MEDIATING EFFECT OF IDENTIFICATION OF AVATAR: SOCIAL PHOBIA, DEPRESSION AND IGD'S SYMPTOMS

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A RESEARCH PROJECT
SUBMITTED IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE BACHELOR OF SOCIAL SCIENCE (HONS) PSYCHOLOGY
FACULTY OF ARTS AND SOCIAL SCIENCE
UNIVERSITI TUNKU ABDUL RAHMAN

MARCH. 2019

Mediating Effect of Identification of Avatar: Social Phobia, Depression and IGD's Symptoms.

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This research project is submitted in partial fulfilment of the requirements for the Bachelor of Social Science (Hons) Psychology, Faculty of Arts and Social Science, Universiti Tunku Abdul Rahman. Submitted on March 2019.

ACKNOWLEDGEMENTS

It would be impossible to complete this research without the assistance of each individual that help us throughout the entire process in completing this research. Therefore, we are deeply thankful to Ms T'ng Soo Ting, our Final Year Project supervisor. She have been supporting, guiding, advising and coaching us throughout the entire research. With all of her supports and advices, it have helped us to a very great extent to complete this research.

Furthermore, we would like to take this opportunity to express our gratitude to all the respondents of this research for their participation in this research and also their patience during data collection. Besides, we would like to appreciate the help from other Final Year Project group, which included Bong Wei Jian, Emilia Teh Yi Wen, Yon Da Yaw, Tee Ru Yuan, Khor Jia Huan, and Poh Lin Shan by offering help and sharing information from Ms T'ng Soo Ting.

In addition, we would also like to take this opportunity to express our gratefulness to our parents for their encouragement as long as their understanding along the way.

Last but not least, we sincerely show our deepest appreciation to each and every one of you who have lent your helping hand in this research.

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APPROVAL FORM

This research paper attached hereto, entitled "The Mediating Effect of Identification of Avatar on the Relationships between Social Phobia, Depression, and Internet Gaming Disorder's Symptoms" prepared and submitted by Iris Pang Chee Yin, Lam Ke Wei, and Nah Zi Ying in partial fulfillment of the requirements for the Bachelor of Social Science (Hons) Psychology is hereby accepted.

_____ Date: _____

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Abstract

Internet Gaming Disorder (IGD) has become a concerning phenomenon in recent years but it is not taken seriously in Malaysia. The present study aims to investigate the mediating effect of identification of avatar (IOA) on the relationships between social phobia, depression, and IGD's symptoms. A total of 702 respondents were included in the final analyses. Respondents were sampled using a purposive sampling techniq1ue with cross sectional design. A self-administrated online questionnaire which consisting of 39 items adapted from Internet Gaming Disorder Scale-Short Form (IGDS-SF), Social Phobia Scale-Short Form (SPS-SF), Montgomery-Asberg Depression Rating Scale, and The Player-Avatar Identification Scale (PAI) were used to collect data. Cognitive-behavioral model of pathological Internet use (PIU) and social identity theory were used to justify the integration of social phobia, depression and IOA and IGD's symptoms. Multiple linear regression result indicated that social phobia, depression, and IOA were positively predicted IGD's symptoms. IOA was the strongest predictor of IGD's symptoms among Malaysian youth, followed by depression and social phobia. Besides, mediation analysis revealed that IOA mediates the relationship between social phobia, depression, and IGD's symptoms. The present study sheds light on understanding the importance of the state of psychological well-being among youths. As a result, the findings of this study have important implications for individuals, parents, universities, and policy makers. In short, social phobia, depression and IOA were identified as predictors of IGD's symptoms among youth in Malaysia.

Keywords: social phobia, depression, identification of avatar, Internet gaming disorder's symptoms, Malaysian youth

DECLARATION

We declare that the material contained in this study is the end result of our own work and that due acknowledgement has been given in the bibliography and references to all sources be they printed, electronic, or personal.

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List of Abbreviations

APA	American Psychiatric Association
β	Beta
CI	Confidence interval
D	Depression
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5th Edition
EDA	Exploratory data analysis
F	F value
IGD	Internet gaming disorder
IOA	Identification of avatar
M	Mean
MMORPG	Massively multiplayer online role playing games
MOBA	Multiplayer online battle arena
N	Total sample size
n	Sub sample size
NIMH	National Institute of Mental Health
p	P value
PIU	Pathological Internet used
SP	Social phobia
SD	Standard deviation
SE	Standard error
SIT	Social Identity Theory
t	t value
VIF	Variance inflation factor

Chapter I

Introduction

Background of Study

In the mid-1990s, Internet has grown rapidly after its early introduction and presented to the public. The advancement of technology has also allowed more accesses to the Internet by all regions of society (Liu, Mirza, Narayanan, & Souligna, 2018). In the 2000s, Internet games have been spread widely and the usage of Internet games has grown rapidly among youths (Kuss, 2013).

Moreover, the development of Internet gaming has shown disproportionate and caused potential issues in gaming (Pontes & Griffiths, 2014). After the debate of the first profit-making video games in the US in the 1970s, video gaming addiction started to be reported in the academic literature (Kowert & Quandt, 2015). Griffiths (2015) stated that there are more people involved in video game playing and video game addiction in the 2000s. The online environment has been enabled due to the development of the medium, and it allows players to gather virtually and create online communities globally.

Massively Multiplayer Online Role Playing Games (MMORPGs) is being recognized as a game genre that is problematic and are significantly associated with IGD (Yee, 2006; Kuss, Louws, & Wiers, 2012; Stavropoulos, Kuss, Griffiths, & Motti-Stefanidi, 2016). At the same time, Multiplayer Online Battle Arena (MOBA) games have grown rapidly and greater impact in online gaming industry recently in Malaysia (Hu, Stavropoulos, Anderson, Scerri, & Collard, 2018).

On the other hand, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) has recognized Internet gaming disorder (IGD) as one of the mental conditions due to the problematic video game usage and gaming money have been increased (Sioni, Burleson, & Bekerian, 2017; Rho et al., 2017). Therefore, there are more researchers

started to study both video game addiction and online video gaming (Griffiths et al., 2016; Petry et al., 2014).

Past study has shown that pathological variables such as depression and social phobia are positively related to IGD's symptoms (Walther, Morgenstern, Hanewinkel, 2012). According to the study conducted by Sioni et al. (2017), the results showed that social phobia is partially mediated by identification of avatar (IOA). In other words, an indirect link might also exist between the pathological variables and IGD's symptoms via IOA.

Hence, the current study is to examine the mediating effect of IOA on the relationships between social phobia, depression, and IGD's symptoms.

Problem Statement

According to Statista (2017), the number of Internet users is increasing from 20.68 million to 21.93 million between 2015 and 2018, and it is expected to expand to 23.41 millions of users by the year of 2022. Additionally, 72.7% of the users use the Internet for leisure activities such as listening to online radio or music while 70.0% of the users use the Internet to download video and watch TV. 68.6% and 41.6% of the Internet users access the Internet to download images, audio, or reading materials, and play computer games respectively (Malaysian Communications and Multimedia Commission, 2017). In other words, there are around 9.1 million people are playing computers games in 2018. This is supported by the fact that online gaming is becoming an increasingly important source of entertainment among younger population (Jap, Tiatri, Jaya, & Suteja, 2013).

Meanwhile, IGD has become a serious and growing social problem after the introduction of online video games (Peeters, Koning, & Eijnden, 2018). Mental health professionals have recognized the IGD as one of the mental health condition in the

DSM-5 (American Psychiatric Association, 2013). Therefore, the studies on Internet gaming disorder symptoms has turned into a trend, there are many countries such as Australia (Thomas & Martin, 2010), Norway (Wittek et al., 2016), Germany (Rehbein, Kliem, Baier, Moble, & Petry, 2015), Greece (Stavropoulos, Alexandraki, & Motti-Stefanidi, 2013), Pakistan (Khan & Muqtadir, 2016), Iran (Ahmadi & Saghafi, 2013), Turkey (Canan, Ataglu, Ozcetin & Icmeli, 2012), China (Wang et al., 2011), and Taiwan (Lin et al., 2014) started to conduct research on the IGD symptoms. However, the risk factors that lead to IGD's symptoms still remain unclear (Rawshon, Ramayah, Mahmud, & Rabaya, 2017).

Internet games have been spread widely and the usage of Internet game has grown rapidly among youths in the 2000s (Kuss, 2013). As stated in Malaysia's policy, the current study aimed to focus on the age of youth ranged from 18 to 29 which also is known as the "digital generation" (Soh, Ong, Yan, & Teh, 2012; Ministry of Youth and Sports Malaysia, 2018). According to the meta-analysis of the research on IGD conducted by Fam (2018), it showed that the prevalence and the severity of IGD were found to be higher in Asian countries such as Malaysia, China and India than Western countries such as Australia and Europe. Therefore, IGD's symptoms are severe enough to be studied among Malaysian youth aged 18 to 29 as it is being recognized as one of the psychiatric disorders.

Apart from that, excessive Internet gaming can have adverse impact on youths' health such as poor sleep quality, poor general health, depression, anxiety (King, & Delfabbro, 2019), loneliness (Lemmens, Valkenburg, & Peter, 2011), and conduct problems (Brunborg, Mentzoni & Froyland, 2014). Additionally, excessive Internet gaming will bring negative consequences on psychosocial of the youths such as maladaptive coping (Batthyany, Muller, Benker, & Wolfling, 2009; Hussain & Griffiths,

2009), increased stress (Batthyany et al., 2009), poorer social skills (Griffiths, 2010), low self-efficacy (Jeong & Kim, 2011), and decreased concentration (Faiola, Newlon, Pfaff, & Smslova, 2013).

Massively Multiplayer Online Role Playing Games (MMORPGs) is being recognized as a game genre that is problematic and are significantly associated with IGD (Yee, 2006; Kuss et al., 2012; Stavropoulos et al., 2016). World of Warcraft, WoW, is one of the game under MMORPGs, which are focusing on playing with teammates cooperatively, and has been concluded to be highly associated with its popularity (Nardi & Harris, 2006; Stavropoulos et al., 2016).

However, there are other game genres such as Multiplayer Online Battle Arena (MOBA) games have grown rapidly and greater impact in online gaming industry recently (Hu et al., 2018). For instance, the top played MOBA games for the personal computer is League of Legends in 2015 (Statista, 2015). Defence of the Ancients 2 or League of Legends host hundreds to thousands of players daily and can only be played with other players (Hu et al., 2018). It means that MOBA games have been viewed as game applications that focus on cyber-relationship that demonstrate a social element which builds up the players' absorbance and attractiveness (Young, Pistner, O'Mara, & Buchanan, 1999; Lemmens & Hendriks, 2016). Yet, do not have much research being done on MOBA (Hu et al., 2018).

In addition, the pre-existing psychopathology variables which are social phobia and depression were the strongest predictors of IGD's symptoms (Davis, 2001; Hyun et al, 2015). Firstly, social phobia was the strong predictor of IGD's symptoms (Hussain & Griffiths, 2008). MOBA gamers can fulfil their unmet basic social needs in the real world by playing online games. Thus, gamers with higher social phobia tend to have more IGD's symptoms (Hussain & Griffiths, 2008). Secondly, in Seay and Kraut's

(2007) assertion, depression was positively related to IGD's symptoms. This is because players who are depressed tend to have low self-regulation and it will lead to IGD symptoms (Seay & Kraut, 2007). Additionally, players who have higher depression level tend to be less active in their social world, hence, they prefer to spend more time playing Internet games such as MOBA (Seay & Kraut, 2007). Therefore, the players who have higher depression level tend to show more IGD's symptoms (Seay & Kraut, 2007).

Moreover, recent researchers have studied the risk factors such as social phobia, depression, IOA separately on IGD's symptoms and the mediation effects between IGD and psychopathology of escaping in gaming is not identified (Sioni et al., 2017; Burleigh, Stavropoulos, Liew, Adams, & Griffiths, 2017; Laconi, Pires, & Chabrol, 2017). However, there is no previous studies have explicitly addressed social phobia, depression and IOA together in IGD's symptoms among Malaysian youths. This research gap has not been filled by the pertinent literature. In order to fill this gap, the cognitive-behavioral model of pathological Internet use (PIU) and social identity theory were used to justify the integration of social phobia, depression and identification of avatar in this study.

Therefore, the current study aimed to examine the mediating effect of IOA on the relationships between social phobia, depression and IGD's symptoms.

Research Questions

1. Does social phobia positively predict IGD's symptoms among Malaysian youth?

2. Does depression positively predict IGD's symptoms among Malaysian youth?

3. Does IOA positively predict IGD's symptoms among Malaysian youth?

4. Does IOA mediate the relationship between social phobia and IGD's symptoms among Malaysian youth?

5. Does IOA mediate the relationship between depression and IGD's symptoms Malaysian youth?

Research Objectives

1. To examine the predictive effect of social phobia on IGD's symptoms among Malaysian youth.

2. To investigate the predictive effect of social phobia on IGD's symptoms among Malaysian youth.

3. To study the predictive effect of social phobia on IGD's symptoms among Malaysian youth.

4. To determine the mediating role of IOA between social phobia and IGD's symptoms among Malaysian youth.

5. To examine the mediating role of IOA between depression and IGD's symptoms among Malaysian youth.

Hypotheses

1. Social phobia positively predicts IGD's symptoms among Malaysian youth.

2. Depression positively predicts IGD's symptoms among Malaysian youth.

3. IOA positively predicts IGD's symptoms among Malaysian youth.

4. IOA mediates the relationship between social phobia and IGD's symptoms among Malaysian youth.

5. IOA mediates the relationship between depression and IGD's symptoms Malaysian youth.

Significance of Study

The current study provides a better understanding of the risk factors, which are social phobia, depression, and IOA for IGD's symptoms. The current study offers an integrated model with three variables (i.e., social phobia, depression, and IOA) in the context of IGD's symptoms from a theoretical perspective. It serves as a guideline for parents and educators to prevent Internet gaming addiction by implementing the right treatment plan and strategy (Kuss et al., 2017).

Obsessive to Internet gaming is considered as a mental health issue, therefore, continued research will help the professionals to have a better understanding of the development assessment criteria, risk factors, and provides research-based prevention and treatment to the society (Carlisle & Carrington, 2015). It highlighted the importance of IGD prevention in ensuring that youth will have a better life functioning. Additionally, medication is unable to cure obsessive Internet gaming. In order to overcome Internet gaming addiction, ones must understand the meaning of Internet gaming the people attach to it (Peters & Malesky, 2008). Furthermore, with the knowledge related to IGD, clinical psychologists are able to describe and deliver an effective treatment program to youth (Mora-Cantallops & Sicilia, 2018).

Despite that, the study also creates awareness about the severity of IGD among Malaysian youths. According to the findings of the present study, there are many important implications, especially for clinicians and researchers (Naskar, Victor, Nath, & Sengupta, 2016). This study able to assist clinicians and researchers to have better a

understanding of the crucial system that promotes IGD's behaviors. Li et al.'s study (2013) suggested that in order to provide better coping strategies for pathological gamers, ones must understand and meet them in the virtual world as it provides a better understanding of their problems.

Additionally, policy makers such as the Ministry of Youth and Sports will focus more on the pathological factors of IGD and take actions in implementing policies and regulations related to Internet gaming addiction (Saunders et al., 2017) as both depression and social phobia have an significance impact on youth's Internet gaming behavior through identification of avatar. It provides an insight into the government in examining the context of IGD's symptoms. For instance, a management center of depression and social phobia can be established to raise awareness among the public about the consequences of depression and social phobia on IGD's symptoms through IOA. It helps to educate and encourage the public not to have excessive Internet gaming which might lead to IGD's symptoms.

Conceptual Definition

Social phobia is being known as the intense fear that involved in an unfamiliar social situation (Hockenbury, 2013). If social phobia is untreated, it will lead to significant impairments in terms of social and vocational functioning (Hofmann & Bogels, 2006). Individuals with social phobia are facing difficulty in forming and retaining social and personal relationships (Aderka et al., 2012).

Depression is a mood disorder when an individual is experiencing a loss of interest and persistent sadness over time (Plieger, Melchers, Montag, Meermann, & Reuter, 2015). National Institute of Mental Health (NIMH, 2016) stated that depression can become chronic and cause to substantial impairment in an individual's daily functioning.

IOA refers to visual representation or the embodiment of the game user (You, Kim, & Lee, 2017). IOA is defined as a single construct or four-first order constructs which involving the feeling during play, absorption, a positive attitude toward the avatar and the importance to identity (Dong, Liau, & Khoo, 2013).

IGD's symptoms refers to the excessive use of the Internet to engage in games, which leading to impairment or clinically significant distress (Laconi et al., 2017). According to the diagnostic criteria outlined in the for IGD, the nine core criteria which are preoccupation, withdrawal, tolerance, unsuccessful attempts to control playing, loss of interest, continued use despite problems, deceiving, escaping negative mood and functional impairment (Patrick & Christopher, 2017).

Operational Definition

Social phobia is the feeling of fear of being judged negatively by others in a social environment. Social phobia scale - short form, which consists of 6 items was used to measures anxious thoughts and behaviors with social scrutiny. The higher scores indicate the higher level of social phobia. (Peters, Sunderland, Andrews, Rapee, & Mattick, 2012).

Depression is a serious mental illness that negatively affects how an individual feels, thinks, and act. Montgomery-Asberg Depression Rating Scale was used to screen depression. It consists of nine items. The higher scores indicate that the higher level of depression (Yee, Mat Yassim, Loh, Ng & Tan, 2015).

IGD is when an individual relies on internet gaming obsessively. Internet Gaming Disorder Scale-Short Form (IGDS9-SF) was used to access the severity of IGD and its negative effects. It consists of nine items. The higher the score, the higher the degree of gaming disorder (Pontes & Griffiths, 2015).

IOA is the player identify the avatars with themselves. The Player-Avatar Identification Scale was used to assess the identification of the player with one's gaming avatar. It consists of 15 items. The higher score indicates the higher IOA (Li et al., 2013).

Chapter II

Literature Reviews

Conceptualizing on IGD's Symptoms

"Problem video game playing", "Internet game addiction", "video game addiction", "online game addiction", "problematic online gaming", these are the terms have been used to define obsessive internet video gameplay (Pontes & Griffiths, 2014). The broad variety of name, definitions and instruments adapted to problematic video gaming has led to inconsistencies among researchers analyzing the prevalence of the behavior (King, Haagsma, Delfabbro, Gradisar, & Griffiths, 2013; Kuss & Griffiths, 2012; Petry et al., 2014).

The APA (2013) introduced the IGD in DSM-5 in May 2013 for further study. IGD is defined as the intended and losing control over Internet use to play online video games, in turn, leads to remarkable impairment or distress (APA, 2013). According to APA (2013), individuals with IGD experience symptoms same as those who developed addictive behaviors such as substance dependence; there are nine diagnostic symptoms include experience of unpleasant symptoms when gaming is not allowed (i.e., "withdrawal"), unsuccessful attempts to stop or control participation in games (i.e., "loss of control"), the need to spend overtime in games (i.e., "tolerance"), spend too much time thinking about games (i.e., "preoccupation"), and jeopardizing significant relationships or opportunities because of gaming (i.e., "negative consequences"), deceiving family members or others about the amount of gaming (i.e., Rehbein "deception"), loss of interest or passion in previous hobbies and entertainment (i.e., "give up other activities"), non-stop excessive use of games despite understanding of psychological problems (i.e., "continuation"), escape or relieve unpleasant feelings by playing games (i.e., "escape") (Refer to Appendix A, p. 88).

IGD is a serious health threat worldwide to the extent that can cause in a wide range of negative psychosocial consequences such as functional impairment in work, socializing, education and hobbies (Griffiths, Davies, & Chappell, 2004; Rehbein,

Kleimann, & Moble, 2010; Yee, 2006), lower psychosocial well-being and loneliness (Lemmens et al., 2011), decreased academic achievement (Jeong & Kim, 2011; Rehbein et al., 2010), maladaptive coping (Batthyany et al., 2009; Hussain & Griffiths, 2009), increased stress (Batthyany et al., 2009), poorer social skills (Griffiths, 2010), low self-efficacy (Jeong & Kim, 2011), and decreased concentration (Faiola et al., 2013).

Moreover, IGD also has a significant potential impact on public health risk; thus, it is important to understand its precursors may provide information that can be used for more effective prevention and intervention policies (APA, 2013; Kuss & Griffiths, 2012).

Conceptualizing on Social Phobia

One of the important risk factors in the context of IGD is the social phobia. An exaggerated and consistent fear of embarrassment or mortification in social situations, and causing an individual to have high levels of distress and trying to avoid those situations, is being known as social phobia. It was first introduced in DSM-III in 1980. Additionally, an individual might be afraid of meeting people, speaking, writing, or eating in public. An individual might also afraid to be presented foolish or nervous, being laughed at or being criticized, and making mistakes. When an individual feels insecure or under evaluation, he or she will appear sweating, blushing, and tachycardia is triggered (Haug et al., 2000).

Furthermore, individuals with social phobia will experience intense fear of certain unfamiliar social situations (Hockenbury, 2013). Social phobia usually discourages individuals from interacting with other people socially in real life due to irrational fears and internalized experiences of inadequacy. As a result, those who are social phobia tend to withdraw themselves from the interpersonal situation, as social interaction makes them feel undesirable and unimportant (Sioni et al., 2017).

In addition, individuals with social phobia have difficulties in presenting their real self, disclosing themselves to others, starting and retaining a relationship (Erwin, Turk, Heimberg, Fresco, & Hantula, 2004; McKenna, Green, & Gleason, 2002; Rapee & Heimberg, 1997; Rodebaugh, 2009). Moreover, social phobia can significantly affect one's social, psychological well-being, occupational, and quality of life as social phobia is associated with low perceived social support, loneliness, social isolation and negative interpretations of others' behaviours and intentions (La Greca & Lopez, 1998; Torgrud et al., 2004; Wittchen & Beloch, 1996). Therefore, individuals with social phobia might have a comorbid psychiatric condition such as other anxiety disorders, substance use disorders, and major depressive disorders (Wittchen & Beloch, 1996).

Conceptualizing on Depression

Another important risk factor in the context of IGD is depression. Depression is a common but serious mental illness that often characterizes with feeling sad, guilt or low self- worth, discouraged, unmotivated as well as general loss of interest and pressure in life (World Health Organization, 2017). Previous studies found that depression in university students is noted around the world (Eller, Aluoja, Vasar, & Veldi, 2006; Ibrahim, Kelly, & Glazebrook, 2012; Mahmoud, Staten, Hall, & Lennie, 2012) and seems to be increasing (Reavley & Jorm, 2010). However, most of the young people do not talk about or seek help for mental health problems. They tend to use self-help method in place of professional help, which has potentially harmful consequences such as alcohol and substances use (Castaldelli-Maia et al., 2012).

Depression can become chronic and cause to substantial impairment in an individual's ability to take care of daily responsibilities such as work, study, sleep, and eat (NIMH, 2016). Depression affects how an individual cognitively and emotionally. It will only be recognised if the symptoms remain everyday last for at least two weeks and

interfere with daily functioning (NIMH, 2016). Furthermore, depression has been associated consistently with a higher risk of developing several addictive behaviours such as substances use, gambling, and alcohol (Swendsen & Merikangas, 2000; Volkow, 2004). Additionally, depression can also lead to suicide and it is the major contributor to suicide death, which number close to eight hundred thousand per year (WHO, 2017).

Depression is extremely common and widespread problem among university students across the country (Sarokhani et al., 2013). It can be one of the most stressful times in person's life as they are going through a critical transitory period in which they are going from adolescent to adulthood. Some students get depressed due to several stresses such as get and maintain a good grades, plan or worry for future, away from home and try to fit in a new environment often cause anxiety among the students (Buchanan, 2012). Hence, they may cry frequently, absent classes, isolate themselves without realizing they are depressed as they found that they cannot handle the stresses by themselves (Castaldelli-Maia et al., 2012).

Conceptualizing on IOA

IOA is one of the important components in the context of IGD. According to You et al. (2017), IOA is a player identifies with his or her avatar and feels affection to it. IOA also knowns as "player-avatar identification" (Dong et al., 2013), "avatar-self connection" (Jin, 2010), "character identification" (Soutter & Hitchens, 2016). The avatar is one of the key attributes that affect a player's psychological experiences during exposure to online games (Klimmt, Hefner, & Vorderer, 2009). The more a player plays on their avatars, the more the avatar acquire knowledges, experiences, and achievements, and hence, either player or avatar accumulate in-game values (Bessiere, Seay, & Kiesler, 2007; Carter, Gibbs, & Arnold, 2012).

