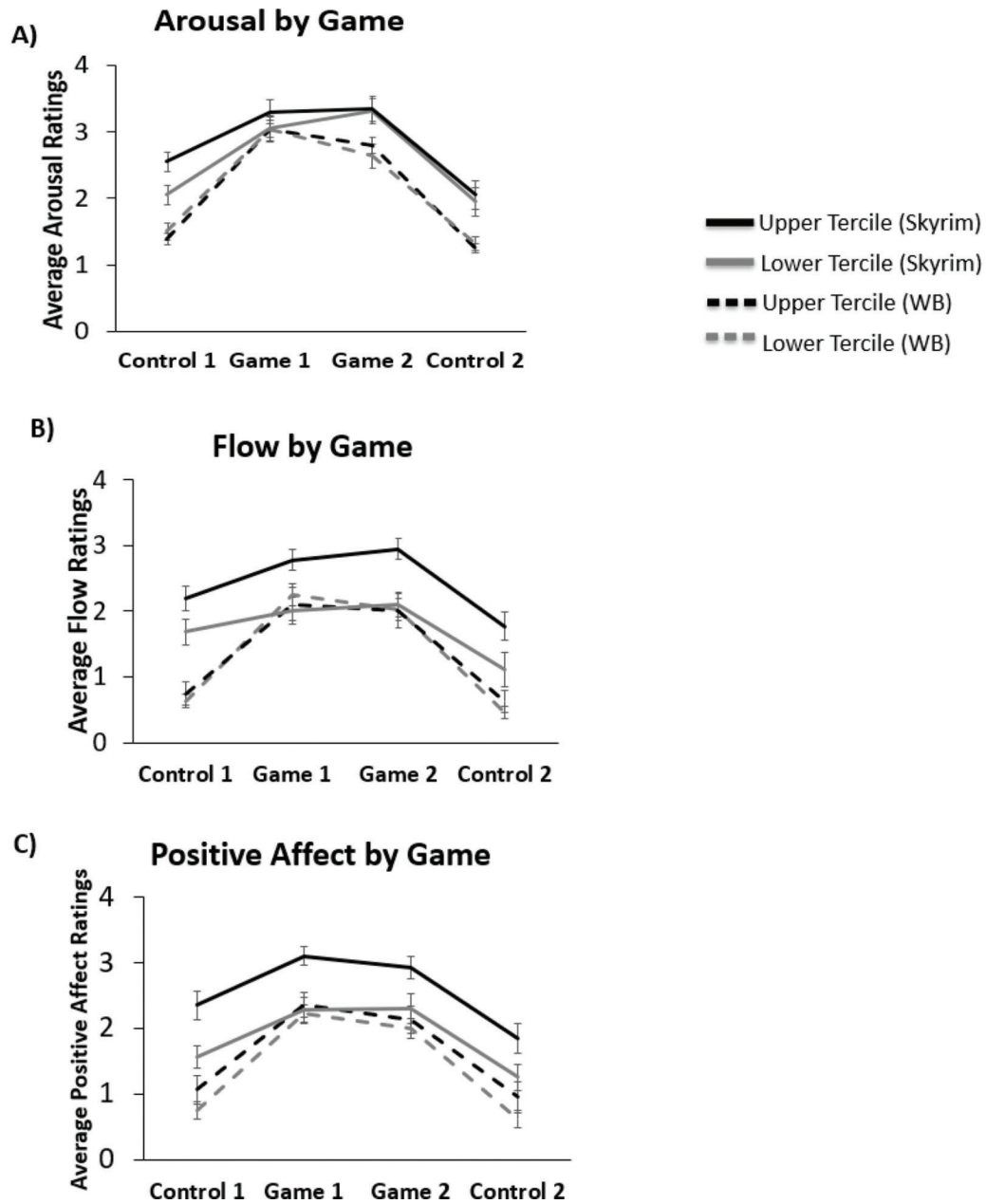
Comparing the RPG Skyrim With the Platform Arcade Game Winterbells

For arousal, flow, and positive affect, data were analysed by using a mixed factorial ANOVA with block as the within factor and tercile (lower third of escape scores, upper third of escape scores) and game (RPG Skyrim, platform arcade game Winterbells) as between factors. For all analyses, the main effect of block was caused by game epochs leading to greater arousal, flow, and positive affect. For brevity, block effects are described below only if they interacted with either game or tercile, and only significant effects are reported.

