

# The Fabric of Fellowship: Examining Group Dynamics in Final Fantasy Video Games

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Received: December 30, 2024

Accepted: February 13, 2025

Online Published: March 18, 2025

doi:10.5539/cis.v18n1p78

URL: <https://doi.org/10.5539/cis.v18n1p78>

## Abstract

Personality is an important aspect when deciding group dynamics. Depending on a person's way of decision-making, or choice of playstyle, this can change a Final Fantasy game's playthrough. For this study, the playstyles of Final Fantasy X in Japan and the United States were surveyed. This research involved using Hofstede's cultural dimensions theoretical framework combined with Likert scale player responses. This research project aimed to show that individual player decisions aligned with the choices expected and predicted by the Hofstede's cultural dimensions framework. The project focused on five of the Hofstede dimensions: individualism/collectivism, masculinity/femininity, time orientation, uncertainty avoidance, and restraint/indulgence. The data collected validated this hypothesis in the majority of the dimensions studied.

**Keywords:** video games, decision making, playstyle, behavior, Final Fantasy X, Hofstede cultural dimensions

## 1. Introduction

The Final Fantasy is a longstanding franchise, offering players a role-playing fantasy gaming experience through multiple titles (Fujii, 2005). Establishing itself as one of the most prominent Japanese Role-Playing Game (JRPG) series, Final Fantasy titles allow the players themselves to create decisions during each turn based on the battle situation.

Final Fantasy X, the 10<sup>th</sup> game in the main Final Fantasy series, was released in 2001 by Square Enix. It is considered a seminal title in the Role-Playing Game (RPG) genre, marking the series' transition to the PlayStation 2 platform. The game's narrative depth, character development, and emotional storytelling have earned it critical acclaim and a lasting legacy in the gaming community (Mitra, 2020). Final Fantasy X was lauded for its innovative conditional turn-based combat system, which allows for real-time strategy and party member switching during combat. Rather than focusing on a single protagonist, as seen in similar genres, Final Fantasy X places the focus on establishing a group dynamic. The game revolves around seven characters each with different abilities, characteristics, and diverse backgrounds.

With each situation encountered in the game, players must decide which available characters will join their group and what roles are to be assigned to each of those group members. Throughout the game, players may call upon specific characters to perform an action, attack enemies, or utilize items. Some players are quite conservative and play safely, while others may play more dynamically to create a more challenging experience. Players are additionally afforded the ability to directly control any of the individual characters throughout their play session.

The influencing factors behind these character decisions establish an area of research that may allow for a deeper understanding of what drives gaming behavior. This project aims to correlate players' decisions with demographic information to better understand the different types of Final Fantasy X players. The data that was collected is analyzed using Hofstede's Cultural Dimensions to understand these influences and help to explain why these relationships exist (Hofstede, 2011).

### 1.1 Role-Playing Games (RPGs)

In the right context, roleplay can afford a person the opportunity to better understand themselves (Matthews, 2003; Howard, 2015). Most examples of roleplay will include a narrative for the character to be 'played'.

In the Final Fantasy games, each of the characters follows an eastern Asian style of structured narrative called *Kishōtenketsu* (pronounced "kee-show-ten-ketsu"), a style which differs greatly from examples of European counterparts (Bean, 2020; Ratan et al., 2021). *Kishōtenketsu* storytelling shifts the focus from a larger conflict, to one that prioritizes each individual character's growth within their own separate narratives. This broadens the scope of the characters, allowing players to easily form connections to specific game characters (Bean, 2020).

Many European styles of storytelling, particularly those found in RPGs, often follow a male-oriented theme. Final Fantasy game narratives often focus on female characters, who have their own strong narrative arcs.

In the Final Fantasy series of games, players are repeatedly given insight into each character's goals and motivations. These are often derived from their extensive backstories (Bean, 2020). The player's own individual personality traits, goals, and motivations will have an impact on how they perceive the different game characters. This may then translate into decisions that affect the group dynamic, such as a player choosing to ignore certain characters with whom they have the weakest connection (Ratan et al., 2021).

Previous research studies have examined the idea of player bias towards characters/roles and in-game decisions based on the player's general personality traits. Players who scored higher in empathy and agreeableness showed favoritism towards video game characters that were perceived to be less aggressive, while players who preferred aggressive characters scored lower in these categories (Delhove & Greitemeyer, 2020). These findings are supported by other studies that demonstrated that aggressive in-game behaviors shared a correlation with lower scores of humility and honesty, and higher scores of psychopathic traits (Worth & Book, 2014).

The Gamer Motivation Profile (GMP) was developed to understand individual motivations when playing video games (Yee, 2016). Although it has found extensive use in game-related studies, GMP has not been used specifically in gamer-personality-related studies. Most of the existing research in this area focuses on Massively Multiplayer Online Role-Playing Games (MMORPGs) and do not examine the group dynamics of the games (Delhove & Greitemeyer, 2020; Worth & Book, 2014; Yee, 2016). Very few studies undertake analysis of gaming personalities across different countries and cultures (Ratan et al., 2021).

Another significant omission from the previous research studies involves identifying characteristics of the player. All the previous studies in this field used the standard practice of viewing gender as strictly binary instead of multivariable, i.e. male and female were the only options given when collecting information on gender. This created an issue for those players who do not fit into the given options (i.e. agender, nonbinary, etc.). This omission is significant since this demographic category can have an enormous influence on the way a player identifies with any character in a game, which in turn will have a significant impact on any in-game decisions (Thornham, 2008; Winn & Heeter, 2009; Phan et al., 2012).

RPGs have been repeatedly shown to foster social connections and enhance emotional intelligence among players (Cao, 2024). Previous research has highlighted that the immersive nature of RPGs allows players to experiment with different identities and social roles, which can lead to improved empathy and interpersonal skills. The social dynamics within RPG online groups also foster a sense of belonging and community among players. Research findings suggest that RPGs can serve as a platform for social interaction and collaboration, promoting positive social behaviors and relationships (Lee et al., 2024).

Studies on the role of narrative in RPGs and its impact on player engagement have found that compelling storytelling and character development can significantly enhance the immersive experience, leading to greater player satisfaction and emotional investment (Domingues et al., 2023; Bowman, 2024).

A number of studies have investigated the impact of RPGs on mental health, particularly in relation to anxiety and depression. The findings suggest that engaging in RPGs can serve as a form of escapism and stress relief, providing players with a sense of control and accomplishment that can positively affect their mental well-being (Causo and Quinlan, 2021; Arenas et al., 2022; Baker et al, 2023). This aligns with research work that has shown the therapeutic potential of RPGs in clinical settings, proposing that these games could be used as a complementary treatment for various psychological disorders (Bages et al, 2021; Bean and Cannell, 2023).

RPGs have also been shown to have a role in education, with research suggesting that these games can be effective tools for teaching complex subjects and fostering critical thinking skills. The findings have indicated that RPGs can provide a dynamic and engaging learning environment, promoting active participation and deeper understanding of the material (Setiyani et al., 2021; Winardy and Septiana, 2023).

Recent advancements have even focused on the development of AI-driven RPGs that adapt to players' emotional states and preferences. Machine learning algorithms can be used to create personalized gaming experiences, enhancing player engagement and satisfaction (Deng and Fan, 2021; You et al., 2024; Ratican and Hudson,

2024)

### 1.2 Cultural Impact

Hofstede's Cultural Dimensions provide a statistical basis for understanding the different values and structures that exist across cultures (Hofstede, 2011). Though it should always be acknowledged that these differentiate drastically on the individual level, there are general patterns that appear when analyzing any collective society as a whole (Figure 1). These findings are often compared to numerous studies in which the purpose is to understand the influence that demographic location has on predicting one's behavior (Cheng, 2020).

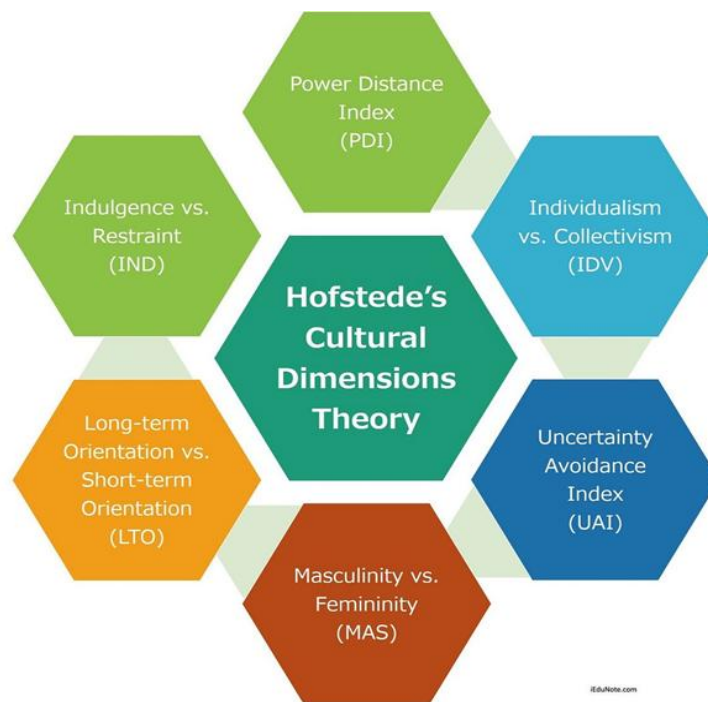


Figure 1. The Individual Dimensions Measured When Using Hofstede's Cultural Dimensions Theory

Creators of video games can discover a variety of benefits from this type of research. Developers who understand how audience's beliefs, values, and other core aspects impact their motivations, decisions, and overall experience, can translate that insight into effective design decisions (Rogers, 2014; Hodent, 2017).

