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"Girls can't play": The Effects of Stereotype Threat on Females' Gaming Performance

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Abstract

The current study examined the impact of stereotype threat on female online gamers' performance and further examined whether manipulating the availability of multiple social identities effectively eliminated these performance decrements. Further, participants' implicit attitudes towards female online gamers were assessed. Eighty-one participants (60 female) were assigned to one of four experimental conditions: 1), stereotype threat, 2), multiple social identities, 3), female control, and 4), male control. They completed an Implicit Association Test and a gaming task. The number of coins collected in a five-minute time period provided a measure of gameplay performance. Results indicated that stereotype threatened females underperformed on the gaming task relative to males in the control condition. The intervention of multiple social identities successfully protected females' gameplay performance from stereotype threat. Additionally, differences were found between conditions in implicit attitudes pertaining to gender-gaming competence. This research highlights the harmful effects of negative stereotypes on females' gaming performance, and suggests that these decrements may be eliminated when females identify with an alternative positive social identity.

Keywords: STEREOTYPE THREAT; SOCIAL IDENTITY THEORY; MULTIPLE SOCIAL IDENTITIES; GENDER; DIGITAL GAMES; IMPLICIT ATTITUDES

"Girls Can't Play": The Effects of Stereotype Threat on Females' Gaming Performance

1. Introduction

Online gamers are characterized typically as being male, socially inept and undesirable, resulting in them often perceived as being lower status than other social groups (Kowert, Festl, & Quandt, 2014; Kowert, Griffiths, & Oldmeadow, 2012; Kowert & Oldmeadow, 2012). Empirical research also indicates that online gamers are evaluated negatively in terms of their relative popularity, attractiveness and dominance (Kowert et al., 2012). Resultantly, online gaming has become an activity associated with a highly specific, caricatured and a somewhat stigmatized image (Kowert et al., 2014). Some research has attempted to deconstruct these negative conceptions and revealed key overlaps between stereotypical perceptions of online gamers with other social groups such as comic book enthusiasts, 'nerds' and students (Kowert & Oldmeadow, 2012). Consequently, individuals who engage in such activities are viewed as socially deficient in comparison to their peers, with these social repercussions ascribed especially to online gamers (Kowert & Oldmeadow, 2012).

Stereotypical attitudes towards women in gaming raise further concerns. When exploring previous research on character representation in digital games, there is a key distinction between male and female characters (Leonard, 2003; Thompson & Zerbinos, 1995; Williams, Martins, Consalvo, & Ivory, 2009). For example, within a sample of games studied, Williams et al. (2009) found that 40% did not include any female characters. Furthermore, in games that did include female representation, these were in secondary roles with females portrayed in overly sexualized ways or as victims of aggression (Burgess, Dill, Stermer, Burgess, & Brown, 2011; Dietz, 1998; Dill & Thrill, 2007; Ivory, 2006; Leonard, 2003; Provenzo, 2000; Williams et al., 2009). Additionally other studies have demonstrated the impact of a female avatar's sexualized appearance on acceptance of rape myth and sexism

(Fox & Bailenson, 2009). Evidence indicates further that females are often perceived as passive or dependent on men, and deemed less competent (Ivory, Fox, Waddell, & Ivory, 2014; Mou & Peng, 2008), which is further supported by research demonstrating how male game characters engage more frequently in leadership and achievement-based tasks compared to females (Thompson & Zerbinos, 1995). Additionally, research which has examined voice-based communication in gameplay has revealed that multiplayer gamers make three times more negative comments towards a female voice compared to a male voice (Kuznekoff & Rose, 2012). These stereotypical representations, as well as general conceptions about internet and game cultures being highly masculinized (Kerr, 2003; Schumacher & Morahan, 2011) may threaten the perceptions which individuals hold towards female gamers, and consequently their behavior towards them (c.f., Cicchirllo, 2009; Dill & Burgess, 2012).

