A Cross Cultural Study Comparing Dutch and Chinese on Game Motivation and Sense of Responsibility

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Preface

Dear reader,

Thank you for taking the time to read this thesis. Many hours went into this research, and I'm proud to present you the final version.
I would like to thank Sam van Oosterhout for critically reviewing this work, and Eriko Fukuda for her continuous feedback during the time of writing. Without these two, this could have been a very different thesis (not in a good way, I might add). Furthermore, I would like to thank Lane Xu for helping me with finding Chinese respondents for this research, and many of my friends (you know who you are) for helping me with the Dutch respondents.

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In this work we investigated if the relationship between video game motivation and sense of responsibility is moderated by country. No literature is available concerning this combination of topics, however previous studies show that these may be connected (Bialas, Tekofsky, & Spronck, 2014; Burton, Farh, & Hegarty, 2000; Fridenson-Hayo, et al., 2017; Lee & Wohn, 2012; Meya & Eisenack, 2018). To answer the research question, a survey was conducted amongst Dutch and Chinese people for a cross-cultural comparison. Results showed that there was indeed a connection between sense of responsibility and game motivation, as well as game motivation and country. However, a moderation effect does not seem likely. Still, these results bode well for video game research as these insights provide new paths for future research.

1. Introduction

The video game market has been growing steadily since 2015 and the number of players keeps increasing. The specific reasons why an individual plays video games are still a grey area as there are many reasons for someone to play a video game. For instance, a player plays games to relax, enjoy a story or the feeling of achievement when winning. With the increasing amount of time individuals spend on playing video games, it is essential to explore why people play video games and how they differ in the way they play.

Most of the research done on playing (online) video games has been focused on its risks and probable disadvantages (Ng & Wiemer-Hastings, 2005; Peters & Malesky Jr, 2008; Wang & Chu, 2007). These studies mainly highlight the risks of video game addiction and the increasing amount of time spent on playing (online) video games. Fewer studies have shed light on the advantages (Griffiths, 2010; Ng & Wiemer-Hastings, 2005; Wang, Khoo, Liu, & Divaharan, 2008). These studies discuss the intrinsic motivations for playing video games and the differences between addiction and excessive gaming. Specifically, excessive gaming does not mean that someone has an addiction to playing video games. This purely depends on the player's motivation and context. Unfortunately, most studies define only the negatives or positives and attribute this to gaming or parts of it being either wholy bad or good. Gaming cannot simply be labeled as good or bad (Demetrovics et al., 2011). Instead, exploring the motivational perspective of gamers and their needs for playing video games will yield more specific insights instead of labeling gaming as good or bad.

Kahn et al. (2015) defined six dimensions for video game motivations (e.g. socializers, completionists, competitors, escapists, story-driven, and smarty-pants) that could categorize a player into one or a combination of these dimensions, taking into account a player's cultural background. However, these dimensions have not been used in a (cross-cultural) study before, apart from its own validation study.

Moreover, gaming motivations are often linked to a player's personal traits (Klimmt & Hartmann, 2006; Frostling-Henningsson, 2009; Demetrovics, et al., 2011), but seldom to their sense of responsibility (Chiou & Wan, 2007; Meya & Eisenack, 2018). Sense of responsibility is a factor when growing up (e.g. doing your assigned house chores or studying), meaning that it develops as you grow older. Although it is shown that personal traits are part of a player's motivation to play video games, this is not the case for sense of responsibility. Therefore, the central goal of this research is to address if game motivations can be correlated with someone's sense of responsibility.

Studies done combining sense of responsibility and gaming only highlighted the aspect of gaming that taught personal values and responsibility (Schwartzman, 1997; Chiou & Wan, 2007). There is currently no research that studies correlation between sense of responsibility and gaming motivations.

To focus the study, the Netherlands and China were chosen for cross-cultural comparison. These two countries were chosen for their considerable differences in cultural dimensions (Hofstede, 2001; 2018), and the accessibility of both target groups.

As the research question is further specified, the following research question is presented: *Does the difference in gaming motivation between Dutch and Chinese people affect their sense of responsibility?*

The lack of (recent) cross-cultural video game-related studies and the lack of correlational studies between sense of responsibility and game motivations are the two gaps in literature that this study hopes to fill with the proposed research question.

This study intends to be conducive to the advancement of scientific research by investigating if gaming motivations and sense of responsibility are moderated by culture as there is little to no research done combining these variables. Moreover, exploring motivations of gamers may yield new insights that could be useful for video game companies.

2.Theoretical Framework

The theoretical framework presents literature that explains and discusses the variables used in this study. First, it explores gamer target demographics (section 2.1), gaming motivation theories and different studies that researched why people play video games (section 2.2). Previous studies about gaming motivation scales will be addressed, as well as other variables that affect game motivation (section 2.2.1). Second, sense of responsibility theories are addressed (section 2.3). Specifically, definitions, studies combined with game motivations (section 2.3.1), and previous developed scales (section 2.3.2). Next, cultural differences are discussed, specifically the collectivism versus individualism dimension, comparing the Netherlands and China (section 2.4). Furthermore, culture is addressed with gaming motivations and sense of responsibility (section 2.4.1, section 2.4.2). At last, it discusses the created hypotheses to answer the research question (section 2.5).

2.1 Target Demographics

The video game industry is one of the fastest growing industries around the world. In Western Europe, two out of three people play video games on a regular basis (Lai, 2017), with over 266 million gamers. In the Netherlands specifically, three out of four people aged eight years or older play video games regularly (Warman, 2008). These numbers may possibly have increased over time as the video game industry is still growing worldwide. In China the industry is rapidly growing with increased revenue every year (Ernkvist & Ström, 2008). China, being the largest market for video games worldwide, has one out of three people play video games on a regular basis (Lai, 2017) with over 461 million gamers in total.

Gamers, younger people aged 18-24, appear to purchase the most video games compared to people above and below this age category (Earnest.com, 2015). This could indicate that mainly students buy and play video games the most compared to others. Moreover, demographics about respondents from previously done studies (Yee, 2006; Ong, Deolalikar, & Peng, 2015; Tekofsky S. ,2016; 2017,) showed the same age range on average (15-25 years old) with the largest group being male (about 80%), confirming the overlap between age groups among multiple studies. As age significantly affects the way people play video games (e.g. gameplay) (Tekofsky, Spronck, Goudbeek, & Broersen, 2013), this study will stay in range of this group (18-30) but will not differentiate in gender.

2.2 Why People Play Games

This section lays out relevant studies related to game motivation. With game motivation, we signify the specific reason why someone plays a video game. For instance, playing with friends or competition.

