

Country as a proxy for culture? An exploratory study of players in an Online Multiplayer Game

Alessandro Canossa
Institute of Visual Design, Royal
Danish Academy, Denmark
acan@kglakademi.dk

Ahmad Azadvar
Ubisoft, Sweden
a.azadvar@gmail.com

Jichen Zhu
IT University of Copenhagen
Denmark
jichen.zhu@gmail.com

Casper Hartevelde
Northeastern University, United
States
c.hartevelde@northeastern.edu

Johanna Pirker
TU Graz, Austria
jpirker@iicm.edu

ABSTRACT

Relatively little is known about whether and how people from different countries play differently. Existing literature is still debating whether countries can serve as proxies for cultures. This paper is among the first to present a large-scale exploratory study ($n = 14,361$ from 107 countries) trying to validate empirically whether it is acceptable to utilize countries to group players of Ubisoft's Rainbow Six Siege, a popular online multiplayer game. We developed a survey collecting various player information, including demographics, habits, appreciation, and several psychological measures. Through a data-driven approach, this paper examines whether the variance in responses within users from the same country is less than the variance identified between users from different countries. If the answer is positive, then the approach of utilizing country as a proxy for culture could be justified empirically. The results show that players from the same countries respond to the survey in a marginally more homogeneous way than players from different countries.

CCS CONCEPTS

• **Human-centered computing**; • **Empirical studies in HCI**; **HCI theory, concepts and models**; **Collaborative and social computing theory, concepts and paradigms**; • **Applied computing**; • **Computer games**;

KEYWORDS

culture, country, player experience, online games, geography, psychological measurements

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1 INTRODUCTION

Gaming is a global phenomenon. Communities of players form across different parts of the world. Do people from different countries play the same? Are they motivated to play in different ways? Are there patterns of how they respond socially to each other? And most importantly: is grouping players by countries a legitimate approach when attempting to investigate cultural differences? Answers to these types of questions will have a significant impact on not only how to design and market games in different parts of the world but also how to provide localized player experience, especially in marginalized countries. It is widely accepted that cultures exert a strong influence on how people behave in the real world [18, 36] as well as online [38, 29]. There is little evidence that suggests games are an exception. Compared to other media consumption (e.g., Internet [17], news [38], cinema [45], advertisement [11]), however, surprisingly little is known about whether, and how, people from different countries play distinctively. Common approaches to game analytics tend to categorize players based on demographics (such as gender, race, and age [56]), psychographic properties [34], or in-game behavior [12].

There have been relatively few attempts at comparing a large number of players from different cultures to understand similarities and differences (e.g., [58]). Most existing work in this area is built on relatively small sample sizes, and their results are inconclusive regarding culture impacts. This paper presents an exploratory study that sheds light on whether countries can be used as proxies for cultures. Existing literature in games and other domains [43, 21, 20, 22, 24, 25, 5, 44, 46], tends to take a narrow view of culture and operationalize it geographically as players' countries of residence at the time of the play; this is often assumed a priori, not tested. At the same time, recent work [47, 48, 7] has cast doubts on the practice of using countries as proxies for cultures. It becomes then necessary to verify whether players from the same countries respond to the survey in a more homogeneous way than players from different countries, alas whether country is indeed a useful grouping variable to distinguish players. The answer to this question can impact both the game industry and HCI research: indeed, recruiting practices for playtesting as well as considerations on sample composition for research would need revising. Our analysis shows that players

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from the same countries display a relatively lower variability than those from different countries. Together with established practices, it thus provides empirical grounds for country-level analyses.

We carried out our study in the global player community of *Rainbow Six Siege* (R6S) [53], a popular online multiplayer game published by Ubisoft. Given the disagreement in existing literature on what a survey should contain to be able to capture a broad concept such as culture, we adopted a comprehensive approach. We devised a large survey covering both individual and community factors that may play a role when playing an online multiplayer game. Specifically, the survey includes demographics (e.g., age, gender), self-reported habits (e.g., hours spent, money spent), appreciation (e.g., rating, technical maturity), and psychographics. The latter is based on six different psychographic instruments [3, 32, 37, 16, 39, 15] assessing psychological need satisfaction, presence, communication and community attitudes, agreeableness and empathy, disruptive retaliation attitudes, and reaction to stressors. In collaboration with Ubisoft, we collected survey responses from 14,361 active R6S players, from a wide range of 107 countries in the EMEA (Europe, the Middle East and Africa) and APAC (Asia-Pacific) regions.

