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## THESIS SERIES

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The Value Systems of Player and Their Relation to In-Game Behavior in a Massively Multiplayer Online Role-playing Game

2017

# PhD

## 1999–2020 THESIS SHOWCASE

With regard to the Emergent Cyclical Levels of Existence Theory (ECLET) proposed by Graves (1970, 1974, 2005), this study identifies the value systems of Chinese online game players. ECLET provides a new way to look at people's differences through successive personality stages or value systems, each with its predominant way of thinking and behaving. Through examining the characteristics of players' value systems and their relationships with the in-game behaviour of an online game (which is played by millions of people), this research suggests the application of ECLET in game development from a new perspective. The empirical data pertaining to Chinese individuals provide a foundation for future investigations in Emergent Cyclical Levels of Existence Theory and expand the understanding of the relationships between personality and playing features in future research.



School of Design,
The Hong Kong Polytechnic University
PhD 2020.

Original copy: https://theses.lib.polyu.edu.hk/handle/200/9006

# THE VALUE SYSTEMS OF PLAYER AND THEIR RELATION TO IN-GAME BEHAVIOR IN A MASSIVELY MULTIPLAYER ONLINE ROLE-PLAYING GAME

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**Ph.D**

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**2017**

**The Hong Kong Polytechnic University**

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# The Value Systems of Player and Their Relation to In-game Behavior in a Massively Multiplayer Online Role-Playing Game

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A thesis submitted in partial fulfillment of the requirements for the degree Doctor of Philosophy

July 2016

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_____ (Signed)

WANG CHAOGUANG (Name of student)

## Abstract

Understanding the characteristics of players is an essential part of game design. This thesis reports the results of my study to identify the value systems of Chinese online game players based upon the Emergent Cyclical Levels of Existence Theory (ECLET) by Clare W. Graves (Graves, 1970, 1974, 2005). The ECLET provides a new way to look at the differences in people through successive personality stages or value systems, each with its own predominant way of thinking and behaving.

I conducted a survey of 5,427 participants within the MMORPG Ghost II that measured their value systems based upon the ECLET. The study showed that Chinese online game players are mainly operating at Blue value system, a core value that is to sacrifice self now in order to receive reward later. The data were also compared with instrument averages resulted from global measurement main based on western subjects. The differences across the demographic variables such as gender, age and occupations were also investigated.

This study then further examined the relationship between player's value systems and their actions in playing the Ghost II. Online survey data from 1,577 players containing value systems and demographic variables were paired with their behavioral metrics within the game world and analyzed for this study. A number of positive correlations were found between the score of Red value system and the in-game metrics that were

collected to represent their playing behavior. Participants that scored high on Red value system also tend to spend more real money in the game, level up their character and ability as quickly as possible, and seek other achievements in forms offered by the game world. These characteristics for fun, power and immediate gratification are also predicted by the Red value system in Clare W. Graves' model. With this work, it is shown that there is a correlation between in-game behavior and real-life behavioral attitudes as modeled by the Emergent Cyclical Levels of Existence Theory.

The research provides a more comprehensive look at value systems of players in relation to their specific playing behaviors. The finding helps us to better design, evaluate and understand enjoyment in games. The links between value systems and online consumption can be applied to the designing of virtual items that ultimately generate the revenues for the game. Another possibility directly applicable to game design would be to use inferred learning styles of players as modeled by their certain value system to minimize the learning curve involved to master game play. The results show the possibility of inferring users' value systems based on their activity traces within the game.

The study is significant in its research methodology (using commercial data from an online-game which is currently played by millions of people) as well as its findings regarding players' core values and their relationship to in-game behavior. By

examining the characteristics of players' value systems and its' relationships with in-game behavior, this thesis work allows for a new look at ECLET and its' application in game development. The empirical data about Chinese individuals establish a baseline and provide a starting point for the future study of the Emergent Cyclical Levels of Existence Theory. Further work can continue to expand the understanding of the relationships between the personality and playing features building on this study.

## Publications Arising from the Thesis

Journal Papers:

**Wang, C.,** & Yu, G. (2016). The value system characteristics of Chinese online game players. *Entertainment Computing* 17 (2016): 1-8.

**Wang, C.,** & Yu, G. (Under Review). The relationship between player's value systems and their In-game behavior in a massively multiplayer online role-playing game*. International Journal of Gaming and Computer-Mediated Simulations.*

Conference Papers:

**Wang, C.,** & Yu, G. (2016, May). The value system characteristics of Chinese online game players. Paper presented at the 2016 Science of Consciousness Conference. Tucson, AZ, USA.

**Wang, C.,** & Yu, G. (2015, July). The relationship between player's value systems and their in-game behavior in a massively multiplayer online role playing game. Paper presented at the 2nd Annual Conference of Chinese DiGRA, "Digital Games in China and Chinese Speaking Area: Past, Present and Future". Tsinghua University, Beijing, China.

## Acknowledgement

To my father, who passed away eight years ago, the bedtime stories you told me every night in my childhood firstly inspired me to explore the unknown knowledge and pattern of this world. I wish this thesis will also be a good story I want to write and share with other people.

I thank my supervisor, Dr. Gino Yu, for your patience and permanent support from the very beginning. I am very grateful to you for letting me run with the topic of my choosing and for having confidence in my abilities. As you said, you never blame me for delaying or mistake I made, nor give me a hand to complete any work I should finish by myself. What you do is to stand at a position that you thought I should achieve, and wait for me to arrive there. Because of this, I need not to please you, but have a freedom to be myself and go my own way. I spent four amazing years under your guidance, and open a new door in my mind.

To my new born daughter, your smiling face is the best gift to me. To my wife, thank for your love and supporting throughout the whole process, and your encouraging is a main driver of this doctorate program.

I thank Prof. Ming Xi Tang, Chair of the Board of Examination, and Dr. Jayne Gackenbach and Dr. Johan Hoorn, External Examiners, for their constructive

feedback and comments.

I also wish to thank all the experts I encountered along the journey of my PhD, from whom this work has benefited from discussions, comments, and words.

Wang

June, 2016

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# List of Glossary

**Emergent Cyclical Levels of Existence Theory（ECLET）**: Also known as Levels of Human Existence, a theory of human development by Clare W Graves. It describes how people view the world in a complex way using multiple perspectives combining different disciplines of biology, psychology and sociology. ECLET argues that human nature is not fixed and that, people continue to construct new conceptual models of the world in response to the interaction of external conditions with internal neuronal systems.

**Value Systems**: A term developed and tested by Clare W Graves and Don Beck. Value Systems refer to a worldview, an organizing principle and a mindset that expresses itself through ideas, habits and cultural practices. They act as filters through which individuals, organizations, and societies experience and understand the reality of the world, and consist of a hierarchy of needs and corresponding behavior

**Spiral Dynamics**: It is an extension and elaboration of the ECLET by Clare W Graves. Don Beck and Chris Cowan introduced the Spiral Dynamics in 1996, which has been accepted as the most authoritative theory on Gravesian model and referenced by a number of other theorists.

**Massively Multiplayer Online Role-Playing Games (MMORPGs)**: Video games in

which players create an avatar that evolves and interacts with other avatars in a shared virtual world. They differ dramatically from single-player or small multi-player online games in the vast number of participants able to play together, and in a persistent game world which continues to evolve after the player is offline.

# CHAPTER 1 Introduction

## 1.1 Motivation

Video games have been recognized as one of the most engaging forms of entertainment today, and represent a revolution of considerable financial, social and cultural impact. The number of video game player in China increased to 517 million in 2014 with a total market revenue of US$18.5 billion (China Gaming Industry Report, 2014). And among them, MMORPGs (massively multiplayer online role-playing games) have become the most popular game genre in China, which accounted for about a third of the entire gaming market revenue (China Gaming Industry Report, 2014).

Understanding player characteristics is an essential part of game design, and also has important implications for increasing games' potential for positive impact on society. As Bartle indicated, game designers must understand their target audience (Bartle, 1996), and Bateman and Boon also established the concept of Demographic Game Design (DGD) that aims to identify and meet the desires of the different player styles (Bateman & Boon, 2006). As the market keeps growing and diversifying, game development today suffers sever low retention rate of new players and expensive marketing cost. For instance, one game project needs to devote at least 50 million Chinese Yuan to recruiting 100,000 new active players (China Gaming Industry

Report, 2012). A detailed player profile will help to gain insight about the characteristics of the audience in order to fulfill the needs of the target population. For example, comprehending the particular learning style of target players will determine how the game should be designed and unfold tutorials in order to improve retention rates of new players. It will help to render game development cost more competitive, especially in the marketing programs.

Recent developments in game business practices related to selling virtual goods within games have especially elevated the need for learn more about player characteristics (Hamari & Tuunanen, 2014). In this new situation, the designers not only need to create compelling game playing, but also have to think who would be the customer for the virtual goods and how to offer products that better match their needs and wants. For example, it was found that in online games, the developer can identify different players and market virtual goods to certain players in certain style of play (Hamari & Lehdonvirta, 2010). Who the players are and what they like has become a million-dollar question for the game industry today.

Personality, which reflect the behaviors that define and characterize each individual, have been identified as one of the key components to understanding both the uses and effects of video games. Previous research has revealed that personality can explain an amount of variability in playing styles and game genre preferences (Bateman & Boon, 2006; Zammitto, 2010; Degraft-johnson, Wang, Sutherland, &

Norman, 2013). Existing research has also shown a link between personality and motivation for playing games (Jeng & Teng, 2008, Park, Song & Teng, 2011), and a connection between an individual's personality and playing behavior within game (Yee, Ducheneaut, Nelson, & Likarish, 2011; Tekofsky, Spronck, Plaat, Van den Herik, & Broersen, 2013). MMORPGs are "a gold mine of personality data" (Yee, 2006), because the diversity of player behaviors within the game world offers unique opportunities to study the relationship between personality and game playing.

However, the characteristics of players as a group are still not well understood, and little research was found to investigate the relationship between personality of player and their in-game behavior. The limited number of existing researches were deemed inadequate, both because they were narrowly focused on the horizontal personality model and because the theoretical framework of the research was vague. What's more, most of the current gaming research tends to be based on self-reported data obtained from the players using interviews, surveys, or ethnographic observations. To address these limitations, we should pay more attention to longitudinal data collected directly from games, which provides us with a solid empirical foundation to better understand these complex virtual worlds (de Castell, Taylor, Jenson, & Weiler, 2012). Studies about Chinese players are also still very rare, and a better knowledge of them is to be hoped, given that Chinese players are the largest video game playing group in the world.

## 1.2 Hypothesis

I proposed the general hypothesis that the value system of player would be related to the in-game behavior in a manner that is consistent with value system characteristics.

## 1.3 Objectives

In this thesis, I intend to develop an understanding of the value systems of player in China, and determine the relationship, if any, between the value systems of players and their actions in the game world. The Emergent Cyclical Levels of Existence Theory (ECLET) as developed by Clare W Graves (Graves, 1970, 1974, 2005) was selected as grounding theory for my thesis. It provides a new way to look at the differences in people through successive personality stages or value systems, each with its own predominant way of thinking and behaving. I applied this theory among Chinese players and adapted it to explain their playing behavior more authentically.

I summarized with a five-point list comprising the questions this thesis work attempted to answer:

1. What are the value systems of Chinese players?

2. Is there any demographic difference on the value systems, such as gender, age and occupations?

3. Is there any difference between Chinese and Western participants on the value systems?

4. What are relationships between value systems of players and their in-game behavior?

5. How can the theory of ECLET be applied to game design?

## 1.4 Significance

The personality characteristics of individuals who play video games and their relation to the activities players choose in games are directions of video game research that have potential significance but have yet to be fully explored. The key issue that I address in this thesis work is to present a method to link value systems of individuals as constructed by Graves to their actual playing behavior. This research will add significantly to this field and may enable the game industry to create more engaging and targeted games.

The primary goal of this research is to contribute to game study and design by providing a more comprehensive look at value systems of players in relation to their specific playing behaviors. Understanding the value systems of player and their correlation to game playing can provide the foundation to assessing the target user

and determining what game mechanisms are appealing to them. And also the marketing and promoting will benefit a lot from identifying target player since it makes recruiting new player more precise and easier. This type of specific information is valuable during the design process when understanding enjoyment of games, evaluating design choices, and improving playability. Graves' model has not been used this way before and is a contribution to knowledge in understanding the player characteristics.

In addition, correlating game experiences with real-life tendencies also has important implications for increasing games' potential for positive impact on society. It will allow us to apply the effects observed in video games to the real world. Video games can be used as a platform for creating experiences that facilitate exploration of one's personality and promote positive behavior change in real word.

## 1.5 Thesis outline

Chapter 1 This chapter states the motivation on the study, presenting the research objectives and questions. The research scope and significance are also discussed, and the overall structure of the thesis is given.

Chapter 2 This chapter presents a literature review on researches that investigate player behavior, personality and video game playing. And then the chapter introduces

the construct of value system, setting up the theoretical frameworks for analysis and discussion. The selected tools for measuring such construct are also introduced.

Chapter 3 This chapter introduces the process used in the study to collect data for answering the research questions. The questionnaire translation and verifying, the game selected to recruit the participants, and the process for data collecting are described.

Chapter 4 This chapter presents the data analysis process performed to examine the characteristics of the sample, the value systems of player and their relations to game playing. The focus is on the correlations between self-reported data and behavioral data as recorded by game metrics.

Chapter 5 This chapter summarizes the main findings and sought to discuss the possible application and contributions to the field. The limitations of this research are also examined and continuations that can be addressed in future work are presented.

# CHAPTER 2 Review of the related literature

## 2.1 Player behavior and personality

The majority of the previous work about personality and video game has focused on exploring personalities in its relation to addiction, aggression and violence, which is out of the scope of this research. In this chapter, I firstly give a brief introduction about playing behavior and player model research, and then secondly present a literature review on researches that explore personality as a way to better understand game playing and game design, and thirdly summarize the limited number of studies available to the present on the links between personality and playing behavior in MMORPGs.

### 2.1.1 Playing behavior and player model

Individuals who play video games can decide not only which game to play but also which action to take in a particular game. The video games today provide a diverse of choices for the user, in which players can level up their characters through completing quests and killing monsters, seek to learn new skills, collect virtual money and acquire more powerful equipment. They can also group together or compete with many other players. Therefore, players engage in different in-game behaviors and differ in their playing styles, preferences and motivations (Bartle, 1996; Yee, 2006). A number of

player model or player typology has been created to identify and synthesize various behaviors exhibited during play (Hamari & Tuunanen, 2014)

Among the studies regarding these behavior differences in game playing, the split between hardcore and casual player is one of the earliest. Hardcore players are considered to have high skills of game playing, and enjoy progressing, challenge and game mastery in the game. They take game playing as a lifestyle preference and commit a considerable time and money on game. Compared with them, casual players just see game playing as another time passing entertainment. They buy and play fewer games or only play games recommended by their hardcore friends. This model with dividing players into just two segments is of course too simplistic and generalizing (Bateman, 2011), and there are so many other players whose playing behaviors should be placed in between the two extremes.

Bartle's Player Types are another well-known and most referenced model about players' different activities in game (Bartle, 1996). Through observing player behavior in the early MUDs (Multi-User Dungeons/Domains), Bartle classified player as Socializers, Achievers, Killers and Explorers based on two underlying axes (action vs. interaction and player-orientation vs. world-orientation). Each type has its' own motivations, in-game behavior and play interest. For example, Achievers prefer action and are world-oriented, while they derive satisfaction from constant progressing and gaining power in the game world. By contrast, Socializers prefer interaction and are

player-oriented, and enjoy meeting and forming relationships with other players. However, Bartle's model is derived from his experience rather than empirical data and suffers from a number of weaknesses. And behaviors and motivations of player can change across different time and context, it may be impossible to pin-point to what category people belong to. If player have to choose between four types in the test, the result will be dichotomous and self-fulfilling.

Yee worked further in Bartle's direction and sought to create an empirically grounded player model based on the survey data from 3,000 game players (Yee, 2006). Yee developed a questionnaire to measure players' motivations using items referred to Bartle's model and collected from players' comments, and explored playing patterns through factor analysis. The goal of his research was to identify groups of motivations that are as homogenous as possible, but that differ from each other in a significant way. Yee's study revealed 10 motivation components of players, which then can be grouped into 3 overarching components: Achievement (consisting of Advancement, Mechanics and Competition), Social (consisting of Socializing, Relationship and Teamwork), and Immersion (consisting of Discovery, Role-Playing, Customization and Escapism). As seen by Yee, each motivation component has its' own preferred usage pattern and in-game behaviors. For example, Advancement motivation desires to progress rapidly, gain power and accumulate wealth and status in game world, Socializing motivation wants to help and chat with other players, and Discovery motivation has an interest in finding unknown knowledge and things. Yee's Socializing

and Role-playing motivations conflate Bartle's Socializers type, and Mechanics and Discovery motivations overlap in the context of Bartle's Explorer type. However, Customization and Escapism motivations have not been discussed in Bartle's research. And also Yee found several of the Bartle's Types correlate to a high degree and are not mutually exclusive as Bartle assumed, for example, members of raid-oriented guilds may be both Achievers and Socializers (Yee, 2006). Existing research has also verified the relationship between Yee's motivations of player model and in-game behaviors, for example, the number of hours devoted to World of Warcraft daily appeared to be strongly related to an advancement motive (Billieux et al., 2013). However, Yee's research received criticism for drawing more upon the self-reports of invested and expert players (de Castell et al., 2012).

A number of other studies attempted to model player qualitatively through conceptualizing behavioral playing data gathered from data mining. Harrison and Roberts believed that data mining method can create accurate player models based on observation data, and can be used to develop "a data-driven technique for designing models of user behavior" (Harrison & Roberts, 2011). Drachen investigated different playing patterns in the popular action game of Tomb Raider: Underworld by using game log information, such as number of character's deaths, rewarding and leveling (Drachen, Canossa, & Yannakakis, 2009). They identified four player styles with different behavior preference: Veteran, Solver, Pacifist and Runner. For instance, the Veteran die rarely and complete the game very quickly, and Solver focus on

solving the puzzles in the game playing. Ahmed tried to identify player typology in EverQuest II by analyzing the data of their actions and behaviors (Ahmed, Mahapatra, Poole, Srivastava, & Brown, 2014). They explored user log data of 1,854 players over 27 weeks, such as types of activities, rewards, and casualties, and discovered meaningful typologies among players.

For the existing research for explaining and anticipating player behavior, one major limitation is that they have more to do with game design than with players' free choice. In the video game, all players just rush for the rewarding activity designed by the developer, and there for, there is not a significant difference in the actions and behaviors player taken. For example, the behaviors of getting a sword and the completing a quest may be highly correlated, but this finding just demonstrated the way the game was designed and not because of anything from the players' tendency or preference. As noted by researchers, video games gradually started having the exact same dimensions of player typologies that designer intended to construct because player behavior will follow the rule defined by designer (Hamari & Tuunanen, 2014). For instance, when game designers use Bartle's typology as a tool and create game elements to resonate with certain player types, the same player types are found to be dominant within the game as well. In other words, the findings perhaps indicate that a number of gamer typology or model researches that aim to synthesize playing behaviors are partly self-fulfilling and self-validating. The player action and decision among game world may be too complex to understand just by these kinds of playing

behaviors data (both from self-report and data mining) that are significantly affected by external rewards and objectives of the game mechanics. There are more personal attributes such as players' intrinsic motivation, learning preferences and personality that should be considered in the explanation to their in-game behaviors.

### 2.1.2 Personality and game playing

Personality is defined as the organized totality of characteristics or qualities that makes a person different from others. It combines attitudes, motivations, needs and emotions, and influences how people think, behave, and approach internal and external situations (Mischel, Shoda, & Smith, 2004). The personality accounts for how individuals feel, think, act and behave in the life and influences their development in across the life span. The profiling personality has been extensively used to better understand consumer behavior. There has been numerous research about the factors that may affect leisure preference of a given group, community and population, such as age (child and adolescent, adult and elderly), education, income, gender, occupation and social class (Bammel & Burrus-Bammel, 1996). However, for predicting leisure behavior, the traditional demographic variables have proven to be weak (McGuiggan, 1999), and as suggested before, personality may be a better predictor of choice than demographics for experiential products (Barnett, 2006).

The response to video game is based on the relationship between the game content

and the interpretation within the mind of the player. Video game create a symbolic reality consisting of symbolic elements (game objects) and actions that obey fixed rules (game mechanics). During the course of game play, the players' interaction with the game creates a reality portrayed within their mind. The decisions that are made during game play are primarily based upon the relationship between the presentation of the game content and the interpretation occurring within the mind of the player (Kiili & Lainema, 2010; Nacke & Lindley, 2008). The experiential interpretation is constructed based upon the player's worldview, conditioning, and behaviors (Kultima & Stenros, 2010). The players' experience as well as their physiological reaction to the situation among game playing, reveal their unique conditioned behaviors and beliefs (Rao, Asha, Rao, & Vasudevaraju, 2009). The experience of a video game is entirely within the mind of the player and heavily affected by their world view and belief (Yu, Martin, & Chai, 2012).

The research has demonstrated players behaved much the same in games as they do in the real world (Bayraktar & Amca, 2012), and the patterns of neurons arising from virtual experiences are very similar to those arising from physical threats (Mukamel, 2010; Blascovich & Bailenson, 2011). The personality has a strong influence on how people think and behave in the real world, and should, therefore, also influence their behaviors in video games as well. The game playing is thought to be a personally revealing activity, while the players are personally invested in their avatars and the environment (Yee, Ducheneaut, Nelson, & Likarish, 2011).

Existing research has shown that personality can efficiently explain a substantial amount of variability in video game preference. The Five Factor Model of personality (FFM), also known as Big Five, is a well-known and most referenced personality theory in related research. FFM recognized five dimensions of personality: Openness to experience (curious, imaginative, open-minded), Conscientiousness (responsible, organized, efficient), Extraversion (talkative, ambitious, assertive), Agreeableness (friendly, cooperative, loyal), and Neuroticism (anxious, emotional, fearful) (John & Srivastava 1999). A person's personality is determined by the likeliness of each dimension, for example, people with high Conscientiousness are thought to be task-orientated, well-organized and reliable. Teng examined differences on Five Factor personality traits between online game players and non-players, and found that players scored higher on the Openness, Conscientiousness, and Extraversion (Teng, 2008). Ventura discovered that there were a number of significant correlations between playing styles and the personality traits of Openness and Conscientiousness (Ventura, Shute & Kim, 2012). Hartmann and Klimmt explored personality as a viable concept for explaining why people selected games on top of other forms of media entertainment (Hartmann & Klimmt, 2006). The influence of Five Factor personality traits on the experiential gratification of online game players also has been observed (Jowon & Guiohk, 2012).

Researchers found that the personality is relevant to the reasons why people play video games. The personality traits have a link with different motivations to playing

online games, for example, Openness was positively related to role playing motivation and Neuroticism was negatively related to teamwork motivation (Jeng & Teng, 2008). The work of Park verified the links between personality and motivation to play games, and two FFM personality traits of Extraversion and Agreeableness were identified as strong motivation predictors for playing online games (Park et al., 2011). Graham examined the relationship between FFM personality traits and motivations for playing World of Warcraft, and revealed several correlations between players' personality and their playing motivations (Graham & Gosling, 2013).

The relationship between personality and specific game type preference also has been investigated. Zammitto compared five personality traits of Five Factor Model to 8 game genres preference and found 2.6-7.5% of game preferences can be explained by personality factors (Zammitto, 2010). The relevant personality traits of the Five Factor Model matched game elements of the genre, for example, the Extraversion is relevant to online play. Park and Lee (2012) demonstrated the influence of personality traits on the experiential gratification of online game players. Using the Five Factor Model of personality, Nicole also found significant relationships between personality types and game genres (Nicole, 2012). For instance, people who enjoy casual games tend to be more extraverted and that people who enjoy role-playing games and action games tend to be less extraverted. Another research examined the relationships between the FFM personality and preference to four different genres of video games (fighting, racing, dancing, first-person shooter) (Degraft-johnson et al., 2013). They

found a number of significant correlations, for example, Agreeableness was positively correlated with liking of dancing games.

So far as personality and playing styles was concerned, Bateman and Boon conducted an extensive study on adaptation of Myers-Briggs typology to games, and informed the concept of Demographic Game Design (DGD) (Bateman & Boon, 2006). Myers and Briggs categorized personality to 16 types according to four bipolar axes (Introversion versus Extroversion, Sensing versus Intuition, Thinking versus Feeling and Judgment versus Perception). These 16 types are commonly recognized by their acronym, for example, an individual whose results suggest a preference for Introversion, Intuition, Thinking and Judgment would type INTJ (Myers, 1995). The work of Bateman and Boon explored the personality as a mean to better understand game content, genres, or preferences, and how such information can affect game design. In their original study, 408 participants completed a Myers-Briggs Type Indicator (MBTI) test and a questionnaire on their playing habits and gaming purchases. Through cluster analysis, the 16 personality types of MBTI were grouped into four playing styles with different tastes and needs: Conqueror, Manager, Wanderer, and Participant. Each player type is associated with particular playing behaviors and preferences and is linked to particular personality types drawn from the MBTI. Conquerors enjoy winning, advancing and challenging in the game, and they are correlated with the Thinking and Judging personality traits. On the contrary, Wanders don’t welcome any difficulty, but search for the fun and novelty within the

game, since they are associated with the Feeling and Perceiving personality. Manager type players focus on honoring their playing skills and enjoy tactical challenge, while they are associated with MBTI traits of Thinking and Perceiving. Participant type players are associated with the personality traits of Feeling and Judging. They want to be a part of the game's story, and tend to create an emotional connection with the characters. By investigating how the personality patterns can be applied to game playing, Bateman and Boon established a new way of thinking about game design, arguing that designer should learn and satisfy the needs of players. In his later work in the same field, Bateman was also looking into a new typology of players based on neurobiological principles and Temperament Theory (Bateman & Nacke, 2010). Research has also demonstrated there is a relationship between four player types as identified by DGD model and FFM personality traits in a video game (McMahon, 2012). For example, Conqueror type player reported higher levels of Conscientiousness than Participant type players, while Participant type players scored higher on Openness to experience than Manager type players.

The personality has been considered to be even more important as predictors of in-game behavior. Since the personality determines how individuals behave in real life to a certain extent, it should also have a strong influence on their virtual behavior within game world. Griebel found both the personality traits and values of players correlated with their specific game play behaviors in Sims 2 (Griebel, 2006). Thirty participants firstly completed a Five Factor Model personality test, a value survey and

a demographic information questionnaire, and then were required to play Sims 2 for 30 Sims-days, that is approximately 10 hours. After game playing, another survey was administered to collect detailed data on how participant played the game, such as the behaviors of character and their economic careers in the game. The results demonstrated that personality traits of Neuroticism, Openness and Conscientiousness highly related to game play behavior. For example, players who scored high on Neuroticism were likely to miss bills payments and change careers more often in the game, and participants with high Openness tended to spend money impulsively and engaged in sex frequently. And player also did project their values such as wealth and creativity onto their game characters. For example, gamers who valued wealth in real life were prone to report it was important for their character to earn higher incomes in Sims 2.