According to past studies, longer playing time will result in a stronger IOA (Muller et al., 2014; Ng & Wiemer-Hastings, 2005). Additionally, players with active participation in online games experience greater IOA and satisfaction through the identification (You et al., 2017). Whang and Chang (2004) found that players' enjoyment can reinforce stronger IOA. Moreover, players use their avatars to join communities or groups such as guild, party, they become emotionally attached to their communities, and thus have stronger cognitive and emotional identification with their avatars (Obst & White, 2005). As a result, the players' connection with their avatars gradually develop and strengthen into a stronger psychological attachment (Wolfendale, 2007).

This kind of attachment develops a sense that player's physical, physiological states, psychological states, perceived traits and identity exist within the virtual world (Biocca, 2006), and has been defined as "self-presence" (Ratan, 2013). Those players who experience a high level self-presence tend to instil their avatars with the idealized version of physical appearances or personalities that they desire to possess (Burleigh et al., 2017). The players attempt to make up self-discrepancies in real life by creating idealized identities of their actual self (Bessiere et al., 2007). This is important because individuals' psychological well- being is linked to the difference between their actual and ideal self (Higgins et al., 1987), these discrepancies between actual and ideal self are associated with negative health outcome, such as depression and anxiety (Gonnerman, Parker, Lavine, & Huff, 2000).

However, IOA can improve game enjoyment (Trepte & Reinecke, 2011), trust in others (Kim, Lee, & Kang, 2012), health outcome (Kim & Sundar, 2012), intrinsic motivation (Birk, Atkins, Bowey, & Mandryk, 2016), self-esteem (Watts, 2016), game appreciation (Bowman et al., 2016), learning interest (Bachen, Hernandez-Ramos,

Raphael, & Waldron, 2016), game loyalty (Teng, 2017). IOA can also help to reduce deceptive behavior (Hooi & Cho, 2013) and self-discrepancy (Bessiere et al., 2007).

Social Phobia and IGD's Symptoms

In Weinstein et al.'s study (2015), social phobia is associated with IGD symptoms. Individuals with social phobia prefer to have social interaction through online or virtual (Lee & Stapinski, 2012). The massive virtual environment can allow players enjoy the interactions with fellow players through various in-game events such as communicating with each others, marrying other avatars, producing and trading items and completing party quests (You et al., 2017).

In addition, players can build up their own community such as guild, party, or blood alliance within the game community. Virtual interaction is non-threatening compared to actual interaction as nonverbal behavior is excluded. Therefore, players are allowed to control and regulate the amount and depth of social interaction (You et al., 2017). Players with higher levels of social phobia more likely to express their true selves in games, and have strong in-game emotional support as opposed to weak face-to-face emotional support which is significantly associated with IGD's symptoms (Lee & Leeson, 2015).

Online communication could also provide socially phobic players with the opportunity to satisfy social relational needs while avoiding the perceived stress associated with the face-to-face communication. Hence, these players may be at particularly high risk of developing IGD because they can easily and successfully form a meaningful and new relationship in online than offline settings (Sioni et al., 2017).

Consequently, these game characteristics may intense play to a problematic extent especially those individuals with social phobia (Lee & Stapinski, 2012). Thus, we

hypothesize that social phobia positively predicts IGD's symptoms among Malaysian youth.

Depression and IGD's Symptoms

Depression has been introduced as a predisposition cause of addictions that related to Internet, including IGD (Davis, 2001). Individuals with higher psychopathology are more defenseless to the addictions as they have lesser psychosocial resources and less desire to withdraw from emotional difficulties (Ko, Yen, Chen, Yeh, & Yen, 2009; Wu, Li, Lau, Mo, & Lau, 2016).

Depression is one of the psychological factors associated with IGD. According to Young (1998), 54% of Internet addicts had a history of depression. Individuals who have depression had a high chance of being addicted to online gaming because online gaming can serve as a way for them to escape from dissatisfactions and difficulties in daily life and also provide them emotional support in game community (Ryu et al., 2018).

According to Li et al. (2011), players who had high levels of depression tended to have higher levels of escapism, and more likely to engage in problematic gaming behaviors; thus, developed IGD's symptoms. Games can be used as a tool of distraction because the focus is on what happened within the game rather than their own mind (McGonigal, 2011). Wei, Chen, Huang, and Bai (2012) found that player with depression more likely to use the online games excessively as a way self-medicating. Consequently, negative consequences in one's actual life increase potential addiction tendencies, such as loss of control over time spent online, which lead to IGD (Ohno, 2016). Depression serves as a risk factor to IGD's symptoms as the addictions are always associated with malfunctioning of emotional regulation strategies (Stavropoulos, Gentitle, & Motti-Stefanidi, 2015).

In other words, individuals wanted to experience the positive feelings such as being respected and being in control, as a result, they will play more online video game so that they can escape from the feeling of depressed that they experienced offline (Yen, Ko, Yen, Wu, & Yang, 2007). Obsessive online players tend to counterbalance the disadvantages in real life situation by escaping online (Kardefelt-Winther, 2014). It clearly shows that IGD behaviours are able to initiate positive feelings immediately, however, it might also amplify the dysfunctions in real life later such as neglecting everyday's responsibilities which will also facilitate and makes depression feelings last longer, and ended up becoming a malicious cycle (Stavropoulos, et al., 2016). Hence, we hypothesize that depression positively predicts IGD's symptoms among Malaysian youth.

IOA and IGD' Symptoms

According to Smahel, Blinka and Ledabyl (2008), IOA may lead to IGD's symptoms. Players who perceive their avatars as being more superior to their actual selves might develop a strong emotional attachment to their avatars and display deeper avatar self-identification (Zhong & Yao, 2013). According to Ducheneaut, Wen, Yee, and Wadley (2009), players desire to build and experience their ideal selves, hence avatars can be serve as a way to experience with idealized personality.

In other words, players intend to show their "best" sides of themselves through the game (Ducheneaut et al., 2009). This could lead to these players establish a strong link with their avatar to the extent that they see their avatars as some part of themselves; thus, fully engaged in the virtual world such as overemphasize with their avatar's experiences and suffer adverse effects (Smahel et al., 2008). Apart from this, there are some past studies found that having the ability to control the characteristics of avatar can allow players to build connection with their avatar and to identify with them

(Bowman, 2010; Ducheneaut et al., 2009; Waggoner, 2009; Kline, Dyer-Witheford, & De Peuter, 2003).

Although the attachments of players to their avatar are originally created as a source of satisfaction, may later become unpleasant (Smahel et al., 2008). Players might develop negative emotions or worsen pre-existing mental distress when any online interaction resulting in negative consequences on their avatars (Sioni et al., 2017).

Consequently, gameplay is more likely to become more severe because of greater gaming persistence and preoccupation, thus lead to more use-related problems for these players (Sioni et al., 2017). Additionally, players who have strong IOA will relate their avatars' emotions, identities, and values as part of their own and identify their avatars as representations of their ideal selves (Grahman & Gosling, 2013; Lim & Lee, 2009). As identification of avatar increases, more psychological resources are devoted to generate and maintain one's virtual self, and thus may lead to excessive online gaming (Sioni et al., 2017). Thus, we hypothesized that IOA mediates the relationship between social phobia and IGD's symptoms among Malaysian youth.

Social Phobia, IOA, and IGD's Symptoms

According to Maslow hierarchy of needs, social needs are the third level of needs after the activation of safety needs. Human needed to be accepted and loved by others in order to fulfil the needs of affiliation (Kaur, 2013). Players' online social interaction is conducted through their avatars and the avatars provide a presence to the user (You et al., 2017). These mediated interactions allow some players, particularly the socially phobic, to develop significant friendships, to experience a sense of community and belonging during gameplay that may not otherwise be obtained from the real world (Grinberg, Careaga, Mehl, O'Connor, 2014). An avatar not only beyond being a player's

representation, but also be understood as a psychic projection of the player identity (Sioni et al., 2017).

Dunn and Guadagno (2012) found that players tend to create or choose avatars with idealized version of personality that compensate for their shortcomings, especially those socially phobic players who are dissatisfied with their actual selves may be strongly appealed to create an avatar with an endlessly altered and momentary identity (Sioni et al., 2017). These players can engage socially through their avatars without fear of negative social evaluation as their identity are protected anonymously. These interactions would allow them to indulge more in the virtual world and reinforce stronger IOA by meeting and satisfying their needs for social connection (Sioni et al., 2017). Socially phobic individuals are more psychologically attached with their avatar, which encourages more often and intense participation in the game, and more likely to exhibit IGD's symptoms. Consequently, individuals with social phobia promote stronger identification with one's avatar, and thus aggravates IGD's symptoms (Sioni et al., 2017).

Depression, IOA and IGD's Symptoms

Individuals with high level of depression may have greater discrepancy between their actual self and ideal self. Therefore, they often express their negative feelings about themselves by projecting their idealized self onto their avatar (Bessiere et al., 2007; Ducheneaut et al., 2009; Messinger et al., 2008). Furthermore, individuals with greater discrepancies between their actual self and ideal self have lower self-esteem (Higgins, 1987; Moretti & Higgins, 1990), therefore they more likely to create an idealized avatar to decrease their actual-ideal discrepancies and increase their self-confidence and self-esteem (McKenna & Bargh, 1998). This process could foster a level

of dependency and thus, increase both game immersion and gameplay time (Ng & Wiemer-Hastings, 2005).

According to Burleigh et al. (2017), individual with higher level of depression and stronger IOA are at a high risk of developing IGD's symptoms. Moreover, depressed individuals are more vulnerable to IGD significantly over the time as they experienced stronger IOA. Additionally, another past study also found that the relationship between depression and IGD's symptoms occurs when IOA exits. Depression is highly associated with IOA, thus in turn highly associated with IGD's symptoms.

In other words, depressive individuals are more likely to relate themselves with avatar, thus a greater attachment is formed, which encourage longer time spent on gaming and lead to IGD's symptoms (You et al., 2015).

Theoretical Framework

The cognitive-behavioral model of pathological Internet use (PIU). The present study adopted a cognitive-behavioral model of Pathological Internet Use (PIU) that dimensionally conceptualized IGD behaviors to study the levels of social phobia and depression of players and IOA. The PIU was developed by Davis (2001).

The introduction of the Internet is the stressor in this model. A more empirically event is the experience of a new technology found on the Internet; however, it might be difficult to trace back on an individual's first experience with the Internet. It can be the first time an individual on an online shopping services, an online chat services, or an online stock tracking services. The exposure to such technologies is a distal necessary cause of symptoms of PIU (Davis, 2001).

Distal causes of Internet use is the hidden psychopathology such as social anxiety and depression while proximal causes is the maladjusted thinking which is an individual

evaluate himself or herself and the world negatively (Davis, 2001). This theory suggests the distal necessary cause of symptoms of PIU is psychopathology (Davis, 2001) such as social phobia and depression. It means in order for the IGD's symptoms to happen, psychopathology must be present (Davis, 2001). It is used to understand the causes of problematic levels of gamers who play online games such as MOBA. This theory emphasizes that the cognition of people is the main source for abnormal behavior (Davis, 2001). There are two components that are required for the development of pathological behaviour which are life events such as playing MOBA and pre-existing psychopathologies such as social phobia and depression. This is because it reinforces the individual socially and psychologically to engage in that activity continuously, and results in compulsive and excessive use, occupational and social issues, and symptoms of withdrawal (Caplan, 2002; Davis, 2001).

In addition, Internet serves as a safer and secure environment for an individual who experiences social phobia. It is better than face-to-face interactions as it does not involve auditory and physical cues which an individual with social phobia are afraid of (McKenna, & Bargh, 1999; Ng & Wiemer-Hastings, 2005; Peter & Malesky, 2008). Lee and Stapinski (2012) also claimed that individual with higher social phobia preferred online interaction instead of face-to-face interactions. Hence, as proposed in cognitive-behavioral model of PIU, social phobia and depression may affect an individual to play online role-playing video game so that they can release distress, at the same time, they can also receive social rewards such as they are having more opportunity to interact with others in a safer and secure way. As a result, it causes higher levels of online role-playing video game usage, which might cause Internet gaming addiction (Davis, 2001).

Individuals who have problematic use of online role-playing video game are those with higher intensity of social anxiety (Davis, 2001). In other words, online role-playing

video games initiate players with social phobia the chances to present the real self to others (Cole & Griffiths, 2007; McKenna et al., 2002; Williams, Kennedy, & Moore, 2011). As a result, the social needs that are unable to be achieved face-to-face will be met online (Hussain & Griffiths, 2009; Wan & Chiou, 2006), a new relationships will be formed through online game as well (Herodotou, Kambouri, & Winters, 2014; Ng & Wiemer-Hastings, 2005; Williams et al., 2011). IGD players tend to escape from reality and deal with anxiety or depressive symptoms by engaging in gaming. Therefore, IGD serves as a maladjusted dissociative or coping strategy (Kardefelt-Winther, 2014; Schimmenti, Guglielmucci, Barbasio, & Granieri, 2012).

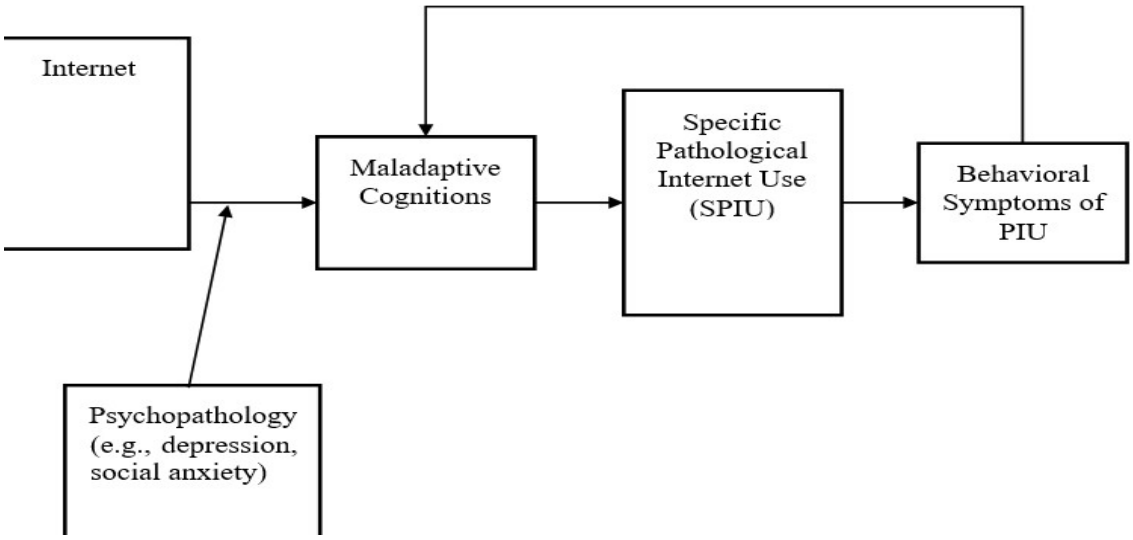


Figure 2.1. The cognitive-behavioral model of pathological Internet use (PIU)

Social identity theory. Additionally, social identity theory (SIT) was developed by Tajfel and Turner (1979), suggested that individuals have several levels of selves, such as "social" and "personal" levels. Social identity refers to the perception of how an individual defines "group". It helps an individual to identify himself or herself as part of a certain group, differentiate themselves from others, and categorize himself or herself into a specific social group. Individuals tend to view themselves as exemplars of a social group

and the collectivism affects the behavior when social identity is activated (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987; Verkuyten & Hagendoorn, 1998). Besides, personal identity refers to the self-categorization as a unique individual with unique skills, attributes, and belief (Baumeister, 1998). Behavior will be influenced by individuals' motives and beliefs when personal identity is salient (Stets & Burke, 2000).

Internet serves as a platform for an individual to explore identity in a more flexible and anonymous way. Long-term relationships are encouraged by the creation of an online role-playing video game. Players can form guilds, formal groups with lots of members within the virtual environment (Guegan, Moliner, & Buisine, 2015). The avatar, as a digital self- representation, which players can use to express themselves, and individuals tend to choose avatars that are similar to their personality (Dunn & Guadagno, 2012). Players imagine themselves are their own avatar as the interactive control of game character develops a strong connection between the player and his or her avatar (Klimmt, Hartmann, & Frey, 2007; Vorderer, 2000).

Individuals identify more strongly with social groups when they feel and experience uncertainty about themselves, or what is expected of them. An individual will identify with a group that provides one's clear normative prescriptions for behaviors as the context is perceived as more meaningful and less complicated in order to reduce uncertainty. In the virtual world, the number of people can be large, and people are allowed to interact with strangers. Therefore, individual may find other individuals more attractive socially and minimize social and physical uncertainty as they are able to predict the attitudes, beliefs, and values of others, due to all of them show typical traits and behaviors in the online community when entering a virtual world (Gabbiadini, Mari, Volpato, & Monaci, 2014). Players develop a sense of belonging to a

specific group of players within a guild in games, may help to define a sense of identity in players (Sporcic & Glavak-Tkalic, 2018).

According to Guegan et al. (2015), the process of identification among players in line with the social identity framework and reported that being player and being a guild member directly contribute to social identity. Furthermore, a dual system of identification may be activated by a sense of belonging to gaming community: engagement within a game while online, members of a gaming community while offline (Badrinarayanan, Sierra, & Martin, 2015). Additionally, social identity can provide social support, individuals are more able to give and receive support from groups that they identify with (Haslam, O'Brien, Jetten, Vormedal, & Penna, 2005).

Therefore, players with a uncertain self-concept are more likely to engage in online gaming as online gaming allow them to experience of being involved into different roles in virtual world or create an avatar as a representation of one's ideal self with a clearly defined identity, which help them to generate a clearer identity of themselves (Bessiere et al., 2007; Leménager, Gwodz, Richter, Reinhard, Kämmerer, Sell, & Mann, 2013; Przybylski, Weinstein, Murayama, Lynch, & Ryan, 2012). This provides players a temporary detachment from reality and their actual self, and thus leads to problematic and excessive gaming behaviors.

Identification with an avatar can help to decrease self-discrepancies and reduce unpleasant emotions, and this reduction of self-discrepancies between actual and ideal self is associated with positive consequences (Higgins, 1987), which contribute to enjoyment in games and higher intrinsic motivation in gaming (Przybylski et al., 2012). Individuals with a low self-concept, reduction of self-discrepancies and social identity formation through gaming community, identification with an avatar, or guilds in a virtual world, can be seen as a form of escapism. Gaming for the individuals with a

poor self-concept may serve as a way of escape and avoidance of oneself which can lead to develop IGD's symptoms (Sporcic & Glavak-Tkalic, 2018).

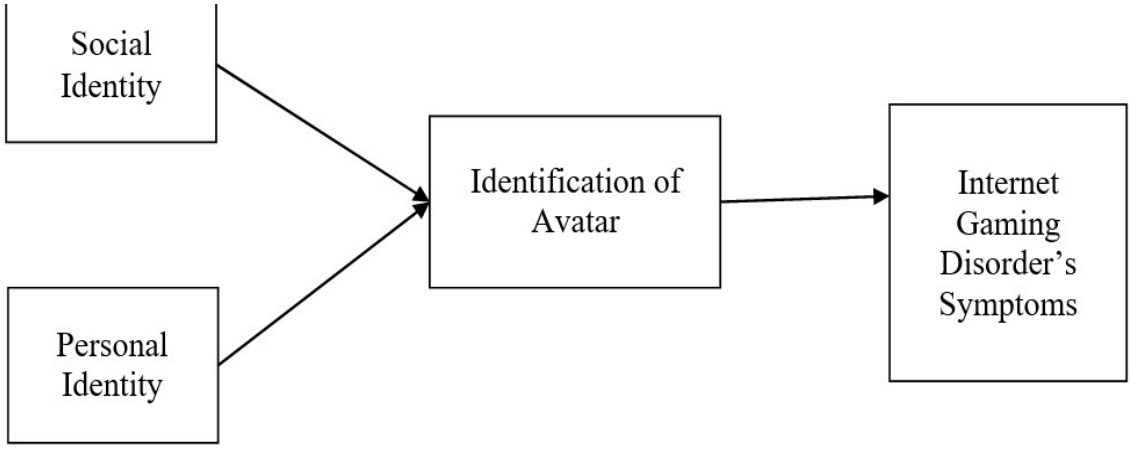


Figure 2.2. The social identity theory (SIT)

Conceptual Framework

The independent variables in this study are social phobia and depression while IGD's symptoms are the dependent variable. Additionally, IOA plays the role of mediator in this study. We hypothesized that (1) social phobia positively predicts IGD's symptoms through IOA, (2) depression positively predicts IGD's symptoms through IOA.

The pre-existing psychopathology variables which are social phobia and depression were the strongest predictors of IGD's symptoms (Davis, 2001; Hyun et al, 2015). The social phobia and depression have both direct and indirect effect on IGD's symptoms (Davis, 2001; Li et al., 2013; Tang, 2018). Past study showed that depressive symptoms are highly associated with IOA and thus leads to IGD's symptoms (Li et al., 2013). At the same time, Tang's study (2018) showed social phobia has indirect effect on IGD's symptoms.

Thus, in present study, by adopted the cognitive-behavioral model of Pathological Internet Use (PIU) and social identity theory (SIT), it can explain that

the IOA plays a mediating role in examining the relationships between social phobia, depression and IGD's symptoms.

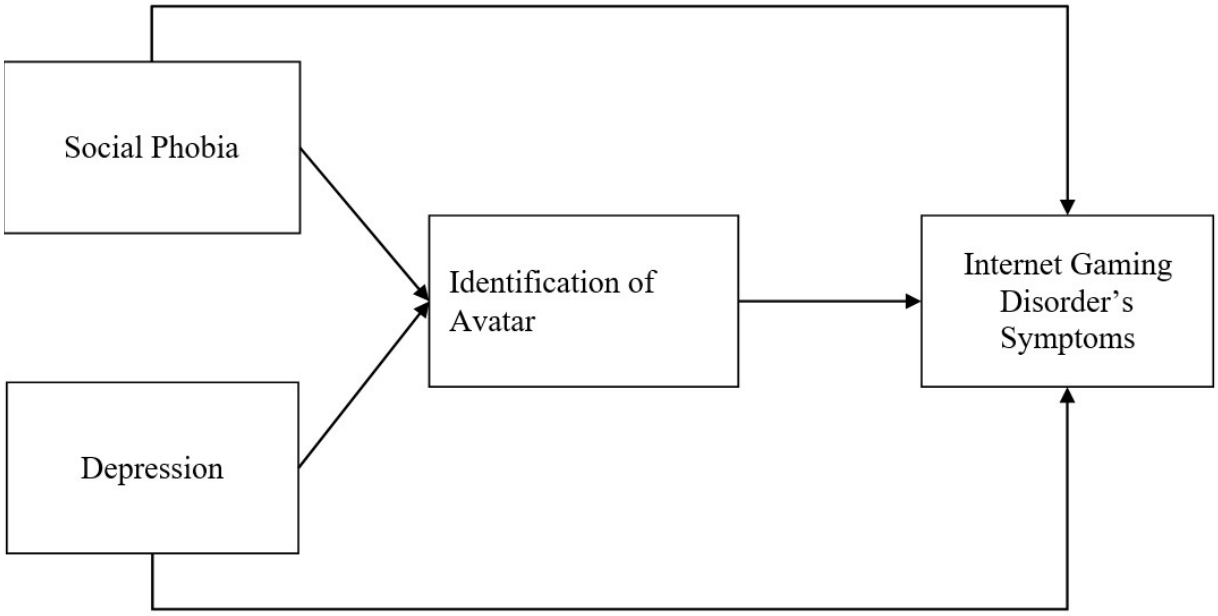


Figure 2.3. Conceptual framework of the study on the mediating effect of identification of avatar on the relationship between social phobia, depression and Internet gaming disorder's symptoms.

Chapter III

Methodology

Research Design

The present study adopted a cross-sectional design and quantitative research design. All data which included personal information, social phobia, depression, IOA and IGD's symptoms were obtained through structured and self-administered questionnaires all at one time. By conducting cross-sectional studies, all data at the set point in time were collected through structured and self-administered questionnaires and

it allows the researchers to assess the prevalence of a variable of interest (Thelle & Laake, 2015; Levin, 2006; Salkind, 2005) such as IGD's symptoms. It also enhances the efficiency of the study as it is an economical way to collect concerned information (Arnett & Claas, 2009; Levin, 2006; MacFadven, Hastings, & Mackintosh, 2010). A cross-sectional design allows researchers to expose many risk factors and outcomes at one point in time (Sedgwick, 2014; Johnson, 2010). Therefore, cross-sectional design was employed in the current study.