Klimmt and Hartmann (2006) found out that people play games both for ‘effectance motivation’, the drive to have an effect on your environment through your own efforts, and self-

efficacy, one's belief in one's ability to succeed in specific tasks. However, these are general motivation and do not account for cultural differences or individual motivations that Bartle (2004) and Yee (2006) researched. They studied motivations per individual and not general motivations. To be more specific, general motivations apply to every gamer, while individual motivations differ from person to person.

For example, Yee (2006) researched Massively Multi-User Online RolePlaying Games (MMORPGs) and found out that these kind of video games are not simply a pastime for its gamers, but a valuable platform where they could interact with others on a daily basis. These intrinsic motivations are not necessarily related to the general motivations reported by Klimmt and Hartmann (2006), but the need for interaction with other gamers is a specific game motivation.

In addition, Henningsson (2009) studied motivations for online first-person-shooter and role-playing game players through interviews and observations. His results showed that social aspects of playing, namely cooperation and communication, were the main motivations for gaming in addition to escapism in these specific game genres. This indicates that for these type of games, completely different motivations except for escapism were discovered.

A gamer's play style is related to these specific motivations. A study conducted by Tekofsky (2017) showed that both game behavior and a gamer's play style are related to motivation. An example of this could be that one gamer could be more focused on gathering items, while another is more focused on completing quests as quickly as possible, thus showing that different kinds of players get motivated by playing the same games with a different focus.

Bartle (2004) associated four different playing styles with the motive to play video games (i.e. socializers, explorers, achievers, and killers). Yee (2006) tested these four styles with a 40-item questionnaire (e.g. "How important is it you to level up as fast as possible?") on a sample of MMORPG players. The sole purpose of this study was to further research the game motivation dimensions described by Bartle (2004). However, the results of the analysis showed that there were 10 different motivational dimensions instead of four. These dimensions were instead of achievement: advancement, mechanics, and competition. Instead of social: socializing, relationship, teamwork, and explorers. Instead of killers (Yee defined those as immersion): discovery, role playing, customization, and escapism. Moreover, the results also suggested that the dimensions are not mutually exclusive and that it is possible that multiple categories can characterize a player.

Next, Demetrovics et al. (2011) studied the motivational aspects related to playing video games. The results of this study confirmed their preliminary model as they identified seven motivational factors (e.g. social, escape, competition, coping, skill development, fantasy, and recreation). Demetrovics et al. (2011) used a 27-item questionnaire, named Motives for Online Gaming Questionnaire (MOGQ). Compared to Yee (2006), Demetrovics et al. combined several features into a single dimension such as socializing, relationship, and teamwork into social. Moreover, Demetrovics et al. added new factors such as recreation. Note that Yee (2006) studied MMORPG

players, while Demetrovics et al. (2011) studied online gaming as a whole, making this a more generalized study. Demetrovic et al. claimed that the dimensions defined by the MOGQ seemed to cover the full range of possible motives with online gaming.

Finally, Kahn et al. (2015) claims that game motivation scales are often limited by their focus on specific game genres or player culture. Therefore, they validated their Player Motivation (PM) scale across two distinct gaming genres (multiplayer online battle online arena (MOBA), and massively multiplayer online (MMO) and cultures (North American and Chinese). The game motivation scale consists of six different dimensions (e.g. socializers, completionists, competitors, escapists, story-driven, and smarty-pants) which gamers are grouped into. After this study, a 20-item validated scale (reduced from 104) remained, that will also be used in this study. In comparison to Yee (2006) and Henningsson (2009), who used MMORPGs, online first-person-shooters, and role-playing video game genres in their studies, the Player Motivation Scale by Kahn et al. (2015) does not differentiate between video game genres. Moreover, it does not differentiate between online and offline gaming compared to Demetrovics et al. (2011). As mentioned before, it does not differentiate between culture either, therefore making the Player Motivation Scale suitable for this study.

2.2.1 Other Variables that Affect Game Motivation

Besides effectance motivation, self-efficacy, and preferred play style, there are other variables that affect game motivations. Those are gender, and age (Tekofsky, Miller, Spronck, & Slavin, 2016). When looking at video games as a whole, gender shows that males prefer competition-based games, whereas females prefer role playing games for immersion and social interaction (Tekofsky, Miller, Spronck, & Slavin, 2016). This indicates that males are more likely to be achievers or killers, while females are more likely to be explorers or socializers according to Bartle's gaming motivation dimension theory. Age showed that gaming performance decreased when players grow older (Tekofsky, Spronck, Goudbeek, & Broersen, 2013). Research done by Tekofsky, Spronck, Goudbeek, and Broersen (2013) showed that age also influences play style significantly. This indicates that as a gamer grows older and their performance decreases, they could change how they play video games. Therefore, it might be possible for someone to become more of an explorer than an achiever as age increases.

Additionally, Ong, Deolalikar, and Peng (2015) discovered that the different play styles from gamers can be clustered together. For instance, based on the kind of character the gamer played, the way they behaved and the people they played with. This data, can then be used to predict game based outcomes, specifically winning rates fairly well.

2.3 Sense of Responsibility

This section discusses the sense of responsibility variable. First, it explains what is meant by sense of responsibility (section 2.3). Second, the development of the Student Responsibility Scale is

described (section 2.3.1). Finally, section 2.3.2 lays out relevant literature that includes sense of responsibility and game motivation.

Heider (1958) conducted early analysis of personal sense of responsibility and outlined that responsibility is based on causality (i.e. what was done) and expectations (i.e. what should have been done). Later, Lickona (1991) defined personal responsibility more broadly; 'taking care of self and others, fulfilling our obligations, contributing to our communities, alleviating suffering, and building a better world.' Another theoretical framework for understanding personal responsibility is the Triangle Model of Responsibility by Schlenker et al. (1994). In this model, personal responsibility is described as the combined strength of three elements; prescriptions (i.e. rules for conduct), events (i.e. units of action), and identity (i.e. actor's roles, qualities, commitments, and pretensions).
A literature review done by Mergler (2017) showed that there is a strong commonality in the definitions of personal responsibility, namely, self-control of behavioral choices is a key component.

2.3.1 Gaming Motivations and Sense of Responsibility

This section lays out the few studies that are related to sense of responsibility and gaming motivation. The lack of related studies is another gap in literature this study hopes to fill.

A study trying to reduce online gaming addiction (Chiou & Wan, 2007), showed that sense of responsibility was a key factor in changing gaming behavior among young gamers. Their experiment revealed that adolescent players who felt a strong sense of responsibility appeared to exhibit greater attitude change and were more effective in trying to reduce online gaming addiction compared to adolescent players who did not have a strong sense of responsibility.