Currently, there is limited research to support correlations between in-game preferences and decisions with gender and demographics. Previous studies have implied a relationship between a gamer's motivation and preferred game genre with their respective (binary) gender and geographical location. For example, players from Germany scored much lower in motivations that involved playing games for pastime (leisure) or playing games for the social communication. This correlated with the fact that Germany scores very low on indulgence (one of the Hofstede cultural dimensions), suggesting that they are less likely as a culture to prioritize leisurely activities (Bean, 2020; Ratan et al., 2021).

Previous research has also shown, with regard to playstyle, that similarities exist between players with comparable cultures. When examining team-based First-Person Shooter (FPS) games, countries with a lower score in masculinity (another Hofstede cultural dimension) performed higher in cooperative actions such as assisting and reviving other teammates (Ravari, 2021). Other studies found correlations between cooperative and individualistic playstyles and the associated country's individualism score (another Hofstede cultural dimension) (Bialas, 2014).

Previous literature in this field has explored the cultural impact of RPGs, highlighting how these games can serve as a medium for cultural exchange and understanding, often allowing players to engage with and appreciate different cultural perspectives. RPGs have an array of social and psychological impacts, as well as a potential to foster empathy, collaboration, and critical thinking among players (Cerezo-Pizzaro et al., 2023)

This prior research has explored the influence of RPGs on other games and media products as well as their

representation in popular culture. Specific role-playing aspects have caused a 'drop down' effect whereby RPGs feed upon common themes and tropes to impact gaming as a whole (Byers and Crocco, 2016). This work has emphasized that RPGs often incorporate diverse cultural elements, allowing players to engage with and appreciate different cultural perspectives MacCallum-Stewart et al., 2018; Fraile-Jurado, 2024).

In longitudinal studies, gender equality was found to have a significant impact on personalities from different countries (Eden et al., 2010; Fors Connolly et al., 2020). Several studies report findings that support the existing stereotypes in which male gamers report a higher interest in competitive and action games (such as sports and FPS), whereas females report a higher interest in more traditional games (such as puzzles and card games) and a lower interest in violent games (Lucas et al., 2004). Female gamers also tend to dislike characters that exhibit extreme examples of gender-stereotyping (Hartmann & Klimmt, 2006).

While correlations supporting Hofstede's cultural dimensions framework exist, there are valid critiques when considering its ability to explain relationships and correlations. One study provides a list of assumptions one should consider when relying on the model. Two assumptions should be considered when using this model (Tung & Verbeke, 2010) :

- (1) External events can directly influence a country's score, thus enabling it to evolve over time. Therefore, it is possible that when applying Hofstede's cultural dimensions framework to a long-standing game such as Final Fantasy X, a person's in-game decisions may be different depending on the age of the player and when they played the game.
- (2) The relationship that exists between each of the cultural dimensions and the phenomenon in question is not linear. This means that a positive or negative change in the score of a country's dimension will not result in an equal amount of change of the exhibited values/beliefs pertaining to such.

To overcome these assumptions, it is necessary to identify additional relationships which may help in explaining correlations where possible (Tung & Verbeke, 2010).

### 1.3 Group Dynamics in Final Fantasy

Group cohesion is a critical construct in social and organizational psychology, referring to the extent to which members of a group are united in their pursuit of common goals and their interpersonal bonds. High levels of cohesion can enhance group performance, foster a supportive environment, and improve overall satisfaction among group members (Carron & Brawley, 2000). Cohesive groups are more likely to exhibit effective communication, mutual trust, and cooperation, which are essential for achieving collective objectives. Furthermore, cohesive groups can better navigate conflicts and challenges, maintaining resilience and adaptability in dynamic contexts (Beal et al., 2003; Jef et al., 2018).

Therefore, understanding and fostering group cohesion is imperative for the success of teams in various settings, from the workplace to video games (Keith et al, 2021; Mach et al., 2010). Team cohesion is typically influenced by five individual sub-dimensions (Meier, 1994) :

- **Task** - An attraction or bonding between group members based on a shared commitment to achieving the group's goals and objectives.
- **Social** - A closeness and attraction within the group that is based on social relationships within the group.
- **Belongingness** – The degree to which members of a group are attracted to each other.
- **Group Pride** – The extent to which group members exhibit liking for the status or the ideologies that the group supports or represents, or the shared importance of being a member of the group.
- **Morale** – Individuals' high degree of loyalty to fellow group members and their willingness to endure frustration for the group.

Group cohesion is an important factor in the Final Fantasy X game, achieving team flow is essential. The player seeks to establish a party of characters to clear the main storyline or side-quests. Teams within Final Fantasy X are influenced predominantly by the **Task** sub-dimension from the above list. The game is focused on a group of characters bonding over a shared commitment to overcome the main antagonist (Salas et al., 2015).

Equipment and spells are among the items that a Final Fantasy X player may freely choose how to distribute, but there are limits in the amount that can be equipped to each character (Preuss et al, 2010). While attempting to create team flow, the player must ultimately decide which character(s) they will provide the most attention to, as well as how items and spells are distributed amongst their group. Personality, as previously mentioned, can have

a dominant influence on how a player connects with a character, as well as the different roles that character can assume in a role-playing game (Bean, 2020; Mitra, 2020). Using theoretical frameworks, such as Hofstede's cultural dimensions, it should be possible to form predictions about the effects that an individual's personality will have on decisions regarding the overall group dynamic within games like Final Fantasy X.

Within Final Fantasy X, a group's workflow may be improved by figuring out how each individual character's abilities may complement those of other characters or finding ways to reduce redundant effects that items and spells may produce (Watts et al., 2017). This can have a serious impact on the choices a player makes regarding which characters make up the group, how much time a player spends customizing each character, and which character the player controls during the game session.

Within Final Fantasy X, the combat system is also critical in influencing how players will pick jobs, abilities, spells and items. For example, while there may be a powerful ability the player wishes to use and add to a character, the penalties or costs behind it may not be favorable. Given the abundance of complex choices provided by the in-game mechanics, many players may want to simplify things for a better playing experience (Watts et al., 2017; Bean 2020). Players sometimes assign a role, spell or item in Final Fantasy X simply because it is something that they are the most familiar with from their experience with earlier Final Fantasy titles. Another factor which may influence the group setup are players who want to experiment with different team/character setups and configurations.

Together, all these variables and factors potentially provide an understanding of the in-game decisions made by players. Recognizing when these decisions have a simple explanation or have been influenced by culture or personality is crucial in avoiding misleading conclusions.

## 2. Research Methodology

The Final Fantasy X game challenges players to recruit and utilize groups of in-game characters to progress through the storyline and complete side quests. These characters are unique in gender, personality, and representations of existing stereotypes. The overarching purpose of this study is to examine how in-game decisions align with player personality and demographics from a group dynamics perspective, specifically in the context of RPGs.

### 2.1 Research Objectives

The study aimed to achieve the following overarching objectives:

1. To identify the most frequently chosen characters by players in both Japan and the United States and explore any cultural or regional patterns.
2. To assess whether character and gameplay choices align with established cultural dimensions, such as individualism-collectivism and power distance.
3. To examine potential gender-based differences in character and gameplay preferences.

### 2.2 Research Hypotheses

The previous review of the literature surrounding cultural and gender correlations with respect to video games, supports the existence of several relationships (Bean, 2020; Bean & Groth-Marnat, 2016). These studies have recognized multiple behavioral patterns when observing playstyles, preferred genres, and gaming motivations, often these align with existing theoretical frameworks, such as Hofstede's cultural dimensions (Ratan, 2021; Ravari, 2021).

Final Fantasy X provides an experimental environment that allows for further insight into how different demographic groups perceive characters and roles through the required team building and complex in-game decisions. As noted, there is a lack of research that investigates these group dynamics in RPGs such as the Final Fantasy series.

The research described in this paper examines gaming motivations and preferred playstyles by a range of demographic groups and genders. Below are the proposed hypotheses of the intended research:

1. **Hypothesis 1 - Individualism-Collectivism: H1** : Players from cultures characterized by higher individualism scores, such as the United States, are more likely to make in-game choices that prioritize individual characters in their group over other party members.

**H1-H0:** There is no significant difference in in-game character choices between players from cultures with varying levels of individualism-collectivism.