Other evidence points to the assertion that those who play games frequently are less critical of stereotypical content towards females than less frequent players (Brenick, Henning, Killen, O'Connor, & Collins, 2007). Interestingly, the observed "Proteus Effect" underpins a process whereby a players own behavior conforms stereotypically with those which are consistent with their avatar's appearance (Yee & Bailenson, 2007; Yee, Ducheneaut, Yao, & Nelson, 2011). These aforementioned trends, as well other findings showing general dislike of violent content and sexualized gender stereotypes among females (Hartmann & Klimmt, 2006; Yee, 2008), may provide some explanation for the observation that females are typically absent from gaming communities, and are often marginalized from accessing gaming technology, relative to their male counterparts (Crawford & Gosling, 2005; Horrell & Schott, 2000). This issue has been the focus within a range of studies. Specifically these have demonstrated consistent evidence of negative judgements and behaviors being attributed in instances of non-contingence to gender norms for both genders (Fox & Tang, 2014). The

experiences of women within gaming has received due attention and highlighted numerous key issues for encouraging greater female participation both in gameplay and within the gaming industry itself (Kafia, Hetter, Denner, & Sun, 2008).

What is not known, however, is whether these adverse conceptions towards females may transpire into attitudinal and behavioral changes for female gamers. Indeed, it is conceivable that these negative conceptions may have an effect on females' perceptions of competence and actual game play performance. The term 'stereotype threat' (Steele & Aronson, 1995) refers to situations in which individuals' performance may be hindered by stereotype-salient cues. In their seminal experiments, they reasoned that knowledge of a prevalent cultural stereotype regarding African American's intellectual ability might interfere with these students' performance. Two decades of research has now demonstrated the pervasive effects that negative stereotypes exert on targeted individuals, across a range of tasks and diverse populations (c.f., Nguyen & Ryan, 2008). To date, however, no research has examined whether females' knowledge of the societal stereotypes pertaining to their participation in gaming has a deleterious effect on their gameplay performance. Further, it is unknown whether males hold implicit negative attitudes towards females in the domain of online gaming, and whether females themselves endorse such stereotypes. In line with evidence that suggests social judgements relating to competence often have stark intergroup differences (Fiske *et al.,* 1999; 2002; Morton, Rabinovich, & Postmes, 2012; Swim & Sanna, 1996), we examine both male and females' implicit attitudes towards gendered gameplay. Underpinned by stereotype threat theory, it is predicted that the salience of a negative gender-related stereotype may hamper females' gaming performance. Moreover, it is predicted that females who experience stereotype threat will reveal greater implicit attitudinal associations between female online gamers and incompetence relative to those who do not receive such threat. As well as examining the conceivable harmful impacts of such stereotypes on female

players, both in respect of implicit attitudes and performance detriments, we also aimed to explore any potential "interventions" which may alleviate these expected effects. This would therefore provide a practical approach to these issues, which could subsequently inform future game development initiatives.

1.1.Multiple Social Identities Approach

Social identity theory (SIT; Tajfel, 1978, 1979; Tajfel & Turner, 1979) provides a theoretical framework in which to understand, and potentially reduce, the impact of stereotype threat on attitudes and behavior. SIT posits that individuals have two sources of identity; a personal identity which defines them as idiosyncratic individuals, and a social identity which ties them to membership in valued groups. Within this, a mergence of a personal self and the self as a product of valued social groups is established (Luhtanen & Crocker, 1992; Swann, Gómez, Seyle, Morales, & Huici, 2009). A strong sense of social group affiliation has been found to be associated with heightened self-esteem (Abrams & Hogg, 1988; Hogg & Abrams, 1990; Simsek, 2013) through a perception of value on being a part of an "in-group" (Ellemers, Haslam, Platow, & Knippenberg, 2003). Additionally, membership in groups has been found to contribute to self-concept, life satisfaction and psychological well-being (Crocker, Luhtanen, Blaine, & Broadnax, 1994; Isiklar, 2012; Kong, Zhao, & You, 2013; Simsek, 2013). Particularly in relation to female online gamers, the degree of social identity to a female gaming community or female in-group may contribute to friendships with other players (Kaye, 2014) and foster a positive self-concept and psychological wellbeing. However, this positive social identity may be threatened when female gamers perceive that they will be judged in comparison to their male counterparts.

