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The moderating role of psychosocial well-being on the relationship between escapism and excessive online gaming

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Abstract

The purpose of this study was to empirically test the proposed theory of compensatory internet use, suggesting that people who play online games excessively are motivated to do so because they need to cope with psychosocial problems (Kardefelt-Winther, 2014a; Kardefelt-Winther, 2014b). The study used survey data from players of World of Warcraft (WoW), a popular MMO game. The indicators of psychosocial problems were high stress and low self-esteem and the motivation was escapism. The empirical analysis investigated interaction effects between indicators of psychosocial well-being and motivations. It was hypothesized that the relationship between escapism and negative outcomes would be positive for individuals with high stress or low self-esteem, which would be indicative of escapist online gaming as a coping strategy. However, this was only expected for individuals who experience more negative outcomes from their online gaming, which would highlight an important difference between those who experience many problems and those who experience few. The results showed that both stress and self-esteem moderated the relationship between escapism and negative outcomes as expected. In both cases, the relationship between escapism and negative outcomes was positive in the presence of more psychosocial problems (i.e. high stress or low self-esteem) for those who experience many negative outcomes, but not for those who experience few. The results support the theory of compensatory internet use and suggest that excessive online gaming may be a coping strategy for life problems.

1. Introduction

Online gaming is a rapidly growing hobby amongst people of all age groups, where the Massively Multiplayer Online (MMO) game is one of the most popular genres with millions of players across the world. Due to their immense popularity, MMO games have become a hot topic for researchers investigating excessive online gaming. Most research on the topic is based in one way or another on Young (1998), who conceptualized internet addiction[1] as an impulse-control disorder based on the existing diagnosis for Pathological Gambling found in the Diagnostic and Statistical Manual of Mental Disorders (DSM). Since then, researchers have approached the phenomenon of excessive internet use and excessive online gaming from a perspective of addiction and mental disorders. The dominant theoretical stance suggests that gaming addiction is a legitimate behavioral disorder (e.g., Young, 2009; Lemmens, Valkenburg & Peters, 2011). It is argued to be symptomatically similar to substance dependence (Salguero & Moran, 2002; Hsu, Wen, & Cherng, 2009; Kuss et al., 2012) and appears to be caused by a variety of vulnerability factors and is associated with a number of psychiatric co-morbidities (e.g., Kuss et al., 2012; King et al., 2013). It is worth mentioning that internet gaming disorder has also been included in the appendix for the DSM-V pending further research.

Several arguments have been made about the addictive potential of MMO games in particular. Blinka and Smahel (in Young & Abreu, 2011) stated that rewards in an MMO game are often closely tied with long-term and everyday presence in the game, which would increase the incentive to play every day and for increasing periods of time. Based on this, some researchers have argued that the games' reward schemas may induce operant conditioning via variable-ratio reinforcement schedules (e.g., Charlton & Danforth, 2007; Hsu et al., 2009; King & Delfabbro, 2009; Hussain, Griffiths, & Baguley, 2012) which will keep the player playing. A less compulsion-centered approach to the subject has focused on the motivations that underlie online gaming. A validated framework for motivational factors in MMO games was constructed by Yee (2006, 2007), measuring a player's orientation to online gaming in relation to the three broad motivations of achievement, social interaction and immersion. This framework has been used in studies on excessive online gaming (e.g, Yee, 2007; Caplan et al., 2009; Kuss et al., 2012, Kardefelt-Winther, 2014a) and the results suggest that certain motivations, primarily escapism, reinforce maladaptive patterns of uncontrollable gaming which can result in social or occupational negative outcomes for the player.

In this paper I wish to move away from a view of excessive online gaming as an addiction and a mental disorder. The purpose is to empirically investigate the theory of compensatory internet use that I have described in detail elsewhere (Kardefelt-Winther, 2014a; Kardefelt-Winther, 2014b), but which has as its basic tenet that excessive internet use occurs when people are motivated to go online to cope with life problems. The degree of life problems determine how strong the need and motivation to cope is, and the stronger the need the more time will be spent online to the detriment of other activities. Gaming provides certain affordances that may facilitate coping but the game itself is not the culprit, it merely acts as a potential facilitator of compensation for psychosocial problems. The idea that internet use

