Gender, Gaming Motives, and Genre: Comparing Singaporean, German, and American Players

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Abstract—This study examines gender and country differences with respect to a range of gaming motivations (e.g., social, performance, habit) and game genre choices (e.g., action, sports, casual). Surveys were conducted with 634 university students from Singapore, Germany, and the United States. Overall, the findings suggest that many game motivations and genre choices differed by player gender, country, and the interaction between gender and country in some cases. Further, game motivations and genre choices were related to each other, though sometimes in a negative direction. Finally, differences in gaming motivations, genre choices, and gender, but not the country of residence, were all found to relate to differences in future intention to play. Although these topics have been studied in isolation in previous research, the present study contributes unique insights about the intersections of gender, cultural background, gaming motivations, and genre choices.

Index Terms—Cultural differences, game genre, gaming motivations, gender and gaming, quantitative survey.

I. INTRODUCTION

A NOT OBVIOUS goal for game publishers is to appeal to as many players as possible, regardless of gender or cultural background. Data from the United States suggest that nearly half of video game players are women [1], but research also finds that certain play motivations and game genres are sharply divided by gender [2]–[6], though not always following traditional gender stereotypes [7]. Some argue that such divisions are based on inherent biological characteristics associated with sex, such as spatial rotation ability [8], [9], despite evidence that differences in gaming ability appear to diminish if women and men are given the same amount of time to play [10]–[13]. In line with these latter studies, we suggest that observed gender differences in gaming motivations and genre choices result from the larger cultural context within which gendered play emerges [14]–[17]. Although there are many cultural-comparison studies of game-related topics, such as gender, motivation, or genre, [18]–[24], no cross-cultural studies of which we are aware have examined differences in gender, motivation, and genre in unison. The present study seeks to unify the literature and develop a more complex theoretical understanding of the intersection between these facets of gaming while also offering practical implications to inform game-design-targeted toward specific groups or markets.

This exploratory study examines the differences between men and women in three countries—Singapore, Germany, and the United States—with respect to a range of gaming motivations (e.g., social, performance, habit) and game genre choices (e.g., action, sports, casual). Results suggest that a player’s gender and country of residence—and in some cases the interaction between the two—are, indeed, associated with differences in gameplay motivations and genre choices, but not for all motivations/genre choices in the same way. We interpret these patterns using the lens of Hofstede’s widely researched dimensions of culture (e.g., individualism versus collectivism, masculinity versus femininity) [25] and an understanding of gender differences and stereotypes in the context of video gaming. Our findings offer insights that add to the literature on personal and cultural differences in the use of video game and its underlying motivations. Our findings also have practical implications, such that game publishers can use them to help design games that appeal to more targeted and/or broader audiences of potential future players.

A. National-Level Cultural Differences

As Carlson and Corliss [26] contend, decisions during video game production and distribution are often entangled with tensions between location and globalization. To meet market needs, designers and distributors must have a good understanding of how cultural differences, as bounded by national borders and regulations, influence players and gameplay choices [27]. Past cross-cultural research on game motivations has largely focused on scale validation [21], [28], [29]. Very few have examined both the effects of gender and cultural background on gaming-related behaviors. One study found that offline gender dynamics in a given country do not consistently correspond to gender differences in online play or performance [22]. In another study [23], both cultural competency and gender were found to affect players’ genre choices and motivations, with native-language speakers and women more likely to play...
text-heavy massively multiplayer online role-playing games (MMORPGs) and to be motivated by fantasy, immersion, and social factors, while non-native speakers and men were more likely to play multiplayer online battle arena (MOBA) and first-person shooter (FPS) games and to be motivated by competition. It is unclear from such work, however, to what extent country and gender affect players’ motivations and/or genre choices, or in what combination.

B. Gaming Motivation and Gender

Past research has found gender differences regarding gaming motivations. One study showed that masculinity was positively associated with challenge and competition, while femininity was not found to be linked with any gaming motivations [30]. Another study suggested that male players were more motivated by achievement and women players by social factors [31], while yet another found women players were more likely to be motivated by escapism, immersion, and relationships, while men were likely motivated by achievement or manipulation [32]. Elsewhere, male players have been found to score higher on most gaming motivations than female players, suggesting that other factors such as the amount of play time should be considered when examining gender differences [4], [33], [34]. Further and in contrast to some of the more stereotypically aligned findings, a more recent study of over 1000 players of social-network games and MMORPGs found that women scored higher than men in achievement motivations, with no gender differences found for social motivation [7]. Together, these somewhat inconsistent findings suggest that gendered patterns of gaming motivations may result from cultural factors related to the context in which the gaming occurs, highlighting the need for cross-cultural comparative research. We, therefore, ask: (RQ1) How do players’ gender and country of residence relate to gaming motivations?