Respondents

A total of 781 respondents were recruited online using purposive sampling method. After filtering the data by removing data which does not met inclusive criteria from 7 respondents, there were 774 respondents. Besides, 45 data set with missing value were found and filtered, 729 respondents have remained. Furthermore, after removing the outliers from 27 respondents, there were 702 respondents. Among the 702 respondents, there were 499 males and 203 females. The respondents age ranged from 18 to 29 years (M = 21.92, SD = 2.32). The sample consists of 20.2% Malays, 47.0% Chinese, 11.9% Indians, and 2.6% others. The inclusion criteria for study respondents include all the recruited respondents must be MOBA gamers, aged between 18 years old to 29 years old, and at least have 12 months of online gaming experiences. In contrast, exclusion criteria were included professional gamers, non-MOBA gamers, gamers who aged less than 18 years old or more than 29 years old, and gamers who have less than 12 months of online gaming experiences. Youths under the age of 18 are to be enrolled as parent consents must be obtained from their parents or guardians (National Institute of Mental Health [NIMH], 2011). Thus, they were not allowed to be enrolled as respondents in research if the consent of parents or guardians cannot be

reached.

Location of Study

The present study specifically focused on the entire region of Malaysia, which included northern region, east coast region, central region, and southern region, as the respondents were recruited through online. By recruited online, the present study was able to access samples from different states at one time.

Sampling Methods

Purposive sampling, one of the non-probability sampling techniques was executed to access MOBA youth gamers who aged 18 to 29 in Malaysia. Non-probability sampling was used as the sampling frame of this study was not identified (Battaglia & Micheal, 2011). Purposive sampling technique is a non-random technique which the researchers decide the information needed. In addition, purposive sampling technique was adopted as it involves identification and selection of individuals that are competent and knowledgeable in the field of relevant interests and will be able to assist with the research (Etikan, Musa, & Alkassim, 2016). With purposive sampling technique, the respondents were selected due to the qualities and experiences (Bernard, 2002). In this study, only MOBA gamers aged from 18 to 29, with at least 12 months of online gaming experience were selected. Due to the MOBA games had grown rapidly and have a greater impact in the online gaming industry in Malaysia, therefore, MOBA gamers were selected (Hu et al., 2018). Online data collection was chosen because it has been shown to be cost-effective and permits relatively easy access to relevant populations (i.e., gamers), who were the relevant population in the present study (Griffiths, 2010). In addition, by using online data collection method, the study can access to targeted individuals in different location which reduces the time and efforts of the researchers in collecting data (Wright, 2006).

Sample Size Calculation

The sample size was calculated by Daniel Soper's Calculator (2019). According to the Daniel Soper's Calculator, the minimum required sample size was 62 with the medium anticipated effect size of .30 and the desired statistical power level of .95 (refer to Appendix C, p. 100). Sample size has to be selected adequately to get desired precision. According to Cohen's (1988) guidelines of $f^2 \geq 0.02$, $f^2 \geq 0.15$, and $f^2 \geq 0.35$ represent a small, medium, and large effect sizes, respectively (refer to Appendix C, p. 101).

Measures

Internet gaming disorder. Internet Gaming Disorder Scale-Short Form (IGDS-SF) measures an individual's severity of IGD, but not to diagnose IGD (refer to Appendix B, p. 88). This inventory was developed by Pontes and Griffiths (2015) and consists of nine items based on the nine core criteria of the DSM-5. According to APA (2013), the nine criteria for IGD consist of: (1) preoccupation with online games; (2) experience withdrawal symptoms when online gaming is not allowed; (3) tolerance, the increment of time spent on online games; (4) loss of control, lack of self-control over online gaming; (5) give up other activities, lack of passion on past interests or hobbies due to online games; (6) continuation, overuse of online games despite acknowledge its adverse consequences; (7) deception, lying to family members, therapists, and others about the amount of online gaming; (8) escape, letting off unpleasant feelings by playing games; (9) negative consequences, threatening to one's relationship and other daily functioning. It accessed the online gaming activities which happened within the past 12 month's duration.

All the items are administered on a 5-point Likert scale ranging from 1 (*Never*) to 5 (*Very Often*). Examples of these items are: "Do you feel more irritability, anxiety or

even sadness when you try to either reduce or stop your gaming activity?", "Do you feel the need to spend increasing amount of time engaged gaming in order to achieve satisfaction or pleasure?", and "Do you systematically fail when trying to control or cease your gaming activity". Furthermore, higher scores of Internet gaming disorder's symptoms indicate that the individual repeatedly playing online games, which leads to the higher chances of getting Internet gaming disorder.

In the present study, the mean score of this inventory was served as a cut-off point to determine an individual's Internet gaming disorder's symptoms from low (below 21.39), to high (above 21.39). The maximum score was 39, and the minimum score was 9 in the current study. The total score was ranged from 9 to 45. The Cronbach's alpha for pilot study and actual study were .81 (refer to Table 3.1). The higher scores indicate higher level of Internet gaming disorder (Pontes & Griffiths, 2015).

Social phobia. Social Phobia Scale-Short Form (SPS-SF) measures an individual's anxious thoughts and behaviours in daily life (refer to Appendix B, p. 96) and was developed by Peters et al. (2012). This inventory has a total of six items and was administered on a 5- point Likert scale ranging from 1 (*not at all characteristic or true of me*) to 5 (*extremely characteristic or true of me*). Examples of the items include: "I get nervous that people are staring at me as I walk down the street", "I worry about shaking or trembling when I'm watched by other people", and "I would get tense if I had to sit facing other people on a bus or train".

In the present study, the mean score of this inventory allows the researcher to determine an individual's social phobia levels from low (below 7.42), to high (above 7.42). The maximum score was 24, while the minimum score was 0 in the current study. The total score was ranged from 6 to 30. The Cronbach's alpha for pilot study and actual

study were .87 (refer to Table 3.1). In summary, the higher scores indicate the higher level of social phobia.

Depression. Montgomery-Asberg Depression Rating Scale measures the individual's severity of depression (refer to Appendix B, p. 89-95) and was developed by Svanborg and Åsberg (1994). It consists of nine items and all the items were administered on a 7-point Likert scale ranging from 0 (*none at all*) to 3 (*maximum*). Examples of item include, "Here you should try to indicate your mood, whether you have felt sad or gloomy. Try to recall how you have felt during the past 3 days, whether your mood has been changeable or much the same", "Here you should indicate to what extent you have had feelings of inner tension, uneasiness, anxiety, or vague fear, during the past 3 days. Pay particular attention to how intense any such feelings have been, whether they have come and gone or persisted almost all the time", "Here you should indicate how well you sleep - how long you sleep, and how good your sleep has been for the past three nights. Your assessment should reflect on how have you actually slept, regardless of whether you have used sleeping pills. If you have slept more than usual, you should mark the scale at zero (0)".

In the present study, the mean score of this inventory was served as a cut-off point to determine an individual's depression level from low (below 5.48), to high (above 5.48). The maximum score was 17, and the minimum score was 0 in the current study. The total score was ranged from 0 to 18. The Cronbach's alpha for pilot study and actual study were .84 and .82 respectively (refer to Table 3.1). The higher scores indicate that the higher level of depression.

Identification of avatar. The Player-Avatar Identification Scale (PAI) assess a player's identification with his or her gaming avatar (refer to Appendix B, p. 98-99) and was developed by Li, Liau, and Khoo (2013). This inventory consists of 15 items

and all the items were administered on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Example of the items include: "When my character is facing danger in the game, I feel nervous", "I feel the same disappointment when my character experiences a failure in the game", and "When my character achieves his/ her goals, I feel happy".

In the present study, the mean score of this inventory was served as a cut-off point to determine an individual's identification of avatar from weak (below 45.12), to strong (above 45.12). The maximum score was 73, and the minimum score was 18 in the current study. The total score is ranged from 15 to 75. The Cronbach's alpha for pilot study and actual study were .87 and .86 respectively (refer to Table 3.1). In summary, the higher scores indicate that the higher level of identification of avatar.

Table 3.1

Reliability of the Instrument

Variable	No. of Items	Cronbach Alpha		
		Past Study	Pilot Study	Actual study
IGD's symptoms	6	.92	.81	.81
SP	9	.94	.87	.87
D	15	.76	.84	.82
IOA	9	.91	.87	.86

Note. IGD's symptoms = Internet gaming disorder's symptoms; SP = social phobia; IOA = identification of avatar; D = depression.

Procedure

Prior to the actual study, a total of 100 respondents were recruited online for the pilot study.

By conducting the pilot study, the researchers are able to ensure the instruments' reliability (Christodoulou et al, 2015). It was also designed to test the workability of methods and procedures used, as a result, both of them also can be applied in a larger study (Thanane et al, 2010). Furthermore, pilot study also identifies the potential effects and relationships that might have contribution in a study (Thanane et al, 2010).

The respondents were recruited through Qualtrics. A link was generated from the website that later have been distributed to the public through social media platform, Facebook groups, such as Dota 2 大马华人玩家群 (D2CM) (Dota 2 Malaysian Chinese Player Group (D2CM)), Dota2VIP Malaysia, DOTA 2 Malaysia, Dota 2 Malaysia, League of Legends Malaysia, DOTA 2 WTF MOMENTS, Komuniti Dota 2 Malaysia, (Community for Dota 2 Malaysia), Komunity Dota2 Malaysia (Community for Dota2 Malaysia), Komuniti Dota 2 Malaysia (Overseas Students only) (Community for Data 2 Malaysia (Overseas Students only) (refer to Appendix D, p. 102-110) was completed for approximately four weeks. Respondents were informed about the nature of the study, their rights, and what they would be required to do on the first page of the link. Informed consent was given to potential respondents before answering the questionnaire to ensure that every respondents was informed that their information will be kept privately and confidentiality.

After that, they were required to complete the five sections which including the demographic profile, Ten-Iten Internet Gaming Disorder Test (IGD-10), Social Phobia

Scale-Short Form, The Player- Avatar Identification Scale, and Montgomery-Asberg Depression Rating Scale in approximately 20 minutes. The data collected from each respondent were stored in a secure server which only accessible to the researchers with a password for Final Year Project purpose.

Data Cleaning

Any personal information retained will be destroyed or deleted when the information is no longer required. Before filtering and analysing data, every respondent was randomly assigned a number to that individual. Each respondent has their own unique number for record purpose. All the data stored in the computer will be stored in a folder with strong password and will only be assessed by researchers involved in this study. Thus, all the personal identifiers will be stored safely on the server. The incomplete responses were filtered out from the data set. Reliability was run after collecting all the data. A total of 736 data were collected and seven cases were being removed as it does not meet the inclusion criteria. Besides, 27 univariate outliers were removed. Therefore, 34 respondents were deleted in total, and 702 respondents are retained for data analysis.

Data Analysis

In the present study, the SPSS version 20 was used to analyse the data of the study. Several levels of analyses were conducted to test the objectives of the study. A pilot study was conducted, and reliability analysis for each variable was run. Social phobia, depression, and identification of avatar were used as the predictors and IGD's symptoms set as the outcome variable. Additionally, Cronbach's alphas was used to indicates whether an instrument is consistent, stable, and error free across different scale items and over time (Sekaran & Bougie, 2010). George and Mallery (2003) suggested the rules of thumb for evaluating the Cronbach's Alpha coefficients which is considered

"fair", between .70 and .79, "good" between .80 and .89, and "excellent" from .90 upwards.

Before the actual data analysis, normality assumption which included Skewness and Kurtosis, Shapiro-Wilk's W test, Kolmogorov-Smirnov test, Q-Q plot, and histogram were tested (Pallant, 2016). The degree of symmetry and tailedness of variable distribution were measured by the coefficient of Skewness and Kurtosis respectively (Sheskin, 2011; Westfall, 2014). Skewness and kurtosis values between -2 to +2 is acceptable for psychometric purposes (George & Mallery, 2010; Khan, 2015). Shapiro-Wilk's W test is used to test the assumption of normality based on the correlation between the data and the corresponding normal scores (Peat & Barton, 2005). The p-value is greater than 0.05, then the null hypothesis is not rejected, it means the normality assumption is met (Ghasemi & Zahediasl, 2012).

Next, Kolmogorov-Smirnov test was first derived by Kolmogorov (1933) and later modified and proposed as a test by Smirnov (1948) is used to test the assumption of normality in the case of a large sample. The normality assumption is not met if the p value of this test is less than .05 (O'Donoghue, 2009).

Thirdly, Q-Q plots are used to test the assumption of normality. There are observed value and expected value are plotted on the graph. The data were not normally distributed if the plotted value vary more from a straight line, whereas the data were normally distributed if the plotted value lie approximately on a straight line (Emad-Eldin & Ozturk, 1988).

Additionally, the histogram is used to predict a normal distribution in which the observed values are plotted against the frequency, showing the visual estimation whether the distribution is bell-shaped (Pallant, 2016; Das & Imon, 2016).

Jacob Cohen's $f2$ measure which assesses effect size was calculated. The effect sizes of 0.02, 0.15, and 0.35 are termed small, medium, and large respectively (American Psychological Association, 1999).

Next, exploratory data analysis (EDA) was used to understand the general structure of the date, to obtain overall descriptive summary, and to validate and support findings (Monsen, 2017; Chatfield, 1986). The descriptive statistics was used to explore the demographic data of the respondents such as age, sex, relationship status, occupation, race, and education level. Means, standard deviations, and internal consistency were calculated prior to statistical analysis.

Lastly, inferential statistics was used to discover multiple linear regression. Multiple linear regression was run in order to identify the predictors of IGD's symptoms among MOBA gamers. All the statistical tests were utilized with a significance value of .05 as the cut-off point.

Prior to the multiple linear regression, eight multiple linear regression assumptions were tested in the present study. All data were first screened for the outliers by Tukey's (1977) method which is boxplot. Continuous univariate data: lower and upper quartile, lower and upper extreme, and median of a data set are able to be displayed through boxplot (Tukey, 1977). Eight assumptions were checked, which were (1) the dependent variable should be measure in continuous scale, (2) in respect of independence, (3) multicollinearity is not violated, (4) independent error is met where the value of Durbin Watson is close to two, (5) multivariate outliers, (6) linearity of residual, (7) residual normality, (8) homoscedasticity (Reddy & Sarma, 2015; Garson, 2012; Pallant, 2016; Muzaffa, 2016).

Firstly, the dependent variable should be measure in continuous scale either in ratio or interval. Secondly, in respect of independence refers to a respondent's behavior

does not influence the behavior of another (Muzaffa, 2016). Thirdly, multicollinearity is a tool to test the collinearity when there are more than one predictors. It is determined by the tolerance, that no variability of an independent variable can be explained by another independent variable. The value of tolerance indicate collinearity when it is less than 0.10 (Jamal, 2017). Variance inflation factor (VIF) is used to quantify and measure inflated variance (Jamal, 2017). Multicollinearity will causes a poor regression coefficients if the VIF values is greater than 10 (Michael, Hussaini, & Agboola, 2015). Next, independence of errors occurred when the errors distribution were not influenced by the previous observations. Regression model was tested and autocorrelation in residuals was measured by Durbin-Watson statistic. The values ranged from 0 to 4 and the value obtained should be close to 2 to fulfil this assumptions (Chen, 2016). Additionally, multivariate outliers are typically examined in the statistical data with at least two independent or dependent variables (Hayes, 2018; Muller, Judd, & Yzerbyt, 2005). Multivariate outliers can be identified by using the Mahalanobis distance, which is the distance between two data points in multivariate space. Mahalanobis distance was used to identify outliers when data is multivariate normal (Mahalanobis, 1930). Multivariate outliers can also be detected by using Cook's distance. It is used to assess the changes in regression coefficients (Cook, 1977). The outliers were known as influential points when the value of Cook's Distances is more than one. Centered leverage value is used to check for outliers and leverage. The equation of centered leverage value, $2[(k + 1)/n]$, where k = number of independent variables and n = number of observation (Dhakal, 2017).

Furthermore, Hayes's (2018) process macro was employed in this current study to test whether the identification of avatar mediates the relationships between the social phobia, depression and IGD's symptoms. The serial mediation model that consisted of two indirect effects: (1) social phobia positively predicts IGD's symptoms through

identification of avatar, (2) depression positively predicts IGD's symptoms through identification of avatar. If the 95% bias-corrected confidence interval (CI) generated using 1000 bootstrapped samples does not contain zero, the indirect effect is considered statistically significant (Hayes, 2018).

Chapter IV

Results

Normality Assumptions

Before conducting the actual analysis, the normality assumptions were checked. Table 4.1 showed that the absolute values of skewness and kurtosis fall within the acceptable range of -2 to 2 (George & Mallery, 2010; Khan, 2015), which is -.066 to .625 and -.575 to -.311 for skewness and kurtosis respectively, suggesting that the variables were normally distributed. Besides, a bell-shaped histogram was obtained as it was

normally distributed (refer to Appendix E, p. 115-118) and the normal Q-Q plot revealed that the observed value for each score was normally distributed as it was near to the straight line (refer to Appendix E, p. 119-122) Moreover, a significant result was obtained from Kolmogorov-Smirnov test as the p value is less than 0.05, indicating that the normality assumption Kolmogorov-Smirnov test was not met (refer to Appendix E, p. 123). However, Smirnov (1948) stated that it is difficult to meet the normality assumption for Kolmogorov-Smirnov test due to the large sample size. Therefore, it was justifiable as the sample for current study was large.

Table 4.1

Skewness and Kurtosis

Variables	Skewness	Kurtosis
IGD's symptoms	.378	-.384
SP	.540	-.575
IOA	-.066	-.384
D	.625	-.311

Note. IGD's symptoms = Internet gaming disorder's symptoms; SP = social phobia; IOA = identification of avatar; D = depression.

Multiple Linear Regression Assumptions

Dependent variable must be in continuous scale. IGD's symptoms was measured on an interval scale.

In respect of Independence. The respondents of this research were independent as a respondent's behaviours do not influence another respondent's behaviour (Muzaffar, 2016).

Multicollinearity. In table 4.2, the Variance Inflation Factor (VIF) and tolerance ranged from 1.030 to 1.221 and .819 to .971 respectively, this indicated that multicollinearity assumptions was not violated.

Table 4.2

Coefficients

Model	Standardized Coefficients	t	Sig.	Collinearity Statistics	
				Tolerance	VIF
SP	.089	2.652	.008	.819	1.221
IOA	.469	15.229	.000	.971	1.030
D	.274	8.270	.000	.838	1.193

Note. SP = social phobia; IOA = identification of avatar; D = depression.

Independent error. The result of Durbin Watson falls at a value of 1.956 (refer to table 4.3), which is close to 2, indicating the residual series free of autocorrelation met the assumption of independence of errors (Chen, 2016).

Table 4.3

Model Summary

Model	Durbin Watson
1	1.956

Multivariate outliers. Mahalanobis Distance, Cook's Distance, and Centered Leverage Value were used to test multivariate outlier with the standard deviation of 2. The benchmarks of Mahalanobis Distance and Cook's Distance were not more than 10 and not more than 1 respectively. The Centered Leverage Value is 0.0114, which was calculated by the equation 2[(3 + 1)/702] where 3 is number of predictors and 702 is total sample size in the present study (Dhakal, 2017). The result (refer to Appendix E, p. 126-140) showed that no single data was violated the assumptions. Therefore, no multivariate outlier was removed.

Linearity. There was no relationship shown from residual scatter plot (refer to Appendix E, p. 124) between residuals and dependent variable predicted value as linearity was indicated between them (Cohen & Cohen, 1983).

Residual normality. Normality of residual is used to analyse influential cases that are inappropriate of a model (Cohen, Cohen, West, & Aiken, 2003) (refer to Appendix E, p. 124).

Homoscedasticity. In order to achieve homoscedasticity, the variance of residuals must be equal or same for all the dependent variable predicted value (Osborne & Waters, 2002) (refer to Appendix E, p. 124).

Descriptive Statistic

Background of respondents. A total of 736 respondents were collected, and 27 respondents were removed as a univariate outlier by boxplot (refer to Appendix E, p. 111-114). In table 4.4, table 4.5, and table 4.6, the overview of the descriptive data were shown in the table form. There are 20.2% Malays, 47.0% Chinese, 11.9% Indians, and 2.6% other with the number of 499 males, and 203 females. The age of the respondents ranged from 18 to 29 years old (M = 21.92, SD = 2.318). Majority which is 59% of the respondents played two to four hours a day (N = 414). Majority which is 33.5% of the respondents played nine times and above per week (N = 235) and 28.3% which is the majority are having two to four years of gaming experiences (N = 199). Furthermore, a majority, 12.6% of the respondents started to play Internet games at the age of 12 years old (N = 89). Most of the respondents, 82.5% were spending RM0 to RM100 (N = 579) and 69.2% of them are having family members who also play Internet games (N = 486).

Table 4.7 presented the descriptive statistic for Internet gaming behaviors. Respondent that scored lower than the value of mean is considered to be low in certain variable under study whereas respondent who score higher than the value of mean was believed to be high in certain variable under study. In Table 4.8, there were 55.6% of respondents, who were having mean lower than 21.39 were being categorized as having lower IGD's symptoms while 44.4% of respondents who were having mean higher than 21.39 were having higher IGD's symptoms. Besides, 55.6% of respondents with the mean lower than 7.42 were having lower level social phobia while 44.4% with the mean higher than 7.42 were having higher level of social phobia with the mean. Furthermore, with the mean lower than 5.48, there are 53.7% of respondents were having lower level of depression while 46.3% of respondents with the mean higher than 5.48 were having higher level of depression. Moreover, 50.3% of respondents with the mean lower than

45.12 were having low level of IOA while 49.7% of respondents with the mean higher than 45.12 were having high level of IOA.

Table 4.4

Descriptive Statistics for Demographic Variables

Variables	Mean	SD	Median	Min	Max
Age	21.92	2.318	22.00	18	29
Sex	1.29	.454			
Race	1.96	.719			

Table 4.5

Descriptive Statistics for Gender

Variables	Frequency	Percent
Male	499	58.0
Female	203	23.6

Table 4.6

Descriptive Statistics for Race

Variables	Frequency	Percent
Malay	174	20.0
Chinese	404	47.0
Indian	102	11.9
Others	22	2.6

Table 4.7

Descriptive Statistics for Internet Gaming Behaviours

Variables	Mean	SD
Gaming frequency (per week)	2.82	1.020
Average gaming duration (per day)	2.07	.701
Gaming experience (in years)	3.12	1.264
Average monthly spend on Internet games (RM)	1.33	.858
Family member(s) who play Internet games	1.31	.462

Table 4.8

Descriptive Statistics for Main Variables

Variables	N	%	Mean	SD	MD	Min	Max
SP	702		7.42	5.88	7.00	0	24.0
Low		390					
High		312					
D	702		5.48	4.08	5.00	.0	17.0
Low		377					
High		325					
IOA	702		45.12	10.48	45.00	18	73.0
Low		353					
High		349					
IGD's symptoms	702		21.39	6.43	21.00	9	36.0
Low		390					
High		312					

Note. IGD's symptoms = Internet gaming disorder's symptoms; SP = social phobia; IOA = identification of avatar; D = depression.

Inferential Statistic

Multiple linear regression. Multiple regression analysis was used to test if the social phobia, depression, and IOA significantly predict IGD's symptoms. The regression analysis summary is presented in table 4.9. The model was statistically significant, ($F(3, 698) = 128.922$, $p < .001$) and accounted for 35.4% of the variance. It was found that IOA ($\beta = .47$, $p < .001$) was the strongest predictor in explaining IGD's symptoms, followed by depression ($\beta = .27$, $p < .001$) and social phobia ($\beta = .09$, $p = .008$).

Table 4.9

Predictors of IGD's symptoms among Malaysian Youth (n = 702)

Criterion variable	Predictor variable	F	Adjusted R Square	df	Beta	t	Sig.
IGD's symptoms	SP	128.922***	.354***	3	.089***	2.65	.008
	D				.27***	8.27	.000
	IOA				.47***	15.23	.000

Note. IGD's symptoms = Internet gaming disorder's symptoms; SP = social phobia; IOA = identification of avatar; D = depression. ***p < .001

Mediation Analysis. The mediating effect of IOA in the relation between social phobia, depression, and IGD's symptoms was hypothesized. The direct and indirect effects of social phobia and depression on IGD's symptoms through IOA was conducted using model 4 of PROCESS macro developed by Hayes (2018), which uses a bootstrap resampling process repeated 1000 times to generate a 95% bias-corrected confidence interval. A 95% of confidence intervals (CI) from a total of 1000 bootstrap samples were generated to assess the significance of the indirect effects. A significant indirect effect was assumed when the confidence interval (CI) does not intersect through zero (Hayes, 2013). In this study, social phobia and depression served as a predictor, IOA served as a mediator and IGD's symptoms served as the outcome variable.

In Figure 4.1, the mediation analysis showed that identification of avatar was found to have significant effect on IGD's symptoms, $B = .289$, $t = 14.604$, $SE = .020$, $p < .001$, 95% CI [.250, .328]. The result supported that the IOA significantly predicted IGD's

symptoms. Social phobia was found to have significant effect on IGD's symptoms, B = .305, t = 7.691, SE = .040, p < .001, 95% CI [.227, .383]. The result supported that the social phobia significantly predicted IGD's symptoms.