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[1] Also referred to as excessive internet use, compulsive internet use, problematic internet use – labels that have been used interchangeably to describe more or less the same concept (Widyanto & Griffiths, 2006).

may be a way to cope with negative feelings is not new and often mentioned in the literature on internet addiction and excessive online gaming (e.g., Armstrong et al., 2000; Bessiére et al., 2008; Chak & Leung, 2004; Whang et al., 2003; Widyanto & Griffiths, 2006; Young, 2009; Young & de Abreu, 2011; Shen & Williams, 2011; Kuss et al., 2012; Kim, LaRose & Peng, 2009; Hussain & Griffiths, 2009). However, this is rarely empirically investigated or considered in research, perhaps because the idea seeks to go beyond a framework of addiction and compulsion. This study is done against the background of earlier work showing how escapism, a motivation for online gaming (Yee, 2007), mediated the effects of stress on negative outcomes (Kardefelt-Winther, 2014a). These results indicated that direct effect models focusing only on psychosocial problems as predictors may not be adequate when exploring the antecedents of excessive online gaming.

2. Testing the theory of compensatory internet use

In an attempt to bring the psychological approach and the motivational approach together, Kardefelt-Winther (2014a) investigated psychosocial well-being and motivations for play in conjunction and showed empirically that the relationship between psychosocial well-being and online gaming addiction may be mediated by motivations for play. This formed the basis for the theory of compensatory internet use. Methodologically, this suggests that psychosocial well-being may be usefully explored as part of a chain of events rather than focal point. In other words, psychosocial well-being may be considered an underlying cause for motivations for play, and in some cases this interplay may lead to negative outcomes (2014a). While previous research on excessive online gaming has focused either on the direct effect of motivations for play on negative outcomes (e.g., Caplan et al., 2009; Kuss et al., 2012) or the direct effect of psychosocial well-being on negative outcomes (e.g., Kim et al., 2006; Young & de Abreu, 2011; Lemmens et al., 2011; Van Rooij, 2011; Kim, LaRose, & Peng, 2009; Fioravanti, Dèttore, & Casale, 2012), this study will explore how psychosocial well-being and motivations for play interact in predicting negative outcomes. While the theory is applicable across different internet activities and platforms, this paper seeks to test the theory in the context of online gaming. To the author's knowledge, this is the first study to explore the interaction between psychosocial well-being and motivations for play in this context. The following paragraphs will briefly discuss one gaming motivation and two indicators of psychosocial well-being that were used in this study, together with an outline of their respective associations with online gaming addiction.

2.1 Escapism
In early media and communication studies several researchers examined escapism as a key motivation for internet use. Miller (1996) suggested escape as a primary motivator for seeking gratifications through the internet. Similarly, Parker and Plank (2000) found that both a relaxation and an escape factor predicted internet usage. These findings have been replicated across a number of studies (e.g., Ferguson & Perse, 2000; Korgaonkar & Wolin, 1999). Young (2009) has suggested that people may go online to experience subjective mental escape, making internet use an effective emotional escape strategy for everyday life, but where adverse consequences may follow. In regards to gaming, Hussain and Griffiths (2009) reported in a qualitative study that over one third of gamers claimed that relaxation and escape was a key function of playing. In a study of online gaming, Yee (2007) found that the best predictor of a high score on Young's Diagnostic Questionnaire (1998) for internet

addiction was escapism, indicating that the player is using the online game to avoid thinking about real life problems. This suggests that players who go online with the motivation to escape from life problems may experience more negative outcomes from their gaming, a result supported by subsequent studies (e.g., Caplan et al., 2009; Kuss et al., 2012).

2.2 Perceived stress

Perceived stress can be defined as a situation that is appraised as threatening or otherwise demanding and where insufficient resources are available to cope with the situation (Cohen, Kamarck, & Mermelstein, 1983). In relation to media use, Zillman (1982; Zillman & Bryant, 1985) investigated the relationship between stress and television viewing and suggested that television can temporarily alleviate the negative feelings from stress by displacing anxious thoughts. This led researchers to propose that some viewers may use the television primarily to relieve stress which could lead to feelings that were addictive in nature (Anderson & Collin, 1996). Whang, Lee & Chang (2003) reported that work-related stress significantly increased internet use amongst people who displayed symptoms of internet addiction, while those who were not excessive internet users instead reported higher levels of drinking when stressed. Whang et al., (2003) concluded that people use different behavior repertoires to cope with stressful situations and that internet use may be one such behavior. In support of this argument, Leung (2007) found that playing online games may reduce stress arousal for children and adolescents.