C. Game Genre and Gender

The links among game genres, player characteristics, and gaming preferences have been key research interests for both academic and industry actors. In one study, masculinity was slightly negatively related to the use of role-playing games (RPGs) and femininity was negatively related to the use of action-oriented games [30]. Another study with children and teens found that male players preferred physically oriented games (e.g., action, racing) and female players preferred traditional games (puzzle, board games) [4]. Yet another study with middle school students found that male teens preferred to play active and strategic games and female teens preferred to play creative and explorative games [35]. In contrast, another study concluded that male high school students preferred to play racing, sports, and FPS games, and female students preferred to play action/adventure, puzzle, card, and board games [36]. Although across these studies there do seem to be some common patterns—most of which align with traditional gender stereotypes (e.g., masculinity and sports games)—there are notable counter examples (e.g., female players of action games). Further, there is a lack of knowledge about the relationships among gender, cultural background, and game genre choices, especially across North America, Europe, and Asia. Our second research question is, therefore: (RQ2) How do player gender and country of residence relate to game genre choices?

D. Gaming Motivation and Genre Choice

A few studies have looked at how gaming motivations and genre choice relate to each other. MMORPG players tend to have low achievement but high immersion motivations, while FPS players have relatively high levels of achievement motivation [37]. One study developed a nine-factor measure of individual motivations and preferences for video game use and examined associations with game title choices [38]. This study found differences in play motivations between genres and also within the genre (e.g., RPG players are motivated by story, while free-form RPGs players score higher on autonomy than carefully scripted RPGs players). However, these studies were done in single countries. The current study collects data from three different countries in distinct regions to answer the question: (RQ3) How do gaming motivations relate to game genre choices, controlling for player gender and country?

E. Future Intention to Play

One of the key concerns of the gaming industry is to predict game players’ future intention to purchase and play particular (genres of) games. In the United States, attitudes toward play, enjoyment, and the expectations of significant others were found to predict intention to play online games [39]. In Thailand, enjoyment value, monetary value, and promotion programs were found to predict future purchase intention of online game prepayment cards [40], while in Brazil, challenge, diversion, fun, fantasy, and social interaction were found to influence intention to play and pay for games [41]. Evidently, current research still lacks a nuanced understanding of the interplay among gender, country, motivation, genre choice, and players’ future intention to play. Therefore, our final question is: (RQ4) To what extent do players’ gender and country of residence, gameplay motivations, and genre choices relate to future intention to play?

II. METHODS

Our cross-national comparison of gaming motivations and genre choices is taken from a larger survey administered to participants from Southeast Asia, Western Europe, and North America. Survey participants from one representative country per region—Singapore (SG), Germany (DE), and the United States (U.S.)—are included in this analysis. We chose these countries because they are socioeconomically similar to each other and, hence, we would expect differences to be less influenced by economic variations and instead more by cultural factors. All participants were students in similar age ranges (see Table I for descriptive statistics) attending major universities in their respective countries. This sampling approach minimized the potential for differences based on socioeconomic status or life-stage. The surveys were translated iteratively (based on discussions among the researchers from each country) into Singaporean English, German, and American English and then
TABLE I
PARTICIPANT DESCRIPTIVE STATISTICS FOR EACH COUNTRY

| Country | N  | Age (M) | Age (SD) | n (female) | n (male) |
|---------|----|---------|----------|------------|----------|
| SG      | 109| 20.73   | 4.37     | 27         | 82       |
| US      | 327| 20.69   | 1.68     | 200        | 127      |
| DE      | 211| 23.24   | 6.13     | 128        | 83       |

administered online in each respective country. Depending on each university’s policy, students either received extra course credit or were entered into a prize raffle in exchange for participation. Responses were included in our analysis for participants over 18-years old, leading to a total of 647 participants across all countries (355 women, 292 men).

A. Measures

Motivations for playing games were assessed from a scale validated across the selected countries [42]. Participants responded to a prompt (“If you were to play games in the near future, how likely is it that you:”) for multiple items for each individual subscale on a five-point Likert scale ranging from “very unlikely” to “very likely” or from “strongly disagree” to “strongly agree,” depending on the item wording. The subscale for Habit (α = .92), referring to gaming as a normal and repeated behavior, included three items, such as, “gaming is something I often start doing automatically” and “gaming is part of my normal routine.” The subscale for Reactivity (α = .81), referring to perceiving digital gaming as a morally worthwhile activity, included three items, such as, “I feel good about playing games” and “I feel that playing games is useless” (reverse coded).