Other related studies tried to explore the game play as a tool to assess the personality profile of individual, and they also set out to identify the correlations between the personality and play behavior. Lankveld created a custom module for the role-play game Neverwinter Nights which can automatically store an extensive data of game behavior. They correlated the game behavior data to scores on the personality questionnaire of 44 participants, and demonstrated that all five traits of the Five Factor Model have an effect on players' in-game behavior (van Lankveld, Spronck, van den Herik, & Arntz, 2011). Tekofsky investigated the correlations between Five Factor Model personality traits and playing behavior of Battlefield 3 provided by a database

of their game statistics and found that play style correlated significantly to players' personality (Tekofsky, Spronck, Plaat, Van den Herik, & Broersen, 2013). For example, the score on Conscientiousness is negatively correlated with speed of action in the game. Griebel also suggested that we can use the game Sims 2 as a projective measure of personality (Griebel, 2006).

As shown above, the existing research has revealed the links between the personality and video game playing. However, much research has been done on single-player or small multi-player online games that offer only a limited number of behavioral choices. For example, in some puzzle games, there is only one action or move available. Individuals' personality may have little impact on their game playing in these kinds of games, where all players must behave the same move and don't have a free choice. To explore the relationships between the personality and playing behavior better and add significantly to this field, researchers should pay more attention on the massive games that allow players greater freedom to make significant and meaningful choices between activities with different content and goals in the game world.

### 2.1.3 Personality and behavior in MMORPGs

MMORPGs (massively multiplayer online role-playing games) are online games where a very large number of players can create their own avatars and coexist in a shared game world. Compared with simple games, MMORPGs offer both a diverse of

game play and the opportunity to create and control avatars, and allow players to make meaningful behavioral choice and decision that are relevant to their personality. Players can level up their characters through earning more experience points for completing quests and killing monsters. They can seek to learn new skills, collect virtual money and acquire more powerful equipment which can add a competitive edge in their combat. MMORPGs allow players to interact with not only a variety of game content but also many other players. Players need to group together in order to progress at the optimal rate, and they can also compete with others in player-versus-player activities. MMORPGs differ dramatically from single-player or small multi-player online games in a diverse of behavioral choices, a vast number of participants who can play together and a persistent game world which continues to evolve after the player is offline. Therefore, players can choose different in-game behavior freely and form different playing styles, interests and motivations (Bartle, 1996; Yee, 2006).

One special advantage for studying MMORPGs is that through accessing to game server data, researchers are able to study player behavior and pattern in a diverse, extensive, and finely grained way (de Castell et al., 2012). Researchers have never before been able to get access to such a high precise recording at all time of what a person says and does, and all actions can be tracked unobtrusively without observer effect. And hence, the virtual world created by MMORPGs provides an unparalleled research platform for exploring the relationships between personality and behaviors with unique affordances (Yee et al., 2011; Worth & Book, 2014).

The studies conducted on the personality in its relation to behaviors in online games are still very rare. However, some researchers have revealed several meaningful correlations between personality and in-game behaviors in MMORPGs. Yee's study firstly examined the link between personality and in-game behaviors in World of Warcraft (Yee et al., 2011). In their study, 1,040 participants completed a web-based Five Factor Model personality test, and then the personality profile was paired with behavioral metrics over a four-month period. It was found that many behavioral cues in the game World of Warcraft were related to personality traits of the Five Factor Model. For example, Extraverts prefer group activities over solo activities, and players that scored higher on Openness had more characters and completed more exploration achievements. The score on Agreeableness was positively correlated with the total number of performing friendly visual interactions such as hug emote, and negatively correlated with the number of killing more players in player-versus-player combat. Yee also indicated that these behavioral indicators among MMORPGs can be used to infer a player's personality traits.

In contrast, McCreery found no significant correlations between Five Factor Model personality traits and behavior in World of Warcraft (McCreery, Krach, Schrader, & Boone, 2012). In their study, personality measured by questionnaire was correlated with a set of pre-defined behavior, such as the Agreeableness trait and corresponding sets of ‘‘agreeable’’ in-game behavior of players. 30 minutes' video-recorded game playing in World of Warcraft was reviewed and marked to determine whether a

behavior associated with a pre-defined behavior set. However, as acknowledged by McCreery, the validity of the behavior sets defined was not analyzed, and it is not clear whether the items in each set form appropriate and reliable scales. Also the sample size (*n* = 39) in their study may be too small to have a generalized conclusion. So their study may underestimate the possible relationships between player personality and in-game behavior in World of Warcraft.

In a more recent study, Worth conducted a survey to investigate the links between players' personalities of the World of Warcraft and their different behaviors within the game (Worth & Book, 2014). The selected personality model for their work is the HEXACO, including six factors: Honesty-Humility (H), Emotionality (E), Extraversion (X), Agreeableness (A), Conscientiousness (C), and Openness to Experience (O). The HEXACO shares several common elements with the Five Factor Model with one addition of the Honesty-Humility dimension. 205 participants were invited to complete a personality test and an in-game behavior survey on the typical activities in World of Warcraft. Significant correlations were observed between HEXACO personality traits and six behavior components they found. For instance, Social Player-versus-Environment activities positively correlated with Extraversion, and Helping and Immersion activities were positively correlated with Openness to experience.

### 2.1.4 Summary

To sum up, the personality characteristics of player are still not well understood, and the activities player choose in video games have not to be fully examined. Furthermore, the nature of the link between player personality and in-game behavior has not been clarified clearly. In particular, a considerable amount of research has narrowly focused on the Five Factor Model of personality. However, what they did not take into consideration is that players' tasting and their game practices can change across different time and context. The Five Factor Model proposed that underlying personality traits of an individual are stable and fixed, and the existing research based upon this model are unable to explain players' changing tastes in relation to their personality. Other kinds of trait theory (HEXACO) and typology theory (MBTI) of personality have come into same doubt, since the assumption is that personality traits or types are stable.

As McLuhan indicated, the games are collective and social reactions to the main drive or action of a specific culture (McLuhan, 1994, pp. 259 – 264). Games are extensions of the popular response to the workaday stress, and could be faithful models of a culture. When cultures change, so do previously accepted patterns of games. For example, baseball is a game of one-thing-at-a-time, fixed positions and specialist jobs such as belonged to the mechanical age, which makes it become the abstract image of an industrial society living by split-second timing. However, in the electric age,

baseball lost its psychic and social relevance for new way of life and had been replaced by American football in general acceptance. American football is no positional that agrees very well with the new needs of decentralized team play in the electric age.

Because behavior and preference of player can change, it may be impossible to pin-point to what category or trait they belong to. The horizontal psychological typologies merely identify stylistic differences and are unable to explain players' changing tastes in relation to their personality. Neither trait personality theory nor typology personality theory are well suited to researching or analyzing players' in-game behavior in the context of their changing taste and practice. The foundation in the form of a developmental theory of personality is much more important for any future player behavior research that will be sufficiently robust in this area. The study needs to overcome the drawbacks and explores personality in its relations to not only players gaming behavior but also their changing tastes.

A further consideration is that the majority of existing work is carried out using only self-reports method of survey and uses a very small sample sizes. However, de Castell stated that self-report method is categorically not a reliable method for accurate data gathering in the context of game study, and gave a caution regarding self-reported data. For example, he argued that we must pay attention to the features of the player population among which the survey data is captured. Yee's survey

research on player motivations was criticized for recruiting expert players as participants primarily from gamer forums, and so the finding cannot be generalized across the different player.

Additionally, the limited number of research available for studying personality and in-game behavior using game metrical data overlook more precise information related to game mechanics. Much research relied on self-edited game level or public database of game to record and analyze players' behavior, but not used commercial game data (also live player data sets). For example, Yee's study did not get access to the official database of World of Warcraft from Blizzard who developed and run the game. Only general behavioral metrics that have little to do with core game mechanics were found and analyzed, such as sum of hugs and waves, ratio of need rolls and ratio of healing done (Yee et al., 2011). Though these cues can help to explore the personality expression in online games, the findings cannot explain and anticipate the key playing performance.

Finally, the participants of aforementioned studies about personality and game playing were mostly recruited from English speaking especially Northern American samples. There is a need to focus on the players from different cultural backgrounds, and the current study aimed to fill in this gap by investigating the MMOPRGs players in China.

## 2.2 Value systems model

The personality theory established by Graves is chosen as the theoretical framework for this thesis. This chapter briefly outlines his Emergent Cyclical Levels of Existence Theory, and summarizes related studies and measurement instrument.

### 2.2.1 Emergent Cyclical Levels of Existence Theory

Graves performed decades of empirical research between the 1950s and the 1970s regarding what is mature human personality and concluded in a framework of human development he named the Emergent Cyclical Levels of Existence Theory (Graves, 1974, 1976, 2005). Graves' theory revealed that people continue to construct new conceptual models of the world in response to the interaction of external conditions with internal neuronal systems (Graves, 2005). These states of equilibrium between environmental problems of living and neurological coping systems were referred as levels of existence or value systems.

Graves conducted his project over nine years, and the supplementary research was spread over another twelve years. Participants were required to write reports about mature human personality independently without consulting any authority or anyone else. In this approach, Graves collected the basic data about the phenomenological view of what is mature personality. And then, the independent judges were arranged

to place these descriptions of mature personality into the fewest possible internally consistent categories. The judges were not involved in the production of these concepts of mature personality and knew nothing about the nature of the project except for classifying the reports.

Graves found that the judges came up with essentially the same classification and recurring elements and systems were shown by the empirical data. The concepts fell clearly into two major categories of expresses self and sacrifice self. The express-self systems are more externally oriented (make the world fit them), and sacrifice-self systems are more internally oriented (fit themselves to the world).

From the empirical data he collected, Graves found more subtypes for these two basic categories in subsequent research and eight stages of human development have been identified, which can be found in individual as well as in societies and cultures (Graves, 2005, p.128). The development state is designated by numbered levels and pairs of letters from Graves's original terminology, while the first letter stands for the existential problems (A, B, C, D, E, F, G, H) and the second for the coping systems (N, O, P, Q, R, S, T, U) (Graves, 2005, p.161-162).

Graves also noted that people alternated their focus in a cyclic fashion, while the sacrifice-self system always changed to an express-self system, and that the express-self system always changed to a sacrifice-self system. People focused first upon expression self to control the external world, then upon the inner world and attempts to come to peace with it.

1. AN: express self in order to stay alive as a human and so as to perpetuate the species.
2. BO: sacrifice self to the established tribal ways of one's elders.
3. CO: express self at all cost lest one feels ashamed for not living forever in the mouths and legends of humans.
4. DQ: sacrifice now in order to get rewards later.
5. ER: express self for what self desires in a reasoned calculating, not overly risky manner.
6. FS: sacrifice self now to valued peers in order to get rewards now.
7. GT: express self for what self desires but not at the expense of others.
8. HU: sacrifice self to the natural existential realities of life by adjusting to these realities.

The development of existing stages occurs in a fixed order, and each movement up resulted in new capacities and increasing behavioral freedom. As seen by Graves, "The mature person tends to change his psychology continuously as the conditions of his existence change. Each successive stage or level of existence is a state through which people may pass on the way to other states of equilibrium" (Graves, 2005, p. 29). After solving current existential problems, individuals will cope with new problems, and could move from one system to another up the hierarchy, and there for, we

cannot freeze the nature of human into any fixed types or traits. However, in some cases they may also stabilize in a stage or even regress to a lower level under certain conditions. His theory broke away from understanding human development as no more than a linear process that moves not only forward but also backwards.

And in the development process, the new existing level will merely establish subordination of the older ones, not eradicate of them. For example, when stage 3 takes over, the stage 2 is still there and subordinated in it. The new stage includes and transcends the previous ones, thus forming a natural hierarchy and there is a mixture of existing levels at work in each person all the time. At the same time, a person may be advanced in some levels, medium in others, and low in others. When we say an individual, organization or culture is positioned at a level, we just referred to the nodal position on the development staircase, and other levels are also present in more or little amounts.

Graves revealed that human development is not only a hierarchical process, but also an open-ended process. Human nature is an open, constantly evolving system, and there is not a final state of psychological maturity for human development. The HU (8th) is the final stage identified by Graves, but new problems and neurological systems will proliferate into new and higher-order forms of psychological being in development staircase forever and on.

When a person operates in a certain existing level, he or she has a psychology that is specific to that state. As said by Graves, “his emotions, ethics and values, biochemistry, state of neurological activation, learning-systems, preference for education, management and psychotherapy are all appropriate to that state”. And moreover, “he would have to respond negatively to forms of education, management and therapy not appropriate to the state of his centralization” (Graves 2005, p. 29-30). For example, Graves maintained we should manage people the way they want to be managed, but not assumed that they all like participatory decision-making in management. A closed personality at the certain level prefers a paternalistic form of management.

Graves described adult behaviors in a manner that allows for the reason for existence that impact on individuals’ value systems instead of focusing on intelligence and temperament. This model describes how people view the world in a complex way using multiple perspectives combining different disciplines of biology (neural systems), psychology (personality) and sociology (anthropology and systems theory), which aims to explain the biopsychosocial development of human existence. The ECLET model reveals the existence of the same familiar stages of psychological development that had been identified by numerous theoretical models of previous researchers (Lee, 1999), including Maslow's hierarchy of needs (Maslow, 1954), Erikson’s eight stages of psychosocial development (Erikson, 1950) and Kohlberg’s six stages of moral development (Kohlberg, 1981).

Graves himself has examined the ECLET in its relationships to 23 theoretical models of stage developmental, and felt that his overall findings on the levels of existing were in general accord with the well-researched conclusions of the other developmentalists (Graves, p. 439-446). However, Graves also believed that no theory conceived before could explain his data adequately. Most of existing models saw human development as terminal with an ultimate achievable state, and their breadth is a problem. For example, Maslow defined the self-actualizing as the ultimate state, and on the contrast, Graves' model shown that there is a need for levels beyond self-actualization and higher and higher levels of stage will forever emerge (Graves, 2005, p. 147). Erikson's and Kohlberg's stages were also both not open-ended and conceived the human development to be as a final end state.

Graves's work which went farther than the other developmental psychologists in the way it not only described distinct stages, but also shown how these same stages are related to each other in a living system of evolution. For instance, Maslow's hierarchy of needs lacked of a cyclic factor and what Maslow described as "belonging" was only one of the several forms of "belonging" in levels of ECLET, but they are different in each of the three. Stage 2 was valuing one's elders, stage 4 valuing one's higher authority, stage 6 valuing one's peers and stage 8 valuing one's existential world.

### 2.2.2 Spiral Dynamic and its' development

After his death in 1986, Graves' academic achievements was adapted to the model of Spiral Dynamics and introduced to a wider audience by his students and successors Beck and Cowan (Beck & Cowan, 1996). Spiral Dynamics is an extension and elaboration of the ECLET (Kotze, 2009) and accepted as the most authoritative theory on value systems. Today Gravesian theory is secularly called Spiral Dynamics, which in turn is referenced by a number of other theorists and researchers.

Beck and Cowan integrated Graves' construct with the term of meme developed by Dawkins from the field of genetics (Dawkin, 1976) into a new concept named vMeme (value meme). Dawkins defined the meme as a unit of culture (a belief, pattern of behavior, worldview etc.) that is analogous to a gene, and it can reproduce itself from one individual to another. vMemes refer to a core value system that expresses itself through memes, and are considered to be a bio-psycho-social-spiritual DNA-type script which can also replicates itself through a culture. "A vMeme transposes itself into a world view, a value system, a level of psychological existence, a belief structure, organizing principle, a way of thinking, and a mode of living" (Beck & Cowan, 1996, p. 40). It plays out in three levels of individuals, organizations and societies.

Beck and Cowan conceptualized eight vMemes that are the various levels of psychological existence from ECLET and together describe the different ways in

which people see and engage with the world. They introduced the color labels used to describe the eight vMemes. The warm colors represent express-self category and I-orientated vMemes, including Beige (AN), Red (CP), Orange (ER) and Yellow (GT). In contrast, the cool colors represent sacrifice-self category and we-orientated vMemes, including Purple (BO), Blue (DQ), Green (FS) and Turquoise (HU).

The vMemes will be activated in a consistent pattern and sequence according to the historic times, geographic place, social circumstances, and life problems we are facing. People possess the capacity to create new vMemes and move to higher vMemes. Each Meme has its three phases of entering, peak, and declining. The classification between three phases of each existing level is one of the most significant contributions that Beck and Cowan made to ECLET, because it explains how a value system takes place within the individual.

The vMemes describe types of thinking in people rather than types of people and each value system can be more or less activated in each of us at any one time. So we cannot assign individuals to a fixed stage or typology and there is no such thing as a Red person, or a Green person. None of the value systems is inherently better or worse than any other, while the healthy expression of each value system is essential to the development of the entire spiral. When a new level appears, all low vMemes previously acquired in development stages will be retained in the composite value system and can be drawn in healthy ways when situations demand it. For example,

we might think about religion through the Blue value system, but express Red in a football game and rely upon Purple in the family.

The same principles of vMemes apply as much to a single individual as to an entire culture or society. The cultures and countries are thought to be formed by the emergence of memes or value systems, which define who they are as a people and bond a group together. The Spiral Dynamics model offers an incisive and dynamic perspective on the development of worldviews or value systems within individuals, organizations, nations and cultures, tracking historic emergence from clans to tribes to networks and holograms. Beck and Cowan apply the principles of Spiral Dynamics worldwide in leadership, public education, prison rehabilitation, business management and other social concerns such as South Africa's transition from apartheid.

In the meantime, a considerably number of other studies and books have appeared, referring to Graves' model or Spiral Dynamics, described a wide range of extensive applications in which the value systems could be used, such as psychology, management and cultural studies (Wilber, 2000; Robinson, 2007; Cook, 2008; Meyer, 2010; Laubscher, 2013; Reitter, 2014). For instance, Wilber refer Spiral Dynamics as "one series of photos of the Great River of life", which he in turn has named as "The Spiral of Development" (Wilber, 2000).

Utilizing Graves' theory and Spiral Dynamics in the study of values systems, Krumm further developed their original construct into nine levels of human existing with a 9th stages called Coral which is considered to be the Red of the second tier (Krumm, 2013). The model of nine Levels presents a framework for personality development and evolution of organizations and cultures. It attempts to better understand the development of value systems among persons, groups and organizations. For example, how a person fits into a company or what challenges posed by the environment and how promising the current value systems are.

Based on the value system of Graves and the theory of Spiral Dynamics, Dawlabani presented a framework for explaining the evolution of economic systems which he called EMEnomic Cycles (Dawlabani, 2013). Dawlabani described four active macroeconomic systems corresponding to the first tier of six value systems as defined by Graves, and a fifth economic system for seconding tier of human existing. For example, the first detailed MEMEnomic era was the Fiefdoms of Power Cycle, which lasted from the end of the United States Civil War to the middle of the Great Depression. It is identified with the values of the third stage (Red) as seen by Graves, such as egocentrism, heroism, and feudalism, in which a few men built and control an entire economy. The forth Cycle was Democratization of Information Cycle which started in the 1990s and is still going through the growth phase today. It is identified with the values of sixth stage (Green), seeking the equal distribution of information, knowledge and resources. Dawlabani commented that global crisis today such as

dysfunction in Washington, and the Arab Spring are symptoms of the transition to the Fourth Cycle. He argued that we must move up to new higher order value systems to solve existential economic and social problems that cannot be solved by the previous system.

### 2.2.3 Characteristics of eight value systems

Graves' value systems are adapted to the concept of vMemes by Beck and Cowan (Beck & Cowan, 1996), and also referred as Levels of Consciousness (Wilber, 2000) or worldviews (Dinan, 2013; Yeats, 2012). The value systems are the primary term I used in this thesis work, which are considered to be modes of adjustment for coping with the perception of the reality of the world.

A value system is defined as "a worldview, an organizing principle, a set of priorities, a mindset, and a specific bottom-line. They serve as magnets around which our cultural "stuff" clusters and aligns itself. They determine how people think rather than what they value. They are the invisible forces that drive human perceptions and social change" (Beck, 1999).

Beck and Cowan designated a different color for each value as symbol in their Spiral Dynamics Model, which has been widely accepted and used (Beck & Cowan, 1996). In this thesis the basic colors added by Beck and Cowan will be used to describe the

different value systems, while AN will be referred to as Beige, BO will be referred to as Purple, CP will be referred to as Red, DQ will be referred to as Blue, ER will be referred to as Orange, FS will be referred to as Green, GT will be referred to as Yellow, and HU will be referred to as Turquoise. As conceptualized by Graves, human has gradually developed eight levels of existence or value systems so far which move on to next one in a fixed order as shown in Table 2-1.

Table 2-1

*Summary of Value Systems*

| Level and label | Means values | Nature of existence | Basic theme |
|---|---|---|---|
| 1th AN (Beige) | None | Automatic | Express self as if just another animal according to the dictates of one's imperative psychological needs |
| 2th BO (Purple) | Traditionalism | Tribalistic | Sacrifice self to the way of your elders |
| 3th CP (Red) | Exploitation | Egocentric | Express self, to hell with the consequences, lest one suffer the torment of unbearable shame |
| 4th DQ (Blue) | Sacrifice | Deferentialistic | Sacrifice self now in order to receive reward later |
| 5th ER (Orange) | Scientism | Materialistic | Express self for what self desires, but in a fashion calculated not to bring down the wrath of others |
| 6th FS (Green) | Sociocentricity | Personalistic | Sacrifice now in order to get acceptance now |
| 7th GT (Yellow) | Accepting | Cognitivistic | Express self for what self desires, but never at the expenses of others and in a manner that all life, not just my life, will profit |
| 8th HU (Turquoise) | Experiencing | Experientialistic | Adjust to the realities of one's existence and automatically accept the existential dichotomies |

| | |
|---|---|
| | as they are and go on living |

*Note.* configured based on Graves (2005) and Beck and Cowan (1996)

Beige (AN)

The problem of this stage is the survival, and the reaction of individual is the automatic equipment of the neurological system. Simply staying alive is more highly valued than anything else. People live much like other animals and are at the automatic state of physiological existence, while whatever reduces pain or tension is good. They were driven by instincts and genetics needs such as food, shelter and reproduction, seeking only the immediate satisfaction of their basic physiological needs.

The only example of Beige today can be seen in new born infants, the senile elderly or patients with severe mental illness. And in some cases, survivors of a tragedy may also regress to Beige state temporarily and rely on basic human instinct to survive.

Key Values: survival and companionship, instinct-driven biological needs

Basic Motives: staying alive through innate sensory equipment

Purple (BO)

The need of this stage is for stability and security, and the coping system is to bond together in a family, a clan or a tribe that offers protection, security and belonging. People prefer for paternalistic atmospheres, and strongly rely on their leaders such as parents, teachers, coaches or supervisors, etc.

This is a form of existence based on myth, taboo and tradition, and they sacrifice self to the way of the elders. People show allegiance to elders, custom and clan, seeking to maintain a way of life that they do not understand and cannot be questioned. They also have the first real ability to assign cause and begin to connect the two events in a primitive causal relationships based on myth and superstition. The learning method is by trial and error based on classical or Pavlovian conditioning, in which association is created but the reason behind it cannot be explained.

Key Values: tradition, magic-mythical awareness, rituals, taboos, obedience, family bonds

Basic Motives: blood relationships and mysticism in a magical and scary world

Red (CP)

The theme of this stage is to express self, but to hell with the consequences. People begin to realize personal power and to rebel against authority figures, rules, and traditions. They are impulsive, self-assertive, and egocentric, with a strong desire to do as they please. They have no feeling of guilt, but have a strong feeling of shame.

The priority is the self and the self-expression and the decisions are made which bring immediate gratification without regard for the long-range consequence. People either seek to survive through dominance and aggression or seek survival through submission to the stronger, and as a result, the few became conquerors and rulers, but the many became those who submitted. And therefore, victor or hero who can choose to do as he pleases becomes the most revered figure of this stage.

The word is viewed as a hostile and alien place for them to explore and conquer. There is an intentional learning system in which people begin to manipulate their world rather than to accept it passively.

Key Values: power, needs to be noticed, aggression, control, force, dominance and avoiding shame

Basic Motives: enforce power over self, others, and nature through exploitive independence

Blue (DQ)

This stage is primarily motivated by interest in meaning and purpose of life, and the primary value is self-sacrifice, order and loyalty. People learn to control impulses and sacrifice now in order to prove themselves worth of more lasting life. They tend to suppress their own inner life and value a rigid ordering of the outer world.

People have the capacity for guilt when break the rules, and they can learn best when there is a threat of punishment. A set of rules and regulations are recognized, which one should follow and result in everlasting happiness. They think in an absolutistic fashion and classify the whole world into black or white, good or evil, right or wrong. Other being is taken into account, but they are judged in terms of having the right or the wrong feeling. This has a lot in common with the Purple level, but now it is the perceived authority that sets the rules for life instead of the elders.

Hierarchies are stressed and they easily defer to a higher authority (God, the government, or teachers) through which a new source of security is found. Clearly defined social roles are perceived to describe the proper way each class is to behave.

Key Values: sacrifice for honor, order, loyalty, purpose, guilt and consequences, observe hierarchies, patience, certainty

Basic Motives: absolute belief in one right way and obedience to authority

Orange (ER)

People at Orange strive for self-achievement with the goal of preserving and increasing their prosperity. They are energetic and enjoy the process of competition in which they can demonstrate their abilities to attain goals and get ahead in life.

Once again, people attempts to conquer the world, and there is a similarity between the Blue and the Red system. However, their success is not achieved at the expense of others and within the constraints of society. They try to find the best solution by their own rational thought and technology rather than through raw, naked force as they did at the Red level. The learning occurs through analysis and careful testing and nothing is for sure until proven so.

Key Values: material success, status, competing to achieve results, profit orientation, growth, prosperity

Basic Motives: possibility thinking focused on making things better for self

Green (FS)

The theme for this stage is that sacrifice now to get acceptance now. People at Green become centrally concerned for self-discovery, group recognition, and uniqueness of each person.

In this level, individuals like being part of a group or a bigger movement and the need for community, equality and unity are paramount. They will self-sacrifice for the benefit of their group or community, and society's resources are shared among all. They value the authority of those contemporaries rather than the elders or powerful people, and the decisions are expected to reach through consensus. Success was seen as the result of the correct team configuration, while participation and inclusion are more important concepts.