After controlling the effects of IOA, the direct effect of social phobia on IGD's symptoms continues to exist, B = .217, t = 6.162, SE = .035, p < .001, 95% CI [.148, .286]. More importantly, the indirect effect of social phobia on IGD's symptoms through IOA was found to be significant, B = .088, SE = .019, 95% CI [.050, .125]. The results supported that IOA mediates the association between social phobia and IGD's symptoms.

In Figure 4.1, the mediation analysis showed that IOA have a significant effect on IGD's symptoms, B = .296, t = 15.756, SE = .019, p < .001, 95% CI [.259, .333]. Result supported that IOA significantly predicted IGD's symptoms. Depression was found to have significant effect on IGD's symptoms, B = .546, t = 9.735, SE = .056, p < .001, 95% CI [.436, .656]. Result supported that depression significantly predicted IGD's symptoms.

After controlling the effects of IOA, the direct effect of depression on IGD's symptoms continues to exist, B = .488, t = 10.105, SE = .048, p < .000, 95% CI [.394, .583]. More importantly, the indirect effect of depression on IGD's symptoms through IOA was found to be significant, B = .057, SE = .029, 95% CI [.002, .117]. The results supported that IOA mediates the association between depression and IGD's symptoms.

As a result, the indirect effects of IOA in the relation on social phobia and IGD's symptoms were statistically significant, B = .088, SE = .019, 95% CI [.050, .125]. Similarly, the indirect effects of IOA in the relation on depression and IGD's symptoms were statistically significant, B = .057, SE = .029, 95% CI [.002, .117]. In other words, the present study suggests that IOA is a significant mediator in the relation between

social phobia, depression, and IGD's symptoms as the confidence interval does not contain zero.

There are two measures which related to simple mediation models included the ratio of the indirect effect to the total effect (refer to Appendix E, p. 125).

Social phobia

$$PM = \frac{ab}{ab+c'} = \frac{ab}{c} = 1 - \frac{c'}{c} = 1 - \frac{0.22}{0.31} = 0.29 \quad ,$$

and the ration of the direct effect to the total effect,

$$1 - PM = 1 - \frac{ab}{ab+c'} = 1 - \frac{ab}{c} = \frac{c'}{c} = \frac{0.22}{0.31} = 0.71$$

Depression

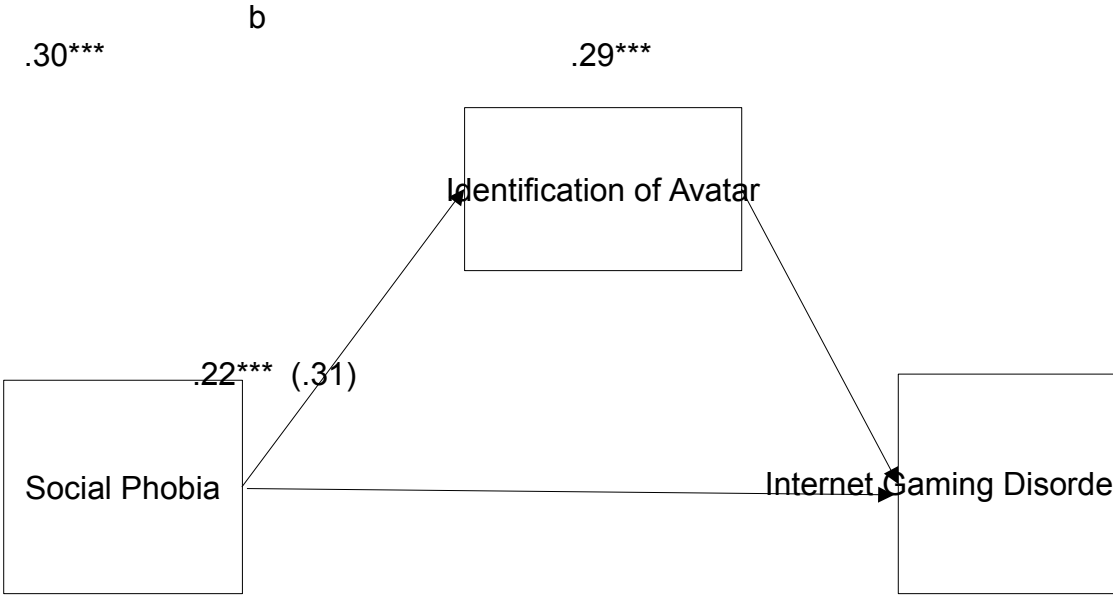
$$PM = \frac{ab}{ab+c'} = \frac{ab}{c} = 1 - \frac{c'}{c} = 1 - \frac{0.49}{0.55} = 0.1 \quad ,$$

and the ration of the direct effect to the total effect,

$$1 - PM = 1 - \frac{ab}{ab+c'} = 1 - \frac{ab}{c} = \frac{c'}{c} = \frac{0.49}{0.55} = 0.9$$

where a is the slope linking X to M, b is the conditional slope linking M to Y, c is the total effect of X on Y, and c' is the conditional slope linking X to Y (Alwin & Hauser, 1975; Buyse & Molenberghs, 1998; Mackinnon, 2008; Mackinnon, Fairchild, & Fritz, 2007; Mackinnon, Warsi & Dwyer 1995; Shrout & Bolger, 2002; Tofighi, MacKinnon, & Yoon, 2009; Wang & Taylor, 2002).

(a)


b
.30***
.29***
Identification of Avatar
.22*** (.31)
Social Phobia
Internet Gaming Disorde

a

c'(c)

b

a

c'(c)

(b)

.19***

.30***

Identification of Avatar

.49*** (.55)

Figure 4.1. Mediation model showing the effects of (a) social phobia, (b) depression, and IOA on IGD's symptoms. N = 702. Values shown are unstandardised coefficients. Total effect of social phobia and depression was shown in parenthesis.
***p< .001

Chapter V

Discussion

The present study aimed to examine the mediating role of IOA in the relationship between social phobia, depression, and IGD's symptoms among Malaysian youths. Referring to the findings of the present study: (1) social phobia has a significant outcome on IOA; (2) depression has a significant outcome on IOA; (3) and IOA significantly predicts IGD's symptoms. In other words, both social phobia and depression and IOA contribute to IGD's symptoms and IOA mediates the relationship between social phobia and depression among youths.

H1: Social Phobia Positively Predicts IGD's Symptoms among Malaysian Youth

The findings of the present study showed that social phobia was significantly predicted IGD's symptoms, which was consistent with the previous study (Lee & Stapinski, 2012). It indicating that individuals with social phobia favour online interaction over real life as they are afraid to communicate with others face-to-face. By involving in online gaming, it allows gamers to fulfil the need of social connection by chatting with others player which they are unable to do it in real life setting. They are free to quit from the games as easy as by clicking a button to log out from the games whenever they feel

uncomfortable (Sioni et al., 2017). Another past study also found that individuals with social phobia prefer to express themselves and are more able to interact with others through Internet gaming instead of having face-to-face interaction (Marriott & Buchanan, 2014). These advantages cause them become obsessed with Internet gaming and thus exhibit IGD's symptoms.

H2: Depression Positively Predicts IGD's Symptoms among Malaysian Youth

Moreover, depression was found to be significantly predicted IGD's symptoms, which was similar to past studies (Griffiths et al., 2016; Stetina et al., 2011; Yen et al., 2007). Individual with depression were more likely to involve themselves in virtual world as they were having dysfunctional or limited emotional coping strategies (Stavropoulo et al., 2015). In other words, whenever they experienced something depressed or upset, the only way to cope with this emotions is involved in Internet gaming as they do not have more knowledge about other coping strategies. Online gaming can assist them in reducing unpleasant feeling and experiencing pleasant feeling as their ideal virtual self in the virtual world can serve as a way for them to express or escape from their depressed emotions, which lead to increased lengths of playing time (Yen et al., 2007). For instance, gamers with depressed emotion tend to escape from the reality by involving themselves in Internet gaming, and the longer duration they involved in it, the higher chances they will exhibit IGD's symptoms. This is a continuous cycle where depression and IGD's symptoms occurred simultaneously as when the individual are feeling depressed, they will go for Internet gaming as it is their only coping strategy.

H3: IOA Positively Predicts IGD's Symptoms among Malaysian Youth

In addition, the results of this study were also in line with Smahel et al, (2008) who found that IOA was a mediator for IGD's symptoms among youths. This is due to the stronger attachment gamers developed with their ideal avatars which lead them to indulge

to Internet gaming. When gamers developed strong emotional attachment with the ideal avatar, they will engaged fully in the virtual world which leads to the exhibition of IGD's symptoms. Apart from that, gamers who created an avatar that has attractive physical appearance tend to perceive themselves as the avatar, even though they do not have such attractive physical appearance in real life. Consequently, a strong emotional attachment formed which increase their involvement in Internet games and hence develop IGD's symptoms (Yee & Bailenson, 2007).

H4: IOA Mediates the Relationship between Social Phobia and IGD's Symptoms among Malaysian Youth

IOA mediates the relationship between social phobia and IGD's symptoms. The present study found that individuals with social phobia, and those who attached strongly with their avatars are more likely to develop IGD's symptoms. It was consistent with the previous studies (You et al., 2017; Grinberg et al., 2014) which suggested that social phobia was associated with IOA and have significant contribution to IGD's symptoms. This is because the gamers used their avatars to have online social interaction, which allowed the gamers especially those with social phobia to obtain friendship in a virtual world. Socially phobic gamers are more likely to attach themselves with their idealized avatar. It allowed them to experience Internet gaming more frequently as they were being reinforced by the social interaction that they might not be able to experience in the actual world (Sioni et al., 2017). Apart from that, gamers with social phobia are unconfident about themselves and anxious about how others perceive and evaluate them, and thus they create idealized avatar to obtain social approval, which give them a sense of identity and improve self-esteem (Grinberg et al., 2014; Moore & Johnson, 2009). Therefore, they were more likely to develop IGD's symptoms.

H5: IOA Mediates the Relationship between Depression and IGD's Symptoms Malaysian Youth

IOA mediates the relationship between depression and Internet gaming disorder's symptoms. The findings of present study demonstrated that depressed gamers who connect strongly with their avatar are more vulnerable to IGD's symptoms. It was consistent with the previous studies (Bessiere et al., 2007; Ducheneaut et al., 2009; Messinger et al., 2008; Burleigh et al., 2017) which suggested that depression was associated with IOA and contributed significantly to IGD's symptoms. This is due to gamers with depression were having greater discrepancies between their actual self and ideal self (Higgins, 1987; Moretti & Higgins, 1990). Hence, they will create an admired avatar to reduce the discrepancies that they encountered. In short, gamers with depression tend to extend the duration of gaming to enjoy the pleasure from ideal avatar, and thus IGD's symptoms will be exhibited.

Summary of Findings

Furthermore, the present findings highlighted that the social phobia, depression, and IOA were significantly contributed to the IGD's symptoms of youths. The results of the present study were paralleled with the studies of Weinstein et al. (2015), Davis (2001), and Smahel et al., (2008) which was conducted to examine the role of social phobia, depression, and IOA in predicting IGD's symptoms. Correspondingly, previous studies (Weinstein et al., 2015; Lee & Leeson, 2015; Li et al., 2015; Stavropoulos et al., 2015; Smahel et al., 2008) stated that social phobia, depression, and IOA were strongly influenced the IGD's symptoms among youths.

As predicted, the mediation analysis showed that IOA mediates the relationship between social phobia, depression, and IGD's symptoms. The mediation analysis were in

line with Sioni et al. (2017) who found that IOA mediates the relationship of social phobia, depression, and IGD's symptoms.

Limitations and Recommendations

The present study has several limitations. First, the cross-sectional nature of the current study might not be convincing than the findings collected from longitudinal study which might be able to explore the causal relationship between the social phobia, depression, IOA and IGD's symptoms. Cross-sectional study will restricts the causality implications which longitudinal study would develop stronger competency in making causal statements (Nasurdin & Ahmand, 2001). Therefore, longitudinal study will be recommended to apply in future study in order to have a better understanding on the causal link of the variables over a long period of time.

In addition, the current study was mainly based on the perspective of gamers. Researchers unable to understand the current situation from another perspective due to the reason that only gamers were involved in this study but not their parents. Future study may be encouraged to explore the perspective of the parents toward their children as a gamer. At the same time, future study may examine the well-being of their children by collecting the responses from parents. By collecting data from both parents and youth, researchers are allowed to make a comparison between both parents and youth which could provide a better understanding on the risk factors and thus help to reduce the IGD's symptoms among youth.

Additionally, the present study are more centred on the negative impacts of online gaming, however, there are some gamers are benefited from these games. Several past studies showed that online gaming can improve one creativity and problem solving skills, regulate and enhance mood states, and learn prosocial skills (Prensky, 2012; Jackson et al., 2012; Russoniello, O'Brien, & Parks, 2009; Ewoldsen et al., 2012). Further study should

be pursued to examine the causal factors that some individuals can obtain positive experiences from games and it might be beneficial in preventing mental health issues (Sioni et al., 2017).

Furthermore, the duration for completing the questionnaire were too long due to the lengthy questionnaire. This might cause the respondents withdraw in the middle of answering the questionnaire or simply complete the questionnaire without putting effort as they are losing their patient, which will affect the results and the process of data collection. Therefore, future study may consider to use a shorter but reliable questionnaire to avoid the same issue to occur.

Last but not least, one of the limitations was social desirability. Respondents may felt uncomfortable when filling the questionnaire as the personal information such as email or phone number was requested in this study. They might not be completely honest in selecting the items as they were worried that their identity will be known by researchers. Therefore, future study should consider not to collect the email or phone number from the respondents to avoid dishonestly.

Implications of the study

Theoretical implications. Despite of the limitations, the present study has suggested that IOA mediates the relationship between social phobia, depression, and IGD's symptoms. The theories that used in the present study were cognitive-behavioral model of PIU and social identity theory. The findings of present study added value to both of the theories. The present study found that social phobia and depression which related to IOA were significantly correlated to IGD's symptoms. Therefore, these theories can be applied in the same topic in the future. Moreover, these theories can be also applied in Malaysia setting as the findings of the present study was compatible with these theories.

Furthermore, the theoretical frameworks provide an understanding that individuals with either social phobia or depression are vulnerable to the IGD's symptoms, and thus highlights the concern of the intervention developments which focused at preventing and treating these issues.

Practical implications. The findings of this present study may bring advantages to respondents, parents, universities, and individual as it can help to understand the psychological state of well-being among youths. Thus, attention should be given to the behaviors of excessive Internet gaming and actions should be taken to improve youths' psychological state of well-being. For instance, parents should monitor their children's Internet gaming behaviors and the durations of playing Internet games from time to time in order to prevent them to get addicted to Internet games. In addition, universities can emphasize the awareness of using online gaming as a maladaptive emotional self-regulation strategy. For example, universities should organize campaigns or events regarding proper way of emotional self-regulation. Apart from that, individuals should also aware of their own psychological well-being in order to prevent severe psychological distress. To illustrate, individual should seek for professional helps when one identify the warning signs rather than immerse oneself in online gaming.

Furthermore, prevention and treatment could be implemented by focusing on IOA in order to assist interventions in terms of cognition and self-reflection which is used to improve self-awareness related to discrepancies between virtual and real self. The advantage of examining such relationships may bring benefits to individual psychotherapy either from a cognitive-behavioral or psychodynamic perspectives as it gives vital experiential information.

Internet gaming addiction could be prevented, diagnosed, and treated by conducting a program and policy. It also helps to educate individual with Internet gaming

addiction to play Internet games in an appropriate way. For instance, a cooperation between policy makers, therapists, and counsellors can be established to provide treatment such as psychoeducation to cope with the issues addressed in this study. Ministry of Health Malaysia could raise awareness of the consequences of having Internet gaming addiction and educate the public in preventing themselves involve in it. Campaign, talk, exhibition can be done at universities and public areas in order to reduce the risk of getting IGD among youth. Additionally, this study also assists mental health professionals to point out that problematic Internet usage as an issues, and they can work with the issue earlier as prevention is better than sure. For instance, coping strategies could be focused by professionals who are working with youths such as psychologist, counsellor, etc. to provide sufficient protection and prevention to youths for getting involved in IGD.

Conclusion

In this study, social phobia, depression and IOA were identified as predictors of IGD's symptoms among youth in Malaysia. An interventional approach which includes the combination of family, society, school and authorities is typically the most effective in improving the well-being of youths. The results not only offer a new perspective on the mediating role of IOA on the relationships between social phobia, depression, and IGD's symptoms but also highlight the necessity for future studies to explore multiple mediators to have better understanding of IGD's symptoms.

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Appendix

Appendix A: DSM 5: Internet Gaming Disorder

Proposed Criteria

Persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress as indicated by five (or more) of the following in a 12-month period:

1. Preoccupation with Internet games. (The individual thinks about previous gaming activity or anticipates playing the next game; Internet gaming becomes the dominant activity in daily life).
   Note: This disorder is distinct from Internet gambling, which is included under gambling disorder.
2. Withdrawal symptoms when Internet gaming is taken away. (These symptoms are typically described as irritability, anxiety, or sadness, but there are no physical signs of pharmacological withdrawal).
3. Tolerance—the need to spend increasing amounts of time engaged in Internet games.
4. Unsuccessful attempts to control the participation in Internet games.
5. Loss of interest in previous hobbies and entertainment as a result of, and with the exception of, Internet games.
6. Continued excessive use of Internet games despite knowledge of psychosocial problems.
7. Has deceived family members, therapists, or others regarding the amount of Internet gaming.
8. Use of Internet games to escape or relieve a negative mood (e.g., feeling of helplessness, guilt, anxiety).
9. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of participation in Internet games.
   Note: Only nongambling Internet games are included in this disorder. Use of the Internet for required activities in a business or professional or social Internet use. Similarly, sexual Internet sites are excluded.

Appendix B: Questionnaire-Montgomery-Asberg Depression Rating Scale

The purpose of this questionnaire is to provide a detailed picture of your present mental status. You should try to assess how you have been feeling ***during the past 3 days****. The statement express various degrees of distress from none at all (0) to maximum (3). Put on (P) to indicate indicates your condition during the past 3 days. Don't spend too long thinking about your answers, but try to get through the questionnaire fairly quickly.*

1. Mood		Here you should try to indicate your mood, whether you have felt sad or gloomy. Try to recall how you have felt during the past 3 days, whether your mood has been changeable or much the same.
	0	I can either cheerful or sad, depending on the circumstances.
	0.5	
	1	I feel a bit low for the most part, though sometimes it eases up a little.
	1.5	
	2	I feel thoroughly low and gloomy. Even things that normally cheer me up give me no pleasure.
	2.5	
	3	I feel so utterly low and miserable, that I can imagine nothing worse.

2. Feeling of unease		Here you should indicate to what extent you have had feelings of inner tension, uneasiness, anxiety, or vague fear, during the past 3 days. Pay particular attention to how intense any such feelings have been, whether they have come and gone or persisted almost all the time
	0	I feel calm for the most part.
	0.5	

	1	I sometimes have unpleasant feelings of unease.
	1.5	
	2	I am constantly plagued by feelings of uneasiness that can be very strong, and which I must make an effort to overcome.
	2.5	
	3	I have dreadful, persistent or unbearable feelings of anxiety.

3. Sleep		Here you should indicate how well you sleep – how long you sleep, and how good your sleep has been for the past three nights. Your assessment should reflect how have you actually slept, regardless of whether you have used sleeping pills. If you have slept more than usual, you should mark the scale at zero (0).
	0	I have no sleeping problems, and get as much sleep as I need. I have no difficulty in falling asleep.
	0.5	
	1	I have some sleeping problems. Sometimes it is hard to get off to sleep, or I sleep more lightly or restlessly than usual.
	1.5	
	2	I sleep at least 2 hours a night less than usual. I wake often during the night, even if nothing has disturbed me.
	2.5	
	3	I sleep very badly, no more than 2-3 hours a night.

4. Appetite		Here you should indicate how your appetite has been, and try to recall whether it has differed in any way from normal. If your appetite has been better than usual, you should mark the scale at zero (0).
	0	My appetite has been much the same as usual.
	0.5	
	1	My appetite has been poorer than usual.
	1.5	
	2	I have had almost no appetite at all. Food seem tasteless and I have to make myself eat.
	2.5	
	3	I haven't felt like eating at all. I need persuading if I am to get anything down.

5. Ability to concentrate		Here you should try to indicate your ability to collect your thoughts, to concentrate on what you are doing. Try to recall how well you have been able to cope with tasks requiring different degrees of concentration – for instance, compare your ability to read a more complex text and an easy passage in the newspaper, or to pay attention to the TV.
	0	I have no difficulty in concentrating.
	0.5	
	1	Occasionally I find it hard to concentrate on things that I would usually finding interesting (e.g., reading, or watching TV).
	1.5	

	2	I find it particularly hard to concentrate on things that usually require no effort (e.g., reading, or talking with other people).
	2.5	
	3	I am quite unable to concentrate on anything at all.

6. Initiative		Here you should try to assess your ability to get things done. This item concerns how hard or how easy is it for you to get started on things you think should be done, and to what extent you feel you must overcome inner resistance (inertia) in order to get started on anything.
	0	I have no difficulties start new tasks
	0.5	
	1	When I have to get on with something, I find it more difficult than usual.
	1.5	
	2	It requires great effort for me to get started on simple tasks that I normally perform more or less without thinking
	2.5	
	3	I cannot get started with the simplest every-day tasks.

7. Emotional involvement		Here you should assess your interest in your surroundings, in other people, and in activities that normally give you pleasure.
	0	I am interested and involved in my surroundings, and this gives me pleasure.
	0.5	

	1	I feel less strongly about things that normally arouse my interest; it is harder than usual to be cheerful, or to be angry when there is cause.
	1.5	
	2	*I feel no interest in my surroundings, not even for friends and acquaintances.*
	2.5	
	3	*I no longer have any feelings. I feel painfully indifferent, even toward those closest to me.*

8. Pessimism		Here you should consider how you view your future, and how you feel about yourself. Consider to what extent you may feel self-critical, whether you are plagued with guilty feelings, and whether you have been worrying more than usual – for example, about your finances or your health.
	0	I view the future with confidence. On the whole I am quite satisfied with life.
	0.5	
	1	Sometimes I am self-critical and think I am less worthy than others.
	1.5	
	2	I brood over my failures and feel inferior or worthless, even if others may not agree.
	2.5	
	3	Everything seems black to me, and I can see no glimmering of hope. I feel I am thoroughly useless, and that there is no chance of forgiveness for the awful things I have done.

9. Zest of life		This item concerns your appetite for life, and whether you have felt listless and weary of life. Have you had thoughts of suicide, and if so to what extent do you consider it a realistic escape?
	0	My appetite for life is normal.
	0.5	
	1	Life doesn't seem particularly meaningful, though I don't wish I were dead.
	1.5	
	2	I often think it would be better to be dead, and though I don't really want to commit suicide it does seem a possible solution.
	2.5	
	3	I am quite convinced that my only solution is to die, and I give a lot of thought to the best way to take my own life.

Appendix B: SPS-6

CENTRE FOR EMOTIONAL HEALTH

MACQUARIE University

Social Interaction Anxiety Scale (SIAS-6) and Social Phobia Scale (SPS-6)

Name:	Date:

Instructions: For each question, please circle a number to indicate the degree to which you feel the statement is characteristic or true of you. The rating scale is as follows:.

0 Not at all characteristic or true of me	1 Slightly characteristic or true of me	2 Moderately characteristic or true of me	3 Very characteristic or true of me	4 Extremely characteristic or true of me

1.	I have difficulty making eye contact with others	0	1	2	3	4
2.	I find it difficult mixing comfortably with the people I work with	0	1	2	3	4
3.	I tense up if I meet an acquaintance on the street	0	1	2	3	4
4.	I feel tense if I am alone with just one person	0	1	2	3	4
5.	I have difficulty talking with other people	0	1	2	3	4
6.	I find it difficult to disagree with another's point of view	0	1	2	3	4
7.	I get nervous that people are staring at me as I walk down the street	0	1	2	3	4
8.	I worry about shaking or trembling when I'm watched by other people	0	1	2	3	4
9.	I would get tense if I had to sit facing other people on a bus or train	0	1	3	3	4
10.	I worry I might do something to attract the attention of other people	0	1	2	3	4
11.	When in an elevator, I am tense if people look at me	0	1	2	3	4
12.	I can feel conspicuous standing in a line	0	1	2	3	4

SCORING: SIAS-6: Items 1-6 ; SPS-6: Items 7-12. Scores are calculated by summing the 6 ratings for each scale. There are no reverse-scored items.