This article first looks at existing work on cultural comparison in games as well as work that questions the use of country as proxy for culture. Following that, we describe the game chosen for this research. Subsequently we describe the composition of the survey; then we present the dataset collected and finally attempt to answer the main research question: do players from the same country respond to the survey in a more homogeneous way than players from different countries?

2 RELATED WORK

The term “culture” has been used to describe various phenomena in different disciplines. For instance, it is commonly used to refer to ethnic groups in anthropology, nations in political science and sociology, and organizations in management [18]. In games literature, most research uses “culture” to refer to the countries and regions where players reside [10, 41, 58, 9, 27, 54, 83, 33, 4, 2, 23]. For instance, Ćwil and Howe [10] recruited participants from the U.S. and Poland to compare gamer identity in these two countries. Johry et al. [27] compared gameplay data during COVID between Europe and India.

The term “culture” has also been used to describe culture-related differences among players. For instance, Tekofsky et al. [51] used whether a player is a native English speaker to define “Anglosphere cultures” and “non-Anglosphere cultures.” Wohn et al. [57] used the ethnicity of players living in the same geographic region (i.e., White or Asian players) to understand the impact of cultural backgrounds on gameplay. Finally, Lee and Wohn [31] used Hofstede’s well-established theory [18] to differentiate the different cultural values (i.e., individualism or collectivism) of participants recruited from the same American Midwestern university. It is worth mentioning that the only existing theory used in game research about cultural differences is Hofstede’s cultural dimensions.

While most related work engages multiple cultures for comparison, some take a cross-cultural approach to understanding global trends. In one of the early works, Griffiths et al. [14] aggregated

survey data from 540 *Everquest* players from 22 countries in four continents to examine “who are players” from a global perspective (even though the data is heavily skewed to US and UK players). Other researchers (e.g., [28, 8]) use data from a specific culture to test the generalizability of the theories built initially for another culture. For instance, Kahn et al. [28] proposed a new scale for player motivations and then examined its validity across two distinct gaming genres and cultures: North American League of Legends players and Chinese Chevalier’s Romance Online 3 (MMO) players.

Existing work mostly seems to use countries and social and geographic regions as a way to operationalize culture and specifically identify the country of origin through the IP address of players. This approach has the benefit of bypassing the problem of players misrepresenting or concealing their origin, a problem that is endemic to self-reported information. At the same time, this approach cannot account for the use of VPN or players traveling to other countries. This method for operationalizing culture has its roots in Hofstede’s work [18, 19, 20, 21, 22, 23], but recently there has been a wave of research questioning that approach and found that only 80% of variation in cultural values resides within countries, confirming that country might not be always a good proxy for culture [49]. Taras et al. propose alternative demographic and environmental characteristics, such as occupation, socio-economic status, wealth, freedom, globalization, and instability. Their results suggest that it may be more appropriate to talk about cultures of professions, socio-economic classes, and free versus oppressed societies, than about cultures of countries.

Our goal, as stated in the research question, is to verify these two positions in communities of players from different countries: is it acceptable to operationalize culture as country and group players by country of origin through their IP addresses?

3 PLAYER COMMUNITY: RAINBOWSIX SIEGE

Tom Clancy’s *Rainbow Six Siege* (R6S) [53] is an online, multiplayer, action, first-person shooter (FPS) video game published by Ubisoft in 2015 and later updated in 2020 (Figure 1). The game leverages tactical team-based gameplay. Overall, this game provides a rich platform to investigate our research questions for several key reasons: 1) it has a broad committed player base from across the world for large-scale cross-cultural analysis, 2) it mitigates economic differences, to a certain extent, between countries by not requiring recurring payments and offering free to play events (although offering an in-game option to purchase vanity items), and 3) its complex gameplay potentially supports a variety of play styles, intrinsic motivation factors, and social interactions between players. The rest of the section provides necessary information about the game to contextualize our survey structure (detailed in Section 4.2): demographics, habits, appreciation, and psychographics.

3.1 Player Demographics, Habits, and Appreciation

R6S primarily attracts an adult audience, largely falling within the 18-34 age range. Each match lasts on average 20 minutes; players that complete the single-player campaign (roughly 3 hours), accumulate 139 hours of playtime on average. The game has about



Figure 1: Teams of attackers and defenders with their unique weapons and fortifications lined up in Rainbow Six Siege (R6S).

40,000 concurrent daily players online on average [1]. This demographic preference could be attributed to the game’s tactical, team-based gameplay, which appeals to more mature audiences seeking a more strategic and communicative gaming experience [26]. R6S has also successfully tapped into various social groups and interests. For instance, its strong eSports scene has attracted competitive players and spectators alike. The game also appeals to more casual gamers who enjoy the collaborative, social aspects of its team-based gameplay [13]. In terms of gender, male players make up a considerable portion of the R6S player base. However, the number of female players has been increasing over the years [55].