For all remaining questions, participants responded to the prompt, “If you were to play games in the near future, how likely is it that you will ….” The subscale for Agency (α = .82), referring to expectations to play games according to players’ preferences, included three items, such as “free to do as you please during the game” and “determine for yourself how the game plays out.” The subscale for Escapism (α = .78), referring to the motivation to leave daily routines behind and experience otherwise impossible events through games, included three items, such as “can put daily reality aside” and “play to have a moment for yourself.” The subscale for Narrative (α = .80), referring to being engaged in the game’s story, included four items, such as “interested in the story” and “feel that the story comes across as convincing.” The subscale for Pastime (α = .80), referring to passively playing games rather than actively seeking them out, included three items such as, “play to pass the time” and “play because you have nothing better to do.” The subscale for Performance (α = .82), referring to the expectation to perform well in digital games, included three items, such as “get far in the game” and “advance well.” The subscale for Social (α = .85), referring to expectations to play with others and friends, included three items, such as “play with other players,” and “get to know other players better.”

Gaming genre use was assessed based on the question, “How often have you played the following genres during the past six months?”, to which participants responded on a six-point Likert scale ranging from “never” to “very often.” The genres to which participants responded, derived from discussions of previous genre studies [3], [23], were listed alongside multiple internationally recognized game examples.

- Action-Adventure Games (e.g., Assassin’s Creed, Uncharted, Max & Sam).
- Strategy, MOBA, or Resource Management Games (e.g., StarCraft, League of Legends).
- Massively Multiplayer Online RPGs (e.g., World of Warcraft).
- Single-Player RPGs (e.g., Skyrim, Final Fantasy, Pokémon).
- Casual, Social Network, Puzzle, Card, or Word Games (e.g., Angry Birds, Tetris).
- Music, Movement or Fitness Games (e.g., Just Dance, Wii Fit, Guitar Hero).
- Sports Games (e.g., FIFA, Madden NFL).
- Fighting Games (e.g., Tekken, Mortal Kombat).
- Building, Open World, or Sandbox Games (e.g., Minecraft, Second Life).
- Platform Games (e.g., Super Mario, Rayman, Sonic, Prince of Persia).
- Racing Games (e.g., Mario Kart, Need for Speed, Gran Turismo).
- Shooters (e.g., Battlefield, Call of Duty, BioShock).

Past Play and Future Play were measured through the questions, “How often have you played games during the past six months?”, and “How often do you expect to play digital games during the coming six months?” respectively. Response options ranged on a six-point scale from “never” to “daily.”

Gender was treated as a dichotomous variable, with participants categorized as women or men. Although gender is increasingly understood as a continuous or multivariate variable [43]–[45], here it is treated as a dichotomous construct. It is worth noting that only one respondent chose not to report gender on the dichotomous scale. That individual was not included in the present analysis because of the focus on gender comparisons.

III. RESULTS

Prior to addressing the research questions, we calculated the correlations within gaming motivations (see Table II) and genre choices (see Table III). Because results of both tests suggest that the correlations were in the small-to-medium range and also given previous evidence for the discriminant validity of the motivation constructs [28], [42], violations of assumptions about collinearity were unlikely in the subsequent series of multivariate analysis of covariance (MANCOVA) tests.

In order to address RQ1 (How does player gender and country of residence relate to game motivations?), a MANCOVA test was conducted with participant gender and country of residence as the categorical independent variables, past play as a control variable, and gaming motivations as the outcome variables. According to the multivariate tests, game motivations altogether differed significantly by participant gender, $F(16, 633) = 10.11$, $p < .001$; Wilk’s $Λ = 0.89$, $η_p^2 = .11$, country, $F(16, 1266) = 9.30, p < .001$; Wilk’s $Λ = 0.80$, $η_p^2 = .11$, and the interaction

\[ a = 0.80, \eta = 0.89, \Lambda = 0.80, \]
between gender and country, $F(16, 1266) = 2.59, p < .001$; Wilk’s $\Lambda = 0.94, \eta_{p}^2 = .03$. Note that past play was also a significant predictor, confirming the importance of controlling for it, but is not included in the table (see Table IV) to simplify data presentation.

Results suggest that player gender and country do, indeed, relate to specific game motivations, controlling for past play time. Nearly all game motivations differed significantly by gender, with the exception of agency ($p = .05$) and pastime. For all significant differences, all motivations were higher for men ($M = 3.4, SE = .04$) than women ($M = 2.78, SE = .05$). Country of residence was related to differences in habit, reactivity, escapism, pastime, and social motivations. These differences are only interpreted for those motivations with $\eta_{p}^2 > .02$, namely pastime and social. According to a post-hoc comparison by country (Tukey’s HSD), for the pastime motivation, Germany ($M = 3.46, SE = .06$) was significantly lower than Singapore ($M = 3.49, SE = .03$) and the United States ($M = 3.46, SE = .06$), both at the $p < .001$ level, while Singapore was higher than the US at the $p < .05$ level, [LLCI = .03, ULCI = .49].

These main effects for gender and country of residence should be interpreted in consideration of the significant interaction effects with respect to narrative, social, and, to a lesser extent, agency motivations, though the effect sizes for these interactions were all small (see Table IV). The pattern of interaction is visualized for social motivations in Fig. 1 and was similar for narrative and agency games as well. Namely, the gender differences for these motivations were smaller in Germany compared to Singapore and the United States.