Of interest to stereotype threat theory, therefore, is how people contend with a group membership that does not contribute to greater self-esteem (Rydell, Beilock, & McConnell,

2009). In such situations, social identity theorists postulate that individuals of stigmatized in-groups may disassociate with a group that does not heighten their self-esteem (Tajfel & Turner, 1986), and capitalize on "multiple social identities" (Rydell et al., 2009; Rydell & Boucher, 2010). Research has documented the malleable and fluid role of social identities, which are contextually dependent (Reicher, 2004). For example, individuals typically categorize themselves as in-group members of multiple social groups (Hugenberg & Bodenhausen, 2004; Macrae, Bodenhausen, & Milne, 1995). Furthermore, research suggests that when two applicable social identities are present, individuals will categorize themselves in line with the most positive identity (Mussweiler, Gabriel, & Bodenhausen, 2000). From this perspective, subjective disassociation from one social group and association with another can be utilized as a protective strategy to bolster self-esteem and avoid negative group conceptions (Hugenberg & Bodenhausen, 2004; Macrae, Bodenhausen, & Milne, 1995; Rydell & Boucher, 2010). Transferring this body of research to the theory of stereotype threat, it is therefore conceivable that performance deficits may be eliminated when individuals categorize themselves in line with a non-stigmatized identity (Rydell et al., 2009; Shih, Pittinsky, & Ambady, 1999). For example, Rydell et al. (2009) found that females underperformed on a test of mathematical ability when they perceived the test to be diagnostic of gender-related ability. However, female participants solved significantly more math problems when they were concurrently primed with a positive (i.e., student) and negative (i.e., female) social identity in the ability domain. Thus, it seems that performance deficits may be eliminated when individuals are able to replace the performance implications garnered from a negative social identity with propositions made accessible from a positive social identity. Extending this line of research, an additionalaim of the current study examines whether manipulating the availability of multiple social identities – attached to

performance implications – can alleviate the effects of stereotype threat on females' gameplay performance.

1.2.Research Overview

The current research has a threefold remit; 1), to examine the effect that stereotype threat exerts on female gamers' performance; 2), to explore the utility of multiple social identities in eliminating stereotype threat effects; and 3), to examine whether stereotype threat heightens implicit gender stereotypical attitudes related to female incompetence in gameplay, and whether this view is already endorsed by male gamers.

2. Method

2.1.Participants

Only participants who identified as 'online gamers' were recruited for the current study, in accordance with previous research which states that group and domain identification moderates stereotype threat susceptibility (Aronson et al, 1999; Steele, 1997; Stone, Lynch, Sjomeling, & Darley, 1999). A total of 81 participants (*M*age = 21.40, *SD* = 4.89; 60 female) participated in return for Psychology course credits or £3 remuneration. Of the total sample, 57.3% identified themselves as "casual" gamers, with the remainder being "social" (15.6%), "hard-core/experienced" (9.4%) and "professional/serious" (1.0%). Additionally, the majority of the sample indicated that they played online games at least on an "occasional" basis (91.36%), and for an average of at least 1-5 hours per week (86.42%). Female participants were assigned randomly and equally to one of three experimental conditions: 1) stereotype threat, 2) multiple social identities, and 3) a non-threat control. A sample of male participants (n = 21) was also recruited and assigned to a second control condition[1].

[1] Previous research in other domains has shown that males perform equivalently in stereotype threat and control conditions (c.f., Rydell, Van Loo, & Beilock, 2014). The decision was therefore made to only recruit a male control condition.