Important to our study, R6S has a significant presence in numerous geographic regions, with the game being particularly popular in North America, Europe, and parts of Asia. The international spread of the game speaks to its broad cultural appeal and its success in different gaming markets [6]. R6S offers a freemium business model, coupled with the sale of in-game content. It means that the game itself must be purchased, but after that it offers a rotating roster of operators free-of-charge. It is worth noting that all monetized elements are non-pay-to-win; real-money purchases do not confer competitive advantages, aligning with the gaming community’s stance against such practices [35].

R6S was initially launched in 2015 garnering consistently positive reviews (Metacritic score of 79). Over the years and through a series of patches and updates, it managed to raise its status as one of the most accomplished strategic shooters around, securing a committed and consistent player base. Tapping into a dedicated player community like this one was necessary to ensure a sufficient completion rate for our extensive survey.

4 METHODOLOGY

As seen in Section 2, previous work examining the impact of culture on play experience provided little agreement on how to compose a

survey able to capture a complex construct such as culture. Therefore, we chose to build a survey that included many constructs to see if such complex effects could be captured. In this section, we further detail our research approach, the composition of the survey, and the sampling strategy.

4.1 Survey Design

The objective is to explore and assess the extent of variation in play attitudes, both within and between different countries. This involves comparing responses among players within the same country and understanding how the responses of players from different countries differ from each other. In short, it is necessary to establish whether between-country variance outweighs within-country variance. For that purpose, after normalizing the data, our investigation first revolved around comparing within-group and between-group variance when the individuals were grouped by their countries of origin. The within-group variance quantifies how much individuals vary within the same country, while the between-group variance quantifies how much countries, viewed as distinct groups, differ from each other, we therefore must establish whether between-country variance outweighs within-country variance.

4.2 Research Approach

Culture can be understood as the collection of values, beliefs, customs, motivations, expectations, attitudes, habits, and practices that guide and inform the actions of people, or other social groups. A survey was created to capture the different aspects of culture in the context of an online multiplayer game, including both individual as well as community measures to mirror existing work on individualistic and collectivistic cultures [19]. The survey contains 139 items grouped into 29 factors and comprising four sections: a) demographics, b) self-reported habits, c) appreciation, and d) psychographics. Demographics include “Age” and “Gender Identity.” Self-reported habits include “Number of hours spent on video games in a typical week” (HrsWeek) and “Money spent on video games in

a typical month” (MnMnth). Appreciation includes “General rating of the game” (Rating) and “Maturity of the game build” (Maturity). Psychographics is a combination of six questionnaires [3, 32, 37, 16, 39, 15] aimed at exploring inter-relations between the above-mentioned concepts. It includes more complex measures such as “Motivation Evaluation,” “Presence,” “Insights,” “Community and Communication Attitudes,” “Openness and Empathy,” “Cheating and Retaliation,” and “Stressors”.

4.3 Sampling

Between February 20 and March 18, 2022, we launched in collaboration with Ubisoft a survey in EMEA and APAC regions (excluding North, Central, and South America) to active players of R6S. The survey was delivered through emails registered on the platform Ubisoft Connect [52] in compliance with GDPR regulation [42] to a random sample of players of R6S who had more than 3 hours of gameplay in the last two weeks prior to the data collection. The regions polled were Europe, Africa, the Middle East, Asia, and Oceania (i.e., the EMEA and APAC regions). The Americas (i.e., NCSA region) were not included in the data collection as it required a separate outreach campaign and the region had already been recently polled by a previous Ubisoft campaign. We are aware that these sampling choices are sub optimal but unfortunately we did not have the option of including the missing territories. After cleaning up, which consisted of removing incomplete or spam entries, 14,361 valid and complete set of responses were recorded from 107 countries, with a range of respondents from 1,740 to 1 per country (see Figure 2). The top ten countries with the highest frequency of responses were: China ($n = 1,740$; 12.12%), Germany ($n = 1,738$; 12.10%), Great Britain ($n = 1,349$; 9.39%), Russia ($n = 969$; 6.75%), France ($n = 709$; 4.94%), Italy ($n = 646$; 4.5%), Australia ($n = 547$; 3.81%), Poland ($n = 476$; 3.31%), and Turkey ($n = 423$; 2.95%). There were 44 countries with fewer than 10 responses. To keep the homogeneity of responses and representation in the number of records, we chose to include only responses from countries with at least 136 respondents. An elbow plot of respondents per country shows a clear drop-off between rank 26th (Ukraine, $n = 136$) and 27th (Romania, $n = 118$). This operation resulted in a dataset of 12,279 players from 26 countries.

