**TITLE**: Internet Gaming Disorder: Compensating as a Draenei in World of Warcraft

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**AUTHORS**:

Maria Morcos[1]

Vasileios Stavropoulos[1]

John Jason Rennie[1]

Michael Clark[1]

Halley M. Pontes[2]

**AFFILIATIONS:**

[1] Cairnmillar Institute Melbourne, Australia

[2] Division of Psychology, School of Medicine, University of Tasmania, Launceston, Australia

**CORRESPONDING AUTHOR**:

Dr. Halley M. Pontes

Address: University of Tasmania, Newnham Campus, Launceston TAS 7001

Phone number: +44 115 941 8418

Email: contactme@halleypontes.com

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## Abstract

The diagnosis of Gaming Disorder (GD) has been recently proposed in the beta draft of the eleventh revision of the International Classification of Diseases (ICD-11) by the World Health Organization (WHO). This follows the inclusion of Internet Gaming Disorder (IGD), as a condition requiring additional research in the Diagnostic Statistical Manual for Mental Disorders (DSM-5), issued by the American Psychiatric Association (APA). Further research has been recommended to enhance understanding of excessive gaming, especially in the context of user-avatar (in-game figure representing the gamer) relationships. The association between selecting the Draenei race, compensation of real-life deficits through gaming and the gamer's gender were investigated as IGD risk factors among players of the online game, World of Warcraft (WoW). A normative online sample of WoW gamers (N = 404 $M_{age}$ = 25.56; 13-75; Males = 299; 74%) completed the Internet Gaming Disorder Scale–Short-Form (IGDS9-SF) and the compensation subscale of the User-Avatar Questionnaire. Regression, mediation and moderated mediation analyses were conducted. Overall, players with higher levels of compensation exhibited greater levels of IGD symptoms. Interestingly, choosing the Draenei race was associated with increased compensatory behavior, which in turn linked to higher IGD risk. These associations were mildly stronger among females. Findings suggest that virtual demographics, such as the Draenei race, and their interplay with compensatory behaviors should be carefully considered when creating prevention and intervention policies targeting excessive gaming, especially when it involves the use of avatars.


*Keywords:* Internet Gaming Disorder, World of Warcraft, Avatar, Compensation, Gender, Draenei.

## Introduction

Accessibility of the internet through a variety of devices, such as laptops and smartphones, has enhanced its use in today's society (Anderson, Steen & Stavropoulos, 2017; Jenkins, Ford & Green, 2018). Currently, there are over 4 billion internet users (Internet World Stats, 2019), while internet applications have expanded and proliferated to cover a variety of activities, ranging from communication to entertainment and commerce (Australian Bureau of Statistics, 2018; Mei, 2018). Among those, online gaming has emerged as both a popular and controversial online activity for individuals across all age groups due to its potential effects on psychological health and wellbeing (Stavropoulos et al., 2018a). The hiking popularity of online gaming could be partially attributed to the growing diversity of video games, as games have rapidly evolved from simple point-and-click to highly enticing Massively Multiplayer Online Role-Playing Games (MMORPGs) with persistent virtual worlds, immersive storylines and the ability to create an in-game figure of representation or an avatar (Kuss et al., 2013; Barnes, 2018). In MMORPGs players are able to create their own avatar in a fantasy world and complete in-game goals or tasks called "quests" either individually or with the help of other players. In general, MMORPGs are developed and structured to be endless, such that even after completing the games' main objectives, players often have to complete secondary goals and forms of horizontal progression, which could include improving their avatar by acquiring virtual goods (e.g., "gear"). Additionally, these games are frequently updated, with new content being introduced fairly regularly. MMORPGs have a unique characteristic due to involving a persistent world, whereby the game cannot be stopped or paused and continues to exist even when players are not actively playing or logged in the game (King & Delfabbro, 2019). Thus, it may not be surprising that average online gamers, independent of age, have been reported to spend an approximately 22 hours per week on gaming (Messinger et. al, 2008).

**Internet gaming controversies**

Despite negative stereotypes labelling online gamers as 'intellectually lazy' (Granic, Lobel & Engels, 2014), research has shown that such negative stereotypes of gamers are often not fully supported (Kowert, Festl & Quandt, 2014), and that gaming can promote various cognitive and emotional benefits, such as mood improvements, decreased stress levels (Bowman & Tamborini, 2012), faster attention allocation and enhanced visual processing (Granic, Lobel & Engels, 2014). Interestingly, 'trial and error' gaming processes encourage gamers to experiment with different techniques and strategies, therefore improving dexterity, reaction times, analytical and problem-solving skills (Prensky, 2012). Nonetheless, excessive gaming can result in significant detrimental outcomes, such as diminished work performance, sleep deprivation and addictive behaviors (Porter, Starcevic, Berle & Fenech, 2010). Although gaming can precipitate mood elevations, Bowman and Tamborini (2012) found this effect is no longer present when video games are used excessively. Instead, maladaptive behaviors and coping strategies are developed due to online disinhibition, whereby individuals may express themselves more freely online due to the perceived anonymity online (Suler, 2004).