Key Values: equality, participation, community, harmony, fairness and adaptation, belonging

Basic Motives: well-being of people and building consensus get highest priority

Yellow (GT or A'N')

People of this level discover personal freedom without harm to others or excesses of self-interest. They live within the constraints of society while seeking to enjoy their maximum individual freedom. They accept the inevitability of nature's flows and forms.

If it is realistic that we should suffer, and then suffer we should. For example, they enjoy a good meal when it is there, but do not miss it when it is not.

Increasing knowledge and information is valued, and material possessions, power and status are secondary. They prefer being managed through competence but not status or position, and tend to be self-motivated.

The previous six levels viewed the world as being correct only from their perspective. At Yellow, people think in a multi-perspective and systemic manner, and can transcend to any of the lower levels at will. As seen by Graves, the levels are repeated with GT as another AN in the second tier at a higher level and the threshold of being human.

Key Values: inspiration, personal development, lifelong learning, fitting a living system, spiritual growth

Basic Motives: flexed adaptation to change through connected, big-picture views

Turquoise (HU or B’O')

Turquoise is the BO of second tier, and people have become global citizens who focus on the good of all living entities as integrated systems. There is a desire to serve

the well-being of the whole using personal capacities accumulated.

People think globally, ecologically and intuitively, and characterized by the values of collective intuition, systemic action, sustainability and responsibility for the future of life. Self is regarded as part of larger, conscious, spiritual whole that also serves self. People are driven by the winds of knowledge, and learning takes place through observation and participation and a sense of simply being.

Key Values: collective intuition, global harmony, the well-being of mankind, sustainability, survival of life on earth

Basic Motives: attention to Whole-Earth dynamics and macro-level actions

As seen by Graves, a distinct jump occurs during stage 6 to 7 transitions, while stages 1 to 6 make up the levels of the first tier and stage 7 and 8 make up the second tier. Two tiers are identified with a distinct jump between them (Beck & Cowan, 1996). The value systems in the first tier are characterized by fear, and on the contrast, the value systems in the second tier are based on love. There is a fundamental difference between getting and giving, taking and contributing, destroying and constructing. For example, from stages 1 to 6, people react to the lacks and needs in an individual's environment. Even the people in the stage 6 are attempting to meet for approval and acceptance from peers.

### 2.2.4 Selection of measuring instrument

After selecting the personality theory of ECLET, it is necessary to choose a qualified tool that can measure this construct. A number of efforts have been made to develop an instrument for assessing a person's position in the levels of ECLET. Early in 1979, under the supervising of Don Beck, Hurlbut created a questionnaire in her research for revealing the level of existence as set forth by Graves' model (Hurlbut, 1979). Another instrument was developed in 1982 in a doctoral thesis to measure individual's value systems (Lee, 1982). In recent years, many new instruments appeared as business tools for consulting, coaching and training, including Roberts Worldview Assessment for measuring core values, attitude and thinking styles (Roberts, 2010), 9 Levels of Value Systems based on Graves' model (Dobbelstein & Krumm, 2012).

Graves himself also noted these kinds of tests and admitted that some have had a measure of success. He commented that the developers of the instrument must comprehend his theory and understand what is to be assessed. Those who have tried to develop instruments should be based "not on what the person thinks but how s/he thinks, not on what people do or what they believe but how they do what they do, and how they believe that which they do believe" (Graves, 2005, p. 69). It is not possible to identify the operating value system of people by observing their behavior, and the only way to determine the value system is to recognize why they do this.

The CultureView (http://5deepvitalsigns.com/products/instruments/cultureview-series/) is derived from the original work of Clare W Graves and built upon the work of Don Beck. It was developed and owned by Don Beck and originated in paper form in 1997. In 2001, it was conversed to electronic form by Don Beck and Christopher Cooke jointly. Don Beck worked with Graves closely until Graves' death in 1986, and then continued to spend almost thirty years adapting the work of Graves. He headed the National Values Center (http://www.spiraldynamics.net/) for utilizing Graves' theory in the study of values, which is the home of Spiral Dynamics Integral (SDi) and presents publications and worldwide trainings based upon the ECLET. CultureView developed by Don Beck, therefore, seemed one of the most qualified instruments to assess individual's value system based on Graves' theory.

The score of CultureView provides insight into eight indicators of personal mindset:

*Cultural Fit Factor*

How individual is fit with current lifestyle, parents, friends, and career developments.

*Perception of Society's Priorities*

The essential priority individual perceived, including Trust, Respect, Principles, Profit, People, Purpose, and Planet.

*Coping Mechanisms*

Coping mechanisms assess different existing levels according to the ECLET, while highest scores are an indicator of the dominant value systems that influence all individual think and do. The scores measure how individual think rather than what they think, reflecting their unique worldviews, belief structures and operating systems. Coping Mechanisms are invisible DNA which influence all individual perceive and do in the world.

*Perception of Organizational Priorities*

The present and desired organizing principles individual perceived in their organization.

*Change Patterns*

The worldviews changing process of individual is identified as First Order Change (Horizontal, change within a given value system) or Second Order Change (Vertical, change between different value systems).

*Readiness for Change*

The worldview change of individual is classified to five different states including Alpha (content with situation), Beta (sense change is required), Gamma (feel stuck and trapped), Delta (see a clear way forward) and New Alpha (utilize new thinking).

*Executive Change Intelligences*

The score shows individual's strengths in managing worldview change, including Entrepreneurial (launching a new value system), Translational (preserving on existing systems) and Transformational (transforming from one value system to another).

*Patterns of Thinking*

The patters of processing the information are classified as digital (left brain) and analogue (right brain) thinking styles.

The CultureView instrument had been used for many years and a database was available for reference. Since 2001, it has over 12,000 electronic completions globally, and has been translated to many different language versions including English (UK), Dutch, Korean, German, and Spanish.

### 2.2.5 Summary

To explore the relationships between personality and in-game behavior of player, selecting a personality theory has been a delicate and thorough decision. The most appropriate model must align with the objectives of this thesis work, and be able to describe and explain the construct I examined. Graves' theory has evident implication in the analysis of responses to video game, and its' substance resides on revealing different sets of worldviews individuals place on their decisions and actions. It can be anticipated that the value systems of individual will also have an effect on responses to

video game.

The ECLET arises as a suitable candidate also due to their unique view on the evolving and always-open-to-change nature of the personality. The ECLET moves beyond the assessment of fixed horizontal dimensions and type indicators of the individual personality. Unlike horizontal psychological personality theory, such as Myers-Briggs personality type system or Five Factor Model which merely identify stylistic differences, Graves' ideas about the development of personality are distinctly hierarchical. For example, according to Graves' model, we not only know that a person is operating on the Blue but that he came from the Red and could move up to the Orange. Compared with Five Factor Model or other personality theory, this valuable information will shed further light onto what the personality research related to player behaviors has been consistently neglecting.

Though Graves' model has been accepted and used in many fields, the value systems of game players are still not investigated. And what is more, in spite of its' popularity, the knowledge on the application of value systems in China was minimal and virtually no empirical data about the ECLET are available on Chinese people. Graves believed that the ECLET model has a cross-culturally validity (Graves, 2005, p. 4), and Beck also stated that Spiral Dynamics "describes human nature in a universal sense rather than through personality types or racial, gender, and ethnic traits" (Beck & Cowan, 1996, p. 30). However, it is still not clear whether the value systems Graves

identified exist in China today.

# CHAPTER 3 Methodology

This thesis work is interested in identifying the value systems of players and examining if there is a relationship between value system and in-game behavior. The purpose of this chapter is to describe the procedures used to collect data for answering the research questions. The methodology and research design are introduced and the questionnaire translating and verifying process are also presented.

## 3.1 Research design

With an innovative mixed methodology, this thesis work brings together methodological approaches from questionnaire and game metric technique. The study consists of two separate parts: to identify the value systems of player by massive online survey, and to investigate and analyze participants' in-game behaviors by data mining. The combined method developed in this thesis can overcome the shortages of each method and thus satisfy the research objectives better.

The first phase of my study involves collecting data on value systems, demographic variables and gaming experience by using questionnaires. The objective is to map out the value system characteristics of players and their backgrounds. Participants access the research survey through a link within the game world, and complete it online. These self-report data collected are analyzed and further compared with instrument averages resulted from global measurement. The difference across the

demographic such as gender, age and occupations are also examined. Survey provides a quick and easy way to collect empirical data and has been a widely acknowledged and accepted tool in many fields. However, when applying survey method to the context of video game study, it should be noted that self-report method itself may be an unreliable source of data that leaves room for interpretation bias. Compared with traditional self-report method, the game metric technique based on server data enables us to access a high precise recording of players' behavior. The second phase of this research consists of investigating the in-game behavior through game metrics and pairing these data with players' value system profile created by online survey. A number of correlation analyses are performed to examine the relationship between self-report data and game metric data, allowing us to quantify the links between values system and in-game behavior.

Participants in this study are self-selected players solicited from the MMORPG of Ghost II. The access to an online game like Ghost II which is currently played by millions of people is one of the most prominent and interesting aspect of this research.

## 3.2 CultureView translation and verifying of Chinese version

Under the consent by Don Beck and Christopher Cook, I employed a Chinese translation of the CultureView to assess value systems of online players in this study. Table 3-1 lists representative statements of CultureView for six selected value system.

Table 3-1

*Representative Statements of Six Stages of ECLET from Cultureview*

| Level and label | Representative statements |
|---|---|
| 2th BO (Purple) | “A "caring parent" supervisor who takes care of us.” “Preserves traditions, customs, festivals while protecting our groups.” |
| 3th CP (Red) | “A boss who is tough but lets me be tough, too.” “Spunky, risky, bold, daring, often rebellious.” |
| 4th DQ (Blue) | “Loyal, dependable, ordered, with firm convictions and beliefs.” “Treats everybody by the same rules and is stable and dependable.” |
| 5th ER (Orange) | “Manoeuvre strategically to land on top.” “Thinks strategically and is competitive so we can be successful.” |
| 6th FS (Green) | “Warm, open, inclusive, with focus on feelings and community.” “Join with others to share and care.” |
| 7th GT (Yellow) | “Be Authentic by integrating natural functions and flows.” “Self-reliant, autonomous, flexible, with multiple interests.” |

The Beige (AN) stage is not included in the CultureView instrument, because this stage is a sub verbal level and therefore cannot be examined by verbal test. People on the Beige (AN) stage are illiterate, too young to read or in a medical condition that prevent them from reading. In 2013, the CultureView was upgraded to a version including new items for assessing Turquoise (HU) state. However, the people

centered in Turquoise are only 0.1% among the whole population as estimated by Beck (Beck & Cowan, 1996, p. 301). And especially in a developing country like China, the percentage should be even lower, while Graves pointed out that the lower the socio-economic status of the individual, the more his existing state tended to be low in the hierarchy of the ECLET. More items will demand a high time investment of the participants. I used the original version of CultureView (CSo) to measure six value systems from Purple (AN) to Yellow (GT). The Chinese version used here also didn't include the items for the Perception of Organizational Priorities in order to shorten the responding time. It is a ranking question that will need more time and energy to complete, and moreover, about one third of the online game player in China is full time students and they don't have any experience worked in an organization.

After translating to Chinese, the CultureView was tested among people who can speak both fluent English and Chinese. 10 participants firstly completed the English or Chinese version randomly, and then were invited to complete the other corresponding version. After each testing, the correlation was calculated between English and Chinese items, computing Pearson Correlation for the items of continuous variables and Chi-Square Tests for the items of nominal variables. If the result is not significant ($p > 0.05$), the translation of those items will be revised and be brought to one more test again with another 10 participants.

Totally, 4 sessions of testing were conducted to make sure that 77 items translated to

Chinese is significantly correlated with their original English items. For 4 items that I could not get a significant result even after 4 tests, I finally selected the translation with the highest correlation with the original English item. The item for Executive Change Intelligences is a multi-choice question with up to 18 different options and I did not have enough cases for each option in these 10 person tests. For this multi-choice item, the correlation was calculated for reference but it did not ensure a significant result. The correlation analysis between Chinese version and original CultureView has been attached as Appendix I.

The original CultureView is known to have high validity as verified by the expert review and shown through the personal interview in coaching process and academic research (Holwerda & Karsten, 2006). The high correlation between Chinese and English items has also indicated that the Chinese version can retain the validity and reliability of the CultureView. I then examined the test-retest reliability of the Chinese version with 20 participants, and they completed the CultureView twice with an interval of one week. Among the 81 questions tested here, 87.65% of items were significantly correlated between two tests, showing good reliability of the questionnaire. More details about reliability of CultureView can be found in Appendix II.

Finally, an online version of CultureView with Chinese items translated and verified was created, and used to assess the value systems of Chinese players in the present

study. The full questionnaire has been attached as in Appendix III.

## 3.3 **Ghost II**

Ghost II (http://nie.163.com/en/qn2.html#aw, NetEase Inc., China), a 3 dimension real-time massively multiplayer online role-playing game (MMORPG) that is playable on computers, is currently one of the most popular online games available commercially in China.

Ghost II is a free-to-play MMORPG developed and published by the Chinese company NetEase. Early in 2011, just 131 days after it was released, the total number of registered players was announced as over 12 million, and it was elected as the Most Expected Online Game Masterpiece in 2013 by Chinese players. Ghost II won the attention from both players and industry, and was ranked as one of the Top Ten Domestic MMORPG in 2012 and 2013 by Chinese game media. The choice of Ghost II for this study was because of its popularity and huge number of active players that could offer a broad range of participants with good representativeness and researcher's previous association with NetEase as an employee.

Ghost II is derived from a fantastic story among a famous Chinese classical mythology novel named *Strange Tales of Liaozhai*. Like Word of Warcraft, as shown in Figure 3-1, the game creates a massive virtual fantasy world occupied by ghosts,

demons, fairies and also humans. Ghost II offers a high degree of behavioral choice for players, which makes it an appropriate platform for a study of player personality and in-game behavior.

*Figure 3-1.* The avatar and game playing in Ghost II

The game play of Ghost II is designed around a huge number of story-lines, multi-player raids and quests that refer to a specific in-game adventure or endeavor. Player first creates and customizes a character with different skill sets at level one, and increase in character level and strength by accumulating experience and skill points through engaging in a wide range of activities. Ghost II features a considerable number of different objectives and mechanics for players to choose and explore, including completing quests, defeating monsters, getting to the next level, meeting and getting to know other players, exploring landscapes, acquiring rare items and being part of a story.

Ghost II not only allows the interaction with the game content but also provides a rich context for social interaction with other players, where player could find his/her brother, team player or even virtual spouse. Players are encouraged in different ways to communicate and collaborate with other players and to complete difficult game content together, and they can also regroup in massive guilds. PvP (player-versus-player) activities are also provided from one-to-one duels to large 20 vs 20 battlegrounds, in which players can attack other people either solo or as part of a multiplayer battle. Therefore, players can choose different in-game behaviors that are particularly appealing to them and form their own playing styles and preferences through the game.

## 3.4 Administration of the online survey

With the permission of the NetEase Company that developed and runs Ghost II, the linkage of CultureView survey was presented to the player within the game world directly, and all data was automatically collected and stored via the online survey system of NetEase.

*Figure 3-2.* Online survey in Ghost II

The data collection took place over a period of one week, and all respondents were not paid or compensated for their participation. As shown in Figure 3-2, when players first logged in during this period, a message appeared and invited them to complete the online survey. When clicking the link to the survey included in this message the participants were taken to a website to submit their questionnaires online. The message appeared only once and was not presented again when this character logged on next time. Also this research limited the survey and invitation message to characters above level 15 in order to ensure I could gain sufficient information about in-game behavior from the higher level characters and also to not interrupt the game play of new players.

The data form collected in this research contained: items of CultureView questionnaire as independent variables, gender, age, income, areas of residence,

occupation, education background as background variables, and character identity number of player, IP address of respondent, completion time as technical control variables. An open-ended question about why they select this game was also answered, identifying how player perceive the game themselves.

Except for this massive survey in Ghost II, another online survey was conducted among non Ghost II players in order to collect more data as a comparative group. The participants were recruited from email address, website forum, WeChat or QQ group (popular instant messaging software in China). They were asked to complete the CultureView questionnaire online and provide information regarding their gender, age, education background, areas of residence, monthly income and online game playing experience.

## 3.5 Game metric

This research had access to the official database of Ghost II in order to collect data of the participant's actual in-game behavior. Player character ID was used as the key for game metrics retrieval, and the players' self-report data containing demographic and value system variables was paired with their character profile created by data mining.

Overall, what a player says and does at all times is precisely recorded in MMORPGs, and we can track nearly all actions through the analysis of game logs. However, I

cannot extract all possible variables for analysis in this research, and a basic grasp of core game mechanics is necessary. This thesis work limited the game metrics to a meaningful and manageable subset of longitudinal behavioral data as shown in Table 3-2.

Table 3-2

*In-Game behavior in Ghost II*

| Variables | | Description |
|---|---|---|
| 1 | Time played | Amount of time (minutes) logged onto the game since the character was created |
| 2 | Consumption | Amount of real money (China Yuan) spent in game for virtual items since the character was created |
| 3 | Character level | Level of current character |
| 4 | Wushan magic stone level | Level of magic stone , an item for enhancing equipment |
| 5 | Character ability score | Reflecting comprehensive ability of character |
| 6 | Achievement point | Total number of achievement player has completed |
| 7 | Ranking of ability among friends | Ranking among all the friends player has added |
| 8 | Equipment score | Sum of all equipment item scores |
| 9 | Ability practice | Number of times player has augmented character skill and ability |

| | | |
|---|---|---|
| 10 | Number of friends | Total number of present friends added |
| 11 | Goodwill point | Gaining through grouping and helping lower level player |
| 12 | Guild level | Level of guild belonged to |
| 13 | Guild point | Contribution to guild by finishing quest or activities |
| 14 | Dueling point | Number of winning in duel with players |
| 15 | Player killing point | Number of killing other player maliciously |
| 16 | Guanning battleground score | Gaining through Killing against other player and winning a battle in battleground |
| 17 | Pet score | Pet is a little functional but largely decorative companion |
| 18 | House score | Reflecting player house's construction, which is mainly for decorating and vanity |
| 19 | Narrative point | Count of completing main storyline quests |
| 20 | Marriage | Married or not |
| 21 | Mentorship | In a mentorship or not |
| 22 | Character Class | Classes players chose, which each has a unique set of abilities |

All the metrics data recorded here is tracked since the character was first created and were cumulative over a long time in the game world. The in-game behavior data analyzed was the core game performance statistics of Ghost II and also covered a wide range of behaviors, such as the character level, playing time, the quality of equipment, achievement score, the amount of PvP activities, friendship and guild

membership, etc.

# CHAPTER 4 Results

This chapter introduces the analysis process of the data collected. To answer the research questions, I firstly described the value systems of player, and then, a series of correlation was performed to explore relations between value systems and in-game behaviors. Section 1 describes how a data reduction was performed to in order to assure a corrected data set. Section 2 shows the characteristics of the sample. Section 3 identifies the value systems of player. Section 4 explores the relationships between value systems and in-game behaviors through correlation analysis. Section 5 presents the multiple linear regression analysis between value systems and behavioral variables. Section 6 examines the mediation effect of demographic variables. Section 7 further performed a multivariate ANOVA analysis.

## 4.1 Data reduction

My research received the submissions from 14,068 participants and a data filter was applied in order to maximize the integrity of the final result. Online survey suffers from a low completion ratio, since responding is anonymous and it may be viewed as an interruption to the operation or participants' game play.

Thurs, I first excluded data with any missing information in the items of CultureView questionnaire, and I ended up with 6,625 participants' data that was fully completed,

producing a completion ratio of 47.09%. Secondly, duplicate responses were identified and excluded by comparing IP addresses. Because one player may be playing with multiple avatars at the same time and complete the survey more than once, only the first submission from a same IP address was included for further analysis in order to ensure the result is about real players and not virtual characters. The rate of duplicate responses was trivial, and only 73 responses were excluded in this phase. Finally, 1,125 participants who overused the same response were removed, such as inputting seven across nearly all items. This excluded the participants with a biased response style to ensure the result from only individuals who were serious about filling in their answer. In total, 5,427 participants were left in the sample after the three filters were applied. Their average time for completing the questionnaire was 21 minutes.

In the second survey among non Ghost II players, a total of 143 responders submitted their questionnaires online, and 112 participants' data were completed and valid for analysis.

## 4.2 **Participant demographics**

The majority of respondents are male, and over one-third of them are aged between 19 and 22 years. The design of the study was to be demographically inclusive, and there was a concern that self-selected group for the survey may not reflect the player

population in general. Three main characteristics of sample (gender, age and education background) were compared with a large normative sample of 1.5 million Chinese players' data collected and reported in 2012 (China Gaming Industry Reporting, 2012). It can be seen from Figure 4-1, 4-2 and 4-3 that the participants of this survey (Ghost II players) are consistent with the characteristics of the Chinese players in general.

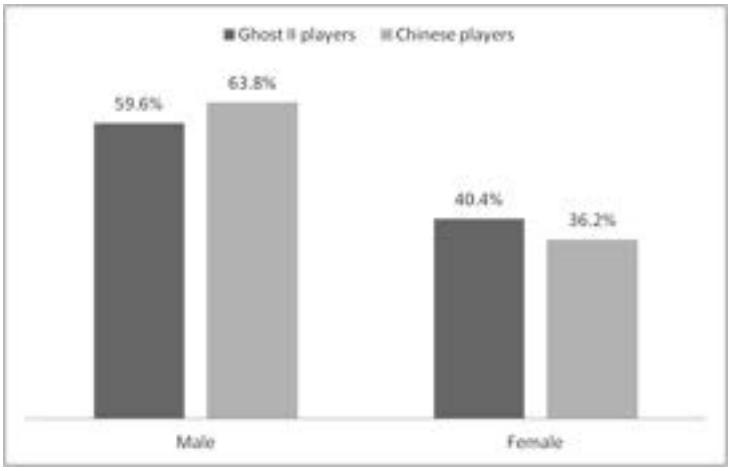


*Figure 4-1.* Gender distribution of Ghost II players and normative sample

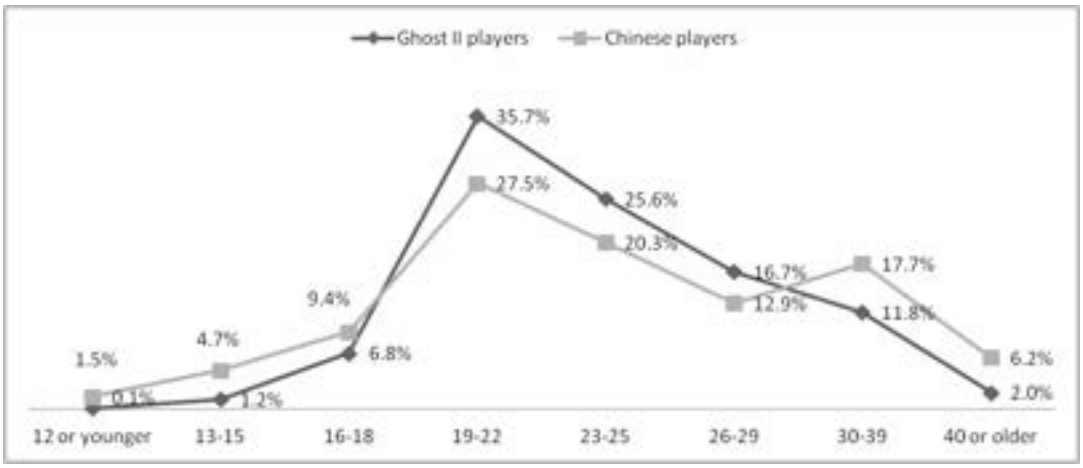


*Figure 4-2.* Age distribution of Ghost II players and normative sample

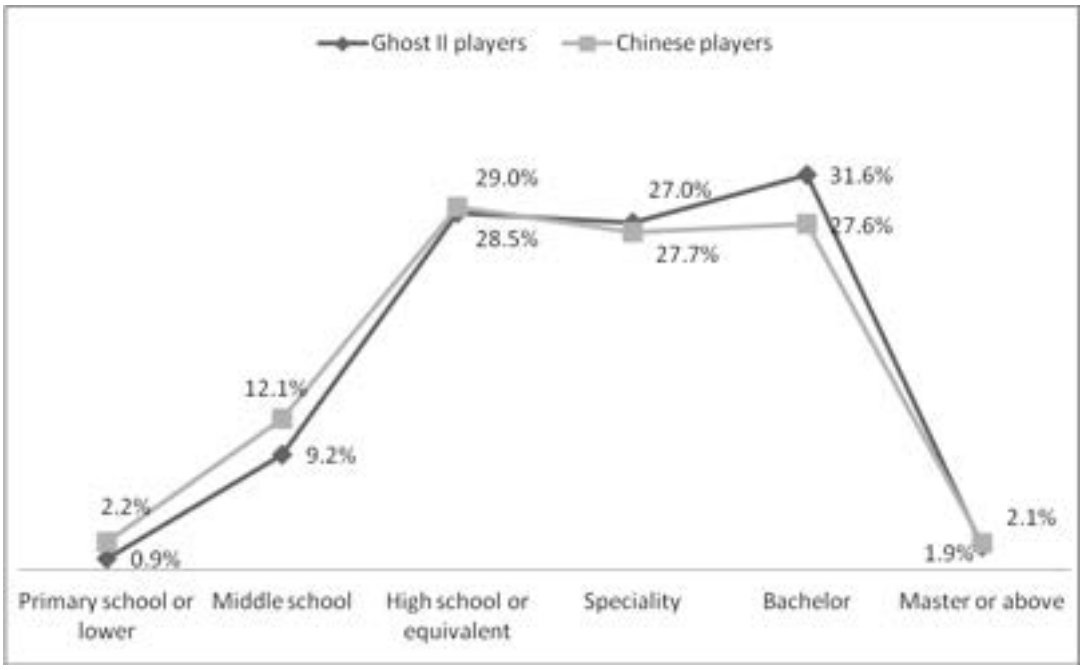


*Figure 4-3.* Education level of Ghost II players and normative sample

Figure 4-4 provides a breakdown of the monthly personal income (RMB ¥, China Yuan); nearly one-third of them earned no monthly income, and about a quarter had a monthly income between 3,001 to 5,000 RMB.