5 RESULTS

In this section, we first outline the characteristics of our general sample by presenting a brief summary of the demographics and play habits. Subsequently, we provide answers to our research question: comparing variance of responses within countries with variance of responses between different countries.

5.1 Descriptives: Demographics and Play habits

In terms of the participant’s age and gender distribution, our sample is largely consistent with the overall R6S community (Section 3.1): 17.57% ($n = 2,523$) of our participant group were 18 years old, 63.27% between 19–24, 14.32% between 25–34, 3.22% between 35–44, and the remaining 1.62% is 45+. As for gender identity, 90.53% of the participants identified as Male, 5.18% as Female, and 4.29% chose “other” or did not wish to disclose.

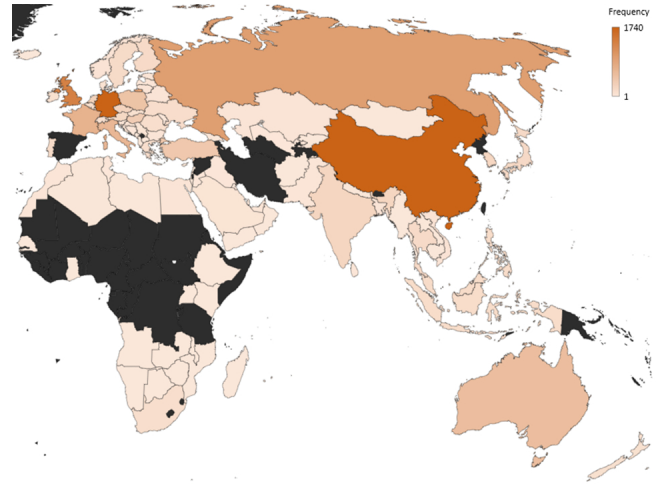


Figure 2: Heatmap of survey participation by country. The NCSA region (the Americas) was not included in this data collection.

When it comes to playing habits and video game consumption, only 5.16% ($n = 741$) of the participants self-reported to play less than 3 hours of video games in a typical week. More popular options were 4–10 hours/week (26.69%), 11–20 hours/week (30.37%), 21–30 hours/week (18.03%), and more than 30 hours/week (19.75%). Spending money on games for a large portion of participants ($n = 7,115$; 49.54%) was limited to “up to \$10 in a typical Month.” Others reported to spend \$11–30 (28.42%), \$31–60 (13.02%), or more than \$60 (9.01%).

5.2 Do players from the same countries respond to the survey in a more homogeneous way than players from different countries?

Most existing cross-cultural game analysis assumes that player data can directly be segmented by countries (e.g., [19]). However, it cannot be assumed a priori that countries are a statistically meaningful way to cluster players if players across different countries are more similar to each other than players from a given country. Furthermore, recent work [47, 48, 7] has cast doubts on the practice of using countries as proxies for cultures.

Hence, we compare the variance of responses between players from the same country and compare it to those from different countries. To calculate within-country variance, we grouped players by their respective countries and calculated the mean of each of the 29 factors that we considered from the survey (see section 4.2) for each country. We then calculated the differences between each response for each player and the mean of their country, then squared the differences to make them positive, and, finally, divided the sum of the squares by the number of players in each country (average Euclidean distance). Lastly, we averaged this measure for all countries.

For between-country variance, we calculated the overall average individual distance from the overall mean of the entire dataset. For this, we calculated the mean for all participants for all the 29

factors. As before, we then calculated the differences between each response for each player and the overall mean, then squared the differences to make them positive, and, finally, divided the sum of the squares by the number of overall players.

The within-country variance quantifies how much individuals vary within the same country, while the between-countries variance quantifies how much countries, viewed as distinct groups, differ from each other. Our within-country variance was 5.02, marginally smaller than the between-countries variance of 5.17. We ran standard two-tailed two-sample variance tests to obtain p-values. The T-statistics showed that the difference in variance, albeit relatively small, is statistically significant at 0.05 significance level. Even with a somewhat small margin, this result shows to some extent that players from the same country are more similar in their responses than those from different countries. This result, together with the established practice or using country as a proxy for culture, validates both the approach to using country as the unit of analysis and, at the same time, given the weakness of the variance margin, support the idea of considering other grouping factors, as Taras et al. suggest. For example, cultures of professions, socio-economic classes, and free versus oppressed societies, beside the traditionally accepted cultures of countries.

