



RSGC  
Royal St. George's College

The Young Researcher

2020 Volume 4 | Issue 1

# Not a Children's Game: Misogyny in the North American Online Gaming Community

Siyu (Elaine) Liu

## Recommended Citation

Liu, S. (2020). Not a children's game: Misogyny in the North American online gaming community. *The Young Researcher*, 4 (1), 234-255. Retrieved from <http://www.theyoungresearcher.com/papers/liu.pdf>

ISSN: 2560-9815 (Print) 2560-9823 (Online) Journal homepage: <http://www.theyoungresearcher.com>

All articles appearing in *The Young Researcher* are licensed under CC BY-NC-ND 2.5 Canada License.

# Not a Children's Game: Misogyny in the North American Online Gaming Community

Siyu (Elaine) Liu

This ethnographic study examines gamers' in-game text-based conversations in *League of Legends* to study the gender relations in the North American online gaming community in the post-#MeToo era. While it finds the overall environment to be supportive regardless of players' gender, the *League* community deems heterosexual men as prototypical players, and female players actively fulfill this stereotype. Players with female usernames receive more negative comments, especially when their teams are winning. The highest-ranking players use the most positive language to communicate, while medium-ranking players use the least positive language. Recommendations to improve gender relations include imposing stricter policies to target toxicity, implementing computer programs to identify offensive language and warn the perpetrators, and initiating and publicizing toxicity ratings for players to promote self-regulation. By installing these suggestions into Riot Game's existing anti-toxicity measures, the online gaming environment could become more inclusive.

*Keywords:* misogyny, *League of Legends*, video games, #MeToo

## Introduction

Five hours per week. This is how much time an average adult gamer spends playing video games with others online (McGonigal, 2010). As video games continue to replace TV, movies, and board games as the most popular source of entertainment, female participation has dramatically increased, making up 46% of the American gaming community as of 2019 (Entertainment Software Association, 2019). This expansion, however, has not been accompanied by greater gender equality in the anonymous, virtual gaming space, particularly in terms of verbal harassment, the

excessive sexualization of female avatars, and gender-based exclusion.

Players of multiplayer often communicate through text chats. In this anonymous, instantaneous, and unmoderated platform, like social media, "harsh criticism, anger, hatred and threat[s]" can proliferate under the effects of "individuation and disinhibition," and women are frequently victims of verbal sexism (Kessler, 2013, p. 29). In particular, the devastating effects of 2014's GamerGate controversy<sup>1</sup> on feminist developers and critics can be attributed to the explicit hostility, contentious debates, and polarized opinions facilitated by online anonymity. As such, misogynistic speech

<sup>1</sup> The GamerGate controversy was an outcry by the gaming community against female influences in games, ultimately leading to cyber-aggression towards women in the industry (Chatzakou et al., 2017).

proliferates in chatrooms, further perpetuating sexism both in and outside of the online gaming community.

## *League of Legends*

With more than 33 million monthly players, *League of Legends* (hereinafter *League*) is one of the most popular battle arena games in the world (Ratan et al., 2015). While *League* doesn't release specific player demographics, many studies found that most battle arena game players are young men below the age of 30 (Jenson & de Castell, 2018; Ratan et al., 2015; Trepte et al., 2009). In *League*, players team up for a "capture-the-flag"-style race. The game arena is a forest consisting of three lanes that meet at the two ends. To win the game, the five-player team must cooperate to destroy the three enemy "towers" in each lane, the three "inhibitors"<sup>2</sup> at the end of the lanes, and finally the "Nexus"<sup>3</sup> behind the "inhibitors." *League* players select from a wide assortment of avatars called "Champions" with different appearances and strengths. Some are more suitable for certain positions than others. Specifically, the five positions are Carry, Support, Top, Mid, and Jungle. Top and Mid are each responsible for one lane; Carry (typically offensive) and Support (typically defensive) cooperate in the third lane; Jungle plays in spaces in between the lanes and assists all other roles. Ratan et al.'s narrative research found that many people deem Support the "easiest" position, hence the most "suitable" for women despite it being the least popular among men (2015).

There are multiple "game modes" in *League*. Players are allowed in Ranked games<sup>4</sup> upon reaching Level 30, which requires roughly 100 hours of gameplay. This research studies interactions between Ranked players.

Players on each team are connected via a text chat, where their usernames, actions (kills, in-game purchases, requests for assistance) and dialogue are displayed. Despite its popularity and widespread social implications, little is known about the gender dispar-

ity in the *League* community. As such, understanding the extent to which *League* players' in-game conversation perpetuates sexism in the North American gaming community is crucial to evaluating the gender equality landscape in 2020. This study analyzes how gendered usernames, female-leaning avatars, and playing skills correlate with misogynistic speech to examine the roots of sexism in *League*.

## Literature Review

### Female Gamers' Experience

#### Verbal Harassment

While swearing and "flaming"<sup>5</sup> in chatrooms are prevalent regardless of the targets' gender (Gray, 2012, p. 414), women are the principal victims of verbal sexual harassment during gameplay (Ballard & Welch, 2017; Brehm, 2013; Fox & Tang, 2014; Gray, 2012; Shaw, 2010). Ballard and Welch's 2015 online survey found that women experience significantly higher rates of sexual harassment and pursuit and that heterosexual men are most frequently the perpetrators. These results are confirmed in Kuznekoff and Rose's experiment (2013), which found that, in *Halo 3*—a game that uses voice chat—female voices receive negative attention three times more often than male voices or no voice at all. Kasumovic and Kuznekoff, Professors in Communication, discovered through a true experiment that lower-skilled male players are more hostile toward female-voiced teammates but more submissive towards male-voiced players in the identical scenario (2015). Professional female gamers face similar obstacles—Ratan et al. summarize a series of incidents, such as a female e-sport athlete being sexually harassed by a male *League* during a live webcast, and the feminist game critic Anita Sarkeesian being threatened by gamers dissenting with her

2 Structures in the game that a team must destroy before attacking the enemy "Nexus."

3 A structure that serves as the primary objective of League games. A team destroys their opposition's Nexus to win the game.

4 Ranked games are the competitive alternative to normal games, as players who finish with higher ranks by the end of the season receive monetary rewards. With money as an incentive, Ranked players are often more engaged in the gaming community and emotionally charged during gameplay.

5 spontaneous creation of homophobic, racist, and misogynist language

cause of improving female representation in games (2015, p. 440). The lack of respect for professionals further discourages women from entering the gaming community; companies failing to address gender issues risk losing potential female customers.

Online anonymity magnifies sexism in the gaming community. In the absence of real-life repercussions, users behave less responsibly (Gray, 2012; Kessler, 2013; Ruvalcaba et al., 2018; Suler, 2004). For instance, two groups of researchers led by Joseph Thompson (2017) and Shane Murnion (2018), respectively, analyze in-game chats from *StarCraft 2* and *World of Tanks*. Both find prevalent profanity, abusive language, racism, and cyberbullying. Additionally, a research team led by Omar Ruvalcaba, Psychology Professor at California State University, investigated misogyny in comments on Twitch<sup>6</sup> (2018). They find that female streamers are over 10 times more likely to receive sexual comments than males, and that 37% of the positive comments toward women players focused on appearance, compared with 7.5% for men (2018, p. 13). While Ruvalcaba et al.'s research finds a correlation between gender and sexual harassment, Maass et al. (2003) attribute this to male gamers' need to "bolster their own masculinity," especially when they perceive their gender identity to be threatened.

Given the power of verbal communication in perpetuating sexism, chatroom sexual harassment reinforces real-life harassment (Menegatti & Rubini, 2017). Fox, Cruz, and Lee's 2015 experiment establishes a cause-and-effect relationship between online and offline sexist behaviours: exposure to and participation in sexism on social media encourage misogynistic attitudes and actions in the workplace. Results from numerous studies confirm that overt sexism affects women's psychology and behaviour, disengages them from social activities, harms their self-esteem, and diminishes their career aspirations (Fedi & Rollero, 2016; Jarunratanakul & Jinchang, 2018; Kuchynka et al., 2018; Maass et al., 2003).

### Female Representation in Games

Sexualizing female characters perpetuates stereotypes in gaming communities. Studies have found

that exposure to sexualized content exacerbates gender stereotyping and objectification, causes viewers to develop prejudicial beliefs on sexual assault, and constructs unrealistic beauty standards (Bègue et al., 2017; Cassell & Jenkins, 1998; Dietz, 1998; Ivory, 2006; Morawitz, 2007; Ogletree & Drake, 2007; E. Taylor, 2007). It also causes female players to become concerned with their body image and self-efficacy (Karsay et al., 2018; Kondrat, 2015; Morawitz, 2007; Vandenbosch et al., 2017). These results can be explained by the designing algorithms: as the idealized body image is often defined by that of the strongest character, players constantly compare themselves to the characters they are roleplaying and viewing. This leads women to believe they are unable to achieve success with their "imperfect" bodies.

In contrast, the freedom to choose usernames and Champions makes *League* a medium for players' self-expression, as they experiment with genders, sexualities, personalities, and ways of interacting with the world in the socio-political context of the game. This freedom, however, makes determining the players' genders impossible.