To address RQ2 (How does player gender and country of residence relate to game genre choices?), a MANCOVA test was conducted with participant gender and country as the categorical independent variables, past play as a control variable, and game genre choices as the outcome variables. Note that 15 participants who said they never play video games also did not select any genre choices and were not included in these analyses. According to the multivariate tests, genre choices altogether differed significantly by participant gender, $F(13, 613) = 26.34, p < .001$; Wilk’s $\Lambda = 0.64, \eta_{p}^2 = .36$, country, $F(26, 1226) = 15.78, p < .001$; Wilk’s $\Lambda = 0.56, \eta_{p}^2 = .25$, and the interaction between gender and country, $F(26, 1226) = 4.85, p < .001$; Wilk’s $\Lambda = 0.82, \eta_{p}^2 = .09$. Past play was also a significant predictor, confirming the importance of including it as a control variable, but is not included in the table (see Table V) to simplify data presentation.

### TABLE II
GAMING MOTIVATION CORRELATIONS AND DESCRIPTIVE STATISTICS

|       | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|
| Habit | .53** |     |     |     |     |     |     |     |
| Reactivity | .36** | .45** |     |     |     |     |     |     |
| Agency | .48** | .45** | .55** |     |     |     |     |     |
| Escapism | .42** | .54** | .58** | .73** |     |     |     |     |
| Pastime | .24** | .26** | .31** | .23** |     |     |     |     |
| Performance | .51** | .55** | .55** | .58** | .29** |     |     |     |
| Social | .47** | .39** | .41** | .42** | .45** | .21** | .47** |     |
| Mean   | 2.43 | 3.81 | 3.26 | 3.00 | 3.07 | 3.33 | 3.24 | 2.54 |
| SD     | 1.20 | 0.90 | 0.91 | 1.00 | 1.00 | 1.02 | 1.01 | 0.97 |

*p < .05, **p < .01 (2-tailed)

### TABLE III
GAME GENRE CORRELATIONS AND DESCRIPTIVE STATISTICS

|       | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Casual |     | .22** |     |     |     |     |     |     |     |     |     |     |     |
| Racing |     |     | .12** | .20** |     |     |     |     |     |     |     |     |     |
| Sports | .02 | 0.37** | .07 |     |     |     |     |     |     |     |     |     |     |
| Platform | .25** | .57** | .36** | .29** |     |     |     |     |     |     |     |     |     |
| Action | .00 | .33** | .37** | .35** | .39** |     |     |     |     |     |     |     |     |
| Shooter | .00 | .34** | .28** | .43** | .36** | .60** |     |     |     |     |     |     |     |
| RPG | .11** | .34** | .42** | .23** | .47** | .58** | .46** |     |     |     |     |     |     |
| Music | .25** | .40** | .23** | .13** | .36** | .20** | .16** | .21** |     |     |     |     |     |
| Fighting | .17** | .46** | .32** | .39** | .57** | .51** | .48** | .51** | .35** |     |     |     |     |
| MMORPG | .07 | .27** | .44** | .21** | .35** | .45** | .39** | .51** | .27** | .49** |     |     |     |
| Building | .05 | .32** | .39** | .24** | .42** | .50** | .49** | .55** | .27** | .55** | .44** |     |     |
| Simulation | .14** | .39** | .35** | .28** | .45** | .40** | .39** | .40** | .31** | .54** | .47** | .49** |     |
| Mean   | 2.38 | 1.64 | 1.53 | 1.47 | 1.86 | 1.38 | 1.32 | 1.30 | 1.17 | .86 | .76 | .75 | .63 |
| SD     | 1.64 | 1.50 | 1.69 | 1.74 | 1.48 | 1.65 | 1.68 | 1.66 | 1.28 | 1.31 | 1.29 | 1.21 | 1.14 |

*p < .05, **p < .01 (2-tailed)

### TABLE IV
RESULTS OF MANCOVA TEST PREDICTING GAMING MOTIVATIONS

|       | F (Gender) | $\eta_{p}^2$ | F (Country) | $\eta_{p}^2$ | F (Gender * Country) | $\eta_{p}^2$ |
|-------|------------|--------------|-------------|--------------|----------------------|-------------|
| Habit | 21.02**    | .03          | 5.32**      | .02          |                      |             |
| Reactivity | 25.63**    | .04          | 5.37**      | .02          |                      |             |
| Agency | 3.705      | .01          | 5.11**      | .02          |                      |             |
| Escapism | 11.22**    | .02          | 6.65**      | .02          |                      |             |
| Narrative | 20.21**    | .03          | 6.75**      | .02          |                      |             |
| Pastime | 15.9**     | .05          |             |              |                      |             |
| Performance | 32**       | .05          |             |              |                      |             |
| Social | 50.71**    | .07          | 14.14**     | .04          | 5.95**               | .02         |
| $df$ | (1, 646)   | (1, 646)     | (2, 645)    |              |                      |             |

*p < .10, **p < .05, ***p < .01, ****p < .001

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Fig. 1. Social gaming motivation by gender and country.