2.2.Stereotype Threat Manipulation

Participants received one of three sets of instructions that corresponded with each experimental condition.Female participants in the stereotype threat condition (1) were primed with the following information that manipulated the relevance of a negative social identity to gaming performance:

> "We are interested in researching gameplay performance in a range of different populations. As you may know, research has demonstrated that males are more competent in gaming than females. There is therefore a negative stereotype that females are incompetent gamers compared to males. This study therefore aims to better understand what factors might predict these gender differences in gameplay performance. Your performance on the gaming task will therefore be compared to that of other female and male gamers who have participated in this study. One specific question is whether males are more competent than females at all types of gaming."

Female participants in the multiple social identities intervention condition (2) were primed with the following information, which manipulated the implications of a positive and negative social identity to gaming performance:

> "We are interested in researching gameplay performance in a range of different populations. This study therefore aims to better understand what factors might predict better gameplay performance. As you also may know, research has demonstrated that males are more competent in gaming than females. There is therefore a negative stereotype that females are incompetent gamers compared to males. However, this negative stereotype does not apply to you. That is because you are an experienced game

> player, and as such, you are competent compared to those who do not play games. This research is therefore aimed at better understanding the differences between experienced and non-experienced gamers. Your performance on the gaming task will be compared to other populations. One specific question is whether online gamers outperform non-gamers on all types of games."

Participants in both the female and male control conditions were given a generic overview of the study, which explained that we were interested in examining factors relating to game play, and did not highlight any negative stereotypes regarding gameplay competence:

> "We are interested in researching gameplay performance in a range of different populations. This study is aimed at better understanding what factors might predict better gameplay performance. Your performance on the gaming task you are doing today will be compared to others who have been taking part over the last few months".

2.3.Measures

2.3.1. Social identity

The '*Three dimensional strength of group identification scale'* (Cameron, 2004) was utilized as part of our inclusion criteria and, additionally, ensured that there were no differences in social identity between experimental conditions. This 12-item questionnaire includes three sub-scales of *centrality* (e.g., "I often think about being a female online gamer"); *in-group affect* (e.g., "In general, I'm glad to be a female online gamer") and *in-group ties* (e.g., "I feel strong ties to other female online gamers")[2]. Participants endorsed their agreement with the

[2] In the male control condition, participants were given these statements in reference to their gender (e.g., "I feel strong ties to other male online gamers").

12 statements on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). The questionnaire resulted in high internal consistency in the current study (Cronbach's *a* = .77).

2.3.2. Implicit attitudes towards (female) online gamers

For the purposes of the current research, we created a novel Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). Participants were required to match various evaluative attributes (e.g., Competent, Incompetent, Able, Unable, Expert, Novice, Girl, Woman, Boy, Man) to two superimposed categories of 'Female Online Gamer' or 'Male Online Gamer' with 'Good' or 'Bad'. Accordingly, participants' IAT scores provided a measure of implicit gender stereotyping towards females' gaming ability. IAT *D*-scores were computed in accordance with a recommended scoring algorithm (Greenwald, Nosek, & Banaji, 2003). Consistent with predictions, overall positive *D*-scores indicate a stronger associative belief for male gaming competency (female gaming incompetency). Contrary to predictions, negative *D*-scores indicate a stronger associative belief for female gaming competency (and male gaming incompetency).

2.3.3. Gameplay Performance

Gameplay performance was measured through a gaming task, which participants were asked to play for a period of five minutes. The game was designed specifically for the purposes of the current research to avoid any potential confounds of familiarity and skill level on game play performance[3]. The benefits of using custom games compared to their "off-the-shelf" counterparts for the purposes of research have been previously highlighted (Järvelä, Ekman, Kivikangas, & Ravaja, 2012). Here it has been noted that commercial games may be

[3] This game was designed independently by Game Design students at Academy of Digital Entertainment, NHTV prior to the research being formulated. Given that the designers were blind to the aims of the research, there are no tangible biases in the actual game design.

limited in logging capabilities and naturally cannot be as easily manipulated in a meaningful way for experimental enquiry (Järvelä et al., 2012; McMahan, Ragan, Leal, Beaton, & Bowman, 2011). Therefore, the use of a custom game was deemed the most appropriate strategy for the purpose of the current research. The game was "*Supertux*" which was played through a PC platform. This was a 2D "jump and run side-scroller" game in which participants operated a penguin across a maze with a series of obstacles, and accumulated coins. Participants were informed that their objective was to collect as many coins as possible in the allocated time limit.