### Marginalization and Exclusion

Regardless of gender, participation, skill level, or game platform, gamers are more likely to perceive heterosexual men as prototypical gamers (Brehm, 2013; Easpaig, 2018; Wasserman & Rittenour, 2019). As a result, women are frequently excluded and often compelled to hide their gender (Brehm, 2013; Holz Ivory et al., 2014; McLean & Griffiths, 2018; Vermeulen et al., 2017). Specifically, women typically play alone, anonymously, and avoid verbal communication (McLean & Griffiths, 2018). They are also less likely to participate in offline gaming communities: Local Area Network parties, Internet cafés, and competitive gaming tournaments remain overwhelmingly male-dominated despite the recent spike in female gamers (Bryce & Rutter, 2003; Ratan et al., 2015; N. Taylor et al., 2009). While some women enjoy the comfort of anonymity, those who reveal their gender often find their legitimacy and competence questioned (McLean & Griffiths, 2018, p. 976). As misogyny proliferates and normalizes (Brehm,

6 a popular streaming platform for gamers that allows viewers to comment in the chat window embedded next to player video streams

2013; Easpaig, 2018), women find gaming less enjoyable, they then underperform and become less likely to self-identify as gamers (Kaye & Pennington, 2016; McLean & Griffiths, 2018; Vermeulen et al., 2014). The effects of marginalization extend beyond the online community. McLean and Griffiths' survey found female gamers frequently experience anxiety and loneliness due to the lack of social support they receive while gaming. Vermeulen et al.'s study corroborates McLean and Griffiths, emphasizing how this gender-based exclusion is detrimental to women's self-conception, well-being, and social relationships outside of the gaming community (Vermeulen et al., 2017).

## *League of Legends*

Riot Games takes various initiatives to minimize toxicity in the *League* community, including publishing a summary of expected behaviours in "Summoner's Code," allowing players to report toxic players or turn off text chats, banning frequent offenders, and offering a filtering option to replace coarse language in the text chat with asterisks (*Summoner's Code - League of Legends*, 2017). Meanwhile, excessive sexualization of female Champions (Carvalho & Cappelli, 2018, pp. 5–6) and misogyny in the *League* community perpetuate gender stereotypes just like games in previous studies. Combining results from qualitative experiment and analysis of users' behavior-log data provided by Riot Games, Ratan et al. contend that, while men and women develop skills at the same rate, women are less confident in their skills, often pressured to fulfill particular "lesser" in-game roles (usually Support), and are frequently perceived as "unwelcomed and/or unskilled" in the *League* community (2015, p. 440). These findings lead the researchers to hypothesize that the "often toxic, misogynistic nature of exchanges between players" is responsible for the dearth of female gamers (2015, p. 443).

## Gap Analysis

Verbal sexual harassment, sexualization of female characters, and the exclusion of women contribute to gender disparity in the gaming community and overall online sexism. *League*, particularly, harbours

all three attributes, further perpetuating misogyny. Indeed, the culture of video games and gamers is detrimental to the worldwide gender equality landscape.

These challenges, however, have seen improvements in the past two years, especially since the #MeToo movement of 2017. Many women have spoken up about sexual harassment, companies have updated their anti-harassment policies, and society has become more engaged in feminist initiatives, leading to unparalleled "cultural resonance and reach" (Cobb & Horeck, 2018). The number of sexual harassment cases reported to the police has spiked in America and Canada (Morgan & Oudekerk, 2019; Rotenber & Cotter, 2018). While the status quo for gender equality has shifted significantly in entertainment, hospitality, and fashion, harassment culture has not come to an end (Tippett, 2018; Williams & Lebsock, 2018). No study, however, has investigated misogyny in gamers' in-game, text-based conversations in the post-#MeToo world. Shane Murnion's study comes closest. It focuses on the development of cyberbullying identification technology rather than the potential causes and societal implications of misogynistic language (2018). While this research examines sexist practices in *League*, the results provide insight into the social dynamics of the greater online gaming community.

## Methodology

This study employed ethnography to investigate online gaming communities' "shared patterns of behavior, language, and actions" (Creswell, 2014). According to British sociologists Martyn Hammersley and Paul Atkinson (2007), ethnography is an extremely flexible research methodology that generates qualitative and/or quantitative data through the researcher's participation in other people's communities. Rich and authentic data can be collected through visual and auditory observation, interviews, and document and artifact collection.

Virtual ethnography—which collects data from the Internet—is a viable method for this research. Since each game's text chat is only accessible to its players, gaining a deep understanding about sexism requires immersion in the *League* community. Moreover, ethnography uncovers insights that would otherwise be missed, because players' language and the context of

the gameplay provide information that cannot be predicted. Many researchers have used virtual ethnography to collect authentic and generalizable data to investigate gaming practices and norms (Chee, 2015). Kuznekoff and Rose (2013) used ethnography to study gamers' verbal interactions in Halo 3, interviewing female volunteers about their experience and quantitatively analyzing audio chats. Sociologist Simona Isabella (2007) wrote ethnographic diaries about her gaming experience to study relationships between players of role-playing games. Dr. Michael Strangelove (2007) from the University of Ottawa has used ethnography to study violence and hegemonic incidents in the warfare simulation game Battlefield 2 from video recordings. This research combines previous studies' methodologies to research communications in *League*.

### Data Collection

*League*'s algorithm-based matchmaking process assigns players into two teams that have an equal chance of winning. Players may choose to communicate through a built-in text chat. This study collected data from recorded *League* games. The variables studied are the gamer's username (female-sounding versus male-sounding or gender-neutral), skill levels (low, medium, high), and Champion (commonly deemed suitable for women versus others). Stereotypically, women play Champions including Janna, Soraka, Lux, Morgana, Sona, Nami, that are easier to control and more suitable for defense, internalizing the gender-based expectation to play Support. Skill level is determined as follows:

Low: Iron, Bronze. This tier accounts for 33.7% of *League* players.

Medium: Silver (36%).

High: Gold and above (30.3%) (Rank Distribution, 2019).

This study then used content analysis to compare the types of comments directed toward players in order to determine the association (or lack thereof) between the type of feedback a player gives or receives and their skills, Champions, and the gender indicated by their username.

Ranked players of all levels were recruited through email and social media as research participants (hereinafter "volunteers"). This study collected video record-

ings<sup>8</sup> of Ranked games played on the North American server. Volunteers were asked to "solo-queue," so they were paired with four randomly selected players of similar ranks to ensure random sampling. Volunteers were asked to avoid using inappropriate language and play and communicate as they naturally would to minimize inter-observer variability (Pannucci & Wilkins, 2010). In each game, the volunteers' teammates' verbal interaction as the game progresses was observed. Their teammates remained unaware of this study so that they would behave naturally, ensuring that players neither reduced nor increased misogynistic language to adhere to social or in-game expectations.

Qualitative observation and quantitative data analysis were employed in this research. Namely, I played Ranked games with strangers for two months, qualitatively observing their interactions with me. I also examined my volunteers' video recordings to evaluate players' attitudes toward each other. To quantitatively analyze audio recordings, gamers' conversations were transcribed with OCR.space (*About the Free OCR API*, n.d.) and analyzed with Lexalytics to evaluate sentiment, assigning each line of conversation a sentiment score between -2 and 2, with -2 being the most negative and 2 being the most positive (*Lexalytics Sentiment Analysis Whitepaper*, n.d.). The "sentiment library"—Lexalytics' database that comprises a set of adjective and phrases manually scored by Lexalytics' coders—was customized to identify and evaluate misogyny in the context of *League* (see Appendix 1). Scoring each line, misogynistic and low-scoring comments were then manually analyzed to determine their implications and significance.

This study aimed to understand the perpetrators of sexism and circumstances under which misogyny occurs by comparing the types of comments directed toward male and female players of different skill levels. This research design is similar to Kuznekoff and Rose (2013). My preliminary research and literature review led to the following hypotheses:

H1: Female usernames (e.g. "KatieCandy-Cane83") receive more negative comments than male (e.g. "Jason123") or gender-neutral usernames (e.g. "DTHD079").

H2: Players receive more negative comments when playing as stereotypical female Champions.

8 Volunteers were asked to record their games and submit the recordings for analysis.

# MISOGYNY IN THE ONLINE GAMING COMMUNITY

H3: Lower-level players give and receive negative comments more frequently, because advanced players would focus more on the game than the players.

## Ethical Note

This research—approved by the school’s Internal Ethics Review Board—did not pose ethical concerns to my target community. It is impossible to determine the real-world identities of players through their usernames. Additionally, players’ usernames were anonymized in this report.<sup>9</sup>

## Results

Ethnographic data were collected during January and February 2020, by myself and 14 volunteers. In total, 54 games were recorded, from which 2,435 lines of conversation between 230 players were extracted via OCR.space (see Appendix 2 for python code), analyzed with Lexalytics (see Appendix 3 for an example of sentiment scoring), and plotted in histograms (see Appendix 4).