2. **Hypothesis 2 - Masculinity-Femininity:** *H2* : Players' character preferences and gameplay styles may reflect the cultural dimensions of masculinity and femininity, with certain choices aligning with the traditional values and roles associated with their respective cultures, i.e., favoring physical attackers over supportive characters.  
**H2-H0:** There is no significant association between players' character preferences and the cultural dimensions of masculinity and femininity.
3. **Hypothesis 3 - Time Orientation (Long-term vs. Short-term):** *H3* : Players' in-game choices and gameplay styles will reflect cultural differences in time orientation. Participants from cultures emphasizing long-term orientation, characterized by patience and persistence, will tend to prioritize characters and strategies that lead to sustained success in the game.  
**H3-H0:** There is no significant relationship between players' in-game choices and their cultural time orientation.
4. **Hypothesis 4 - Uncertainty Avoidance:** *H4* : Players' character preferences and gameplay approaches will align with their cultural tendencies regarding uncertainty avoidance. Participants from cultures with high uncertainty avoidance will exhibit a preference for characters and strategies that minimize risks through research and preparation.  
**H4-H0:** There is no significant relationship between players' character preferences and their cultural tendencies regarding uncertainty avoidance.
5. **Hypothesis 5 - Restraint-Indulgence:** *H5* : Players' in-game choices will reflect their cultural orientation regarding indulgence and restraint. Participants from cultures emphasizing indulgence will prioritize character choices that strictly align with favoritism, placing a stronger emphasis on their personal preferences  
**H5-H0:** There is no significant association between players' in-game choices and their cultural orientation regarding indulgence and restraint.

One could possibly predict that most findings will agree with those found in existing research that found correlations between player decisions and Hofstede's cultural dimensions. However, it is crucial that other confounding factors and variables are taken into account with every gameplay decision made by the players.

### 2.3 Sampling and Participants

The recruitment process adhered to the following specific eligibility criteria and ethical considerations:

- **Eligibility Criteria:** Each participant was required to be over the age of 18 and have completed one full playthrough of Final Fantasy X, ensuring a minimum level of familiarity with the game.
- **Recruitment Sources:** Most of the participants were recruited from Amazon Mechanical Turk (MTurk), a platform commonly used for online data collection (Aguinis et al., 2021). The remaining participants were recruited from Clickworker, an online platform that allows people to earn money by completing micro-tasks (Tubaro et al., 2020). These dual sources of recruitment allowed for a diverse participant pool (Rani & Furrer, 2019).
- **Recruitment Language:** The recruitment language used for both MTurk and Clickworker was carefully worded to avoid revealing the specific purpose of the study. This approach helped mitigate potential biases stemming from participants' awareness of the study's objectives.
- **Verification Process:** To ensure the quality and authenticity of data, participants were required to submit a unique ID tied to their account or provided by the recruitment platform. Only data from verified participants meeting the eligibility criteria were collected.
- **Anonymity and Confidentiality:** Data collection was conducted anonymously to protect participant privacy and confidentiality. Ethical guidelines for research involving human participants were strictly followed throughout the study.

This comprehensive recruitment process ensured that participants were diverse in terms of nationality, age, and gaming experience, while also maintaining the integrity and reliability of the collected data.

### 2.4 Experimental Protocol

This experimental study employed a cross-sectional comparative design to investigate and compare character and gameplay choices made by players of the video game Final Fantasy X between two distinct groups:

individuals residing in Japan and those residing in the United States.

Final Fantasy X offers players a selection of characters, each closely tied to distinct play styles and established stereotypes within the game's narrative. The primary objective of the experimental data collection was twofold:

- Firstly, to identify patterns in character selections and gameplay choices, thereby gaining insights into player preferences and choices within the Final Fantasy X gaming context.
- Secondly, to explore how these character and gameplay choices relate to patterns of behavior outlined by Hofstede's Cultural Dimensions.

The data collection procedure for this study was rigorously designed to gather multifaceted insights into participants' personalities, character preferences, gameplay choices, and their interplay with cultural dimensions.

An altered version of the Big-Five personality test was used to collect personality data on each of the experimental participants (Gosling et al., 2003). Further information was gathered using the Gamer Motivation Profile (GMP), often which measures gamer motivations and type through the use of a Likert scales (Yee, 2016; Hart, 2016; Ratan et al., 2021).

Lastly, all participants were afforded the opportunity to explain and justify certain in-game decisions they made through a structured survey responses. Through the implementation of personality-specific questions and individual decision explanations, confounding factors and variables were taken into account with every gameplay decision made by the players

### 2.5 Data Collection

The primary source of data was the responses obtained through the structured survey questionnaire. Data was collected anonymously to ensure participant privacy and confidentiality. This research adhered to ethical standards for conducting research involving human participants. The survey itself was structured into four distinct sections, each with a specific focus :

- **Section 1: Self-Assessment of Personality Traits.** Participants completed a ten-item self-assessment of their perceived personality traits. These Likert scale questions measured the strength of agreement with statements tied to specific personality traits based on the Big-Five personality test (Gosling et al., 2003).
- **Section 2: Gameplay Preferences and Playstyle.** The second section of the survey collected data on the participants' gameplay preferences and play styles within Final Fantasy X. It featured Likert scale questions designed to assess various aspects of participants' gaming tendencies using mechanisms taken from the GMP (Yee, 2016). This included character valuation, character identification, and preferences for particular character types within the game. These questions were thoughtfully crafted to align with specific cultural dimensions from the Hofstede framework (Hofstede, 2011).
- **Section 3: Character Preferences and Valuation.** Participants were instructed to rank each individual character from Final Fantasy X in two specific orders :
  - *Preference* : how much they identified with, or liked, each character.
  - *Value* : how powerful or useful they believed each character to be.

Responses were recorded using a Likert scale format. Participants were also asked to indicate if they considered any character within the game's narrative to not belong to the group.

- **Section 4: Party Crafting and Decision-Making Scenarios.** In this section, participants were presented with a number of game scenarios within Final Fantasy X. Each participant was asked to create a specific in-game party to deal with the scenario presented. This section emphasized gameplay choices and specific decision-making strategies.

### 2.6 Data Analysis

To address the research objectives, statistical analysis was conducted, utilizing Chi-Square tests and Welsch t-tests. Chi-Square tests were employed to assess the relationship between character and gameplay choices across both demographics, while t-tests were used to compare the Likert scale ratings and explore potential gender-based differences in character and gameplay preferences.

All the data analysis was performed using R Studio, a widely used statistical software tool, to execute the statistical tests and generate results (Verzani, 2011).

## 3. Results

The study involved 67 total participants, with 37 participants from Japan and 30 from the United States. The

binary gender demographics from each country, as self-reported by the participants, is shown in Table 1.

Table 1. The Binary Gender Demographics from Each Country, as Self-Reported by the Participants

Gender (Binary)	Japan	United States
Female	43 %	37 %
Male	57 %	63 %

The Hofstede dimensions graph shown in Figure 2 compares data from Japan and America across the six cultural dimensions: Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Long Term Orientation, and Indulgence. Each dimension is represented by two bars, the figures for Japan are shown in orange and the USA is shown in blue.

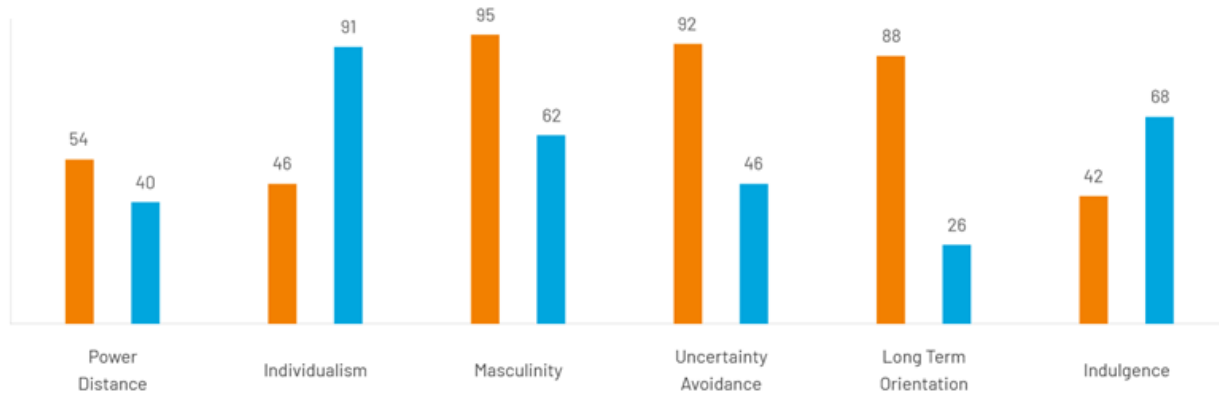


Figure 2. A comparison of Hofstede's scores between Japan and the U.S.

### 3.1 Personality Tests

The statistical analysis of the data collected from the personality tests is shown in Table 2.