Singapore ($M = 2.68, SE = .10$) and the United States ($M = 2.71, SE = .05$), both at the $p < .001$ level, while Singapore was higher than the US at the $p < .05$ level, [LLCI = .03, ULCI = .49].

These main effects for gender and country of residence should be interpreted in consideration of the significant interaction effects with respect to narrative, social, and, to a lesser extent, agency motivations, though the effect sizes for these interactions were all small (see Table IV). The pattern of interaction is visualized for social motivations in Fig. 1 and was similar for narrative and agency games as well. Namely, the gender differences for these motivations were smaller in Germany compared to Singapore and the United States.
### Results of MANCOVA Test Predicting Game Genre Choices

|                         | F (Gender) | F (Country) | F (Gender x Country) | \(\eta^2\) |
|-------------------------|------------|-------------|----------------------|----------|
| Casual                  | 12.92 **   | 11.98 **    | 3.64 *               |
| Racing                  | 15.89 **   | 17.75 **    |                      |
| Strategy                | 3.59 †     | 7.01 **     |                      |
| Sports                  | 137.82 *** | 18.55 **    | 20.81 ***            |
| Platform                | 22.63 **   | 3.56 *      |                      |
| Action                  | 87.69 ***  | 15.41 **    | 3.34 *               |
| Shooter                 | 103.82 *** | 14.95 **    | 11.16 ***            |
| RPG                     | 27.49 ***  | 12.56 **    |                      |
| Music                   | 9.38 ***   | 75.21 **    | 11.54 ***            |
| Fighting                | 34.24 ***  | 51.75 **    |                      |
| MMORPG                  | 23.45 ***  | 34.1 **     |                      |
| Building                | 17.84 ***  | 33.89 **    |                      |
| Simulation              | 23.62 ***  | 88.38 **    |                      |

| dF | (1,631) | (1,631) | (2,630) |
|----|---------|---------|---------|

Note: Not all variables included in the test are presented here.

### Results of MANCOVA Test Predicting Game Genre Choice

| Habit | Reactivity | Narrative | Social |
|-------|------------|-----------|--------|
| B F   | \(\eta^2\) | B F       | \(\eta^2\) |
| Casual| 0.16 3.76  | 0.01 4.75  | 0.01   |
| Racing| 0.29 4.75  | 0.01 4.75  | 0.01   |
| Strategy| 0.29 12.06 | 0.02 4.75  | 0.01   |
| Sports| -0.27 13.26 | 0.02 4.75  | 0.01   |

| Platform | \(\eta^2\) | B F | \(\eta^2\) | B F |
|----------|-------------|-----|-------------|-----|
| Action   | 0.19 5.33   | 0.01 16.14 | 0.01 |
| Shooter  | 0.24 11.68  | 0.02 4.77  | 0.01 23.94 |
| RPG      | 0.27 13.35  | 0.02 12.41 | 0.02 13.23 |

Note: Not all variables included in the test are presented here.

### Results of MANCOVA Test Predicting Game Genre Choice

| Music | Social |
|-------|--------|
| B F   | \(\eta^2\) |
| Fighting| 0.17 6.04  | 0.01 11.85 |
| MMOORPG| 0.25 19.33 | 0.03       |
| Building| 0.26 24.68 | 0.04       |
| Simulation| 0.18 13.29 | 0.02       |

Note: Not all variables included in the test are presented here.

### Note

The gender difference for these genres was smaller in Singapore compared to the United States and Germany.

Results suggest that player gender and country of residence do, indeed, relate to specific game genre choices, controlling for past play time. Nearly all genre choices differed by gender with the exception of strategy \((p < .10)\) and platform games. For all significant differences, all genres except casual and music were higher on average for men \((M = 1.80, SE = .04)\) than women \((M = .83, SE = .06)\). For casual and music games, use was higher for women \((M = 1.63, SE = .07)\) than men \((M = 1.95, SE = .08)\). All genre choices differed by country with no exceptions. According to a post-hoc comparison by country (Tukey’s HSD), across all genres combined, Germany \((M = .94, SE = .05)\) was significantly lower than Singapore \((M = 2.065, SE = .08)\) and the United States \((M = 1.34, SE = .04)\), both of which also differed significantly, all at the \(p < .001\) level.

These main effects for gender and country should be interpreted in consideration of the significant interaction effects with respect to sports, fighting, shooter, casual, platform, and action games. The latter three should be considered cautiously given the low effect sizes \((\eta^2 = .01)\). Still, for sports, fighting, and shooter games, the effect sizes were in the small but meaningful range. The pattern of interaction is visualized for sports games in Fig. 2 and was similar for fighting and shooter games as well.