**Internet Gaming Disorder and risk factors**

Excessive gaming has attracted global attention, thus prompting the development of diagnostic criteria by official medical bodies (Stavropoulos, Burleigh, Beard, Gomez & Griffiths, 2018b). The diagnosis of Gaming Disorder (GD), independent of internet use, has been recently included in the beta draft of the eleventh revision of the International Classification of Diseases (ICD-11; World Health Organization [WHO], 2018). This followed the inclusion of Internet Gaming Disorder (IGD) as a condition requiring further research in the Diagnostic Statistical Manual for Mental Disorders (DSM-5; American

Psychiatric Association, 2013). IGD is defined as the persistent use of online gaming leading to significant distress to the player (American Psychiatric Association, 2013). The DSM-5 lists nine clinical criteria; however, only five must be endorsed over a one-year period for a diagnosis of IGD. This includes preoccupation with gaming (i.e. eight to ten hours daily), withdrawal symptoms, tolerance, unsuccessful curtailing of gaming, loss of other interests, excessive engagement, deceiving others, using gaming to relieve negative moods, and loss of relationships, jobs or other significant opportunities (American Psychiatric Association, 2013). Given that IGD underscores the notion of the internet in online gaming, the DSM-5 definition of IGD will be utilized.

Several authors suggested that prior to official recognition of IGD as a mental health disorder, a better understanding of risk factors associated with IGD is needed (American Psychiatric Association, 2013; Petry & O'Brien, 2013; Pontes, 2018). The relationship between the users and their avatars has been consistently illustrated as an under-researched area that could be particularly informative in IGD treatment (Liew et al., 2018; American Psychiatric Association, 2013). Avatars, or the gamer's virtual identity, can be customized extensively (e.g. appearance, armor, class, and role). Thus, players who perceive a gap between their actual and ideal self may compensate by building their ideal virtual self in the gaming world (Bessiere et al., 2007). A significant attachment between the user and the avatar is subsequently formed, leading to an increase in gaming involvement and IGD risk (Livingston, Gutwin, Mandryk & Birk, 2014). Furthermore, a recent study found that the more idealized the avatar is for the player, the more IGD symptoms are experienced via the player's increased avatar identification (Mancini, Imperato & Sibilla, 2019). Thus, IGD risk is generally greater among gamers who customize an idealized avatar and exhibit high levels of identification with it (Mancini, Imperato & Sibilla, 2019).

**Multi-massively online role-playing games and World of Warcraft**

Video games such as MMORPGs present as the ideal context to study IGD risks due to their avatar customization features and their heightened addictive potential (Stavropoulos et al., 2017). MMORPGs are games that allow the player to create and assume the role of a character, as well as the ability to play with others online, thereby advancing the gamer's involvement (Lis et al., 2016). Excessive involvement poses a risk for several reasons, such as escaping real life problems (Hussain & Griffiths, 2009), offering immediate gratification upon completing challenges (Stavropoulos, Kuss, Griffiths & Wilson, 2016) and enabling online socialization without the demands of face-to-face relationships (Stavropoulos et al., 2017).

A popular and globally expansive MMORPG is World of Warcraft (WoW). It is set in a fantasy world called Azeroth, where players can engage in combat with and against one another to in-game gain rewards (Blizzard Entertainment, 2018). WoW has attracted global international attention (Reer & Kramer, 2017; Snodgrass et al., 2017; Livingston, Gutwin, Mandryk & Birk, 2014; Blinka, 2008) and it has been consistently cited as a risk factor for IGD due to its features (Pawlinkowski & Brand, 2011; Lehenbauer-Baum & Fohringer, 2015). Moreover, WoW offers extensive avatar customization options as gamers can choose certain characteristics, through selection of a 'race' and a'class', as well as a particular faction to align themselves with; alliance or horde (McArthur, 2017). These features vary in terms of their narrative, game mission and skills, which can accommodate the gamer's needs to identify with their avatars and build an ideal self (Newon, 2011). For instance, the race of Draenei refers to a strong and stoic warrior that is able to heal other players (see *Table 1* for a comprehensive list of races). Hence, players can express a wide variety of ideologies, behaviors and beliefs through their selected WoW avatar characteristics, which nurtures the

user-avatar relationship and exacerbates IGD risk (Livingston et al., 2014). As a result, recommendations for future research entail focusing explicitly on the interplay between real and virtual demographics in the development of IGD (Liew et al., 2018).

-Insert Table 1-

**Risk and Resilience Framework**

Similar to past research, the present study utilizes the risk and resilience framework (RRF; Stavropoulos et al., 2018c). Resilience is the ability of an individual to mantain a positive outlook in the face of adversity, whereas risk involves factors that escalate susceptibility to a particular disorder (Masten, 2014). The RRF proscribes that the intensity of psychopathological behaviors can vary based on the interaction between individual characteristics and contextual features, such as age and culture respectively (Masten, 2014). Virtual and gamer-related factors are particularly important when examining IGD (Adams et al., 2018; Liew et al., 2018), thus they have been emphasized in the present study as significant risk factors for IGD. Specifically, virtual factors (examined here) will include the interplay between compensation tendencies and virtual demographics, such as selecting the WoW race of Draenei. Furthermore, the gender of the gamer will be examined as a gamer-related risk factor.