For arousal, there was a main effect of block, $F(2.511, 198.361) = 159.20$, $p < .001$, $\eta_p^2 = .668$, and a main effect of game, $F(1, 79) = 24.317$, $p < .001$, $\eta_p^2 = .235$ (with Skyrim generating more arousal [$M = 2.70$] than Winterbells [$M = 2.119$]). There was also a significant interaction between block and game, $F(2.511, 198.361) = 7.376$, $p < .001$, $\eta_p^2 = .085$. This was caused by greater arousal in Skyrim in both control blocks and Game 2 (all p values $< .001$), but equivalent arousal in Game 1. This interaction can be seen in Figure 5.

For flow, there was a main effect of block, $F(1.940, 153.221) = 105.9$, $p < .001$, $\eta_p^2 = .573$, and a main effect of game, $F(1, 79) = 22.132$, $p < .001$, $\eta_p^2 = .219$ (with Skyrim generating more flow [$M = 2.07$] than Winterbells [$M = 1.36$]). There was

Figure 5
Comparison of Subjective Responses for Each Game Type Following Each Epoch in the ABBA Design (Control 1, Game 1, Game 2, and Control 2) by Upper and Lower Tercile of Escape Scores.



Note. Panel A: Average subjective ratings of arousal. Panel B: Average flow ratings. Panel C: Average positive affect ratings. Error bars represent ± 1 SE. WB = Winterbells.

also a significant interaction between block and game, $F(1.940, 153.221) = 14.441$, $p < .001$, $\eta_p^2 = .155$. This was caused by greater flow in Skyrim in both control blocks and Game 2 (all p values $< .001$), but equivalent flow in Game 1. There was also a main effect of tercile $F(1, 79) = 5.935$, $p = .017$, $\eta_p^2 = .070$. Those in the upper

tercile showed greater flow ($M = 1.896$) than did those in the lower tercile ($M = 1.514$). This main effect was qualified by a game-by-tercile interaction, $F(1, 79) = 4.006$, $p = .049$, $\eta_p^2 = .048$. Simple effects revealed that whereas those in the upper tercile of escape scores experienced significantly greater flow than did those in the lower tercile while playing Skyrim ($p = .004$), the average flow scores were equivalent across terciles while playing Winterbells ($p = .751$). This game-by-tercile effect is shown in Figure 5.

For positive affect, there was a main effect of block, $F(1.974, 155.918) = 99.74$, $p < .001$, $\eta_p^2 = .558$, and a main effect of game, $F(1, 79) = 28.178$, $p < .001$, $\eta_p^2 = .263$ (with Skyrim generating more positive affect [$M = 2.2$] than Winterbells [$M = 1.35$]). There was also a significant interaction between block and game, $F(1.974, 155.918) = 5.874$, $p = .004$, $\eta_p^2 = .069$. Although Skyrim generated greater positive affect across all four blocks (smallest p value = .002), these differences were especially pronounced in the control conditions (e.g., for Control 1, Skyrim triggered an average positive affect rating of 2.05 versus .70 for Winterbells; for Control 2, $M = 1.71$ for Skyrim, $M = .46$ for Winterbells). There was also a main effect of tercile, $F(1, 79) = 14.886$, $p < .001$, $\eta_p^2 = .159$, caused by those in the upper tercile showing greater positive affect ($M = 2.09$) than those in the lower tercile did ($M = 1.505$).