Fig. 2. Sports game choices by gender and country.

To further simplify presentation of the large number of comparisons, only the gaming motivations that were associated with at least three genres are presented in the table. Of the omitted motivations, agency was significantly associated with sports games, \(B = -0.15, F(13, 607) = 3.77, p < .05, \eta^2 = 0.01\), pastime was significantly associated with casual games, \(B = 0.20, F(13, 607) = 8.23, p < .01, \eta^2 = 0.01\), and action games, \(B = -0.16, F(13, 607) = 8.58, p < .05, \eta^2 = 0.01\), while performance motivation was associated with action games, \(B = 0.15, F(13, 607) = 4.42, p < .05, \eta^2 = 0.01\). Note that although statistically significant, these findings as well as many of the results in the table have quite small effect sizes \((\eta^2 < .02)\) which are limited in statistical meaningfulness and are potentially spurious due to the large sample size. Hence, these particular findings should be interpreted with caution.

To address RQ3 (How do game genre choices relate to gaming motivations, controlling for player gender and country of residence?), we conducted a MANCOVA with the gaming motivation subscales as the continuous independent variables, participant gender, country and past play as control variables, and game genre choices as the outcome variables. According to the multivariate tests, genre choices altogether differed significantly by the motivations of habit, \(F(13, 607) = 5.11, p < .001\); Wilk’s \(\Lambda = .90, \eta^2 = .10\), reactivity, \(F(13, 607) = 2.42, p < .01\); Wilk’s \(\Lambda = .95, \eta^2 = .05\), narrative, \(F(13, 607) = 1.89, p < .05\); Wilk’s \(\Lambda = .96, \eta^2 = .04\), pastime, \(F(13, 607) = 1.92, p < .05\); Wilk’s \(\Lambda = .96, \eta^2 = .04\), social, \(F(13, 607) = 5.55, p < .001\); Wilk’s \(\Lambda = .89, \eta^2 = .11\). Note that country, gender, and past play were also significant predictors, confirming the importance of including them as control variables, but they are not included in the table (see Table VI) to simplify data presentation.

To further simplify presentation of the large number of comparisons, only the gaming motivations that were associated with at least three genres are presented in the table. Of the omitted motivations, agency was significantly associated with sports games, \(B = -0.15, F(13, 607) = 3.77, p < .05, \eta^2 = 0.01\), pastime was significantly associated with casual games, \(B = 0.20, F(13, 607) = 8.23, p < .01, \eta^2 = 0.01\), and action games, \(B = -0.16, F(13, 607) = 8.58, p < .05, \eta^2 = 0.01\), while performance motivation was associated with action games, \(B = 0.15, F(13, 607) = 4.42, p < .05, \eta^2 = 0.01\). Note that although statistically significant, these findings as well as many of the results in the table have quite small effect sizes \((\eta^2 < .02)\) which are limited in statistical meaningfulness and are potentially spurious due to the large sample size. Hence, these particular findings should be interpreted with caution.
However, the three notable exceptions are the associations between habit motivations and sports games, social motivations and casual games, and agency motivations and sports games.

Finally, to address RQ4 (To what extent do player gender, country, gameplay motivations, and genre choices relate to future intention to play?), we conducted an analysis of variance with participant gender and country as the categorical independent variables, gaming motivation and genre choices as the continuous independent variables, past play as a control variable, and future play intention as the outcome variable. Results suggest that future play intention was positively associated with habit motivations, $B = .23$, $F(1, 631) = 28.89$, $p < .001$, $\eta^2_p = 0.05$, negatively associated with social motivations, $B = -.10$, $F(1, 631) = 5.88$, $p < .05$, $\eta^2_p = 0.01$, and fighting genre choices, $B = -.07$, $F(1, 631) = 4.38$, $p < .05$, $\eta^2_p = 0.01$. Further, there was a difference by participant gender, $F(1, 631) = 8.94$, $p < .01$, $\eta^2_p = 0.02$, with higher future intentions for men ($M = 3.39$, $SE = .06$) than women ($M = 3.10$, $SE = .06$).

IV. DISCUSSION

The present study, which involved a survey of over 600 university students from Singapore, Germany, and the United States, examined the associations among gender, cultural background, gaming motivations, and genre choices. Overall, the findings suggest that many game motivations and genre choices do, indeed, differ by player gender, country, and the interaction between gender and country in some cases. Further, game motivations and genre choices were related to each other, though sometimes in a negative direction. Finally, differences in gaming motivations, genre choices, and gender, but not country of residence, were all found to relate to differences in future intention to play. Although these topics have been studied in isolation in previous research, the present study contributes unique insights about the intersections of gender, cultural background, gaming motivations, and genre choices. These insights offer an understanding of the field that is not only useful to scholars but may also inform the approach of game designers and producers toward targeting potential future players and broadening audiences.