2.4.Procedure

Following an initial briefing, participants completed a demographics questionnaire and a measure of social identity. They were then presented with one of three primes, which corresponded to their assigned experimental condition (See 'stereotype threat manipulation'). Next, participants were asked to play a digital game in which they were instructed to collect as many coins as possible, in a time limit of five minutes. Here, participants' final score provided a measure of gaming performance. Subsequently, participants completed the IAT to provide a measure of implicit attitudes towards (female) online gamers.. The ordering of these latter tasks was counterbalanced across conditions[4]. To evaluate the effectiveness of the stereotype threat manipulation, participants were asked if they were knowledgeable in regards to the negative stereotype about females' incompetency in gameplay (Yes/No), and were able to write down any additional stereotypes that they knew about female gamers. This item was included given previous evidence indicating that an individual's personal belief in the validity

[4] Previous research has indicated that the ordering of test instruments can influence stereotype threat effects (Brodish & Devine 2009; Logel, Walton, Spencer, Iserman, Hippel & Bell, 2009). No significant differences in gameplay performance were found between those who undertook the IAT prior to the gaming task and vice versa (t (79) = .56, p = .58).

of the stereotype is an important factor in determining outcomes associated with stereotype threat (Shapiro & Neuberg, 2007). Finally, all participants were debriefed and were reassured that the negative stereotype that they had heard was not a true reflection of their ability and was only utilized to measure the effects of stereotype threat on performance.

3. Results

3.1.Gameplay Performance

Outliers (n = 2, ± 3 *SD*) were treated in line with procedures outlined by Tabachnick and Fidell (2013). A one-way between-factors Analysis of Variance (ANOVA) was conducted on participants' gameplay performance as a function of experimental condition. Simple main effects were elucidated with pairwise comparisons (including a Bonferroni correction). A significant main effect of condition was found, $F(3, 81) = 11.43$, $p < .001$ $\eta_p^2 = .31$. This indicated that males (M = 340.05, SD = 45.10) outperformed females in the control condition (M = 276.75, SD = 59.48) and in the stereotype threat condition (M = 256.35, SD = 50.92), p = .001. There was no difference between the stereotype threat and female control condition, p > .05[5]Moreover,the intervention of multiple social identities successfully protected females' performance (M = 300.35, SD = 33.78) relative to the stereotype threat condition (M = 256.35, SD = 50.92), $p < .05$. There was no difference found between the multiple social identities condition and the female control condition, $p > .05$. Furthermore, there was no significant difference found between participants' performance in the multiple social identities condition (M = 300.35, SD = 33.78) and the male control (M = 340.05, SD = 45.10)

[5] Results of a manipulation check indicated that 93.3% of females (irrespective of condition) indicated that knew of a negative stereotype regarding female incompetency in the domain of gaming, and this did not vary between the female stereotype threat and female control conditions ($p > .05$). This may explain why females in the control condition underperformed relative to the male controls as they may have inadvertently experienced stereotype threat. Further research is required to elucidate this effect.

($p > .05$), indicating that this intervention bolstered females' performance to the level of males. (See Table 1).

3.2.Implicit Attitudes

A one-way ANOVA was performed to examine the effect of stereotype threat condition on implicit attitudes towards competence in gaming. A significant main effect of experimental condition was obtained, $F(1, 81) = 10.12$, $p < .001$, $\eta_p^2 = .28$. Female participants in the control condition implicitly endorsed that females were competent gamers ($M = -.43$, $SD = .32$) compared to the males in the control condition who reported that males were more competent ($M = .12$, $SD = .39$), $p < .001$. Furthermore, both females in the stereotype threat ($M = -.34$, $SD = .29$) and multiple social identities conditions ($M = -.20$, $SD = .37$) endorsed greater female gaming competency compared to males in the control condition ($M = -.34$, $SD = .29$), both $p < .05$.