**Effects of compensation**

Limited research has examined compensation as a potential pathway to IGD (Lee-Won et al., 2016; Blinka, 2008). Compensation is a defensive coping behavior which protects against threats to an individual's self-esteem, thereby reducing anxiety by exaggerating a self-perceived deficiency (Lee-Won et al., 2016). A relatively large body of research show that the psychological process of compensation can be enacted through avatar customization,

and that compensatory gaming behaviors can generalize to areas outside appearance, such as socialization, level of group acceptance and personality traits (Stavropoulos et al., 2017). For instance, in Lee-Won and colleagues' (2016) study, men who felt self-conscious of their muscular features were more likely to exaggerate muscular definition in their avatars. As a result, users utilized their avatars as a means to cope with threats to their real-world appearance. These users reported increased attachment to their customized avatars, thus strengthening the user-avatar relationship (Lee-Won at al., 2016). In a similar vein, the study by You, Kim and Lee (2017) found that overall self-esteem and social skills had significant negative associations with IGD, while depression presented significant positive association with IGD. Furthermore, You et al. (2017) found that avatar identification played a key mediation role as depressive symptoms had an indirect effect on IGD risk via avatar identification.

Additionally, over-reliance on virtual avatars was identified as a potential risk factor towards developing IGD, with users deriving a sense of heightened confidence and pleasure due to ease of interactions and satisfaction with virtual appearance. As a result, online gaming may be used as a means to escape reality and relieve negative moods associated with low confidence and body dissatisfaction, which can potentially increase IGD behaviors (Liew et al., 2018).

**Draenei race**

The Draenei race in WoW has been selected as a variable in the present study due to its lore (i.e., in-game narrative) and specific racial and general skills. In WoW, the Draenei race has an extensive history of trauma and war, which is reflected by the translation of the name 'Draenei' to the 'exiled one' (Blizzard Entertainment, 2018). Additionally, they are natural in-game healers and are the only WoW race able to cast an active healing spell on

themselves or another ally via their main racial skill called the "Gift of the Naaru", providing healing to the chosen target for a large amount of health overtime. The Draeneis were forced to flee their homes due to impending evil and found temporary sanctuary in the World of Draenor. However, they were hunted and slaughtered by orc warlocks. The Draeneis that survived sought refuge in their new home, Azeroth, where they have dedicated themselves to defend it at all costs. The Draeneis have multiple racial abilities (e.g., Heroic Presence, Gem-cutting, and Shadow Resistance), such as their ability to heal, both themselves and allies, and their strength in battle (Blizzard Entertainment, 2018).

The Draenei's history of severe trauma could accommodate identification processes in more psychologically vulnerable gamers (Fonagy, 2018). This is reinforced by evidence suggesting that those who have undergone trauma can become resilient by finding coping mechanisms (Denov, 2010; Miller & Rasmussen, 2009). To the best of the authors' knowledge, no previous study has examined the links between selecting the Draenei race in WoW and psychological compensation. Thus, it is assumed that gamers who have experienced real-life difficulties may be more likely to identify with a race that is both traumatized and resilient simultaneously. In doing so, Draenei gamers may be more likely to compensate and seek solace in WoW, therefore increasing their risk of IGD.

**Effects of biological gender**

Biological gender, particularly male, has been associated with addictive use of the internet and related-behaviors (Kuss, Pontes & Griffiths, 2018; Pontes, 2017; Pontes et al., 2019; Stavropoulos, Alexandraki & Motti, 2013; Stavropoulos et al., 2018c). For instance, past research found that males are more likely to become addicted to online gaming (Ko, Yen, Chen, Chen & Yen, 2005; Chou, Condron & Belland, 2005). This aligns with findings that males are more likely to engage in internet gaming than females (Entertainment Software

Australia, 2018). Ko and colleagues (2005) suggest this may be due to the tendency for males to pursue a sense of achievement as a means of coping, which is granted in MMORPGs such as WoW. Chou and colleagues (2005) expanded upon these findings by suggesting that males are more attracted to online games that allow them to exert power, dominance, control, and violence. Similarly, DiGiuseppe and Nardi (2007) reported that males are more likely to choose 'powerful' characters that deal high amounts of damage to other players and in-game characters. Nevertheless, mixed results have been produced on the sole interplay between compensatory behaviors and gender (Lee-Won et al., 2016; Villani et al., 2012). Thus, ascertaining the degree that the association between being a Draenei, compensation tendencies and IGD behaviors may vary across both genders could be meaningful. Investigating this issue and generating such knowledge is key to clinical work, as it can inform which gender and virtual identities may be at higher risk for developing IGD. Gender and avatar-sensitive prevention and treatment protocols can be developed, taking concurrently into consideration the predominant reasons that males may turn to internet gaming (Chou, Condron & Belland, 2015).

