The Dissertation Committee for Leah Ariela Fredman Certifies that this is the approved version of the following Dissertation:

NOT JUST A GAME:
SEXUAL TOXICITY IN ONLINE GAMING HURTS WOMEN

Committee:

William B. Swann, Jr., Supervisor

James Pennebaker

John Hopson

Melissa Boone

Robert A. Josephs

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by

Leah Ariela Fredman

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Abstract

Not Just a Game:
Sexual Toxicity in Online Gaming Hurts Women

Leah Ariela Fredman, Ph.D.

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Supervisor: William B. Swann, Jr.

It is unclear how sexual toxicity in gaming (STIG) affects women psychologically, if it prompts them to withdraw from gaming, or why it might do so. Three preliminary studies established that STIG is especially devastating to women. Preliminary Study 1 demonstrated that relative to men, women viewed STIG to be more serious and upsetting, and were more negatively impacted by STIG than non-sexual toxicity. Preliminary Study 2 found that reports of past STIG, but not past general toxicity, interacted with gender to predict posttraumatic stress disorder (PTSD) checklist scores in women. Furthermore, STIG uniquely predicted reporting past self-verification failure and perceived betrayal, which, in turn, mediated STIG's effect on PTSD checklist scores. Preliminary Study 3 provided evidence that STIG impacted a new outcome variable, withdrawal from gaming. Specifically, in a sample of female gamers, reports of past STIG experiences predicted past long-term, but not short-term (e.g. quitting mid-match) withdrawal. Also, reports of past general toxicity did not predict either type of

withdrawal. Study 1 replicated the findings from Preliminary Studies 2 and 3. Study 1 indicated that toxicity type interacted with gender, such that only women withdrew in the long-term from gaming following STIG (neither gender withdrew in the short-term). Additionally, Study 1 revealed that a feeling of betrayal mediated these effects. To determine the causal impact of the apparent mediators of STIG, Study 2 experimentally manipulated three potential mediators: perceptions of betrayal, self-verification, and control. Females who perceived increased feelings of self-verification from other teammates were less likely to withdraw from gaming; the other two potential mediators trended in the predicted direction but were not significant. Study 3 further validated these ideas with a qualitative study of five female gamers. The participants all believed that STIG's effects were more serious than general toxicity, and described how combinations of betrayal and lack of self-verification exacerbated their experiences, and eventually led them to withdraw from certain games. The participants also all opined that they believed the onus to combat toxicity more effectively is on the companies, and that it is especially important to focus on combating *sexual* toxicity.

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Introduction

Women face horrific forms of sexual toxicity in gaming (STIG) when playing online—including taunts, threats, and requests for sexual favors among others (Fletcher, 2012). STIG is pervasive despite women consisting of approximately half of all gamers, and a third of gamers playing online video games that are considered hard core—such as Call of Duty and League of Legends— (Paaßen, Morgenroth & Stratemeyer, 2017). Although STIG is know to prompt withdrawal from gaming (Fox & Tang, 2016), it is unclear precisely why STIG causes women to withdraw. The goal of this research is to construct and test theoretical models explaining why victims of STIG withdraw from gaming, and to explore what interventions female gamers believe may help to reverse those effects. I propose that one mechanism through which STIG may cause withdrawal is by diminishing one's sense of control. In addition to this loss-of-control pathway, I suggest an identity pathway in which STIG threatens the gamer's confidence that the other gamers share her values, regard her as a worthy gamer, and will refrain from betraying her. This implies that interventions targeting control and identity pathways should reengage female gamers who have withdrawn. To set the stage for my model of reactions to STIG, I first review the literature on STIG as well as virtual assault more generally.

Sexual toxicity in online gaming

In the summer of 2014, gamers spontaneously rallied around the hashtag GamerGate, under the guise of criticizing feminist gaming journalism. The movement

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quickly escalated to stalking and threatening the rape and murder of female game

designers, players, scholars, and sympathizers (cf. Mortensen, 2016). Although most

male gamers did not make violent threats against women, GamerGate seems to be

emblematic of the gaming community's attitudes toward women (Richard & Gray, 2017).

One study found that employing a feminine voice while gaming predicted receiving three

times as many negative comments as employing a masculine one (Kuznekoff & Rose,

2013). Although, to my knowledge, no studies have examined whether women

experience specifically more STIG than men, a recent study showed that women

streaming (i.e. playing on an online platform where viewers can type live comments into

a public chatroom associated with that channel) on Twitch, were subjected to sexual

comments almost 11 times more than their male streamer counterparts (Ruvalcaba,

Shulze, Kim, Berzenski & Otten, 2018). As gaming—at least anecdotally—is often

considered a space that was created for men by men (Paaßen, Morgenroth & Stratemeyer,

2017), it is unsurprising that these comments "involved sexualization of body parts,

sexual acts, or sensual or sexual desires directed toward the streamer". Similarly, it is

unsurprising that female gamers frequently have had their abilities questioned due to their

gender, were asked to perform sexual favors, or were actively ostracized by male players

(Westendorf, Knouf, Pederson, 2017).

Empirical evidence demonstrates that STIG prompts many women to withdraw

(Fox & Tang, 2016). Yet if there is evidence that STIG triggers withdrawal, there is little

indication as to why it does so. The one exception to this is a single study demonstrating

that two factors mediate the impact of STIG on withdrawal: rumination and perceptions

that the gaming companies are indifferent to STIG (Fox & Tang, 2016). Given the dearth

of research on this topic, it is not surprising that next to nothing is known regarding

interventions that might neutralize the impact of STIG on withdrawal. I begin by

examining the impact of similar situations—virtual and real-world violence, sexual

harassment, and sexual assault—on female victims.

Does sexual toxicity during online gaming uniquely impact women?

Few studies shed light on female gamers' perceptions, experiences, and behaviors

(Westendorf, Knouf, Pederson, 2017). Even fewer studies have systematically examined

STIG's impact on women, and why it leads them to withdraw (cf. Fox & Tang, 2016).

However, by examining women's non-gaming sexual harassment experiences I can

generate hypotheses regarding STIG's impact. Fox and Tang (2016) reviewed the

literature on extra-virtual sexual harassment—a term that includes offensive, sex-related

communications and contact—and concluded that sexual harassment can lead to

emotional and behavioral disturbances. These included outcomes such as depression and

anxiety, as well as ones like sleep disturbances and withdrawal from the troubling

environment, and even PTSD (Larsen & Fitzgerald, 2011). A meta-analysis found that

life satisfaction as a whole dropped following sexual harassment in the workplace

(Willness, Steel & Lee, 2007), and well-being diminished even when hostility towards

female employees was experienced strictly vicariously (Miner-Rubino & Cortina, 2007).

Research on women's outcomes that focused exclusively on sexual violence

found similar results; compared to other forms of assault, sexual assault—like STIG (Fox

& Tang, 2016)—was more likely to lead to rumination. Ruminating on the sexual assault

in turn produced PTSD symptoms (e.g. Dunmore, Clark, & Ehlers, 2000; Michael, Ehlers, Halligan, & Clark, 2005). Furthermore, female veterans suffered greater adverse effects following sexual assault, as compared to physical assault. Thus, it seems STIG may affect women more than general toxicity. However, as gaming occurs in the virtual world, it is unclear whether these findings will generalize to such environments.

Although STIG occurs in a virtual space, research on the impact of indirect interactions—such as written communications and virtual interactions—suggests it may be just as deleterious as extra-virtual experiences. One study finds that simply reading hate speech directed at one's group is enough to induce emotional and behavioral outcomes in the victims (Leets, 2002). Furthermore, technology-based victimization—such as cyberstalking and virtual rape—which can be thought of as virtual sexual harassment, has been shown to produce a variety of long-term, extra-virtual damaging outcomes. These outcomes included fear, depression, PTSD symptoms, and quitting one's job (Cripps, 2016; Nobles, Reyns, Fox, & Fisher, 2014). These studies suggest that being sexually victimized in a game environment—despite it being virtual—may seriously impact victims. Other research suggests that STIG negatively affects women more than men. For example, female cyberstalking victims engaged in more protective behaviors than men (Nobles, Reyns, Fox, & Fisher, 2014), suggesting that women are especially fearful of a negative virtual encounter, and more affected by it than men..

The consequences of STIG may be particularly devastating for women. Fox and Tang (2016) examined female gamers' toxicity experiences, and found rumination was a unique STIG outcome—mediating STIG's effect on withdrawal. As rumination predicted

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PTSD severity extra-virtually (Michael, Ehlers, Halligan, & Clark, 2005), its unique association with STIG leads to the possibility that STIG—but not general toxicity—will predict PTSD symptoms. Cote's (2017) qualitative study of women's STIG experiences further supports the notion that any sexual threat—even a virtual one—will seriously compromise women's wellbeing.

Cote (2017) argued that STIG's unique power stems from women's (appropriate) socialization to fear sexual assault, making it very hard to brush off as a joke. While a threat of rape online is not an existential threat, as it is extremely unlikely the threatening party will carry it out, the realistic fear of sexual assault in the daily lives of women reifies it. I refer to this phenomenon as reified sexual threat. Reified sexual threat predicts that gender moderates toxicity type's impact. That is, sexual toxicity in online gaming will be especially deleterious to women. Although, to my knowledge, no research systematically examines this prediction, or whether STIG promotes negative health outcomes, such as PTSD symptoms, previous research lends additional credence to the notion that women are especially fearful of sexual violence—even more than murder (Hickman & Muehlenhard, 1997). In fact, even women's fear of non-sexual violence or harassment is due to their heightened concern of sexual assault (Ferraro, 1996), probably because for women ''fear of crime is fear of rape'' (p. 700; Warr, 1984). This finding was later validated among female college students as well, who feared rape more than any other violent crime, and far more than men feared it (Fisher & Sloan, 2003). As female students were much more likely to experience sexual violence than their male counterparts, this fear was well founded.