6 DISCUSSION

Here, we discuss the results and then consider future work and limitations of our work. Investigating the variance of responses between countries and within the same country provided a weak, albeit positive and significant (at 0.05 level via paired t-test) answer to the research question. This means that there is some credence to work that questions equating culture with the country [50] but at the same time it does not rule out the approach selected by a large body of work, since answers are more homogeneous for players in the same country than across our whole sample. This result adds further credit to the approach used by many researchers (i.e., [19]) to group individuals by country, but opens the road to either look at alternative factors (socio-economic classes, individualistic tendencies, societal freedom, etc.) or dismiss grouping factors altogether and just look at players as individuals.

6.1 Future work

As discussed above, the standard practice is to utilize country as a proxy for culture, at the same time there is a growing body of research objecting to that practice [50]. We propose to follow both avenues and try to analyze similarities and differences in the player population both using country as grouping factor and also bypassing any grouping strategy and then looking at country representation per cluster. Additionally, it would be interesting to triangulate survey responses with in-game behavior, for example, whether players chose PvE rather than PvP, or which operator they chose, or even looking into usage of the Voice Over IP chat system.

6.2 Limitations

While this study provides valuable insights into player experience, several limitations should be considered. First, the instruments we used can introduce possible bias and inaccuracy. Since we rely on self-reported data, it is subject to under- or overreporting. In

addition, as the study reflects on retrospective experiences, a recall bias [40] might affect our data. The survey's length might have contributed to participant fatigue, potentially affecting the quality and completeness of the responses. The choice of having only one game is a limitation since it may have cultural elements that are not controlled for.

In terms of sampling, the study was limited to EMEA and APAC regions, excluding players in the Americas, and thus may only represent part of the RS6S player population, as mentioned earlier, we did not have the opportunity to include the missing territories. As our survey was sent via emails (in major local languages), language or cultural barriers might not be fully accounted for. Furthermore, our survey participants were self-selected, and a sampling bias might be introduced. We can also identify a gender discrepancy despite increasing female participation in traditionally male-dominated genres like tactical shooters. Reasons might include factors such as potential feedback shyness. Although our sample is among the largest ones to date, these limitations may affect the generalizability of our findings.

In terms of methodology, we compared aggregated variance using t-statistics, for future work we plan to compare the variance of each of the 29 factors examined pairwise as well as employing alternative statistics such as ANOVA or F-tests and adding corrections to rule out spurious results.

We also acknowledge the impact of the authors' worldviews in our data analysis. In various stages of our iterative data analysis (e.g., selecting cutoff points and selecting clustering algorithms), we relied on our own assessment of what would lead to higher explaining power. It is possible that we gravitated towards analyses more consistent with our world views, as Science and technology studies (STS) have long established [30]. Even though we attempted to mitigate this effort by including authors from diverse cultures and academic backgrounds, we acknowledge this as a limitation.

Finally, there is some evidence that equating countries and cultures can overlook some gaps within a country [49]. While we follow the established conventions of ascribing certain behaviors to different countries in cross-cultural psychology [19] and player experience research, we acknowledge this approach risk marginalizing underrepresented populations within a country and is another potential limitation of our work.

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REFERENCES

- [1] ActivePlayer.io. 2023. Tom clancy's rainbow six siege: player count, sales, facts & news. <https://activeplayer.io/tom-clancys-rainbow-six-siege/>. Accessed: 2023-07-31. (2023).
- [2] Kaori Ando, Junkichi Sugiura, Susumu Ohnuma, Kim-Pong Tam, Gundula Hübner, and Nahoko Adachi. 2019. Persuasion game: cross cultural comparison. *Simulation & Gaming*, 50, 5, (Oct. 2019), 532–555. doi: 10.1177/1046878119880236.
- [3] Ahmad Azadvar and Alessandro Canossa. 2018. Upeq: ubisoft perceived experience questionnaire: a self-determination evaluation tool for video games. In *Proceedings of the 13th international conference on the foundations of digital games*, 1–7.