Appendix B: IGDS9-SF

Table 4 The Internet Gaming Disorder Scale–Short-Form (IGDS9-SF)

	Never	Rarely	Sometimes	Often	Very often
1. Do you feel preoccupied with your gaming behavior? (Some examples: Do you think about previous gaming activity or anticipate the next gaming session? Do you think gaming has become the dominant activity in your daily life?)	○	○	○	○	○
2. Do you feel more irritability, anxiety, or even sadness when you try to either reduce or stop your gaming activity?	○	○	○	○	○
3. Do you feel the need to spend increasing amount of time engaged gaming in order to achieve satisfaction or pleasure?	○	○	○	○	○
4. Do you systematically fail when trying to control or cease your gaming activity?	○	○	○	○	○
5. Have you lost interests in previous hobbies and other entertainment activities as a result of your engagement with the game?	○	○	○	○	○
6. Have you continued your gaming activity despite knowing it was causing problems between you and other people?	○	○	○	○	○
7. Have you deceived any of your family members, therapists, or others because the amount of your gaming activity?	○	○	○	○	○
8. Do you play in order to temporarily escape or relieve a negative mood (e.g., helplessness, guilt, anxiety)?	○	○	○	○	○
9. Have you jeopardized or lost an important relationship, job, or an educational or career opportunity because of your gaming activity?	○	○	○	○	○

Appendix B: PAIS- 15 items

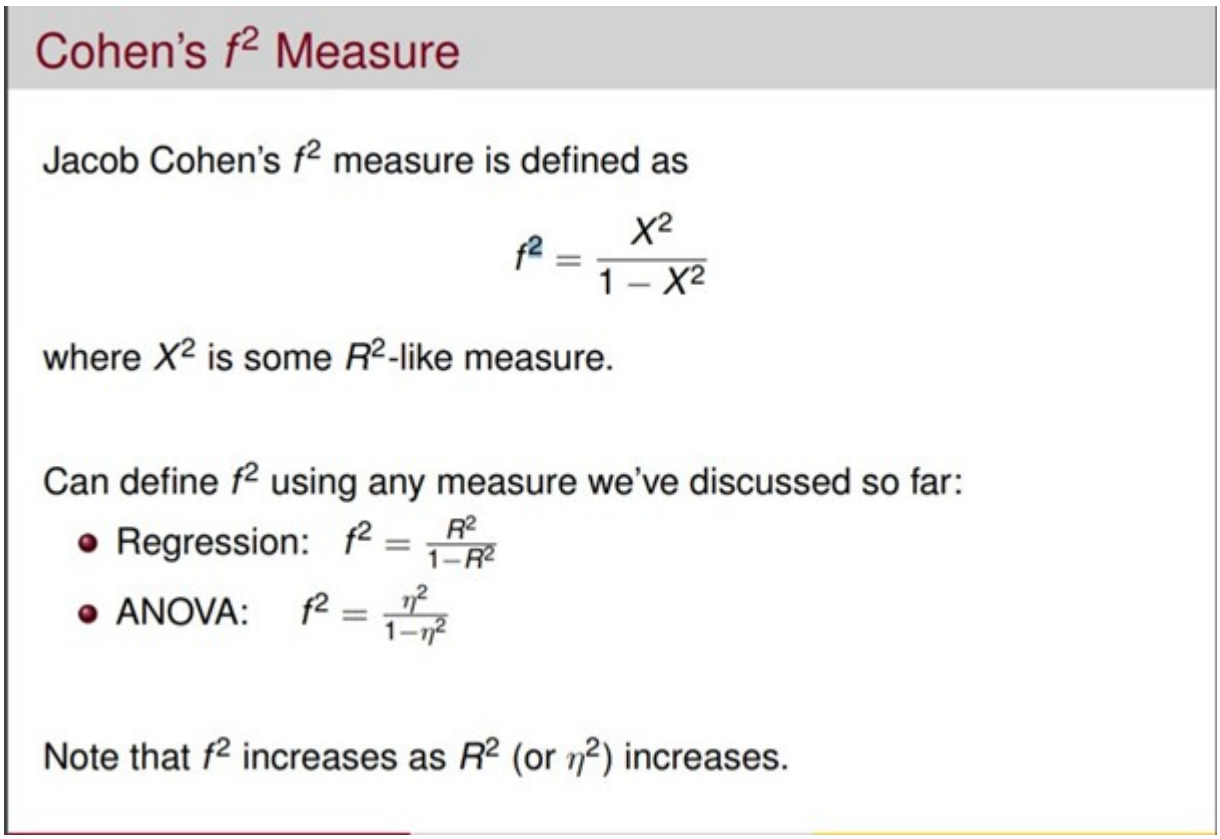
The Player-Avatar Identification Scale

Notes: 1 = "Strong disagree", 2 = "Disagree", 3 = "Neutral", 4 = "Agree', 5 = "Strongly agree"

	1	2	3	4	5
1. When my character is facing danger in the game, I feel nervous.					
2. I feel the same disappointment when my character experiences a failure in the game.					
3. When my character achieves his/ her goals, I feel happy.					
4. I feel the same joy my character experiences when a task is accomplished.					
5. I have forgotten my surroundings during the game.					
6. I have forgotten myself during the game.					
7. I feel as if I am physically in the game					

world during the game.					
8. I never regret that I play my game character.					
9. I am proud to play the character I am playing now.					
10. Other gamers are happy to be friends with my game character.					
11. My co-gamers have high respect for my character.					
12. The characters I play reflect who I am.					
13. My character and I are one and the same.					
14. The characters I play influence the way I feel about myself.					
15. The characters I play are important to my sense of what kind of a person I am.					

Appendix C: Jacob Cohen's



Cohen's $f^2 = r^2 / (1 - r^2)$

Depression, R2= .31
Social Phobia, R= .33
Identification of Avatar, R2= .248

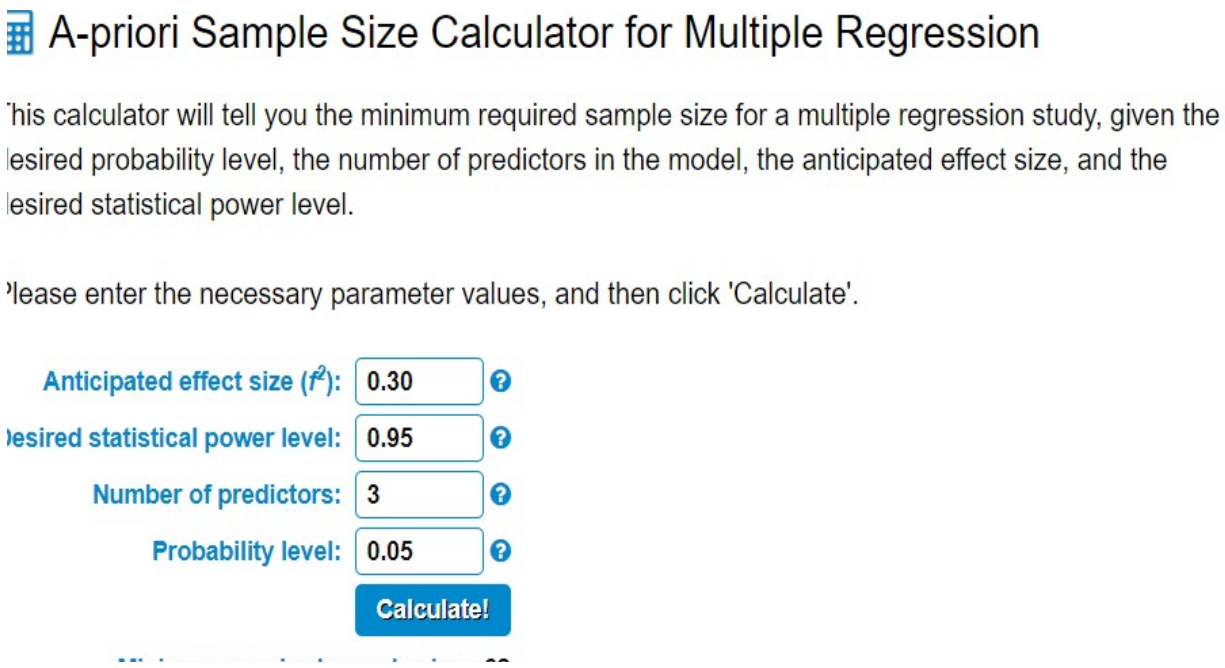
Depression
F2 = 0.31/(1-0.31) = 0.449

Social Phobia
F2 = (0.33)^2/(1-(0.33)^2) = 0.122

Identification of Avatar
F2 = 0.248/(1-0.248) = 0.330

Average= (0.449+0.122+0.330)/3 = (

Appendix C: A-priori Sample Size Calculator for Multiple Regression



SMALL EFFECT SIZE: $f^2 = .02$. Translated into R^2 (9.2.3) or partial R^2 for Case 1 (9.1.8), this gives $.02/(1 + .02) = .0196$. We thus define a small effect as one that accounts for 2% of the Y variance (in contrast with 1% for r), and translate to an $R = \sqrt{.0196} = .14$ (compared to .10 for r). This is a modest enough amount, just barely escaping triviality and (alas!) all too frequently in practice represents the true order of magnitude of the effect being tested. The discussion under "Small Effect Size" in Section 3.2.1 is relevant here: what may be a moderate theoretical ES may easily, in a "noisy" research, be no larger than what is defined here as small.

MEDIUM EFFECT SIZE: $f^2 = .15$. In PV terms, this amounts to an R^2 or partial R^2 of $.15/(1 + .15) = .13$, hence R or partial $R = .36$ (compared to $r = .30$ for a medium ES). It may seem that 13% is a paltry amount of variance to define as "medium" when a set made up of several variables is used, but keep in mind that we are defining population values—these are not subject to the inflation (least squares overfitting) which requires correction for shrinkage of a sample R^2 (Cohen & Cohen, 1983, pp. 105–107). In any case, if an investigator finds this criterion too small (or, for that matter, too large) for an area in which he is experienced, he clearly has no need for conventions —he should specify the R^2 (or partial R^2) appropriate to his substantive content and type of F test, and determine the f^2 from the relevant formula in the preceding material.

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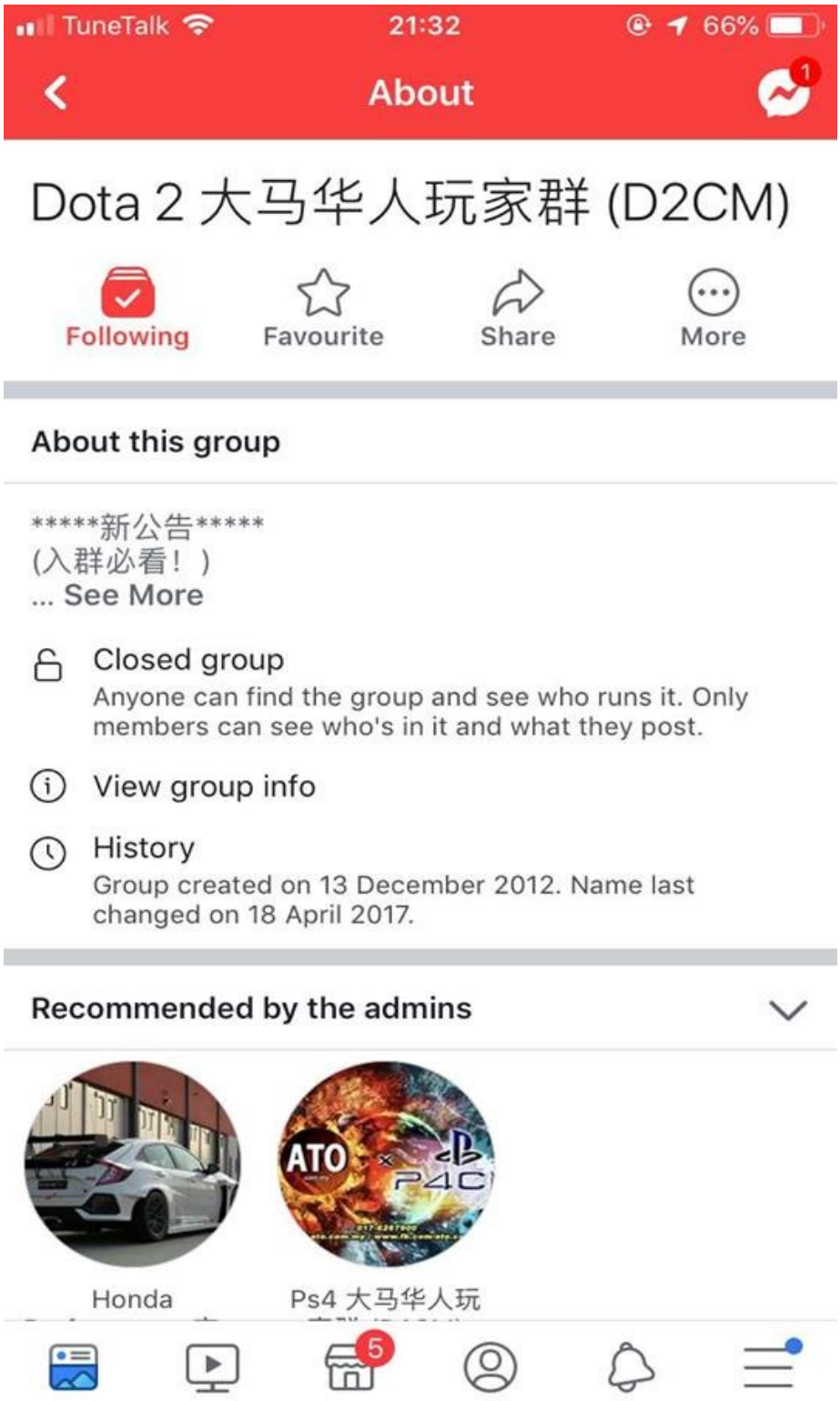
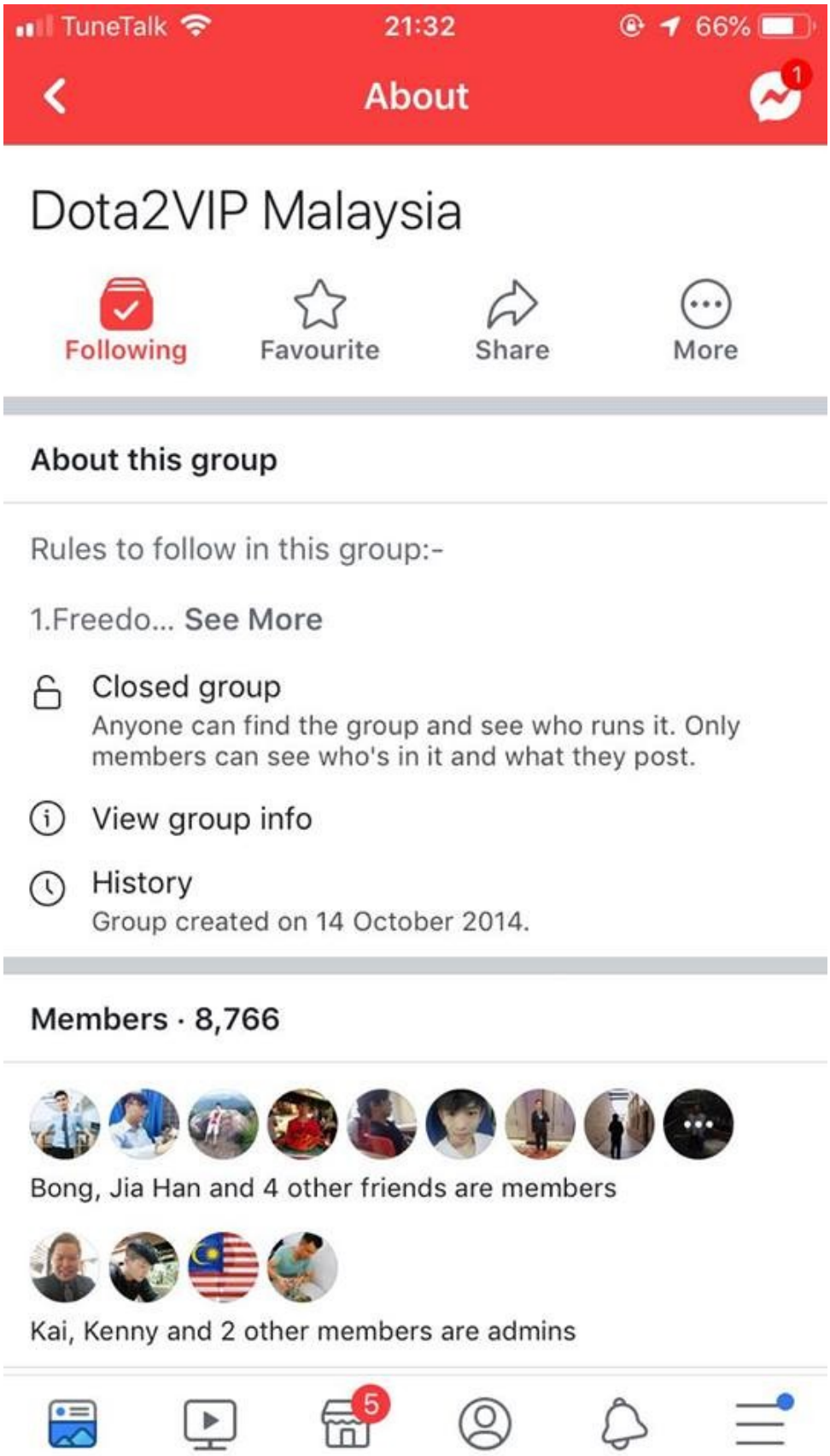
LARGE EFFECT SIZE: $f^2 = .35$. This translates into PV = .26 for R^2 and partial R^2, which in terms of correlation, gives .51 (slightly larger than the $r = .50$ defining a "large mount" of correlation). This value seems about right for defining a large effect in the middle of the range of fields we cover. It will undoubtedly be often found to be small in sociology, economics, and psychophysics on the one hand, and too large in personality, clinical, and social psychology on the other. As always, this criterion is a compromise that should be rejected when it seems unsuited to the substantive content of any given investigation.

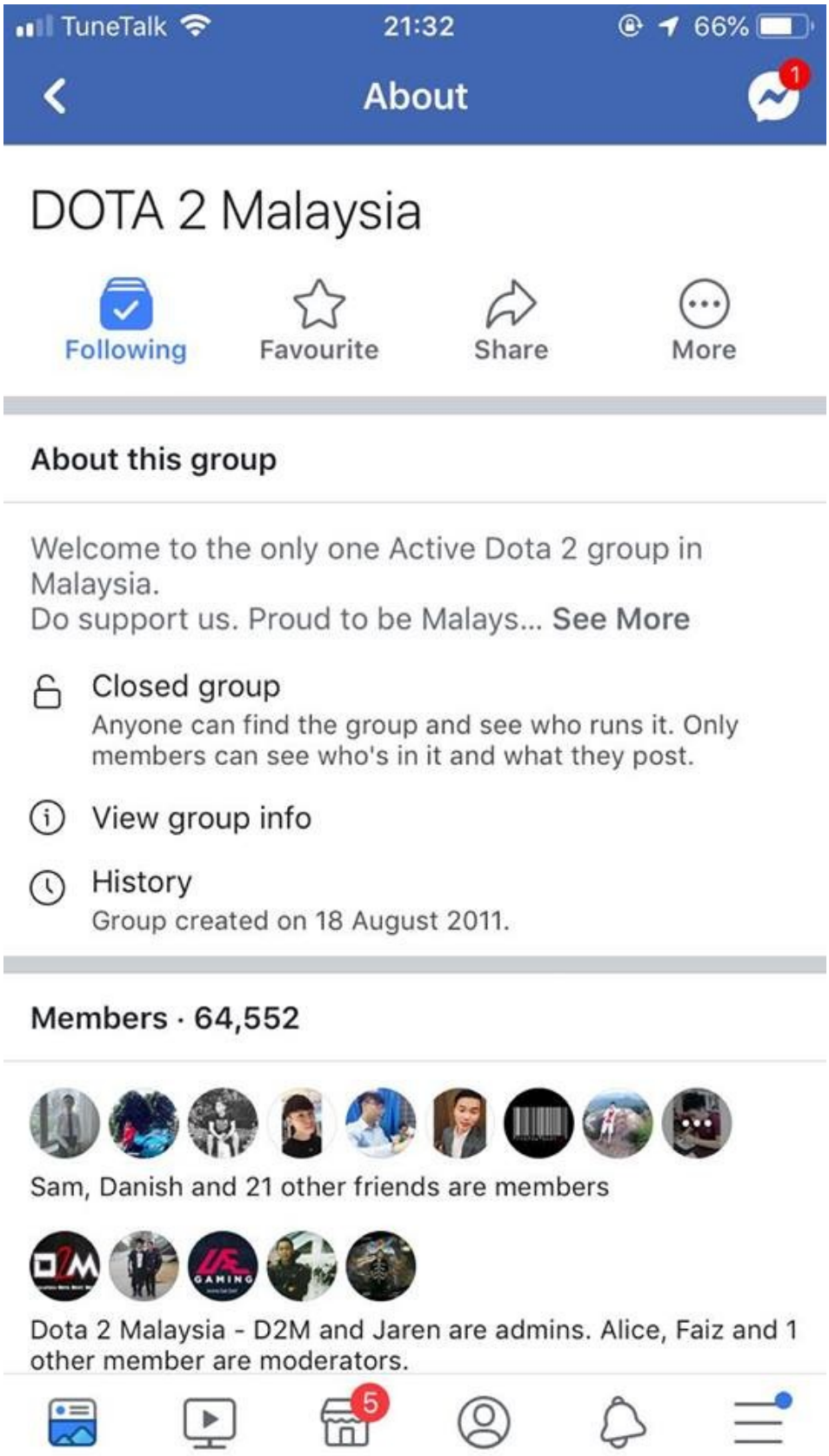
Appendix D: Facebook MOBA Group


TuneTalk
21:32
66%
About
Dota 2 大马华人玩家群 (D2CM)
Following
Favourite
Share
More
About this group
*****新公告*****
(入群必看！)
... See More
Closed group
Anyone can find the group and see who runs it. Only members can see who's in it and what they post.
View group info
History
Group created on 13 December 2012. Name last changed on 18 April 2017.
Recommended by the admins
Honda
Ps4 大马华人玩

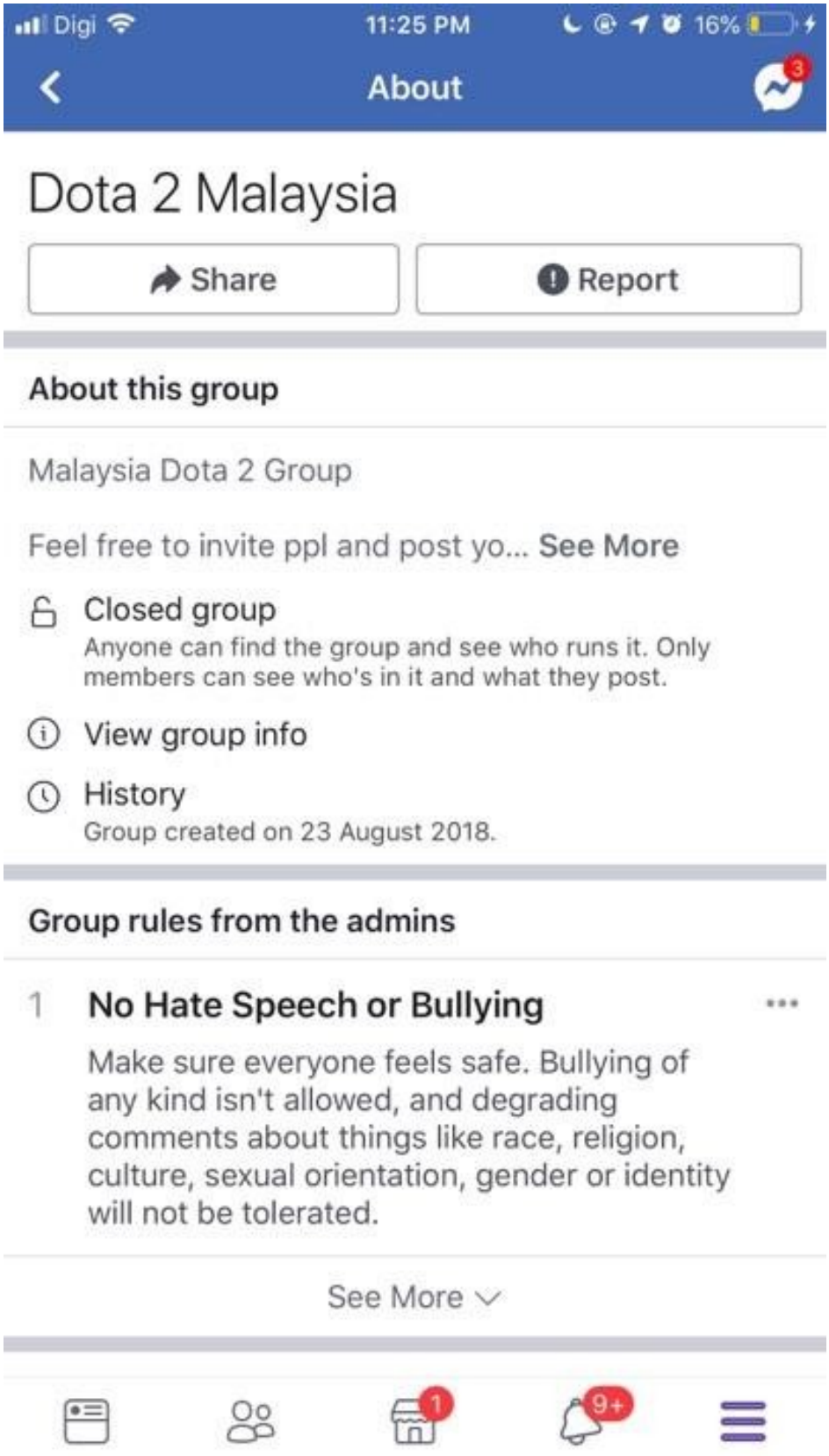
Appendix D: Facebook MOBA Group


TuneTalk
21:32
66%
About
Dota2VIP Malaysia
Following
Favourite
Share
More
About this group
Rules to follow in this group:-
1.Freedo... See More
Closed group
Anyone can find the group and see who runs it. Only members can see who's in it and what they post.
View group info
History
Group created on 14 October 2014.
Members · 8,766
Bong, Jia Han and 4 other friends are members
Kai, Kenny and 2 other members are admins