Among the 54 games:

- 11 were played with female usernames;
- 31 with stereotypical female Champions;
- 19 played at Low level, 21 at Medium, and 14 at High;

- The volunteer’s team won in 17 games and lost in 33 games.<sup>10</sup>

The mean sentiment score (hereinafter “MSS”) for all 2,435 entries was 0.014090 with a standard deviation of 0.371645, indicating a slightly positive gaming environment. The mode was 0, as most entries communicate factual information and contain minimal emotion.

Two-sample T-tests (see Appendix 5) were performed to evaluate the association between the MSSs and the username gender (female or male), Champion gender (female or male), and game outcome (win or lose). A one-way Analysis of Variance (ANOVA) (see Appendix 6) was performed to determine the correlation between the MSSs and the player’s rank.

The probability values (p-values) were computed for all statistical tests in this study. A p-value less than the significance level<sup>11</sup> indicates statistical significance in the result. This study chose 0.1 as the significance level to offset limitations in Lexalytics’ analysis algorithm and sampling bias, as discussed in the Limitations section.

## Correlation #1 – Username Gender and Sentiment Scores

To process this data, the sample was divided into two categories based on username gender. Sample size, MSS, and sample standard deviation were calculated for each. Players with female usernames received

Table 1: Sentiment Score by Username Gender

	Female	Gender-Neutral or Male
Sample Size	317	2118
Mean Sentiment Score (MSS)	-0.011653	0.017943
Sample Standard Deviation	0.359977	0.373290

9 All usernames provided as examples in this report are pseudonyms that communicate the same gender identity as those used or observed in this study, instead of the actual usernames. For example, if the real username was “James987,” this report would anonymize it as “Jake123.”

10 The outcome of four games cannot be determined, as the recordings were cut off. Data from these four games were included to examine Correlation #1, 2, and 3, but not Correlation #4.

11 Significance level ( $\alpha$ ) for social studies research is typically chosen as 0.1, 0.05, or 0.01, depending on factors including sample size, power of the test, and expected losses from Type I and II errors (Starnes et al., 2015). It is chosen before the tests are carried out.

## MISOGYNY IN THE ONLINE GAMING COMMUNITY

more negative comments than players with male or gender-neutral usernames, as evidenced by the statistics in Table 1. A 2-sample T-test indicates statistical significance ( $t=-1.3586$ ,  $p=0.0875$ ) in the difference between the sample MSSs for female and male or gender-neutral usernames. Specifically, since  $p<0.1$ , the significance threshold, the null hypothesis (the MSS among the two groups is equal) was rejected, proving sufficient evidence supports Hypothesis 1: female-username players receive more negative comments.

### Correlation #2 – Champion Gender and Sentiment Scores

The difference in the MSSs shown in Table 2 suggests that gamers playing female Champions received fewer negative comments, contradicting Hypothesis 2, which predicted that players receive more negative comments when playing stereotypical female Champions. This result, however, is not statistically significant ( $t= 0.50020$ ,  $p= 0.61699$ ).

### Correlation #3 – Rank and Sentiment Scores

Table 3 shows a statistical summary of the sentiment scores by rank. The highest-ranking players experienced the lowest level of verbal negativity, supporting Hypothesis 3, predicting that more advanced players give and receive fewer negative comments. Medium-ranking players received the most negative comments, which was not hypothesized. A one-way

ANOVA shows that the differences between ranks, as represented by the MSSs, however, are not statistically significant ( $f=1.20337 \times 10^{(-9)}$ ,  $F=63$ ).

### Correlation #4 – Outcome and Sentiment Scores

According to Table 4, players received more positive comments when their teams won. A 2-sample T-test indicates statistical significance ( $t= 2.13169$ ,  $p= 0.0165765$ ) in the difference between the sample MSSs.

The strong association between sentiment scores and game outcome sheds light on a potential confounding variable for Correlation #1, as the volunteer's team lost the game in six out of the eight female-username games that used the text chat. Female-username players, however, were found to receive more negative comments when their teams won, as illustrated in Table 5. The statistical significance of this result ( $t= -1.67742$ ,  $p= 0.04884$ ) verifies the correlation between username gender and sentiment scores. With female usernames receiving more negative comments when their teams won, this result highlights notable gender disparity as, in general, players tend to receive more positive comments when winning.

### Qualitative Observations

Table 6 suggests that players frequently devalued themselves, refused responsibility for their teams' losses, and expressed frustration when their teammates

Table 2: Sentiment Scores by Champion Gender

	Female	Male
Sample Size	1565	870
Mean Sentiment Score (MSS)	0.016804	0.009209
Sample Standard Deviation	0.387286	0.342322

Table 3: Sentiment Scores by Rank

	Low	Mid	High
Sample Size	854	898	683
Mean Sentiment Score (MSS)	0.009576	0.006402	0.029842
Sample Standard Deviation	0.359369	0.394749	0.355116

Table 4: Sentiment Scores by Game Outcome

	Win	Lose
Sample Size	927	1460
Mean Sentiment Score (MSS)	0.034545	0.001356
Sample Standard Deviation	0.367044	0.376415

Table 5: Sentiment Score by Outcome for Female-Sounding Names

	Win	Lose
Sample Size	57	243
Mean Sentiment Score (MSS)	-0.087752	0.013587
Sample Standard Deviation	0.424859	0.342609

Table 6: Example and Frequency of Observed Phenomena

Trend	Examples	Frequency
Frustration when Teammates Fail to the Team's Expectations	"how can someone be this bad at the strongest role in the game" "zed do u know how to play?" "imagine having 8 kills as talon not being able kill anyone lmfao" "zero mental players"	5 games
Self-Devaluation (self- "flaming")	"im ruining that for the rest of you" "I'm playing terrible" "hopefully the game goes better without me"	4 games
Refuse Responsibility	"that was a glitch" "not my fault"	7 games
Extreme Toxicity (frequent hostile language, insulting teammates, name-calling)	"you are a good player... I hope your parents don't die...hope your dog doesn't die in front of you" "don't bother responding I muted ur disgusting"	6 games
Warn Toxic Gamers	"im gonna report you"	6 games
Encourage Teammates when the Team is Under-Performing	"just try your best, gamer" "stop voting to surrender, we can win"	10 games
Thank Other Players for Their Time	"ggwp" ("good game, well-played")	Almost every game

failed to meet the team's expectations. Players also effectively identified and criticized toxic gamers, cheered on their teammates, and expressed gratitude towards other players regardless of the game's outcome.

In one low-level game, one male-username player who was playing a stereotypical female Champion said, without context, "send noods" (a parody of "send nudes") to the volunteer player, who was playing a stereotypical female Champion with a gender-neutral username. In requesting naked pictures, the offender reduced their teammate's value to their body, leaving their skill and contribution to the team unacknowledged. The volunteer player dismissed the request, saying "yikes"; other teammates perceived it as a joke (one responded with "lol") and moved on to game-related discussions. No other explicitly misogynistic language was observed in this study.

## Discussion

Qualitative analysis and hypothesis testing provided critical information about gender relations in the North American gaming community. By using linguistic sentiment as an indicator of misogyny, this study finds that, in the post-#MeToo world, perceivable sexism persists in online gaming communities.

### Normalized Masculinity

The *League* community perceives heterosexual men as prototypical players, and female gamers actively fulfill this stereotype by selecting masculine usernames and employing male-like language in in-game chats (e.g. "c'mon bro"). These results corroborate previous studies (Brehm, 2013; Easpaig, 2018; Holz Ivory et al., 2014; McLean & Griffiths, 2018; Vermeulen et al., 2017; Wasserman & Rittenour, 2019). Specifically, although women make up 46% of the American gaming population and it is unlikely that all 230 research participants were men, no player's username was explicitly feminine.<sup>12</sup> On the other hand, explicitly masculine usernames such as "Jake123" or "BrandonXYZ" were common. One female volunteer explained that she had chosen a gender-neu-

tral username to avoid sexual attention or harassment from "thirsty people [crushing] on [her] over the Internet and ask[ing] for [her] socials." This is consistent with women throughout history, such as the Bronte sisters and J.K. Rowling, who have sought male or gender-neutral pseudonyms to improve their career prospects and to fit into a male-dominant world, like *League*. Similarly, female *League* players choose male or gender-neutral usernames to seek acceptance in the male-dominant space, reinforcing gender stereotypes and further marginalizing women in the gaming community.

Linguistic analysis of gamers' conversations also found evidence of the normalization of masculinity in gamers' speech patterns. According to American linguist Mary Talbot, women use more "standard" language (proper and formal grammar, vocabulary, and sentence structure), less slang, and communicate more emotions when speaking than men (2010). Psychologists Susan Herring (1994) and Savicki et al. (1996) further argue that, when communicating online, men challenge group members and use argumentative, coarse, and abusive language more often.