Table 2. Comparing the Statistical Results from the Personality Tests of Participants from Japan and the USA

FACTOR	t	df	p-value	Mean (Japan)	Mean (USA)
Extrovert	-1.1879	57.0520	0.2398	4.5946	5.0333
Critical	0.2798	58.5400	0.7806	3.9459	3.8333
Dependable	-1.2227	62.9160	0.2260	5.3784	5.7000
Anxious	-0.5012	57.7300	0.6181	3.4864	3.7000
Open	-1.0768	59.5830	0.2859	5.1621	5.4667
Reserved	-0.9278	58.4410	0.3573	4.2162	4.6000
Sympathetic	-1.078	55.3960	0.2857	4.7567	5.1667
Disorganized	0.0038	50.9330	0.9970	3.1351	3.1333
Calm	-1.2963	63.2200	0.1996	4.9189	5.3667
Conventional	-0.7241	49.2430	0.4724	3.2703	3.6000

Table 3. Comparing the Statistical Results from the Structured Survey Questions from Japan and the USA

QUESTION	t	df	p-value	Mean (Japan)	Mean (USA)
Research Character Roles	-2.5080	64.9740	0.01465	4.9560	5.7000
Focus on One Character	-0.5192	63.5140	0.6054	4.6757	4.8667
Prefers Aggressive Characters	-1.1337	56.3400	0.2617	4.3784	4.8667
Plays in a Selfless Manner	-0.3863	62.4070	0.7006	4.8378	4.9667
Plays in a Selfish Manner	-1.0680	55.9840	0.2901	3.6212	4.1000
Shares Resources Between Characters	-2.0626	63.3200	0.04326	4.7297	5.4333



<b>Cautious/Conservative Playstyle</b>	0.4010	58.7270	0.6898	5.0811	4.9333
<b>Fun/Careless Playstyle</b>	-0.2958	51.304	0.7686	3.9459	4.0667
<b>Character Preparation Time</b>	-1.9612	63.806	0.0543	5.4324	5.9000
<b>Chooses Strongest Character</b>	-0.9102	64.6310	0.3661	4.8378	5.1333

As can be seen from the values in Table 2, none of the p-values for any of the personality traits measured are less than 0.05. This suggests that the results are not statistically significant, and hence there is little to distinguish personalities traits between participants from the Japan and the USA.

### 3.2 Structured Survey Data

The statistical analysis of the data collected from the structured survey questions relating to participant decisions while playing Final Fantasy X is shown in Table 3.

The statistical analysis of the data collected from the structured survey questions relating to character likeability (how much players identified with the character) while playing Final Fantasy X is shown in Table 4.

Table 4. Comparing Character Likeability Scores from Participants in Japan and the USA

<b>CHARACTER (LIKEABILITY)</b>	<b>t</b>	<b>df</b>	<b>p-value</b>	<b>Mean (Japan)</b>	<b>Mean (USA)</b>
<b>Yuna</b>	1.7902	63.4760	0.0782	5.5000	4.900
<b>Tidus</b>	-0.7491	60.4250	0.4567	4.2500	4.5333
<b>Lulu</b>	0.6298	58.1400	0.5313	5.0570	4.7931
<b>Wakka</b>	-2.1871	58.3420	0.0327	4.1111	4.9667
<b>Kimhari</b>	1.1419	58.2760	0.2581	4.3243	3.8000
<b>Auron</b>	-1.6489	63.4020	0.1041	4.8611	5.5000
<b>Rikku</b>	1.3251	63.0830	0.1899	5.1111	4.5667

The statistical analysis of the data collected from the structured survey questions relating to character value (how strong or useful they thought the characters was) while playing Final Fantasy X is shown in Table 5.

Table 5. Comparing Character Value Scores from Participants in Japan and the USA

<b>CHARACTER (LIKEABILITY)</b>	<b>t</b>	<b>df</b>	<b>p-value</b>	<b>Mean (Japan)</b>	<b>Mean (USA)</b>
<b>Yuna</b>	1.2518	50.0880	0.2164	5.6216	5.2000
<b>Tidus</b>	1.3356	63.5555	0.1865	5.2162	4.7667
<b>Lulu</b>	-2.3987	63.9000	0.01938	4.6389	5.4333
<b>Wakka</b>	-0.3518	60.9360	0.7262	4.7027	4.8276
<b>Kimhari</b>	0.5509	62.2060	0.5837	4.1111	3.9000
<b>Auron</b>	-0.2075	60.7750	0.8363	5.1621	5.2414
<b>Rikku</b>	-0.54046	58.1420	0.5909	4.6756	4.8966

## 4. Statistical Analysis

In addition to exploring cultural dimensions and their potential influence on in-game preferences, this experiment incorporated a set of personality test questions aimed at gaining further insight into the participants' traits and tendencies. These questions were based on an altered version of the Big-Five personality test (Gosling et al., 2003). This part of the experiment was designed to provide a broader context for understanding the factors that might influence gameplay choices in Final Fantasy X.

Despite the comprehensive nature of these personality test questions, none of them yielded statistically significant differences between participants from Japan and the United States. None of the Welch t-test p-values for any of the personality traits measured are less than 0.05 (Table 2). This suggest that personality traits alone may not be the primary drivers of in-game character preferences and gameplay styles. Instead, it underscores the complex interplay of various cultural, individual, and contextual factors that shape players' decisions in the virtual realm.

The statistical analysis from the experiment will be presented in terms of each of the individual hypotheses.

#### 4.1 Hypothesis 1 : Individualism-Collectivism

The first experimental hypothesis was stated as :

**Hypothesis 1 - Individualism-Collectivism: H1:** Players from cultures characterized by higher individualism scores, such as the United States, are more likely to make in-game choices that prioritize individual characters in their group over other party members.

**H1-H0:** There is no significant difference in in-game character choices between players from cultures with varying levels of individualism-collectivism.

The first hypothesis examined the cultural dimension of individualism-collectivism and its potential impact on character preferences and gameplay styles. Since Japan has a score of 46 in individualism, and the United States has a significantly higher score of 91 (Figure 2) there was an expectation of significant difference in gameplay styles between the two groups of participants (Hofstede, 2011).

In the structured survey, participants were asked a set of Likert scale questions. Six of these questions were designed to allow the measurement of individualism vs. collectivism among the participants (Table 3). These questions specifically aimed to assess various aspects of individualistic and collectivistic tendencies in decision-making and gameplay preferences.

The statistical analysis countered the expected result, participants from the United States (with its stronger individualistic orientation) did not significantly favor individual character choices over group dynamics when it came to character preferences in the game. Instead, the results demonstrated a complex interplay of cultural norms and individual preferences.

Only one question produced a statistically significant p-value ( $p > 0.05$ ) in a Welch's t-test, this was when the participants were asked about how they distribute resources amongst party members (Table 3). The American participants were significantly more inclined than the Japanese participants to distribute resources equally between the game characters in their group. The United States displayed a higher mean score (5.43) compared to Japan's mean score (4.72).

As the majority of Likert scale questions designed to measure this cultural dimension did not yield statistically significant differences, this suggests that, within the scope of the study, cultural variations in individualism vs. collectivism tendencies may not strongly influence participants' in-game decision-making. Therefore, the null hypothesis (**H1-H0**) was accepted.

#### 4.2 Hypothesis 2 - Masculinity-Femininity

The second experimental hypothesis was stated as :

**Hypothesis 2 - Masculinity-Femininity: H2 :** Players' character preferences and gameplay styles may reflect the cultural dimensions of masculinity and femininity, with certain choices aligning with the traditional values and roles associated with their respective cultures, i.e., favoring physical attackers over supportive characters.

**H2-H0:** There is no significant association between players' character preferences and the cultural dimensions of masculinity and femininity.

Hofstede's dimensions tell us that Japan's masculinity score is a higher at 95 compared to the United States' score of 62. In this experiment, character likeability ratings were collected from participants in both Japan and the United States (Table 4). These ratings were collected to assess how players from these two different cultural backgrounds perceive the characters in the game. A graphical representation of this data is shown in Figure 3.

Among the participants from the United States, the character Auron received the highest average likeability rating. This indicates that American players may appreciate strong, authoritative, and protective character traits. On the other hand, Kimhari had the lowest average likeability rating among US players, suggesting that this character may not resonate as strongly with American players.

Among the participants from Japan, the highest average likeability rating to Yuna, a character known for her loyalty and generosity. This suggests that Japanese players may value characters with supportive and nurturing qualities. Wakka received the lowest average likeability rating among Japanese players, indicating that this character may not resonate as strongly with Japanese players.

To further explore the alignment of character preferences with cultural dimensions, Welch's t-tests were conducted on the participant character ratings for both countries. The tests were used to identify whether there were significant differences in character likeability between Japan and the United States.

Among all the characters analyzed, the ratings for Yuna and Wakka (Table 4) were the only ones to produce a significant p-value in the t-test ( $p=0.03276$ ). This means that there was a statistically significant difference in how Japanese and American players perceived these characters.