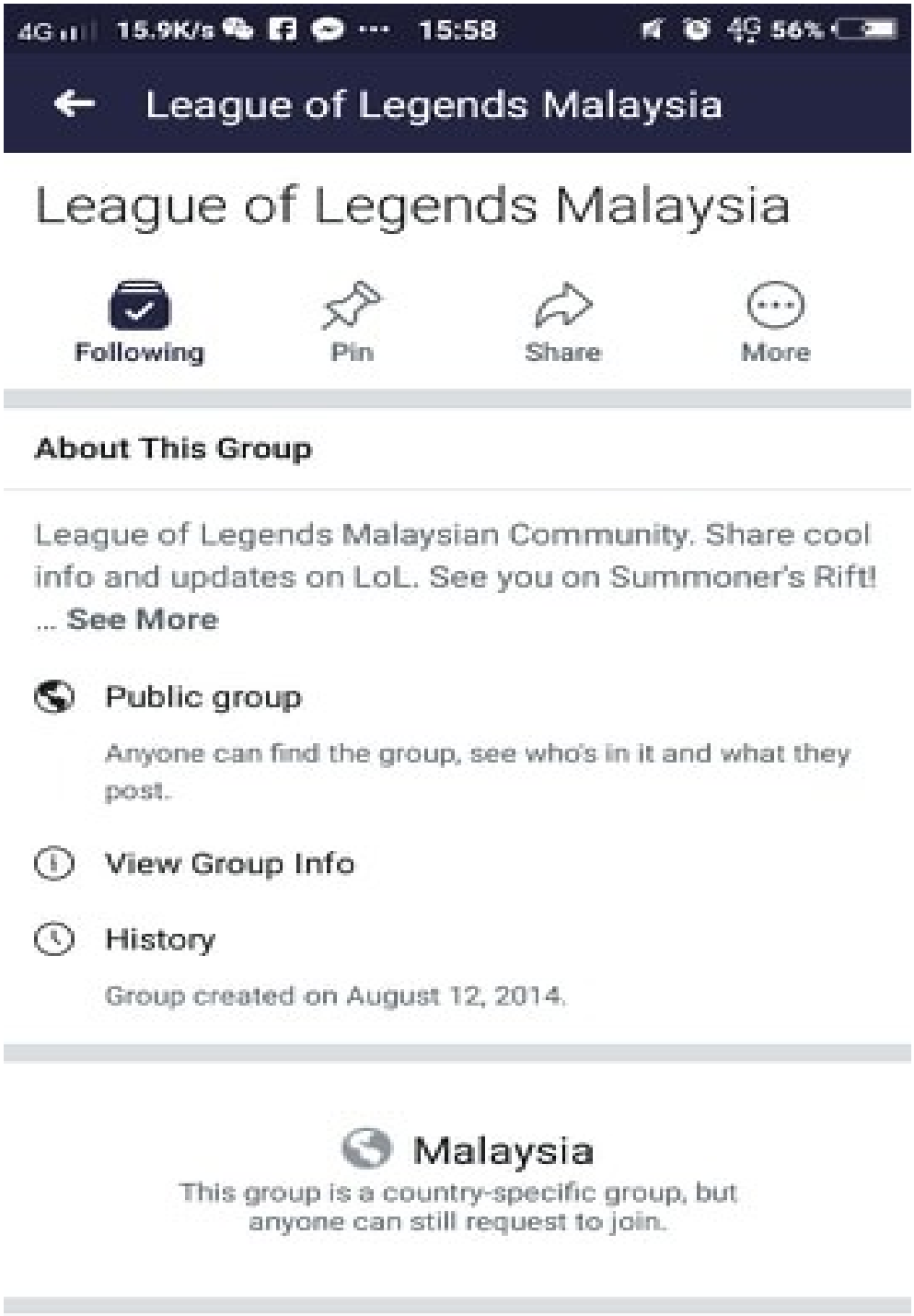
Appendix D: Facebook MOBA Group


TuneTalk
21:32
66%
About
DOTA 2 Malaysia
Following
Favourite
Share
More
About this group
Welcome to the only one Active Dota 2 group in Malaysia.
Do support us. Proud to be Malays... See More
Closed group
Anyone can find the group and see who runs it. Only members can see who's in it and what they post.
View group info
History
Group created on 18 August 2011.
Members · 64,552
Sam, Danish and 21 other friends are members
Dota 2 Malaysia - D2M and Jaren are admins. Alice, Faiz and 1 other member are moderators.

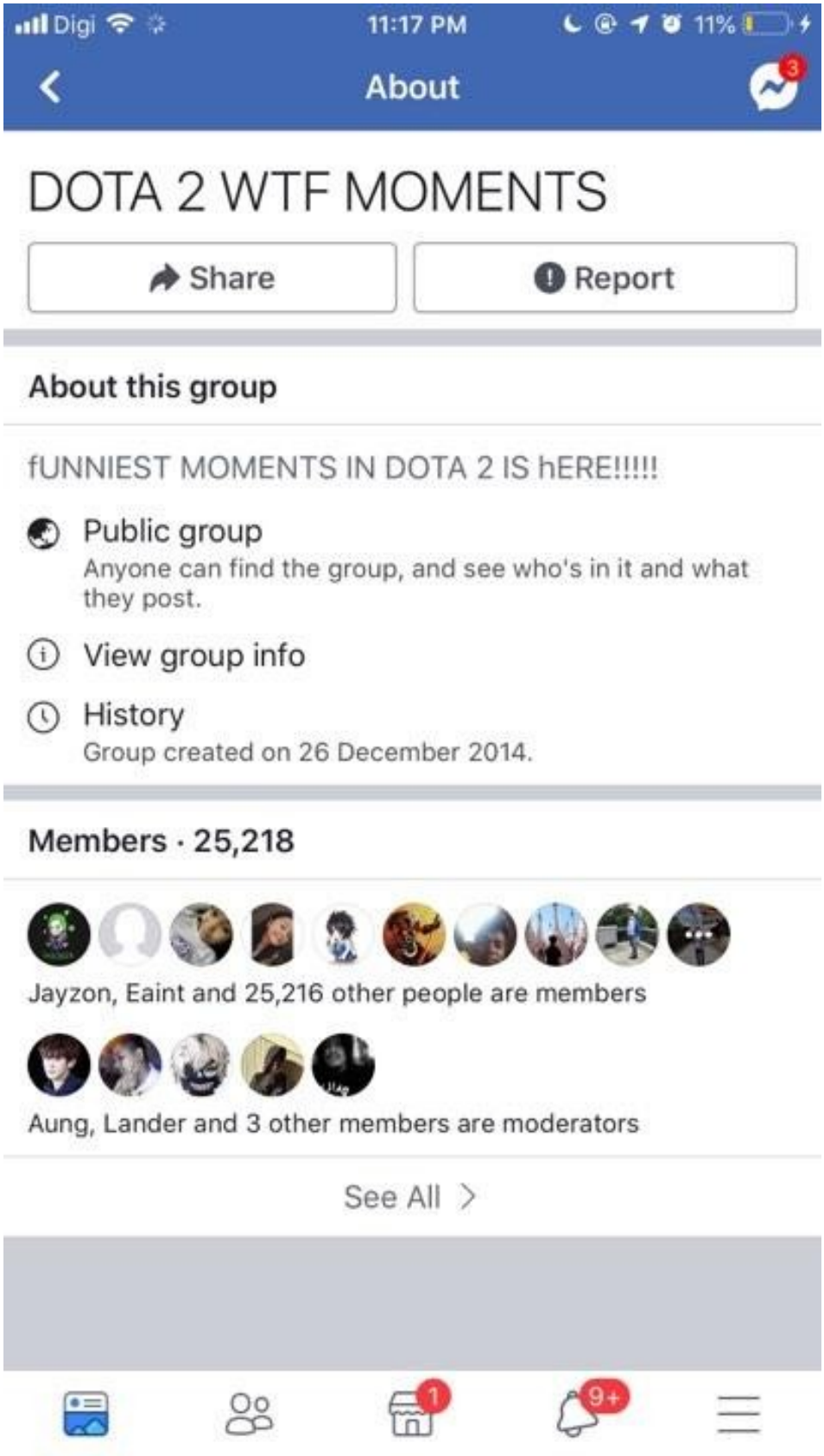
Appendix D: Facebook MOBA Group



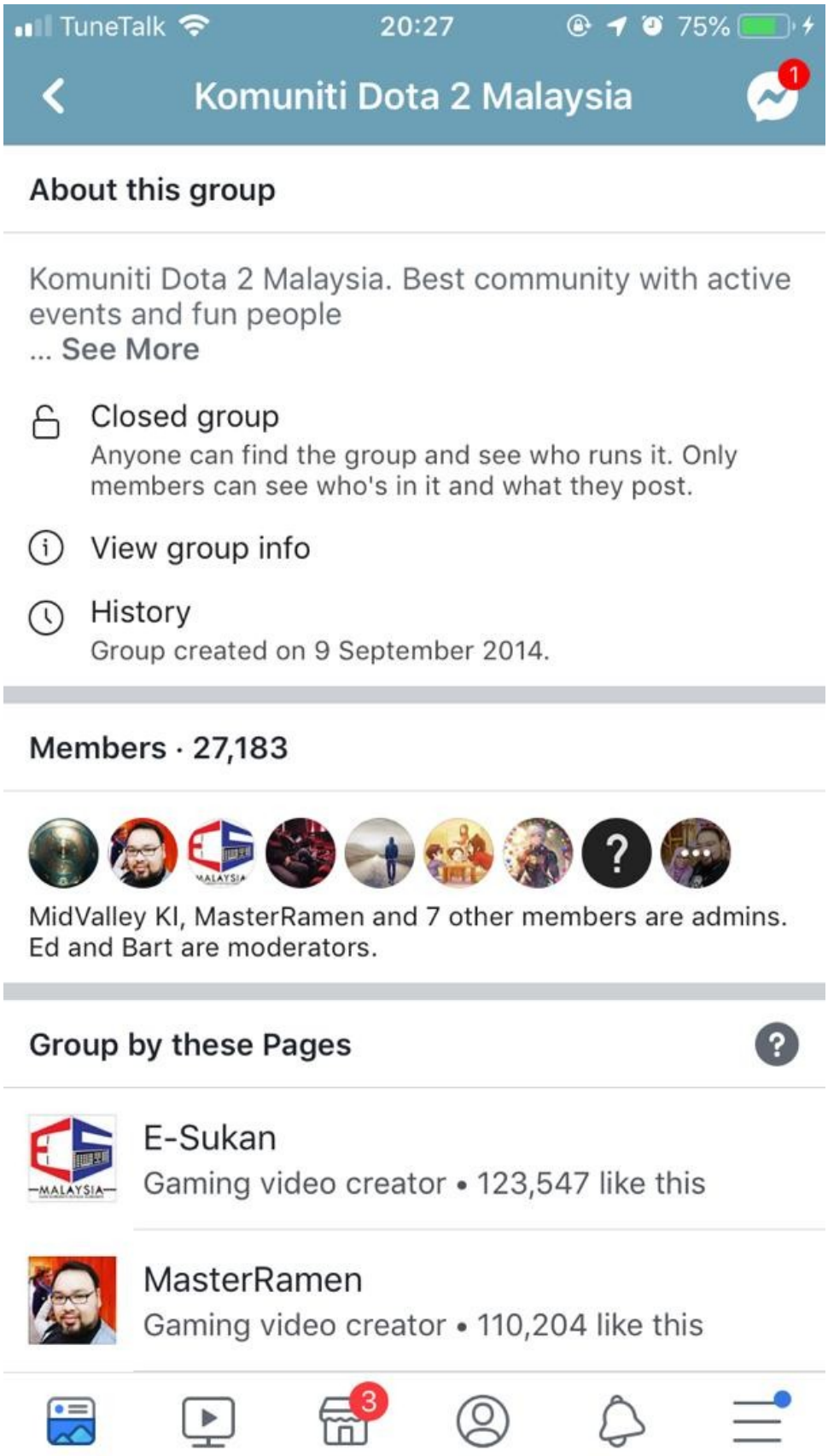
Appendix D: Facebook MOBA Group



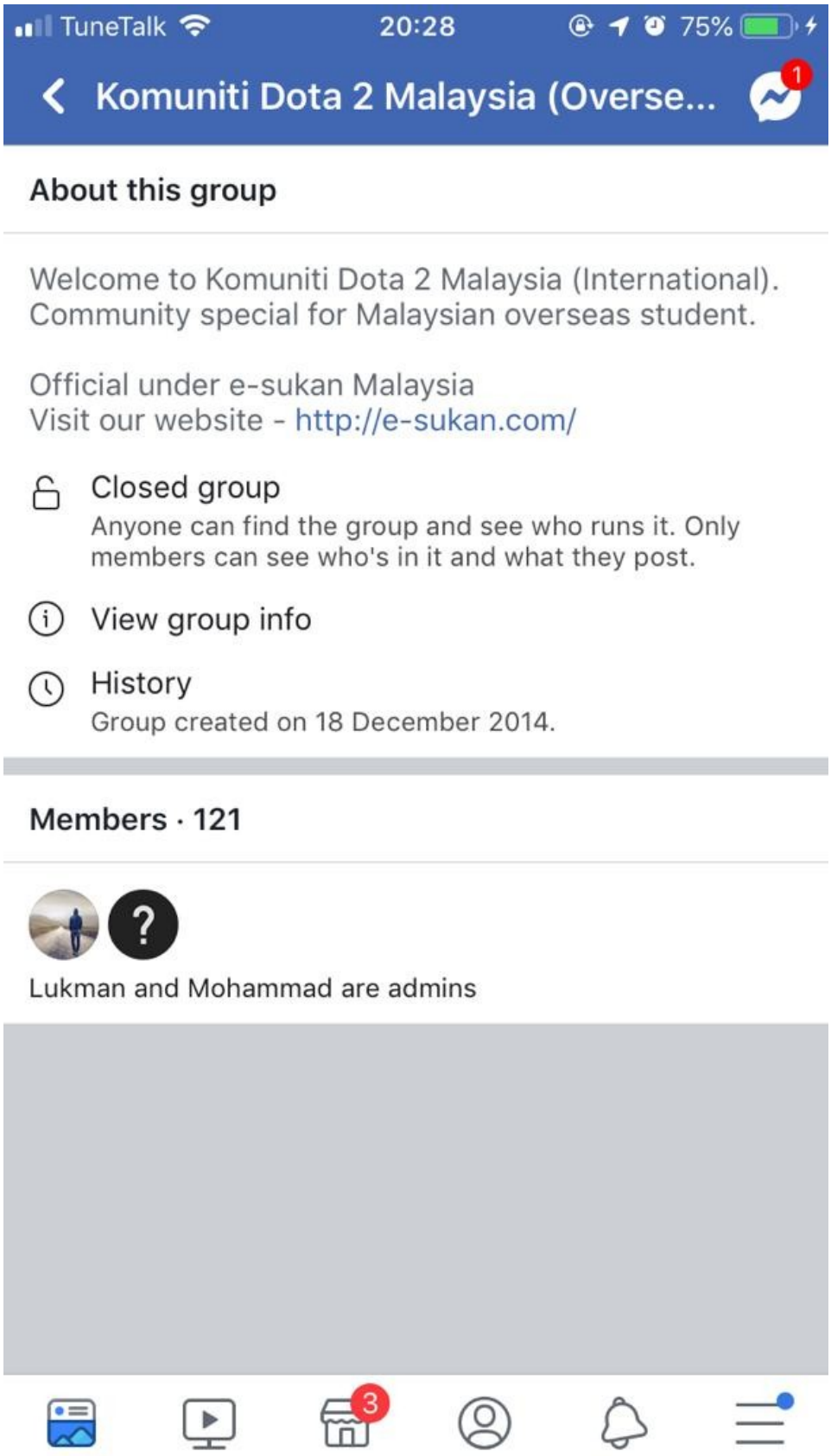
Appendix D: Facebook MOBA Group



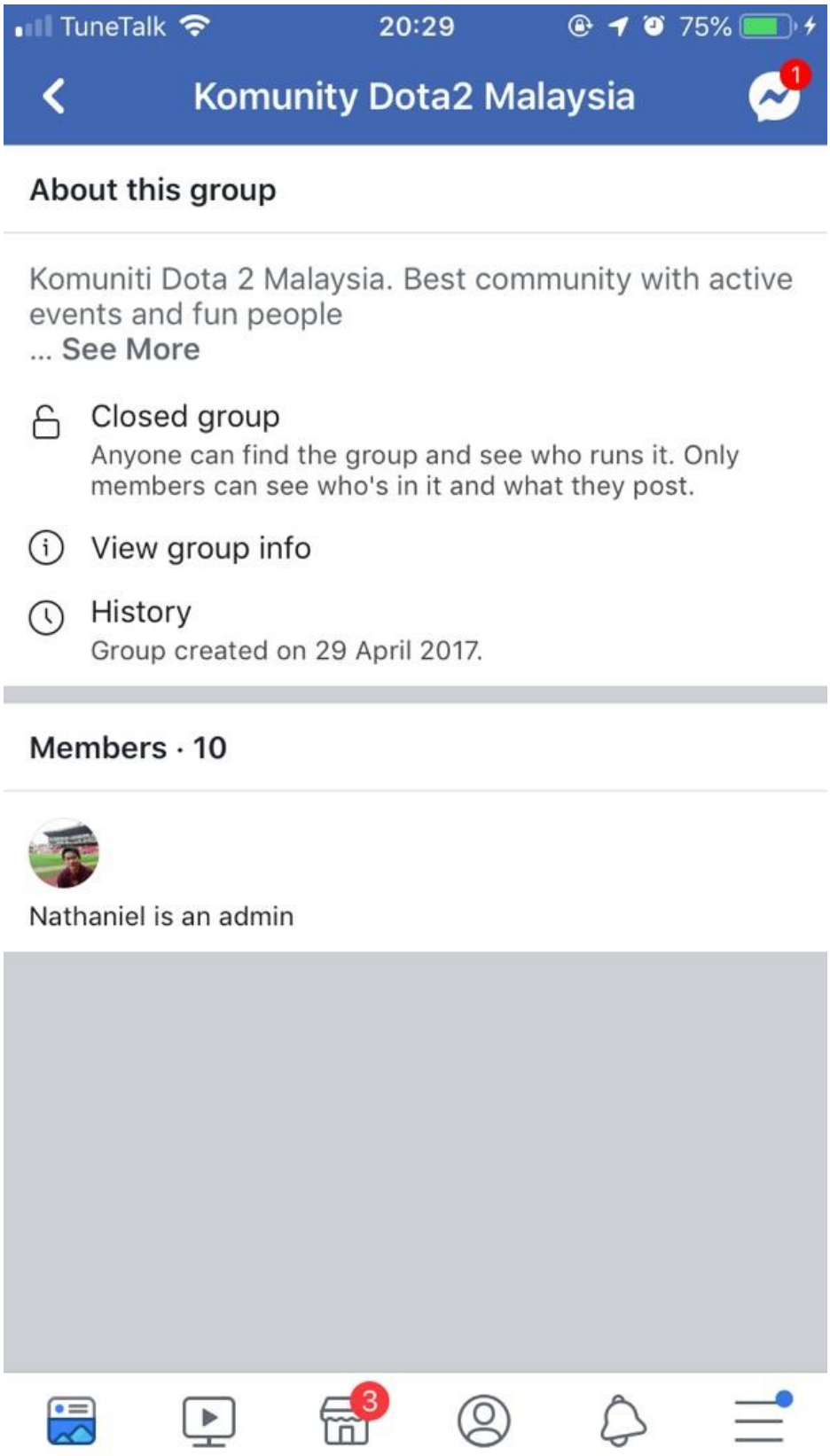
Appendix D: Facebook MOBA Group



Appendix D: Facebook MOBA Group


TuneTalk
20:28
75%
Komuniti Dota 2 Malaysia (Overse...
About this group
Welcome to Komuniti Dota 2 Malaysia (International).
Community special for Malaysian overseas student.
Official under e-sukan Malaysia
Visit our website - http://e-sukan.com/
Closed group
Anyone can find the group and see who runs it. Only members can see who's in it and what they post.
View group info
History
Group created on 18 December 2014.
Members · 121
Lukman and Mohammad are admins