[Table 1 here]

4. Discussion

The aims of the current study were threefold: First, to examine whether female online gamers experience stereotype threat effects; 2), to explore whether the multiple identities paradigm is an effective intervention to reduce performance detriments; and 3), to investigate whether females internalize, and male gamers endorse, the negative stereotype pertaining to females' gaming ability. Findings indicated that stereotype threat had an additive effect on female gamers' underperformance compared to males in a control condition. Specifically, females in the control group underperformed relative to males in a control group. However, the salience of negative gender-related stereotype further decreased females' gameplay performance in comparison to males. Moreover, the intervention of multiple social identities successfully

alleviated these performance deficits, with females in this condition outperforming those in the stereotype threat condition. Indeed, such findings demonstrate that negative perceptions towards females in the domain may have a direct effect on gaming performance outcomes, and highlight further that such stereotypical attitudes are a pressing concern. Given that these effects have not been previously observed in the context of digital gaming, the current findings offer a unique contribution to the current literature and suggest need for additional work to be dedicated to this domain.

Whilst negative stereotypes and associated behaviors remain a societal issue, which may not be easily changed, we advocate the importance of exploring strategies to reduce the potentially harmful effects of such stigmatization. In regards to this, the current findings revealed that the 'intervention' of multiple social identities successfully mitigated performance deficits, with females in this condition performing significantly better than those under stereotype threat. Furthermore, this simple manipulation bolstered females' performance to a level comparable with males in the control condition. This suggests that performance decrements may be eliminated when females associate with a non-stigmatized gaming identity, and may therefore present as a practical means to eliminate stereotype threat effects. These findings provide further support for the theoretical framework of 'multiple social identities' (Rydell et al., 2009; Rydell & Boucher, 2010), whilst also highlighting its efficacy in a context previously unexplored within this body of literature. The implications of these findings are noteworthy, particularly when considering them in light of previous research showing that stereotypes towards females in gaming contexts contribute to real world prejudices (c.f., Cicchirllo, 2009; Dill & Burgess, 2012). As such, our findings suggest that female gamers may overcome negative out-group attitudes and the deleterious effects these may exert on performance by fostering a broader "gamer" identity.

Results of the current study indicated further that, regardless of experimental condition, females implicitly endorsed female gaming competence relative to male competence. These findings, suggesting that females hold these positive implicit competence beliefs, are encouraging and could be suggested to provide a positive protective mechanism in contexts of threat. However, the finding of male endorsement of male gaming-competence is an issue of additional consideration. That is, it could be speculated that these inherent beliefs could be a basis through which discriminatory behavior towards female gamers is established. Thus, an understanding of the subtle cues that may prime implicit associations of gender and competence is an area for further development. In particular, this may relate to social comparison cues in digital games (e.g., performance indicators of other players), which may provide an implicit prime for players to associate gaming competence based on gender. Previous evidence highlights the influence of between-gender comparisons on attributes such as interdependence (stereotypically female) and independence (male), on individuals' self-attributions of these constructs (Guimond, Chatard, Martinot, Crisp, & Redersdorff, 2006). Additionally, social comparisons have been found to be a determining factor on an individual's own self attributions and identity (Mussweiler et al., 2000). Therefore, given the social nature of many digital games, this issue would be worthy of empirical enquiry to provide evidence for their role in implicit priming and their operationalization in contemporary digital systems.