Discussion

The correlation between escape scores and depression approached, but fell just short of, significance. Yet, in this experiment we showed that the more players endorse excitement gaming, the *fewer* symptoms of depression they experience. Although greater escape scores were only marginally correlated with depression scores, escape scores were significantly associated with mindfulness problems in daily life, as indexed by the MAAS. In contrast, excitement scores were unrelated to mindfulness in general. Such findings support our hypotheses that, similar to their problem gambler counterparts in Dixon et al., escape players likely experience mindfulness problems that are related to their depressive rumination when they are not gaming. Furthermore, in terms of problematic play, we also showed that greater escape endorsements were associated with video gaming-related problems as measured by the PVPQ, whereas excitement scores were unrelated to such problems. This result mirrors previous findings regarding the relationship between escape gaming and gaming-related problems.

Interestingly, our two game types had very different effects on flow, arousal, and positive affect. Specifically, it is clear that players had more enhanced experiences of arousal, flow, and positive affect during our selected RPG than during the platform flash arcade game, regardless of whether players fell into the upper or lower terciles of escape scores. We attribute these robust differences to the strong immersive properties that are unique to our selected RPG. This was especially evident when we compared players' more robust scores when wandering through a stripped-down dungeon for the control conditions of Skyrim with their scores when playing the platform arcade game. It is reasonable to assume that even though the control

dungeons were an impoverished version of the actual game dungeons, wandering through the impoverished dungeons was still much more engaging than monotonously sliding a mouse back and forth in the control conditions for the arcade game.

Of more importance, compared with non-escape players, escape players experienced more profound experiences of flow and positive affect in *Skyrim*. In contrast, flow and positive affect scores did not differentiate between escape and non-escape players in *Winterbells*. Such patterns of results suggest that escape gamers may only experience profound flow and enjoyment when in games that are especially designed to be immersive. We provide a more detailed comparison between the games' structural characteristics in the general discussion.

General Discussion

Taken together, our findings suggest that escape gamers and non-escape gamers have distinct experiences within and beyond game play. We show that, in consistency with previous research on both video gaming and gambling, gaming to escape is related to experiencing negative mood (e.g., depression) and mindfulness problems outside of gaming. Notably, endorsing excitement as a motivation to play was unrelated to depression or problems with mindfulness outside of the gaming context. If anything, the more that players endorse excitement gaming, the *fewer* symptoms of depression they report (at least in Experiment 2). These opposing relationships for excitement and escape motivations more firmly ground our findings in a negative reinforcement framework: Escape players may be using gaming as a way to distance themselves from their negative thoughts and feelings in daily life. Moreover, the relationship between higher depression and escapism complements previous research, such that gaming to escape is a potential risk factor for the development of problems related to gaming.

In many ways, the relationships between escape gaming and depression mirror those found in the gambling literature. In multiline slots gambling, depressed players experience profound flow and its consequent positive affect, a situation that makes multiline slots highly rewarding. A similar pattern emerges here: Those who endorse gaming to escape experience high levels of flow and positive affect. The similarity between the contexts is important given the disparity between multiline slots gambling and RPGs. In multiline slots, flow seems to be linked to the frequency of reward. Those playing multiple lines experience more frequent rewards than do those playing single-line games, and they also experience more flow. In RPGs, rewards are relatively infrequent; in the current study, for example, most players correctly solved two puzzles within 15 min. In multiline slots games, players receive positive feedback far more frequently (nearly every other spin in some games). Thus, profound flow may be experienced in the two contexts for very different reasons. The skill in video games likely contributes to flow; many games use a ramping structure, including the one here, such that as players get better, the game gets harder. That is, video game designers may compensate for increased skill by increasing the challenge. This skill-challenge balance is known to promote flow. In contrast, despite what some players

may think, there is no skill in slots. Thus, flow in this context may be linked to the reinforcement schedule.