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Taken together, it seems that women fear sexual violence more than men, and more than other forms of violence. Therefore, it stands to reason that STIG should be especially impactful for women, and may even hurt their mental health. If STIG uniquely impacts female gamers' mental health, this could help explain why women may be especially likely to withdraw when sexually victimized. However, as only a single study examines STIG's unique impact, the first step is to examine what psychological processes might prompt STIG female victims to withdraw.

Mediators of the impact of STIG on withdrawal

To date, only one study has examined what mediators are unique to online gaming sexual harassment, finding that both rumination and organizational responsiveness mediate STIG's role in withdrawal (Fox &Tang, 2016). That said, it is unclear from the rumination measure what specific aspects of the toxicity were troubling to participants. In light of these concerns as well as the fact that the consensus in the field is that most behaviors have multiple causes ("Research Methods in Psychology," 2017), I decided to probe deeper into the impact of STIG on female gamers. Following research on sexual assault and harassment, I hypothesize that diminished control is an additional psychological process that explains why STIG promotes the withdrawal of female victims. That is, research on real-world assault outcomes found that the intensity and frequency of sexual assault victims' experiences increased their PTSD symptoms, and diminished their perceptions of control (Bolstad &Zinbarg, 1997). Furthermore, these researchers found that an internal locus of control predicted indicating a greater likelihood to fight when participants imagined being threatened with rape.

The importance of perceptions of control in the decision of STIG victims to withdraw becomes even more apparent when examining the coping behaviors of victims who persevere. These victims coped utilizing mechanisms such as gender-masking—choosing non-feminine usernames and avatars, as well as avoiding speaking (e.g. Chan, 2017; Cote, 2017; Fox &Tang, 2016)—and responding aggressively to their attackers (Cote, 2017). Thus, when female victims felt that they could manage their future experiences—either by passing as men, or through self-defense—they did not withdraw. It therefore appears that withdrawal is triggered by feeling unable to either avoid future toxicity or defend oneself, indicating that perceptions of diminished control mediate female victims' withdrawal.

In addition to diminished control, identity threat may also explain why female STIG victims withdraw from gaming. Female gamers often feel unwelcomed, unsupported, and judged as inferior by other players (Bentham, 2016; Yee, 2006). Being targeted by STIG may foster feeling rejected by the gaming community—above and beyond what general toxicity targeting may promote. This is because sexual toxicity predominantly singles out women for their gender identity, while general toxicity—trash talking—is considered part of the gaming culture (e.g. Cote, 2017; Nakamura, 2012). Thus, by singling out women, STIG may signal to female victims that their personally-held self-view of being an important part of the community is not shared by the other players; that is, other gamers are not self-verifying them. In addition, their belittling or threatening by other gamers—especially by teammates—may be perceived as a betrayal. Finally, as most women firmly oppose STIG, victimization indicates that the other

players do not share their core values. Taken together, these processes may threaten a female victims' gamer identity.

Gomez and his colleagues (2017) have identified feelings of lack of self-verification (Swann 1983; 2012), betrayal, and disparate core-values—sentiments that I proffer STIG promotes—as the elements of identity threat that can promote withdrawal even among strongly aligned group members. Accordingly, I hypothesize that these identity-threat-components in conjunction with diminished control, will cause female gamers who experience STIG to withdraw from gaming. That is, feelings of diminished control and identity threat will mediate the direct effect of STIG on withdrawal. Additionally, manipulating these hypothetical mediators of the effects of STIG should trigger withdrawal from gaming. Three preliminary studies laid the groundwork for the dissertation studies. Specifically, these studies examined the relationship of reified sexual threat to STIG, as well as the relationship between STIG and the outcomes of mental health, and withdrawal. These preliminary studies additionally investigated whether the hypothesized mediators of perceptions of future control and identity threat—which was conceptualized as betrayal, self-verification, and core values (Gomez et al, 2017)—mediated STIG's harmful mental health outcomes.

Preliminary Studies

As highlighted earlier, while past research on STIG hypothesized that STIG's seriousness is a product of reified sexual threat, it did not test it. Furthermore, it neither empirically examined whether STIG was associated with serious outcomes such as PTSD symptoms, nor did it systematically investigate whether STIG uniquely promoted withdrawal. To address these issues, I conducted three preliminary investigations. In the first preliminary study, I examined perceptions and outcomes of STIG for men versus women, and how STIG's impact compared to that of general toxicity. Preliminary Study 2 investigated whether STIG's psychological impact on women transcended rumination, and led to symptoms of PTSD. In addition, Preliminary Study 2 examined the link between toxicity type and the hypothesized mediators of control and identity threat among women. It also investigated whether these variables mediated STIG's effect on PTSD symptoms. Preliminary Study 3 investigated whether STIG versus general toxicity might cause women to withdraw from gaming and, if it did, for how long.

Preliminary Study 1

To systematically test the reified sexual threat hypothesis, I asked in Study 1 whether men and women evaluated STIG differently. Specifically, I examined in a 2 (gender) X 2 (STIG vs general toxicity) design whether STIG was viewed as more serious and distressing by women as compared to men. In addition, I investigated whether women found STIG more distressing than general toxicity—a distinction that men were not expected to make. Because the sample included both gamers and non-gamers, I controlled for age and online gaming experience.

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A sample of 328 participants completed the survey on Mechanical Turk (Buhrmester, Kwang & Gosling, 2011) in exchange for a small fee. All data from two participants with duplicate IP address were excluded, as it raises the possibility that a single respondent completed the survey twice. Data from nine participants who failed the attention check, and data from seven participants who worked in the gaming industry were excluded as well. The attention check item was embedded at the end of the survey, asking participants to indicate which quote they received in their manipulation. This left a sample of 310 participants (61.61% females, $M_{age} = 37.36$). As the data were analyzed in R, a program that excludes participants with missing data, degrees of freedom vary slightly across analyses.

Participants began by reading five STIG, or five general toxicity quotes emblematic of the toxicity that gamers face online from other players. The sexual toxicity quotes that female participants received were taken from interviews (Cote, 2017; Fletcher, 2012) conducted with female gamers. To make the sexual toxicity relevant to men in the STIG condition, male participants received slightly modified quotes; the term "breasts" was replaced with "testicles", and "boyfriend" with "girlfriend". Quotes in the general toxicity condition were identical for both men and women. These quotes were adapted to remove the toxicity's sexual nature. The term "breasts" was change to "body"; "boyfriend" to "friends"; "rape" to "hurt" or "kill"; and, "bitch" to "asshole".

The final quotes in each condition were as follows:

General toxicity condition:

"I will tear your body into bloody shreds"

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"I hope your friends beat you. Nah, you can't get any friends."

"I hope you get hurt and you and your family are killed"

"I totally just killed you with this shotgun"

"Asshole"

Sexual toxicity condition (women/men):

"I will tear your <breasts/testicles> into bloody shreds"

"I hope your <boyfriend/girlfriend> beats you. Nah, you can't get a
<boyfriend/girlfriend>."

"I hope you get raped and you and your family are killed"

"I totally just raped you with this shotgun"

"Bitch"

After reading the quotes, participants indicated across four items on a 1 to 7 scale how serious (α = .90, M = 5.42, SD = 1.53) they believed the quotes to be ("It is completely impossible to view this quote as a joke"; "It's entirely unacceptable for someone to say anything like this"; I think saying this is a very serious problem"; and "There is nothing humorous about these quotes"). Although a previously constructed bullying scale does measure how serious bullying is (Schäfer et al., 2004), it asks the seriousness of specific types of bullying. As the current study looks at the seriousness of the toxicity quotes as an aggregate, and not of each quote individually, this scale was an inappropriate seriousness measure for the current study, leading me to construct my own, short scale.

Next, participants reported across four items on a 1 to 7 scale how distressed (α = .96, M = 4.77, SD = 1.96) they would be if they were playing a game online, and another player spoke to them that way ("If a player said these quotes to me I would be very upset"; "It would be hard for me to block out hearing something like these quotes"; "It would distress me greatly if a player spoke to me that way"; "I would be greatly disturbed if those quotes were directed at me"). I created these items as previous distress measures all appeared to measure general distress, often at the emotional level (e.g. a single item, thermometer measure, and the Kessler-6), or asked how upsetting specific types of bullying were (e.g. the Gatehouse Bullying Scale asks how upsetting was it to be teased). These previous measures were therefore inappropriate, although the current study's distress items clearly echo the questions asked in the bullying scales (e.g. Bond, Wolfe, Tollit, Butler, & Patton, 2007). Participants' online gaming experience was measured as the number of weekly hours spent playing, and was controlled for due to the possibility that online play impacted their perceptions of the toxicity quotes.

Did participants' distress vary as a function of their gender and the toxicity type?

A linear regression model examined whether gender and toxicity type interacted to predict different levels of perceived distress, even while controlling for weekly hours played online. Age, along with a continuous measure of hours played online weekly, were entered into the model as covariates. As the regression checks indicated that the model may be violating the normality assumption, the model was conducted a second time as a robust linear model. To correct for a heteroskedasticity violation, I examined

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variance stabilizing transformations of the dependent variable (Statistics Solutions, 2013), and selected a squaring transformation as it rectified the violation.

The Gender X Toxicity Type interaction was statistically significant ($b = -7.30$, $p = .04$). To decompose the interaction, I wrote a function in R to estimate the percentile confidence intervals for the distress means reported by the four conditions of interest: men in the sexual toxicity condition and the general toxicity condition, and the women in each of those conditions. Overlapping intervals indicate the means are not statistically different. The bootstrapping function utilized 10,000 bootstraps, and provided support for the hypothesis.

Three of the mean's intervals did overlap: men's in the sexual condition (CI[3.64, 4.65]), and both men (CI[2.97, 3.87]) and women's (CI[4.36, 5.09]) in the general toxicity condition. Only the mean of women in the sexual condition did not overlap with any of the other means, and was higher than them (CI[5.77, 6.30]). These finding suggest that women in the sexual toxicity group were the most distressed, and that women, but not men, considered STIG more distressing than general toxicity.