- [4] Mateusz Bialas, Shoshannah Tekofsky, and Pieter Spronck. 2014. Cultural influences on play style. In 2014 IEEE Conference on Computational Intelligence and Games. 2014 IEEE Conference on Computational Intelligence and Games (CIG). IEEE, Dortmund, Germany, (Aug. 2014), 1–7. isbn: 978-1-4799-3547-5. doi: 10.1109/CIG.2014.6932894.
- [5] Paul Brewer and Sunil Venaik. 2012. On the misuse of national culture dimensions. *International Marketing Review*, 29, (Oct. 2012). doi: 10.1108/02651331211277991.
- [6] Martin A. Fischler and Robert C. Bolles. 1981. Random sample consensus: a paradigm for model fitting with applications to image analysis and automated cartography. *Commun. ACM* 24, 6 (June 1981), 381–395. <https://doi.org/10.1145/358669.358692>
- [7] Esports Charts. 2022. The worldwide impact of rainbow six siege. Retrieved Aug. 1, 2023 from <https://escharts.com/blog/r6-siege-impact>.
- [8] Douglas Chun, Zhen Zhang, Eric Cohen, Liviu Florea, and Omer F Genc. 2021. Long-term orientation and the passage of time: is it time to revisit Hofstede's cultural dimensions? *International Journal of Cross Cultural Management*, 21, 2, 353–371. eprint: <https://doi.org/10.1177/14705958211026342>. doi: 10.1177/14705958211026342.
- [9] John Colwell and Makiko Kato. 2003. Investigation of the relationship between social isolation, self-esteem, aggression and computer game play in Japanese adolescents. *Asian Journal of Social Psychology*, 6, 2, (Aug. 2003), 149–158. doi: 10.1111/1467-839X.t01-1-00017.
- [10] John Colwell and Makiko Kato. 2005. Video game play in british and japanese adolescents. *Simulation & Gaming*, 36, 4, (Dec. 2005), 518–530. doi: 10.1177/1046878105279409.
- [11] Malgorzata Ćwil and William T. Howe. 2020. Cross-cultural analysis of gamer identity: a comparison of the united states and poland. *Simulation & Gaming*, 51, 6, (Dec. 2020), 785–801. doi: 10.1177/1046878120945735.
- [12] Marieke De Mooij. 2019. Consumer behavior and culture: consequences for global marketing and advertising. *Consumer Behavior and Culture*, 1–472.
- [13] Anders Drachen, Alessandro Canossa, and Georgios N Yannakakis. 2009. Player modeling using self-organization in tomb raider: underworld. In 2009 IEEE symposium on computational intelligence and games. IEEE, 1–8.
- [14] Esports Earnings. 2022. Rainbow six siege esports earnings. Retrieved Aug. 1, 2023 from <https://www.esportsearnings.com/games/492-rainbow-six-siege>.
- [15] Mark D. Griffiths, Mark N.O. Davies, and Darren Chappell. 2004. Demographic factors and playing variables in online computer gaming. *CyberPsychology & Behavior*, 7, 4, (Aug. 2004), 479–487. doi: 10.1089/cpb.2004.7.479.
- [16] Sheldon Hanton, David Fletcher, and Guy Coughlan. 2005. Stress in elite sport performers: a comparative study of competitive and organizational stressors. *Journal of sports sciences*, 23, 10, 1129–1141.
- [17] Michael L Hecht. 1978. Hecht, michael l. measures of communication satisfaction, human communication research, 4: 4 (1978: summer) p. 350. *Human Communication Research*, 4, 4, 350.
- [18] Marc Hermeking. 2005. Culture and internet consumption: contributions from cross-cultural marketing and advertising research. *Journal of computer-mediated communication*, 11, 1, 192–216.
- [19] Geert Hofstede. 2011. Dimensionalizing cultures: the hofstede model in context. *Online Readings in Psychology and Culture*, 2, 1, (Dec. 1, 2011). doi:10.9707/2307-0919.1014.
- [20] Geert Hofstede. 2020. The 6-d model of national culture. URL: <http://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-nationalculture>.
- [21] Geert Hofstede. 2006. What did globe really measure? researchers' minds versus respondents' minds. *Journal of International Business Studies*, 37, 6, 882–896. <https://EconPapers.repec.org/RePEc:pal:jintbs:v:37:y:2006:i:6:p:882-896>.
- [22] Geert Hofstede, Michael Harris Bond, and Chung-leung Luk. 1993. Individual perceptions of organizational cultures: a methodological treatise on levels of analysis. *Organization Studies*, 14, 4, 483–503. eprint: <https://doi.org/10.1177/017084069301400402>. doi: 10.1177/017084069301400402.
- [23] Geert Hofstede and Robert R. McCrae. 2004. Personality and culture revisited: linking traits and dimensions of culture. *Cross-Cultural Research*, 38, 1, 52–88. eprint: <https://doi.org/10.1177/1069397103259443>. doi: 10.1177/1069397103259443.
- [24] Gert Jan Hofstede, Catholijn M. Jonker, Tim Verwaart, and Neil Yorke-Smith. 2019. The lemon car game across cultures: evidence of relational rationality. *Group Decision and Negotiation*, 28, 5, (Oct. 2019), 849–877. doi: 10.1007/s10726-019-09630-9.
- [25] Jeffery D. Houghton, Andrew Carnes, and Christopher N. Ellison. 2014. A cross-cultural examination of self-leadership: testing for measurement invariance across four cultures. *Journal of Leadership & Organizational Studies*, 21, 4, 414–430. eprint: <https://doi.org/10.1177/1548051813515753>. doi: 10.1177/1548051813515753.
- [26] R.J. House, P.J. Hanges, M. Javidan, P.W. Dorfman, and V. Gupta. 2004. *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies*. SAGE Publications. isbn: 9781452208121. [https://books.google.de/books?id=\\$4MByAAQBAJ](https://books.google.de/books?id=$4MByAAQBAJ).
- [27] Jeroen Jansz and Martin Tanis. 2005. The appeal of violent video games to lower education youth. *Computers in Human Behavior*, 23, 1, 76–96.