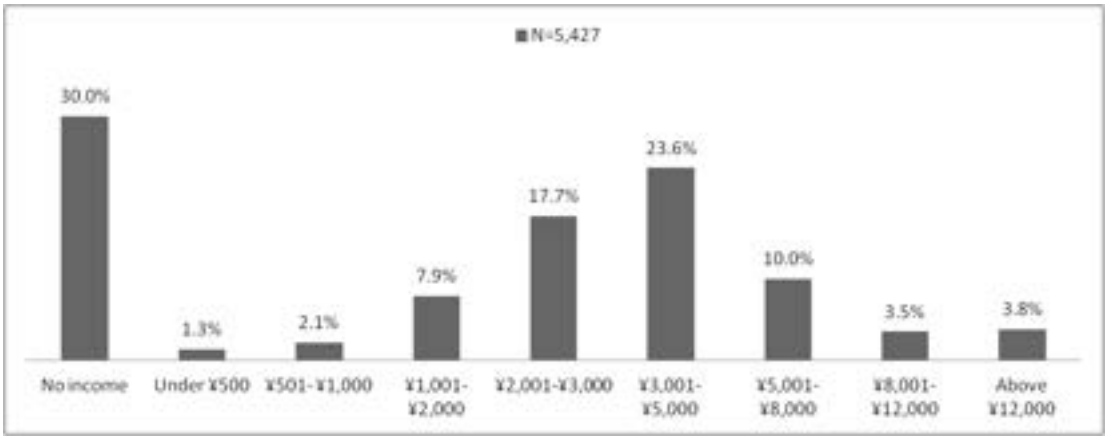


*Figure 4-4.* Monthly personal income of Ghost II players

As is revealed in Figure 4-5, most participants had extensive prior experience with online games. More than 40 percent had online game experience of over four years,

nearly one fifth from two to three years, and more than 15 percent from three to four years.

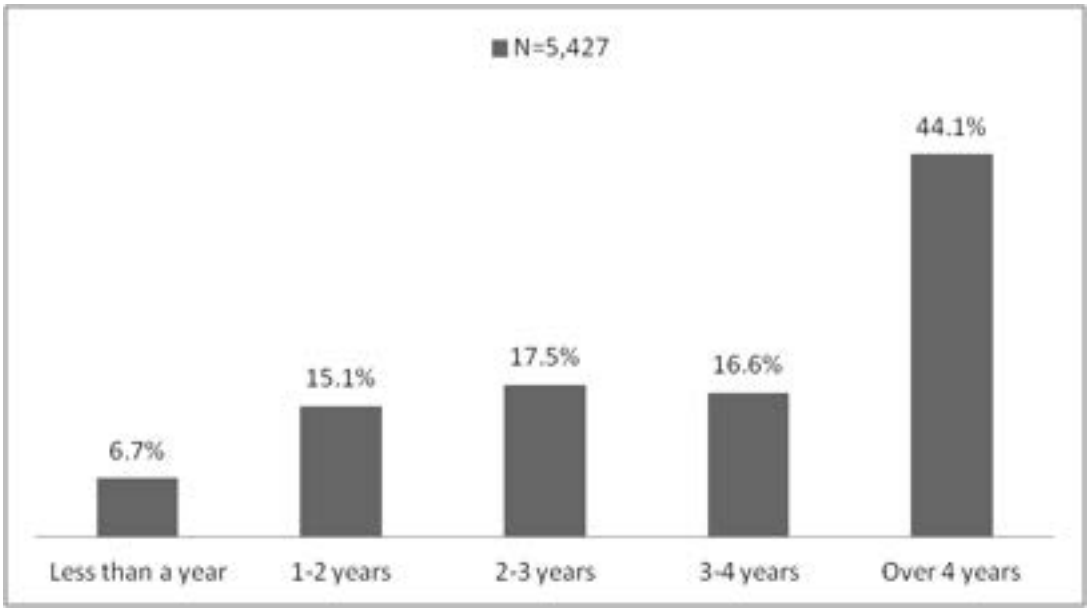


*Figure 4-5.* Online game experience of Ghost II players

For the games they played mostly prior to Ghost II (one-choice question), about 40 percent selected the opinion of “other”, since the game was not listed in this item. Before registering with Ghost II, over one tenth played League of Legends mostly, nearly 10 percent played Fantasy Journey to the West 2 mostly, more than seven percent played CrossFire mostly, and about one twentieth played World of Warcraft mostly. As Figure 4-6 indicates, the game experience of participants covered nearly all popular MMORPGs available in the Chinese market.

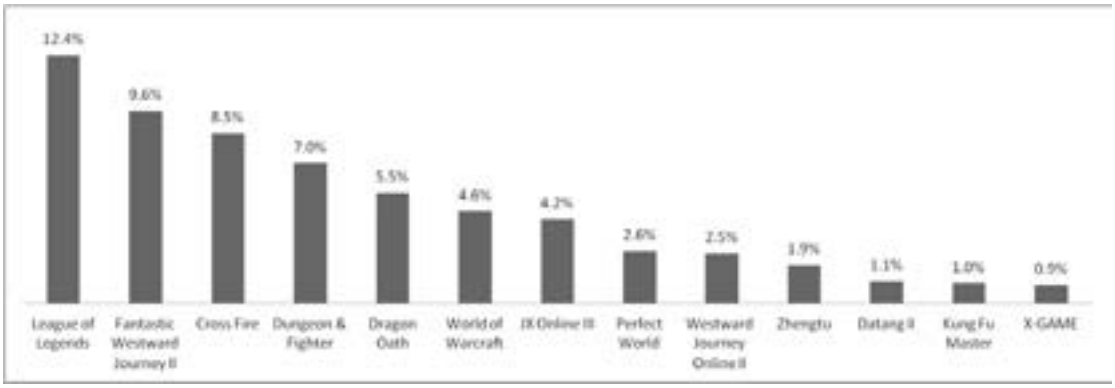


*Figure 4-6.* MMORPGs prior to Ghost II

Overall, nearly 30 percent of the participants registered as a full time student, and more than one quarter selected the category of “other”. For the people who occupied a full time job (*n* = 2,413), nearly eight percent worked in technology or research occupations, more than six percent worked in sales occupations, and more than six percent worked in production occupations.

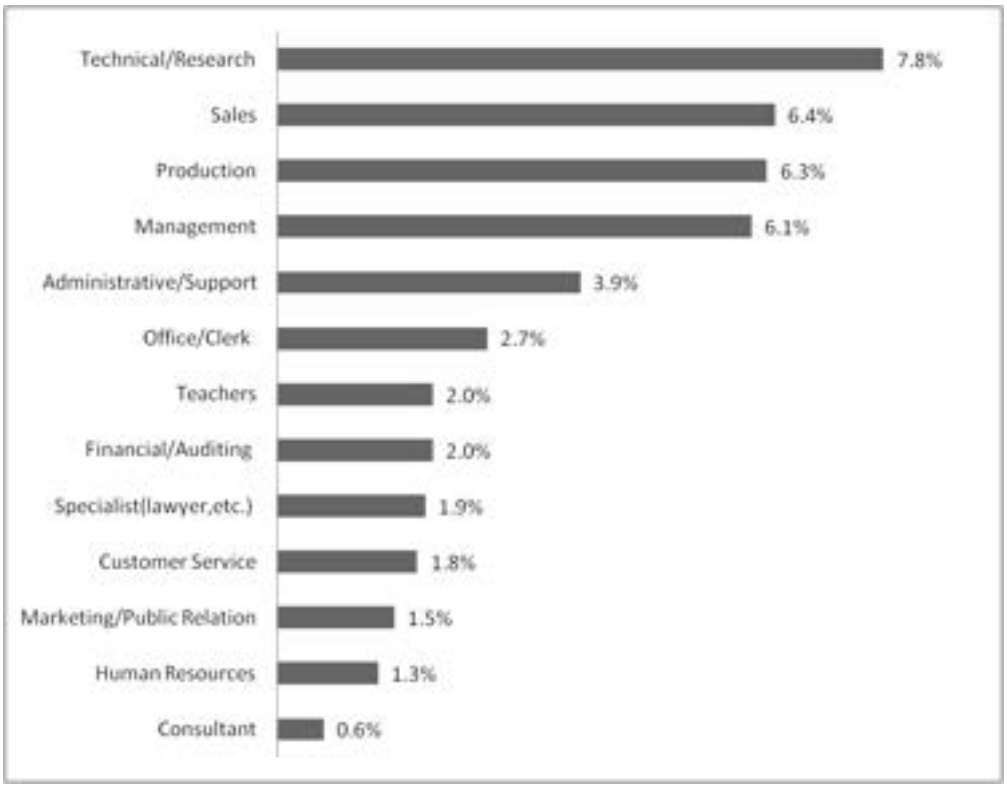


*Figure 4-7.* Occupational status of Ghost II players

Participants' locations were spread out across 33 difference provinces and regions of China, and less than one percent (*n* = 42) came from overseas regions not listed in the opinions. Zhejiang (12.3%), Guangdong (9.8%), and Jiangsu (9.6%) had the three biggest portions.

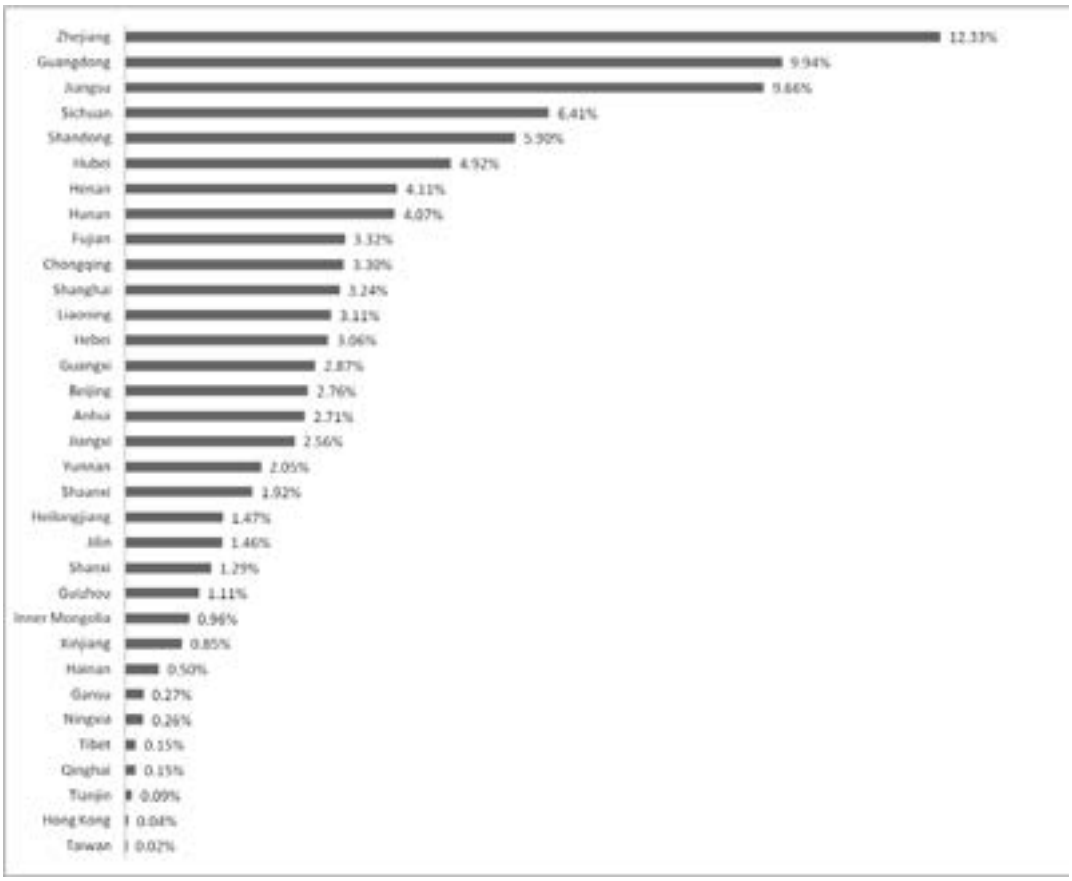


*Figure 4-8.* Locations of Ghost II players

For the comparative group, more than three quarters (75.2%) of them are female, and nearly half (48.1%) are aged between 19 and 22 years. About fifty-five percent (54.5%) of participants are no online game players, and nearly 40 percent (37.5%) have playing experience from 1 to 4 years of other online games. More than 70 percent (73.5%) are full time students, and more than two thirds (69.2%) study for or achieved a bachelor degree, and about 70 percent (70.9%) don't earn a monthly income.

## 4.3 Value systems of Chinese players

The value systems of Chinese participants were analyzed and the results were compared with instrument averages resulted from global measurement of the CultureView since 2001. The difference across the demographic variables such as gender, age and occupations were also examined. Since the purpose is to identify the value systems of players, I only focused on the scores of Coping Mechanisms measure by Cultureview, and the scores collected about transition zones between value systems are not considered and analyzed here. The Coping Mechanisms reflect an individual's value systems on operating and measure how they think rather than what they think as emphasized by Graves.

### 4.3.1 Descriptive statistics of value systems

Descriptive statistics were calculated for 6 value systems of Ghost II players (*n* = 5,427) and comparative group (*n* = 112), and the results (means and standard deviations) are presented in Table 4-1. Ghost II players reported themselves to score highest on Blue and roughly middling on Green, Yellow and Orange. Purple was scored as the lowest, and the second lowest was the value of Red.

Table 4-1

*Value Systems of Ghost II Players, Comparative Group and Instrument Average*

| Value systems | Ghost II player average | *SD* | Comparative group average | *SD* | Instrument average |
|---|---|---|---|---|---|
| Purple | 21.1 | 6.4 | 20.4 | 6.1 | 17.4 |
| Red | 22.8 | 6.4 | 22.3 | 5.3 | 20.7 |
| Blue | 28.5 | 6.6 | 28.2 | 5.9 | 29.2 |
| Orange | 25.0 | 6.5 | 24.4 | 4.9 | 30.1 |
| Green | 28.0 | 5.8 | 28.0 | 4.8 | 28.1 |
| Yellow | 27.8 | 6.0 | 27.6 | 4.6 | 34.2 |

It can be seen from Table 4-1, the average score of Ghost II players are about the same as the results of comparative group, which shows that our sample recruited from Ghost II reflects the characteristics of general Chinese people.

Using comparative group data, a series of independent sample t-test were also performed to investigate the difference between online game players ($n$ = 42) and none online game players ($n$ = 61) across 6 value systems, and no significant result was found.

The results for Ghost II players were compared further with the instrument average score from all usages of CultureView since 2001(mainly from western countries). As

we can see from Figure 4-9, for Chinese players, the score of Purple and Red system are much higher than the instrument average, and the mean score of Orange is lower than the western participants.

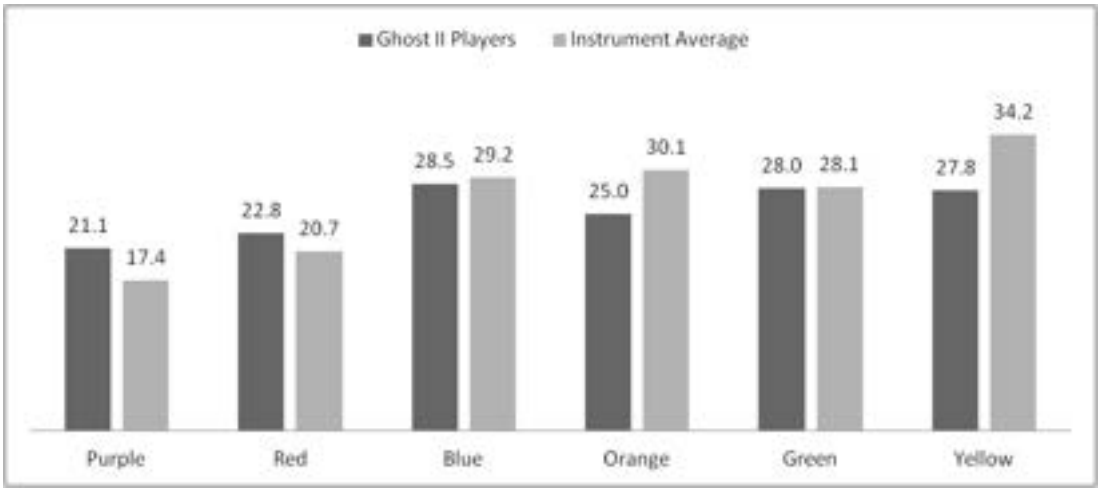


*Figure 4-9.* Differences in Ghost II players / instrument average

The most significant difference between them was observed on the score of Yellow, while the result of Chinese respondents is considerably lower than the average of western participants. The scores of Chinese players and instrument average on Blue and Green are very similar, and especially the result of the Green score was almost the same.

### 4.3.2 Demographic differences analysis

An independent sample t-test was used to explore gender differences (male *n* = 3,237, female *n* = 2,190), and the effects of gender on value systems are shown in Table 4-2.

**Table 4-2**

*Results of T-Tests for Gender Differences*

| Value systems | Mean | *df* | *t* | *p* |
|---|---|---|---|---|
| Purple | Male = 20.87<br>Female = 21.43 | 5425 | -3.19** | .001 |
| Red | Male = 23.27<br>Female = 22.08 | 5425 | 6.80** | .000 |
| Blue | Male = 28.67<br>Female = 28.30 | 5425 | 2.00* | .045 |
| Orange | Male = 25.65<br>Female = 23.97 | 5425 | 9.29** | .000 |
| Green | Male = 27.76<br>Female = 28.24 | 5425 | -2.96** | .000 |
| Yellow | Male = 27.62<br>Female = 28.06 | 5425 | -2.66** | .008 |

*Notes.* * $p < 0.05$. ** $p < 0.01$.

As we can see from Figure 4-10, the male participants scored significantly higher than the females in the value systems of Red, Blue and Orange, and the females scored higher than the males in the value systems of Purple, Green and Yellow.

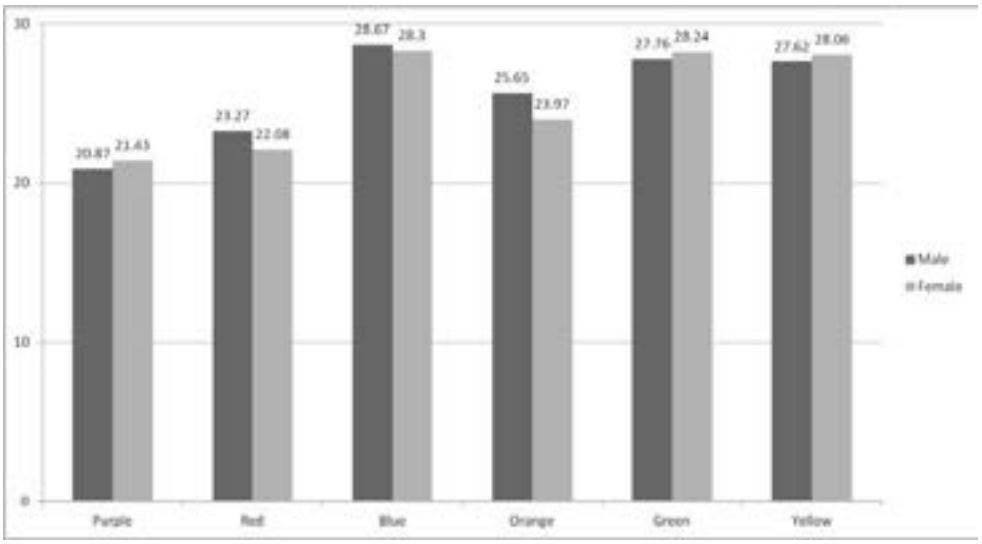


*Figure 4-10.* Gender differences in value systems

As shown in Table 6, a series of one-way between-participants analysis of variances (ANOVAs) were performed to explore the age, occupational status, education background and income level differences on the scores of value systems.

Table 4-3

*ANOVAs of Group Differences*

| Value Systems | Age group (*n* = 5,420, *df*=6) | | Education level (*n* = 5,427, *df*=5) | | Occupation status (*n* = 2,413, *df*=12) | | Income Level (*n* = 3,797, *df*=7) | |
|---|---|---|---|---|---|---|---|---|
| | *F* | *p* | *F* | *p* | *F* | *p* | *F* | *p* |
| Purple | 1.44 | .195 | 1.27 | .274 | 2.29** | .007 | 1.00 | .427 |
| Red | 11.50** | .000 | 1.33 | .250 | 2.96** | .000 | 11.18** | .000 |
| Blue | 10.75** | .000 | 5.79** | .000 | 2.84** | .001 | 2.93** | .005 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Orange | 9.32** | .000 | 3.70** | .002 | 6.20** | .000 | 19.23** | .000 |
| Green | 1.63 | .135 | 6.11** | .000 | 2.24** | .008 | 1.75 | .093 |
| Yellow | 3.72** | .001 | 3.44** | .004 | 1.41 | .153 | 4.12** | .000 |

*Notes.* * $p < 0.05$. ** $p < 0.01$.

Age groups: 13-15, 16-18, 19-22, 23-25, 26-29, 30-39, 40 or older

Education level: primary school or lower, middle school, high school or equivalent, speciality, bachelor, master or above

Occupation status: consultant, human resources, marketing/public relation, customer service, specialist, financial/auditing, teachers, office/clerk, administrative/support, management, production, sales, technical/research

Income level (monthly): under ¥500, ¥501- ¥1,000, ¥1,001- ¥2,000, ¥2,001-¥3,000, ¥3,001- ¥5,000, ¥5,001- ¥8,000, ¥8,001- ¥12,000, above ¥12,000

Because the sampling number of age group of 12 or younger is small ($n$ = 7), this subgroup was not included for one-way ANOVA here. As summarized in Table 4-3, the differences were statistically significant on the value systems of Red, Blue, Orange and Yellow.

As revealed in Figure 4-11, the scoring of Blue and Orange increase steadily with age, and the older participants scored higher than the younger ones. The scoring of Red and Yellow also rise gradually with the age, but drop sharply after 30 years old.

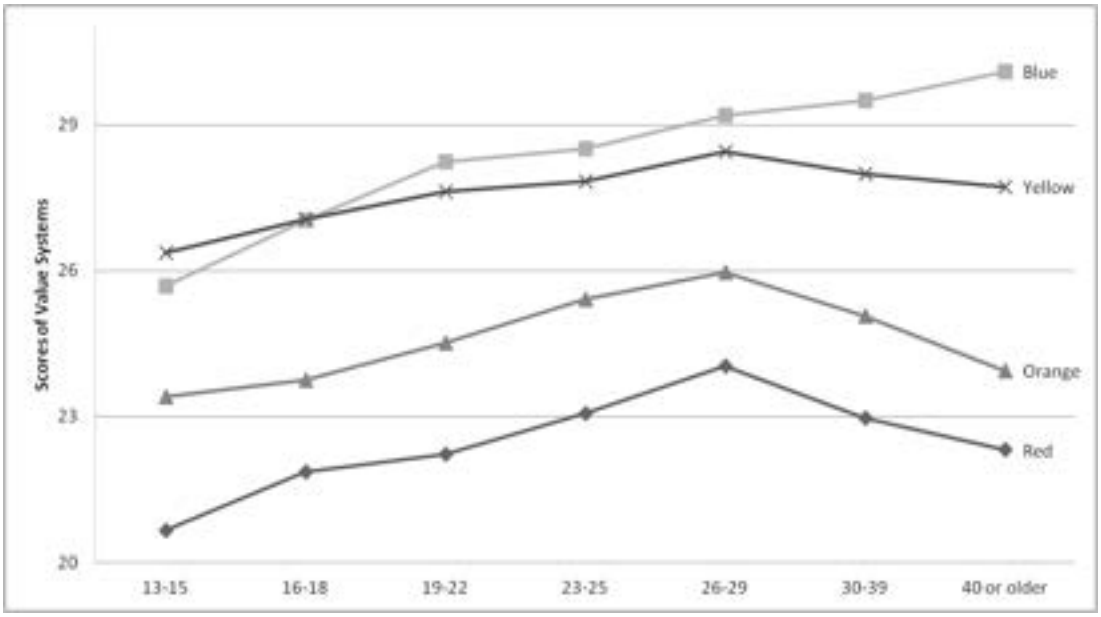


*Figure 4-11.* Age differences in value systems

As shown in a two-way ANOVA (Gender*Age), there are a significant interaction effect between gender and age on the score of Purple, $F$ (6, 5406) = 2.981, $p$ = 0.007 and Blue F (6, 5406) = 2.504, $p$ = 0.02)

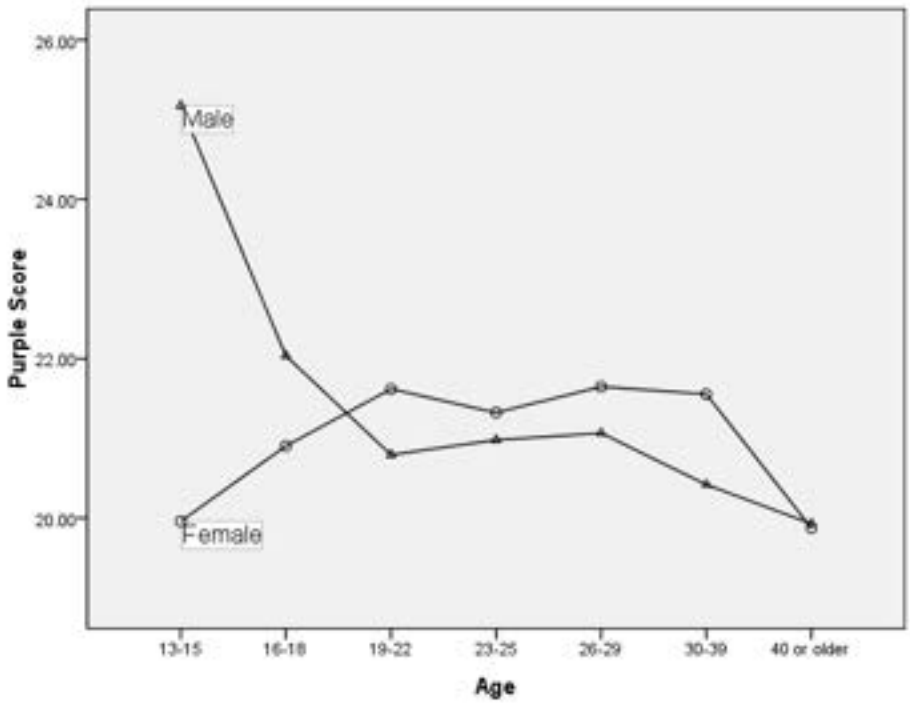


*Figure 4-12.* Interaction effect between gender and age on Purple

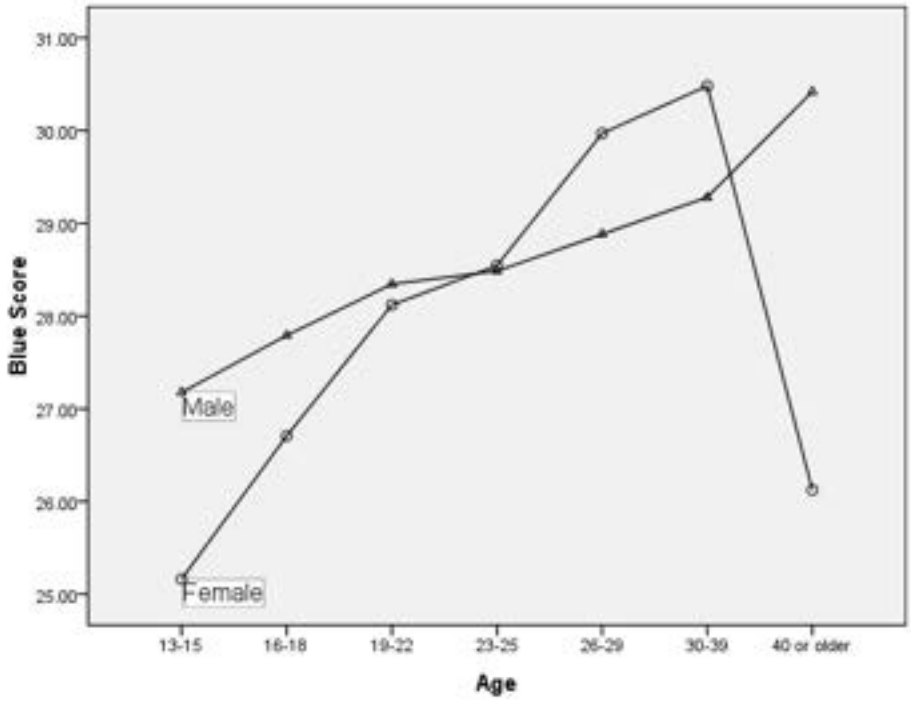


*Figure 4-13.* Interaction effect between gender and age on Orange

For the education level, the significances were revealed on the scores of Blue, Orange, Green and Yellow. As indicated in Figure 4-14, all those four scores increased slightly with the education level, but turn to decline at the level of Bachelor degree.