Did participants' perceptions of seriousness vary as a function of their gender and the toxicity type?

A second linear regression model examined whether gender and toxicity type interacted to predict different levels of perceived seriousness. As the regression checks indicated that this the model may also be violating the normality and the heteroskedasticity assumptions, it too was conducted a second time as a robust linear model, with the outcome variable transformed by raising it to the third and a half power.

The Gender X Toxicity Type interaction was significant ($b = -219.40$, $p = .001$) when controlling for age and number of hours played weekly online. As above, I wrote a function in R to estimate the whether the 95% percentile confidence intervals for the seriousness means reported by the four conditions of interest overlapped, and found that all hypotheses were supported. As only the general toxicity means of men (CI[4.20, 4.96]) and women (CI[4.81, 5.42]), and the men's sexual toxicity mean (CI[4.66, 5.48]) overlapped, the finding suggest that STIG affects women in a unique way (CI[6.26, 6.60]), and that they consider it the most serious. That is, unlike men, women considered STIG more serious than general toxicity. Additionally, women considered STIG more serious than men considered it to be.

Together, these findings suggest that women, but not men, viewed STIG as deleterious and qualitatively different than general toxicity. Although this study augmented the impoverished empirical knowledge of female gamers' experiences (Westendorf, Knouf, Pederson, 2017), it is unclear what—if any—STIG's potential extra-virtual impact is. Thus, Preliminary Study 2 examined whether STIG, but not general toxicity, predicted increased posttraumatic stress disorder checklist scores in female gamers, and whether reports of past perceptions of lack of control and identity threat mediated this potential outcome.

Preliminary Study 2

Preliminary Study 2 examined whether—as predicted by reified sexual threat—STIG may have affected female gamers extra-virtually. This study examined whether STIG predicted an increase in PTSD checklist scores—a measure of PTSD

symptoms—among female, but not male gamers. In addition, it examined whether this gender distinction was uniquely related to reports of past sexual, as compared to general, toxicity. Online gamers were recruited for participation through posts on online gaming pages, as well as social media—a common recruitment method in gaming research (e.g. Fox &Tang, 2016). Participants were aware that they were volunteering their time, and that they would not be compensated for it. Although the original sample consisted of 56 online gamers, one participant's data was removed for selecting "other" for the "gender" variable, as the effect of gender was an integral part of this study. Three additional participants' data were excluded: two for failing the attention check, and another for working in the gaming industry. Thus, the final sample consisted of 52 participants (63.46% females, $M_{age} = 30.88$).

Drawing upon previous research, participants received a list of 11 harassing behaviors adapted from Fox and Tang's (2013) list of 19 online gaming sexual and general toxicity types. As the original list is comprised of uneven numbers of sexual and general toxicity types (nine versus 11, respectively), I was worried that utilizing the original measure would create STIG and general toxicity independent variables that had disparate predictive powers. Therefore, I modified some items from each list, leaving a total of 11 items that represented both sexual and general toxicity types (e.g. threats of either general bodily harm or rape). Participants responded to each of the 11 toxicity types twice; once for sexual toxicity, and once for general. Participants were told that the toxicity type can occur either as a form of sexual toxicity (depending on the content and whether the participant's gender is known), or

as a form of general toxicity. They were additionally given examples for many of the items. For example, for the item "Insulted", participants were told an example of a sexual toxicity item might be "Being called a "bitch"", whereas a general toxicity insult example may be "asshole". The 11 toxicity behaviors included:

1. Swearing at
2. Insults
3. Doubting player abilities
4. Asking players to leave the game
5. Physically threatening players
6. Joking about harming players
7. Threatening players' family
8. Threatening to report players
9. In game harassment
10. Making unreasonable requests, advances, or soliciting favors
11. Comments about appearance

Rather than responding to the items dichotomously, indicating whether participants ever experienced that form of toxicity, each item was rated on four scales; two scales examined the frequency and intensity of the item in its sexual toxicity form, and two examined it in its general form. The frequency scales were rated on a 6-point scale from "Never" to "All of the time", while the intensity ratings ranged from "Extremely mild" to "Extremely intense", along with an option for "Not relevant; I've never experienced this harassment". For analyses, both the frequency and intensity

scales' verbal options were converted to a 1 to 6 scale, and the "Not relevant" option on the intensity scale was converted to a 0.

Two composite frequency/intensity items—one for STIG ($\alpha = .89$, $M = 6.44$, $SD = 5.34$), and one for general toxicity ($\alpha = .89$, $M = 8.12$, $SD = 5.4$)—were created by multiplying the mean STIG frequency scores by the STIG intensity scores, and mean general toxicity frequency scores by the general toxicity intensity scores. This was done to represent both the frequency and intensity dimensions—as previous research on sexual toxicity has highlighted both of those dimensions' importance.

Next, participants completed items measuring each of the hypothesized mediational pathways of control ("I felt I had no control over the harassment" and "While the harassment was ongoing, I felt powerless"; $\alpha = .73$, $M = 3.86$, $SD = 1.66$). Although Larsen and Fitzgerald (2011) modified a previous scale to measure control in their study, their scale consisted of 15 items, most of which measured self and other-blame for the sexual violence. As that scale was both long—raising concerns of participant fatigue—and mostly irrelevant to the type of control that the studies in the dissertation examined, here and in later studies I created my own items to measure control.

I additionally created my own items to measure identity threat, as these were based on research not yet published (Gomez et al., 2018), where the identity pathways were deduced based on interviews, rather than measured with questions. The identity pathways included self-verification failure ("Being harassed that way proves that other players don't see me as a valuable gamer" and "The harassment

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demonstrates that players don't see me as the gamer I see myself" ; $\alpha = .82$, $M =$ 4.34, $SD = 2.05$), betrayal ("Other players betrayed me by harassing me that way" and "The harassment left me feeling as though I had been stabbed in the back" ; $\alpha =$ .84, $M = 3.63$, $SD = 1.87$), and disparate core values ("Being harassed that way proves my core values differ from those of other gamers" and "The harassment demonstrates that other gamers lack my values"; $\alpha = .93$, $M = 5.24$, $SD = 1.68$). These pathways were averaged to create an identity threat composite score ($\alpha = .88$, $M = 4.40$, $SD = 1.57$).

Finally, participants completed the posttraumatic stress disorder checklist (Weathers, Litz, Herman, Huska, & Keane, 1993), along with the following instructions: "Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, then select one of the numbers to the right to indicate how much you have been bothered by the problem following your experience with the harassment you faced above." The list included 17 PTSD symptoms, such as "I found it hard to wind down" and "I felt I was close to panic". All items were rated on a 1 to 5 Likert scale, and were added to create a PTSD symptoms score ($\alpha = .89$, $M = 26.90$, $SD = 9.69$). The checklist items included:

1. Repeated disturbing memories, thoughts, or images of the stressful experience?

2. Repeated, disturbing dreams of the stressful experience?

3. Suddenly acting or feeling as if the stressful experience were happening again (as if you were reliving it)?

4. Feeling very upset when something reminded you of the stressful experience?

5. Having physical reactions (e.g., heart pounding, trouble breathing, or sweating) when something reminded you of the stressful experience?

6. Avoiding thinking about or talking about the stressful experience or avoiding having feelings related to it?

7. Avoiding activities or situations because they remind you of the stressful experience?

8. Trouble remembering important parts of the stressful experience?

9. Loss of interest in activities that you used to enjoy?

10. Feeling distant or cut off from other people?

11. Feeling emotionally numb or being unable to have loving feelings for those close to you?

12. Feeling as if your future will somehow be cut short?

13. Trouble falling or staying asleep?

14. Feeling irritable or having angry outbursts?

15. Having difficulty concentrating?

16. Being "super alert" or watchful or on guard?

17. Feeling jumpy or easily startled?

PTSD checklist score range broken down by gender

The highest PTSD disorder checklist score for men was 37, while for women it was 54. The lowest score for both genders was 17—the scale's lowest possible point. Although the scale should not be used for diagnoses without an interview by a trained mental health professional, recommended cutoff scores for a PTSD diagnosis often range between 44 and 50 (e.g. Ruggiero, Ben, Scotti, & Rabalais, 2003). One study suggested that for civilian women a cutoff score of 30 is appropriate (Walker, Newman, Dobie, Ciechanowski, & Katon, 2002). Among women, 6.06% scored above 50, and an additional 9.09% scored between 43 and 45. Lastly, participants completed demographic questions including gender, age, and number of hours they played online on a weekly basis.

Did female gamers experience heightened toxicity, regardless of type?

Two exploratory Welch t-tests examined whether gender predicted heightened overall toxicity, or whether women experienced heightened sexual toxicity, while men experienced heightened general toxicity—the way a recent Pew report (2017) suggested. Women ($M = 7.75$) reported heightened STIG ($t(44.05) = -2.58, p = .01$) as compared to men ($M = 4.16$), but not ($t(32.02) = 1.50, p = .14$) heightened general toxicity ($M = 7.23$) as compared to men ($M = 9.67$).

Did gender interact with toxicity type to predict PTSD checklist score?

Although the descriptive statistics (Table 1) and correlations (Table 2) of the primary variables paint an interesting picture, a regression model is necessary to understand whether an effect is present even when controlling for competing variables, and is especially important when considering moderation.

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Gender	General Toxicity		Sexual Toxicity		PTSD Checklist Score	
	M	*SD*	*M*	*SD*	*M*	*SD*
Male	9.67	5.98	4.16	4.44	22.5	5.98
Female	7.23	4.92	7.75	5.44	29.4	10.57

TABLE 1: Independent and dependent variables' descriptive statistics by gender

		Sexual Toxicity	General Toxicity
Overall	General Toxicity	.51***	
	PTSD Checklist Scores	.67***	.48***
Men	General Toxicity	.22	
	PTSD Checklist Scores	.02	.30
Woman	General Toxicity	.88***	
	PTSD Checklist Scores	.79***	.78***

Note: *: p < .05; **: p < .01; ***: p < .001

TABLE 2: Overall and gender-specific correlations between sexual toxicity, general toxicity, and posttraumatic stress disorder checklist scores.