Although 46% of video game players are female, all *League* players in this study texted with similar linguistic habits. Qualitatively analyzing their linguistic patterns found that *League* players, regardless of gender, assume men's speech patterns, using direct and provocative language to challenge teammates (e.g. "I dumb you dumb" for "I'm not sure if I'm dumb or you're dumb"), slang (e.g. "smurf," referring to an experienced player creating a new account to be matched with inexperienced players for easy wins), and shorthand to communicate emotions (e.g. "rofl" for "roll on the floor laughing"; "gg" for "good game"). While the fast-paced, competitive nature of *League* requires players to avoid excessive communication to focus on playing, the persistence of these patterns in pre- and post-game chats signifies the normalization of male-leaning linguistic patterns and ingrained sexism in the gaming community.

### Cooperative Gaming

*League* players are cooperative. In this study, 93% of the games communicated strategies and acknowl-

12 A few usernames were changed to female-sounding usernames for this research, prior to participation in the game for this study. For example, a username similar to "Firespark007" was changed to one similar to "KatieCandyCane83." The finding that none of the 230 usernames are feminine does not take into account this change.

edged skillful teammates via text chat. Often, players paired up to attack the same lane based on their Champions' strengths and weaknesses upon discussions in the chat, enhancing the team's overall performance. This cooperation was present regardless of username or Champion, as defeating the enemies—the ultimate objective—requires systematic planning and all team members' cooperation. Gamers cheered on their teammates, even when the team was underperforming. This study also observed a normalized expectation for players to extend friendly gestures to thank their teammates and opponents for their participation by saying “gg” or “ggwp” when games finish.

### Competitive Gaming

*League* players are competitive. Results have shown that players had high expectations for their teammates' skill level and were pressured to contribute to the team and advance to a higher rank. While statistically insignificant, “High Rank” players (MSS=0.0298) were the most positive and tolerant of their teammates' mistakes and “Mid Rank” players (MSS=0.009576) were the least positive and tolerant. These findings agree with Kasumovic and Kuzneff

(2015), who contend that the prospect of losing their “in-game status” upon the entrance of female players or being defeated in games encourages gender-based hostility. Their theory provides a plausible explanation for trends observed in this study: “Mid-Rank” players are the most prone to this “hierarchical reorganization,” and “High Rank” players are the most focused and most confident in their skills, and therefore the least fearful of the consequences of losing.

*League's* competitive nature may explain toxicity in the gaming community. Alfie Kohn (1992), studying human behavior, noted how competition “poisons” relationships and intensifies aggression. This research observed higher levels of negativity in the text chat when the team lost or forfeited (MSS=0.001356), as opposed to when the team won (MSS=0.034545). However, the opposite holds for feminine-username players. Blaming teammates for the team's losses and using excuses like technical difficulties were com-

mon among players of all levels, while self- “flaming” when the player expected their teammates to “flame” them was more prominent among players in lower ranks. Nevertheless, more comprehensive studies are required to explain this gender disparity and verify whether the observed trend was due to sampling bias, as only 11 games were played with female usernames in this study.

### Effectiveness of Existing Policies

This study finds that *League* players are aware of and effectively utilize anti-toxicity measures to forge a more positive gaming environment. Eight of the 14 volunteers opted to filter coarse language. In all six games where a player exhibited extreme toxicity, their teammates asked them to stop and threatened to report their accounts (“report Veigar<sup>13</sup> for toxicity please and ty”). These accusations were mostly direct and lacked explanation, which may be due to the fast-moving nature of the game. Toxic behavior stopped after such warnings in four of the six games, whereas the toxic player reacted defensively (“report me”) and continued using toxic language in the other two. While Kwak et al.'s analysis (2015) of over 10 million player reports found that the reporting feature was rarely used, this study found the threat of reporting to be an effective means of diminishing toxic behaviors. No association was found between extreme toxicity and username gender, Champion gender, rank, or the game outcome.

While online anonymity gives players greater confidence to call out inappropriate behaviors, it may be abused to exacerbate sexism, racism, and hatred in the gaming community. According to feminist Loretta Ross (2019), call-out culture<sup>14</sup> can be toxic, as justified call-outs to challenge ill-intended provocateurs often regress to public shaming, inspire self-indulgence, and discourage genuine discourse. Although these phenomena were not observed in *League*, her suggestion of employing honest conversation rather than “weaponiz[ing] suffering” is nevertheless applicable to the gaming community.

<sup>13</sup> Veigar is the name of a Champion.

<sup>14</sup> A form of public humiliation or shaming often seen on social media that aims to hold individuals and groups accountable for actions perceived to be offensive by others, who then call attention to this behaviour.

## Limitations

This study has a few limitations. First, the experiment design assumes gender to be binary, as non-binary genders are difficult to identify through *League* usernames and Champions. Additionally, sentiment scores assigned by Lexalytics might be biased, as its “sentiment library” was constructed by human coders and myself, and is unable to accommodate for spelling mistakes, sarcasm, or *League*-specific abbreviations.

Furthermore, researcher bias might have occurred in the qualitative analysis of gamers’ conversations, as the sentiment of language was subjectively determined. Volunteers played and communicated differently, which might have affected other players’ behavior. Moreover, the sample size was small (54 games). A greater sample size would provide results that more accurately reflect the gender relations in *League*.

## Conclusion

This study examined the gender relations in the North American gaming community. The quantitative and qualitative evaluation of in-game discourse in *League of Legends* sheds light on the perpetrators of sexism in the post-#MeToo era. Hypothesis 1 was supported; Hypothesis 2 was rejected. Hypothesis 3, predicting that more advanced players give and receive fewer negative comments, was partially supported, as high-ranking players were found to use the most positive language to communicate, whereas mid-ranking players used the least positive language.

In general, *League*’s anti-toxicity policies are effective in promoting a supportive gaming environment, and *League* players have an integral understanding of expected behavior, communicating cooperative strategies and calling out toxicity. While female username players received more negative comments, the gender disparity was less prominent than that found in previous studies conducted pre-#MeToo. This study finds no significant instances of misogyny—the only incident of explicit gender-based harassment was dismissed by the target and perceived as a joke by their teammates. While this result signifies that the post-#MeToo gender equality landscape is generally improving, the difference between the perception and treatment of female versus male gamers highlights

that entrenched gender bias persists, as men continue to be perceived as archetypal gamers and women are marginalized due to their gender.

The many challenges posed by gender-based exclusion and toxicity can be mitigated by creating an environment that supports women in the gaming community. To start, given the hyper-sexualization of female *League* Champions (Bell, 2017), Morawitz highlights the possibility of reversing gender stereotypes by desexualizing female Champions and adding female Champions who are equally strong, if not stronger, than their male counterparts (2007, p. 99). Simultaneously, Riot Games should encourage players to report inappropriate behavior, impose stricter policies to target toxicity, and penalize abusers of the online space. A linguistic analysis program like Lexalytics could be developed specifically to identify offensive language in *League*, and implemented in the in-game chat room to warn toxic players of their inappropriate behavior in real time or block them from the text chat. Riot Games might also consider implementing a toxicity rating for *League* players to promote self-regulation by making the ratings public.

## Further Research

Studies using a similar methodology should attempt to achieve greater control and minimize inter-observer variability by recruiting more volunteers to dilute differences in their playing and communication styles. A larger sample should be collected, and more researchers should participate in content analysis to mitigate sampling and researcher bias. Additionally, a more robust sentiment analysis program needs to be developed to analyze more accurately gamers’ language. Moreover, future studies should explore correlations between verbal toxicity and other factors, such as the players’ win rates and time of the day the game was played. Finally, although a different methodology is required, future studies can explore the age and socioeconomical status of the perpetrators and victims of misogyny.