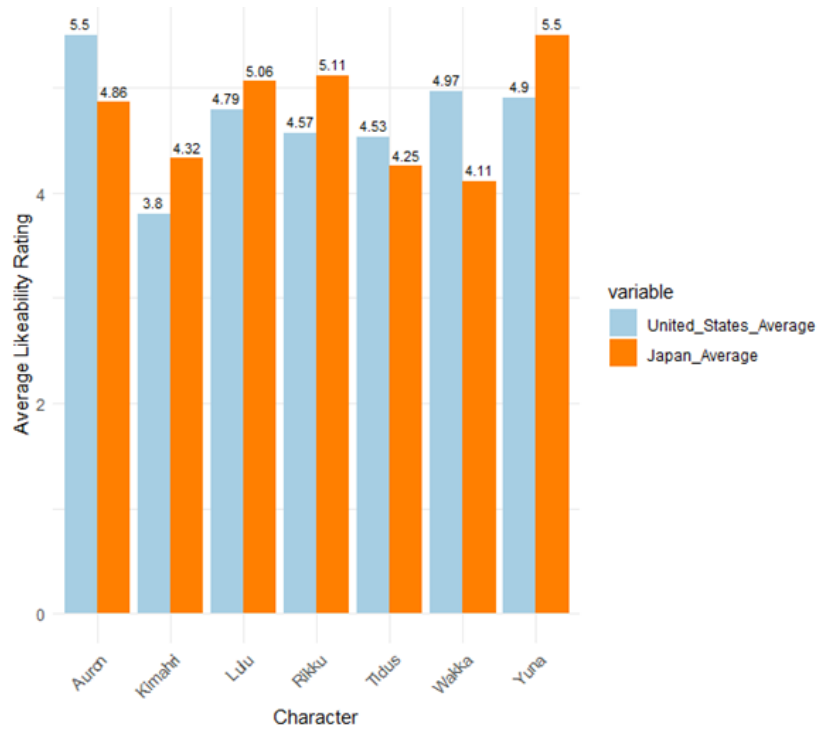


Figure 3. Average Likeability Scores of Characters in Final Fantasy X by Country

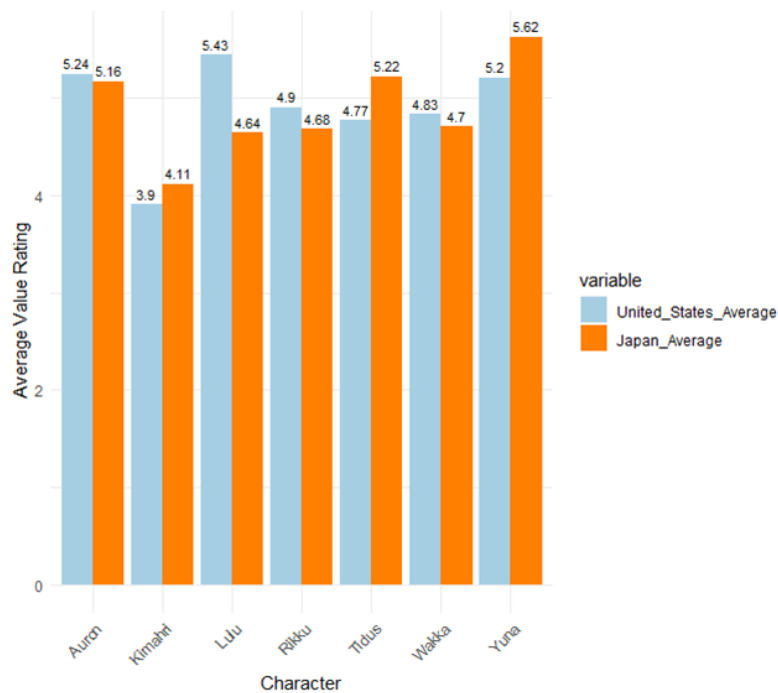


Figure 4. Average Value Scores of Characters in Final Fantasy X by Country.

In addition to the likeability of each character, data was also collected on the perceived value of each character, asking participants to rate each one in terms of strength and usefulness (Figure 4).

Experimental participants from the United States rated Lulu as the character with the highest value, averaging at

5.43. This suggests that US players found Lulu to be the most valuable character in terms of strength and usefulness. It is worth noting that Lulu did not secure the highest likeability ratings among US participants, American participants ranked this character fourth on likeability. Kimahri received the lowest value rating from US participants, with an average score of 3.90. This is congruent with the likeability ratings, where Kimahri also received one of the lowest likeability ratings among US players.

For participants from Japan, the character Yuna received the highest value rating, boasting an average score of 5.62. This indicates that Japanese players predominantly considered Yuna to be the most valuable character in terms of strength and usefulness. This observation resonates with the likeability ranking findings, where Yuna also received the highest likeability ratings in Japan. Kimahri also received the lowest value rating among Japanese participants, with an average score of 4.11. Kimahri also garnered one of the lowest likeability ratings in Japan, emphasizing a consistent pattern of perception.

To further explore the alignment of character preferences with cultural dimensions, Welch's t-tests were conducted on character ratings for both countries. The tests were used to identify whether there were significant differences in character likeability between Japan and the United States.

The analysis of only one character, Lulu, (Table 5) produced a significant p-value in the t-test ( $p=0.01938$ ). This means that there is a statistically significant difference in how Japanese and American players perceive the value of this character.

The statistical analysis illustrated noteworthy differences in character ratings for Lulu (in the context of value) and Yuna and Wakka (in the context of likeability). However, it's crucial to highlight that the majority of the characters, including Tidus, Kimahri, Auron, and Rikku, did not display statistically significant variances in either likeability or value ratings between the two countries. For example, this can be seen in the way participants from both countries ranked Kimahri very low in both categories. Consequently, the character ratings for these individuals do not reveal significant distinctions between the two countries concerning cultural dimensions of masculinity and femininity. Therefore, overall the null hypothesis (**H2-H0**) was accepted.

#### 4.3 Hypothesis 3 - Time Orientation (Long-term vs. Short-term)

The third experimental hypothesis was stated as :

**Hypothesis 3 - Time Orientation (Long-term vs. Short-term): H3** : Players' in-game choices and gameplay styles will reflect cultural differences in time orientation. Participants from cultures emphasizing long-term orientation, characterized by patience and persistence, will tend to prioritize characters and strategies that lead to sustained success in the game.

**H3-H0:** There is no significant relationship between players' in-game choices and their cultural time orientation.

This hypothesis expected that participants' character preferences and gameplay approaches would align with their cultural tendencies regarding time orientation. Cultures emphasizing long-term orientation prioritize patience and persistence, potentially leading to sustained success strategies in-game. Conversely, cultures with short-term orientation might favor strategies that yield immediate advantages.

This Hofstede dimension was assessed based on only one question from the structured survey. This question asked participants about how often they were thinking about how to best prepare their party within the game for future challenges.

A Welch t-test analysis of the answers to this question produced a p-value of 0.05423, indicating that while there is a notable difference in mean scores between Japan (mean = 5.43) and the United States (mean = 5.9), it falls just short of the conventional alpha level of 0.05 for statistical significance. Therefore, the null hypothesis (**H3-H0**) was accepted.

#### 4.4 Hypothesis 4 - Uncertainty Avoidance

The fourth experimental hypothesis was stated as :

**Hypothesis 4 - Uncertainty Avoidance: H4** : Players' character preferences and gameplay approaches will align with their cultural tendencies regarding uncertainty avoidance. Participants from cultures with high uncertainty avoidance will exhibit a preference for characters and strategies that minimize risks through research and preparation.

**H4-H0:** There is no significant relationship between players' character preferences and their cultural tendencies regarding uncertainty avoidance.

This hypothesis stated that participants' character preferences and gameplay approaches would align with their cultural tendencies regarding uncertainty avoidance. Cultures with high uncertainty avoidance seek security and structure, possibly leading to preferences for characters and strategies that minimize risks through research and preparation. Conversely, cultures with low uncertainty avoidance embrace ambiguity and novelty, potentially fostering more open experimentation and diverse character selections.

To assess this cultural dimension, participants were asked directly about how often they find themselves researching roles before assigning them to party members. Participants were also asked about their preferred style of play and their risk-taking pre-disposition. Japan, with a high uncertainty avoidance score of 92 on this cultural dimension (Figure 2), was expected to have more participants who agreed with this statement. In contrast, the United States had a lower score of 42 on this dimension.

The analysis employed Welch's t-test to examine if significant differences existed between the two groups. The results produced a significant p-value of 0.01465.