2.3 Self-esteem

Self-esteem can be defined as an evaluation of one's self-concept, which is heavily dependent on reflected appraisals, social comparisons, and self-attributions (Rosenberg, Schooler, & Schoenbach, 1989). Several studies found an association between low self-esteem and internet addiction (e.g., Ko et al., 2005; Kim & Davis, 2009; Fioravanti, Dèttore & Casale, 2012). Douglas, Mills and Niang (2008) suggested that being online removes physical and interpersonal hindrances which allows those with low self-esteem to engage in social interactions, but may also lead to overuse of the internet. Online gaming has been proposed as a way for individuals with low self-esteem to escape reality and allow the player to compensate for a weak self-image by seeking out a game they have mastery over (e.g., Lemmens, Valkenburg, & Peters, 2011; Williams, Yee, & Caplan, 2008).

3. Hypotheses

Because online gaming is such a popular hobby it would be problematic to suggest that everyone who plays to escape from real life is at risk of experiencing negative outcomes. Playing online games to relax and escape is one of its primary functions (Williams, Yee, & Caplan, 2008; Hussain & Griffiths, 2009) and may also have positive outcomes (Leung, 2007; Wood, Griffiths, & Parke, 2007). As only a minority of all players experience negative outcomes, it seems important to focus on that minority when seeking to understand why this happens. Then, it will be possible to contrast these results with results from players who experience few negative outcomes. This would give insight into the differences between those who experience more negative outcomes and those who experience few, which is a useful way to explore the antecedents of problematic engagement with such a widespread and popular activity. Statistical analysis on the full sample would reveal broader tendencies within that sample, but interaction effects that may explain excessive gaming in some respondents may be negated unless these respondents are examined separately. Therefore

the respondents will be divided based on their negative outcomes score to allow for such comparative analysis.

The theory of compensatory internet use suggests that players who experience more negative outcomes from escapist online gaming behavior do so because they use the game to alleviate psychosocial problems, which makes it difficult or undesirable to regulate the game play. Accordingly, it is hypothesized that the association between escapism and negative outcomes depends on the level of stress or self-esteem. This interaction effect is expected to be significant only amongst those who experience a high degree of negative outcomes and would then offer an explanation to why such behavior occurs.

This gives a first set of hypotheses for those who experience more negative outcomes:

H1: *The relationship between escapism and negative outcomes is positive for those with high levels of stress*.

H2*: The relationship between escapism and negative outcomes is positive for those with low self-esteem.*

And a second set of hypotheses for those who experience few negative outcomes:

H3*: The relationship between escapism and negative outcomes is not moderated by the level of stress.*

H4*: The relationship between escapism and negative outcomes is not moderated by the level of self-esteem.*

4. Methods

4.1 Recruitment and sample
Players of World of Warcraft (WoW) were chosen to represent MMO players in this study. This was done because WoW is one of the most popular MMO games with over 10 million subscribers (Blizzard Entertainment Inc., 2012). WoW also represents the genre of fantasy role playing MMO's which accounts for around 70% of all MMO subscriptions (White, 2013). Data were collected via the Internet to ensure a large response rate and because it allowed for easier targeting of WoW players specifically. After completing an informed consent procedure, players completed a 10-15 minute survey. No incentives were given for participation. Participants were recruited through an online survey on a large WoW fan-based forum, http://mmo-champion.com. The inclusion criteria were filling out 100 percent of the questions. A total of 898 players filled out the questionnaires, of which 196 had to be excluded due to missing data. The final sample included 702 participants ranging in age from 14 to 60, of which 89% were male.

4.2 Assessment
One questionnaire was used to assess demographic variables, psychosocial well-being, negative outcomes of play and gaming motivations. Demographic variables included questions about age (M=23.6, SD=6.7) and gender.

Two indicators of psychosocial well-being were chosen from previous studies on excessive internet use and assessed with validated instruments. Five-point likert scales were used throughout, with responses ranging from "Strongly Disagree" to "Strongly Agree". The first indicator was Perceived stress, measured by four items from Cohen et al.,'s (1983) Perceived Stress Scale (M=2.5, SD=0.7, α=.75), with items focused on the perceived feeling of control over life events. The second indicator was self-esteem, measured by six items from Rosenberg et al.,'s (1989) Self-esteem scale (M=3.7, SD=0.7, α=.84), with items focused on feelings of self worth and attitude towards oneself.