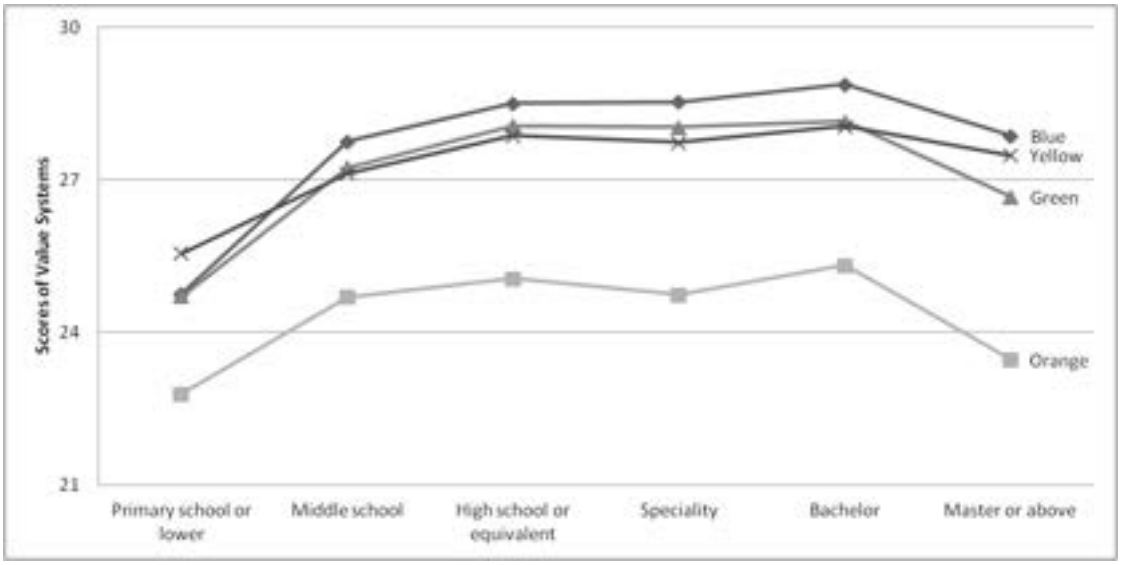


*Figure 4-14.* Education level differences in value systems

From one-way ANOVA, the significant differences are observed on the scores of Purple, Red, Blue, Orange and Green across different occupations. Figure 4-15 provides the scores on Blue value system of 13 different occupations.

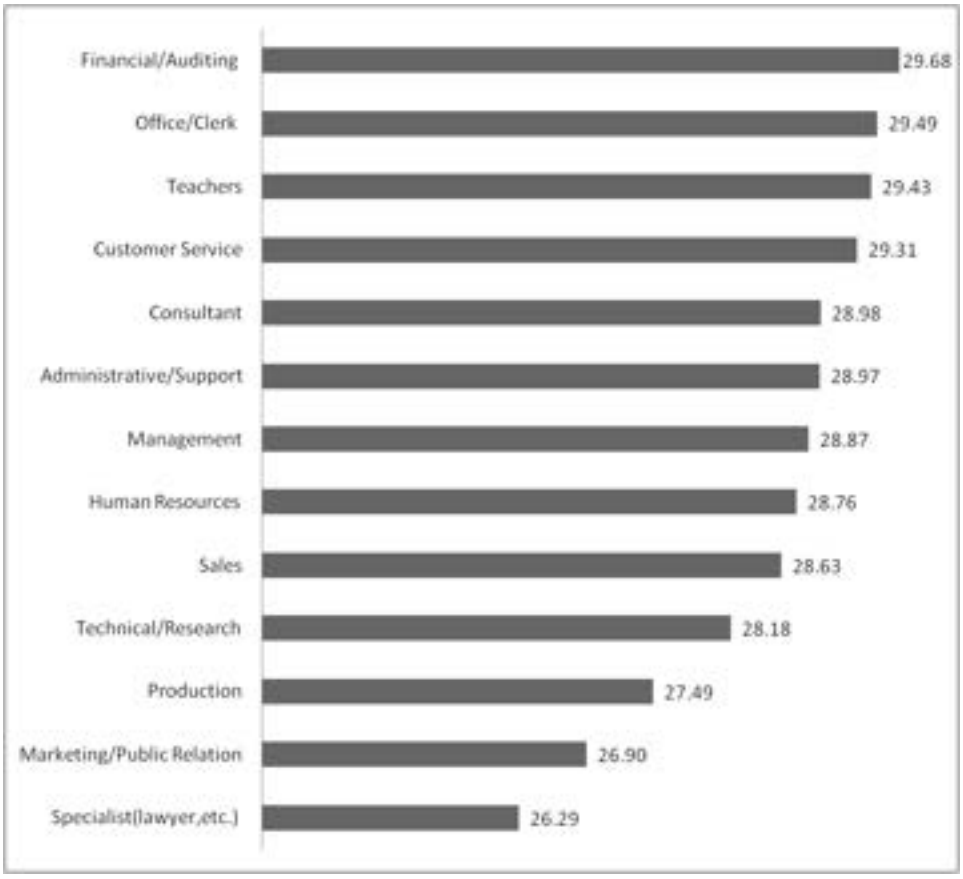


*Figure 4-15.* Occupational differences on the Blue score

For the personal income, I found that the scores of Red, Blue, Orange and Yellow differed significantly across the income level. It can be seen from Figure 4-16 that they all increased slightly with the income level.

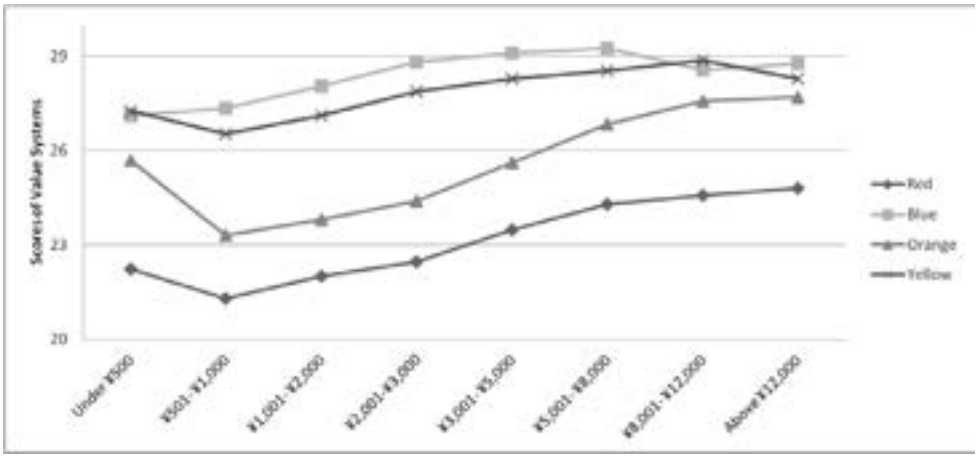


*Figure 4-16.* Income level differences in value systems

I also used an ANOVA ($n$ = 3,341) to assess the impact of different MMORPGs participants played before current Ghost II playing. As presented in Figure 4-17, only one significant difference was found between prior online games on the score of Blue, $F$ (1, 12) = 2.06, $p$ = 0.017.

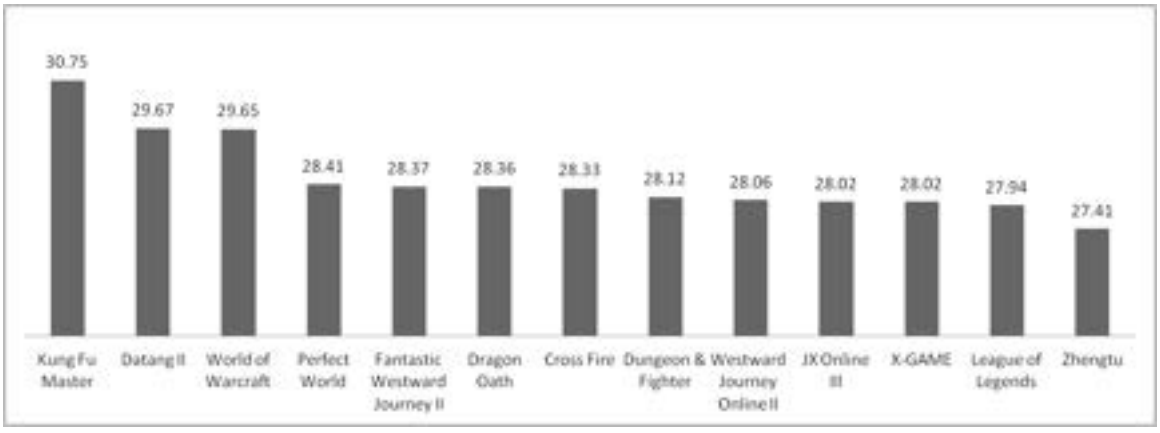


*Figure 4-17.* Differences of Blue in prior MMORPGs experience

## 4.4 Correlations between value systems and in-game behavior

The primary intent of this thesis work was to test whether there would be significant correlations between scores on each of the six value systems of the individual and the in-game behavior in Ghost II.

Given the large sample (n = 5,427) of online survey result, it will need more time and energy to do data mining for each participant's playing action, and as we all know, there is also a risk for large sample that a significant result will be found in most cases even just with a very weak correlation. To reduce the work load of game metric and limit the increased risk of large sample in correlation calculating, 30% of the instances (*n* = 1,577) were selected randomly by random sampling process of SPSS through the whole data sets for following game metric analysis. It is not so large but also ensures the sampling representativeness for this research. 1,577 participant's scores on each of the six value systems measured here were paired with their playing behavior data in Ghost II, and then the correlation between variables was examined.

The game metrics need to be normalized. For example, a player who played for one year would spend more money in the game than a player who player just three months. But there wasn't one variable that all metrics could be normalized against. Most in-game behaviors were normalized against the time played, including consumption, Wushan magic stone level, ability practice, number of friends, dueling

point, player killing point, Guanning battleground score, ranking of ability among friends and guild point. Some metrics that were highly dependent on character level were normalized against character level accordingly, such as equipment score, house score, goodwill point, narrative point and guild level. For example, a level 60 character can be easily accepted as a member by a higher level guild than a level 20 character. For metrics that could not be normalized, their original numbers were calculated, including character level, character ability score, achievement point, pet score, marriage, mentorship and class.

A series of Person's r correlation test was performed between scores on the six value systems measured by CultureView and continuous player behavior variables recorded by game metrics. Person's r analysis was also applied to determine the correlations between the score of value systems and two dichotomous variables of marriage and mentoring relationship of players, since we can use Person's r to calculate point biserial correlation. The ordinal variable of in-game behaviors was calculated the correlation to value systems through Spearman's r. Table 4-4 lists the total number of significant correlations per value system. The correlations with $p < 0.05$ are considered to be significant.

Table 4-4

*Correlations between Value Systems and Player Behavior*

| Variables | | Description | Purple | Red | Blue | Orange | Green | Yellow |
|---|---|---|---|---|---|---|---|---|
| 1 | Time played | Amount of time spent in the game | -.003 | .036 | .047 | **.**005 | .036 | .020 |
| 2 | Consumption by time | = Consumption / Playing time | .041 | **.101**** | .035 | **.090*** | .015 | .035 |
| 3 | Character level | Level of player character | .017 | **.064*** | .034 | .034 | .028 | .028 |
| 4 | Magic stone level by time | = Wushan magic stone level / Playing time | .018 | **.061**** | -..018 | .049 | -.038 | .042 |
| 5 | Character ability score | Max ability score | .011 | **.063*** | .039 | .035 | .049 | .037 |
| 6 | Achievement Point | Total achievement score | .004 | .042 | .031 | .007 | **.058*** | .026 |
| 7 | Ranking by | Ranking of | .000 | -.014 | .007 | .010 | -.027 | .036 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | time | ability among friends / Playing time | | | | | | |
| 8 | Equipment score by level | = Equipment score / character level | .020 | **.050*** | .041 | .028 | **.053 *** | .034 |
| 9 | Ability Ability practice by time | = Ability practice number / Playing time | .007 | **.051*** | .011 | .047 | .047 | .007 |
| 10 | Friends number by time | = Number of friends / Playing time | .013 | .007 | -.008 | .023 | -.033 | .016 |
| 11 | Goodwill point by level | = Goodwill point / Character level | -.007 | .017 | **.064*** | .022 | .033 | .018 |
| 12 | Guild level by level | = Guild level / Character level | .027 | .033 | .000 | .033 | .010 | .005 |
| 13 | Guild point by level | = Guild point / Playing time | .009 | -.011 | .013 | .034 | -.025 | -.005 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 14 | Dueling point by time | = Dueling point / Playing time | .021 | .022 | .017 | .037 | -.002 | .014 |
| 15 | Killing point by time | = Player killing point / Playing time | .015 | .023 | -.015 | .013 | -.024 | -.005 |
| 16 | Battleground score by time | Guanning battleground score / Playing time | .002 | .018 | -.015 | -.006 | -.010 | -.004 |
| 17 | Pet score | Max pet score | .010 | **.061*** | .031 | .042 | .047 | .043 |
| 18 | House score by level | = House score / character level | .018 | .018 | .021 | .000 | **.056**** | .021 |
| 19 | Narrative point by level | = Narrative point / character level | -.006 | **.053**** | .015 | .017 | .029 | .007 |
| 20 | Marriage | Married or not | -.012 | -.015 | .004 | .018 | -.024 | .010 |
| 21 | Mentorship | mentorship or not | -.020 | -.019 | -.013 | -.017 | .010 | .017 |

*Note:* * $p < 0.05$. ** $p < 0.01$.

The significant results revealed by value systems will be described in the following sections. No significant correlations were found between in-game behavior and scores on the Purple or Yellow value systems, all $p > 0.05$.

### *Red*

As defined by Clare W Graves, the theme of Red state is to express self and to hell with the consequences (Graves, 2005, p. 225). The people operating at the Red level are “egocentric, impulsive and hedonistic” and “for him the best answer to any problem is the one that brings him immediate pleasure regardless of what happens to anyone else.” (Graves, 2005, p. 237) The motivation is for power, fun, and control, and the belief is “might-is-right”. People centered in this state begin to view self as a powerful being, and seek a form of existence with which he can explore and manipulate the world.

Of the six value systems measured here, Red provides the most and strongest correlations with in-game behavior of the player. Players who scored high on Red tend to advance in the game as quickly as possible. It can be seen from Figure 4-18 that the character level (10) of the player increases gradually with the scoring on the Red.

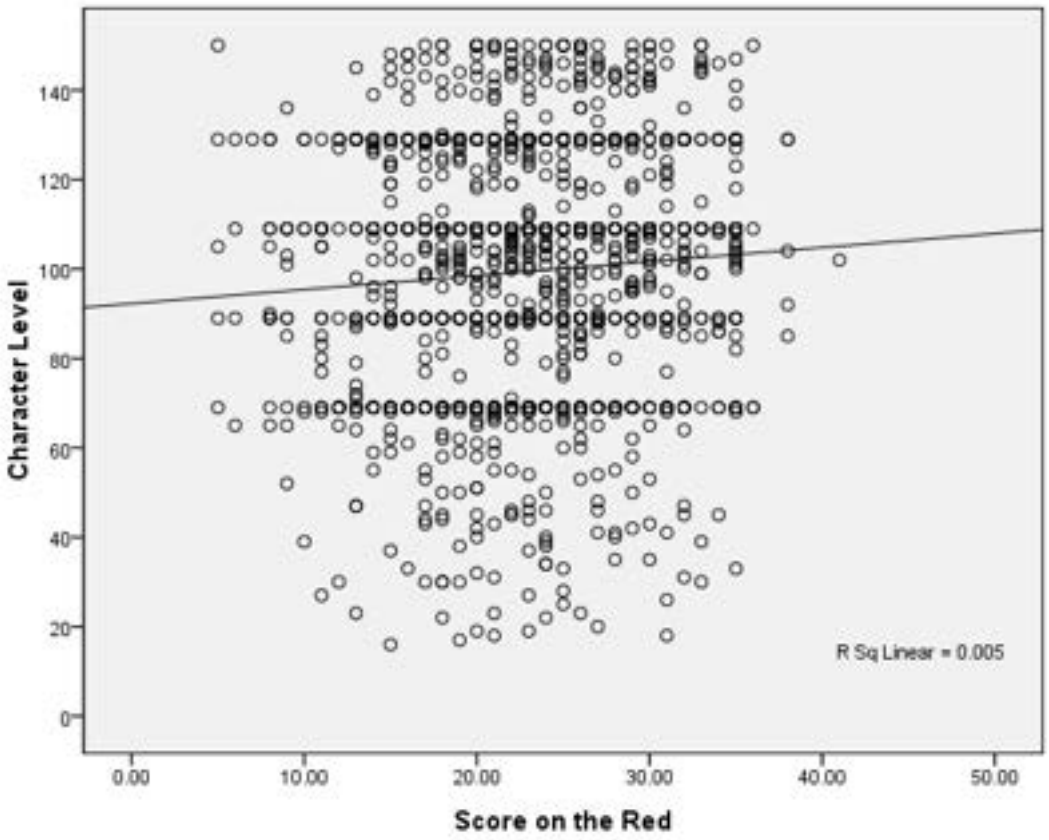


*Figure 4-18.* Correlations between character level and Red

They spent more real money to buy in-game items (2), which is the main indicator of devotion to the game for a free-to-play game. As shown in Figure 4-19, they had a higher Wushan magic stone level (4) and equipment score (8), showing that they seek to become powerful and acquire rare items that other players may never have. The Wushan magic stone is a core game mechanic of Ghost II, which can be used to level up the property value of equipment and items, and so contributes a lot to promote the total ability of the character. Players gained Wushan magic stones mainly through paying real money directly within the game, and can also acquire a little number of them through completing some quests and raids.

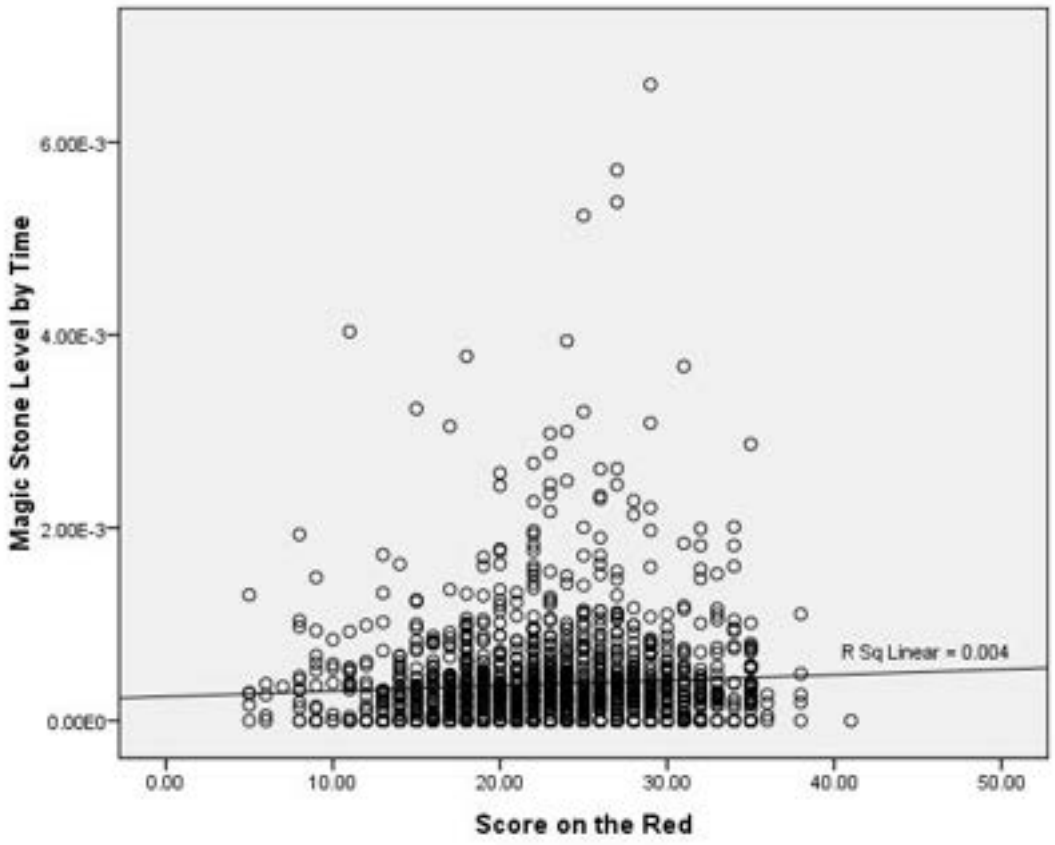


*Figure 4-19.* Correlations between magic stone level by time and Red

Such players enjoy making constant progress and gaining priority in the forms offered by the game. They completed a higher number of ability practice (9) as indicated in Figure 4-20, and their ability score (5) were also high, which means they spent a lot of time and money to improve or optimize their own character. They completed the main storyline and gained more narrative points (19), which can be used to level up present skills or acquire new skills. They even had a high score on their pet (17), which provides some help in fighting but mainly as a customization.

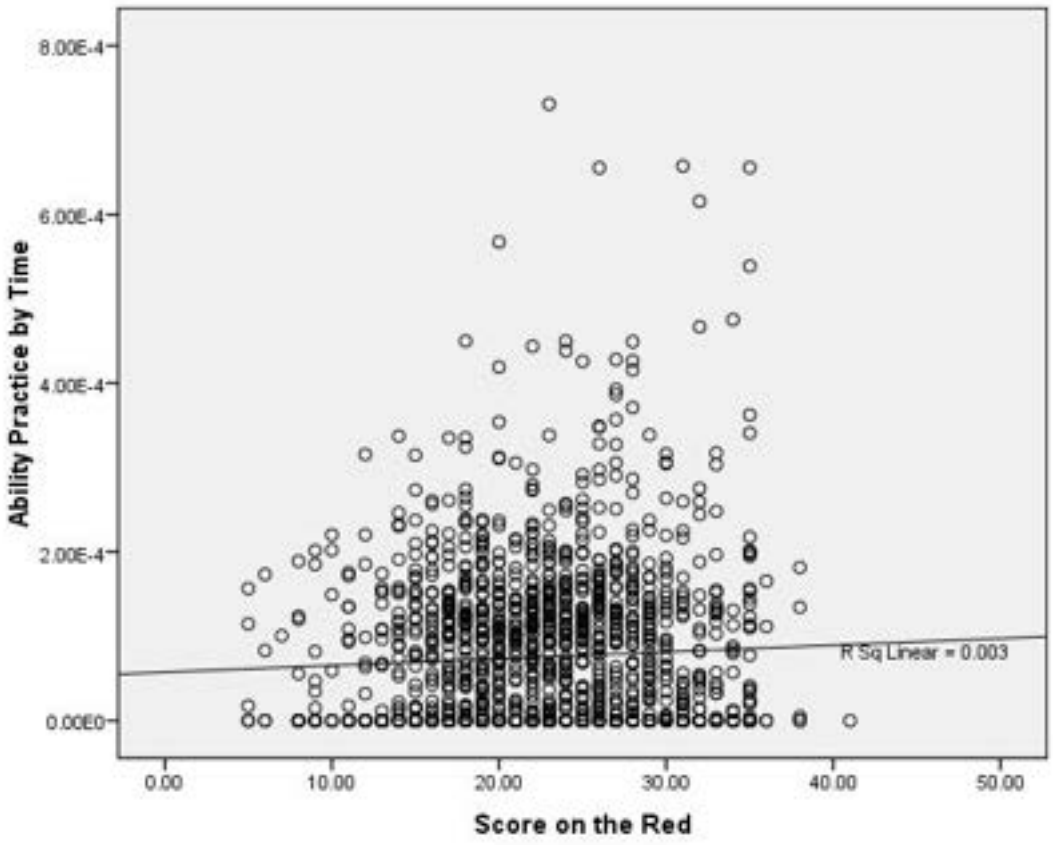


*Figure 4-20.* Correlations between number of ability practice by time and Red

***Blue***

The primary value of the Blue state is to sacrifice now to get reward later. People here control their impulses, and easily defer to a higher authority. They also follow certain rules which are considered to offer a clear sense of right and wrong. They begin to have feelings for other people, which are shown as affection for people like them and shunning of people unlike them. They show tenderness towards others who follow the same rules they obey, but they turn against those who ignore the right way they perceived.

As indicated in Figure 4-21, they gained more goodwill points (11), which is a reward for grouping with a lower level player and helping them to kill monsters or complete quests. They tended to take care of and teach the lower level player how to play the game which means to follow the “right” rules set in the game.