During RPG game play, escape gamers displayed more profound flow and positive affect than non-escape gamers did, but this effect did not translate into our platform arcade game. In fact, our RPG was much more exciting and immersive to players regardless of whether they played for escape or not, lending credence to existing research that shows that RPGs promote higher degrees of immersion (Johnson et al., 2012). Our novel findings highlight how this deep level of immersion fostered by RPG games may act as a powerful medium for escape players to withdraw successfully from reality (Hilgard et al., 2013; Hussain & Griffiths, 2009).

The pronounced differences in flow, positive affect, and arousal between our RPG and the arcade platform game are likely rooted in the structural characteristics unique to each game genre. Relevant antecedents of flow in a video game include game play in which players feel a strong sense of control and action fluency, player skills that match the challenges presented in the game, and a clear goal and unambiguous feedback in the game (summarized in Chen, 2007; Fong et al., 2015; Sweetser & Wyeth, 2005; Wenke et al., 2010). Even the connection to one's avatar can have an impact on the level of flow experienced in game play (Soutter & Hitchens, 2016). Most RPGs such as *Skyrim* encompass these properties. For instance, *Skyrim* promotes a sense of control and action fluency by giving players sufficient time to plan and execute their actions to solve the dungeon puzzle. This also allows for balance between perceived challenges and skills in the game, since players have sufficient time to make correct moves. In contrast, *Winterbells* requires players to persistently make quick and accurate moves in order to avoid falling back to the bottom of the game board. With each successful jump, the game gets harder as the bells fall more quickly and become smaller. Eventually, the challenge of the game starts to outweigh the skills that the players have, causing the rabbit to fall. After a fall, the game starts over, and the skill that they accrued in the previous game, at least in the early portions of the next game, may far exceed the challenge. This may easily throw off the skill-challenge balance, hence making it more difficult to enter flow (Wenke et al., 2010). The design of *Winterbells* is such that although it is fun to play, the frequency of negative feedback falling (i.e., failing) is far more frequent than in RPGs. Thus, the structural characteristics in games such as *Winterbells* may hinder flow, whereas the combination of characteristics in *Skyrim* is more conducive to flow and its key sequela: positive affect.

In general, our in-game assessments of flow and positive affect show that players who play for escape may find relief through the enjoyment of experiencing flow, but effective escape may depend on whether the game itself is conducive to flow. It is clear that the structural characteristics in games are important determinants of whether players are able to fulfil their psychological and physiological needs, dictated ultimately by their reasons for play.

Limitations

This study was not without its limitations. For one, our game type comparison was based on a between-subjects analysis. A more statistically powerful approach would be to make comparisons of multiple games within the same sample. More generally, future researchers should also consider investigating which particular genres appeal most to specific gaming motives.

Second, there were subtle differences in game play duration between the two studies. Specifically, the game epochs in *Skyrim* were slightly longer than those in *Winterbells*. Because of the complexity of the game goals in *Skyrim*, a longer time commitment was required for players to work through the game in a meaningful way. For *Winterbells*, the game's goals were much simpler and thus did not warrant a longer playing time. Future research that compares similar games in a within-subjects design should aim to select games that can facilitate equal epoch lengths.

Conclusion and Future Directions

In general, our research sheds light on the contribution of flow experience, negative mood, and problematic video game play among players who game to escape. Indeed, our study supports existing research that shows that gaming to escape is a motive that is more related to gaming problems and negative moods outside of the gaming context. In contrast, gaming for excitement appears to be less problematic (Hellstrom et al., 2012; Kardefelt-Winther, 2014a). The rewarding and enjoyable state of flow may be a valuable state for escape players in particular, given its ability to provide relief from rumination through increased focus and attention, as well as positive feelings that they might not otherwise get outside the context of a game. Our findings further highlight how the structural characteristics unique to a game genre are an imperative determinant of whether players reach their desired experience dictated by gaming motivation. Games such as RPGs seem to possess structural characteristics that are crucial for escape players to profoundly experience the state of flow. Thus, a consideration of motives and game genres in particular is an important step for understanding risk factors for problem gaming.

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