On the other hand, gaming motivations influence sense of responsibility as well. A study by Meya and Eisenack (2018) proves that gaming increases the sense of personal responsibility in a situation where the game has a purpose of informing its players of climate change. Even though climate change is not relevant for this study, it still indicates that an informative game can influence the sense of responsibility of a gamer.

2.3.2 The Student Personal Responsibility Scale

This section lays out different responsibility scales. Specifically, this section discusses why some responsibility scales are not fitting for this study and explains why the Student Personal Responsibility Scale-10 is fitting and is thus used in this study.

Most of the existing measures of responsibility were examined and found to be irrelevant to the students or younger gamers mentioned in section 2.1, or part of comprehensive personality inventories (Singg & Ader, 2001; Mergler, 2017). Mostly because those measures were for adolescents (i.e. people aged 10-19) (Mergler & Shield, 2016), which are too young for this study, or because they were combined with other variables such as politics or health (Criswell, Owen, Thornton, & Stanton, 2016; Kannan, Brown, Kunitz, & Chapman, 2019) A more appropriate scale for this study

is the Personal Responsibility Scale (PR) by Martel, Mckelvie and Standing (1987). However, this scale had 30 items and the sample used was small which may have affected results. Singg and Ader (2001) attempted to improve this scale. This resulted in the 28-item Student Personal Responsibility Scale (SPRS), where seven items were used from the questionnaire developed by Martel, Mckelvie and Standing (1987). Later, the scale was reduced to 10 (SPRS-10). Their results were consistent with the Triangle Model of Responsibility by Schlenker et al. (1994), as "personal responsibility involves certain prescribed behaviors that lead to goal achievement (i.e. academic success), which influences self-evaluation (i.e. self-esteem via transfer of information from the event to the actor), which – in turn – may strengthen the link between prescribed behaviors and academic success" (Singg & Ader, 2001). The SPRS-10 is used in this study, as it is relatively short and fits the target group best. Singg and Ader (2001) claimed that the SPRS-10 is validated ($\alpha = .74$) and has an acceptable level of consistency as the scale highly correlated with the 20-item version ($r(280) = .80$, $p < .01$).

2.4 Culture

The last section of the theoretical framework discusses the Hofstede culture dimensions and combines it with the previously mentioned variables sense of responsibility and game motivation.

The growing video game industry shows the percentage of gamers is increasing, but not the cultural differences in gaming behavior or motivation between countries. Are gamers a homogeneous group or are there significant differences between countries? Culture dimensions from Hofstede Insights (2018) display cultural differences between nations and are used in this study to compare countries. The dimensions are as followed: power distance, individualism versus collectivism, masculinity versus femininity, uncertainty avoidance, long-term versus short-term orientation, and indulgence. Two countries with significant differences on those dimensions are the Netherlands and China.

The biggest difference when comparing the two countries is on the individualism versus collectivism dimension where China is a more notably collectivistic country (scoring 20), whereas the Netherlands is an individualistic country (scoring 80). A high score on the individualism scale indicates that the people living in the country think more in 'I' form instead of 'we'. Moreover, Individualist societies people are supposed to look after themselves and their direct family only. In Collectivist societies people belong to 'in groups' that take care of them in exchange for loyalty.

The second largest difference is on the masculinity vs femininity dimension, where China scores high on masculinity (66, compared to 18 from the Netherlands). A high score on the masculinity dimension indicates that the country will be driven by achievement, success, and competition. A low score on this dimension indicates that the dominant values in society are caring for others and quality of life (Hofstede, 2018). Overall, the two countries differ greatly on four out of six dimensions (power distance, individualism versus collectivism, masculinity versus femininity, and indulgence) and therefore, its people might have different cultural values on average.

For that reason, one could expect a difference between gamers from the Netherlands and China as culture might influence their behavior or motivations to play video games. For instance, a Chinese gamer might be more of a competitor (on average, compared to a Dutch gamer) since his/her cultural background indicates a high score on the masculinity dimension, meaning that he/she could be more driven by achievement, success, and competition.

2.4.1 Game Motivation and Culture

This section combines culture with gaming motivations. No previous study is available that does a country comparison between the Netherlands and China. It is another gap in video game research.

Fridenson-Hayo, et al. (2017) studied the relationship between gaming and autistic children in a cross-cultural setting. In Israel, Sweden, and the UK, the results of this study showed that serious gaming helped autistic children in developing their body language and integrating certain tasks in their daily routine, another advantage of playing video games. Results varied slightly across countries.

Williams, Yee and Caplan (2008) examined gamer stereotypes and their results defied the common stereotypes. For instance, gamers from their sample had lower BMI scores than the average population. Moreover, cultural orientation (i.e. country of origin) seemed to play a role in the differences as the game playing sample proved to be culturally different than mainstream U.S. society. To be more precise, the study sample was compared to general population of the U.S., and "the health attitudes and religious values differences suggest that the playing population is in some ways culturally different than mainstream U.S." (Williams, Yee, & Caplan, 2008). Williams, Yee and Caplan (2008) state that personal values, cultural norms, or perhaps even generational differences may be factors why their research results defied common stereotypes.

Furthermore, a study by Lee and Wohn (2012) examined whether cultural orientation (i.e. country of origin) affects how people play and interact through social network games. The outcomes were minor, as people's expectations of outcome influenced playing patterns. Specifically, instead of cultural orientation, it seemed that people's expectations influenced playing patterns. However, culture seems to play a small but significant role in explaining why people play (social network) games and how they play them. To be more specific, cultural orientations do not directly affect social network game (SNG) usage patterns, but affects people's expected outcomes of playing SNGs, which in turn affects different usage patterns.

Lastly, play style of gamers is different across cultures (Bialas, Tekofsky, & Spronck, 2014). Research showed that on levels of competitiveness, cooperation, and tactical choices there were notable differences. For instance, German and Swedish players were more cooperative than players from the United Kingdom and United States (Bialas, Tekofsky, & Spronck, 2014). No insights from this study are available comparing the Netherlands and China as this aspect has not been researched yet.

2.4.2 Sense of Responsibility and Culture

This section combines culture with sense of responsibility, discussing relevant studies that included both these variables.

Research conducted by Burton, Farh, and Hegarty (2000) found out that there are cultural differences related to corporate sense of responsibility. U.S. and Hong Kong students were compared to each other. Many differences were found in the four corporate types of responsibilities (e.g. economic, legal, ethical, and discretionary) that were considered most important. Specifically, Hong Kong students thought economic responsibilities were more vital than non-economic ones, compared to the U.S. students.