## References

- About the free OCR API.* (n.d.). Retrieved January 24, 2020, from <https://ocr.space/about>
- Ballard, M. E., & Welch, K. M. (2017). Virtual Warfare: Cyberbullying and Cyber-Victimization in MMOG Play. *Games and Culture, 12*(5), 466–491. <https://doi.org/10.1177/1555412015592473>
- Bègue, L., Sarda, E., Gentile, D. A., Bry, C., & Roché, S. (2017). Video Games Exposure and Sexism in a Representative Sample of Adolescents. *Frontiers in Psychology, 8*. <https://doi.org/10.3389/fpsyg.2017.00466>
- Bell, C. E. (2017). Sexualization and Gamer Avatar Selection in *League of Legends*. *Atlantic Journal of Communication, 25*(2), 65–87. <https://doi.org/10.1080/15456870.2017.1286342>
- Brehm, A. L. (2013). Navigating the feminine in massively multiplayer online games: Gender in World of Warcraft. *Frontiers in Psychology, 4*. <https://doi.org/10.3389/fpsyg.2013.00903>
- Bryce, J., & Rutter, J. (2003). The Gendering of Computer Gaming: Experience and Space. *Leisure Cultures: Investigations in Sport, Media and Technology, 3–22*.
- Carvalho, L. P., & Cappelli, C. (2018). *Sexism and League of Legends: NFR aesthetic analyses* (pp. 38–45). Universidade Federal do Estado do Rio de Janeiro. <http://portaldeconteudo.sbc.org.br/index.php/ersi-rj/article/view/4653>
- Cassell, J., & Jenkins, H. (1998). Chess For Girls?: Feminism and Computer Games. In *From Barbie to Mortal Kombat: Gender and Computer Games* (pp. 2–45). MIT Press.
- Chatzakou, D., Kourtellis, N., Blackburn, J., De Cristofaro, E., Stringhini, G., & Vakali, A. (2017). Measuring #GamerGate: A Tale of Hate, Sexism, and Bullying. *ArXiv:1702.07784 [Cs]*. <http://arxiv.org/abs/1702.07784>
- Chee, F. (2015). Online Games and Digital Ethnography. In *International Encyclopedia of Digital Communication and Society*. Wiley-Blackwell. [https://www.researchgate.net/publication/281650780\\_Online\\_Games\\_and\\_Digital\\_Ethnography](https://www.researchgate.net/publication/281650780_Online_Games_and_Digital_Ethnography)
- Cobb, S., & Horeck, T. (2018). Post Weinstein: Gendered power and harassment in the media industries. *Feminist Media Studies, 18*(3), 489–491. <https://doi.org/10.1080/14680777.2018.1456155>
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed). SAGE Publications.
- Dietz, T. L. (1998). An Examination of Violence and Gender Role Portrayals in Video Games: Implications for Gender Socialization and Aggressive Behavior. *Sex Roles, 42*5–442.
- Easpig, B. N. G. (2018). An Exploratory Study of Sexism in Online Gaming Communities: Mapping Contested Digital Terrain. *Community Psychology in Global Perspective, 119–135*.
- Entertainment Software Association. (2019). *2019 Essential Facts About the Computer and Video Game Industry*. Entertainment Software Association. [https://www.theesa.com/wp-content/uploads/2019/05/ESA\\_Essential\\_facts\\_2019\\_final.pdf](https://www.theesa.com/wp-content/uploads/2019/05/ESA_Essential_facts_2019_final.pdf)
- Fedi, A., & Rollero, C. (2016). If Stigmatized, Self-Esteem Is not Enough: Effects of Sexism, Self-Esteem and Social Identity on Leadership Aspiration. *Europe's Journal of Psychology, 12*(4), 533–549. <https://doi.org/10.5964/ejop.v12i4.984>
- Fox, J., Cruz, C., & Lee, J. Y. (2015). Perpetuating online sexism offline: Anonymity, interactivity, and the effects of sexist hashtags on social media. *Computers in Human Behavior, 52*, 436–442. <https://doi.org/10.1016/j.chb.2015.06.024>
- Fox, J., & Tang, W. Y. (2014). Sexism in online video games: The role of conformity to masculine norms and social dominance orientation. *Computers in Human Behavior, 33*, 314–320. <https://doi.org/10.1016/j.chb.2013.07.014>
- Gray, K. L. (2012). Intersection Oppressions and Online Communities: Examining the Experiences of Women of Color in Xbox Live. *Information, Communication & Society, 15*(3), 411–428. <https://doi.org/10.1080/1369118X.2011.642401>
- Hammersley, M., & Atkinson, P. (2007). *Ethnography: Principles in Practice*. The Cromwell Press.
- Herring, S. (1994). *Gender Differences in Computer-Mediated Communication: Bringing Familiar Baggage to the New Frontier*. American Library Association Annual Convention, Miami. <http://cpsr.org/issues/womenintech/herring2/>
- Holz Ivory, A., Fox, J., Franklin Waddell, T., & Ivory, J. D. (2014). Sex Role Stereotyping is Hard to Kill: A Field Experiment Measuring Social Responses to User Characteristics and Behavior in an Online Multiplayer First-Person Shooter Game. *Computers in Human Behavior, 35*, 148–156. <https://doi.org/10.1016/j.chb.2014.02.026>
- Isabella, S. (2007). Ethnography of Online Role-Playing Games: The Role of Virtual and Real Contest in the Construction of the Field. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 8*(3). <https://doi.org/10.17169/fqs-8.3.280>

## MISOGYNY IN THE ONLINE GAMING COMMUNITY

- Ivory, J. D. (2006). Still a Man's Game: Gender Representation in Online Reviews of Video Games. *Mass Communication and Society*, 9(1), 103–114. [https://doi.org/10.1207/s15327825mcs0901\\_6](https://doi.org/10.1207/s15327825mcs0901_6)
- Jarunratanakul, P., & Jinchang, K. (2018). Does Sexism Affect Thai Women's Psychological and Behavioural Responses? The Stereotype Threat-Buffering Effect of Mindfulness. *Journal of Pacific Rim Psychology*, 12. <https://doi.org/10.1017/prp.2018.10>
- Jenson, J., & de Castell, S. (2018). "The Entrepreneurial Gamer": Regendering the Order of Play. *Games and Culture*, 13(7), 728–746. <https://doi.org/10.1177/1555412018755913>
- Karsay, K., Knoll, J., & Matthes, J. (2018). Sexualizing Media Use and Self-Objectification: A Meta-Analysis. *Psychology of Women Quarterly*, 42(1), 9–28. <https://doi.org/10.1177/0361684317743019>
- Kasumovic, M. M., & Kuznekoff, J. H. (2015). Insights into Sexism: Male Status and Performance Moderates Female-Directed Hostile and Amicable Behaviour. *PLOS ONE*, 10(7), e0131613. <https://doi.org/10.1371/journal.pone.0131613>
- Kaye, L. K., & Pennington, C. R. (2016). "Girls can't play": The effects of stereotype threat on females' gaming performance. *Computers in Human Behavior*, 59, 202–209. <https://doi.org/10.1016/j.chb.2016.02.020>
- Kessler, E. (2013). Social Media and the Movement of Ideas. *European Judaism*, 26–36.
- Kohn, A. (1992). *No Contest: The Case Against Competition*. Houghton Mifflin.
- Kondrat, X. (2015). Gender and Video Games: How is Female Gender Generally Represented in Various Genres of Video Games? *Journal of Comparative Research in Anthropology and Sociology*, 6(1), 171–193.
- Kuchynka, S. L., Salomon, K., Bosson, J. K., El-Hout, M., Kiebel, E., Cooperman, C., & Toomey, R. (2018). Hostile and Benevolent Sexism and College Women's STEM Outcomes. *Psychology of Women Quarterly*, 42(1), 72–87. <https://doi.org/10.1177/0361684317741889>
- Kuznekoff, J. H., & Rose, L. M. (2013). Communication in multiplayer gaming: Examining player responses to gender cues. *New Media & Society*, 15(4), 541–556. <https://doi.org/10.1177/1461444812458271>
- Kwak, H., Blackburn, J., & Han, S. (2015, April). *Exploring Cyberbullying and Other Toxic Behavior in Team Competition Online Games*. [https://www.researchgate.net/publication/274730016\\_Exploring\\_Cyberbullying\\_and\\_Other\\_Toxic\\_Behavior\\_in\\_Team\\_Competition\\_Online\\_Games](https://www.researchgate.net/publication/274730016_Exploring_Cyberbullying_and_Other_Toxic_Behavior_in_Team_Competition_Online_Games)
- Lexalytics Sentiment Analysis Whitepaper*. (n.d.). Lexalytics, Inc. [https://www.lexalytics.com/resources/Lexalytics\\_Sentiment\\_Analysis\\_Whitepaper.pdf](https://www.lexalytics.com/resources/Lexalytics_Sentiment_Analysis_Whitepaper.pdf)
- Maass, A., Cadinu, M., Guarnieri, G., & Grasselli, A. (2003). Sexual Harassment Under Social Identity Threat: The Computer Harassment Paradigm. *Journal of Personality and Social Psychology*, 85, 853–870. <https://doi.org/10.1037/0022-3514.85.5.853>
- McGonigal, J. (2010). *Gaming can make a better world*. [https://www.ted.com/talks/jane\\_mcgonigal\\_gaming\\_can\\_make\\_a\\_better\\_world](https://www.ted.com/talks/jane_mcgonigal_gaming_can_make_a_better_world)
- McLean, L., & Griffiths, M. D. (2018). Female Gamers' Experience of Online Harassment and Social Support in Online Gaming: A Qualitative Study. *International Journal of Mental Health and Addiction*, 17(4), 970–994. <https://doi.org/10.1007/s11469-018-9962-0>
- Menegatti, M., & Rubini, M. (2017). Gender Bias and Sexism in Language: Oxford Research Encyclopedia of Communication. *Oxford Research Encyclopedia of Communication*. <https://dx.doi.org/10.1093/acrefore/9780190228613.013.470>
- Morawitz, E. (2007). *Effects of the Sexualization of Female Characters in Video Games on Gender Stereotyping, Body Esteem, Self-Objectification, Self-Esteem, and Self-Efficacy*. The University of Arizona.
- Morgan, R., & Oudekerk, B. (2019). *Criminal Victimization, 2018*. <https://www.bjs.gov/index.cfm?ty=pbdetail&iid=6686>
- Murnion, S., Buchanan, W. J., Smales, A., & Russell, G. (2018). Machine learning and semantic analysis of in-game chat for cyberbullying. *Computers & Security*, 76, 197–213. <https://doi.org/10.1016/j.cose.2018.02.016>
- Ogletree, S. M., & Drake, R. (2007). College Students' Video Game Participation and Perceptions: Gender Differences and Implications. *Sex Roles*, 56(7–8), 537–542. <https://doi.org/10.1007/s11199-007-9193-5>
- Pannucci, C. J., & Wilkins, E. G. (2010). Identifying and Avoiding Bias in Research. *Plastic and Reconstructive Surgery*, 126(2), 619–625. <https://doi.org/10.1097/PRS.0b013e3181de24bc>
- Rank distribution*. (2019, November 23). <https://www.leagueofgraphs.com/rankings/rank-distribution/na>
- Ratan, R. A., Taylor, N., Hogan, J., Kennedy, T., & Williams, D. (2015). Stand by Your Man: An Examination of Gender Disparity in *League of Legends*. *Games and Culture*, 10(5), 438–462. <https://doi.org/10.1177/1555412014567228>
- Ross, L. (2019, August 17). Opinion | I'm a Black Feminist. I Think Call-Out Culture Is Toxic. *The New York Times*. <https://www.nytimes.com/2019/08/17/opinion/sunday/cancel-culture-call-out.html>