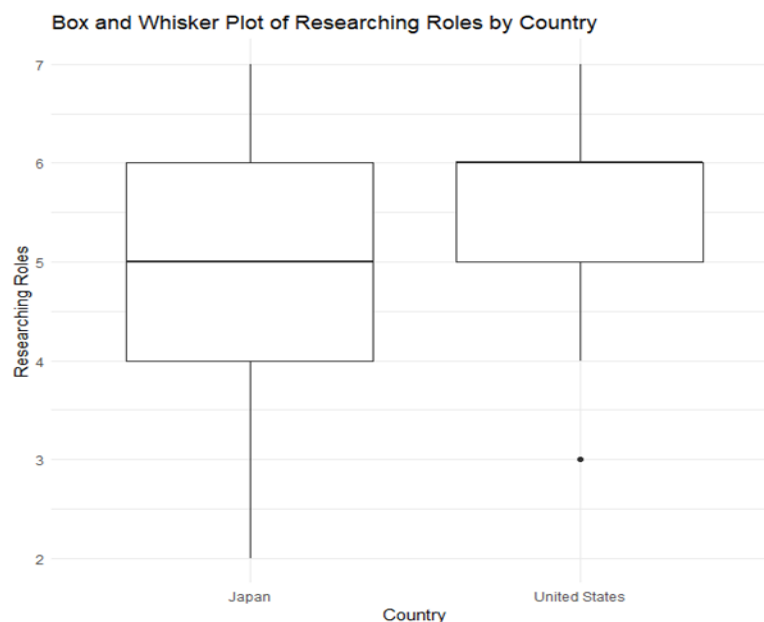


Figure 5. Box and Whisker Plot of How Participants Researched Character Roles by Country

As an additional exploration of cultural time orientation, the data analysis conducted also investigated participants' in-game decisions when facing challenges. The choice between reassigning different characters for immediate solutions and persistently working with assigned party members revealed more potential insights into individuals' tendencies toward short-term or long-term orientation.

The results of Welch's t-test in this case again showed significance and produced a p-value equal to 0.09703. Hence, those players favoring character reassignment for quick solutions exhibited short-term orientation, seeking immediate results. In contrast, participants opting to maintain their party members and persevere reflected long-term orientation, prioritizing preparation and persistence for future challenges.

#### 4.5 Hypothesis 5 - Restraint-Indulgence

The fifth experimental hypothesis was stated as :

**Hypothesis 5 - Restraint-Indulgence: H5 :** Players' in-game choices will reflect their cultural orientation regarding indulgence and restraint. Participants from cultures emphasizing indulgence will prioritize character choices that strictly align with favoritism, placing a stronger emphasis on their personal preferences

**H5-H0:** There is no significant association between players' in-game choices and their cultural orientation regarding indulgence and restraint.

Participants were asked to designate their main character when playing Final Fantasy X, reflecting their preferred avatar during gameplay. If experimental participants were more likely to play as the character they rated the highest in terms of likeability, this was marked as an expression of the Hofstede dimension of indulgence. If the participant experimental participants were more likely to play as the character they rated the

highest in terms of value, or strength, then this was deemed a choice made for practical reasons, reflecting the Hofstede dimension of restraint.

The results of a Pearson's chi-squared test with Yates' continuity correction revealed no statistically significant association between character choice (indulgence or restraint) and the participant's country of origin (Japan or the United States). The p-value obtained was 0.4322, indicating that there was no strong evidence to suggest a significant cultural influence on character selection based on likeability. Therefore, the null hypothesis ( $H_5-H_0$ ) was accepted.

In addition to character choice, a statistical analysis was undertaken of the participant's preferred playstyle, whether they played predominantly for fun, or employed a more cautious (conservative) playstyle. This analysis intended to determine if the participants had a preference for carefree enjoyment (indulgence) or meticulous gameplay considerations (restraint) based on their cultural backgrounds.

The responses revealed a neutral stance on this question with a p-value of 0.7686 in the Welch's t-test. This result suggests that, on average, participants from the two different countries did not strongly lean towards a preference for carefree enjoyment (indulgence) or meticulous gameplay considerations (restraint) based on their cultural backgrounds.

#### *4.6 Integrating Quantitative and Qualitative Findings*

This section combines the quantitative results from the structured survey and personality tests with qualitative insights derived from participant interviews, providing a more nuanced understanding of player decisions in Final Fantasy X.

The quantitative data collected through structured surveys and personality tests revealed distinct patterns in player behavior and preferences. For instance, the survey data indicated significant differences between Japanese and American players in terms of character preferences and gameplay styles. Specifically, the analysis showed that Japanese players favored characters like Yuna, who embodies supportive and nurturing qualities, whereas American players showed a preference for characters like Auron, who represents strength and authority.

The statistical analysis further highlighted cultural dimensions influencing in-game decisions. For example, participants from the United States, characterized by higher individualism scores, displayed a tendency to distribute resources equally among characters, contrasting with the collectivist orientation observed in Japanese players. Additionally, the significant p-values for certain characters, such as Yuna and Lulu, underscored cultural variations in perceived character value and likeability.

To contextualize these quantitative findings, qualitative insights were gathered through participant interviews. These interviews provided deeper explanations for the observed patterns and highlighted the personal and cultural factors influencing player decisions. Many Japanese players expressed a strong emotional connection to Yuna, citing her role as a healer and her narrative arc as resonant with their cultural values of harmony and support. One participant noted, "Yuna's dedication to her duty and her selflessness align with our cultural emphasis on community and helping others."

Conversely, American players frequently mentioned Auron's leadership qualities and his role as a protector as reasons for their preference. An American participant shared, "Auron's strong and silent demeanor represents the kind of hero I admire. He's someone who gets things done without needing to be flashy." These qualitative insights illustrate how cultural values and personal identification with character traits drive player decisions.

By synthesizing the quantitative and qualitative data, a more comprehensive picture of player behavior emerges. The quantitative analysis provides empirical evidence of cultural influences on player decisions, while the qualitative interviews offer contextual depth, explaining the 'why' behind the numbers. For example, the higher value and likeability ratings for Yuna among Japanese players are not merely statistical anomalies but reflections of cultural appreciation for supportive roles.

Similarly, the preference for characters like Auron among American players is rooted in cultural narratives of individualism and leadership. The equal distribution of resources by American participants, initially counterintuitive given their individualistic orientation, is better understood through interview feedback highlighting strategic gameplay considerations and a balanced approach to team management.

Combining these quantitative results with qualitative insights provides a richer, more detailed understanding of player behavior in Final Fantasy X. This holistic approach not only validates the research findings but also offers actionable recommendations for enhancing game design to cater to a global audience.

## 5. Discussion

In the current climate of migration and globalization, personality characteristics of individuals from different countries have received a growing interest. It has been suggested that country aggregate personality traits can provide an insight into the culture of a country. This idea fits well with the commonly held beliefs about strong and reliable differences in the national characteristics of countries (Barrett & Eysenck, 1984).

However, more recent research has repeatedly demonstrated that differences in personality traits between countries are small (Church, 2016). The data has demonstrated that the overall contribution to personality traits from countries was less than 2%. In other words, the relationship between a country and an individual's personality traits, however interesting, are small (Kajonius & MacGiolla, 2017).

The data from this study correlates well with the data from previous studies as none of the p-values for any of the personality traits measured are less than 0.05 (Table 2). This suggests that the results are not statistically significant, and hence there is little to distinguish personalities traits between participants from the Japan and the USA in this study.

The analysis of the experimental results will now be discussed in terms of each of the individual hypotheses.

### 5.1 Hypothesis 1 : Individualism-Collectivism

It's worth noting that while the United States scores higher in individualism (Figure 2), this does not imply that every participant adheres strictly to these cultural norms in their in-game choices. The diversity of player behaviors showcased a nuanced perspective. Participants from the United States did not uniformly prioritize individual characters but instead exhibited varied approaches and gaming styles, with some emphasizing group dynamics and others leaning toward individual character preferences.

Japan, with its collectivist cultural orientation (Figure 2), also showcased a spectrum of gameplay preferences. While collectivist norms in Japan encourage a sense of group loyalty, some participants from Japan expressed strong preferences for individual characters. This suggests that cultural dimensions, while influential, do not have a large impact in dictating in-game choices. The individual player's unique inclinations and personal gameplay experiences have a more significant impact on their character selection.

Interestingly, the only data that did produce a significant p-value, was when the participants were asked about how they distribute resources amongst party members (Table 3). Contrary to the expectations set by their respective scores on the individualism-collectivism dimension, the American participants were significantly more inclined than the Japanese participants to distribute resources equally between the game characters in their group.

This intriguing result highlights the complexity of cultural influences on in-game decision-making. While cultural dimensions provide valuable insights into societal tendencies, it's clear that individual choices can deviate from cultural norms.

### 5.2 Hypothesis 2 : Masculinity-Femininity

These findings provide interesting insights into how character preferences in the game align with cultural dimensions, specifically Hofstede's masculinity-femininity dimension. Given the hypothesis that Japanese players may prefer more aggressive and masculine character roles, since their country ranks higher on the masculinity scale (Figure 2), it is intriguing to observe that Wakka, a character often associated with athleticism and a "big brother" role, garnered lower likeability ratings in Japan.

Conversely, the high likeability of Yuna in Japan, a character characterized by nurturing and support, suggests that Japanese players may appreciate characters with feminine and supportive qualities, even in a culture with higher masculinity scores.

The significance of Wakka's ratings in the t-test results implies that this character's attributes or role may be perceived differently in Japan and the United States, which aligns with the hypothesis related to masculinity vs. femininity. Further analysis and qualitative research may help uncover the specific reasons behind these preferences and cultural variations in character likeability.

One of the most interesting observations from this experiment was the cultural contrast in the perceived value of Lulu. While she ranked as the most valuable character for participants from the United States, Japanese participants did not share the same sentiment. This difference in perception was validated through a statistical analysis employing a Welch t-test, which revealed a significant p-value of 0.01938 for Lulu's value rating.