Escapism was measured with five items from Yee's (2007) gaming motivations inventory (M=3.0, SD=0.7, α=.73), with an alpha value consistent with those reported in other studies using similar measurements (e.g., Caplan et al., 2009; Williams et al., 2008). An exploratory factor analysis ensured that all five items loaded on the same factor and weighted sum scores were used to determine a participant's compound escapism score.

Excessive online gaming was assessed by five negative outcomes that were adapted for WoW from previous studies (e.g., Young, 1998; Widyanto & McMurran, 2004; Caplan 2002, 2005; Griffiths, 2000; Morahan-Martin & Schumacher, 2000; Smahel et al., 2012; Meerkerk, 2007). This scale will be referred to as the negative outcomes (NO) scale to reflect its content, where a higher score refers to more negative outcomes. This scale had satisfactory internal reliability (M = 2.6, SD = 0.8, α =.72). Items are presented below:

1) I sometimes lose sleep because of the time I spend playing WoW.
2) I sometimes skip meals or delay my eating because I am busy playing WoW.
3) I have had conflicts with my partner or parents over the time I spend on WoW.
4) I have lost contact with some friends because I rather spend time on WoW.
5) My school/job performance has suffered because of the time I spend on WoW.

Finally, measurements for additional variables that have been shown to have mediating effects or influence significance levels of the variables in the current study were included to control for spurious results (Kardefelt-Winther, 2014a). Three additional psychosocial variables were included; Diener, Emmons, Larsen, & Griffin's (1985) Satisfaction with Life scale (M=3.1, SD=0.8, α=.84), Russell's UCLA Loneliness Scale (1996) (M = 2.5, SD = 0.8, a = .85) and Mattick & Clarke's Social Interaction Anxiety Scale (1998) (M = 3.0, SD = 1.0, α = .90). Two additional motivational variables from Yee's gaming motivations scale (2007) were included; achievement (M = 3.6, SD = 0.6, α = .71), and social interaction (M = 3.4, SD = 0.7, α = .74). Exploratory factor analysis revealed a simple factor structure where all items loaded as expected.

4.3 Analytical procedure
The sample was divided to allow for comparative analysis between respondents with higher and lower negative outcomes scores. Respondents were divided by their mean negative outcomes score rather than quartiles, as the latter method would put respondents with the same negative outcomes score in different groups. The mean negative outcomes score in the WoW sample was 2.62. The respondents with M_{NO} = 2.6 or above will therefore be referred to as the high negative outcomes group, while respondents with M_{NO} < 2.6 will be referred to

as the low negative outcomes group. This yielded final sample sizes of N=382 for the high negative outcomes group (M_{AGE}=21.9, SD_{AGE}=7.1, M_{NO}=3.26, SD_{NO}=0.53, 91.7% male) and N=321 for the low negative outcomes group (M_{AGE}=24.5, SD_{AGE}=7.6, M_{NO}=1.86, SD_{NO}=0.44, 84.4% male). The negative outcomes score differed significantly between the two groups (t (702) = -37.8, p < .001).

Regression models with interaction terms were fitted to respond to the hypotheses. Predicted regression coefficients for negative outcomes on given combinations of escapism and stress/self-esteem were used to plot the significant interaction effects.

5. Results

A multiple regression model was fitted to respond to H1, using demographic variables, indicators of psychosocial well-being and motivations for play as predictors. Additionally, an interaction term between stress and escapism was included.

Table 1: Multiple regression model on mean negative outcomes scores with interaction term between stress and escapism for respondents with more negative outcomes

Model	Variables	β	t	Model R^2
High NO				.27
	Age	-.039	.196	
	Gender (0F, 1M)	.140	2.49*	
	Social anxiety	-.054	-.544	
	Loneliness	.067	1.13	
	Stress	-.536	-2.68**	
	Sat. w life	-.020	.033	
	Self-esteem	-.095	-1.42	
	Achievement	.292	5.85**	
	Social interaction	-.082	-1.59	
	Escapism	-.099	-.960	
	Escapism*Stress	.877	3.08**	

Base: Respondents high on negative outcomes, N=382.