Therefore, a regression model examined whether general or sexual toxicity best predicted posttraumatic stress disorder checklist scores, and whether toxicity type interacted with gender. The checklist score was entered as the outcome variable, with the interactions of STIG Score X Gender, and General Toxicity Score X Gender as the predictors. As in Preliminary Study 1, age and number of online gaming hours played weekly were added to the model as covariates. As the model failed the

normality assumption it was run again as a robust regression. Although the STIG Score X Gender interaction was significant ($b = 0.96$, $p = .04$). Neither the General Toxicity Score X Gender interaction ($p = .26$), nor the covariates achieved significance ($p > .20$).

To decompose the interaction, the correlations between PTSD checklist scores and STIG scores were computed for men and women separately. For women, PTSD symptoms and STIG scores were strongly correlated ($r = .79$, $p < .001$), while the correlation for men was insignificant ($p = .94$). Thus, it appears that while general toxicity did not affect genders differently for severe outcomes, sexual toxicity did. STIG did not increase PTSD checklist scores for men, but it did increase them for women.

Were the control and identity constructs uniquely associated with STIG—but not general toxicity—among female gamers?

To investigate whether control or identity mediated the effect of STIG on women's PTSD checklist scores, and whether those variables were predicted by STIG, but not general toxicity, four regression models were run with women's STIG and general toxicity scores as the predictors, and their PTSD checklist scores as the outcome. Only STIG significantly predicted control ($b = .20$, $p = .04$), betrayal ($b = .24$, $p = .03$), and self-verification failure ($b = .34$, $p = .008$). As neither type of toxicity predicted the disparate core values outcome ($p > .26$), a new identity threat score comprised of only self-verification failure and betrayal was constructed for female participants ($\alpha = .92$, $M = 3.91$, $SD = 1.9$).

Did the control and identity constructs mediate the effect of STIG on PTSD checklist scores?

To examine the mediation directly I wrote a function in R to estimate the BCa confidence intervals for the control and identity mediation paths individually, as well as the total indirect effect's coefficients utilizing 10,000 bootstraps. The a-paths consisted of two regression models with the identity threat score as the outcome for the first model, and control as the outcome for the second. STIG was the predictor for both. The b path consisted of a regression model with PTSD checklist scores as the outcome, and the mediators and STIG as the predictors. General toxicity was additionally entered as a covariate. While the confidence intervals for the identity path (b = .67, CI[0.26, 1.24]) and the total indirect effect (b = .68, CI[0.28, 1.07]) did not include zero, indicating their significance, the control a-path (b =0.004, CI[-0.37, 0.35]) was insignificant.

It appears that women's STIG experience increased the likelihood that their PTSD checklist scores would increase as well, and that feelings of betrayal mediated this effect. A reason that diminished control may have failed as a mediator, is that it was not measured as perceptions of controlling future STIG incidents from occurring. Rather, it was operationalized as controlling the toxicity while it was ongoing. Therefore, in the dissertation studies I reconceptualized the construct, and measure it as perceptions of controlling future victimization.

Furthermore, it is unknown whether the control and identity mechanisms would mediate the proposed effect of STIG on withdrawal among women; I

addressed this issue in Study 1. However, as Preliminary Studies 1 and 2 focused

exclusively on mental health outcomes, it was necessary to first establish that STIG

could promote withdrawal as well. Therefore, in Preliminary Study 3 I investigated

whether STIG would predict withdrawal among women, as well as whether this

effect was unique to STIG or if it extended to general toxicity.

Preliminary Study 3

Preliminary Study 3 bridged the gap between the mental health outcomes

examined in Preliminary Studies 1 and 2, and the withdrawal outcomes examined in the

dissertation studies. This study sought to establish a link between toxicity type and

withdrawal, to justify further systematic investigation of withdrawal in the dissertation

studies. The study was correlational, and included data from 60 female gamers ($M_{age} =$

25.75) who did not work for the gaming industry. All participants reported experiencing

STIG, general toxicity, or both types of toxicity while gaming. As in preliminary Study 2,

participants were aware that they were volunteering their time, and that they would not be

compensated for it.

For each form of toxicity that participants reported having experienced, they were

asked whether they ever quit in the middle of a toxic match (short-term withdrawal).

They were additionally asked whether following the toxicities they stopped playing the

game for a while (long-term withdrawal), regardless of whether they had engaged in

short-term withdrawal. These single item, dichotomous measures were constructed based

on Fox and Tang's (2016) withdrawal measure. However, as that study measured

withdrawal without differentiating between longer— and shorter—term withdrawal—the

current and following studies utilized questions based on the Fox and Tang (2016) measure, but differentiated between the different types of withdrawal.

Did STIG prompt female gamers to withdraw from gaming?

Two bootstrapped chi-square goodness of fit tests examined whether STIG increased the likelihood that participants withdrew either short or long term, as compared to not withdrawing. The tests compared the distribution of participants who withdrew to the distribution of the participants who did not withdraw; one test examined the short-term withdrawal sores of participants who reported experiencing STIG, while the other examined the long-term withdrawal scores. Only the test for long-term withdrawal following STIG was significant; ten female gamers reported that they did not quit, while 36 said that they did ($X^2(1) = 14.70$, $p < .001$); STIG did not prompt women to engage in short-term withdrawal ($p = .30$)

Did general toxicity prompt female gamers to withdraw from gaming?

Additional chi-square tests investigated whether general toxicity increased participants' likelihood to withdraw. These two tests were identical to the ones above, with the exception that they investigated the short and long-term withdrawal scores of participants following general toxicity instead of STIG. Neither of the tests were significant (ps = .43; .12).

Taken together, it appears that STIG caused women to withdraw for the longer term but not for the shorter term. General toxicity had no effect on either short or long-term withdrawal. Most important, as this evidence that STIG led to longer-term withdrawal provided a basis for pinpointing the mediators of this effect, I turned to this

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issue in Study 1. In addition, Study 1 employed an experimental design, and included

both male and female participants.

<center>**Dissertation Studies**</center>

The dissertation studies included two experimental as well as a qualitative study. The first Study examined whether STIG—but not general toxicity—predicted withdrawal only for women, and whether this finding was mediated by perceptions of control and identity threat. In Study 2, I focused on female participants, and manipulated the hypothesized mediators. In Study 3, a qualitative study, I focused on female participants as well, and investigated participants' anecdotal experiences with STIG, as well as their opinions on ways to redress STIG.

Study 1

Study 1 shed further light on why female gamers' withdrew for longer durations following STIG experiences, a finding that was uncovered in Preliminary Study 3. To further validate the findings, Study 1 experimentally examined withdrawal among both men and women. In addition, it examined whether identity threat and diminished control mediated STIG's effect on the longer-term withdrawal of women.

      Methods

A sample of 253 participants completed the survey on Mechanical Turk (Buhrmester, Kwang & Gosling, 2011) in exchange for a small fee. Data from five participants with a duplicate IP address were excluded, on the concern that a single respondent may have completed the survey more than once. Data from one participant who worked in the gaming industry, as well as from 37 participants who failed the attention check were additionally excluded. The attention check item was embedded at the end of the survey, asking participants to indicate which quote they received in their

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manipulation. This left a sample of 211 participants (46.45% females, M_{age} = 35.80). As the data were analyzed in R, a program that excludes participants with missing data, degrees of freedom vary slightly across analyses.

Participants began by reading four quotes that depicted either STIG or general toxicity that were emblematic of the toxicity that gamers faced online. The sexual toxicity quotes that female participants received were taken from online forums, and real examples that female gamers reported experiencing. To make the sexual toxicity relevant to men in the STIG condition, male participants received slightly modified quotes; the term "whore" was replaced with "faggot", and "mommy" with "daddy". Quotes in the general toxicity condition were identical for both male and female participants. These quotes were adapted to remove the toxicity's sexual nature. The term "rape" was change to "beat"; "cock" to "fist"; "whore" to "asshole"; "mommy/girl/daddy/guy" to "noob"; and the phrase "Oh my god, you're so hot I wanna fuck you" to "Oh my god, you're such a shit player".

The final quotes in each condition were as follows:

General toxicity condition:

"Had a player threaten to find where I live and beat me up because I was a shit player."

"If you ever talk that close to the mic again I'll shove my fist in your throat. You're an asshole."

""You're such a noob. I can't believe you suck that badly." The other player

called me noob and spoke obnoxiously to me through the entire match. Then

when it was over, the player sent me messages too."

"Players on my team started saying thing like "Oh my god, you're such a shit

player." So I just stayed quiet and we started losing, so they started screaming at

me to protect them. So I asked again for help, and they told me to shut the fuck

up because we were losing because I was a noob."

Sexual toxicity condition (women/men):

"Had a guy threaten to find where I live and rape me because I was a shit player."

"If you ever talk that close to the mic again I'll shove my cock in your throat.

You're a whore."

""Oh yeah <mommy/daddy>. Right there <mommy/daddy>." <He/She> called

me <mommy/daddy> and spoke sexually to me through the entire match. Then

when it was over, <he/she> sent me messages too."

"Guys on my team started breathing heavily down the mic and saying thing like

"Oh my god, you're <so hot I wanna fuck>." So I just stayed quiet and we started

losing, so they started screaming at me to protect them. So I asked again for help,

and they told me to shut the fuck up because we were losing because I was a

<girl/guy>."

To help internalize the manipulation, participants were then asked to take a couple

of minutes and write about how they would feel if they were the targets of such behavior.