**The present study**

The present study aims to explore the associations between selecting the Draenei race in WoW, levels of psychological compensation, gender, and IGD behaviors by investigating a normative sample of WoW gamers. Based on the literature review conducted, the following hypotheses were devised for the present study:

$H_1$: WoW players showing higher levels of compensation will also exhibit increased IGD behaviors.

$H_2$: The levels of compensation experienced in the context of choosing the Draenei race may lead to IGD behaviors.

$H_3$: The extent to which compensation tendencies developed in the context of the Draenei race could lead to IGD behaviors may vary due to the gamer's gender.

## Method

### Participants

The current study recruited a sample of 404 WoW gamers ($M_{age}$ = 25.56, *SD* = 7.61, Males n = 299, 74%) to examine the proposed hypotheses outlined above. The estimated maximum sample error was +/- 4.88% (Z = 1.96, confidence level 95%). The missing values ranged between 3.7% and 5.9% across all variables in the study and were missing at random (Little's MCAR test $X^2$ = 31.91, $p$ > .001; Little, 1988). Bootstrapping at 5000 re-samples was additionally applied to the analyses to increase the robustness of the findings. This also ensured that sample power was not reduced due to list-wise deletion of missing value cases. Moreover, *Table 2* presents detailed information regarding demographics and internet use characteristics of the sample.

-Insert Table 2-

### Measures

**Internet Gaming Disorder Scale–Short-Form (IGDS9-SF).** Symptoms of IGD were measured using Pontes and Griffiths' (2015) IGDS9-SF. Respondents addressed 9 items about gaming behaviors and usage over the last 12 months on a 5-point Likert scale, ranging from 1 (never) to 5 (very often). The scores of all items are summed, producing a total score between 9 (minimum IGD symptoms) and 45 (maximum IGD symptoms). Higher scores indicate higher IGD symptoms. This measure is appropriate as it has high criterion-related and concurrent validity (Pontes & Griffiths, 2015) and recent psychometric research has shown its suitability in assessing IGD (Gomez et al., 2018; Pontes, Stavropoulos & Griffiths,

2017). In the current study, it presented good internal reliability, with a Cronbach's alpha of .84.

**User-Avatar Questionnaire.** Psychological compensation was assessed using the relevant subscale of the User-Avatar Questionnaire (Blinka, 2008). Overall, the questionnaire consists of 12 questions measured by the following three latent factors: identification with the avatar, immersion (i.e. whether the player frequently fantasizes about the avatar) and compensation (i.e. whether the avatar is superior or inferior to the real self). Respondents answered items on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Scores on each factor are summed, whereby higher values indicate higher user-avatar associations. This instrument has high internal reliability, with Cronbach's alpha ranging from 0.66 to 0.80 across the three factors (Blinka, 2008). The internal reliability of the compensation factor used for the present analysis was also sufficient (Cronbach a= .78).

**Procedure**

The present study was granted ethical approval from the Human Research Ethics Committee of Cairnmillar Institute (2018/01749-16). A normative sample of WoW gamers was recruited online. Furthermore, traditional methods, such as distributing flyers at internet cafes, and electronic methods, such as Facebook advertising and posting on gaming forums, were used. Data collection was conducted during the months spanning from August, 2017 to April, 2018. Eligible gamers who were interested in participating in the present study completed an online survey via a Survey Gizmo hyperlink. Once participants accessed the hyperlink, a plain language information statement was presented. Participants were asked to provide informed consent, indicated by an approval button clicked with a mouse. All data were collected and collated on SPSS for subsequent statistical analyses. Participants were briefed at the outset and informed that the survey required no more than 30 minutes.

Online data collection methods, as opposed to traditional pen-and-paper data collection, were utilized in order to access a wide demographic of WoW gamers in hard-to-reach places. Griffiths (2010) posited that online data collection holds many advantages, such as reaching wider populations and reducing bias associated with social desirability. This also proved to be a more cost-effective choice of method. It is worth noting that past research has found no significant differences between the efficacy of online collection methods and traditional methods (Weigold, Weigold & Russell, 2013).

**Statistical analysis and estimations**

Gender variables were recoded into 'males' and 'females' (i.e. 0 = females, 1 = males). To assess the first hypothesis, a two-step hierarchical linear regression analysis was conducted to determine if WoW players who show higher levels of compensation exhibited increased IGD behaviors, controlling concurrently for age and gender. IGD behaviors were inserted as the dependent variable. Age and gender were inserted as predictors at the first step of the model, and compensation was inserted as a predictor at the second step. To assess the second hypothesis, a mediation analysis model using Process Macro (Hayes, 2015) was utilized. The race of Draenei (binary coded, 0 = not a Draenei, 1 = Draenei) was the independent variable, and IGD behaviors were the outcome variable. Compensation was inserted as the mediating variable to assess whether selecting the Draenei race was associated with higher levels of compensation that eventuated IGD. To assess the third hypothesis, a moderated mediation analysis using Process Macro (Hayes, 2015) was utilized. This model expanded upon the mediating model testing the second hypothesis by adding gender as a moderator of the associations between the race of Draenei and compensation (*path a*), compensation and IGD (*path b*) and the race of Draenei and IGD (*path c*).