 * Correlation significant, p <.05.

** Correlation significant, p <.01.

In response to H1, the model in Table 1 revealed a significant interaction term between stress and escapism at the p < .01 level with a β-value of .877 (see Figure 1).

Figure 1: Two-way interaction effect between stress and escapism on negative outcomes for respondents with more negative outcomes.
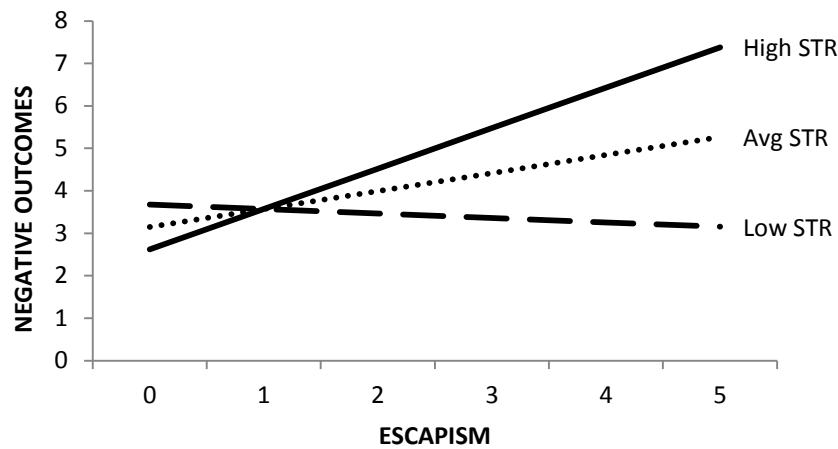
Base: Respondents high on negative outcomes, N=382.

In support of H1 the graph in Figure 1 shows that amongst players with high levels of stress, higher escapism results in more negative outcomes. For players with low levels of stress higher escapism results in fewer negative outcomes. This indicates a strong interaction effect between stress and escapism when predicting negative outcomes in the high negative outcomes group.

A second regression model was fitted to respond to H2. In this model, an interaction term between self-esteem and escapism was included.

Table 2: Multiple regression model on mean negative outcomes scores with interaction term between self-esteem and escapism for respondents with more negative outcomes

| Model	Variables	β	t	Model R^2
High NO				.30
	Age	.005	.181	
	Gender (0F, 1M)	.113	2.51*	
	Social anxiety	-.038	-.683	
	Loneliness	.081	1.34	
	Stress	.063	1.04	
	Sat. w life	-.006	-.100	
	Self-esteem	.794	3.20**	
	Achievement	.299	6.01**	
	Social interaction	-.085	-1.65	
	Escapism	1.14	5.09**	
	Escapism*Self-esteem	-.985	--3.77**	

Base: Respondents high on negative outcomes, N=382.

 * Correlation significant, p <.05.

** Correlation significant, p <.01.

In response to H2, the model in Table 2 revealed a significant interaction term between self-esteem and escapism at the $p < .01$ level with a β-value of -.985 (see Figure 2).

Figure 2: Two-way interaction effect between self-esteem and escapism on negative outcomes for respondents with more negative outcomes
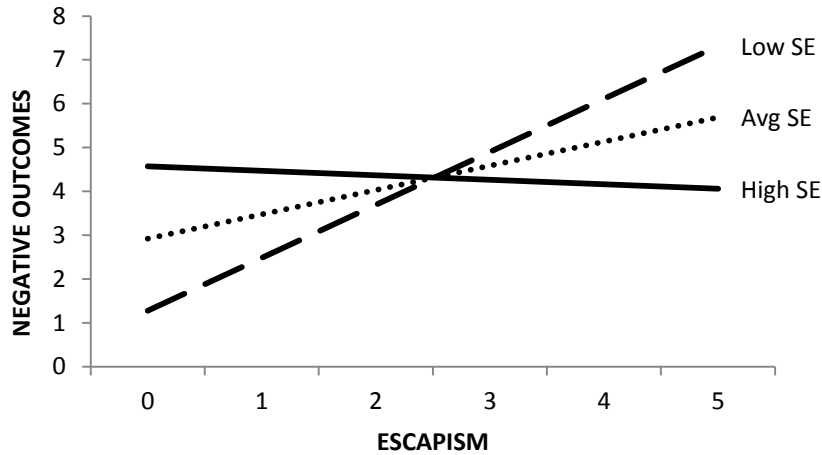
Base: Respondents high on negative outcomes, N=382.