- Rotenber, C., & Cotter, A. (2018, November 8). *Police-reported sexual assaults in Canada before and after #MeToo, 2016 and 2017*. <https://www150.statcan.gc.ca/n1/pub/85-002-x/2018001/article/54979-eng.htm>
- Ruvalcaba, O., Shulze, J., Kim, A., Berzenski, S. R., & Otten, M. P. (2018). Women's Experiences in eSports: Gendered Differences in Peer and Spectator Feedback During Competitive Video Game Play. *Journal of Sport and Social Issues, 42*(4), 295–311. <https://doi.org/10.1177/0193723518773287>
- Savicki, V., Lingenfelter, D., & Kelley, M. (1996). Gender Language Style and Group Composition in Internet Discussion Groups. *Journal of Computer-Mediated Communication, 2*(3). <https://doi.org/10.1111/j.1083-6101.1996.tb00191.x>
- Shaw, A. (2010). *Identity, Identification, and Media Representation in Video Game Play: An audience reception study*. 353.
- Starnes, D., Tabor, J., Yates, D., & Moore, D. (2015). *The Practice of Statistics*. W. H. Freeman and Company.
- Strangelove, M. (2007). *Virtual Video Ethnography: Towards a New Field of Internet Cultural Studies*. [https://www.academia.edu/11241544/Virtual\\_Video\\_Ethnography\\_Towards\\_a\\_New\\_Field\\_of\\_Internet\\_Cultural\\_Studies](https://www.academia.edu/11241544/Virtual_Video_Ethnography_Towards_a_New_Field_of_Internet_Cultural_Studies)
- Suler, J. (2004). The Online Disinhibition Effect. *CyberPsychology & Behavior, 7*(3), 321–326. <https://doi.org/10.1089/1094931041291295>
- Summoner's Code—League of Legends*. (2017). <http://euw.leagueoflegends.com/en/featured/summoners-code>
- Talbot, M. (2010). *Language and Gender*. Polity Press.
- Taylor, E. (2007). Dating-Simulation Games: Leisure and Gaming of Japanese Youth Culture. *Southeast Review of Asian Studies, 192*–208.
- Taylor, N., Jenson, J., & Castell, S. de. (2009). Cheerleaders/ Booth Babes/ Halo Hoes: Pro-Gaming, Gender and Jobs for the Boys. *Digital Creativity, 20*(4), 239–252. <https://doi.org/10.1080/14626260903290323>
- Thompson, J. J., Leung, B. H., Blair, M. R., & Taboada, M. (2017). Sentiment analysis of player chat messaging in the video game StarCraft 2: Extending a lexicon-based model. *Knowledge-Based Systems, 137*, 149–162. <https://doi.org/10.1016/j.knsys.2017.09.022>
- Tippett, E. (2018, February 1). Adapting to the New Risk Landscape. *Harvard Business Review*. <https://hbr.org/2018/02/adapting-to-the-new-risk-landscape>
- Trepte, S., Reinecke, L., & Behr, K.-M. (2009). Creating Virtual Alter Egos or Superheroines? Gamers' Strategies of Avatar Creation in Terms of Gender and Sex. *International Journal of Gaming and Computer-Mediated Simulations, 1*, 52–76. <https://doi.org/10.4018/jgcms.2009040104>
- Vandenbosch, L., Driesmans, K., Trekels, J., & Eggermont, S. (2017). Sexualized Video Game Avatars and Self-Objectification in Adolescents: The Role of Gender Congruency and Activation Frequency. *Media Psychology, 20*(2), 221–239. <https://doi.org/10.1080/15213269.2016.1142380>
- Vermeulen, L., Núñez Castellar, E., & Van Looy, J. (2014). Challenging the Other: Exploring the Role of Opponent Gender in Digital Game Competition for Female Players. *Cyberpsychology, Behavior and Social Networking, 17*(5), 303–309. <https://doi.org/10.1089/cyber.2013.0331>
- Vermeulen, L., Van Bauwel, S., & Van Looy, J. (2017). Tracing Female Gamer Identity. An Empirical Study into Gender and Stereotype Threat Perceptions. *Computers in Human Behavior, 71*, 90–98. <https://doi.org/10.1016/j.chb.2017.01.054>
- Wasserman, J. A., & Rittenour, C. E. (2019). Who wants to play? Cueing perceived sex-based stereotypes of games. *Computers in Human Behavior, 91*, 252–262. <https://doi.org/10.1016/j.chb.2018.09.003>
- Williams, J., & Lebsack, S. (2018, January 25). Now What? *Harvard Business Review*. <https://hbr.org/2018/01/now-what>

## Appendices

### Appendix 1

Name	Weight
grill	-0.45
boobs	-0.5
bitch	-1
whore	-1.2
honey	-0.3
babe	-0.3
(woman OR women) NEAR ((no right) OR (no rights))	-0.6
go back to support	-0.9
slutty OR slut OR thicc <sup>1</sup>	-1
(honey OR babe OR bitch OR girl) NEAR (single OR hot OR cute)	-0.7
(honey OR babe OR bitch OR girl) NEAR (fat OR ugly OR carried OR cute OR boyfriend OR suck)	-0.7
gj <sup>2</sup>	1
boomer	-0.2
wtf	-1
fkin OR fk OR fuck OR fucking	-1
bs	-1
op	1
glhf <sup>3</sup>	1
ez	0.4
stfu	-0.8
gg OR ggwp <sup>4</sup>	1

1 An internet slang for used to describe a woman with a body that is voluptuous and curvy.

2 Short for “good job”

3 Short for “good luck, have fun.”

4 Short for “good game, well played.”

## Appendix 2: Python Code Optical Character Recognition

# read image OCR module

```
import requests,os
def ocr_space_file(filename, overlay=False, api_key='05ff7903c388957', language='eng'):
    """ OCR.space API request with local file.
        Python3.5 - not tested on 2.7
    :param filename: Your file path & name.
    :param overlay: Is OCR.space overlay required in your response.
        Defaults to False.
    :param api_key: OCR.space API key.
        Defaults to 'helloworld'.
    :param language: Language code to be used in OCR.
        List of available language codes can be found on https://ocr.space/OCRAPI
        Defaults to 'en'.
    :return: Result in JSON format.
    """
```

```
payload = {'isOverlayRequired': overlay,
           'apikey': api_key,
           'language': language,
           'detectOrientation': True,
           'OCREngine':2
          }
with open(filename, 'rb') as f:
    r = requests.post("https://api.ocr.space/parse/image",
                     files={filename: f},
                     data=payload,
                     )
return r.content.decode()
```

# TextOutputParse module used in Step 3

```
def addNew(locStr,iReadThisList):
    # check whether the 2 list has i overlaps is true
    # list 1 is the old list, list 2 is the read readings
    def checkIOverlap(i, list1, list2):
        len1=len(list1)
        j=0
        while j<i:
            # print(list1[len1-i+j].replace("\n",""))
            # print(list2[j])
            if (list1[len1-i+j-1].replace("\n",""))!=list2[j]:
                return False
            j=j+1
        return True
    # determine how many elements overlap
    def compare(newList, oldList):
        for i in range (1,min(len(newList), len(oldList))+1):
            if checkIOverlap(i, oldList, newList):
                return i
        return 0
```