## Results

Considering the association between compensation and IGD behaviors ($H_1$), a two-step linear regression analysis model was conducted. IGD behaviors were inserted as the dependent variable, compensation was inserted as the independent variable at the second step of the model, and age and gender effects were inserted as independent variables at step one to be controlled for, as recommended by past literature (Adams et al., 2018). The full two-step hierarchical model accounted for a statistically significant 9.4% of the variance in IGD behaviors. The slope of the regression line for the overall model was significant ($R^2 = .094$, $F_{(2, 365)} = 18.90$, $p = .000$). The specific effect of compensation tendencies accounted for a significant 7.8% of the variance in IGD behaviors, while the slope of the regression line of compensation only on IGD behaviors was also significant ($R^2 = .078$, $F_{Change}(1, 366) = 31.52$, $p = .000$). A one-unit increase in compensation predicted a .607 increase in IGD behaviors (b = .61, SE(b) = .11, $\beta = .28$, $t = 5.61$, $p = .000$).

To assess whether the Draenei race was associated with IGD behaviors, and whether the level of compensation mediates this relationship ($H_2$), Model 4 of Hayes' Process (2015) procedure was estimated using bootstrapped bias corrected and accelerated confidence intervals for 5000 re-samples (see *Figure 1*). The Draenei race was significantly associated with compensation, b = 1.54, $p = .04$, 95% CI [.10, 2.99]. Thus, *path a* of the mediation model was supported. Compensation was also associated with IGD behaviors, b = .61, $p = .000$, 95% CI [.40, .82], therefore *path b* was supported. Furthermore, the indirect effect was b=.94, bootSE = .43, while bootstrapped at 95% CI ranged from .16 to 1.89, indicating that the indirect effect, or the mediating path (*path a*b*) involving compensation, was statistically significant. However, given that the effect (*path c*) of the Draenei race on IGD behaviors was

not significant, b = 1.71, $p$ = .27, 95% CI [-1.31, 4.75], an indirect-only mediation was concluded (Zhao, Lynch & Chen, 2010).

- Insert Figure 1 -

A moderated mediation test using Process Model 59 (Hayes, 2015) was conducted to test whether the gender moderated the mediative associations between choosing the Draenei race, compensation tendencies and IGD behaviors ($H_3$; see *Figure 2).* An indication of gender differences was observed. The moderating effect was significant for females, as indicated by the bootstrapped 95% CI, resulting in values ranging between .026 to 1.83. However, a significant result was not produced for males, as indicated by the bootstrapped 95% CI, with values ranging between -.99 to 3.87. The overall difference between the genders was not significant, as the index value of moderated mediation was -.54, with a bootstrapped standard error of 1.25 at the 95% CI and values ranging from -3.25 to 1.85.

-Insert Figure 2 -

## Discussion

The present study investigated the associations between psychological compensation, selecting the race of Draenei in WoW, biological gender and IGD. The results showed that $H_1$ was supported as WoW players with higher levels of compensation also exhibited higher levels of IGD behaviors. Furthermore, the findings obtained also supported $H_2$ as two associations were found to be significant. Firstly, the Draenei race effect on the development of compensation tendencies, and secondly, the effect of compensation tendencies on the emergence of IGD behaviors. In contrast, the direct association between the Draenei race and IGD behaviors was not significant. Thus, an indirect effect (as opposed to a direct effect) was confirmed, indicating that compensation did in fact effect the link between choosing the

Draenei race in WoW and IGD behaviors. Finally, considering $H_3$, and while gender did not account for a strong variation in the effect of compensation tendencies on the association between the Draenei race and IGD behaviors, a rather mild exacerbating effect was found for female WoW gamers. Overall, the results indicate that virtual demographics (e.g., selecting the Draenei race) and their interplay with compensation should be taken into account when devising prevention and intervention initiatives, targeting excessive gaming that involves avatar use.

**Compensation and IGD**

The present study found that WoW gamers who reported higher levels of compensation exhibited higher levels of IGD behaviors. This is consistent with the compensatory internet use hypothesis (Kardefelt-Winther, 2014;), as well as previous avatar-related findings (Lee-Won et al., 2016; Liew et al., 2018), which support the notion that compensation in avatar customization can become a maladaptive coping mechanism leading to detrimental outcomes. Such intricacy may lead to detrimental outcomes related to excessive gaming, rendering gamers more vulnerable to IGD behaviors (Liew et al., 2018). Avatar customization options are extensive in WoW, whereby individuals are able to create an avatar reflecting their ideal self. Therefore, gamers who may be dissatisfied with their real self can derive a greater sense of satisfaction due to the perceived attractiveness of their idealized virtual self (Lee-Won et al, 2016). As previously discussed, psychological compensation and compensatory behaviors can extend beyond avatar customization and body image, as gamers can attempt to compensate in areas other than appearance (Stavropoulos et al., 2018d; Stavropoulos et al., 2019). Individuals who may feel lonely and lacking social connections in the real world can find solace in online socialization, in which they might experience higher acceptance by a guild; that is, a group of gamers supporting each other