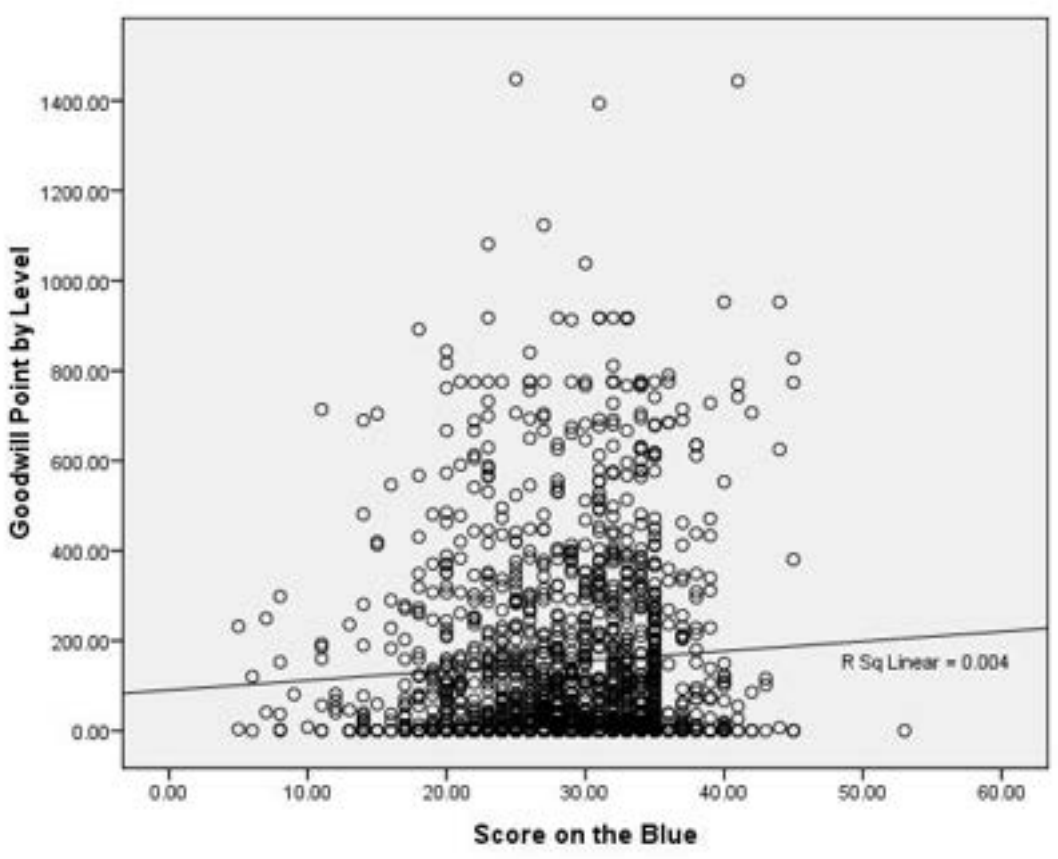


*Figure 4-21.* Correlations between goodwill point by level and Blue

***Orange***

According to Graves’ model, the people of Orange state seek self-achievement and try to find the best solution through rational thought. They value the accomplishments

and enjoy the process of competition.

In terms of game playing performance, the individual who scored high on the Orange value system also spent more real money within the game (2). No other significant correlations were found between Orange score and other achievement indicators of virtual behaviors such as character level or equipment score.

***Green***

As seen by Graves, in the Green state, people are concerned with inner peace and group recognition. They are derived by the need for community, equality and unity. As revealed in Figure 4-22, individuals that scored high on Green had a high score of achievement point (6) and equipment (8), showing they have a diverse of interests within game.

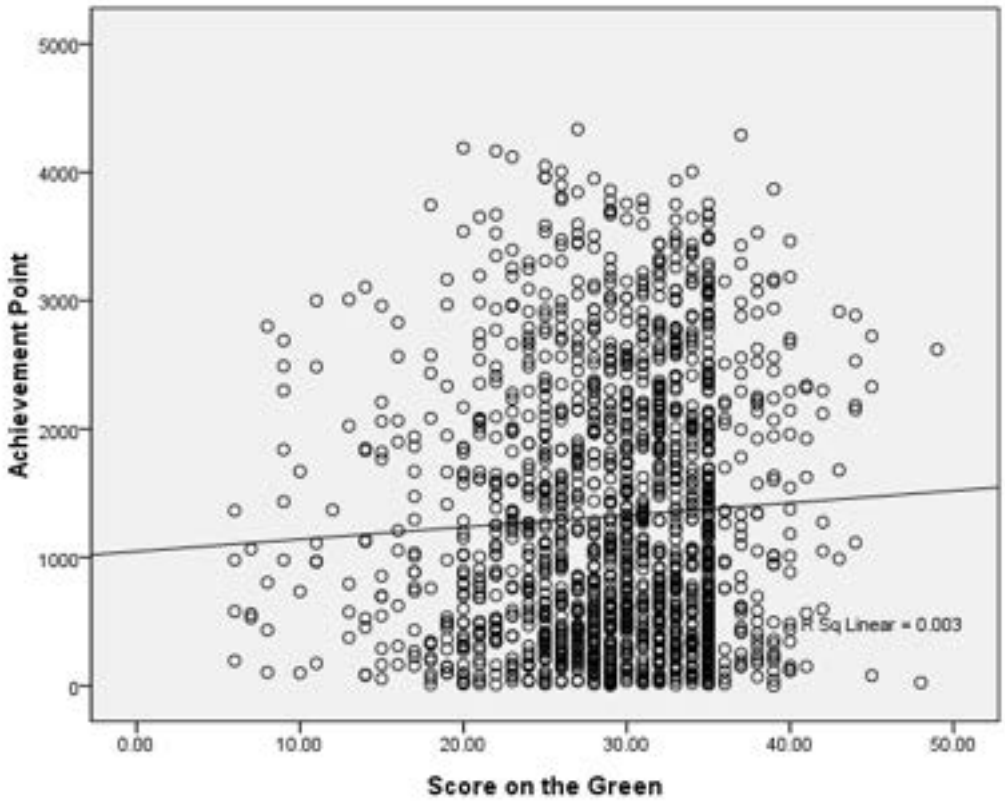


*Figure 4-22.* Correlations between achievement point and Green

And as is shown in Figure 4-23, they were attracted by the house system (18) of the game, which is mainly used for customization and display purpose.

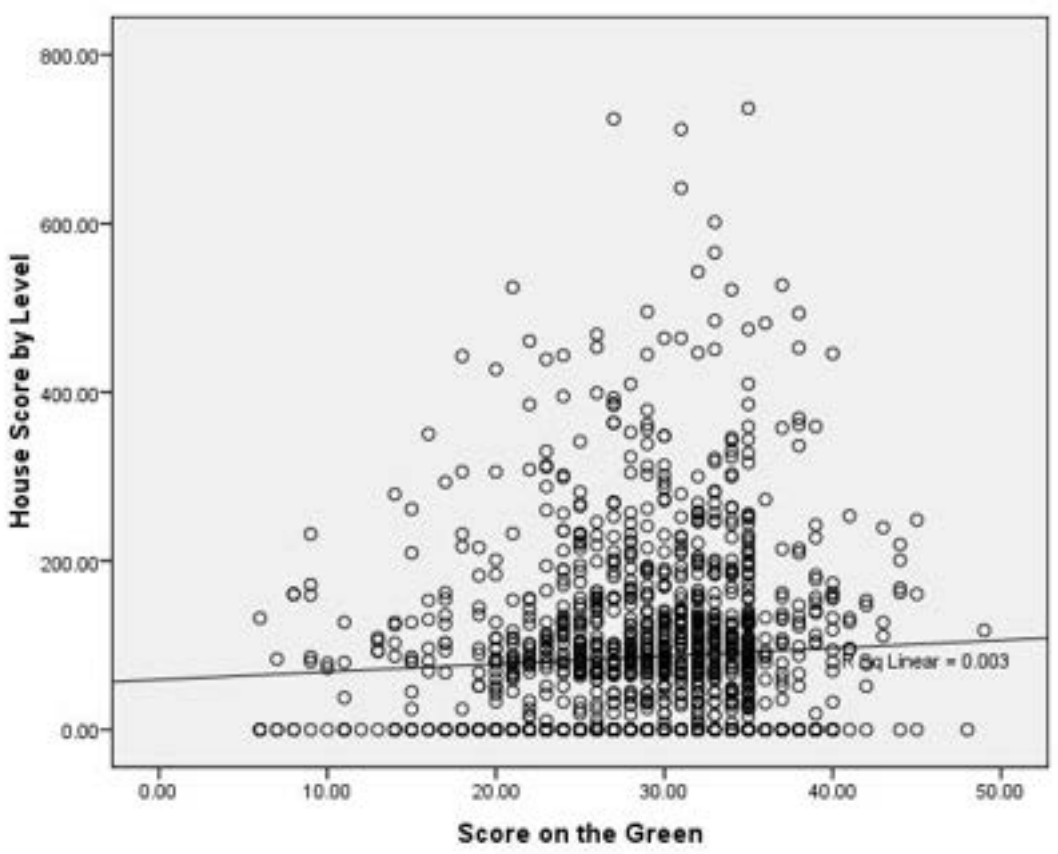


*Figure 4-23.* Correlations between house score by level and Green

Beside the correlation analysis, the impact of character class on value systems was assessed using a one-way analysis of variance (ANOVA). The analyses revealed that there was only one significant difference on the score of Red across ten character classes, $F$ (9, 1567) = 1.90, $p$ = 0.048. As shown in Figure 4-24, swordsman scored highest on the Red followed by the archer; both are classes of material attack.

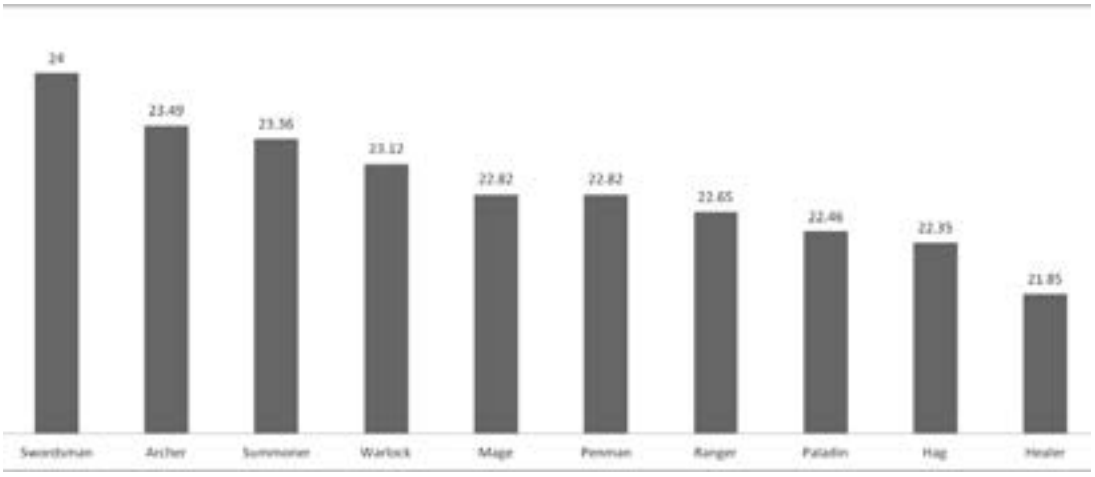


*Figure 4-24.* Character class differences on Red

## 4.5 **Regression analysis**

The correlation coefficient, such as Pearson's r, only reveals the relationship between two variables, and a multiple regression could allow us to better examine the value system in its' relation to more than one behavioral variables.

Six linear multiple regressions were conducted on each of the value systems with 11 behavioral variables as predictors. Such predictors correlated significantly with value system as shown in Table 4-4. I used an Entry method, which forces all 11 predictor variables in to the model simultaneously. As the results in Table 4-5 indicate, only the multiple regressions for Red and Orange were significant, and other four regression models were not significant. It is suggested that we can infer a player's Red or Orange value system statistically using playing behaviors in the game world. However, the regression value is low, which means that only 1.6% of variance in Red or 1.7% of

variance in Orange scores can be predicated by 11 playing behavioral variables.

Table 4-5

*Multiple Regressions on Six Value Systems*

| Variables | R | $R^2$ | Adjusted $R^2$ | *F* | *p* |
|---|---|---|---|---|---|
| Purple | .074 | .005 | -..002 | .775 | .666 |
| Red | .128 | **.016**** | .009 | 2.328 | .007 |
| Blue | .092 | .009 | .002 | 1.221 | .267 |
| Orange | .130 | **.017**** | .010 | 2.438 | .005 |
| Green | .089 | .008 | .001 | 1.126 | .336 |
| Yellow | .081 | .007 | .000 | .932 | .508 |

*Notes:* * $p < 0.05$. ** $p < 0.01$.

As the results shown in Table 4-6, the regression model for the Red includes 11 playing behavioral variables and a constant which represents the Red score if there were no information on in-game behaviors. The slope of the regression line for 11 predictors was presented in the column of the beta value, which indicates the change in the Red for each unit change in the predictor and if the regression is positive or negative. The independent variables of consumption by time, magic stone level by time and achievement point are significant in this model.

Table 4-6

*Coefficients Model for the Red Score*

| Variables | *B* | *SE B* | *β* | *p* |
|---|---|---|---|---|
| (Constant) | 21.04 | | 22.54 | .00 |
| Consumption by time | .00 | .09 | 2.77 | .01 |
| Character level | .03 | .12 | 1.21 | .22 |
| Magic stone level by time | .03 | .21 | 3.10 | .00 |
| Character ability | .00 | -.02 | -.06 | .95 |
| Achievement point | .00 | -.21 | -2.34 | .02 |
| Equipment score by level | .00 | -.11 | -.78 | .43 |
| Ability practice by time | .00 | .00 | -.05 | .96 |
| Goodwill point by level | .00 | -.01 | -.20 | .84 |
| Pet score | .00 | .08 | .73 | .47 |
| House score by level | .00 | -.04 | -.75 | .46 |
| Narrative point by level | .00 | .02 | .27 | .79 |

The best predictors of Red value system were the magic stone level by time ($\beta$ = 3.10, $p$ < .001) followed by consumption by time ($\beta$ = 2.77, $p$ < .005). A regression formula for predicting Red value system using 11 playing behavioral variables can be established as: Red Value System = 21.04 + 0.05 * Consumption by time + 0.12 * Character level + 0.21 * Magic stone level by time - 0.02 * Character ability score -

0.21 * Achievement point - 0.11 * Equipment score by level- 0.004 * Ability Practice by time - 0.006 * Goodwill point by level + 0.08 * Pet score - 0.04 * House score by level + 0.02 * Narrative point by level.

As we can see from the Table 4-7, the predictors of consumption by time, character level, magic stone level by time, achievement point, ability practice by time, goodwill point by level, pet score, house score by level and narrative point by level are significant in the model for Orange value system. A regression formula for predicting Orange is: Orange Value System = 24.02 + 0.07 * Consumption by time + 0.07 * Character level + 0.03 * Magic stone level by time - 0.08 * Character ability score - 0.20 * Achievement point - 0.02 * Equipment score by level + 0.05 * Ability Practice by time + 0.03 * Goodwill point by level+ 0.21 * Pet score - 0.07 * House score by level - 0.01 * Narrative point.

Table 4-7

*Coefficients Model for the Orange Score*

| Variables | *B* | *SE B* | *β* | *p* |
|---|---|---|---|---|
| (Constant) | 24.02 | | 27.41 | 0.00 |
| Consumption by time | 0.00 | 0.07 | 2.23 | 0.03 |
| Character level | 0.02 | 0.07 | 0.83 | 0.41 |
| Magic stone level by time | 386.78 | 0.03 | 1.23 | 0.22 |

| | | | | |
|---|---|---|---|---|
| Character ability | 0.00 | -0.08 | -0.30 | 0.76 |
| Achievement point | 0.00 | -0.20 | -2.27 | 0.02 |
| Equipment score by level | 0.00 | 0.02 | 0.17 | 0.87 |
| Ability practice by time | 3526.44 | 0.05 | 1.56 | 0.12 |
| Goodwill point by level | 0.00 | 0.03 | 1.10 | 0.27 |
| Pet score | .00 | 0.21 | 1.81 | 0.07 |
| House score by level | .00 | -0.07 | -1.43 | 0.15 |
| Narrative point by level | -0.11 | -0.01 | -0.17 | 0.87 |

## 4.6 **Mediation effect analysis**

There may be additional aspects that impact playing behaviors. The mediation effect of demographic variables on the relationships between value systems and in-game behaviors was examined using the casual steps.

The testing involves three steps to examine the regressions between independent variable (x), mediating variable (m) and dependent variable (y). Firstly, the x must have an effect on the y, for instance, as shown in Table 4-8, the Red can predict the consumption by time significantly ($\beta$ = 0.101, $p$ < .001). And then, the x must also have an effect on the m, and as we can see here, the Red also can predict the age significantly ($\beta$= 0.089, $p$ < .001). Finally, the m must predict the dependent variable in

the regression analysis with x and m as two predictors. The complete mediation effect exists when the x has no effect on the y, and the partial mediation effect exists when the x has an effect on the y. In the example of above, both the Red and the age affect the consumption by time significantly, and there for, we observed a partial mediation effect of the age on the relation between the Red and the consumption by time.

As displayed in Table 4-8, the age completely mediates the relationship between the Red and equipment score by level, pet score and narrative point by level, and partially mediates the relationship between the Red and consumption by time, character level, character ability. The age also partially mediates the relationship between the Blue and goodwill point by level and relationship between the Orange value and consumption by time. The income level has a complete mediation effect on the relationship between the Red and consumption by time and magic stone level by time, and also on the relationship between the Orange and consumption by time.

Table 4-8

*Mediation Effect of Demographic Variables on the Relationships between Value Systems and In-game Behaviors*

| Predictor | Dependent variable | *β* | Predictor | Dependent variable | *β* | Mediation effect |
|---|---|---|---|---|---|---|
| Red | Consumption by time | .101** | Red | Consumption by time | .095** | Partial |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Age | .101** | Age | | .060* | |
| Red | Character level | .069** | Red | Character level | .057* | Partial |
| | Age | .101** | Age | | .144** | |
| Red | Character ability | .062* | Red | Character ability | .053* | Partial |
| | Age | .101** | Age | | .108** | |
| Red | Equipment score by level | .050* | Red | Equipment score by level | .042 | Complete |
| | Age | .101** | Age | | .071** | |
| Red | Pet score | .058* | Red | Pet score | .050 | Complete |
| | Age | .101** | Age | | .096** | |
| Red | Narrative point by level | .053* | Red | Narrative point by level | .042 | Complete |
| | Age | .101** | Age | | .109** | |
| Blue | Goodwill point by level | .065* | Blue | Goodwill point by level | .054* | Partial |
| | Age | .107** | Age | | .103** | |
| Orange | Consumption by time | .089** | Orange | Consumption by time | .083** | Partial |
| | Age | .112** | Age | | .061* | |
| Red | Consumption by time | .096** | Red | Consumption by time | .059 | Complete |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Income | .180** | Income | | .209** | |
| Red | Magic stone level by time | .047 | Red | Magic stone level by time | .057 | Complete |
| | Income | .180** | Income | | .095** | |
| Orange | Consumption by time | .083** | Orange | Consumption by time | .038 | Complete |
| | Income | .210** | Income | | .211** | |
| Red | Consumption by time | .101** | Red | Consumption by time | .095** | Partial |
| | Age | .101** | Age | | .060* | |

*Note:* * $p < 0.05$. ** $p < 0.01$.

Two mediation path models are shown in Figure 4-25 and 4-26, in which age partially mediates the relationship between the Red and character ability, and the income level completely mediates the relationship between the Orange and consumption by time.

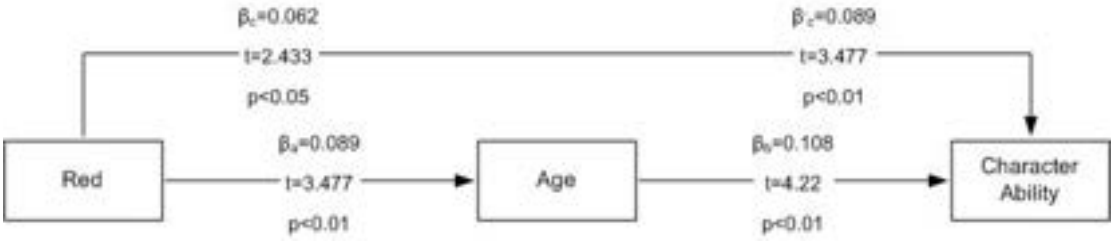


*Figure 4-25.* Path model for mediation effect of age on the relationship between the Red and character ability

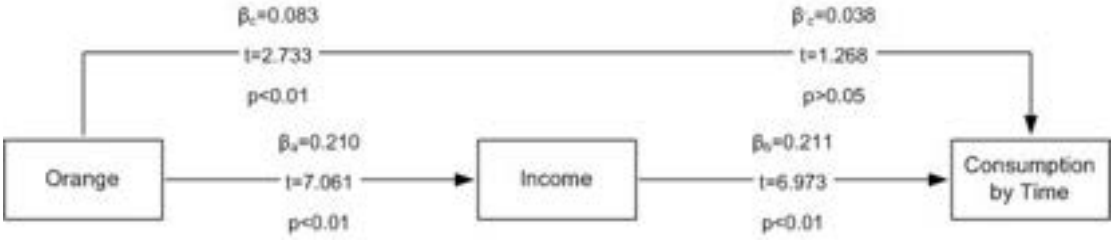


*Figure 4-26.* Path model for mediation effect of income level on the relationship between the Orange and consumption by time

## 4.7 **Multivariate analysis**

The scores of value system were further transformed to the categorical variable and a multivariate ANOVA analysis was performed with the value system type as fixed factor and 14 continuous variables of game metric as dependent variables.

The dominant value system type for each respondent was inferred from their scores if they have the highest scores on one value system in combination with the lowest scores possible on any other value system. According to this criteria, nearly two thirds (65.4%) of the subject (n = 1,031) were assigned a dominant value system type. The 14 dependent variables included: playing time, consumption, character ability, achievement point, equipment score, ability practice, number of friends, guild point, dueling point, player killing point, battleground score, pet score, house score and narrative point.

However, no statistically significant results were found in term of the effect of value system type and players did not differ on 16 in-game behaviors as show in Table 4-9. But the tendency is clear when compares the average differences of game metrics across value system types. For example, the Red were higher on all achievement-orientated behaviors, including consumption, character ability,

equipment and battleground score. The Green were highest on the number of friends than all other five value system types.

Table 4-9

*Multivariate Effects for Value System on In-game Behaviors*

| Dependent variables | *df* | *df error* | *F* | *p* | Means |
|---|---|---|---|---|---|
| Playing time | 5 | 1025 | 1.02 | .40 | Red > Blue > Green > Yellow > Purple > Orange |
| Consumption | 5 | 1025 | 1.17 | .32 | Red > Purple > Orange > Blue > Green > Yellow |
| Character ability | 5 | 1025 | .93 | .46 | Red > Green > Yellow > Blue > Orange > Purple |
| Achievement point | 5 | 1025 | 1.41 | .22 | Red > Green > Yellow > Blue > Purple > Orange |
| Equipment score | 5 | 1025 | 1.04 | .39 | Red > Green > Yellow > Blue > Purple > Orange |
| Ability practice | 5 | 1025 | 1.07 | .38 | Red > Yellow > Blue > Green > Orange > Purple |
| Number of friends | 5 | 1025 | 1.60 | .16 | Green > Red > Blue > Yellow > Orange > Purple |
| Guild point | 5 | 1025 | .72 | .61 | Purple > Green > Orange > Blue > |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | Red > Yellow |
| Dueling point | 5 | 1025 | 1.20 | .31 | Orange > Blue > Yellow > Red > Green > Purple |
| Player killing point | 5 | 1025 | 1.11 | .35 | Orange > Blue > Red > Green > Yellow > Purple |
| Battleground score | 5 | 1025 | 2.71 | .02 | Red > Blue > Green > Yellow > Purple > Orange |
| Pet score | 5 | 1025 | .53 | .76 | Red > Yellow > Green > Blue > Orange > Purple |
| House score | 5 | 1025 | .50 | .78 | Red > Green > Blue > Yellow > Purple > Orange |
| Narrative point | 5 | 1025 | 1.15 | .33 | Red > Yellow > Green > Blue > Orange > Purple |

# CHAPTER 5 Discussion

This chapter summarizes the significant findings in terms of the research questions listed in this thesis. The implication, limitation and future work recommended are also discussed.

## 5.1 Summary of findings

The finding revealed the characteristics of value systems of Chinese respondents, and compared their result with the instrument averages. Through pairing players' value systems from self-report data with their actual behaviors recorded by game metrics, this thesis work also explores the relationships between value systems and playing behavior in a MMORPG.

### 5.1.1 What are the value systems of Chinese players?

The results indicate Chinese MMORPGs players are mainly operating at Blue value system, a core value that is to sacrifice self now in order to receive reward later. As we can see, participants scored highest on the Blue than all other five value systems. This finding is in line with a previous statement of Beck and Cowan who commented that China still centered in the Blue existing state with a monolithic, authoritarian system before moving into Orange structures (Beck & Cowan, 1996, p. 309-310).

It should be noted that there are no “categories” of value systems for different individuals, because the ECLET describe types of thinking within people rather than types of people. We cannot assign individuals to a fixed stage or typology and there is no such thing as a Red person, or a Blue person. When I say Chinese players are positioned at Blue, I just referred to the nodal position on the development staircase, and other levels are also present in more or little amounts. Most of people are in a limited set of the six value systems and at the same time, a person may be advanced in some values, medium in others, and low in others. Beck stated that the spiral is messy, with multiple admixtures rather than pure types, and there for, the focus is not on types of people, but types in people.

### 5.1.2 Is there any demographic difference on the value systems?

For the gender differences, it was found males ranked the Red and Orange higher, while females more emphasized on the Green and Yellow. The finding demonstrated the traditional impression for gender differences, while males tend to be more driven by strength, fight and achievement, and females tend to be more driven by relationship, community and sharing.

The scores of value systems increase steadily with an individual’s age, but Red and Orange scores drop suddenly after 30 years old. It was hypothesized in Hurlbut’s research that the scoring of value systems for persons under thirty years of age would

differ significantly from the results for persons thirty years of age and over but this not supported in her data result (Hurlbut, 1979). The present research demonstrates that there is a sharp decline after age 30 in both Red and Orange value structures. The finding shows the effect of age on value systems, and accords with Kohlberg's statements that age is related to moral development of individual (Kohlberg, 1981).

In Graves' original research, no significant differences were found between any of the different value systems as the intelligence or the academic scoring of the subjects was concerned (Graves, 2005, p. 123, p. 507). But my study shows that education degree achieved seems to have an effect on the value systems of an individual.

And it was revealed before that the testing scores on the Blue, Orange and Yellow differed significantly among the occupations of counselors, managers, and clerical employees (Hurlbut, 1979). My work verified this finding by showing significant differences on the Purple, Red, Blue, Orange and Green across occupations. For example, financial and auditing staffs have the highest score of the Blue, reflecting that they value the ruler, order and law.