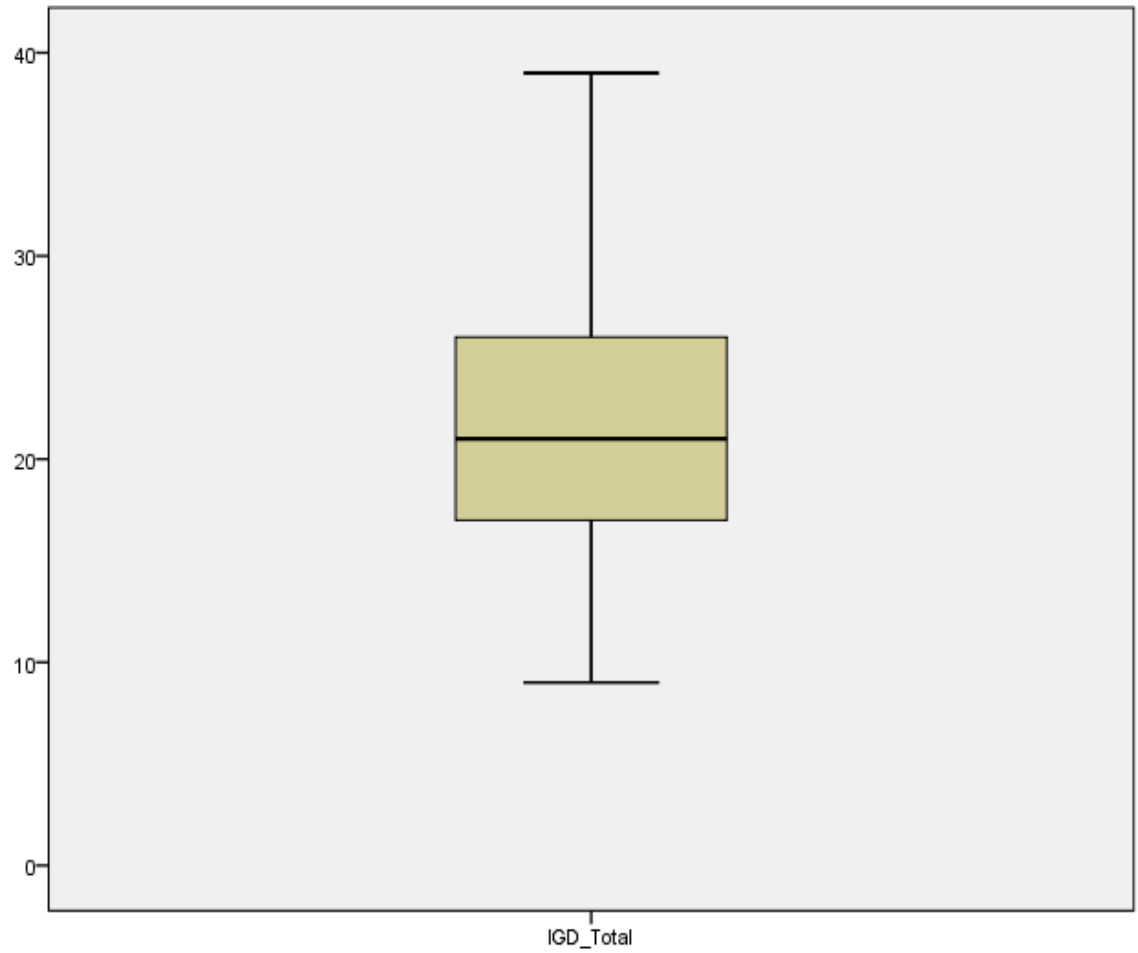
Appendix D: Facebook MOBA Group



Appendix E: Boxplot for Social Phobia

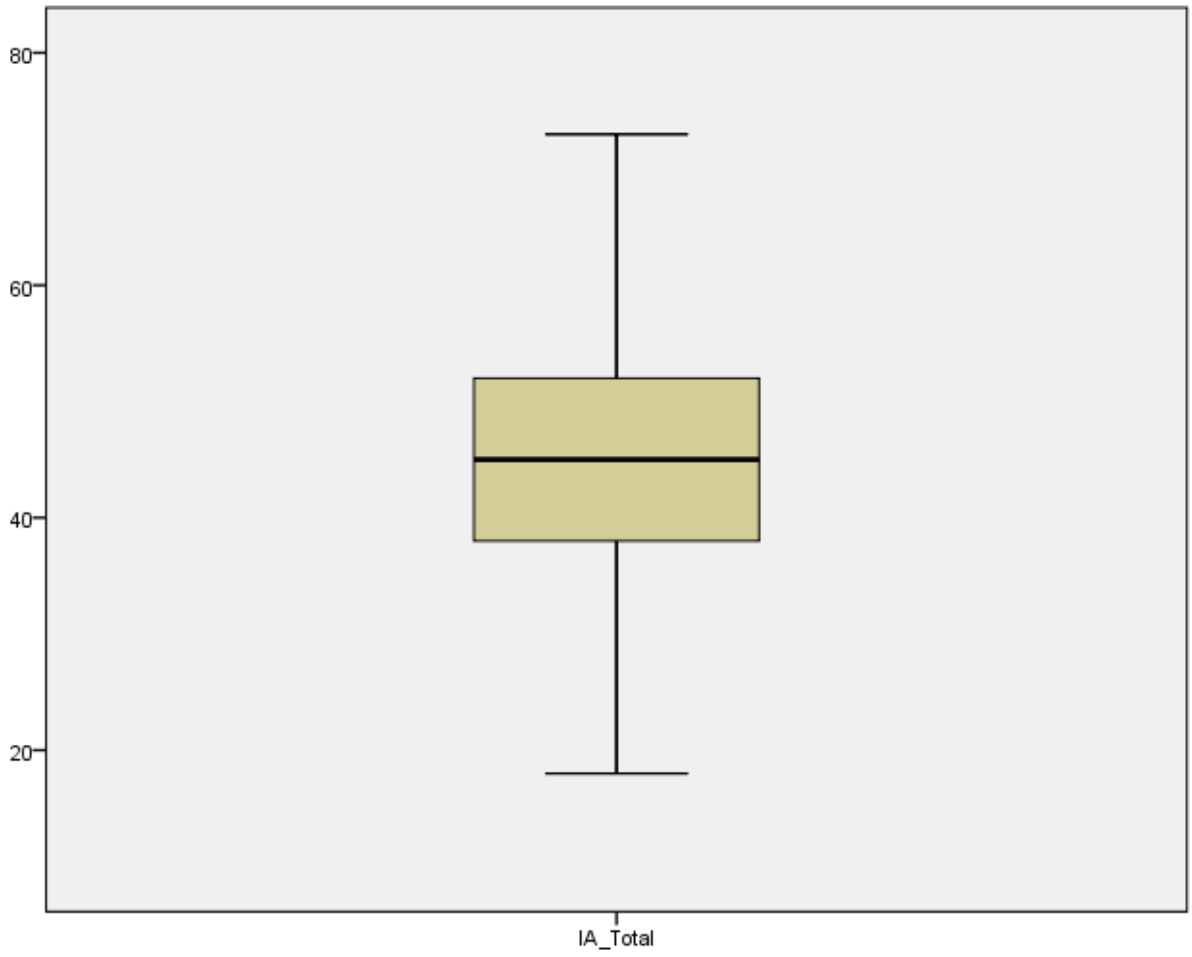

25
20
15
10
5
0
SP_Total

Appendix E: Boxplot for Internet Gaming Disorder' Symptoms

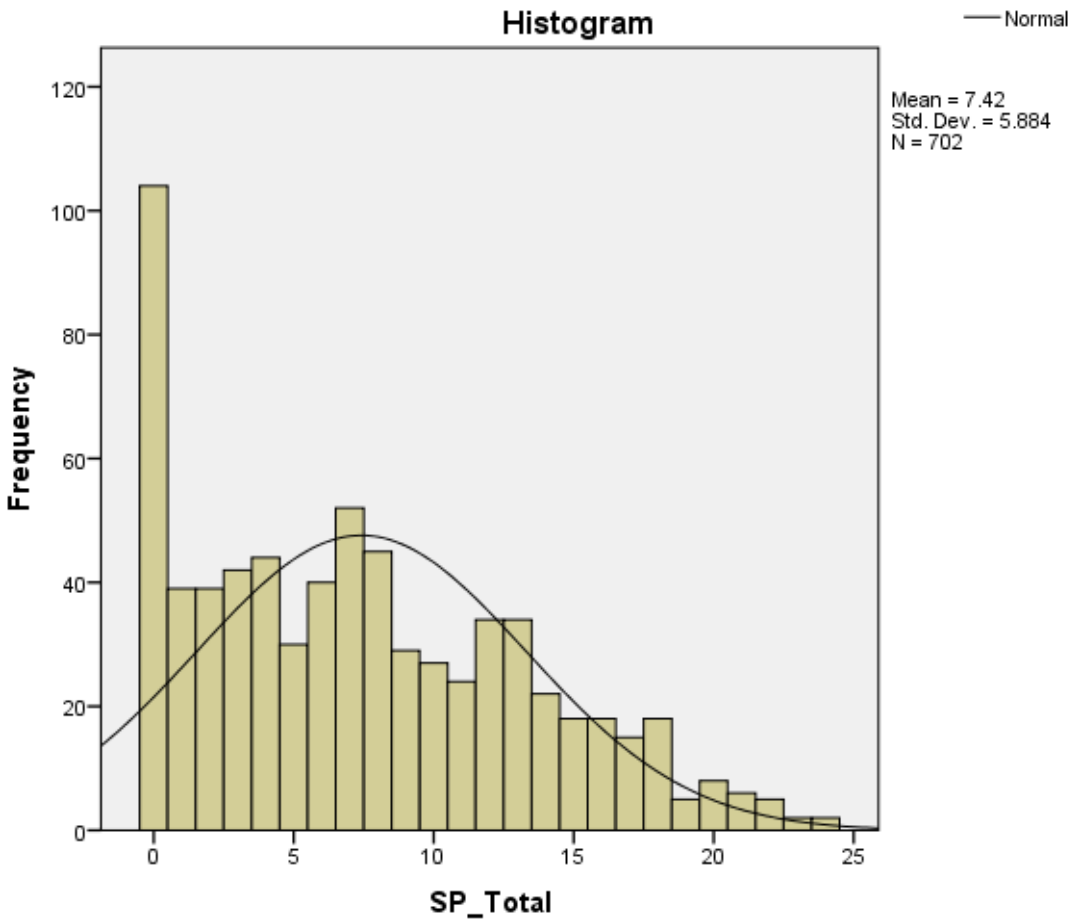


Appendix E: Boxplot for Depression

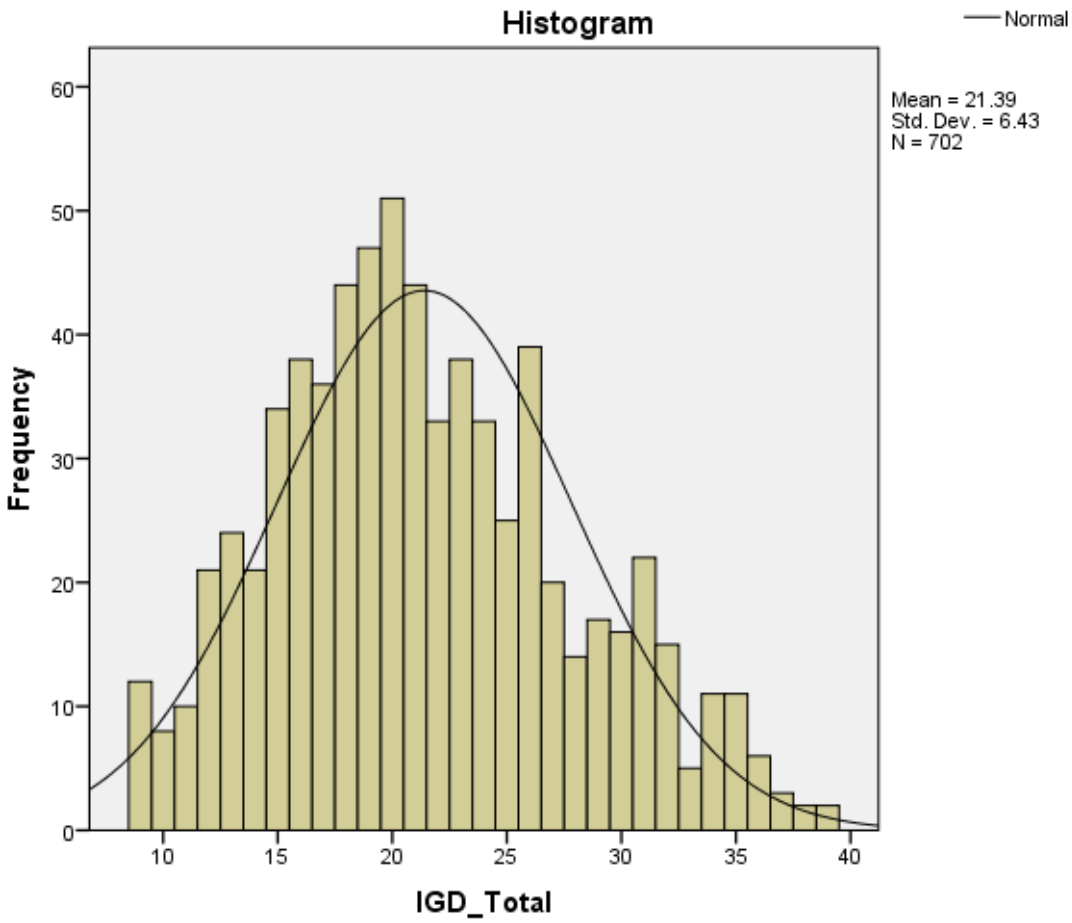
Appendix E: Boxplot for Identification of Avatar


80
60
40
20
IA_Total

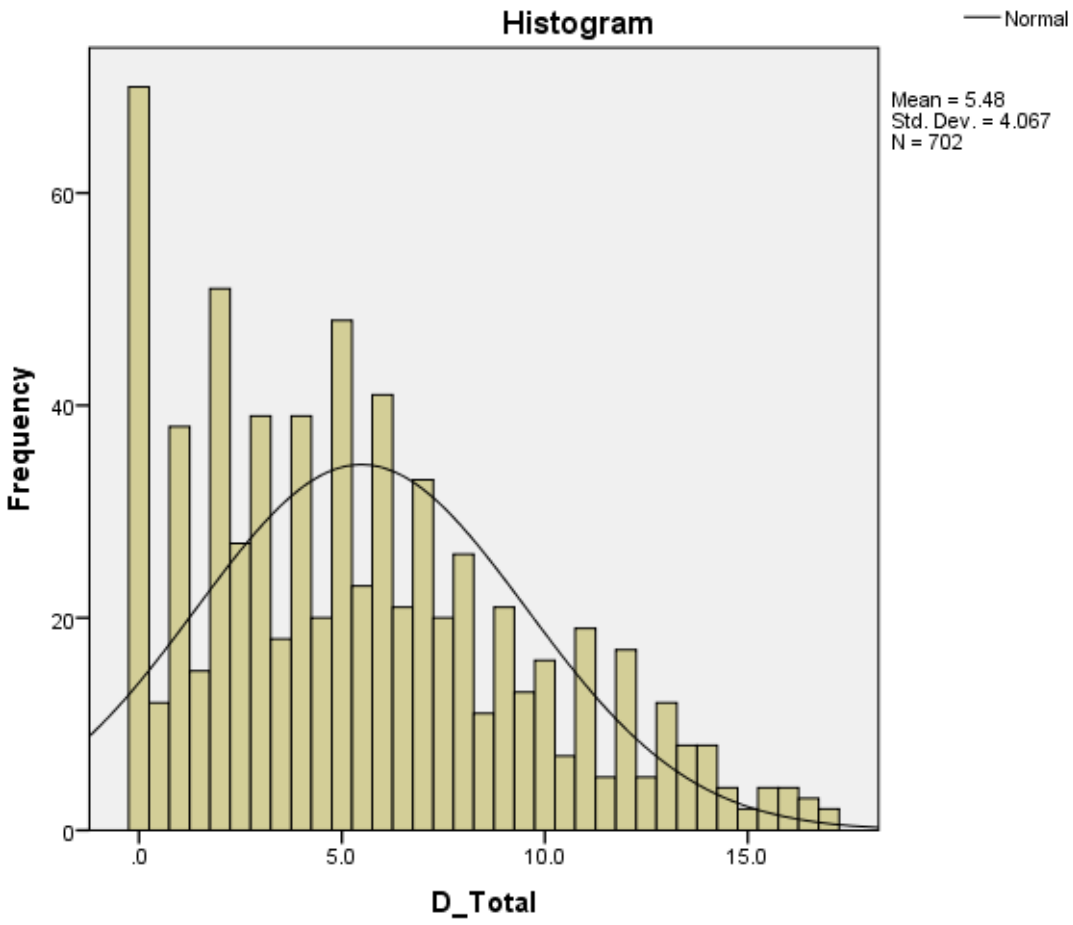
Appendix E: Histogram for Social Phobia



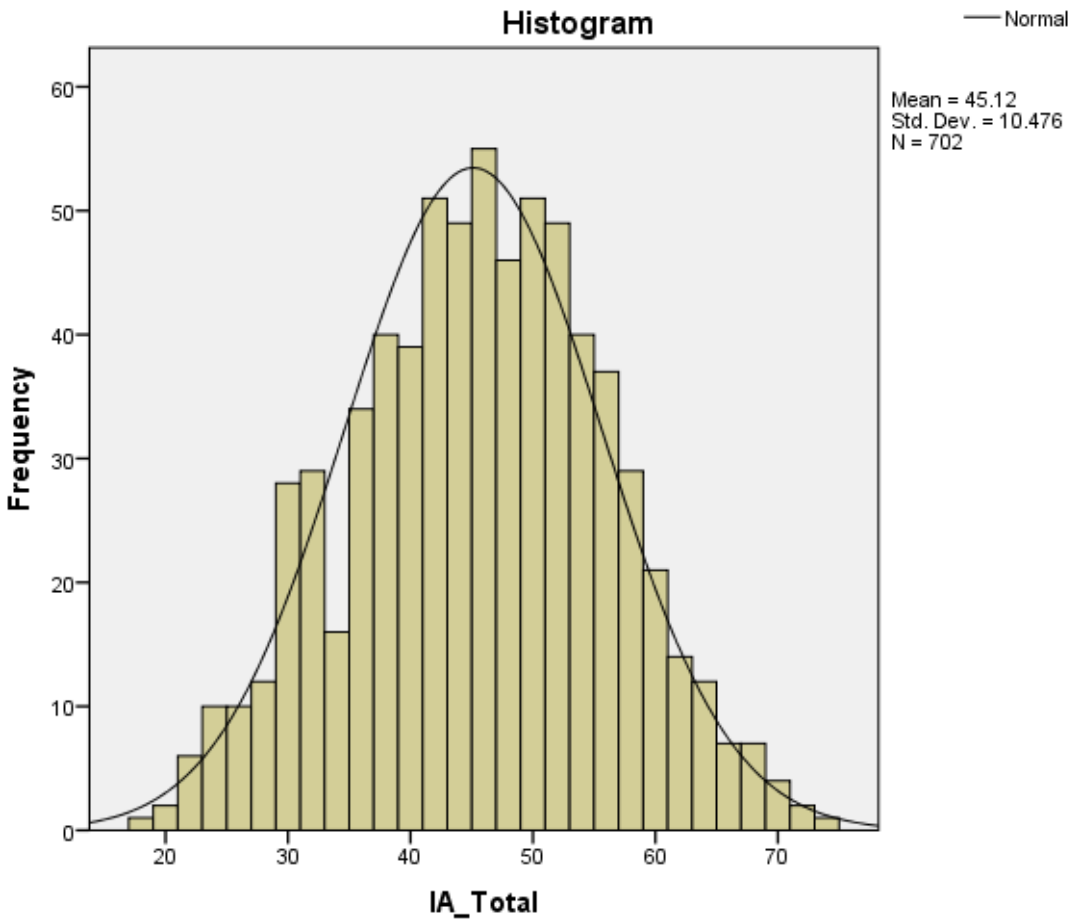
Appendix E: Histogram for Internet Gaming Disorder's Symptoms


Histogram
Normal
Mean = 21.39
Std. Dev. = 6.43
N = 702
Frequency
IGD_Total
0
10
20
30
40
50
60
10
15
20
25
30
35
40

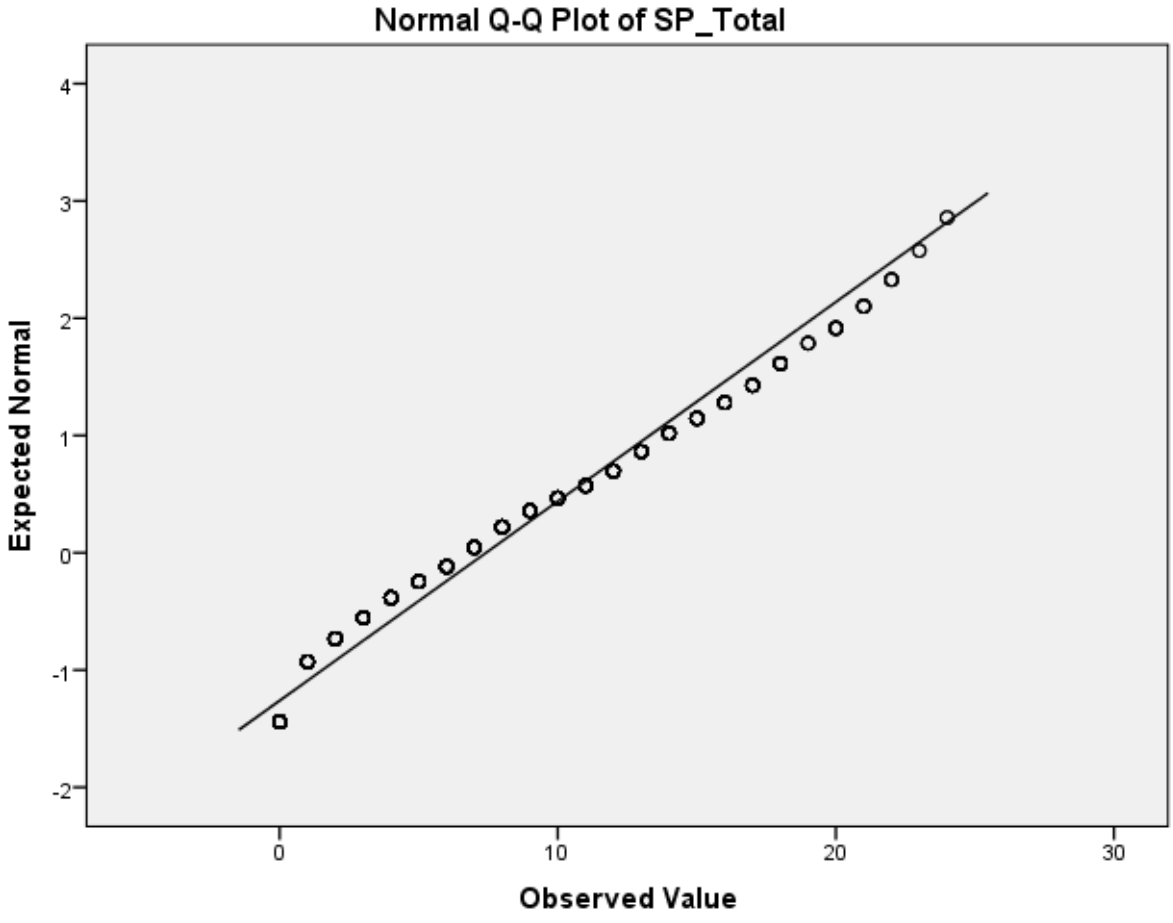
Appendix E: Histogram for Depression

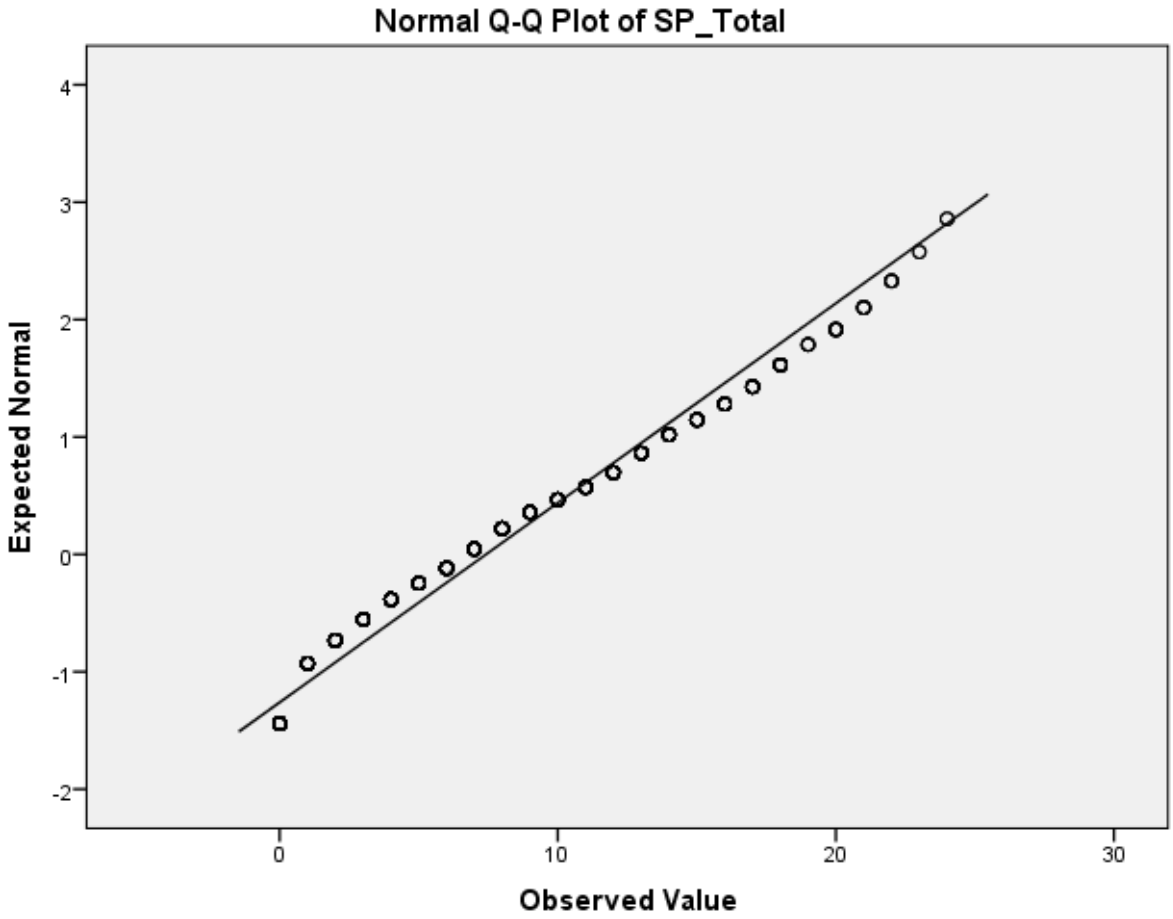

Histogram
Normal
Mean = 5.48
Std. Dev. = 4.067
N = 702
Frequency
60
40
20
0
.0
5.0
10.0
15.0
D_Total