consistently throughout the game (Stavropoulos et al., 2017; Scerri, Anderson, Stavropoulos, & Hu, 2018). Within guilds, gamers may feel a greater sense of purpose and belongingness, and therefore, compensate for their potential lack of socialization in the real world by becoming meaningfully and socially involved in the virtual world (Goodman, Doorley & Kashdan, 2018). This was further supported by Kuss and colleagues (2013), who found that introverted personalities are more likely to find socializing in the virtual world easier and thus preferable. Additionally, this finding supports the well-established notion that preference for online social interactions may elicit internet addiction presentations (Caplan, 2010) in relation to online gaming and other technological addictions (Pontes, Andreassen & Griffiths, 2016; Pontes, Taylor & Stavropoulos, 2018). This has also been attributed to factors such as anonymity and lack of face-to-face contact (Anderson, Steen & Stavropoulos 2017). Nevertheless, higher compensation ultimately leads to a strengthened user-avatar bond (Blinka, 2008). As previously highlighted, gamers exhibiting higher connection with their avatar are at an increased risk of IGD (American Psychiatric Association, 2013; Liew et al., 2018).

**Draenei and IGD**

Selecting the Draenei race in WoW was found to be significantly associated with higher levels of compensation. In turn, compensation is significantly associated with IGD, thus the choice of the Draenei race had an indirect relationship with the emergence of IGD behaviors. Therefore, it can be assumed that a portion of gamers who play as Draeneis may develop stronger attachments to their avatars (Stavropoulos, Mastrotheodoros, Burleigh, Papadopoulos, & Gomez, 2018e; Burleigh, Stavropoulos, Liew, Adams & Griffiths, 2018). This may be particularly prevalent in players who have remained resilient when confronted with challenging life conditions, as the Draeneis also present themselves as a traumatized,

and yet resilient race. Specifically, the Draenei's healing and strength-related capacities may invite increased gaming engagement through psychological projection user-avatar processes, compensation and ultimately IGD risk (Stavropoulos et al., 2017).

According to Denov (2010), many individuals affected by trauma, including violence, assault and threats of death, have a 'compulsion to survive'. This signifies resilience, which denotes individuals that remain optimistic in spite of adversity. Draeneis can be described as resilient, given their effort to find a new home and continue to defend it. Thus, identifying as a Draenei can offer a virtual avenue for gamers that have experienced (or are currently experiencing) hardships to feel more resilient. In other words, identifying as a Draenei through excessive internet gaming could become a viable in-game coping mechanism. Interestingly, Denov (2010) also highlights other coping mechanisms frequently utilized by trauma-stricken individuals. For example, it was found that resilient individuals are highly likely to retreat from mainstream society and rely on the formation of new peer-support structures. Isolating oneself from society is often the case in disordered gaming, as excessive engagement and withdrawal is within the diagnostic criteria (American Psychiatric Association, 2013) and has been reported in case studies of IGD patients presenting with intense social isolation (Voss et al., 2015). Therefore, based on previous research it can be speculated that that individuals who have experienced hardships could be more likely to retreat from society to become immersed as Draeneis on a virtual world (Burleigh et al., 2018). In addition, gamers are able to find and build support structures with other gamers online by joining in-game social groups often called guilds or clans. This is highlighted by Stavropoulos and colleagues (2017), whereby gamers are able to compensate for their lack of social supports in real life by creating online friendships. In that line, Draeneis have multiple functions; they are able to fight in battles due to their strength, and they are also able to heal their peers. Hence, Draeneis are particularly useful, and may be more likely to integrate better

in guilds. As a result, the gamer's levels of compensation and internet engagement may increase, ultimately leading to a susceptibility to IGD due to in-game social activities and character-related self-esteem (alongside the fact that online games in general present higher addictive risk to players; Lemmens & Hendriks, 2016).

**Effects of gender**

Whilst the moderated mediation analyses produced mild gender differences, a stronger effect of compensation tendencies on IGD behaviors was found for Draeneis among female gamers. This aligns with previous research indicating that females are more prone to exhibiting compensating behaviors (Villani et al., 2012). However, it conflicts with a bulk of other past findings, which proscribe that males are more likely to exhibit excessive internet use (Ko et al., 2005). This is potentially due to an increased need to satisfy immediate gratification by completing in-game achievements (Ko et al., 2005; Stavropoulos et al., 2013).

The current findings can be attributed to a number of factors. Male gamers have been assumed to be more prone to games, where (or through which) they exert dominance and control, and tend to choose more powerful and aggressive characters (Di Giuseppe & Nardi, 2007; Chou et al., 2005). Thus, the Draenei race may not be a male's first choice of race, as Draeneis are not an outwardly dominant and controlling race. Clinical literature also contends that there are gender differences in trauma reactions. Traumatized males often exhibit aggression in response to past trauma, while traumatized females are more inclined to show resilience and offering support to others (Carpenter, 2018). Therefore, it could be assumed that it is likely that females would be more likely to align with Draeneis, who exhibit similar reactions to trauma.