Moreover, Mosier and Rogoff (2003) studied U.S. and Guatemalan Mayan mothers, and found out that there is a cultural difference when raising toddlers in the way they teach their children local systems of autonomy and responsibility. The children learn how to participate in their own community, their approach to freedom, and social responsibility. This could indicate that a sense of responsibility is being taught and therefore differs across culture.

Research by Gaertner and Schwettmann (2007) showed that between European countries there were significant differences related to personal responsibility explained by cultural differences. Participants of this study were given certain situations where their help was needed (e.g. support the poor in Afrika, help a handicapped person). In half of these cases, responsibility and cultural background influenced the amount of money donated or willingness to help. German, Austrian and Slovenian students were compared in this longitudinal study, were differences converged a little over time. Still, cultural differences still remained.

Another part of responsibility, filial responsibility (responsibility towards family, e.g. caring for them when they become older), was researched by Santoro et al. (2016). The findings demonstrated that culture and ethnicity affect health evaluations and caregiving decision making. Similar to the research from Gaertner and Schwettmann (2007), participants were given certain situations where they had to make decisions related to helping people (e.g. hiring a health advocate for a family member, deciding the perceived need of help). Results show that there was no difference in culture when deciding to hire a health advocate, but there were differences in the perceived need of help were found across different ethnic groups (White, Black, Asian/Pacific) in the U.S.

In short, we can assume that a sense of responsibility is different in some aspects related to culture (e.g. education, upbringing), and is possibly learned when growing up.

2.5 Hypotheses

To answer the research question; “Does the difference in gaming motivation between Dutch and Chinese people affect their sense of responsibility?”, three hypothesis were created.

H1: *A sense of responsibility is associated with gaming motivation*.

This hypothesis is created as studies show that there may be a connection between sense of responsibility (i.e. 'taking care of self and others, fulfilling our obligations, contributing to our communities, alleviating suffering, and building a better world.' (Lickona, 1991)) and game motivation (i.e. reasons to play video games) (Chiou & Wan, 2007; Meya & Eisenack ,2018), but has not been confirmed yet. Specifically, a sense of responsibility could affect behavior, and therefore affect game motivation.

H2: *Chinese people have different gaming motivations compared to Dutch people.*

As shown by Hofstede Insights (2018), the Netherlands and China have different levels of cultural values. Several studies showed that cultural orientation affected the outcomes of their respective studies. For instance, play style is different across cultures affecting levels of cooperation, competitiveness, and tactical choices (Bialas, Tekofsky & Spronck, 2014). The second hypothesis tries to explore if game motivation is different across culture as well, since play style is affected by motivation (Tekofsky, 2017).

H3: *The relationship between one's gaming motivation and their sense of responsibility is moderated by culture.*

The third hypothesis combines all three to check if culture plays a moderating role between game motivation and sense of responsibility. As sense of responsibility is learned when young (Mosier & Rogoff, 2003) and this is learned differently across cultures, one may expect a relation between these two.

3.Methodology

This chapter describes the chosen methods to answer the formulated hypotheses in the previous section. It starts with the design of the survey and the different measures that were used to construct the survey (section 3.1). The second section discusses the way the survey is distributed (section 3.2). Details of the survey sample are laid out in the third section (section 3.3). This chapter concludes with information about the preparation of the data (section 3.4).

3.1 Survey Design and Measures

The survey was created in English for both Chinese and Dutch people. Games are mainly played in English in the Netherlands. Therefore, we can expect at least a basic level of English from Dutch gamers. To establish the same baseline for Chinese gamers, Chinese gamers were given the same English survey. To confirm, the perceived level of English is asked. People aged between 18 and 30 were analyzed from the survey sample (see section 2.1). The structure of the survey consists of the following four parts and are randomized for respondents to account for possible tiredness at the end of the survey.

1) The first part consists of seven demographic questions. Respondents were asked about age, gender, education level, perceived level of English, gaming hours per week and gaming platform. The education level question was split as the Netherlands and China have different school systems.
2) The second part consists of 15 items, the complete Player Motivation Scale (PM Scale) by Kahn et al. (2015) using a 5-point Likert scale (1 = totally disagree up to 5 = totally agree). The scale measures player motivations and categorizes the respondent into one or a combination of the six motivation dimensions (e.g. Story-driven, Competitor). Examples from the scale are: 'I like to chat with my friends while playing a video game', and 'I like to master all elements of a game'.
3) Next, respondents answered 10 items of the Student Personal Responsibiliy Scale-10 (SPRS-10) by Singg and Ader (2001) using a 4-point Likert scale (1 = 'Most always like me' up to 4 = 'Most never like me'). The scale measured how high the sense of responsibility is from the respondent. Examples from the scale are: 'when I borrow something I fail to return it', and 'I turn all my assignments in on time'.
4) Respondents were asked to answer six questions about the collectivism versus individualism scale (IC) by Srite and Karahanna (2006) that is originally from Hofstede (2001), using a 7-point Likert scale (1= strongly disagree up to 7 = strongly agree). Examples from the scale are: 'Group success is more important than individual success', 'individual rewards are not as important as group welfare.'

The three scales used are original scales (see Appendix A). With regards to the reliability of the PM Scale by Kahn et al. (2015), an average Cronbach's Alpha of .72 was measured by the researchers. As the scale was developed in 2015, there is currently no published study that used this scale in its research yet.

Srite and Karahanna (2006) presented a Cronbach's Alpha of .79 for their IC scale. The researchers used Partial least squares to assess the discriminant validity of the constructs. Results showed that the loadings of the items on their respective constructs were higher than the cross-loadings of the other constructs, and the square root over the average variance was larger than the inter-construct correlations. Criteria stated for discriminant validity by Chin (1998) were met and Srite and Karahanna suggest that the scales are adequately validated.

The SPRS-10 by Singg and Ader (2001) presented a Cronbach's Alpha of .74. Moreover, the SPRS-10 is a validated shortened version of the Student Personal Responsibility Scale (SPRS) consisting of 20 items (Singg & Ader, 2001). The researchers showed that the scale was validated as they used a well-established scale from the Neuroticism, Extraversion, and Openness Personality Inventory-Revised (NEO PI-R; Costa & McCrae, 1992). The NEO PI-R appears to work well for respondents of college age, but do not necessarily need to attend college (Costa & McCrae, 1992).

The ten item version proved to be better as it is shorter, and therefore easier to fill in for respondents. The scale was further validated by Jarman (2001). Jarman (2001) used a parallel scale called the Instructors' Perceptions of Student Responsibility (IPSR) to ascertain validity. Participants of the study were administered the SPRS, and were later evaluated by graduate teaching assistants using the IPSR. Results showed that the SPRS scores were positively related with instructors evaluations on the IPSR.

Table 1 and 2 show the reliability results from this study.