### 5.1.3 Is there any difference between Chinese and Western participants on the value systems?

As comparing with the instrument average of CultureView based on the western data, Chinese respondents scored higher on the Purple and Red value systems, and

scored lower on Orange and Yellow. Especially, the Yellow scores of Chinese are considerably lower than western respondents.

The result showed that Chinese individual is still low in the hierarchy Graves had set up. This result is in line with the early study of Graves in which he found that the lower the socio-economic status of the individual, the more his conception of mature human tended to be low in the hierarchy of the ECLET. Graves believed that a value system is partly a function of individual's response to certain problems encountered as a normal part of staying alive. The more basic is the problem a person is confronted with, the more energy he should focus toward its solution and the less choice he has to do anything else. This of course has been revealed by Maslow's hierarchy need theory (Maslow, 1954).

### 5.1.4 What are relationships between value systems of players and their in-game behavior?

A number of positive correlations were found between the scores of value systems and the in-game metrics that were collected to represent playing behavior. The consumption in the game has a positive relationship with Red and Orange, which means that increases in the scores of those two value systems correspond to more real money spent for the virtual items contained in Ghost II. Both Red and Orange value systems are viewed as externally oriented (expression self to control the world) and strive for self-achievement, and so, a possible explanation for them to purchase virtual items is

that the items give users a performance advantage. As shown by other researchers, there is a link between the virtual item purchases with real money and motivations of playing for advancement, advantage in competitive settings and self-expression, and enhancing playing performance is regarded to as the main driver of real-money spending in games (Lehdonvirta, 2005, 2009).

There is also a positive relationship between goodwill point (gaining through grouping with players who are 15 levels lower than themselves) and Blue value system, where higher scoring of Blue corresponds to an increase in helping others. A key characteristic of Blue value systems that seems to be supported by this preference is caring about other people and giving support.

Both achievement point and house score have a positive relationship with Green value systems. Regarding the positive relationship of achievement point, the people scored higher on Green have a wide range of different interests because the achievement point is the sum of total achievements of leveling up characters, completing quests, competing with others, making friends, joining guilds and exploring new maps. Such players also show interest on the house systems which have more decorative value than functional value. All these suggested that players scored higher on Green (internally oriented) pay more attention on their own inner interest and uniqueness as anticipated by the ECLET.

It was shown that up to eight playing behaviors are positively correlated with the score of Red value system, which accounted for the largest number of significant relationships between the value system and playing features, covering nearly all key game performances from consumption, character level, Wushan magic stone, character ability, equipment, ability practice, pet system to narrative point. This finding reveals that the Red value system is the most important one to explain and anticipate game playing. Players who scored high on the Red value system tend to commit a considerable amount of money on the game, seek powerful items and equipment, and level up their character and skills as quickly as possible.

The features of the Red value system, such as preferring instant gratification, valuing violence and no sense of shame, match the core play dynamics of video games well, where advancement, competition with monsters or other players, impatience and impulsive reactions are presented and reassure the behaviors, feelings and tendencies of Red value. Beck previously noted that video games are a safe place where the Red can go for fun and adventure (Beck & Cowan, 1996, p. 218), because the game environment allow them to behavior as they would normally do in real life and create a scenario with settings that support who they are and how the world works for them.

Other value systems are not activated so much in Ghost II, and this might be because the game design encourages playing behaviors related to Red value (achievement,

violence, might, killing, fighting) and does not allow other play styles to be expressed more. The player behaviors may be affected by the game content and game design, which is a very interesting point about user typologies and playing styles study. This creates a situation where certain playing style being the dominant within the game may be a result of the designing content for this same playing style (Hamari & Tuunanen, 2014). It is also argued that designers embedded values and beliefs in game systems and mechanics, which will certainly have an impact on playing behaviors (Flanagan, Nissenbaum, Belman, & Diamond, 2007). For example, The Sims has been said to inculcate materialist values: players are instructed to earn money, and spend it on acquiring goods.

However, as I emphasized here, the ECLET is not about the category or topology of the people, and there is a mixture of value systems at work in each person all the time. All value systems acquired in an individual's development stages can be expressed in healthy ways when situations demand it (Beck & Cowan, 1996). People employ different value systems when dealing with different aspects of their lives, for example, in a football game, the Red might be appropriate, although the same player might express the Purple in family relationship and think about religion through the Blue. So the game does not favor only players with one value system, but attracts player with different value systems who just express more Red in the game situation.

In addition, video games vary widely in terms of the kinds of game play they offer. Like

other MMORPGs, Ghost II is achievement oriented and encourages players to level up, kill monster and fight against others, which is just the features of Red value. As we noted here, only significant relationships between Red and achievement within the game were found, and no significant links were observed between Red and social interaction or casual playing such as making friends, joining guilds, pet or house system. And there may be already other games that allow different sets of behaviors and support the expressing of other value systems, such as players can cook foods and decorate house in game of Sims and craft items in game of Minecraft. As discovered here, people who scored higher on Green have a higher liking of the house system of Ghost II (a game playing about customization and immersion rather than advancement).

### 5.1.5 How can the theory of ECLET be applied to game design?

This finding has important implication for game design, since it provides valuable information for game designers to understand and meet the need of target users as accurately as possible. Content personalization and system customization based on a user's personality factors have long been interests to the game development. It will help better design and understand enjoyment of games, and support the evaluation of design choices, resulting in a more engaging game experience.

The links between value systems and online consumption can be applied to the

designing of virtual items that ultimately generate the revenues for the game, and help to determine who would potentially be the customer for the virtual items in question and how to better satisfy their needs and wants. This has become a main concern of the game designer and player model research (Hamari & Tuunanen, 2014). For example, for the user scored high on Red, the virtual goods should be presented in a simple, concrete, and visual manner. The short-term benefits they will bring immediately must be stressed.

Another possibility directly applicable to game design would be to use inferred learning styles of players as modeled by their certain value system to minimize the learning curve involved to master game play. Every game starts with a training session in which the participants learn how to perform the various actions that are necessary to play the game. The design of these tutorials is essential for retaining new users and to a certain extent, can determine the success of a commercial game. Comprehending players' different styles on learning will serve to decide which tutorials will tap targeted players and encourage them to keep playing.

As is shown above, the players express more characteristics of Red value systems within their game playing. As maintained by Graves, the people operating at the Red state cannot learn by punishment, because they don't feel or comprehend punishment while their neurological systems for feeling punishment are still not activated (Graves, 2005, p. 236-238). They find their way through learning only by positive reinforcement,

and the learning takes place best when the reward is presented soon after they do what we want them to do. As for designing game tutorials, we shouldn't give any punishment such as death of character or deduction of experience points if an error is made by the new player. Designers should simply ask the player to start again until the desired operation is achieved and then award them immediately. Also, the individual tend to have a very short attention span, and we must have everything structured and never give him a chance to get away without learning and training, while idle hands just get into trouble (Graves, 2005, p. 236). The tutorials design should ensure every minute is laid out and always put something in front of a player in order to hold them right there. They move from a 60 second playing session to the next playing session and if there is any pause in this flow, it will distract their attention and they may leave the game. These design principles can also be adapted to any other game mechanic and user interface design.

The marketing and promotion program of the game industry will also benefit greatly from identifying target users since it helps to develop more effective advertising and recruit new players as cost-effectively as possible. When a person operates on one value system, s/he would respond most positively to advertising which are congruent with that value. For example, for the Blue value system, advertising should emphasize on the testimonial by an authority figure, and the content should be concrete and dogmatic. For players themselves, the findings of this research can be used to recommend what game elements they would enjoy according to their unique value

systems, therefore making sure their game experience is positive.

An added outcome is the use of Graves' model to discuss the various arguments and debates about what is the next generation game. As revealed here, the features of Red was expressed most in the present game. The value system next to Red is Blue, and should we also move on to the Blue game as the next generation genre? As pointed out by Beck and confirmed by the survey data of this study, the current Chinese society is mainly operating at the Blue value system, while players scored highest on the Blue. Blue movements are forged from conditions of chaos, deprivation, and suffering in the Red state, and seek meaning and purpose of living in a more orderly world (Beck & Cowan, 1996, p. 226). People were caused to find new significance in a mission, role, relationship, or ism, and feel the joy of purpose, reason, and direction in life (Beck & Cowan, 1996, p. 231). The Red's egocentric impulsiveness was replaced by the sacrifice self for deferred reward.

Graves himself deeply believed "higher levels are better than lower levels" (Graves, 2005, p. 482-483), because each movement up the levels of value systems has resulted in an increase in the degrees of behavioral freedom. Beck and Cowan indicated that we should meet people, situations, and cultures where they are at, and a better way is to create models that are at most a ½ step ahead of the value system individuals involved. They also commented that value systems changing can generally happen only by small increments, and we cannot impose solutions or

structures that are too far ahead of the curve. With a more complex but inappropriate value system, the result is alienation and rebellion rather than transformation. As we can see, from the earliest video game Space War to today's massive online game World of Warcraft, all the goals set for their players were to kill monsters or collect as many resources as possible. The fun of playing video games mainly came from more powerful skill and ability, higher levels and weapons. Players are killing their way to the next map of the game world, finishing endless quests one by one, to get immediate gratification. The next generation of Blue game may be anticipated, where playing through violence, impulses and clout will be replaced by playing through patience, obeying orders, finding purpose, and doing duty.

## 5.2 Contributions to the field

Up to data, this research is the first investigating of the links between Clare W Graves' construct and players' in-game behavior. By examining the characteristics of players' value system and their relationships with in-game behavior, this thesis work allows for a new look at ECLET and its' application in game research and development.

The findings add to the existing research on video games and players by demonstrating the importance of investigating individual differences in relation to game performance. As shown in this study, different players prefer different in-game behaviors and may have very different experience even within the same game. The

choice of game elements in relation to more personal attributes of an individual will better match what she or he wants. It is a central part of game design to know who gamers are and what they like. Content personalization based on a player's preference is a fundamental concept in game study, and has also always a concern of game development practices. This study examined the Chinese players in terms of their value systems and various behaviors exhibited during play, which allows developing the game content according to audience needs. By understanding how players behave in the game in a manner that is consistent with their real-world tendencies, more appropriate design decisions can be made for game content. The findings enable us design game with certain player styles in mind, and meet the need of target user as accurately as possible.

Except for feeding the industry, the long term implications of this research will be huge. The current thesis work is a first attempt to identify the value systems of game players, and the first empirical study of Graves' existing state among Chinese participants. The empirical data about Chinese individuals establishes a baseline and provides a starting point for the future study of the Emergent Cyclical Levels of Existence Theory.

The results suggest that individuals behave in games in ways that are consistent with their real-world attitudes, which would allow us to infer users' value systems based on their activity traces within the game. Traditional personality assessment methods such as behavioral measurement, observation and questionnaire may suffer from many

weaknesses including ambiguity, high cost and reliability. The games could be used as an alternative method of establishing personality profiles of the individual (Lankveld et al., 2011). Yee believed that MMORPGs are a platform to develop unobtrusive personality assessment tools (Yee et al., 2011). Video games combined the strength of traditional personality assessment tools by quantifying behavior, automating observations and side-stepping self-report, and what is more, it offers a high ecological validity (Tekofsky et al., 2013).

The game experience can also be further used to facilitate personal transformation on their level of existing as defined by Graves, while media content can engage the user's awareness and mind. Griebel indicated that skills used in a virtual world would be naturally translated into real lives of players, and suggested that the game might be a useful instrument in training people to develop certain skills (Griebel, 2006). It was assumed that individuals are born into the bottom of Graves' framework and move up as they progress through life (Graves, 1971). As admitted by Graves, the difficulty in training the Red man is that we do not have someone there to "give them an immediate reward when they do what we want them to do" (Graves, 2005, p. 237). But, in a digital game, players can be rewarded immediately once they achieve the goal set by the game designer. Instead of placing the individual in potentially mortal danger, the game playing for transformation will highlight the underlying negative belief structures in a safe way. By storing awareness acquired through game experience, individuals can slightly moderate their future value system and world view

in real world situations which has the same underlying structure and pattern. Instead of placing them in potentially mortal danger, this will highlight the underlying belief structures in a safe way.

## 5.3 Limitations and future directions

The findings show that player value system is only weakly related to their playing features within game. It was noted the correlations calculated here are low, and according to the effect size classified by Cohen, most of my finding would be “small effect” ($r \leq .10$) (Cohen, 1992). Although statistical relations were obtainable, the personality of a player may be at best one variable among many that needed to be considered for explaining gaming behavior while the large variations commonly present in human behavior.

However, the effect sizes of my findings are magnitude enough and are equal to or greater than the effect sizes reported in other similar research. Meyer disagreed with above standard by a meta-analysis of correlation research in psychology, medicine and everyday life, and argued that we should re conceptualize effect size magnitudes since many variables reported account for only about 2% to 9% of the variance in a criterion (Meyer et al., 2001). For example, he found that the correlation between aspirin and reduced risk of death by heart attack was $r = 0.02$ and the correlation between chemotherapy and surviving breast cancer was $r = 0.03$, but the finding is

still considered relevant. When correlating personality assessment tools with relevant behaviors in real life, small effect sizes were also observed. For example, the correlation between Extraversion test scores of Five Factor Model and success in sales was $r$ = 0.08, and the correlation between Minnesota Multiphasic Personality Inventor (MMPI) score and prison misconduct was $r$ = 0.07.

Additionally, existing research about the correlations between personality traits and the participants' gaming behavior also showed small effect sizes, and most correlations reported before have an effect size of $r < 0.10$ (Yee et al., 2011; Tekofsky et al., 2013). Yee discovered that over 60 percent of significant correlations between scores on five personality traits of FFM with behavior variables in World of Warcraft were at $r < 0.10$ with only three correlations with $r > 0.15$. For example, the number of death in dungeons correlated significantly with score on Extraversion at $r$ = 0.06. In line with this, Tekofsky noted almost all significant correlations they revealed between the 100 IPIP (International Personality Item Pool) scores of FFM and the 173 playing behavior variables in Battlefield 3 have a small effect size of $r < 0.1$, and only the 17 correlations were at $0.10 < r < 0.15$ among all 4,442 significant correlations yielded in their result. Lehdonvirta et al. also found that the gender of player had a statistically significant effect on economic outcomes (the sum of virtual currency and the market value of all items the character possesses) in the MMORPG EVE Online, but the effect size observed is very small (Lehdonvirta, Ratan, Kennedy, & Williams, 2014).

There are multiple sources that influence players' actions within a game, including peer pressure, previous experience, time available, friendship and cultural background. As noted by Zammitto (Zammitto, 2010), personality factors only explained 2.6-7.5% of game preferences in her study. Higher effect sizes may be found between personality and playing behavior in future study if we take into account of more variables and have a better controlled experiment process. A multivariable model with multiple layers of inner and outside personal factors will be needed to fully predict in-game behavior. The small effect sizes of correlations may be partly due to the large sample size of present research. As Meter stated, the research conducted with small sample have lower statistical power and often yield higher effect sizes (Meyer et al., 2001). To sum up, even though at first sight the correlations revealed might be seen as low, considering the broader complexity involved here, thus the proportions covered by value system factors should not be minimized.

One major limitation of the present study is that the results may be slightly biased by recruiting participants and gaining metrics from only one game. It is unclear whether the relationship I found here can also be generalized to other game players. Though as shown above, the background of this sampling reflected the game player population in general, and prior to playing Ghost II, they had the experience in a wide range of nearly all popular MMORPGs available in the Chinese market. More studies are recommended to gather data from additional games to increase the generalization. Another limitation may be the bias of cultural influences, since only the data of

Chinese players was collected. In future study, it would be helpful to do a cross-cultural comparison within game players. And finally, this study relied on the set of variables that Ghost II recorded. It is possible that other unrecorded variables, such as logged chat, may be even more predictive of value systems.

Further work can continue to expand the understanding of the relationships between the personality and playing features building on this study. As mentioned before, players' tastes will evolve and change, and as they do so their personality characteristics would reflect those transformations. A longitudinal study is recommended to track players' changing values and their game tasting. For example, when a player moves up from Red to Blue, will she or he starts to prefer more playing activities correlated with Blue? Another interesting direction of research is to investigate what other variables play a role in playing behaviors. For instance, it has been shown that purchasing virtual items online could be affected by income level and age, and they may be shaped by other demographical variables such as buying habits, cultural background or user identification (Wang, Yeh, & Yen, 2015).

## Appendix I Correlations between Chinese translation and original English items

| *Item No.* | *Items* | *First version and test* | | *Second version and test* | | *Third version and test* | | *Fourth version and test* | |
|---|---|---|---|---|---|---|---|---|---|
| | | Correlations | *p* | Correlations | *p* | Correlations | *p* | Correlations | *p* |
| Culture fit | Lifestyle fit | | | $X^2$ = 0.47 | 0.745 | ***X²* = 0.82 (**)** | **0.000** | | |
| | My parents and I are compatible | | | $X^2$ = 0.54 | 0.087 | $X^2$ = 0.55 | 0.108 | ***X²* = 0.71(*)** | **0.014** |
| | My friends and I are compatible | | | ***X²* = 0.71(**)** | **0.008** | | | | |
| | Career fit | | | ***X²* = 0.71 (**)** | **0.008** | | | | |
| For those who are in my society to survive and prosper in the future, they need to… | Believe in a higher purpose more than in being successful | ***r* = 0.98 (**)** | **0.000** | | | | | | |
| | Follow principles and procedures by doing what is right | *r* = 0.43 | 0.334 | ***r* = 0.86 (*)** | **0.014** | | | | |
| | Strive to be more competitive by stressing bottom line results | ***r* = 0.92 (**)** | **0.003** | | | | | | |
| | Become more sensitive to the total needs of all people | ***r* = 0.88 (**)** | **0.009** | | | | | | |
| | Respect the natural habitat and contribute | ***r* = 0.97 (**)** | **0.000** | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | to the resolution of global challenges. | | | | | | | | |
| | Create an atmosphere of mutual trust and respect among all | ***r* = 0.97 (**)** | **0.000** | | | | | | |
| What matters most to me? | Be Safe by staying close to friends and family | ***r* = 0.87 (*)** | **0.01** | | | | | | |
| | Be Strong by taking charge and calling the shots | ***r* = 0.93 (**)** | **0.003** | | | | | | |
| | Be Dependable by doing what is right and responsible | *r* = 0.36 | 0.429 | *r* = 0.65 | 0.113 | ***r* = 0.76 (*)** | **0.011** | | |
| | Be Successful by setting goals and getting ahead | ***r* = 0.84 (*)** | **0.017** | | | | | | |
| | Be Sensitive by experiencing feelings and promoting harmony | *r* = 0.412 | 0.358 | *r* = 0.40 | 0.367 | ***r* = 0.93 (**)** | **0.000** | | |
| | Be Authentic by integrating natural functions and flows | ***r* = 0.99 (**)** | **0.000** | | | | | | |
| I am… | Spunky, risky, bold, daring, often rebellious | *r* = 0.67 | 0.1 | ***r* = 0.95 (**)** | **0.000** | | | | |
| | Self-reliant, autonomous, flexible, with | *r* = 0.21 | 0.653 | ***r* = 0.93 (**)** | **0.002** | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | multiple interests | | | | | | | | |
| | Loyal, dependable, ordered, with firm convictions and beliefs | *r* = 0.61 | 0.145 | ***r* = 0.86 (*)** | **0.013** | | | | |
| | Ambitious, competitive, a "winner", with strong aspirations | ***r* = 0.93 (*)** | **0.002** | | | | | | |
| | Warm, open, inclusive, with focus on feelings and community | *r* = 0.27 | 0.563 | ***r* = 0.95 (**)** | **0.000** | | | | |
| | Superstitious, "tribal", with family/group/clan rituals | ***r* = 0.99 (**)** | **0.000** | | | | | | |
| I can best be managed when I have… | The power and status to influence my own destiny | ***r* = 0.81 (*)** | **0.029** | | | | | | |
| | A boss who is tough but lets me be tough, too | *r* = 0.52 | 0.231 | ***r* = 0.96 (**)** | **0.000** | | | | |
| | A manamagic stoneent system that is fair and rewards diligence | *r* = =0.48 | 0.275 | *r* = =0.75 | 0.054 | *r* = =0.53 | 0.116 | ***r* = 0.96 (**)** | **0.002** |
| | Access to information and freedom to do the job in my own way | ***r* = 0.85 (*)** | **0.014** | | | | | | |
| | An atmosphere that is | *r* = =0.74 | 0.058 | *r* = =-0.31 | 0.497 | *r* = 0.53 | 0.117 | *r* = =0.80 | 0.055 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | sensitive to needs and feelings of all | | | | | | | | |
| | A "caring parent" supervisor who takes care of us | ***r* = 0.92 (**)** | **0.003** | | | | | | |
| When under stress or threat I… | Become defiant and go on the attack | ***r* = 0.80 (*)** | **0.032** | | | | | | |
| | Manoeuvre strategically to land on top | ***r* = 0.78 (*)** | **0.039** | | | | | | |
| | Return to my roots to feel safe | ***r* = 0.76 (*)** | **0.046** | | | | | | |
| | Go strictly by the rules of the book | *r* = 0.72 | 0.065 | *r* = 0.68 | 0.094 | *r* = 0.39 | 0.260 | *r* = =0.00 | 1.000 |
| | Join with others to share and care | ***r* = 0.84 (*)** | **0.018** | | | | | | |
| | Do what I can to flow with turbulence | *r* = 0.63 | 0.13 | ***r* = 0.91 (**)** | **0.004** | | | | |
| I would like to work for an organization that… | Treats everybody by the same rules and is stable and dependable | *r* = 0.52 | 0.235 | *r* = 0.54 | 0.213 | *r* = 0.63 | 0.051 | *r* = -0.22 | 0.678 |
| | Gives me the respect I deserve and stays off my back | *r* = 0.11 | 0.811 | ***r* = 0.88 (**)** | **0.008** | | | | |
| | Does what is natural while being open and flexible | ***r* = 0.80 (*)** | **0.03** | | | | | | |
| | Preserves traditions, | *r* = 0.71 | 0.076 | ***r* = 0.81 (*)** | **0.027** | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | customs, festivals while protecting our groups | | | | | | | | |
| | Tends to the inner and outer health so we can be fully human | ***r* = 0.81 (*)** | **0.027** | | | | | | |
| | Thinks strategically and is competitive so we can be successful | ***r* = 0.92 (**)** | **0.004** | | | | | | |
| Different people go through different stages of change. In my case… | Everything is okay with me | ***r* = 0.96 (**)** | **0.001** | | | | | | |
| | I am feeling edgy but do not know why | ***r* = 1 (**)** | **0.00** | | | | | | |
| | I feel trapped and helpless | ***r* = 1 (**)** | **0.00** | | | | | | |
| | I am excited and hopeful of good times ahead | ***r* = 0.78 (*)** | **0.038** | | | | | | |
| | I have found fresh ways to deal with my new challenges | ***r* = 0.83 (*)** | **0.021** | | | | | | |
| | All hell is breaking loose | *r* = 0.28 | 0.545 | ***r* = 1 (**)** | **0.00** | | | | |
| | I fear trouble is brewing | ***r* = 0.95 (**)** | **0.001** | | | | | | |
| | A huge burden has lifted off of me | ***r* = 0.96 (**)** | **0.001** | | | | | | |
| | I am still on a clear, steady course | *r* = 0.44 | 0.329 | ***r* = 0.95 (**)** | **0.000** | | | | |
| | I have been | ***r* =** | **0.0** | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | through a lot, but like where I am now | **0.91 (**)** | **04** | | | | | | |
| Patterns of Thinking | scans over/sort out detail | ***X²* = 0.71 (**)** | **0.008** | | | | | | |
| | high touch/high tech | *X²* = 0.59 | 0.053 | ***X²* = 0.60 (*)** | **0.047** | | | | |
| | feeling tones/facts and numbers | ***X²* = 0.71 (*)** | **0.008** | | | | | | |
| | fresh ideas/common sense | *X²* = 0.59 | 0.053 | ***X²* = 0.71 (*)** | **0.014** | | | | |
| | changes, novelty, variety/cut-and-dried | *X²* = 0.59 | 0.053 | ***X²* = 0.71 (**)** | **0.008** | | | | |
| | idealistic/being matter-of-fact | ***X²* = 0.71 (**)** | **0.008** | | | | | | |
| | forest/trees | *X²* = 0.54 | 0.088 | *X²* = 0.37 | 0.289 | ***X²* = 0.71 (**)** | **0.001** | | |
| | roams over/sorts out and evaluates | *X²* = 0.16 | 0.659 | *X²* = 0.09 | 0.809 | ***X²* = 0.38** | **0.196** | | |
| | intuitive/logical | *X²* = 0.59 | 0.053 | ***X²* = 0.71 (**)** | **0.001** | | | | |
| | synthesizer/organizer | *X²* = 0.43 | 0.212 | *X²* = 0.54 | 0.087 | ***X²* = 0.71 (**)** | **0.001** | | |
| | impulsive/patient | *X²* = 0.59 | 0.053 | ***X²* = 0.71 (**)** | **0.014** | | | | |
| | scanner/detailer | ***X²* = 0.71 (**)** | **0.008** | | | | | | |
| | spontaneous/methodical | | | ***X²* = 0.71 (**)** | **0.008** | | | | |
| | visionary/prag | ***X²* =** | **0.0** | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | matic | **0.71 (**)** | **08** | | | | | | |
| | instinctive/calculative | $X^2$ = 0.39 | 0.27 | ***X*² = 0.71 (**)** | **0.014** | | | | |
| I prefer change to be… | | | | | | | | | |
| I prefer change to be… | Only in the direction of improving what we already know and have. | ***r* = 0.98 (**)** | **0.00** | | | | | | |
| | A slow, gradual, and cautious process that preserves our standards. | ***r* = 0.98 (**)** | **0.00** | | | | | | |
| | A sudden shift in our priorities and programs into a new dimension. | ***r* = 0.99 (**)** | **0.00** | | | | | | |
| | A quantum-leap where we replace the old wineskins with the new ones, since the world is changing rapidly. | ***r* = 0.99 (**)** | **0.00** | | | | | | |
| Personally, I thrive on… | Chaotic surprises, sudden turns and bumpy roads. | ***r* = 0.93 (**)** | **0.002** | | | | | | |
| | Order, consistency, and continuity. | ***r* = 1.00 (**)** | **0.00** | | | | | | |
| | Living on a predictable and stable | *r* = 0.32 | 0.484 | ***r* = 0.99 (**)** | **0.00** | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | track. | | | | | | | | |
| | Moving in swirling currents and through jagged edges. | ***r* = 1.00 (**)** | **0.00** | | | | | | |

*Notes: *r*: Pearson Correlation for the items of continuous variables.