## MISOGYNY IN THE ONLINE GAMING COMMUNITY

```
# append the non-overlapping part to file
def writeToFile(previousList, newReading):
    overlap=compare(newReading,previousList)
    # number of entries that overlap
    print(overlap)
    for i in range (overlap,len(newReading)):
        existing.write(newReading[i].replace("","")+ "\n")
myFile=open(str(locStr),"r",encoding="utf-8")
lines = myFile.readlines()
myFile.close()
existing=open(locStr,"a+",encoding="utf-8")
# what is already in the file
print(lines)
writeToFile(lines,iReadThisList)
existing.close()

# Step 1: write all names of pic files
def tFramesTotal(directoryPrefix, t,imageListFile):
    file = open (str(imageListFile),"w")
    if t<100:
        for i in range (1,10):
            file.write(directoryPrefix + " 0"+str(i)+ ".jpg" + "\n")
        for i in range (10,t+1):
            file.write(directoryPrefix + " "+str(i)+ ".jpg" + "\n")
    else:
        for i in range (1,10):
            file.write(directoryPrefix + " 00"+str(i)+ ".jpg" + "\n")
        for i in range (10,100):
            file.write(directoryPrefix + " 0"+str(i)+ ".jpg" + "\n")
        for i in range (100, t+1):
            file.write(directoryPrefix + " "+str(i)+ ".jpg" + "\n")
    file.close()

subfolder= input("hi, what is the subfolder name (directoryPrefix)")
frameNum=int(input("how many frames?"))
imageListFile=input("PlayerName-game number?")
tFramesTotal(subfolder,frameNum,imageListFile)

# Step 2: create aggregate text file for lines
AggFileName=input("how would you like to name your aggregate file?")
AggFile = open (str(AggFileName), "w", encoding="utf-8")

# Step 3: Read each line in the file created in Step 1 and run it through OCR
imageFileNames_in_a_List = open (str(imageListFile),"r",encoding="utf-8").readlines()
print(imageFileNames_in_a_List)
for i in range (0,len(imageFileNames_in_a_List)):

    newLineLoc = imageFileNames_in_a_List[i].find("\n")
    imageFileNames_in_a_List[i]=imageFileNames_in_a_List[i][:newLineLoc]
    read_image=""
    if os.path.exists(imageFileNames_in_a_List[i]):
        print(i)
```

```
        read_image = ocr_space_file(filename=str(imageFileNames_in_a_List[i])) # read the image
        # parse out each line
        result = read_image.find("ParsedText:")
        read_image = read_image[result + 14:]
        result = read_image.find("ErrorMessage")
        read_image = read_image[result]
        newList=read_image.split("\n")
        myLocStr = "C:\Users\2020057\OneDrive - Appleby College\2019-2020 APPLEBY\S_Capstone\Programming\ + AggFileName
        addNew(str(myLocStr),newList)

AggFile.close()
```

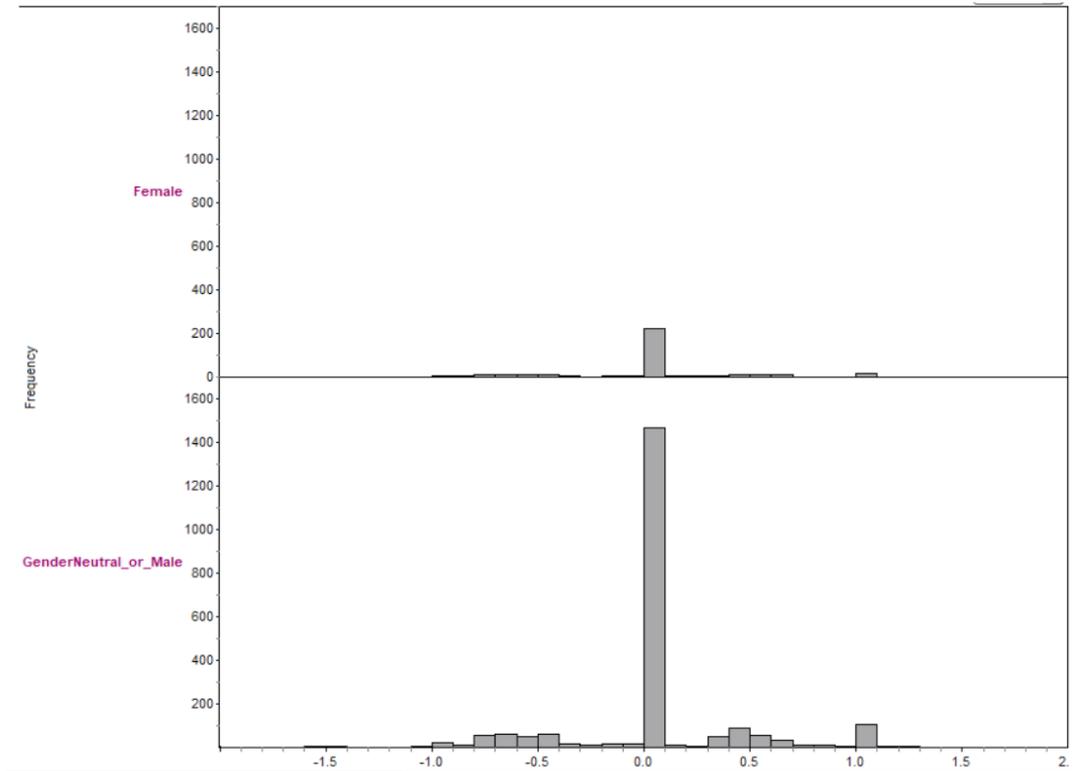
## Appendix 3: Sample Raw Data and Sentiment Score Evaluation

Note: Players' usernames were anonymized.

Entries	Sentiment Score
Player A: Good luck everyone! At\ Hope your morning day evening or night is going well so far and if not i hope it gets better soon	0.5325
Player B: out of range	0
Player C: dont understand why do we havea yummi who deosnt heal	-0.04
Player D: good nett	0.5
Player B: didnt expect that	0
Player E: was oom	0
Player E: didnt have ult	0
Player B: expected that tho	0
Player C: ?	0
Player C: caIt	0
Player C: what u doing	-0.58
Player E: didnt expect renger: to lose	0
Player E: what	0
Player E: wtf	-1
Player E: time for us to throw lol	0
Player C: cant we group?	0
Player D: sure	
Player E: group for once	
Player C: gg	1
Player A: ez	0.4
Player D: gg	1
Player C: ez your mom	-0.09

## Appendix 4: Histograms for Sentiment Score Distribution

Figure 1: Sentiment Score by Username Gender



# MISOGYNY IN THE ONLINE GAMING COMMUNITY

Figure 2: Sentiment Score by Champion Gender

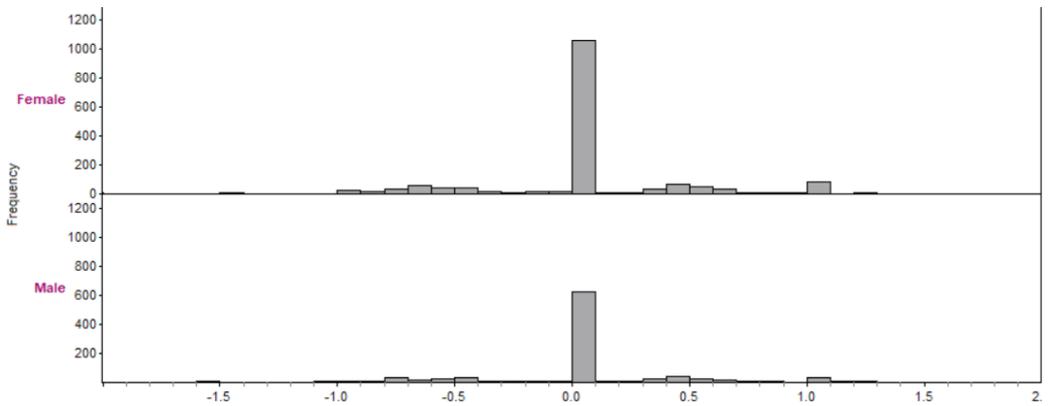
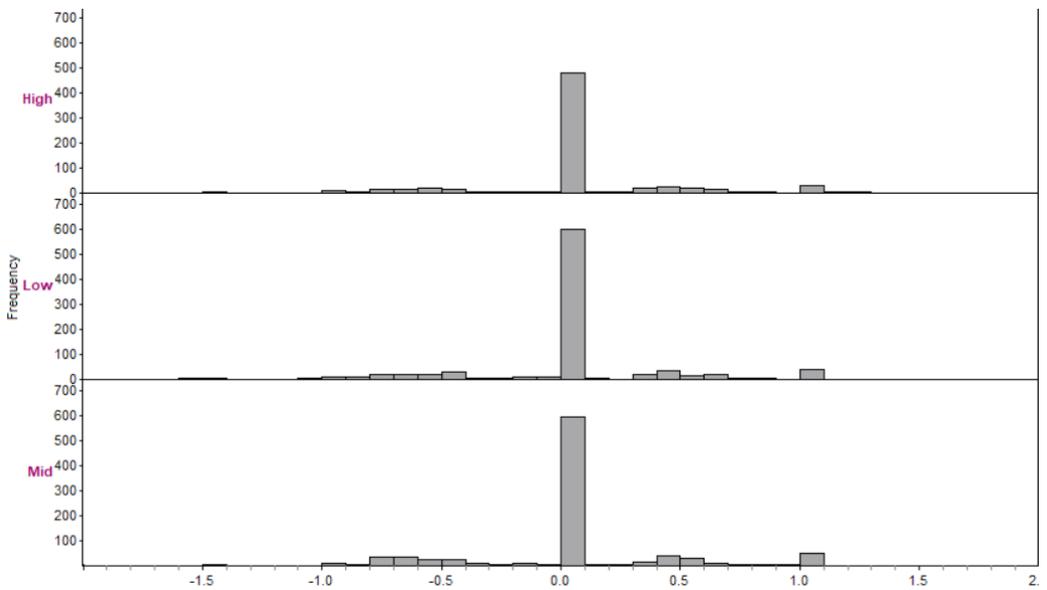