Table 1

Dutch descriptives, mean, standard deviation, and Cronbach's alpha.

	M	*SD*	Cronbach's alpha
Collectivism	3.88	1.03	0.75
Sense of Responsibility	3.13	0.41	0.65
Player Motivation:			
Socialist	3.11	1.13	0.78
Completionist	3.48	0.91	0.81
Competitor	2.75	0.95	0.76
Escapist	3.32	1.09	0.72
Story-Driven	4.12	0.75	0.53
Smarty-Pants	3.17	0.84	0.66

Table 2

Chinese descriptives, mean, standard deviation, and Cronbach's alpha.

	M	*SD*	Cronbach's alpha
Collectivism	3.98	1.26	0.85
Sense of Responsibility	3.18	0.39	0.60
Player Motivation:			
Socialist	3.46	0.87	0.66
Completionist	3.39	0.73	0.58
Competitor	3.03	0.96	0.74
Escapist	3.14	0.95	0.59
Story-Driven	3.79	0.72	0.42
Smarty-Pants	2.95	0.82	0.58

Table 1 and 2 show the mean, standard deviation, and Cronbach's Alpha divided by country. The Cronbach's alpha reliability coefficient usually ranges between 0 and 1, but there is actually no lower limit as the coefficient could be lower than 0 (Gliem & Gliem, 2003). George and Mallery (2003) provided the following rules of thumb to interpret these coefficients; "_ > .9 – Excellent, _ > .8 –

Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and _ < .5 – Unacceptable" (p. 231). Using these rules, the reliability coefficients from table 1 and 2 range from poor to good with one unacceptable score on the Chinese story-driven game motivation dimension.

3.2 Survey Distribution

The survey was created and distributed with Qualtrics, an online survey maker with distribution options. The survey was distributed using volunteer and snowball sampling methods. The survey was shared via social media such as WhatsApp, WeChat, and Reddit. People were encouraged to forward the survey to friends/family who fit the same profile (aged over 18, Dutch or Chinese) after they had filled it out.

Participation in the study was completely voluntary. Respondents were notified of their right to withdraw from participation without any reason and at any time if they wished to do so. Moreover, no financial incentives or rewards were provided to students who completed the survey.

3.3 Survey Sample

A total of 281 people participated in the survey. Of the Dutch respondents (N = 146), 93 were male, and 53 were female. Of the Chinese respondents (N = 101), 38 were male, and 63 were female. The mean age of the Dutch sample was 24.07 (SD = 3.33), and the mean age of the Chinese sample was 24.85 (SD = 3.02). Respondents with another nationality (N = 28) were not analyzed, and non-gamers from the sample were discarded (N = 6).

The perceived level of English from the Dutch sample is higher compared to the Chinese sample. As seen in figure 1 below, both Dutch and Chinese respondents mostly found their level of English at least average (Dutch = 97%, Chinese = 94%). Therefore, it can be assumed that the survey questions were interpreted and understood correctly.

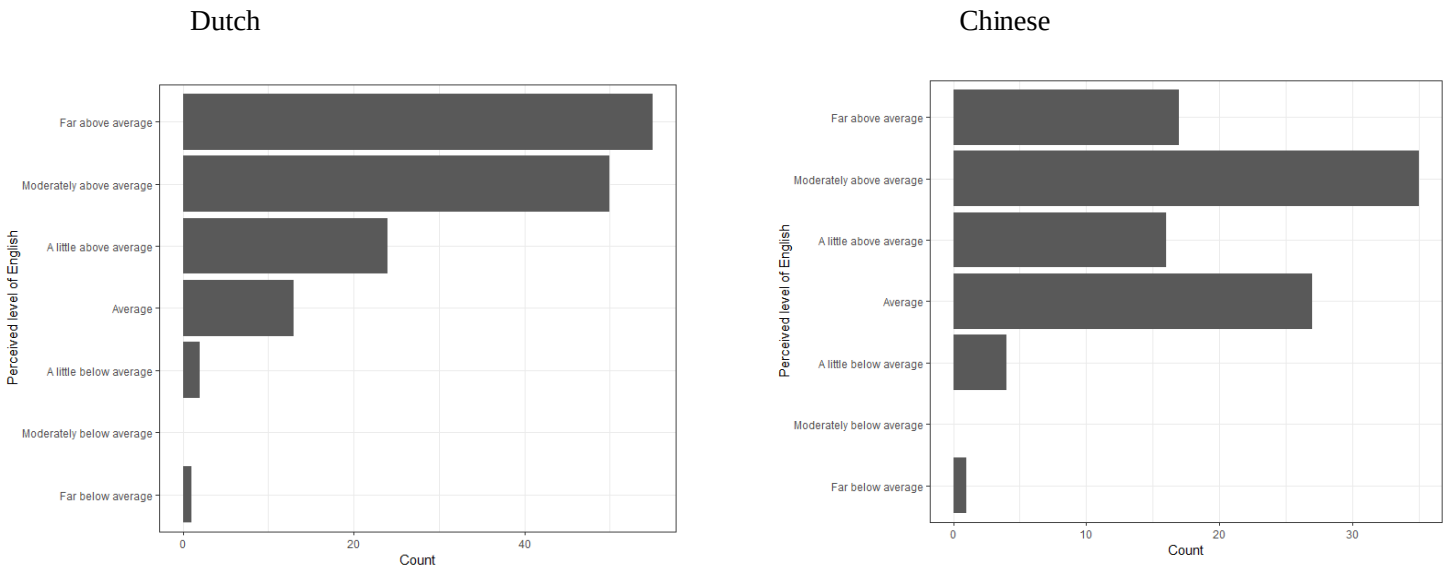

Figure 1. The perceived level of English from Dutch and Chinese respondents.

3.4 Preparation of the Data

The data preparation and analyses were done using R and R Studio (version 3.5.1). In order to test the hypotheses in section 4.2, the following method was used:

Data was discarded if nationality was not originally from a respondent with either the Dutch or Chinese nationality ($N = 28$). Data belonging to respondents who were older than 30 ($N = 2$) was discarded. Moreover, data belonging to respondents who filled in that they had never played games before ($N = 4$) was discarded. The following number of respondents remained: 146 Dutch respondents and 101 Chinese respondents.

Next, partial responses were multiple imputed with the Predictive Mean Method. This method was chosen as the data that needed imputation were all continuous variables with minimum and maximum values. For the Dutch sample, about 3-6 percent of complete cases were missing, whereas the Chinese sample missed about 10-15 percent of complete cases. The missing data pattern was Missing at Random (MAR). Data is regarded to be MAR when the probability that the responses are missing depends on the set of observed responses, but is not related to the specific missing values (Kang, 2013). In this case, respondents left out answers or measures at the end, indicating that they might have been tired or just stopped at that point.