**Strengths, limitations and future research**

The current study possesses a number of strengths, such as a focus on the interplay of real and virtual demographics considering the user-avatar relationship in relation to IGD. This has followed past recommendations which have invited for an emphasis on virtual demographics in relation to IGD (Liew et al., 2018; Burleigh et al, 2018; Adams et al, 2018). Statistically sound methodologies and scales were also employed. Nevertheless, certain limitations should also be considered. Data was collected prior to the most recent expansion of WoW. This could have influenced the results, as gamers may have been more likely to select newer races due to their novelty (Constantinou & Legarth, 2012). Furthermore, self-report instruments were employed, which may have impacted the reliability of the findings, as responses could have been effected by mood and situational factors at the time when the assessment occurred (Adams et al., 2018). Moreover, participants' psychological gender and identification towards their gender may have played a role in the present findings, given that gender was operationalized in a binary way in the present study.

The uneven number of females and males in the sample, 20.5% and 74% respectively, could have affected the generalizability of the results. Obtaining a more even level of female participants should be targeted by future researchers examining psychological processes in relation to IGD, as relatively lower numbers of female gamers has been a consistent limitation in past research (e.g. DiGiuseppe & Nardi, 2007). This may be achieved by targeting advertising at female-dominated groups, such as online 'female gamer' groups. Such groups can be found on Facebook and other gaming forums. This is particularly important due to the increasing number of female internet gamers in recent years (46%; Entertainment Software Australia, 2018). Moreover, Lesbian, Gay, Bisexual and Transgender gamers have not been explicitly investigated here. This constitutes an area that necessitates

attention by future studies, as their compensating associations/attachments with their avatars may pose a significantly higher IGD risk compared to other gamers, in line with recent findings (Pugh, 2018).

In that context, there is a lack of in-depth insight into the past history of participants, which could confound the present findings. It was largely assumed that gamers who chose the race of Draenei did so due to similarities and identification with the Draenei's history. However, past research has found that some WoW gamers choose certain races simply due to their abilities to fight well in battles or attractive appearances (Ducheneaut, Yee, Nickell, & Moore, 2006). Thus, the potential reasons and psychological motives underpinning certain avatar choices should be more holistically scrutinized in future research. This could be done by enabling the use of qualitative information in future studies and by prompting participants to explain why they chose avatars with specific attributes. Additionally, an option where participants could agree to further follow-up phone calls or interviews can be given. This would allow researchers to have a conversation with participants as to why they chose certain races, providing more in-depth insight into their choices.

Despite these potential limitations, the present study has contributed significantly to an area of relatively limited knowledge. It has also corroborated past literature highlighting the clinical significance of the user-avatar relationship (Burleigh et al., 2018; Liew et al., 2018) and how this could inform future IGD prevention and treatment planning.

**Implications and Conclusions**

The present study has investigated an area of research that has been recommended for additional examination, by providing insight into a game with engaging (and likely addictive) features (i.e. WoW), and specific virtual characteristics, such as the selection of certain races, that can exacerbate the risk of IGD. This research can be used to target gamers who may be at

higher IGD risk, based on their virtual characteristics. Thus, the present findings can be utilized to inform the development of interventions that are targeted at particular virtual populations. For example, those identifying as a Draenei could potentially be looking at more trauma-focused interventions.

In conclusion, the present study explored IGD risk in relation to selecting the Draenei race, compensation tendencies (through the use of the avatar), and gender. Overall, it was found that compensation tendencies are associated with increased IGD behaviors. Compensatory behaviors can be enabled by MMORPGs, such as WoW due to their in-depth avatar customization capabilities and the subsequent potential risk of intense user-avatar bond/attachment. The present findings have also shown that the choice of the Draenei race can lead to IGD behaviors, when accommodated by higher compensation tendencies, especially for females. Taken together, this study illustrates that virtual demographics, such as the Draenei race, and their interplay with compensation tendencies in relation to self-perceived deficits should be carefully considered when drafting individualized prevention and intervention IGD treatment plans. In conclusion, disordered gaming related to avatar use should be further emphasized in both interventions and future research.

## Disclosure of Interest Form

### *Conflict of Interest*

The authors declare that they do not have any interests that could constitute a real, potential or apparent conflict of interest with respect to their involvement in the publication. The authors also declare that they do not have any financial or other relations (e.g. directorship, consultancy or speaker fee) with companies, trade associations, unions or groups (including civic associations and public interest groups) that may gain or lose financially from the results or conclusions in the study. Sources of funding are acknowledged.

### *Ethical Approval*

All procedures performed in this study involving human participants were in accordance with the ethical standards of University's Research Ethics Board and with the 1975 Helsinki Declaration.

### *Informed Consent*

Informed consent was obtained from all participants.