Next, participants indicated across 12 items on a 1 to 7 scale their perceptions of the

control ($\alpha = .90$, $M = 4.06$, $SD = 1.79$) and identity threat ($\alpha = .91$, $M = 4.25$, $SD = 1.54$) mediators. Four items measured control "I would be worried that I would be unable to prevent future harassment experiences like that from occurring again"; "I would believe there is nothing I can do to avoid similar harassment in the future"; "I would feel powerless from preventing similar, future harassment incidents from occurring"; and "I would feel I was unable to effectively stop future harassment such as the one I experienced"). An additional eight items measured self-verification failure ("It would indicate that other players don't see me as the qualified gamer I am"; "It would mean that players don't see me as the gamer I see myself"; "I would feel like a dispensable member of the gaming community"; and "It would make me believe that players can't appreciate me for the gamer I am") and betrayal ("I would feel betrayed by other players"; "It would prove that I can't trust other players"; "It would make me feel as though other players stabbed me in the back"; and "It would demonstrate how disloyal other gamers were towards me").

Finally, participants reported how likely they thought they would be to quit following the imagined toxicity experience by rating their agreement with four items on 1 to 7 Likert scales. In line with the pilot study, the first two items ("You would consider quitting in the middle of the game because of the harassment" and "You would actually quit the game/match in the middle because of the harassment") represented a short-term withdrawal measure ($\alpha = .96$, $M = 4.86$, $SD = 2.03$), while the last two items ("You would quit playing the game for a while, after you were harassed while playing it— regardless of whether or not you quit the individual match" and "You would completely

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stop playing that game, after you were harassed while playing it") served as a long-term withdrawal measure ($\alpha = .90$, $M = 4.00$, $SD = 1.99$).

As in the preliminary studies, participants' online gaming experience was measured as the number of weekly hours spent playing, and, along with age, was controlled for due to the possibility that online play impacted their perceptions of the toxicity quotes.

Results and discussion

As withdrawal means varied across genders and manipulations (Table 2), two regression models examined whether toxicity type interacted with gender to predict long-term, but not short-term withdrawal.

		Shorter-Withdrawal		Longer-Withdrawal	
Gender	Condition	*M*	*SD*	*M*	*SD*
Male	Sexual Toxicity	4.44	2.11	3.60	2.03
Male	General Toxicity	4.39	2.07	3.81	2.03
Female	Sexual Toxicity	5.63	1.65	4.79	1.73
Female	General Toxicity	5.17	1.99	3.95	1.96

TABLE 3: Shorter-withdrawal and longer-withdrawal descriptive statistics by gender and manipulation

In both models the interaction of Toxicity Type X Gender served as the predictor, and age and number of weekly online gaming hours served as controls. The models failed the normality assumption, and were conducted a second time as robust regressions. As predicted, the Toxicity Type X Gender interaction significantly predicted long-term withdrawal ($b = -1.11$, $p < .05$; Figure 1), but did not predict short-term withdrawal ($p = .56$).
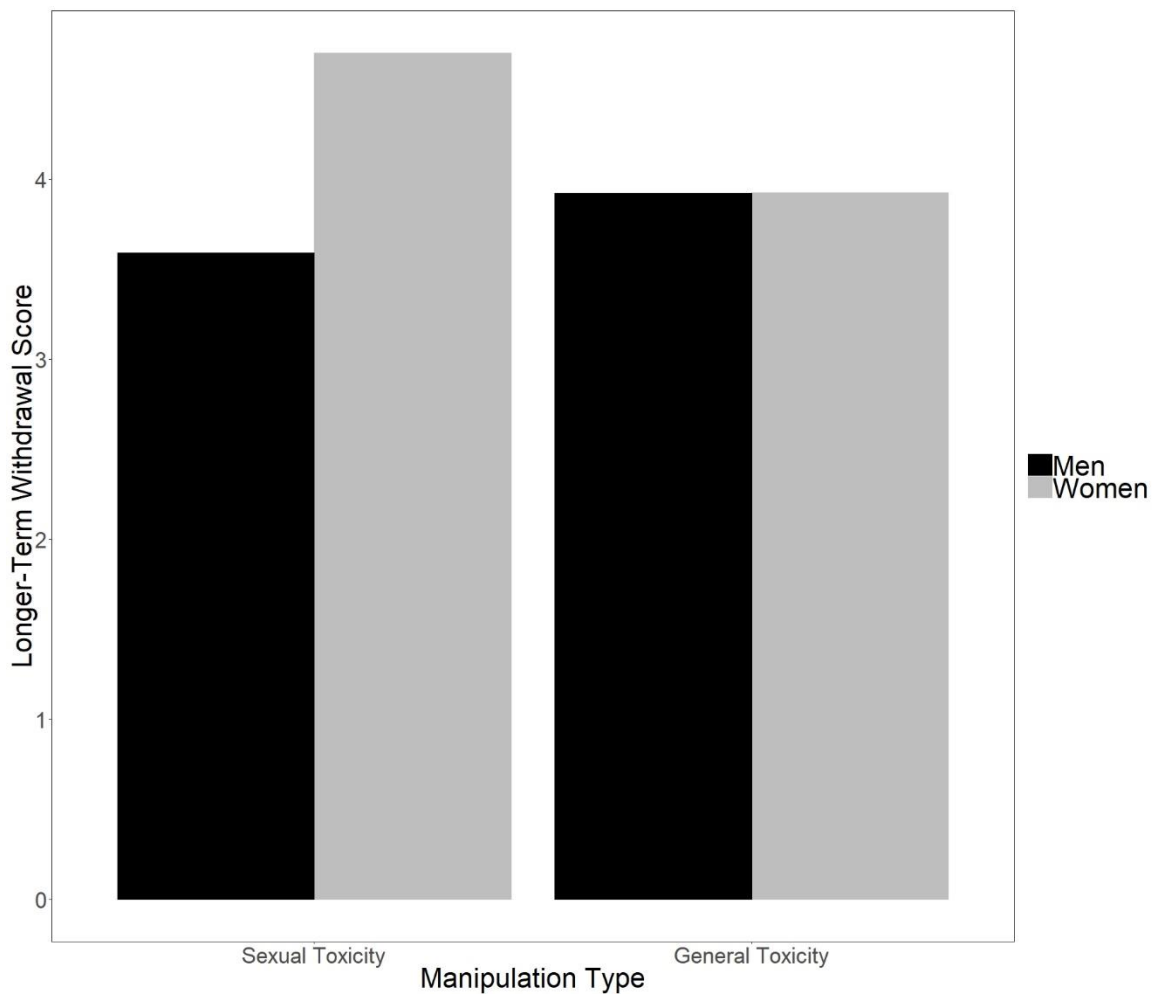
FIGURE 1: Gender moderates the effect of toxicity type on longer-term withdrawal.

Although the regression demonstrated that men and women reacted

differently to STIG and general toxicity, further models were required to understand

the nature of this difference. Therefore, to test the hypothesis that women's

withdrawal scores were elevated in the sexual toxicity condition compared to men in

either condition, and compared to women in the general toxicity condition, additional

analyses were run. To decompose the significant interaction, four regression models

were conducted with long-term withdrawal as their outcome; all regressions

controlled for number of weekly hours played online, and age. A robust linear model

that investigated the effect of toxicity type among women, found that women were

more likely to withdraw long-term after STIG as compared to general toxicity ($b = -.79$, $p < .05$). An identical model examining men did not find an effect for toxicity

type ($p = .41$), indicating that unlike women, men are not more likely to withdraw

long-term following STIG. Two additional regression models—both robust, and one

with the outcome variable raised to the second power to correct for an

autocorrelation violation—investigated gender differences among participants in the

STIG and general toxicity conditions. The models found that women were more

likely than men to withdraw for longer term ($b = 9.82$, $p = .005$) in the STIG

condition, but not in the general toxicity one ($p = .89$).

As in Preliminary Study 2, three additional regression models utilized female

participants' scores to investigate mediational effects. These models examined

whether betrayal, self-verification, and perceptions of future control were predicted

by STIG, but not general toxicity. Toxicity type was entered as the predictor in all

models, and age and weekly online play hours were entered as controls. The first model employed perceptions of betrayal by other gamers as the outcome, and utilized a transformed outcome raised to the 1.9 power to correct for a heteroskedasticity violation. Manipulation predicted perceptions of betrayal ($b = -6.13$, $p = .004$), with STIG (which was coded as 0) predicting a higher long-term withdrawal endorsement score than general toxicity (which was coded as 1). Manipulation failed to predict both self-verification and perceptions of future control (ps > .14).

As the a-paths for control and self-verification were insignificant, neither could be entered into a mediational model. However, as an exploratory analysis two regression models investigated these hypothesized mediators' b-paths. For each of the variables, models with longer-term withdrawal as the outcome, and manipulation, age, and hours played as covariates—were examined. The model examining control was conducted as a robust regression to correct for a violation of the normality assumption, and the model examining self-verification had its withdrawal outcome raised to the 1.6 power to correct an autocorrelation violation. Both control ($b = 1.08$, $p = .006$) and self-verification ($b = .40$, $p < .001$) were significant predictors of longer withdrawal, indicating that female participants who experienced diminished control and self-verification failure were more likely to endorse withdrawing longer term.

As betrayal was the only variable predicted by the manipulation, it was the only variable entered as a mediator into the bootstrapping function. As in

Preliminary Study 2, I wrote a function in R to estimate the BCa confidence intervals for the control and identity mediation paths individually, as well as the total indirect effect's coefficients utilizing 10,000 bootstraps. The a-path consisted of a regression model with the betrayal score as the outcome, and manipulation as the predictor. The b-path consisted of a regression model with betrayal and manipulation as the predictors, and longer withdrawal as the outcome. Both regression models controlled for age and number of weekly hours played online. The confidence intervals of the indirect effect (b = -.57, CI[-1.04, -0.18]) did not include zero, indicating its significance.

Overall, Study 1 replicated and extended Preliminary Study 3. Women, but not men, were more likely to endorse longer-term withdrawal following STIG, but not general toxicity. This difference between men and women did not replicate when examining shorter-term withdrawal. Furthermore, Study 1 demonstrated that perceptions of betrayal by other gamers mediated STIG's effect on withdrawal.