Figure 3: Sentiment Score by Rank



# MISOGYNY IN THE ONLINE GAMING COMMUNITY

Figure 4: Sentiment Score by Outcome

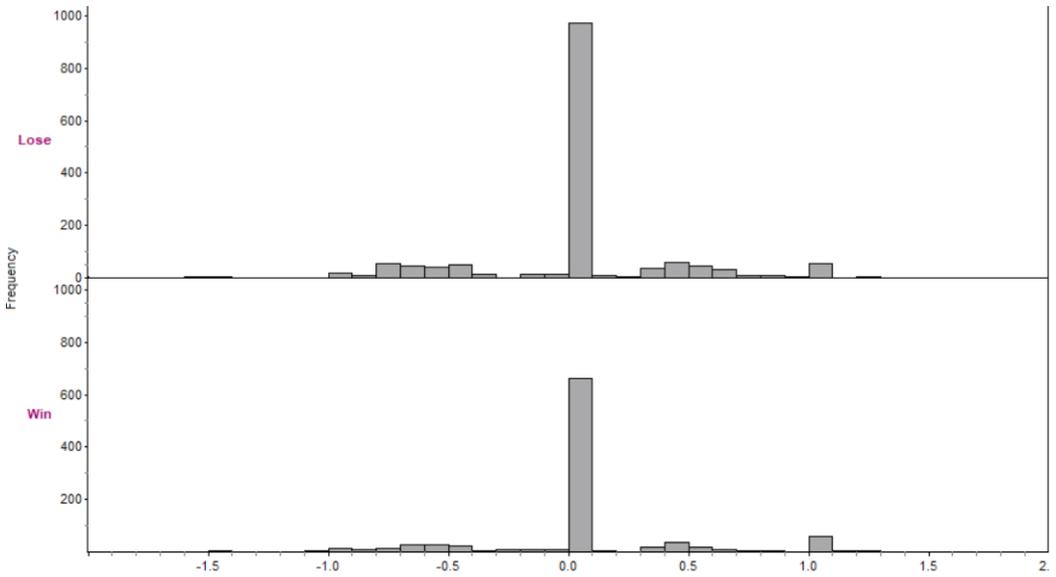
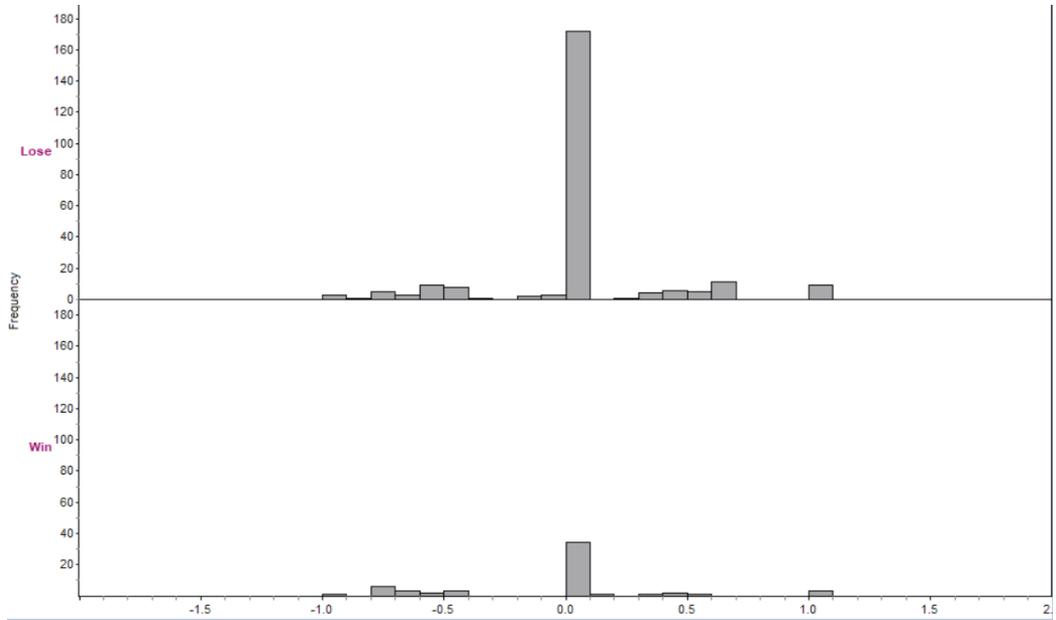


Figure 5: Sentiment Score by Outcome (Female Username Only)



## Appendix 5: Mathematical Explanation of the 2-Sample T-Test

A T-test uses the test statistic,  $t$ , to assess whether the difference between the means of two numerical samples occurred by chance (Starnes et al., 2015).

### Sample 2-Sample T-Test for Correlation 1

Let  $\mu_1$  denote the population mean of the sentiment scores collected from female-sounding username games,  $x_1$  denote the sample mean, and  $n_1$  the sample size of data collected in this strata.

Let  $\mu_2$  denote the population mean of the sentiment scores collected from male-sounding or gender-neutral username games,  $x_2$  denote the sample mean, and  $n_2$  the sample size of data collected in this strata.

$$x_1 = -0.01165347, \quad s_1 = 0.359976992, \quad n_1 = 317$$

$$x_2 = 0.017943041, \quad s_2 = 0.373289555, \quad n_2 = 2118$$

$H_0 : \mu_1 - \mu_2 = 0$ . There is no different in the means of sentiment scores of conversations collected from both groups.

$H_1 : \mu_1 < \mu_2$ . The mean sentiment scores of conversations collected from female-sounding username games is less than the mean sentiment scores of conversations collected from male-sounding and gender-neutral username games.

We choose  $\alpha = 10\%$ , and compute the degree of freedom, standard error, and  $t$  value with the two samples.

$$\begin{aligned} df &= \frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{1}{n_1 - 1} \left(\frac{s_1^2}{n_1}\right)^2 + \frac{1}{n_2 - 1} \left(\frac{s_2^2}{n_2}\right)^2} \\ &= \frac{\left(\frac{0.359976992^2}{317} + \frac{0.373289555^2}{2118}\right)^2}{\frac{1}{317 - 1} \left(\frac{0.359976992^2}{317}\right)^2 + \frac{1}{2118 - 1} \left(\frac{0.373289555^2}{2118}\right)^2} \\ &= 424.2617 \end{aligned}$$

$$\begin{aligned}
SE(x_1 - x_2) &= \sqrt{VAR(X_1 - X_2)} \\
&= \sqrt{VAR(X_1) + VAR(X_2)} \\
&= \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} \\
&= \sqrt{\frac{0.359976992^2}{317} + \frac{0.373289555^2}{2118}} \\
&= 0.0217846605
\end{aligned}$$

$$\begin{aligned}
t &= \frac{x_1 - x_2}{SE} \\
&= \frac{-0.01165347 - 0.017943041}{0.0217846605} \\
&= -1.3585941
\end{aligned}$$

$$\implies p = P(H_1 | H_0) = 0.087499.$$

Therefore, in this instance,  $H_0$  is rejected in favour of  $H_1$ . There is sufficient evidence to suggest that the mean of sentiment scores in games where the volunteer's username is female-sounding is less than the mean of sentiment scores in games where the volunteer's username is not because our p-value (0.087499) is greater than  $\alpha$ . This result is statistically significant.

## Appendix 6: Mathematical Explanation of F-Statistic and P-Value

ANOVA uses the test statistic,  $f$ , to assess the statistical different among the means of two or more groups (Starnes et al., 2015). The f-statistic for one-way ANOVA is determined as follows,

$$f = \frac{\text{between-groups variance}}{\text{within-group variance}}$$

The between-groups variance is determined by

$$\sum_{i=1}^k n_i \frac{(\bar{Y}_i - \bar{Y})^2}{k-1}$$

where  $\bar{Y}_i$  stands for the sample mean in the  $i$ th group,  $n_i$  the number of observations in the  $i$ th group,  $\bar{Y}$  the overall mean of the data, and  $k$  the number of groups.

Within-group variance is determined by

$$\sum_{i=1}^k \sum_{j=1}^{n_i} \frac{(Y_{ij} - \bar{Y}_i)^2}{N-k}$$

where  $Y_{ij}$  is the  $j$ th observation in the  $i$ th group and  $N$  is the overall sample size. This F-statistic follows the f-distribution with degrees of freedom  $d_1 = k - 1$  and  $d_2 = N - k$  under the null hypothesis, which maintains that the mean is the same for all experimental groups in different categories.

If the f-value calculated from the sample was greater than the critical F-value at the selected critical level (10%, 5%, or 1%), then the null hypothesis can be rejected, and the categorical differences are statistically significant.