* $X^2$: Cross Table test for the items of nominal variables.

* $p < 0.05$. ** $p < 0.01$.

## Appendix II Test-retest reliability of the Chinese version of CultureView

| Item No. | Item | Correlation | *p* |
|---|---|---|---|
| 1 | Lifestyle fit | **$X^2$ = 0.5 (*)** | **0.033** |
| 2 | My parents and I are compatible | **$X^2$ = 0.53 (**)** | **0.004** |
| 3 | My friends and I are compatible | | *** Constant** |
| 4 | Career fit | **$X^2$ = 0.53 (**)** | **0.004** |
| For those who are in my society to survive and prosper in the future, they need to… | | | |
| 5 | Believe in a higher purpose more than in being successful | ***r* = 0.48 (*)** | **0.028** |
| 6 | Follow principles and procedures by doing what is right | ***r* = 0.34 (*)** | **0.141** |
| 7 | Strive to be more competitive by stressing bottom line results | ***r* = 0.56 (**)** | **0.008** |
| 8 | Become more sensitive to the total needs of all people | ***r* = 0.48 (*)** | **0.031** |
| 9 | Respect the natural habitat and contribute to the resolution of global challenges. | ***r* = 0.62 (**)** | **0.003** |
| 10 | Create an atmosphere of mutual trust and respect among all | $X^2$ = 0.22 | 0.329 |
| 11 | Best represents of priorities | **$X^2$ = 0.75 (**)** | **0.01** |
| What matters most to me? | | | |
| 12 | Be Safe by staying close to friends and family | ***r* = 0.44 (*)** | **0.044** |
| 13 | Be Strong by taking charge and calling the shots | ***r* = 0.5 (*)** | **0.024** |
| 14 | Be Dependable by doing what is right and responsible | ***r* = 0.54 (*)** | **0.014** |
| 15 | Be Successful by setting goals and getting ahead | ***r* = 0.45 (*)** | **0.041** |
| 16 | Be Sensitive by experiencing feelings and promoting harmony | ***r* = 0.53 (*)** | **0.015** |
| 17 | Be Authentic by integrating natural functions and flows | *r* = 0.13 | 0.582 |
| 18 | Best represents of what matters most | **$X^2$ = 0.76 (**)** | **0.008** |
| I am… | | | |
| 19 | Spunky, risky, bold, daring, often rebellious | ***r* = 0.55 (*)** | **0.012** |

| | | | |
|---|---|---|---|
| 20 | Self-reliant, autonomous, flexible, with multiple interests | ***r* = 0.5 (*)** | **0.026** |
| 21 | Loyal, dependable, ordered, with firm convictions and beliefs | ***r* = 0.59 (**)** | **0.005** |
| 22 | Ambitious, competitive, a "winner", with strong aspirations | ***r* = 0.64 (**)** | **0.002** |
| 23 | Warm, open, inclusive, with focus on feelings and community | ***r* = 0.53 (*)** | **0.017** |
| 24 | Superstitious, "tribal", with family/group/clan rituals | ***r* = 0.5 (*)** | **0.021** |
| 25 | Best represents of what I am… | ***X²* = 0.66 (**)** | **0.003** |
| I can best be managed when I have… | | | |
| 26 | The power and status to influence my own destiny | ***r* = 0.6 (**)** | **0.005** |
| 27 | A boss who is tough but lets me be tough, too | ***r* = 0.49 (*)** | **0.028** |
| 28 | A manamagic stoneent system that is fair and rewards diligence | ***r* = 0.62 (**)** | **0.003** |
| 29 | Access to information and freedom to do the job in my own way | *r* = 0.24 | 0.293 |
| 30 | An atmosphere that is sensitive to needs and feelings of all | *r* = 0.44 | 0.053 |
| 31 | A "caring parent" supervisor who takes care of us | ***r* = 0.53 (*)** | **0.013** |
| 32 | Best represents of what I can best be managed | ***X²* = 0.8 (*)** | **0.011** |
| When under stress or threat I… | | | |
| 33 | Become defiant and go on the attack | *r* = 0.42 | 0.058 |
| 34 | Manoeuvre strategically to land on top | *r* = 0.41 | 0.069 |
| 35 | Return to my roots to feel safe | ***r* = 0.66 (**)** | **0.001** |
| 36 | Go strictly by the rules of the book | ***r* = 0.5 (*)** | **0.024** |
| 37 | Join with others to share and care | ***r* = 0.51 (*)** | **0.018** |
| 38 | Do what I can to flow with turbulence | ***r* = 0.65 (**)** | **0.001** |
| 39 | Best represents of When under stress or threat | ***X²* = 0.84 (**)** | **0.002** |
| I would like to work for an organization that… | | | |
| 40 | Treats everybody by the same rules and is stable and dependable | ***r* = 0.48 (*)** | **0.031** |
| 41 | Gives me the respect I deserve and stays off my back | ***r* = 0.5 (*)** | **0.025** |
| 42 | Does what is natural while being open and flexible | ***r* = 0.58 (**)** | **0.008** |
| 43 | Preserves traditions, customs, festivals while protecting our groups | ***r* = 0.73 (**)** | **0.000** |
| 44 | Tends to the inner and outer health so we can be fully | *r* = 0.38 | 0.102 |

| | | | |
|---|---|---|---|
| | human | | |
| 45 | Thinks strategically and is competitive so we can be successful | ***r* = 0.75 (**)** | **0.000** |
| 46 | Best represents of what I would like to work for | ***X²* = 0.79 (*)** | **0.019** |
| Different people go through different stages of change. In my case… | | | |
| 47 | Everything is okay with me | ***r* = 0.81 (**)** | **0.000** |
| 48 | I am feeling edgy but do not know why | ***r* = 0.6 (**)** | **0.004** |
| 49 | I feel trapped and helpless | ***r* = 0.54 (*)** | **0.011** |
| 50 | I am excited and hopeful of good times ahead | ***r* = 0.51 (*)** | **0.021** |
| 51 | I have found fresh ways to deal with my new challenges | *r* = 0.12 | 0.595 |
| 52 | All hell is breaking loose | ***r* = 0.58 (**)** | **0.006** |
| 53 | I fear trouble is brewing | ***r* = 0.54 (*)** | **0.012** |
| 54 | A huge burden has lifted off of me | ***r* = 0.51 (*)** | **0.017** |
| 55 | I am still on a clear, steady course | ***r* = 0.61 (**)** | **0.003** |
| 56 | I have been through a lot, but like where I am now | ***r* = 0.51 (*)** | **0.018** |
| Patterns of Thinking | | | |
| 57 | scans over/sort out detail | ***X²* = 0.64 (**)** | **0.000** |
| 58 | high touch/high tech | ***X²* = 0.63 (**)** | **0.000** |
| 59 | feeling tones/facts and numbers | ***X²* = 0.63 (**)** | **0.000** |
| 60 | fresh ideas/common sense | ***X²* = 0.64 (**)** | **0.000** |
| 61 | changes, novelty, variety/cut-and-dried | ***X²* = 0.71 (**)** | **0.000** |
| 62 | idealistic/being matter-of-fact | ***X²* = 0.67 (**)** | **0.078** |
| 63 | forest/trees | ***X²* = 0.37 (*)** | **0.078** |
| 64 | roams over/sorts out and evaluates | ***X²* = 0.46 (*)** | **0.017** |
| 65 | intuitive/logical | ***X²* = 0.4 (*)** | **0.049** |
| 66 | synthesizer/organizer | ***X²* =** 0.31 | 0.142 |
| 67 | impulsive/patient | ***X²* = 0.58 (**)** | **0.001** |
| 68 | scanner/detailer | ***X²* = 0.48 (*)** | **0.011** |

| | | | |
|---|---|---|---|
| 69 | spontaneous/methodical | $X^2$ = =0.311 | 0.142 |
| 70 | visionary/pragmatic | **$X^2$ = 0.45 (*)** | **0.022** |
| 71 | instinctive/calculative | **$X^2$ = 0.66 (**)** | **0.000** |
| I prefer change to be… | | | |
| 72 | Only in the direction of improving what we already know and have. | **$r$ = 0.55 (**)** | **0.009** |
| 73 | A slow, gradual, and cautious process that preserves our standards. | $r$ = 0.25 | 0.287 |
| 74 | A sudden shift in our priorities and programs into a new dimension. | **$r$ = 0.59 (**)** | 0.005 |
| 75 | A quantum-leap where we replace the old wineskins with the new ones, since the world is changing rapidly. | **$r$ = 0.73 (**)** | **0.000** |
| 76 | Best represent of change preferred | **$X^2$ = 0.71 (*)** | **0.013** |
| Personally, I thrive on… | | | |
| 77 | Chaotic surprises, sudden turns and bumpy roads. | **$r$ = 0.52 (*)** | **0.017** |
| 78 | Order, consistency, and continuity. | $r$ = 0.25 | 0.265 |
| 79 | Living on a predictable and stable track. | **$r$ = 0.44 (*)** | **0.044** |
| 80 | Moving in swirling currents and through jagged edges. | **$r$ = 0.48 (*)** | **0.028** |
| 81 | Best represent of what I thrive on | **$X^2$ = 0.72 (**)** | **0.001** |

*Notes: *r*: Pearson Correlation for the items of continuous variables.*

** $X^2$: Cross Table test for the items of nominal variables.*

** $p < 0.05$. ** $p < 0.01$.*

* Constant: All subject select same opinion in 2 tests.

# Appendix III Chinese version of CultureView

1. 下面哪句话对我的描述最恰当

(This statement describes me best)

我适合我的生活方式 (I fit my lifestyle)

我的生活方式把我拉伸的太远，要求过高 (My lifestyle stretches me too far)

我的生活方式让我感到无聊和厌倦 (I am under challenged in my lifestyle)

**2. 我和父母志趣相投**

(My parents and I are compatible)

是的 (Yes)

不是 (No)

**3. 我和朋友和谐相处**

(My friends and I are compatible)

是的 (Yes)

不是 (No)

4. 下面哪句话对我的描述最恰当

(This statement describes me best)

在职业上我看不到未来 (I do not see a future for me in a career)

在职业上我能看到美好的未来 (I see a future for me in a career)

**5. 对现在社会上的人来说，要想在将来生存和发展，他们就需要……**

(For those who are in my society to survive and prosper in the future, they need to…)

**（从1-7评分，分数越大优先度越高）**

(Scoring from 1 to 7, the higher score, the more priority)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 相信有一个更高的目标，而不是只追求成功 (Believe in a higher purpose more than in being successful) | | | | | | | |
| 做正确的事情，从而遵守恰当的原则和流程 (Follow principles and procedures by doing what is right) | | | | | | | |
| 强调最终成果，从而努力更有竞争力 (Strive to be more competitive by stressing bottom line results) | | | | | | | |
| 对所有人的全部需求变得更敏感、更体贴 (Become more sensitive to the total needs of all people) | | | | | | | |
| 尊重自然生态环境，为解决全球挑战做出贡献 (Respect the natural habitat and contribute to the resolution of global challenges) | | | | | | | |
| 创造一种相互信任的氛围，所有人之间相互尊重 (Create an atmosphere of mutual trust and respect among all) | | | | | | | |

**6. 对现在社会上的人来说，要想在将来生存和发展，他们就需要……**

(For those who are in my society to survive and prosper in the future, they need to…)

***现在选择1个最能代表你的观点的句子**

(Now select the statement that best represents your view)

* select one opinion form above 6 choices of question

**7.对我最重要的是什么？**

(What matters most to me)

**（从1-7评分，分数越大优先度越高）**(Scoring from 1 to 7, the higher score, the more priority)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 呆在朋友和家人身边，获得安全感<br>(Be Safe by staying close to friends and family) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 掌握权力和发号施令，成为强大的人<br>(Be Strong by taking charge and calling the shots) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 做正确和尽责任的事情，成为可靠和可信赖的人<br>(Be Dependable by doing what is right and responsible) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 设定目标和超越目标，获得成功<br>(Be Successful by setting goals and getting ahead) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 体验情感、促进和谐，变得体贴和善解人意<br>(Be Sensitive by experiencing feelings and promoting harmony) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 整合自然的功能和流程，保持真实和本来的面目<br>(Be Authentic by integrating natural functions and flows) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**8.对我最重要的是什么？**

(What matters most to me)

**现在选择1个最能代表你的观点的句子**

(Now select the statement that best represents your view)

* select one opinion form above 6 choices of question 6

**9.我是……** (I am…)

**（从1-7评分，分数越大越符合我）**

(Scoring from 1 to 7, the higher score, the more like me)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 劲头十足，敢于冒险，大胆，勇敢，常常是反叛的 (Spunky, risky, bold, daring, often rebellious) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 自力更生，独立自主，灵活，有多方面的兴趣 (Self-reliant, autonomous, flexible, with multiple interests) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 忠诚，可靠，有条理，有坚定的信念和信仰 (Loyal, dependable, ordered, with firm convictions and beliefs) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 野心勃勃，好胜心强，是个“赢家”，有坚定的志向和抱负(Ambitious, competitive, a "winner", with strong aspirations) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 热心，坦率，包容，关注情感和群体 (Warm, open, inclusive, with focus on feelings and community) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 迷信，“家族或部落化”，有着家庭/群体/部落的仪式 (Superstitious, "tribal", with family/group/clan rituals) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**10.我是……** (I am…)

**现在选择1个最能代表你的观点的句子**

(Now select the statement that best represents your view)

* select one opinion form above 6 choices of question 9

**11.我能最好地被管理，当我有……**

(I can best be managed when I have…)

**（从1-7评分，分数越大越符合我）**

(Scoring from 1 to 7, the higher score, the more like me)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 能影响我自己命运的权力和地位<br>(The power and status to influence my own destiny) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 一个强硬的老板，但容许我也强硬<br>(A boss who is tough but lets me be tough, too) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 公平的，奖励勤奋的管理体制<br>(A manamagic stoneent system that is fair and rewards diligence) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 能获取信息，有按自己的方式完成工作的自由<br>(Access to information and freedom to do the job in my own way) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 对所有的需要和感受，都很理解和体贴的一种氛围<br>(An atmosphere that is sensitive to needs and feelings of all) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 一个“慈爱父母”式的管理者，照顾着我们<br>(A "caring parent" supervisor who takes care of us) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**12. 我能最好地被管理，当我有……**

(I can best be managed when I have…)

**现在选择1个最能代表你的观点的句子**

(Now select the statement that best represents your view)

* select one opinion form above 6 choices of question 11

**13.当在压力和威胁下时，我……**

(When under stress or threat, I…)

**（从1-7评分，分数越大越符合我）**

(Scoring from 1 to 7, the higher score, the more like me)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 不将其放在心上，继续进攻和奋斗<br>(Become defiant and go on the attack) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 灵活地使用策略，占据优势和先机<br>(Manoeuvre strategically to land on top) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 返回我的老家和老巢，寻找安全感<br>(Return to my roots to feel safe) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 严格照章办事、遵守规则<br>(Go strictly by the rules of the book) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 与其他人团结在一起，彼此分享和相互关怀<br>(Join with others to share and care) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 尽我所能，随着动荡的形势一起流动<br>(Do what I can to flow with turbulence) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**14. 当在压力和威胁下时，我……**

(When under stress or threat, I…)

**现在选择1个最能代表你的观点的句子**

(Now select the statement that best represents your view)

* select one opinion form above 6 choices of question 13

**15.我喜欢去为这样的组织工作……**

(I would like to work for an organization that…)

**（从1-7评分，分分数越大越符合我）**

(Scoring from 1 to 7, the higher score, the more like me)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 用同样的规则公正地对待每个人，并且稳定和可靠 (Treats everybody by the same rules and is stable and dependable) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 给予我应得的尊重，不对我指指点点 (Gives me the respect I deserve and stays off my back) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 认真完成那些平常和自然的事情，同时保持开放和灵活(Does what is natural while being open and flexible) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 保存了传统、风俗和节日，保护着我们的团队 (Preserves traditions, customs, festivals while protecting our groups) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 留心内部和外部的健康状态，让我们成为更完整的人(Tends to the inner and outer health so we can be fully human) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 具有战略性思维和竞争力，从而让我们很成功 (Thinks strategically and is competitive so we can be successful) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**16. 我喜欢去为这样的组织工作……**

(I would like to work for an organization that…)

**现在选择1个最能代表你的观点的句子**

(Now select the statement that best represents your view)

* select one opinion form above 6 choices of question 15

**17.不同的人处于不同的变化阶段。对我来说……**

(Different people go through different stages of change. In my case…)

**（从1-7评分，分数越大越符合我）**

(Scoring from 1 to 7, the higher score, the more like me)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 我对一切都很满意<br>(Everything is okay with me) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 我感到焦躁不安，但又不知道为何<br>(I am feeling edgy but do not know why) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 我感到陷入困境和无助<br>(I feel trapped and helpless) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 我很兴奋，对前面的美好时光满怀希望<br>(I am excited and hopeful of good times ahead) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 我已经找到全新的方法，来应对我的新挑战<br>(I have found fresh ways to deal with my new challenges) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 天正在塌下来，情况一团糟<br>(All hell is breaking loose) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 我担心麻烦正在形成和酝酿<br>(I fear trouble is brewing) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 我已经摆脱了一个巨大的负担<br>(A huge burden has lifted off of me) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 我仍然在一个清楚、稳定的改变过程中<br>(I am still on a clear, steady course) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 我已经经历过很多，但喜欢我现在所处的状况(I have been through a lot, but like where I am now) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**18-1.哪个选项对你的描述最恰当？** (Which option describes you best?)

我的大脑迅速扫描复杂的信息(My mind scans over complex information)

我的大脑分类细节，一步一步地处理信息(My mind sorts out detail and step-by-step sequences)

**18-2.哪个选项对你的描述最恰当？** (Which option describes you best?)

我是“高触感”派，强调感受和感情(I am "high touch" and value feelings)

我是“高科技”派，关注技术，喜欢精确(I am "high tech" and prefer precision)

**18-3.哪个选项对你的描述最恰当？** (Which option describes you best?)

我体会到情调的力量(I sense the power of feeling tones)

我更擅长处理事实和数字(I am better at handling facts and numbers)

**18-4.哪个选项对你的描述最恰当？** (Which option describes you best?)

我用新观念来打扮这个世界(I paint the world with fresh ideas)

我以自己的常识而自豪(I pride myself on my common sense)

**18-5.哪个选项对你的描述最恰当？** (Which option describes you best?)

我依靠改变、新奇和多样性来成长(I thrive on changes, novelty, variety)

我更喜欢一个俗套的、一成不变的世界(I prefer my world to be "cut-and-dried")

**18-6.哪个选项对你的描述最恰当？** (Which option describes you best?)

我因为“过于激进”和理想主义而被批评(I get criticized for being "far out" and idealistic)

我常常被批评太讲究实际、平淡无奇(I am often criticized for being matter-of-fact)

**18-7.哪个选项对你的描述最恰当？** (Which option describes you best?)

相比于单独的“树木”，我更能注意到整体的“树林” (I am much more aware of the "forest" than the "trees")

我常常是看到“树木”，而不是“树林” (I generally see the "trees" instead of the "forest")

**18-8.哪个选项对你的描述最恰当？** (Which option describes you best?)

我的思维漫游在不断变化的景象里(My mind roams over changing landscapes)

我的思维在整理和评估各种想法和方案(My mind sorts out and evaluates ideas and projects)

**18-9.哪个选项对你的描述最恰当？** (Which option describes you best?)

直觉的(Intuitive)

逻辑的(Logical)

**18-10.哪个选项对你的描述最恰当？** (Which option describes you best?)

调和者(Synthesizer)

组织者(Organizer)

**18-11.哪个选项对你的描述最恰当？** (Which option describes you best?)

冲动的(Impulsive)

耐心的(Patient)

**18-12.哪个选项对你的描述最恰当？** (Which option describes you best?)

扫描和概述的(Scanner)

细节的(Detailer)

**18-13.哪个选项对你的描述最恰当？** (Which option describes you best?)

自发的、任意的(Spontaneous)

有规律的、井井有条的(Methodical)

**18-14.哪个选项对你的描述最恰当？** (Which option describes you best?)

空想的(Visionary)

实际的(Pragmatic)

**18-15.哪个选项对你的描述最恰当？** (Which option describes you best?)

本能的(Instinctive)

精心计算的(Calculative)

**19.从下面的角色中选出6个最符合你的:**

(Choose six of the following roles that are most descriptive of you)

挑战界限的人(Challenger of boundaries)

塑造美的人(Sculptor of beauty)

鼓动骄傲自满的人(Agitator of complacency)

维护现有界限的人(Calculative)

调和多种道路的人(Synthesizer of diverse paths)

扩展新视野的人(Expander of horizons)

倡导想法/产品的人(Promoter of ideas/products)

推动全新重造的人(Expeditor of fresh remakes)

想象和预言未来的人(Visualizer of the future)

除旧布新的改革者(Transformer of the old to the new)

真理/秩序的保护者(Protector of truth/order)

机器设备的维护者(Maintainer of machines)

新事物的发明者(Inventor of something new)

人/想法的组织者(Organizer of people/ideas)

改变和革新的代理人(Agent of change and renewal)

新兴系统的实现者(Implementer of emerging systems)

传统习惯的保护者(Preserver of traditions)

风险投资的追求者(Pursuer of risky ventures)

**20.我喜欢的那种改变是……**

(I prefer change to be…)

**（从1-7评分，分数越大越符合我）**

(Scoring from 1 to 7, the higher score, the more like me)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 只限于我们已了解和已有的那些改进方向<br>(Only in the direction of improving what we already know and have) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 维持我们现有的标准，缓慢、逐步、谨慎的改变过程<br>(A slow, gradual, and cautious process that preserves our standards) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 在我们的优先顺序和项目上一个突然的转变，进入一个全新的范围<br>(A sudden shift in our priorities and programs into a new dimension) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 一种飞跃，我们马上旧貌换新颜，因为世界正在迅速改变<br>(A quantum-leap where we replace the old wineskins with the new ones, since the world is changing rapidly) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**21.我喜欢的改变是……**

(I prefer change to be…)

**现在选择1个最能代表你的观点的句子**

(Now select the statement that best represents your view)

* select one opinion form above 6 choices of question 5

**22.从个人来说，我的发展依靠的是……**

(Personally, I thrive on…)

**（从1-7评分，分数越大越符合我）**

(Scoring from 1 to 7, the higher score, the more like me)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 混乱无序的意外之事、突然转变和坎坷的道路<br>(Chaotic surprises, sudden turns and bumpy roads) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 有次序、有一致性和连续性<br>(Order, consistency, and continuity) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 依靠可预料的、稳定的轨道而活<br>(Living on a predictable and stable track) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 在回荡的生活洪流中前行，通过参差不齐的边缘<br>(Moving in swirling currents and through jagged edges) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**23.从个人来说，我的发展依靠的是……**

(Personally, I thrive on…)

**现在选择1个最能代表你的观点的句子**

(Now select the statement that best represents your view)

* select one opinion form above 6 choices of question 5

## Background Information

**您的性别:**

(Your gender)

男 (Male)

女 (Female)

**您的年龄：**

(Your age)

12岁以下 (12 or younger)

13~15岁 (13-15)

16~18岁 (16-18)

19~22岁 (19-22)

23~25岁 (23-25)

26~29岁 (26-29)

30~39岁 (30-39)

40岁以上 (40 or older)

**您当前在读或已获得的最高学位是：**

(Highest education level achieved or pursue now)

小学及以下 (Primary school or lower)

初中 (Middle school)

高中/中专/技校 (High school or equivalent)

大学专科 (Speciality)

大学本科 (Bachelor)

硕士及以上 (Master or above)

**您玩网络游戏有几年了:**

(How many years do you play online games?)

不到1年 (Less than a year)

1~2年 (1-2 years)

2~3年 (2-3 years)

3~4年 (3-4 years)

4年以上 (Over 4 years)

**您选择来玩《倩女幽魂2》的原因是？（300字以内）**

(Why you selected to play the Ghost II?) (No more than 300 words)

**您玩《倩女幽魂2》之前，玩的最多的网络游戏是：**

(Before the Ghost II, which online game did you play mostly?)

梦幻西游2 (Fantastic Westward Journey II)

魔兽世界 (World of Warcraft)

地下城与勇士 (Dungeon & Fighter)

穿越火线 (Cross Fire)

剑网3 (JX Online III)

大话西游2 (Westward Journey Online II)

征途 (Zhengtu)

英雄联盟 (League of Legends)

天龙八部 (Dragon Oath)

御龙在天 (X-GAME)

武魂 (Kung Fu Master)

大唐无双2 (Datang II)

完美世界 (Perfect World)

其它(other, pls write down)

**您现在的月收入：**

(Your current monthly income)

还没有收入 (No income)

500元以下 (Under ¥500)

501~1000元 (¥501- ¥1,000)

1001~2000元 (¥1,001- ¥2,000)

2001~3000元 (¥2,001-¥3,000)

3001~5000元 (¥3,001- ¥5,000)

5001~8000元 (¥5,001- ¥8,000)

8001~12000元 (¥8,001- ¥12,000)

12000元以上 (Above ¥12,000)

**您目前从事的职业：**

(Your current occupation)

全日制学生（Full-Time Students）

生产人员 （Production Occupations）

销售人员 （Sales）

市场/公关人员 （Marketing/Public Relation）

客服人员 （Customer Service）

行政/后勤人员 (Administrative/Support)

人力资源 (Human Resources)

财务/审计人员 (Financial/Auditing)

文职/办事人员 (Office/Clerk)

技术/研发人员 (Technical/Research)

管理人员 (Manamagic stoneent)

教师 (Teachers)

顾问/咨询 (Consultant)

专业人士（如会计师、律师） (Specialist (such as accountant, lawyer, etc.))

其他 (Other)

**您现在的居住地：**

(Your current residence)

安徽 (Anhui)

北京 (Beijing)

重庆 (Chongqing)

福建 (Fujian)

甘肃 (Gansu)

广东 (Guangdong)

广西 (Guangxi)

贵州 (Guizhou)

海南 (Hainan)

河北 (Hebei)

黑龙江 (Heilongjiang)

河南 (Henan)

香港 (Hong Kong)

湖北 (Hubei)

湖南 (Hunan)

内蒙古 (Inner Mongolia)

江苏 (Jiangsu)

江西 (Jiangxi)

吉林 (Jilin)

辽宁 (Liaoning)

宁夏 (Ningxia Hui)

青海 (Qinghai)

陕西 (Shaanxi)

山东 (Shandong)

上海 (Shanghai)

山西 (Shanxi)

四川 (Sichuan)

台湾 (Taiwan)

天津 (Tianjin)

西藏 (Tibet)

新疆 (Xinjiang)

云南 (Yunnan)

浙江 (Zhejiang)

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