4. Results

This section lays out the results gained from the survey. First, descriptive statistics are discussed in section 4.1. Second, each hypothesis is analyzed with an appropriate test in section 4.2.

The first hypothesis explores if sense of responsibility and gaming motivations can be associated together. To test this, a correlation test is selected. The second hypothesis checks if Chinese people have different gaming motivations compared to Dutch people. For instance, people with the Chinese nationality are more prone to have a certain gaming motivation. To test this hypothesis, a series of t-tests were selected. The independent variable is nationality, whereas the six different dimensions from the Player Motivation Scale are the dependent variables. The third hypothesis explores if the relationship between one's gaming motivation and one's sense of responsibility is moderated by culture. To test this hypothesis, multiple linear regression is selected. A summary of the hypotheses is presented in section 4.3.

4.1 Descriptive Data

An overview of platform usage is given in table 3. Respondents were allowed to select multiple platforms. The Dutch sample mainly play video games on their computer and Nintendo system, while the Chinese sample mainly play on their mobile phone. The Dutch respondents seemed to play on a wider variety of platforms compared to the Chinese respondents. Moreover, the Dutch

respondents played 11.23 hours (*SD* = 12.38) per week on average, while this was 5.88 hours (*SD* = 7.12) for Chinese respondents.

Table 3

Percentage overview of video game platform usage.

Platform:	**Dutch**	**Chinese**
Xbox	16%	7%
Playstation	63%	21%
Computer/PC	73%	36%
Mobile Phone	68%	69%
Nintendo	72%	13%
Other	10%	3%

The education level of respondents is summarized in table 4. Chinese respondents mainly have a Bachelor's degree or Master's/Doctoral degree, whereas the Dutch respondents mainly have a High School degree or an HBO Bachelor's degree.

Table 4

Summarized high school levels of respondents in percentages.

Chinese Education Level	%
Primary school graduate	1.0
Junior secondary school graduate (chuzhong (初中)	1.0
Senior secondary school graduate (gaozhong 高 or zhongzhuan 中专)	8.9
Short Cycle graduate (Zhuanke)	6.9
Bachelor's degree	42.6
Master's degree or Doctoral degree	39.6

Dutch Education Level:	%
Less than high school degree	0.7
High school graduate	32.2
Bachelor's degree in college (Dutch MBO)	9.6
Bachelor's degree in college (Dutch HBO)	31.5
Bachelor's degree in college (Dutch WO)	8.9
Master's degree or Doctoral degree	17.1

Table 5 shows the distribution of the data. If skewness or kurtosis z-scores are below -3.29 or above 3.29, the null-hypothesis is rejected, meaning that the data is not normally distributed (Hae-Young, 2013). Only the Dutch skewness scores from the socialist and competitor player motivations fall between these boundaries and are normally distributed.

Table 5

Dutch and Chinese game motivations and z-scores indicating that the data is not normally distributed.

	Dutch		Chinese	
	Skewness Z-score	Kurtosis Z-score	Skewness Z-score	Kurtosis Z-score
Player Motivation:				
Socialist	-2.94	-3.48	-4.20	-4.45
Completionist	-4.30	-4.16	-5.27	-4.11
Competitor	-2.78	-3.54	-3.30	-3.71
Escapist	-3.41	-3.67	-3.44	-3.64
Story-Driven	-6.83	-3.41	-6.25	-3.74
Smarty-Pants	-3.87	-4.27	-4.24	-4.01

4.2 Hypothesis Testing

Hypothesis 1: A sense of responsibility is associated with gaming motivations.

Respondents on average scored 3.14 on sense of responsibility (*SD* = 0.40). Respondents on average scored M = 2.85 (*SD* = 0.96) on the competitor game motivation dimension. Because the data on sense of responsibility and game motivations was not normally distributed (calculated with z-scores, see table 5 above) and the number of participants is larger than 50, Spearman's rho correlation was performed to test the relationships between these two variables. As table 6 shows, the results showed a significant correlation between sense of responsibility and the competitor game motivation dimension, Spearman's rho = -.15, p = .024. Therefore, there does seem to be a genuine correlation between the two measures as the competitor dimension is negatively correlated with sense of responsibility. The other gaming motivation dimensions did not have a significant effect, see table 6 below.

Table 6

Correlation table per game motivation and sense of responsibility

	Socialist	**Completionist**	**Competitive**	**Escapist**	**Story-Driven**	**Smarty-Pants**
Player Motivation:						
Socialist						
Completionist	.17*					
Competitive	.17*	.29***				
Escapist	.12	.28***	.05			
Story-Driven	.14*	.20***	-.10	.54***		
Smarty-Pants	.24***	.26***	.18***	.34***	.30***	
Sense of Responsibility	-.09	-.04	**-.15***	-.07	-.04	-.09

Note. *p<.05, **p<0.1, ***p<.001

Hypothesis 2: Chinese people have different gaming motivations compared to Dutch people.

To test if Chinese people have different gaming motivations compared to Dutch people, we performed a series of independent samples t-tests. The data was not normally distributed (see table 4 above). Therefore the p-value may not be reliable and more weight should be placed on the bootstrapped 95% confidence interval that was provided. On average, the Chinese socialist dimension (M = 3.46, SD = 0.87) was higher than the Dutch socialist dimension (M = 3.11, SD = 1.13). The results of Levene's test showed that equal variance was not assumed ($F(1,245) = 6.90$, $p = .009$). This difference was significant ($t[242] = -2.22$, 95% CI = [-0.519, -0.031]) and generalizes to the population. The difference represents a *small* -sized effect $d = .34$.

Moreover, the Chinese story-driven dimension (M = 3.79, SD = 0.72) was lower than the Dutch story-driven dimension (M = 4.12, SD = 0.75). The results of Levene's test showed that equal variance between groups was assumed ($F(1, 245) = 1.65$, $p = .200$). This difference was significant ($t[229] = 3.23$, 95% CI = [0.114, 0.473]) and generalizes to the population. The difference represents a *small*-sized effect $d = .45$. The other dimensions did not have a significant difference. The results of the performed independent samples t-tests are summarized in table 7.

Table 7

Independent samples t-test results from Dutch and Chinese comparison.

					Levene's Test	
	CI's	*t*	*d*	DF	*F*	*p*
Player Motivation:						
Socialist	[-0.519, -0.031]*	-2.22	0.34	1,245	6.91	.009*
Completionist	[-0.128, 0.285]	0.75	0.11	1,245	6.47	.012*
Competitor	[-0.459, 0.016]	-1.84	-0.29	1,245	0.26	.612
Escapist	[-0.047, 0.463]	1.61	0.18	1,245	4.97	.027*
Story-Driven	[0.114, 0.473]*	3.23	0.45	1,245	1.65	.200
Smarty-Pants	[-0.050, 0.368]	1.50	0.27	1,245	1.48	.226

As two out of six game motivation dimensions are significantly different, H2 is partially supported.