Contrary to expectations, neither perceptions of controlling future toxicity nor self-verification mediated the main effect. This is surprising, as self-verification was predicted by STIG in Preliminary Study 2, and both control and self-verification predicted longer withdrawal. However, in Preliminary Study 2 STIG was measured rather than manipulated. Furthermore, the measure was a combination of both STIG's intensity and frequency, rather than its simple presence or absence, which was the way that it was measured in this study. Therefore, it is possible that had the current study either measured STIG in a more nuanced fashion, or investigated it

among gamers that the mediational effect would have been found. Further research is needed to better understand whether control and self-verification are mediational mechanisms.

Overall, Study 1's focus on mediational mechanisms exclusive to sexual toxicity provided an important starting point for untangling the effects of STIG on withdrawal. Proposed Study 2 built on this work by manipulating the mediational mechanisms, rather than measuring them as the previous studies did. Although only betrayal was predicted by the manipulation in Study 1, all three hypothesized mediators significantly predicted longer withdrawal, and therefore were examined in Study 2. Specifically, Study 2 examined whether increasing perceptions of control over future STIG occurrences, lowering perceptions of betrayal (i.e. other gamers as backstabbers), and increasing self-verification perceptions that other gamers view oneself as a valuable gamer, would decrease the likelihood of longer-term withdrawal.

Study 2

To help further the study of mechanisms promoting withdrawal following STIG, Study 2 manipulated the hypothesized mediators examined in Preliminary Study 2 and in Study 1. Female participants were randomly assigned to one of three experimental conditions, or a fourth control condition. One experimental condition manipulated the ability to control STIG; a second lowered betrayal perceptions; and a third increased self-verification from other gamers during STIG victimization.

Methods

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A sample of 263 female participants who did not work in the gaming industry completed the survey on Mechanical Turk (Buhrmester, Kwang & Gosling, 2011) in exchange for a small fee. All data from participants with a duplicate IP address were excluded, leaving a sample of 258 participants (M_{age} = 38.20).

Participants began by reading one of four randomly assigned STIG vignettes. Three of the vignettes attempted to manipulated either an increase in perceptions of future control, self-verification, or a decrease in perceptions of betrayal. The fourth vignette served as the control condition. All vignettes started the same, asking participants to imagine that they are experiencing the following scenario:

"You are playing an online video game with a team of five other players. You have never met or played before with any of your current team members; the game assigned them to you when you indicated that you wanted to play a match. In order to coordinate, team members use voice chat. During the match you cannot change the volume of the voice chat, or mute any of the other players. Although this is a feature that the game supported in the past, it has not been an option for a long time.

Imagine that after the first five minutes of the game, one of the players comments that you are speaking too close to the microphone. The player says to you: "If you ever talk that close to the mic again I'll shove my cock in your throat. You're a whore." A second player than starts breathing heavily down the microphone, and saying thing like "Oh my god, you're so hot I wanna fuck you." The first player joins, and the two of them keep speaking to you over the course of the game's first

half. As the team starts losing, they start screaming at you to protect them. You ask for help, explaining that you cannot carry the team on your own. Your two teammates tell you to shut the fuck up, because the reason that you are losing is that you are a girl."

In the condition manipulating increased future control, participants learned that they had gained the ability to mute other players halfway through the game: "Suddenly, you notice halfway through the match that in the corner of the screen the muting option has become active again. You quickly mute the two harassing players, and consequently are not subjected to additional harassment for the duration of the match. Later, you learn that the muting feature has been permanently restored to the game, and that players will be able to utilize it whenever they play from now on."

In the condition manipulating a decrease in perception of other gamers' betrayal, participants imagined that other gamers publicly come to their aid: "Suddenly, halfway through the match a third teammate speaks up. He tells the harassing teammates that they are being disgusting. The fourth and fifth teammates join as well, telling the first two to stop talking that way; that their behavior is completely unwarranted. The harassers do not stop their behavior, but the other three teammates continue to have your back until the end of the match."

The condition increasing self-verification was similar to the decreased betrayal condition in that participants imagined that other gamers behaved positively towards them. However, in this condition other gamers offered private self-verification: "Suddenly, you notice halfway through the match that in the corner of the screen you are

receiving messages from your other three teammates. Each is messaging you separately and privately. They are encouraging you to not pay attention to the harassing teammates. They tell you that you are clearly a good player that is playing her best, and the harassers are wrong. They continue to sporadically message you until the end of the match."

Finally, participants in the control condition did not read about any helpful gamers or methods that changed their experience. Instead, they received the following ending: "None of your other teammates say anything, and the two harassers continue yelling and cursing at you. This continues until the end of the match."

To help internalize the manipulation, participants were then asked to take a couple of minutes to write about how they would feel if they were the targets of such behavior. Next, participants indicated across four items on a 1 to 7 scale how likely they thought they would quit following the imagined toxicity. As in Study 1, the first two items ("You would consider quitting in the middle of the game because of the harassment" and "You would actually quit the game/match in the middle because of the harassment") represented a short-term withdrawal measure, while the last two items ("You would quit playing the game for a while, after you were harassed while playing it—regardless of whether or not you quit the individual match" and "You would completely stop playing that game, after you were harassed while playing it") served as a long-term withdrawal measure. However, upon reflection it became evident that the findings from the Pilot Study and Study 1 indicated that the only outcome of interest was longer term withdrawal. Therefore, only longer-term withdrawal was assessed as an outcome ($\alpha = .80$, $M = 4.28$, $SD = 1.89$). Participants' online gaming experience was

measured as the number of weekly hours spent playing, and, along with age, was controlled for due to the possibility that online play impacted their perceptions of the toxicity vignettes.

Results and discussion

I examined whether the withdrawal levels of the participants in the three experimental conditions differed. Similar to Preliminary Study 1, I wrote a function in R to estimate the percentile confidence intervals for the long-term withdrawal means reported by participants in each of the three experimental conditions. Overlapping intervals indicate the means are likely the same. The bootstrapping function utilized 10,000 bootstraps, and found that the confidence intervals of the withdrawal means following perceptions of future control (CI[3.81, 4.61]), self-verification (CI[3.36, 4.31]), and betrayal (CI[3.92, 4.80]), all overlapped. Thus, I collapsed all the experimental conditions into a single condition, and converted the manipulation predictor variable from four levels to two; whether the participant received an experimental manipulation or a control one.

However, combining the three different manipulation into a single category created a large class imbalance in the manipulation variable, as there were now approximately three times as many participants who received one of the manipulations as compared to the number of participants who were in the control condition. As this is a suboptimal situation from a statistical standpoint, I bootstrapped the smaller class—the control condition—and upsampled it until its size was identical to the size of the experimental manipulations class. This converted the dataframe from one with 258 rows,

to one with 388 rows; 194 rows with scores associated with the control condition, and another 194 with scores associated with an experimental manipulation.

A regression tested the primary hypothesis that the withdrawal levels reported by participants in the experimental conditions ($M = 4.14$, $SD = 1.82$) were lower than the withdrawal levels reported by participants in the control condition ($M = 4.73$, $SD = 2.05$). Longer-withdrawal was entered in the model as the outcome, while age and hours played online served as covariates, and the dichotomous variable of whether participants received an experimental manipulation condition or a control one served as the predictor. Despite multiple attempts to correct for the various assumptions the model violated, no satisfactory corrections were found. Thus, to ensure the viability of the statistically significant findings ($b = -0.54$, $p = .005$) I additionally bootstrapped the dataset 100,000 times, ran the regression each time, saved the manipulation variable's coefficient, and created a confidence interval of all the coefficients. As the interval (CI[-0.91, -0.17]) did not include zero, it supported the finding that collectively experiencing either increased control, self-verification, or decreased betrayal, all mitigated STIG's effect on longer-term withdrawal.

As the above analyses examined the collective impact of all three variables combined, I conducted additional regressions to see whether each individual variable mitigated the effect of STIG on withdrawal. I offer the following analogy as a way to clarify the need to decompose the overall effect: If a study was investigating whether fruit had a beneficial effect on one's health, participants might eat either apples,

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bananas, oranges, or no fruit. If the hypothesis were that fruit would increase one's

health, it would be logical to investigate the fruit's effect by combining data from all

the fruit eaters, and comparing it to the data from those in the control condition.

However, if the researchers were also interested in how each fruit affected one's

health relative to not eating fruit, it would make sense to conduct three additional

models to investigate the unique power of each of the fruit. Therefore, in this study I

conducted three additional regressions to compare each experimental condition to the

control condition.

In all regressions longer-withdrawal was entered as the outcome, age and

hours spent playing weekly as covariates, and one predictor. The first model

investigated whether the perceptions of future control manipulation resulted in lower

withdrawal scores as compared to the control condition. The second and third models

similarly examined whether betrayal and self-verification resulted in lower

withdrawal as compared to the control. Despite normality corrections, only the third

model—which additionally had its outcome squared to correct an autocorrelation

violation—was significant. Specifically, compared to participants in a control

condition, participants who imagined experiencing self-verification from other

players, endorsed a lower likelihood to withdraw ($b = -7.25, p = .02$).

These findings are in line with one of Preliminary Study 2's findings—that

lower self-verification was the reason that STIG was harmful to women. However,

these findings also contradicted the other mediational finding from Preliminary

Study 2, as well as the finding from Study 1 that STIG harmed women through

betrayal. Perceptions of control failed as a mediator consistently throughout all studies. It is worth noting, however, that since all the regressions were in the correct direction—with the withdrawal score that was associated with the experimental condition being lower than the control condition's score—and that the combined analysis was significant, that it is possible that the lack of individual findings reflects a deficit in statistical power. Another reason that the mediation failed to replicate may be that the mediators were manipulated in some studies and measured in others. It is additionally possible that my hypotheses regarding the mediators were at least partially incorrect. Finally, it is worth noting that the study did not include a manipulation check to verify that the betrayal and self-verification conditions triggered the hypothesized effects. My assumption was that to decrease betrayal the harassers would have to be publicly confronted, while to increase self-verification even private verification would suffice. However, as I did not test these assumptions empirically, it is possible, for example, that the decreased betrayal manipulation engendered increased self-verification; the increased self-verification manipulation engendered a decrease in betrayal perceptions; or that neither condition engendered either decreased betrayal or increased self-verification, making the mediational results not only mixed, but uncertain as well.