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*Note 1:* Analyses Assumptions: Independence of errors was not violated, as it was found that Durbin-Watson was 1.73 (Durbin & Watson, 1951). Multicollinearity was also not violated; *Variance Inflation Factor* (VIF) was found to be below 10, at a value of 1.01, and *tolerance* was below 2, at a value of .99 (O'Brien, 2007). Univariate outliers were found within the data; based on a parameter of 2.5, 6 outliers were present. Multivariate outliers were also found. According to the chi-square table, where degrees of freedom (df) = 3 and $p < 0.05$, a value of 7.81 was produced. Mahalanobis Distance was 54.02, which exceeded the value of 7.81. Therefore, multivariate outliers are present (Riani, Atkinson & Cerioli, 2009). However, since Cook's Distance is .57, which is below 1, the presence of multivariate was deemed not to affect the data (Cook, 1977). Normality was violated, as can be seen from the histogram and P-P plot. The histogram portrays positive skewness, as seen by the residuals tailing off to the left. Moreover, the P-P plot reveals deviance of values from normality. Homoscedasticity was also violated, as heteroscedasticity was seen in the scatterplot. This was revealed by the fanning out of data. Therefore, adopting past literature recommendations, bootstrapping was applied above the recommended 1000 resamples, as this adequately addresses such deviations (Berkovits, Hancock & Nevitt, 2000).

Table 1. *Race options in World of Warcraft*

| Race | Description |
|---|---|
| Human | Able to socialise with all other races with ease. Trustworthy. |
| Dwarf | Bold and courageous, able to strike powerfully in battle. |
| Night elf | Silent, nimble assassins that are quick on their feet. |
| Gnome | Small, cunning and able to get out of traps with ease. Creative and curious. |
| Draenei | Stoic, loyal and resilient in the face of adversity. Powerful and able to heal self and other. |
| Worgen | Vicious shapeshifter that can transform between human and wolf-like beast. |
| Pandaren | Peaceful, honourable and content with seclusion. Love for food. |
| Orc | Corrupted and used for vengeance. Gains fury in battle. |
| Undead | Previously humans who were killed by the Lich King. Able to feed on others to restore themselves. |

| | |
|---|---|
| Tauren | Honourable and peaceful, strive to preserve balance of nature. |
| Troll | Savage, cruel and intense hatred for most races. |
| Blood elf | Precision in battle and skilled in mystical arts. |
| Goblin | Small creatures. Able to access money easily. |

*Source: Blizzard Entertainment (2018)*

Table 2. *Sociodemographic characteristics of participants*

| | | |
|---|---|---|
| Gender | Male | 299 (74.0%) |
| | Female | 83 (20.6%) |
| | Transgender/Genderqueer/Other | 22 (5.4%) |
| Employment status | Unemployed | 17 (4.2%) |
| | Temporary leave | 4 (1.0%) |
| | Student | 179 (44.3%) |
| | Casual employment | 55 (13.6%) |
| | Trainee | 2 (0.5%) |
| | Full-time employment | 128 (31.7%) |
| | Other | 19 (4.7%) |
| Living with | Family of origin (two parents and siblings if any) | 139 (34.4%) |
| | Mother and siblings if any (parents divorced/separated/widowed) | 32 (7.9%) |
| | Father and siblings if any (parents divorced/separated/widowed) | 7 (1.7%) |
| | With partner and children (if any) | 121 (30.0%) |
| | Alone | 47 (11.6%) |
| | With friends | 19 (4.7%) |
| | Temporary accommodation | 14 (3.5%) |
| | Other | 25 (6.2%) |
| Romantic Relationship Involvement | Yes | 228 (56.5%) |
| | No | 165 (40.8%) |
| | Uncertain/ No Response | 11 (2.7%) |

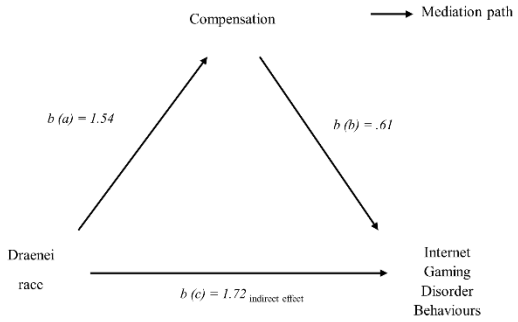


*Figure 1.* The mediating interplay between race of Draenei, Internet Gaming Disorder behaviours and compensation.

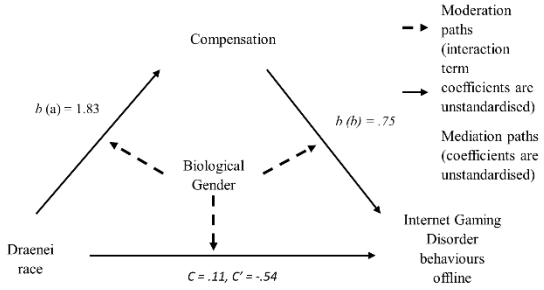


*Figure 2.* The mediating interplay between race of Draenei, compensation and Internet Gaming Disorder across genders.