An additional way of considering how games may serve as implicit primes within this type of research is the presentation of games themselves. Specifically, it may be contested that the detrimental effects of stereotype threat observed in this research could be further heightened through the stimuli employed in different types of games. Although we do not necessarily endorse gendered gaming, there are typical conceptions that some games may be perceived as being more "masculine" than others (e.g., *Grand Theft Auto* compared to *The*

Sims). Indeed, the observed effects of stereotype threat may be enhanced further in instances of females engaged in a game perceived as "masculine" compared to those that are more neutral or "feminine" in nature. This effect may be expected in line with previous findings highlighting the role of contextual factors on promoting stereotypically-congruent behaviors relevant to gender (Postmes & Spears, 2002). This may provide an interesting future direction for research and offer further insight into the underpinnings of stereotype threat within this context. In particular, research may test the psychological outcomes of manipulating avatar gender or other game features likely to be related to identification of masculinity/femininity. Such findings could prove particularly useful to game industry representatives, offering practical insights into game development as a means of potentially reducing the effects of gendered stereotype threat.

Furthermore, one way of extending these current findings may be through examining implicit attitudes in relation to "meta-stereotype" threats, as previously examined in relation to race and ethnicity (Kim & Oe, 2009; MacInnis & Hodson, 2012). Specifically, this characterizes a process by which an in-group believes their relative out-group endorses a stereotype about them (Vorauer, Main, & O'Connell, 1998). In the case of gaming, this may relate to female gamers endorsing the belief that male gamers believe them to be less competent. Therefore, this could usefully extend the current findings by exploring threat but through the framework of the *source* of threat (i.e. from females' perception that the stereotype is endorsed by males, as the out-group). Therefore, utilising the principles of the multi-threat framework (Shapiro & Neuberg, 2007; Shapiro, Williams, & Hambarchyan, 2013) would be useful to further examine the mechanisms through which threat effects occur in this context. Assessing this process at both the personal and collective level and its applicability to online gaming groups may explain in-game attitudes and behavior, particularly in relation to reducing intergroup (e.g., males versus females) negative attitudes

and contact avoidance, as a means of enhancing effective collaborative and harmonious gameplay.

4.1. Limitations & Future Directions

The current study supports previous literature showing that stereotype threat influences performance in a range of domains (Hess et al., 2003; Spencer, Steele, & Quinn, 2003), and further extends this work to the domain of online gaming. However, there are some limitations that should be acknowledged when interpreting the current findings. A specific limitation of the current study is that no baseline measure of gameplay performance was obtained. As such, it could be contested that individual skill level may have confounded the results of this research. Nevertheless, this is a documented limitation in stereotype threat research (e.g., Boucher, Rydell, & Murphy, 2015), which is based on the rationale that adopting baseline measures may allow participants to become familiar and comfortable with a task, thus weakening the effects of stereotype threat manipulations. Moreover, the random allocation of participants to each experimental condition should lessen concern for this issue.

Furthermore, our findings also indicated that females in the control condition underperformed relative to males. In interpreting this finding, one may argue that the stereotype regarding females as incompetent gamers is therefore legitimate. However, a manipulation check revealed further that the majority of female participants in the stereotype threat and control conditions were knowledgeable of the stereotype ascribed to female gamers, and did this not differ as a function of experimental condition. Indeed, research suggests that those who are aware of negative societal stereotypes pertaining to their in-groups ability may be more susceptible to stereotype threat effects (c.f., Elizaga & Markman, 2008; Schmader, Johns, & Barquissau, 2004). As such, it is plausible that females in the control condition may have also, inadvertently, experienced stereotype threat, with this

contributing to their underperformance. This may be particularly the case given that participants in the control condition were also informed that their performance would be compared to "others". Future research may therefore benefit from examining whether stereotype endorsement moderates the effects of stereotype threat on performance in the domain of gaming. In a similar vein, it would be worthwhile to explore whether gender identification moderates the gender stereotype threat-performance link, particularly when considering broader gender categories (such as transsexual) and their relativity to sex of participant. To this end, it would be interesting to assess the extent to which strength of gender identification forms a protective (or indeed, impeding) factor against threat, particularly for those who may belong to stigmatized groups.