When quantitative research yields uncertain or mixed results, such as with the current mediational findings, qualitative research can often help explain these results by providing deeper context (Brannen, 2005). Therefore, Study 3 qualitatively examined female gamers' thoughts on different aspects of STIG. This included

understanding why they found STIG troubling, and how those mechanisms affected the ways that they thought that STIG should be combated. I expected that at least some of the participants would focus on self-verification and betrayal as important components of interventions redressing STIG.

Study 3

Study 3, a qualitative study, sought to corroborate the quantitative findings from the foregoing studies and provide insights into the mixed mediational findings (Brannen, 2005). The study was generative as well, as it examined differences between combating STIG and general toxicity, and it explored who the female gamers thought should redress STIG. Finally, Study 3 also examined what methods the participants believed should be used to reduce STIG, and possible relationships between these methods and the hypothesized mechanisms of betrayal and self-verification.

Methods

A sample of five female participants who did not work in the gaming industry were recruited through snowball sampling. Participants were aware that they were volunteering to complete a semi-structured interview that was expected to take approximately 45 minutes, and that they would not be compensated for it. All interviews occurred during October 2018, and ranged from 35 to 60 minutes. One interview was conducted face-to-face at the participant's workplace, while the rest were conducted as video conference calls. The requirements for participating in the study were identifying as female, online gaming, and being over the age of 18. In addition to granting consent to be interviewed, all participants were reminded that they could skip any questions or

sections that made them uncomfortable, and stop the interview at any time. Participants responded to four sections of questions: their gaming history, toxicity experiences that they witnessed other players going through, their personal toxicity experiences, and their opinions on redressing toxicity in gaming. The first three sections were intended to warm participants up, and help them think about various toxicity experiences while gaming; the final section was intended to be the focus of the study.

However, as this study's focus was on redressing toxicity, it was important to additionally understand if, how, and why participants found STIG experiences to be different from general toxicity ones. Specifically, understanding how STIG affected participants should help pinpoint the mechanisms that interventions should target. This is especially important as contrary to my hypothesis, the mediators of control, betrayal, and self-verification did not consistently mediate STIGs effects across earlier studies. Therefore, while details from the first three sections were mostly limited to those relevant to redressing toxicity, the details included participants' descriptions of STIG's impact on them. In accordance with the thematic analysis technique, a pattern-based approach was selected to identify the recurring themes throughout the interviews and the relevant details to report (Braun, Clarke, & Rance, 2014). The analysis had inductive and deductive elements, as there were both questions that I did not have hypotheses about (e.g. how to regress toxicity), as well as those that I had existing ideas about (e.g. diminished self-verification and betrayal play some role in why STIG negatively affects women).

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To understand participants' beliefs regarding how to redress toxicity, participants opined on STIG's antecedents, why they thought that STIG was harmful, and differences that they believed there were in redressing general toxicity versus STIG. Participants additionally shared which entities or individuals they believed were responsible for redressing toxicity in online gaming, as well as their ideas as to how STIG should be redressed. All of the opinions reported in this study were voiced by participants, and not inferred from their words. Thus, for example, the claim that the aftermath of severe sexual threats is worse than that of severe physical threats, is an opinion that participants shared. Nevertheless, the opinions of participants were not observed or confirmed as part of the study. To maintain anonymity, I use pseudonyms to refer to participants.

Results

STIG's antecedents. Participants opined that several factors explained STIG's antecedents and prevalence in online gaming. Erica and Michelle pointed to the stereotype that gaming was a "boys' game; a boys' world… (where it's continuously asked) well why are women here anyways?" as the reason gamers attacked women in such a personal fashion. They also thought that this was why extreme sexual toxicity was more acceptable and prevalent in the game as compared to extreme non-gendered toxicity. Erica mentioned that games frequently did not have options for feminine characters, and that even if they did, that the masculine ones were always the default. Together with the lack of diversification among game developers (which is a predominantly white, cis, male environment), Erica thought that this sent a message that women did not really belong in gaming and that the gaming space was like a men's

locker room. As this made women outsiders, men felt at ease to target them and take advantage, and utilize language that they would otherwise never use in a co-ed, public space.

STIG's unique effects. All participants agreed that they felt like an anomaly in online gaming spaces; they believed that male gamers' social norms appeared different than the norms that dictated men's behaviors in the extra-virtual, public domain. The female gamers mentioned that any evidence of their gender while online gaming attracted copious amounts of unwanted attention. Some participants, such as Grace and Divya, said the harassment was mostly high in frequency but low in intensity. That is, men incessantly commented on their gender, virtually followed their avatar around in the game, had become enamored by them, wanted their avatars to have sexual intercourse, or offered unsolicited advice as soon as the male gamers realized that they were women— even when the women were at higher levels than the men. Danielle commented that if she turned men down or did not take their advice, they would often target or kill her avatar. She also received extreme sexual threats sometimes, such a man telling her that he would find her, tie her down, lick her, and tear into her pussy. Erica added that she received unsolicited favors, and was expected to reciprocate through sexual gratification, such as sending nude photographs of herself. Michelle was upset when discussing the toxicity that she experienced—which she described as predominantly gendered—concluding that she had permanently stopped playing a few games because of STIG. She said that she would often receive angry, toxic messages even when she was the best player, and provided examples of the targeting that she endured:

"… I would miss a kill and it would be like "Why are you even playing?

You should get back into the kitchen" or something like that. "You

shouldn't be playing this, leave this to the big boys"… I get much more

(harassment) than (my husband) does, even when we play equally (or I play

better, as objectively measured by our game statistics)… I will get the

messages, I will get the harassment, he'll get nothing."

Divya summed what seemed like most of the other participants were saying; that

STIG's personal attack on her identity was far harder to endure than general toxicity,

which could be unpleasant, but was more tolerable as it was not prejudicial.

Differences in identity threat and control mechanisms. It therefore appears that

due to their gender all participants experienced some level of betrayal and lowered self-

verification by male gamers. That is, the participants were focused on identity threat as

the reason that STIG was so harmful, and not on lowered future control. As Cote (2017)

found, many participants engaged in gender-masking methods to prevent future betrayal

and diminished self-verification. Participants abandoned using a microphone while

playing, and changed feminine gaming usernames (a.k.a. gamertags). However, it appears

that gender-masking control methods were perceived as a double-edged sword. That is,

while they did prevent women from experiencing gendered toxicity—as men could

longer discern their gender—they caused the women distress as well. Grace emphasized

the harm that controlling STIG through gender-masking caused. She explained that she

experienced self-blame, as she felt that after so many years she should expect to be

victimized if she did not want to self-censor and pretend to be a man, and instead used

her voice. She thought that this type of betrayal and lack of self-verification was an expected concession that women who wanted to play online had to make, and she did not appear to think that reporting would have been an effective avenue to allow her to use her voice.

It appeared that the participants' experience was that while this type of gender-masking control was effective, it led to psychological distress; it increased feeling that they needed to erase their personhood from the game, and further eroded feelings of self-verification. This may additionally explain why perceptions of control failed to mediate STIG's effect in the previous studies, despite identity threat and control being clearly intertwined. That is, STIG may have only trended significance in predicting diminished perceptions of future control in Study 1 because women already had the ability to control STIG through gender-masking—but they disliked using it. Therefore, although gender-masking successfully prevented feeling betrayed and lowering self-verification by other gamers, participants still did not focus on increasing control as a valued intervention option. It is possible that this was because gender-masking was a form of control that they already experienced, and it had led to other harmful outcomes.

Therefore, if an intervention increased perceptions of control in an innovative way that women have not yet considered, it might still be successful if it were no longer a double-edged sword. One example might be forcing all gamers to gender-mask by default—a idea, that to my knowledge, no game currently implements. A way to enforce mandatory gender masking could involve using a voice mask that cannot be turned off and is applied to all gamers' voices—making them sound neither masculine nor feminine.

Similarly, gamers may be randomly assigned gender-neutral user names. If all gamers had their gender masked this way, women would no longer feel as though they had to pretend to be someone else by deliberately selecting a gender-neutral username, or choosing to stay silent to hide their gender. However, this should, at the same time, prevent STIG just as well as current gender-masking techniques do. Therefore, this would be a solution that could increase women's confidence that they will avoid STIG without requiring them to self-censor their own identity.

Combating STIG versus general toxicity. Erica and Michelle believed that because STIG was acceptable and harmful without effective control options, that STIG would be harder to eradicate, and therefore required more immediate resources. Some participants believed that STIG's ubiquity as compared to general toxicity—regardless of severity—indicated the need to combat it first.

Grace and Danielle, two participants who had both experienced extra-virtual sexual assaults, opined that unlike physical trauma, the aftermath of sexual trauma lasts long after the body heals. Grace also mentioned that in-game sexual threats can be triggers for women who had experienced sexual assault, a notion that Danielle agreed with. When discussing a STIG incident that Grace had found especially distressing, she visibly teared up, and decided that she did not want to provide any specific details of the incident. This was because the pain she was experiencing from simply remembering the incident—despite thinking that the incident no longer bothered her—was still raw and overwhelming. Both Grace and Danielle believed that the longer-lasting aftermath of

sexual trauma dictated that intense sexual violence threats deserved to be eradicated before non-sexual ones.