- [28] Aakash Johry, Günter Wallner, and Regina Bernhaupt. 2021. Social gaming patterns during a pandemic crisis: a cross-cultural survey. In *Entertainment Computing–ICEC 2021: 20th IFIP TC 14 International Conference, ICEC 2021, Coimbra, Portugal, November 2–5, 2021, Proceedings 20*. Springer, 139–153.
- [29] Adam S. Kahn, Cuihua Shen, Li Lu, Rabindra A. Ratan, Sean Coary, Jinghui Hou, Jingbo Meng, Joseph Osborn, and Dmitri Williams. 2015. The trojan player typology: a cross-genre, cross-cultural, behaviorally validated scale of video game play motivations. *Computers in Human Behavior*, 49, (Aug. 2015), 354–361. doi: 10.1016/j.chb.2015.03.018.
- [30] Yoojung Kim, Dongyoung Sohn, and Sejung Marina Choi. 2011. Cultural difference in motivations for using social network sites: a comparative study of american and korean college students. *Computers in human behavior*, 27, 1, 365–372.
- [31] Bruno Latour. 1987. *Science in action: How to follow scientists and engineers through society*. Harvard university press.
- [32] Yu-Hao Lee and Donghee Yvette Wohn. 2012. Are there cultural differences in how we play? examining cultural effects on playing social network games. *Computers in Human Behavior*, 28, 4, 1307–1314.
- [33] Matthew Lombard and Theresa Ditton. 1997. At the heart of it all: the concept of presence. *Journal of computer-mediated communication*, 3, 2, JCMC321.
- [34] Olatz Lopez-Fernandez, Niko Männikkö, Maria Kääriäinen, Mark D. Griffiths, and Daria J. Kuss. 2018. Mobile gaming and problematic smartphone use: a comparative study between belgium and finland. *Journal of Behavioral Addictions*, 7, 1, (Mar. 2018), 88–99. doi: 10.1556/2006.6.2017.080.
- [35] David Melhart, Ahmad Azadvar, Alessandro Canossa, Antonios Liapis, and Georgios N. Yannakakis. 2019. Your gameplay says it all: modelling motivation in tom clancy's the division. In 2019 IEEE Conference on Games (CoG), 1–8. doi: 10.1109/CIG.2019.8848123.
- [36] E. Mollick and N. Rothbard. 2019. Pay to win? the impact of in-game purchases on game play experience. *Journal of Business and Psychology*, 34, 465–479.
- [37] Shaun Moores et al. 1993. *Interpreting audiences: the ethnography of media consumption*. Sage Publications Ltd.
- [38] Mary Beth Oliver, Nicholas David Bowman, Julia K Woolley, Ryan Rogers, Brett I Sherrick, and Mun-Young Chung. 2016. Video games as meaningful entertainment experiences. *Psychology of popular media culture*, 5, 4, 390.
- [39] Stylianos Papathanassopoulos, Sharon Coen, James Curran, Toril Aalberg, David Rowe, Paul Jones, Hernando Rojas, and Rod Tiffen. 2013. Online threat, but television is still dominant: a comparative study of 11 nations' news consumption. *Journalism Practice*, 7, 6, 690–704.
- [40] Duy Tyler Pham. 2021. Investigating the Role Video Game Players' Supportive Communication Plays in Moderating the Effects of Toxicity in Online Gaming. Illinois State University.
- [41] Karen Raphael. 1987. Recall bias: a proposal for assessment and control. *International journal of epidemiology*, 16, 2, 167–170.
- [42] Rabindra Ratan, Vivian Hsueh Hua Chen, Frederik De Grove, Johannes Breuer, Thorsten Quandt, and J Patrick Williams. 2021. Gender, gaming motives, and genre: comparing singaporean, german, and american players. *IEEE Transactions on Games*, 14, 3, 456–465.
- [43] General Data Protection Regulation. 2018. General data protection regulation (gdpr). Intersoft Consulting, Accessed in October, 24, 1.
- [44] 1983. Review article: Geert Hofstede: culture's consequences: international differences in work related values: 1980, beverly hills/london: sage. 474 pages. *Organization Studies*, 4, 4, 390–391. eprint: <https://doi.org/10.1177/017084068300400409>. doi: 10.1177/017084068300400409.
- [45] 1994. Beyond individualism/collectivism: new cultural dimensions of values. Vol. 18. (Jan. 1994), 85–119.
- [46] Maria T Soto-Sanfiel, Isabel Villegas-Simón, and Ariadna Angulo-Brunet. 2021. Uses and consumption of cinema by european adolescents: a cross-cultural study. *Studies in European Cinema*, 18, 2, 119–140.
- [47] Vas Taras, J. Rowney, and Piers Steel. 2009. Half a century of measuring culture: approaches, challenges, limitations, and suggestions based on the analysis of 112 instruments for quantifying culture. 15, (Jan. 2009), 50–75.
- [48] Vas Taras and Piers Steel. 2009. Beyond hofstede: challenging the ten commandments of cross-cultural research. In *Palgrave Macmillan*. Chap. 3, 40–60. https://EconPapers.repec.org/RePEc:pal:palchp:978-0-230-24083-4_3.
- [49] Vas Taras, Piers Steel, and Bradley L. Kirkman. 2012. Improving national cultural indices using a longitudinal meta-analysis of hofstede's dimensions. *Journal of World Business - J WORLD BUS*, 47, (July 2012). doi: 10.1016/j.jwb.2011.05.001.
- [50] Vas Taras, Piers Steel, and Bradley L. Kirkman. 2014. Does country equal culture? beyond geography in the search for cultural entities. *Academy of Management Proceedings*, 2014, 1, 17239. eprint: <https://doi.org/10.5465/ambpp.2014.17239abstract>. doi: 10.5465/ambpp.2014.17239abstract.
- [51] Vas Taras, Piers Steel, and Bradley L. Kirkman. 2016. Does Country Equate with Culture? Beyond Geography in the Search for Cultural Boundaries. *Management International Review*, 56, 4, (Aug. 2016), 455–487. doi: 10.1007/s11575-016-0283-x.
- [52] Shoshannah Tekofsky, Paul Miller, Pieter Spronck, and Kevin Slavin. 2017. The effect of gender, native english speaking, and age on game genre preference