Regarding gender differences in game motivations (RQ1), nearly all motivations (except pastime and agency) were found to be higher for men than women. This is consistent with several previous studies [4], [33], [34] as well as the common gender stereotypes that women are less interested in video gaming than men. Regarding country differences, pastime and social motivations were lower in Germany than in either Singapore or the United States. These main effects should be interpreted in consideration of the significant interaction effects for narrative and social motivations, which suggest that gender differences were smaller in Germany compared to Singapore and the United States.

A possible explanation can be offered by Hofstede’s [25] 6th cultural dimension: indulgence. Germany has the lowest score on indulgence among the three countries. For societies with lower scores on indulgence, people attribute relatively less value to enjoying life and having fun. To play games for socializing or as a pastime would mean to value leisure, which is an indulgence. Further, low-indulgence and wealthy societies, such as Germany, have strict gender norms [25], which is consistent with data suggesting less gender equality in Germany compared to the United States and Singapore [46]. Connolly et al. [47] found that countries with higher gender equality also tend to have larger gender differences in values (i.e., women experience less cultural pressure to conform to male-oriented values). Therefore, in a less indulgent society, gender differences in values are likely to be smaller than in high-indulgence societies. Hence, it follows that gender differences were smaller in Germany compared to Singapore and the United States for social and narrative motivations, both of which are leisure-oriented gaming motivations.

Regarding gender differences in genre choices (RQ2), nearly all genres differed significantly by gender except strategy (marginally significant, $p = .06$) and platform games. Previous research suggests that game genres preference differs by gender, with some variation by country or region [48]. In our study, men reported higher use of most genres, while women reported higher use than men for casual and music genres, which aligns with stereotypes of women gamers as focusing on less aggressive or competitive gaming experiences [3], [49]–[51]. Further, given the over-representation of men in video games and the suggested links between representations and effects [52], higher use among men for most genres is not surprising. Regarding country differences, the use of all genres was highest in Singapore, followed by the United States, followed by Germany. Hofstede’s [25] cultural dimension of uncertainty avoidance (UA) may offer a plausible explanation. UA relates to how societies deal with unpredictability. Singapore scored lowest on UA, followed by the United States and Germany. A study that examined the relationship between UA and consumer’s choices concluded that people from high-UA societies are less likely to accept unfamiliar or new products [53]. In this sense, Singaporeans (low UA) are more accepting and open to various game titles and genres instead of sticking with particular genres.

These main effects should be interpreted in consideration of the significant interaction effects for sports, fighting, and shooter genres, noting significant interaction effects for casual, platform, and action games, but with very small effect sizes. Gender differences for these genres were smaller in Singapore compared to the United States and Germany. Of the three countries, Singapore scored lowest on Hofstede’s [25] cultural dimension of masculinity. In societies that value masculinity, gender differences between men and women are likely to be emphasized. In contrast, when masculinity norms are minimized, the pressure is reduced for men and women to differentiate themselves. This suggests that to the extent video games are perceived as a masculine activity, there is greater cultural pressure in the United States and Germany for women not to play. In comparison, Singaporean culture does not discourage women from playing to the same extent, so their genre choices are more similar to men’s. This logic is supported by the data presented for sports games in Fig. 2. The interaction effect of gender by country seems to be largely driven by women in Singapore, who choose this genre relatively more than women in Germany and the United States.
Regarding the association between game motivations and genre choices (RQ3), both habit and social motivations were associated with most genres, while narrative and reactivity motivations were associated with about half of the genres. A few other motivations were associated with game genres, albeit with very small effect sizes. Most interestingly, while most of these significant associations were positive, sports game use was negatively associated with habit motivations and agency motivations, while casual game use was negatively associated with social motivations.

Broadly, these findings regarding game motivations and genre choices are unsurprising. More motivated players tend to play across more genres. However, the individual associations (or lack thereof) between specific motivations and genres are noteworthy. Foremost, the negative associations provide novel insights into differences in player types. First, people who play sports games tend to play video games neither habitually nor to experience agency. So why do sports gamers play? Sports game choice was not found to relate to any of the other motivations, suggesting that the motivations measured in this study are not exhaustive, which raises a notable gap for future research to address. The negative association between casual games and social motivations is more explainable, given that casual games were found to positively relate to both habit and pastime motivations. Namely, casual gaming is an individual-focused activity, usually conducted in short time increments without much opportunity for social interaction. Other genres are better-suited to fulfill social needs.

Other associations are also telling. The most socially motivating genres, by effect size, were building and MMORPG, which is unsurprising given that these genres tend to be played online with others, including existing friends [54]. Interestingly, MMORPG was also the most habitually driven genre, suggesting that these games are played as a social habit. Other genres, such as building and shooter, also displayed this pattern of being associated with both habit and social motivations, although effect sizes were lower and less consistent. In fact, habit and social motivations were the most common pairing of motivations, with seven genres found to be associated with both (this association was negative in one case: casual genre and social motivations). Still, the data provide evidence that social habits are an important reason that many people play video games, suggesting that future research should focus on the social elements of habitual play.