How to most effectively combat toxicity. All five participants unanimously agreed that the gaming industry should not only be allocating more resources to combat STIG as compared to general toxicity (especially when the toxicity is violent threats), but that the industry is not currently doing enough to combat toxicity. Divya thought that gaming companies' failure to adequately combat toxicity might not be nefarious, but that this did not excuse what she alleged to be lackluster efforts, claiming that "you can't just be like "Oh, I don't want to be held accountable for this cool thing that I created but it went and destroyed the neighborhood" … So you made something that's your baby and you're not watching it grow?!" Divya added that companies would likely put more effort into enforcement if they had to combat a lawsuit. Grace, Michelle, and Divya believed that STIG was leading current female players to leave gaming, and Grace added that that in her opinion potential new female gamers were reluctant to join because of toxicity's pervasiveness; they therefore thought that it was in the companies' best interest as well to adequately combat STIG.

Both Grace and Divya believed that games' current systems for reporting toxicity were inadequate, and that especially for new gamers, the process of filing a report was obfuscated. Divya also mentioned that the current reporting systems, even when effective, were insufficient for a couple of reasons. One reason she had no faith in the reporting system was that it could take a month for the company to examine the report. Divya believed that the toxicity was damaging enough that it was probably worth quitting

the game by that point if one could not figure out a temporary solution on her own. Furthermore, even if a report was effective and the harasser was blocked, the harasser often found ways around it: "You can block that person but if they really want to be an asshole they'll make a new account and follow you and harass you."

It is therefore unsurprising that participants opined that one way that companies should increase their efforts to combat toxicity was by taking additional measures to create a better enforcement system. Erica thought that companies could make better use of artificial intelligence to determine when a woman was being targeted, and to offer her avenues for support. In a similar vein, Divya thought that the industry should do more to demonstrate their support of female gamers, both individually, as well as through online support groups.

Much like Divya, Erica also believed that the change in toxicity started with the company, what she referred to as a top-down model. Erica mentioned game developer diversification as key to combating STIG. She thought that increasing female representation among game developers would result in an inclusive game with more diverse components that would appeal to more women. Erica thought that this in turn, over time, would increase the female player base, and naturally curb toxicity, since as far as she could judge (as it is not always possible to judge when being targeted in typed chat), harassers that targeted her or others have always been men—a belief reported by all participants. Erica believed that gender diversity among game developers would additionally decrease sexual toxicity as it would be a public display of the industry's support of women; a proclamation that gaming was not exclusively a man's space.

Interestingly, these recommendations to combat STIG all included components to lower betrayal and increase self-verification. Increased enforcement, and increasing the number of female players would likely lead to lower incidents of feeling betrayed my male gamers. Similarly, demonstrating that the companies care about female gamers through avatar diversification, game developer diversification, and various forms of supporting female gamers, may not lower betrayal, but could increase the perception that the companies believe that women belong in the gaming space. This may increase the female gamers' self-verification of being a worthy member of the gaming community. These findings corroborated many previous findings, such as those by Cote (2017) and Fox and Tang (2016). Additionally, the findings supported the idea that interventions to increase female gamers' retention should include components to lower betrayal and increase self-verification, in line with what my quantitative studies found. Finally, to my knowledge, this is the only study to date to examine how female gamers believed that the gaming companies can increase female gamers' retention.

General Discussion

Taken together, these studies elucidate how women respond to STIG. The studies additionally begin to explain how STIG promotes different outcomes for women and men. Furthermore, the studies compare women's responses following STIG to men and women's responses following general toxicity. Specifically, women reacted stronger to STIG than general toxicity, and stronger than men reacted to either type of toxicity. STIG appeared to hurt both women's mental health, as well as their desire to keep playing. To my knowledge, these are the first studies examining not only whether women respond to STIG negatively, but also how negatively they respond. Additionally, to my knowledge, it is the first investigation of possible STIG interventions that may increase women's retention in gaming.

This research—especially Study 3—also validated findings from previous studies that had established ways in which women cope with STIG (Cote, 2017), as well as how STIG leads to withdrawal (Fox & Tang, 2016). Specifically, Fox and Tang found that women were especially troubled by gaming companies' lack of caring about STIG, and all participants in Study 3 agreed that the industry should be doing more to combat toxicity. Participants additionally emphasized that the industry should work to help and promote female gamers and developers. Similarly, Cote found that female gamers cope with STIG in a variety of ways, including gender-masking, silencing themselves, arguing with harassers, and withdrawing, which were themes found among the Study 3 participants as well.

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Contrary to my findings, Fox and Tang (2016) did not find among their female participants that STIG uniquely led to withdrawal. However, they did not differentiate between longer-term and shorter-term withdrawal, which Preliminary Study 3 and Study 1 demonstrated was an important distinction. Therefore, another contribution of this research is furthering an understanding of female STIG victims' withdrawal patterns. Finally, to my knowledge, this is the only body of research that not only examined female gamers' problematic experiences in a thorough fashion, but also researched possible ways to begin redressing the issue.

Understanding STIG's deleterious outcomes for women and how they may be redressed has both theoretical and practical implications. In addition to psychologically hurting female gamers, STIG penalizes both them and the industry financially (Westendorf, Knouf, Pederson, 2017). It curtails victims' interest in pursuing STEM careers in the predominantly male gaming industry (Westendorf, Knouf, Pederson, 2017), and discourages them from participating in the lucrative, predominantly male eSports industry (Parker, 2017). Furthermore, as Study 3 anecdotally suggested, withdrawal may hurt the gaming and esports industries by diminishing player and fan bases. Finally, by demonstrating that STIG might produce mental health problems among a particular class of players (i.e, women), the industry may become vulnerable to a class action lawsuit as the industry does not warn them of these dangers. As this research clarified STIG's unique outcomes and mechanisms that impact women, it is the first step in the path to redressing the problem.

Future Directions

Although the current body of work robustly supports across a variety of study designs the notion that STIG is uniquely harmful to women, a number of limitations raise questions that future research should address. A salient example is Preliminary Study 2 that utilized the posttraumatic stress disorder checklist to assess post-toxicity PTSD symptoms. Because these symptoms were reported retrospectively, they are subject to memory biases. Additionally, the sample in the study was small and subject to volunteer bias. Furthermore, although participants were not informed that the study would be about STIG and gender, it is possible that this was at least partially inferred by participants who completed the study. These initial participants may have recruited later participants, and may have shared this suspicion with the later participants that they recruited. As participants were not questioned as to how they found the study, or what others had told them prior to their own participation, it is possible that some participants knew ahead of time what the study was examining, and that this biased their responses. However, as all studies appear to support the idea that STIG uniquely hurts women, the concern here is less about the validity of the main effect, and more as to its size and magnitude, and whether STIG can actually lead to PTSD in women. Thus, future research should emphasize random sampling and collection of live mental health data in order to assess the extent to which STIG can damage women's mental health in a more definitive manner.

A second concern in Preliminary Study 2 that future studies should remedy concerns the toxicity measures. Although the study echoed the subjective measurement of Fox and Tang (2016), it raises a number of concerns. As above, one concern, is the

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measures' retrospective nature. As the measure assessed in detail the frequency and occurrence of a total of 22 items, it is subject to memory bias. Furthermore, it is possible that men and women would assess the frequency and intensity of toxicities differently, even if objectively they experienced them equally. Therefore, future studies should be designed to control for subjective interpretations and memory biases of toxicities' frequencies and intensities.

Additional possible future directions concern the mixed mediational findings. Although STIG's unique, deleterious effect on women consistently replicated across all of the studies, only control uniquely and consistently failed to mediate STIG's effect; betrayal and self-verification were found to be mechanisms in two thirds of the quantitative studies. Additionally, Study 3 suggested that both betrayal and self-verification may be important mechanisms, but that control may not be as important. Conceivably, increasing studies' sample sizes, or perhaps wording or measuring the variables differently, may have helped find a consistent mediational effect—all considerations that future studies investigating the topic should make.

Furthermore, only a single study in the current dissertation manipulated the mediators—a design necessary to establish causality—and that study failed to empirically determine whether the manipulations were effective. Therefore, future research should manipulate the mediators, and determine the manipulations' efficacy as part of the study design.

Finally, future research should examine whether women's previous, extra-virtual sexual violence experiences affected their reactions to STIG. Specifically, as one in five

women are raped in the US (NCADV, 2018)—as were two of the five interviewees in Study 3—it seems likely that a sizeable portion of the female gamers has experienced similar violence, and STIG may trigger those past experiences. If these assumptions, along with STIG's anecdotal ubiquity, are proven correct, this issue may be important to creating and amending gaming studio's policies. For example, in this type of scenario, continuing to advertise the game to women despite knowing that it is a toxic environment that can trigger past traumatic experiences, may prove to be a legal liability. However, without further research it is unclear whether STIG is a trigger, or even whether gamers mimic the general population's rape prevalence.

It is also worth noting that although the current findings' generalizability is limited to female gamers, if identity threat—as the studies have found—is a reason that STIG is harmful to women, many of these findings may replicate in other minority gamers if they were targeted and threatened because of their identity. For example, a self-identifying, Jewish male gamer who is abused with derogatory terms associated with his Semitic identity, is repeatedly subjected to hearing other gamers use the term "Jew" as a verb that means to make money (Schiesel, 2018), and is threatened with anti-Semitic violence—such as being gunned down in a temple, or gassed the way that Jews were in the Holocaust—may react the way that women do to STIG. That is, as a man he would react to STIG like other men, but if faced with threats of persecution because of his religion that is an important component of his identity, he may react to those threats similar to the way that women react to STIG. Alternatively, it may be that reactions to STIG are specific to *sexual* toxicity, in which case the man's reactions to anti-Semitic

violence may be milder than womens' reactions to STIG. Clearly, whether minority-targeting toxicities—such as ethnic, religious, racial, and LGBTQ targeting—engender outcomes similar to those that STIG causes in women is an empirical question, and one that can only be answered with further research.

Coda

In closing, this body of research has helped foster a theoretical understanding of how STIG affects women, as compared to men, and to general toxicity. It has also further clarified possible mechanisms explaining STIG's impact, as well as female gamers' opinions on how to redress STIG. Therefore, this research not only sheds light on the size and nature of the STIG problem, but begins to clarify how it may be solved as well.

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