Hypothesis 3: The relationship between one's gaming motivation and one's sense of responsibility is moderated by culture.

To test the hypothesis that culture moderates the relationship between one's sense of responsibility and game motivations, a multiple linear regression analysis was conducted. All variables of the six game motivation dimension were included: Socialist, Completionist, Competitor, Escapist, Story-Driven, and Smarty-Pants from Kahn et al. (2015), to check if there was a significant effect on sense of responsibility moderated by culture. The overall model was not significant, $R^2 = .08$, $F(13, 233) = 1.50$, $p = .118$. Table 8 shows the results of the performed multiple linear regression.

Table 8

Summarized results of moderated multiple linear regression.

	β	*SE*	*t*	*p*
Intercept	3.45	0.18	18.88	<.001***
Country	-0.39	0.38	-1.02	0.307
Player Motivations:				
Competitor	-0.03	0.04	-0.75	0.456
Completionist	-0.05	0.04	-1.17	0.243
Socialist	-0.04	0.03	-1.23	0.221
Smarty-Pants	0.00	0.05	0.05	0.962
Story-Driven	-0.06	0.05	-1.02	0.307
Escapist	0.04	0.04	1.05	0.297
Interaction:				
Competitor - Country	-0.08	0.06	-1.24	0.217
Completionist - Country	0.15	0.07	2.06	0.040 *
Socialist - Country	0.02	0.06	0.34	0.733
Smarty-Pants - Country	0.02	0.07	0.28	0.782
Story-Driven - Country	0.11	0.09	1.28	0.200
Escapist - Country	-0.12	0.06	-1.89	0.060 .

Note. Significant codes: 0 = ***, 0.001 = **, 0.01 = *, 0.05 = .

Only one significant interaction effect was found. The only significant interaction was on the completionist (M = 3.45, SD = 0.84) game motivation dimension, β = 0.15, SE = 0.07, t = 2.06, p = .040.

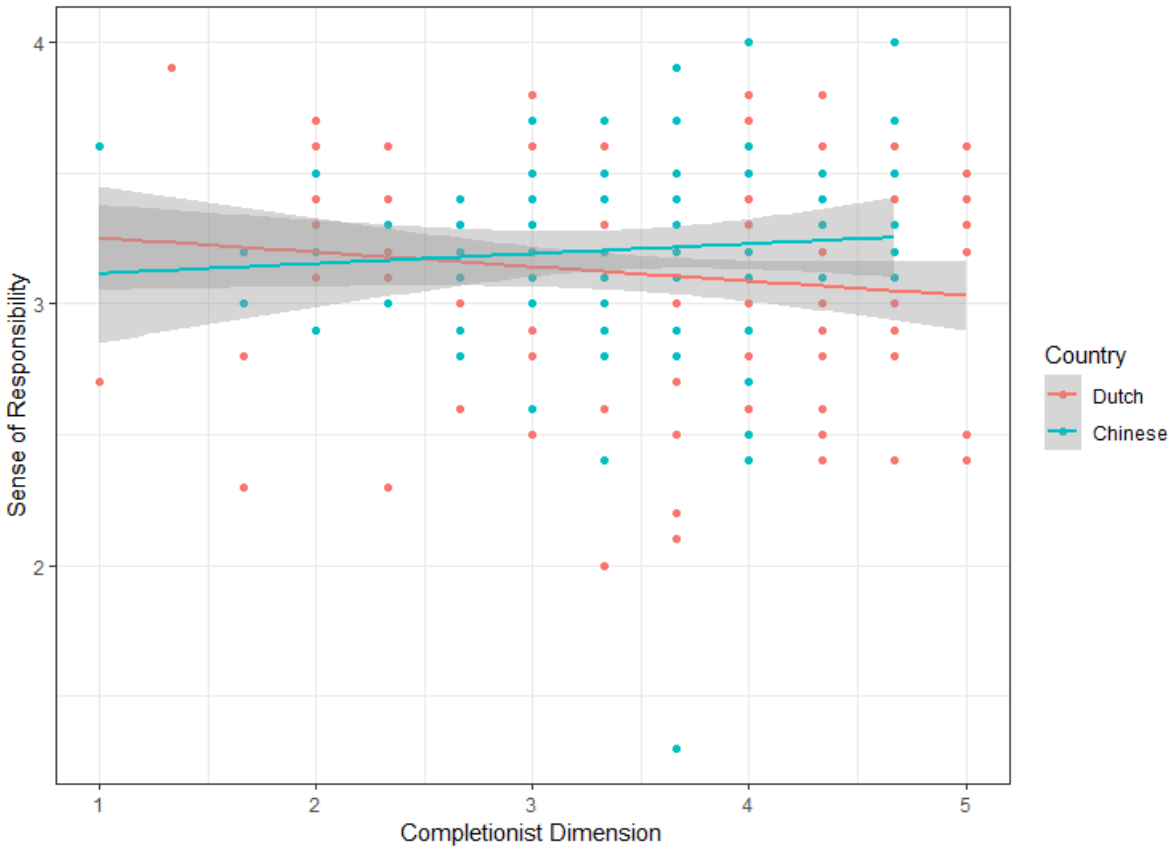

Figure 2. Significant result from moderated multiple regression, Completionist dimension.

Figure 2 shows the significant moderation effect of culture between sense of responsibility and the Completionist gaming motivation dimension. Results should be interpreted with caution as the data was not normally distributed (z-score gaming motivation completionist$_{skewness}$ = -5.27, z-score gaming motivation completionist$_{kurtosis}$ = -4.11, z-score sense of responsibility$_{skewness}$ = -4.61, z-score sense of responsibility$_{kurtosis}$ = -4.15).

To follow up on the significant moderation effect, we performed simple slope analysis. The results of the Chinese simple slopes analysis showed no significant effect (slope = .11, *SE* = .06, *t* = 1.70, *p* = .090). The results of the Dutch simple slopes analysis showed no significant effect either (slope = -.04, *SE* = .04, *t* = 1.17, *p* = .243). The results do not support the hypothesis that culture has a moderation effect on the relationship between sense of responsibility and game motivation.