These variations in character value ratings offer intriguing insights when considered alongside the examination of

character likeability. Notably, character likeability and value are closely intertwined aspects of player perception. For example, despite Lulu receiving high-value ratings in the United States, the character did not secure the highest likeability ratings in the same country. These findings underscore the multifaceted nature of player preferences and the intriguing interplay between liking a character and recognizing their value.

### *5.3 Hypothesis 3 - Time Orientation (Long-term vs. Short-term)*

Although we cannot decisively reject the null hypothesis, it is essential to recognize the intriguing nuance in the analytical results. Despite Japan's higher score on long-term orientation from their Hofstede dimension score, participants from the United States, on average, expressed a slightly higher likelihood of thinking about future challenges.

This unexpected observation emphasizes the complexity of cultural dimensions in shaping in-game preferences, where context and individual perspectives play integral roles. While the hypothesis did not yield definitive results, it again provides valuable insights into the intricate relationship between culture and gaming behavior.

### *5.4 Hypothesis 4 - Uncertainty Avoidance*

The borderline p-value from the Welch t-test indicates that there may be a relationship between cultural factors and gameplay styles. However, other factors or nuances might also play a role in participants' choices during Final Fantasy X gameplay sessions. This again underscores the complexity of in-game decision-making, which can be influenced by various factors beyond just cultural dimensions.

Therefore, while this hypothesis is not definitively rejected, there may be additional variables and considerations that contribute to players' in-game choices. This highlights the need for further exploration and a more comprehensive understanding of these dynamics.

### *5.5 Hypothesis 5 - Restraint-Indulgence*

While the statistical analysis did not identify a strong cultural influence on character choice, it is important to consider that individuals' preferences in gaming can be shaped by a multitude of factors beyond culture, including personal playstyles, gaming experience, and individual inclinations. The absence of a significant association does not negate the possibility that players from both Japan and the United States approach character selection in diverse ways influenced by their unique gaming experiences and styles.

## **6. Conclusions**

Group dynamics covers just a part of the Final Fantasy game series and the values and decisions in the game can be influenced by the players themselves. Some players might opt for different playstyles (casual or conservative), some may focus on a specific character, while others want to diversify their play through by utilizing all available resources to their maximum potential.

This experiment attempted to prove a statistically significant correlation between Hofstede's cultural dimensions and the decisions that players make when playing Final Fantasy X. Four of the five hypotheses resulted in a null hypothesis and did not show any correlation.

Only one hypothesis, Time Orientation (Long-term vs. Short-term), showed a significant correlation. This demonstrated that American players would tend to prepare for scenarios past their current episode or chapter in the game, with a mean score for Japan of 5.43 and the US of 5.90 (Table 3).

Cultural norms had a significant effect on the findings of this research. It is clear that game players from Japan and the US have different upbringings and understandings about many situations, whether they occur in a virtual or real-world environment.

For example, data showed that players in the US identify with more masculine characters rather than more emotional feminine characters. Auron (a strong male archetype) was the rated highest for likeability in America, whereas Yuna (an empathetic female character) had the highest rating on character likeability in Japan.

Another difference between the US and Japan was in the area of individualism. The US being more individualistic because they favored a much more "one character" playstyle, whereas Japan has more diversity and will have variations in group dynamics relative to team playstyles.

Nevertheless, the findings reported in this paper provide results that fall within or outside of group dynamics, whether it be due to cultural differences or an individual's personality.

### *6.1 Practical Implications for Game Developers*

The research outlined in this paper provides valuable insights that game developers can leverage to enhance the



cultural customization of narratives and game mechanics. By understanding how players' in-game decisions and preferences align with their cultural backgrounds, developers can create more engaging and resonant gaming experiences for a global audience.

One practical implication is the importance of incorporating diverse character archetypes and narratives that cater to different cultural values and preferences. For example, the research highlights how players from Japan and the United States exhibit varying preferences for characters based on cultural dimensions such as individualism-collectivism and masculinity-femininity. By designing characters and storylines that reflect these cultural nuances, developers can create more relatable and immersive experiences for players from different cultural backgrounds. This approach can also foster a deeper emotional connection between players and the game's characters, enhancing overall player satisfaction.

Another key implication is the need to tailor game mechanics to align with cultural preferences for gameplay styles. The study indicates that players from different cultures may have distinct approaches to resource management, risk-taking, and character selection. By offering customizable game mechanics that accommodate these preferences, developers can ensure that their games are enjoyable and accessible to a broader audience. For instance, developers can provide options for both conservative and dynamic playstyles, allowing players to choose the approach that best aligns with their cultural tendencies and personal preferences.

The research also underscored the importance of ongoing cultural sensitivity and inclusivity in game design. As cultural norms and values evolve over time, developers should remain attuned to these shifts and continuously adapt their narratives and mechanics to reflect the changing cultural landscape. This proactive approach can potentially help developers stay relevant and maintain a positive relationship with their player base. Additionally, engaging with diverse player communities and soliciting feedback can provide valuable insights that inform the development of more inclusive and culturally aware games.

## 7. Future Research

This experiment demonstrated that there was no significant difference between the personality types in different countries. The experiment also showed a very limited statistically significant correlation between Hofstede's cultural dimensions and the decisions that players make when playing Final Fantasy X.

However, there are many valuable opportunities for future research, that may contribute to a more nuanced understanding of the multifaceted group dynamics at play in the world of gaming.

Some suggested areas for future research include :

### *7.1 Expand the Sample Size of the Participant Population*

Expanding the sample size and diversifying recruitment are critical strategies for enhancing the statistical power and representativeness of any research project. When it comes to statistical power, a larger sample size could significantly reduce the margin of error, leading to more precise and reliable estimates of the population parameters. This would be important for detecting subtle effects and interactions that might otherwise be obscured in smaller, less robust samples. In studies examining complex phenomena like group dynamics in video games, having a larger and more diverse participant pool ensures that the findings are not merely due to chance or outliers but are genuinely reflective of underlying trends.

Diversifying recruitment goes hand in hand with expanding the sample size, as it ensures that the sample more accurately represents the diverse characteristics of the broader population. In the research described in this paper, examining player behavior in "Final Fantasy X," diversity in terms of gender, age, cultural background, and gaming experience can uncover nuanced insights that homogenous samples might miss. By including a wide array of participants, future researchers can identify patterns and correlations that are generalizable across different subgroups, leading to a more holistic understanding of the phenomena under study. This is particularly important when cultural dimensions, such as those proposed by Hofstede, may play a significant role in shaping behavior and preferences.

Representativeness is essential for the validity and credibility of future research findings in this field. When studies incorporate a diverse range of participants, the results are more likely to be applicable to real-world settings. This enhances the practical relevance of the research, allowing game developers, psychologists, and other stakeholders to make informed decisions based on robust and inclusive data. Ultimately, expanding the sample size and diversifying recruitment would not only strengthen the scientific rigor of the research but also ensure that future findings are meaningful and applicable to a wider audience, leading to more impactful and generalizable conclusions.

### *7.2 Adopting Non-Binary Gender Option in Demographics*

As discussed earlier in this paper, adopting non-binary gender options in demographic data collection is essential for improving both inclusivity and accuracy in research. By acknowledging and including non-binary individuals, future researchers would ensure that their studies reflect the full diversity of human experiences and identities. In the context of this research on group dynamics in Final Fantasy video games, recognizing non-binary identities can provide a more comprehensive understanding of how different players engage with the game. This inclusivity allows for a deeper exploration of how gender influences decision-making, playstyles, and character preferences, which might otherwise be overlooked if limited to a binary framework.

Including non-binary gender options could enhance the accuracy of the research findings. When demographic questions are limited to binary gender options, they fail to capture the experiences and perspectives of non-binary individuals. This omission can lead to skewed results and incomplete conclusions, as the data does not accurately represent the diversity of the population. By incorporating non-binary options, future research would more precisely reflect the complexities of gender and its impact on gaming behavior, leading to more valid and reliable findings.

Adopting non-binary gender options promotes ethical research practices by respecting participants' identities and fostering an inclusive research environment. When participants see their identities acknowledged and respected in the research process, they are more likely to feel valued and engaged. This, in turn, can lead to higher quality data, as participants are more willing to provide honest and thoughtful responses. Ultimately, incorporating non-binary gender options would not only advance the inclusivity of the research but also strengthen its scientific rigor, leading to a more nuanced and comprehensive understanding of the phenomena under study.

### *7.3 Examining Responses from More Countries*

Expanding the geographic scope of research to include more countries beyond Japan and the U.S. is crucial for a comprehensive understanding of cross-cultural dynamics. By incorporating a broader array of countries, future researchers can capture a wider spectrum of cultural influences and nuances that may not be evident when focusing solely on Japan and the U.S. This diversification would allow for the exploration of cultural dimensions and behavioral patterns that may vary significantly across different societies, enhancing the generalizability and applicability of the findings. In the context of the research on Final Fantasy X discussed in this paper, including more countries could reveal how different cultural backgrounds influence player behavior, decision-making, and group dynamics in video games, leading to more robust and globally relevant insights.