- and gaming motivations. In *Intelligent Technologies for Interactive Entertainment*. Vol. 178. Ronald Poppe, John-Jules Meyer, Remco Veltkamp, and Mehdi Dastani, (Eds.) Series Title: Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering. Springer International Publishing, Cham, 178–183. doi: 10.1007/978-3-319-49616-0_17.
- [52] Ubisoft. 2018. Ubisoft connect. Web. (2018).
- [53] Ubisoft Montreal. 2015. Tom clancy's rainbow six siege. Video game. (2015). <https://www.ubisoft.com/en-us/game/rainbow-six/siege>.
- [54] HuiwenWang, Bang Xia, and Zhe Chen. 2015. Cultural difference on team performance between chinese and americans in multiplayer online battle arena games. In *Cross-Cultural Design Applications in Mobile Interaction, Education, Health, Transport and Cultural Heritage*. Vol. 9181. P.L. Patrick Rau, (Ed.) Series Title: Lecture Notes in Computer Science. Springer International Publishing, Cham, 374–383. doi: 10.1007/978-3-319-20934-0_35.
- [55] Dmitri Williams. 2008. *The Video Game Industry: Formation, Present State, and Future*. Routledge.
- [56] Dmitri Williams, Nicole Martins, Mia Consalvo, and James D. Ivory. 2009. The virtual census: representations of gender, race and age in video games. *New Media & Society*, 11, 5, 815–834. eprint: <https://doi.org/10.1177/1461444809105354>. doi: 10.1177/1461444809105354.
- [57] D. Yvette Wohn, Yu-hao Lee, Jieun Sung, and Torger Bjornrud. 2010. Building common ground and reciprocity through social network games. In *CHI '10 Extended Abstracts on Human Factors in Computing Systems*. CHI '10: CHI Conference on Human Factors in Computing Systems. ACM, Atlanta Georgia USA, (Apr. 10, 2010), 4423–4428. isbn: 978-1-60558-930-5. doi: 10.1145/1753846.1754164
- [58] David Zendle, Catherine Flick, Darel Halgarth, Nick Ballou, Simon Demediuk, and Anders Drachen. 2023. Cross-cultural patterns in mobile playtime: an analysis of 118 billion hours of human data. *Scientific Reports*, 13, 1, 386.