In support of H2 the graph in Figure 2 shows that amongst players with low self-esteem, higher escapism results in more negative outcomes. For players with high self-esteem, higher escapism results in fewer negative outcomes. This indicates a strong interaction effect between self-esteem and escapism when predicting negative outcomes in the high negative outcomes group.

A third regression model was fitted for the group with low negative outcomes, to respond to H3. This model included an interaction term between stress and escapism.

Table 3: Multiple regression model on mean negative outcomes scores with interaction term between stress and escapism for respondents with low negative outcomes

Model	Variables	β	t	Model R^2
Low NO				.20
	Age	-.001	-.026	
	Gender (0F, 1M)	.035	.642	
	Social anxiety	-.092	-1.49	
	Loneliness	.118	1.73	
	Stress	.336	1.61	
	Sat. w life	.103	1.54	
	Self-esteem	-.087	-1.24	
	Achievement	.364	6.29**	
	Social interaction	-.074	-1.28	
	Escapism	.409	2.45*	
	Escapism*Stress	-.462	-1,49	

Base: Respondents low on negative outcomes, N=321.

* Correlation significant, $p <.05$.

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In support of H3, the model in Table 3 found no significant interaction effect between escapism and stress (p > .13).

A fourth regression model was fitted for the group with low negative outcomes, to respond to H4. This model included an interaction term between self-esteem and escapism.

Table 4: Multiple regression model on mean negative outcomes scores with interaction term between self-esteem and escapism for respondents with few negative outcomes

Model	Variables	β	t	Model R^2
Low NO				.20
	Age	-.006	.115	
	Gender (0F, 1M)	.041	.760	
	Social anxiety	-.090	-1.4	
	Loneliness	.125	1.82	
	Stress	.044	.621	
	Sat. w life	.103	1.60	
	Self-esteem	-.113	-.522	
	Achievement	.365	6.28**	
	Social interaction	-.071	-1.21	
	Escapism	.129	.423	
	Escapism*Self-esteem	.050	-.168	

Base: Respondents low on negative outcomes, N=321.

 * Correlation significant, p <.05.

** Correlation significant, p <.01.

In support of H4, the model in Table 4 found no significant interaction effect between escapism and self-esteem (p > .86).

6. Discussion

The broader theoretical purpose of this paper was to test whether psychosocial well-being moderated the relationship between motivations for internet use and negative outcomes, as the theory of compensatory internet use suggests. The paper specifically examined whether stress or self-esteem moderated the relationship between escapism and negative outcomes for the high negative outcomes group in the context of online gaming. It was hypothesized that the association between escapism and negative outcomes would be positive for those with higher level of stress (H1) or lower self-esteem (H2), in the group of high negative outcomes respondents only. These hypotheses were supported by the findings which showed significant interaction effects (Tables 1 and 2). H3 and H4 stated that there would be no such interaction effects in the group of low negative outcomes respondents; these hypotheses were also supported. This raises the important methodological point that quantitative studies focusing on a particular group of people with certain characteristics need to isolate this group from the wider sample.

Taken together, these results reveal some important differences between players who experience many negative outcomes compared to those who experience few. There were significant interaction effects between psychosocial problems and motivations for play for the high negative outcomes group, but none for the low negative outcomes group. It is possible that the former group experiences more negative outcomes because they use online gaming as a coping strategy for psychosocial issues, in this case high stress and low self-esteem. These finding suggests that life problems, escapism and negative outcomes are all connected and that a higher degree of life problems in conjunction with escapist use of online games may lead to more negative outcomes. This is in line with Whang et al.'s (2003) suggestion that people may have different behavioral repertoires to cope with life problems; online gaming may be one of them. As argued by LaRose and colleagues (2003) this could lead to problematic habit formation in the presence of negative life events and contribute to addiction-like symptoms without having anything to do with true pathology. This causal chain has been suggested many times in research on excessive internet use and online gaming addiction, but no prior study has attempted to empirically verify this proposition. Empirical causality cannot be established by this analysis but the results support the idea on a theoretical level. The findings show initial empirical support for a theory of compensatory internet use and the theoretical proposition that those who experience more negative outcomes from gaming do so because part of their motivation for excessive gaming is grounded in a need to cope with psychosocial problems, in this case high stress or low self-esteem.