The current work also demonstrates the effectiveness of the "multiple social identities" paradigm (c.f., Rydell et al., 2009) as a potential intervention to eliminate performance deficits under stereotype threat. In relation to the current findings, however, it is important to acknowledge that a manipulation check was not employed to examine the extent to which participants adopted this alternative social identity (i.e., being an experienced online gamer) relative to their discredited social identity (i.e., being a female gamer). In order to overcome this potential issue in future research, the IAT could be utilized to examine whether participants assigned to the multiple social identities condition increase their identification with the positively stereotype group (i.e., "I am an experienced gamer") relative to the negatively stereotyped group ("I am female"). This could be achieved by adapting the target terms of "male" and "female" employed in the current study to the target terms of "female" and "experienced gamer". Faster reaction times to the target term of "experienced gamer" and positive evaluative attributes, relative to "female" and negative attributes would indicate that females in the multiple social identities condition have adopted this positive social identity. Furthermore, it could be suggested that the identity of "experienced online gamer" is not a

distinct social identity in comparison to being a “female gamer”, but rather an ‘enhanced’ social identity. Nevertheless, this prime was developed in accordance with previous research (Rydell et al., 2009) and is theorized to lessen female participants’ identification with their gender identity, and increase identification with their gamer identity in order to protect them from the effects of a negative stereotype.

4.2.Conclusion

In the first of its kind, the current research demonstrates stereotype threat effects within the context of digital gaming, particularly for female online gamers, who arguably encounter such threat within their “real world” gaming experiences. Furthermore, our findings highlight the efficacy of the multiple social identities framework as a theoretical basis for lessening these effects and bolstering females’ gameplay performance. The applications of these findings are clearly important, given that previous commentary identifies the utility of the social identity approach to a range of key applied fields, including organization, health and leadership (Haslam, 2014). Here, our findings further suggest that this theoretical framework may be extended to understanding intergroup processes (e.g., prejudice) within virtual environments, such as online digital games. Although evidence for online social identity and its associated impacts is existent in the available literature (Postmes, 2007; Postmes & Spears, 2002), our findings substantiate understanding of specific online group identity processes in relation to their attitudinal and behavioral impacts.

Based on our current findings, a reconsideration of the negative stereotypes and associated behaviors towards female gamers may be a fruitful avenue to pursue. This is supported by previous notions which highlight the importance of reinvestigating stereotypical presumptions about gender and their relevance to digital gaming (Jenson, de Castell, & Fisher, 2007). Moreover, the current findings hold important implications for the gaming

industry. That is, adopting game-based environments that foster more effective and positive forms of social integration between players, and encourage a greater sense of superordinate group membership, may help promote more favourable attitudes towards women within online gaming (Dovidio, Gaertner, Isen, & Lowrance, 1995). Indeed, this is supported by previous commentary suggesting that the role of supportive gaming communities such as *PMS Clan* may ensure greater equity in such environments (Richard & Hoadley, 2013). Therefore fostering more positive communities, for example, through inter-group cooperative tasks, may also promote less hostile attitudes towards female gamers and can be a positive step towards reducing the occurrence of negative in-game behaviors towards this arguably stigmatized group.

Author Disclosure Statement

No competing financial interests exist

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Tables

Table 1.

Descriptive Analysis of the Study Variables

	Experimental Condition			
Variable	Stereotype Threat *M (SD)*	Multiple Identities *M (SD)*	Non-threat Control Female *M (SD)*	Non-threat Control Male *M (SD)*
Gameplay performance (Total score)	253.30 $_{a\ b}$ (58.62)	301.35 $_{a}$ (36.16)	267.75 $_{c}$ (59.48)	340.05 $_{b\ c}$ (45.10)
Implicit attitudes	-.34 (.29) $_{a}$	-.20 (.37) $_{b}$	-.43 (.32) $_{c}$	.12 (.39) $_{a\ b\ c}$
Social Identity [6]	46.75 (10.80)	49.15 (8.98)	52.35 (9.97)	49.29 (11.33)

Note. Means within a row that share a common subscript differ significantly from each other.

[6] Social identity was measured prior to the experimental primes but is denoted between conditions for reference