4.3 Summary

Hypothesis	
A sense of responsibility is associated with gaming motivations.	Partially Supported
Chinese people have different gaming motivations compared to Dutch people.	Partially Supported
The relationship between one's gaming motivation and their sense of responsibility is moderated by culture.	Not Supported

5. Discussion

The goal of this study was to find out if the relationship between game motivation and sense of responsibility was moderated by country, and to contribute to the lack of motivational video game research. This section discusses the results. Furthermore, limitations and ideas for future work will be discussed as well.

The partially supported first hypothesis had surprising results. It was expected to have more significant correlation with game motivation dimensions as the few studies available indicated that there could have been a connection between game motivation and sense of responsibility (Chiou & Wan, 2007; Meya & Eisenack, 2018). Still, the competitor dimension was significant, showing that the level of competitiveness negatively correlates with sense of responsibility

The second hypothesis was partially supported as well. The socialist and story-driven game motivation dimensions were significant between Dutch and Chinese respondents. Chinese respondents scored higher on the socialist game motivation dimension, while Dutch respondents scored higher on the story-driven game motivation dimension. These results could be related to Hofstede's culture dimensions (2018), and specifically to the collectivism versus individualism dimension. Chinese are, according to Hofstede (2018), a collectivistic country and its respondents would therefore be more prone to playing with family, friends, or a close community. The Dutch respondents on the other hand are, according to Hofstede (2018), individualisticly minded. They would therefore be more prone to immersing themselves in single player stories for instance. Interestingly, the two game motivation dimensions that were different between Dutch and Chinese respondents did not include the competitor dimension that was significant in the first hypothesis. As play style is different across cultures affecting levels of cooperation, competitiveness, and tactical choices (Bialas, Tekofsky & Spronck, 2014), one could have expected the competitor game motivation to be significant instead of the story-driven game motivation dimension.

The third hypothesis was not supported. The overall model was not significant. However, there was one significant interaction effect that showed that the completionist game motivation that affected sense of responsibility was indeed moderated by country. Still, notes can be placed with this effect. Mainly because the data was not distributed and the follow up analysis was not significant. This hypothesis should be tested again with normally distributed data, and preferably with a larger Chinese sample.

This study sought out to answer the research question; "Does the difference in gaming motivation between Dutch and Chinese respondents affect their sense of responsibility?". Looking at the results, this question is partially answered. As the first and second hypothesis showed, game motivation is connected with sense of responsibility and with country of origin. However, a moderation effect from country does not seem to be likely. At least not when comparing the Netherlands and China with each other. This could be explained by the fact that different game motivation dimensions were significant in the first hypothesis compared to the second hypothesis, indicating that different motivations affect different factors (e.g. competiveness on sense of responsibility and level of story-driven on country).

An apparent limitation during this study was the difficulty in getting sufficient Chinese respondents. The Dutch sample size was bigger and had a lower percentage of missing data which can be explained by the fact that data collection started in the Netherlands. In hindsight, more participants could have been gathered if the survey was translated into Chinese. Feedback from Chinese respondents showed that more friends would have been willing to fill in the survey if it was written in their language. Future research should implement a Chinese translation for the survey as it will help in getting more participants.

Future research could be done on the interaction between the competitiveness game motivation and sense of responsibility as the first hypothesis showed that there is correlation between them. The results could give more insights in the relationship of these two as it is not known why this correlation is there. Another possible study could shed light on the differences between other countries. This, to explore if other countries with significant differences on the collectivism dimension have the same results as this study, or if other results occur. Lastly, other personal factors besides sense of responsibility might be correlated with game motivation. Future studies may want to look into other factors that perhaps affect why respondents play video games. An example of this could be sense of agency as it would be interesting to see if player motivations are affected by how players make choices and how important the players think they are.

6. Conclusion

The research question that this study addressed, read as follows: “Does the difference in gaming motivation between Dutch and Chinese people affect their sense of responsibility?” . A country comparison was done, where three hypotheses were tested to find an answer to this research question.

The results of this comparison show that the competitor game motivation is correlated with a sense of responsibility. Furthermore, there was a remarkable difference between Dutch and Chinese people. Namely, Chinese people scored significantly higher on the socialist game motivation dimension, whereas Dutch people scored significantly higher on the story-driven game motivation dimension. Another noteworthy result was the significant interaction effect on the completionist game motivation dimension, showing that the relationship between this game motivation and a sense of responsibility was moderated by country. Still, this moderation effect should be interpreted with caution, as the data was not normally distributed and the follow-up analysis was not significant.

It can be concluded that there is indeed a difference between Dutch and Chinese people regarding game motivations. However, a moderation effect does not seem likely. Game motivation and sense of responsibility are negatively correlated, and further research could give reason as to why this is. Other possible research could explore different country comparisons to see if the same results occur. Lastly, another correlation with a psychological factor such as sense of agency with game motivations could offer an interesting starting point for further research as well.

Appendix A

1.

STUDENT PERSONAL RESPONSIBILITY SCALE-10 (SPRS-10)

The following statements concern behavior in everyday life situations. There are no right or wrong answers. Please place a check under the response category that most accurately describes your behavior the majority of the time. (Singg & Ader, 2001)

	Most always like me 1	Somewhat like me 2	Very little like me 3	Mostly never like me 4
1. I leave my things all over the place. (clothes, books, dishes, etc.)				
2. When I borrow something I fail to return it.				
3. I turn all my assignments in on time.				
4. At home or at college I do my fair share of the household chores.				
5. I miss class often.				
6. I send a thank you note after receiving a gift from someone.				
7. I am often late for class or work.				
8. I miss appointments I have made if I'd rather not go.				
9. When I promise to help with a project, I follow through.				
10. If it means giving up some personal pleasures, I delay studying.				

Reverse scoring of items with (Higher the score, more responsible the person is.)

2.
Player Motivation Scale

Dimension
Socializers
I like to chat with my friends while playing a video game
I like to use voice communication when I play
It's important to me to play with a tightly knit group
Completionists
I like to master all elements of a game
I like to figure out how the game works inside and out
I like to try everything that is possible to do in a game
Competitors
Winning is a big reason for me to play video games
I play to win
It is important to me to be the fastest and most skilled person playing the game
Escapists
I like to do things in games which I cannot do in real life
Video games allow me to pretend I am someone/somewhere else
Story-driven
I like to the feeling of being part of a story
I like stories in a game
Smarty-pants
Games make me smarter
I play games to enhance my intellectual abilities

3.

Collectivism Scale

1. Being accepted as a member of a group is more important than having autonomy and independence.
2. Being accepted as a member of a group is more important than being independent.
3. Group success is more important than individual success.
4. Being loyal to a group is more important than individual gain.
5. Individual rewards are not as important as group welfare.

6. It is more important for a manager to encourage loyalty and a sense of duty in subordinates than it is to encourage individual initiative.

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