While it was expected that that the relationship between escapism and negative outcomes would be positive for those with higher levels of stress, it was somewhat unexpected that the relationship between escapism and negative outcomes was negative for those with lower levels of stress. It seemed likely that low stress but high escapism would still be positively associated with more negative outcomes due to the strong association between escapist online gaming and negative outcomes found in a number of studies (and r= .389, p < .001 for the high negative outcomes group in this study). It may be that stress is such an important moderator between the escapism motivation and negative outcomes that in the absence of stress escapist online gaming is no longer a significant predictor (e.g., Kardefelt-Winther, 2014a). As Table 1 shows, stress has a negative association with negative outcomes when controlling for other factors, and escapism has no effect. Thus within the high negative outcomes group, escapism only leads to more negative outcomes for those with high levels of stress but does not have an effect independently when stress is absent. This highlights the importance of exploring motivations and psychosocial well-being together.

Importantly, these results suggest that it is not the escapist motivation per se that is harmful, but supports the theoretical proposition that escapist online gaming may be a response to particular life problems (Kardefelt-Winther, 2014a; 2014b). This supports arguments by Knobloch-Westerwick, Hastall, & Rossmann (2009) who suggested that it is vital to investigate in detail how specific media content affords coping for particular life issues. This would be useful for studies on excessive online gaming to consider, as some authors tend to present and use motivations for play as unique predictors of negative outcomes without considering the antecedents of such motivations. Future studies may usefully employ the compensatory framework tested in this paper where motivations are considered together with the life situation of the player.

7. Conclusions

This study has shown the usefulness of considering the phenomenon of excessive online gaming from a perspective of compensatory use, rather than a perspective of addiction and mental disorders. It allows for a more detailed description of why an individual may use the internet excessively and contextualizes the motivations for excessive online gaming in the presence of life problems, which makes excessive play more understandable. There were some limitations to this study in terms of the sampling. First, respondents were self-selected and the sample may not be representative of the wider WoW player base, as the player base is very diverse. While this was acceptable for the purposes of this study, which was to compare users with high/low negative outcomes rather than draw conclusions about WoW players in general, the results may need to be interpreted with caution. Secondly, the sample was drawn from one MMO game out of many MMO games, which in turn is one online gaming genre out of many genres. In other words, the results also need to be interpreted with caution in relation to other MMO games where a different set of motivations and dynamics may be in place. Although the result can offer a valid indication for MMO players in general, the results may not be generalizable to the wider population of internet users.

While this is the first study to empirically test the compensatory model of internet use, there is plenty of work for future studies in this area. This study explored one motivation and two indicators of psychosocial problems in a specific area of internet use: online gaming. Only looking at Yee's (2006, 2007) framework of gaming motivations there are two more motivations (achievement and social interaction) that may theoretically compensate for a number of psychosocial problems across a variety of internet platforms. In this study for example, achievement was a significant predictor of negative outcomes in all regression models (see Tables 1-4), even after controlling for multiple psychosocial issues and the interaction effects. Furthermore, no study on excessive online gaming has presented empirical support for an association between social interaction and negative outcomes (e.g., Caplan et al., 2009; Kuss et al., 2012; Kardefelt-Winther, 2014a), despite plenty of studies suggesting such a link. Social interaction by itself may not be problematic, but there may be situations where social interaction is used to compensate for life problems which could lead to excessive use. These relationships may be invisible when using a direct effects approach but could be revealed by exploring interaction effects between psychosocial problems and motivations amongst those who experience more negative outcomes from their internet use. Methodologically, this study has shown the benefits of focusing on those who experience more negative outcomes when exploring antecedents of problematic engagement with internet and online games, rather than exploring effects in a full sample where a large percentage of respondents experience few problems following their internet use.

The main implications for future research and theory is that the causes behind what we refer to as online gaming addiction may have less to do with compulsion and more to do with compensation. These findings highlight that a perspective of online gaming addiction as a mental disorder, as proposed in the DSM-V, may be an unfair characterization of a phenomenon that can be explained as a coping strategy for life problems.

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