Finally, future intention to play was found to relate to gender, motivations, and genre choice, but not the country of residence (RQ4). Men reported higher future intentions than women, which is unsurprising given our discussion above, but also perhaps disappointing given the congruence with gender stereotypes. Further, the intention was positively associated with habit motivations, while negatively associated with social motivations and fighting genre choices. While the former finding—people who play habitually expect to continue playing habitually—is unsurprising, the latter raises interesting questions. Why does playing for social reasons discourage people from playing in the future? To speculate, perhaps they feel that without the social fulfillment of playing, they will have no reason to play at all. Similarly, why do fighting-game players plan on playing fewer video games in the future? Perhaps people tend to get bored or frustrated with fighting games given their repetitive nature or complex control schema, causing a negative association with games in general. Qualitative methods would be better equipped to delve into these deeper questions of why such patterns emerged.

The present findings should be considered in light of some study limitations. Most notably, the participant samples may not be representative of their broader populations. Although all respondents were from similar life stages and socioeconomic backgrounds, as with any study conducted in the university context, generalizability is potentially limited. Further, in the Singaporean sample, there were a relatively small number of women participants (n = 27), which raises concerns about unequal sample sizes. Even though ANOVA tests are relatively robust to unequal samples, the chance of Type 1 errors is still increased [55], [56]. A smaller sample size also calls generalizability into further question, though this may not be as large an issue given that the population in Singapore is much smaller than those in Germany and the United States. Still, the findings regarding gender in Singapore—a smaller gender difference compared to the United States and Germany—should be interpreted with caution due to this sampling issue. Another issue with the present study is the focus on gender as a dichotomous characteristic. Gender is increasingly recognized as a continuous or multigendered variable [43]–[45], but the present research was not prepared to delve into this area of inquiry. Finally, it is worth noting that the measures of genre choice and future play intentions were all single items, potentially calling reliability into question. Still, these items seem to have strong convergent validity—they were generally related to each other as well as the single-item past-play control variable—suggesting that these questions were straightforward enough to be interpreted consistently by participants.

A. Practical Implications for Designers and Producers

The limitation notwithstanding, the present findings have implications for design and production in the international video game market. Male players report the largest number of motivations, play the most genres, and have the highest intention of future play. Although these findings are consistent with gender stereotypes, they also point to an opportunity in the games industry. Namely, if game designers and producers target women and girls in ways that increase games’ appeal for them, they will not only broaden their markets but will also help counteract the false gender stereotype that women are less motivated to play video games. The lack of a gender difference for pastime motivations in comparison to all other motivations suggests that games do better with women audiences if they are designed as activities to “pass the time.” This is consistent with the finding that women’s choices of casual games were associated with pastime motivations. However, the cultural background difference should be considered as well. In Germany, pastime motivations were lowest and gendered differences in motivations were also lowest. This might suggest that designing games to appeal to women in Germany is relatively more challenging, even in genres that traditionally do well with women in other places. In stark contrast, in Singapore, gender differences in traditionally
male-oriented genres (e.g., shooter, sports) were relatively low, largely driven by a greater proportion of women who play these genres comparatively. This might suggest that in Singapore—or other countries with similar cultural characteristics (e.g., low masculinity)—games can be designed to appeal to both men and women without much if any differentiation. In some ways, this approach might help counteract gender stereotypes in gaming and in doing so, may help increase women’s play in places where gender divides are larger (e.g., the United States).

While many of the patterns found here were consistent with gender stereotypes, this does not mean that games should be designed to replicate these stereotypes. Critical research in this area is increasing, e.g., [57, 58] and games that do not reinforce gender stereotypes have become extremely popular in recent years (e.g.,*Overwatch, Fortnite*). Such games arguably help counteract gender stereotypes, for example, by offering broader ranges of gender representation in game characters. One reason these games may succeed despite not following traditional patterns of game design might be their very approach to rejecting traditions of genre and player motivations. *Fortnite* appeals to multiple motivations (e.g., performance, social, narrative) and offers elements of multiple genres (e.g., shooter, building, MMORPG). This suggests that games may broaden their appeal by expanding their offerings.

Hence, designers should not look to a single magic-bullet genre or motivation, but instead should focus on complementary combinations. For example, causal games, the most popular genre, were found here to associate positively with habitual motivations, but negatively with social motivations. However, social and habitual motivations were the most popular pairing of motivations across game genres. Perhaps this finding points to a dearth in game offerings that would likely appeal broadly, namely, causal-social-habit games. Most casual games do not offer social elements—they are played as a pastime in short increments—which possibly explains the negative association between the two. But perhaps casual games that creatively address the challenges of integrating social interactions into casual gameplay mechanics (e.g., meaningful asynchronous communication) would be particularly appealing.

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