Additionally, including a more diverse set of countries can help identify universal patterns and unique cultural traits that might be overlooked in a more limited study. For instance, while Japan and the U.S. represent distinct cultural contexts, they do not encompass the full range of cultural variations found worldwide. By incorporating countries with varying levels of individualism, power distance, uncertainty avoidance, and other cultural dimensions, researchers can better understand how these factors interact and influence gaming behavior. This holistic approach could lead to the development of more inclusive and culturally sensitive theoretical frameworks, which can be applied not only to video game studies but also to other areas of social and behavioral research.

Expanding the research to include more countries can foster cross-cultural dialogue and collaboration among scholars, practitioners, and stakeholders. It could encourage the sharing of diverse perspectives and methodologies, enriching the overall quality and depth of the research in this novel field. This collaborative effort could potentially also contribute to the design of more inclusive and culturally aware video games, enhancing the gaming experience for players from different cultural backgrounds. Ultimately, including more countries in the study of cross-cultural dynamics in video games would not only strengthen the scientific rigor of the research presented here but also promotes a more inclusive and global understanding of human behavior and interactions.

### *7.4 Replicating the Study with Other RPG titles*

Replicating the study described in this paper with other RPGs or Final Fantasy titles is important to validate and extend the findings of the research. By conducting similar studies with a broader range of RPGs, researchers could determine whether the observed patterns and correlations found in Final Fantasy X are unique to that game or are generalizable across different titles within the genre. This cross-verification is essential for establishing the reliability and robustness of the initial findings in this paper, ensuring that they are not merely artifacts of the specific game mechanics, narrative, or player base of Final Fantasy X. Furthermore, exploring other Final Fantasy titles, each with its unique set of characters, storylines, and gameplay dynamics, could, in turn, provide

deeper insights into how different elements of game design influence player behavior and decision-making.

Replicating the study across various RPGs could also help identify the underlying principles that govern group dynamics, player preferences, and decision-making processes in video games. Different RPGs often emphasize distinct aspects of gameplay, such as strategic combat, character development, or immersive storytelling. By examining how players engage with these elements across multiple titles, researchers may be able to develop a more comprehensive understanding of the factors that shape player behavior. This knowledge could then be applied to inform game design, creating more engaging and inclusive gaming experiences that cater to a more diverse audience.

Expanding the study to include other RPGs or Final Fantasy titles would also allow for the exploration of broader cultural and demographic influences on player behavior. Each game may attract a different player demographic, and studying these variations would provide valuable insights into how factors such as age, gender, and cultural background impact gaming preferences and decision-making. By capturing a wider range of player experiences, researchers can ensure that their findings are representative and applicable to a global audience, ultimately contributing to the development of more culturally aware and inclusive video games. Overall, replicating the study with other RPGs or Final Fantasy titles is a crucial step towards validating the research described in this paper, enhancing our understanding of player behavior, and promoting inclusivity in the gaming industry.

#### *7.5 Address How Cultural Shifts Over Time May Influence Player Behaviour*

Future research addressing the longitudinal aspects of the research conclusions would be essential to understanding how cultural shifts over time might influence player behavior. Longitudinal studies would involve repeated observations of the same variables over extended periods, allowing researchers to track changes and trends. In the context of the Final Fantasy X study described in this paper, this approach can provide valuable insights into how players' behavior and decision-making processes evolve as they age and as cultural norms temporally shift.

Incorporating a longitudinal design aspect into the experimental procedure described in this paper would enable researchers to observe how players' preferences and playstyles change with the passage of time. As societal values and cultural dimensions evolve, individuals' in-game decisions may reflect these shifts. For example, changes in attitudes toward gender roles, individualism, and risk-taking behavior could influence how players approach character selection and gameplay strategies. By collecting data at multiple points in time, researchers can identify patterns and trends, providing a more comprehensive understanding of the factors driving player behavior.

An examination of these longitudinal aspects would allow for the exploration of generational differences in gaming behavior. Cultural shifts often occur gradually and may be more pronounced in younger generations. By studying different cohorts over time, researchers can compare the behaviors and preferences of players who grew up in different cultural contexts. This can reveal how changes in societal values and technological advancements impact gaming experiences and player interactions. For instance, younger players who are more accustomed to inclusive and diverse representations in media may approach character selection and group dynamics differently than older players.

One additional aspect of addressing the longitudinal aspects of the research is that it could help to validate and extend the initial findings. By replicating the study at different time points and in different cultural contexts, researchers could assess the stability and generalizability of their conclusions. This approach would allow for the investigation of potential moderators and mediators of the observed effects. For instance, researchers could explore how changes in gaming technology, industry trends, and player demographics influence the relationship between cultural dimensions and in-game decisions.

In conclusion, incorporating a longitudinal perspective into the study of Final Fantasy X player behavior potentially offers valuable opportunities to explore the dynamic nature of cultural influences. By tracking changes over time, researchers can gain a deeper understanding of how cultural shifts shape player preferences and decision-making processes, again ultimately contributing to the development of more inclusive and culturally aware video games.

#### *7.6 Examining Links Between Group Dynamics and Narrative*

Examining the links between group dynamics and narrative aspects in games presents an interesting avenue for future research, particularly in the context of Final Fantasy X. As the game's narrative unfolds, the group dynamic among characters can undergo significant changes, influenced by character development, plot twists,

and evolving relationships. Future studies could investigate how these narrative elements impact players' decisions regarding group composition and the roles assigned to different characters.

One area of focus could be the impact of character arcs on group dynamics. As characters in Final Fantasy X grow and develop, their abilities, motivations, and interactions with other characters evolve. Researchers could investigate how these changes influence players' strategies and preferences in forming their teams. For instance, a character's personal growth or pivotal moments in the narrative might make them more appealing or essential to players, leading to shifts in group composition and dynamics.

Future research could explore how different narrative structures and storytelling techniques affect group cohesion and decision-making. Final Fantasy X utilizes a Kishōtenketsu narrative structure, which emphasizes character growth and development. By examining how players respond to this structure and comparing it with other narrative styles, researchers can gain insights into how storytelling influences group dynamics in RPGs. This could also include studying how players' emotional connections with characters, driven by narrative elements, impact their in-game decisions and group cohesion.

More longitudinal studies could be conducted to track changes in group dynamics over the course of the game. By observing how players' teams evolve as the narrative progresses, researchers can identify patterns and factors that drive these changes. This approach would provide a deeper understanding of the interplay between narrative development and group dynamics, offering valuable insights for game developers aiming to create more engaging and dynamic gaming experiences.

### *7.7 Distribution of Resources*

Examining the distribution of specific resources within player groups presents a valuable avenue for future research in the context of Final Fantasy X and other RPGs. Understanding how players allocate items, spells, and other resources among their characters could potentially provide deeper insights into player behavior, strategic decision-making, and cultural influences on gameplay.

One area of focus could be to investigate the factors that drive players' decisions when distributing resources. For example, researchers could explore how players prioritize certain characters over others based on their perceived strengths, roles, and narrative significance. This could involve analyzing whether players tend to favor characters they identify with, those who are essential to the storyline, or those with specific abilities that complement their gameplay style. By examining these factors, researchers can gain a better understanding of the motivations behind resource allocation and how they vary across different player demographics and cultural backgrounds.

Another area of future research could explore how resource distribution evolves over the course of the game. As players progress through the narrative and face increasingly complex challenges, their strategies for allocating resources may change. Longitudinal studies could track players' resource distribution patterns over time, identifying trends and shifts in their decision-making processes. This approach can reveal how players adapt their strategies in response to changing game dynamics, character development, and the evolving storyline.

Following on from the work described in this paper, researchers could examine the impact of cultural dimensions on resource distribution. Building on the insights from the current research, future studies could investigate how cultural factors such as individualism-collectivism, uncertainty avoidance, and power distance influence players' resource allocation strategies. For instance, players from collectivist cultures may be more inclined to distribute resources evenly among their characters to maintain group cohesion, while players from individualistic cultures might prioritize certain characters based on their personal preferences and gameplay goals. By exploring these cultural influences, researchers can provide game developers with valuable insights to design more culturally aware and inclusive gaming experiences.

In summary, future work examining the way players distribute specific resources within their groups can offer a deeper understanding of player behavior and cultural influences in RPGs. By investigating the motivations behind resource allocation, tracking changes over time, and exploring cultural dimensions, researchers could uncover valuable insights that enhance both the academic understanding of gaming and the practical development of more engaging and inclusive games.

### **Acknowledgments**

Not Applicable

### **Authors' contributions**

Annabel Sharrin, Joel Betancourt, and Jeffrey Zhang are masters students on the Human-Computer Interaction program at SUNY Oswego. These students undertook the research work described in this paper, under the

guidance of two professors, Damian Schofield & John Lindstedt. All authors read and approved the final manuscript.

**Funding**

Not Applicable

**Competing interests**

Not Applicable

**Informed consent**

Obtained.

**Ethics approval**

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

**Provenance and peer review**

Not commissioned; externally double-blind peer reviewed.

**Data availability statement**

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

**Data sharing statement**

No additional data are available.

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