Appendix E: Histogram for Identification of Avatar

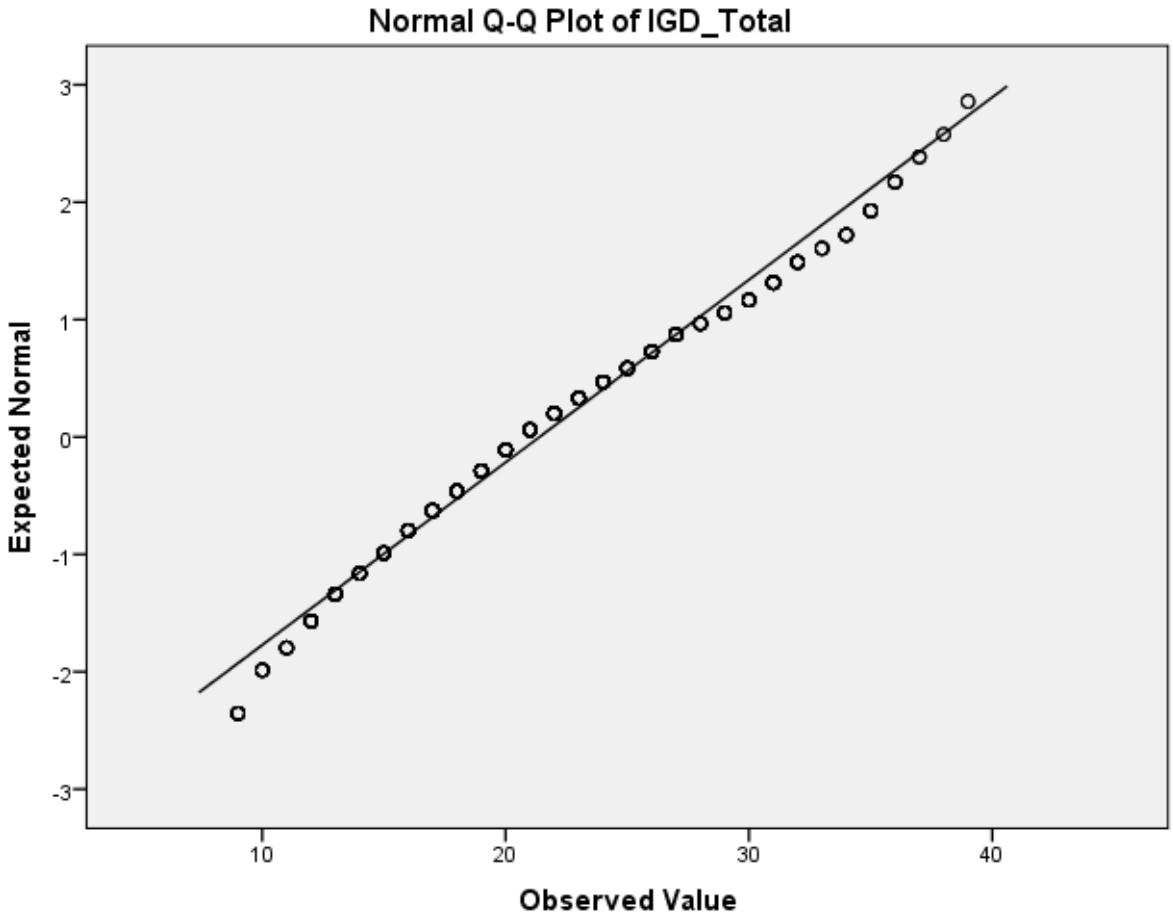

Histogram
Normal
Mean = 45.12
Std. Dev. = 10.476
N = 702
Frequency
0
10
20
30
40
50
60
20
30
40
50
60
70
IA_Total

Appendix E: Normal Q-Q Plot for Social Phobia

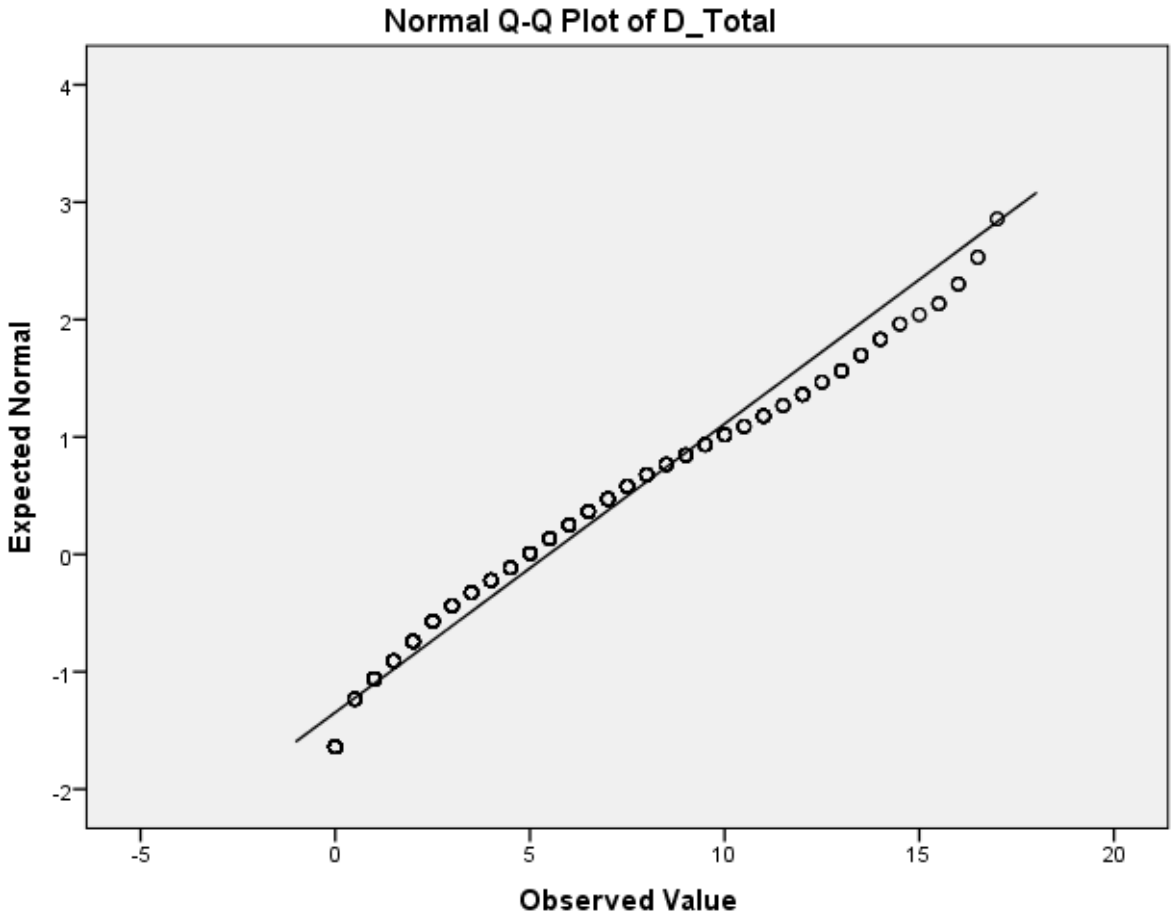



Normal Q-Q Plot of SP_Total
Expected Normal
Observed Value
4
3
2
1
0
-1
-2
0
10
20
30

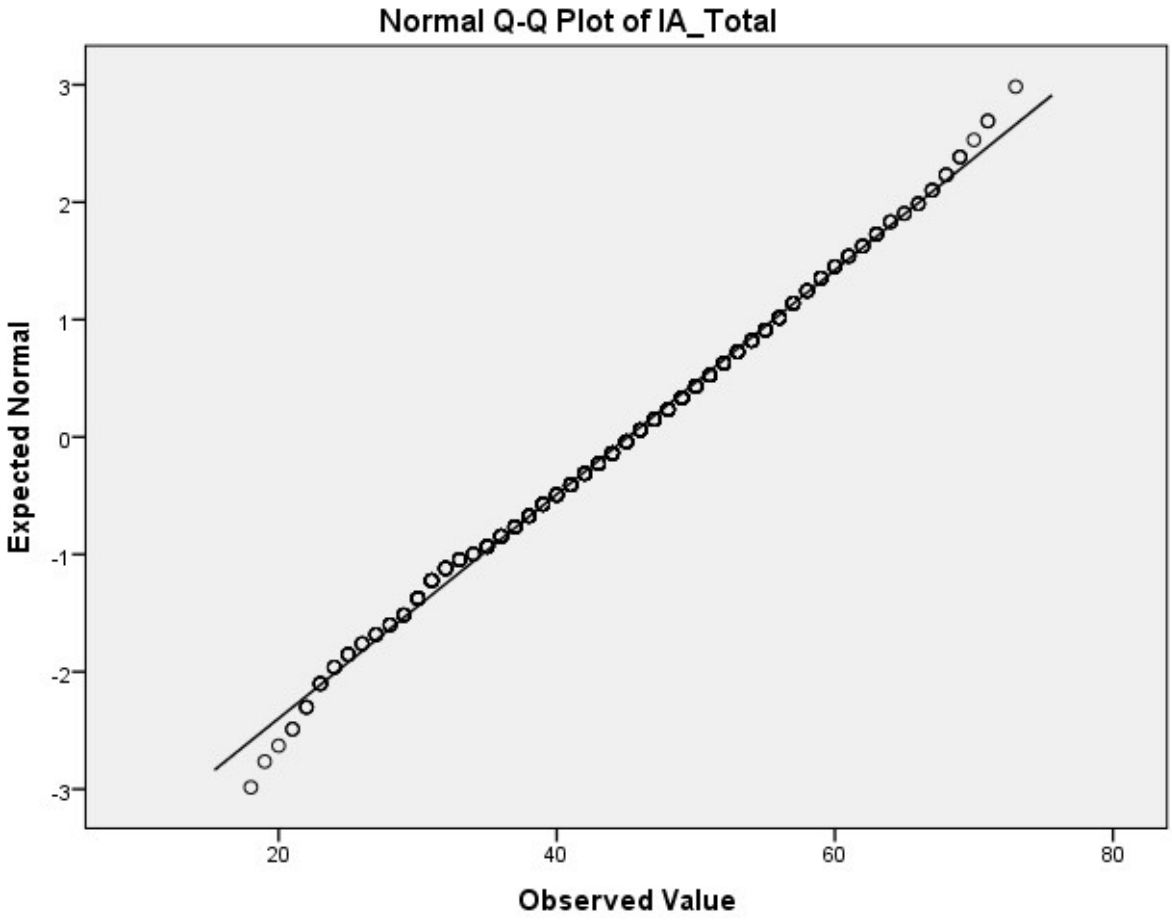
Appendix E: Normal Q-Q Plot for Internet Gaming Disorder's Symptoms


Normal Q-Q Plot of IGD_Total
Expected Normal
Observed Value
3
2
1
0
-1
-2
-3
10
20
30
40

Appendix E: Normal Q-Q Plot for Depression


Normal Q-Q Plot of D_Total
Expected Normal
Observed Value
4
3
2
1
0
-1
-2
-5
0
5
10
15
20

Appendix E: Normal Q-Q Plot for Identification of Avatar



Appendix E: Test of Kolmogorov-Smirnov and Shapiro-Wilk

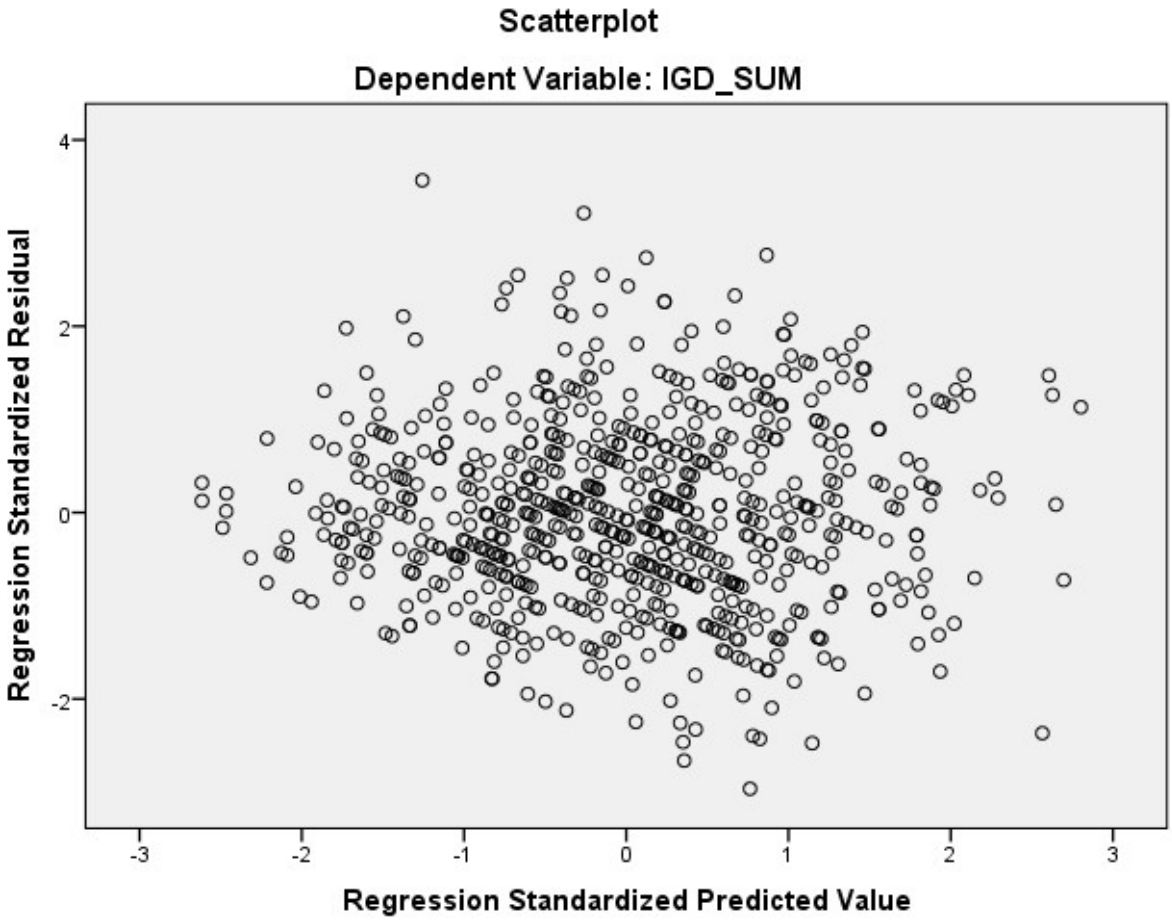
Tests of Normality

	Kolmogorov-Smirnov[a]	Shapiro-Wilk

	Statistic	df	Sig.	Statistic	df	Sig.
SP_Total	.104	702	.000	.939	702	.000
IGD_Total	.080	702	.000	.980	702	.000
D_Total	.089	702	.000	.947	702	.000
IA_Total	.035	702	.042	.995	702	.023

a. Lilliefors Significance Correction

Appendix E: Scatterplot



Appendix E: Effect Size Measures for Mediation Models

PM ¿$\frac{ab}{ab+c'}=\frac{ab}{c}=1-\frac{c'}{c}$

¿$\frac{(0.30)(0.29)}{0.087+0.22}=\frac{(0.30)(0.29)}{0.31}=1-\frac{0.22}{0.31}$

¿$\frac{(0.19)(0.30)}{(0.19)(0.30)+0.49}=\frac{(0.19)(0.30)}{0.55}=1-\frac{0.49}{0.55}$

$1-PM=1-\frac{(0.30)(0.29)}{0.087+0.22}=1-\frac{(0.30)(0.29)}{0.31}=\frac{0.22}{0.31}$

$1-PM=1-\frac{(0.19)(0.30)}{(0.19)(0.30)+0.0.49}=1-\frac{(0.19)(0.30)}{0.55}=1-\frac{0.49}{0.55}$

$1-PM=1-\frac{ab}{ab+c'}=1-\frac{ab}{c}=\frac{c'}{c}$

Appendix E: Test of Mahalanobis Distance, Cook's Distance, and Centered Leverage Value

Case Summaries[a]

			Case Number	Mahalanobis Distance	Cook's Distance	Centered Leverage Value
GROUP_MO	0	1	159	.76865	.00041	.00110
		2	160	.50614	.00011	.00072
		3	161	2.55324	.00000	.00364
		4	162	2.58886	.00052	.00369
		5	163	2.12010	.00176	.00302
		6	164	3.95385	.00018	.00564
		7	165	1.18418	.00303	.00169
		8	166	1.91793	.00175	.00274
		9	167	1.39405	.00025	.00199
		10	168	4.91602	.00121	.00701
		11	169	3.28078	.00046	.00468
		12	170	9.05551	.00785	.01292
		13	171	4.55800	.00145	.00650
		14	172	5.03618	.01094	.00718
		15	173	8.49592	.00307	.01212
		16	174	2.03977	.00022	.00291
		17	176	3.40901	.00072	.00486
		18	177	1.92012	.00246	.00274
		19	178	1.32861	.00005	.00190
		20	179	1.11149	.00024	.00159
		21	180	1.43546	.00000	.00205
		22	181	2.21393	.00584	.00316
		23	183	1.22833	.00048	.00175
		24	184	2.63151	.00006	.00375
		25	185	2.03731	.00015	.00291
		26	186	.53667	.00010	.00077
		27	187	2.27905	.00034	.00325
		28	188	4.82316	.00379	.00688
		29	189	3.57604	.00000	.00510
		30	190	1.37028	.00003	.00195
		31	191	1.70859	.00033	.00244
		32	192	4.61047	.00038	.00658
		33	193	.70683	.00020	.00101
		34	194	2.37024	.00565	.00338
		35	195	6.10872	.00000	.00871

	36	196	3.54661	.00001	.00506
	37	197	7.62403	.00032	.01088
	38	198	1.99088	.00008	.00284
	39	199	1.10227	.00001	.00157
	40	200	2.12576	.00388	.00303
	41	201	1.49084	.00284	.00213
	42	202	4.32157	.00154	.00616
	43	203	.83760	.00019	.00119
	44	204	2.71854	.00301	.00388
	45	205	1.62823	.00258	.00232
	46	207	10.15303	.00690	.01448
	47	208	1.99216	.00000	.00284
	48	209	7.84451	.00333	.01119
	49	210	4.52772	.00093	.00646
	50	211	1.51444	.00047	.00216
	51	212	7.05904	.01802	.01007
	52	213	4.71969	.01124	.00673
	53	214	5.22670	.00001	.00746
	54	215	3.32109	.00016	.00474
	55	216	1.30039	.00045	.00186
	56	217	12.28989	.01230	.01753
	57	218	4.18407	.00345	.00597
	58	219	5.53018	.00143	.00789
	59	220	3.52513	.00014	.00503
	60	221	.44691	.00001	.00064
	61	222	.89995	.00040	.00128
	62	223	1.45126	.00019	.00207
	63	224	1.74114	.00019	.00248
	64	225	4.85498	.00013	.00693
	65	226	11.39090	.00586	.01625
	66	227	2.32508	.00067	.00332
	67	228	4.18643	.00005	.00597
	68	229	2.43221	.00000	.00347
	69	230	2.89527	.00233	.00413
	70	231	1.32838	.00000	.00189
	71	232	2.12892	.00014	.00304
	72	233	.35039	.00001	.00050
	73	234	.51308	.00128	.00073

	74	235	3.90262	.00178	.00557
	75	236	1.90361	.00075	.00272
	76	237	3.96787	.00164	.00566
	77	238	3.15928	.00134	.00451
	78	239	5.19857	.00142	.00742
	79	240	4.65358	.00040	.00664
	80	241	2.48044	.00139	.00354
	81	242	2.63293	.00108	.00376
	82	243	3.37438	.00004	.00481
	83	244	.15030	.00007	.00021
	84	245	2.15974	.00000	.00308
	85	246	1.30533	.00001	.00186
	86	247	2.67315	.00098	.00381
	87	248	4.02668	.00333	.00574
	88	249	.57364	.00001	.00082
	89	250	1.07193	.00009	.00153
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	91	252	2.57079	.00011	.00367
	92	253	1.92760	.00000	.00275
	93	254	1.59596	.00006	.00228
	94	255	3.76772	.00227	.00537
	95	256	2.62633	.00293	.00375
	96	257	1.56328	.00072	.00223
	97	258	.10750	.00002	.00015
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	100	261	1.57063	.00087	.00224
	101	262	5.39611	.00242	.00770
	102	263	1.82455	.00038	.00260
	103	265	.10351	.00000	.00015
	104	266	5.15138	.00050	.00735
	105	267	3.12157	.00000	.00445
	106	268	4.46125	.00291	.00636
	107	269	6.85764	.00034	.00978
	108	270	.92436	.00303	.00132
	109	271	1.94150	.00110	.00277
	110	272	8.70470	.00003	.01242
	111	273	3.15350	.00009	.00450

	112	274	2.21097	.00053	.00315
	113	275	1.20304	.00000	.00172
	114	276	4.26421	.00719	.00608
	115	277	1.61334	.00033	.00230
	116	278	1.29463	.00100	.00185
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	118	280	.49402	.00290	.00070
	119	281	.52147	.00059	.00074
	120	282	9.36740	.00100	.01336
	121	283	3.91498	.00764	.00558
	122	284	.76324	.00000	.00109
	123	285	3.06394	.00088	.00437
	124	286	2.15225	.00122	.00307
	125	287	.19528	.00003	.00028
	126	288	4.01286	.00229	.00572
	127	289	1.32008	.00012	.00188
	128	290	1.78961	.00086	.00255
	129	291	4.37788	.00043	.00625
	130	292	3.56380	.00029	.00508
	131	293	8.37099	.00065	.01194
	132	294	3.07616	.00576	.00439
	133	295	2.00509	.00002	.00286
	134	296	4.19270	.00022	.00598
	135	297	1.73485	.00076	.00247
	136	298	2.74984	.00035	.00392
	137	299	.60977	.00020	.00087
	138	300	1.72640	.00016	.00246
	139	301	4.89726	.00000	.00699
	140	302	.58379	.00017	.00083
	141	303	3.36120	.00807	.00479
	142	304	1.32602	.00059	.00189
	143	305	1.74535	.00012	.00249
	144	306	1.78044	.00000	.00254
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	146	308	6.23444	.00491	.00889
	147	309	2.58942	.00083	.00369
	148	310	5.54534	.00406	.00791
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	150	312	4.03148	.00295	.00575
	151	313	3.00783	.00218	.00429
	152	314	2.44427	.00145	.00349
	153	315	.79963	.00002	.00114
	154	316	2.89430	.00142	.00413
	155	317	.37261	.00001	.00053
	156	318	.60639	.00070	.00087
	157	319	1.65737	.00036	.00236
	158	320	.98182	.00109	.00140
	159	321	1.96763	.00023	.00281
	160	322	1.54477	.00135	.00220
	161	323	2.00432	.00010	.00286
	162	324	3.09276	.00001	.00441
	163	325	1.55005	.00508	.00221
	164	326	1.74015	.00003	.00248
	165	327	.96868	.00027	.00138
	166	328	.07920	.00010	.00011
	167	329	.96793	.00082	.00138
	168	331	1.62284	.00020	.00232
	169	332	2.98226	.00872	.00425
	170	333	1.86033	.00071	.00265
	171	334	.96802	.00023	.00138
	172	335	1.32134	.00004	.00188
	173	336	1.40956	.00227	.00201
	174	337	.71567	.00233	.00102
	175	338	1.31566	.00181	.00188
	176	340	3.12416	.00454	.00446
	177	341	7.45038	.00532	.01063
	178	342	2.87865	.00031	.00411
	179	343	.67947	.00035	.00097
	180	344	.84750	.00017	.00121
	181	345	8.27331	.00178	.01180
	182	346	2.37024	.00107	.00338
	183	347	2.25874	.00011	.00322
	184	348	2.28768	.00216	.00326
	185	349	5.41919	.00172	.00773
	186	350	.78880	.00000	.00113
	187	351	2.68960	.00046	.00384

	188	353	.76324	.00003	.00109
	189	354	4.69461	.00453	.00670
	190	355	4.17548	.00015	.00596
	191	356	2.33334	.00201	.00333
	192	357	.75337	.00097	.00107
	193	358	11.38768	.00089	.01624
	194	359	2.74539	.01186	.00392
	195	360	6.88027	.00017	.00981
	196	361	1.03793	.00000	.00148
	197	362	1.70748	.00369	.00244
	198	363	.85483	.00313	.00122
	199	364	.99871	.00011	.00142
	200	365	1.96428	.00116	.00280
	201	366	1.59679	.00137	.00228
	202	367	2.74896	.00010	.00392
	203	368	.49437	.00030	.00071
	204	369	8.05029	.00207	.01148
	205	372	2.33838	.00026	.00334
	206	373	4.37487	.00104	.00624
	207	374	2.60114	.00039	.00371
	208	375	4.93278	.00006	.00704
	209	376	.82406	.00108	.00118
	210	377	1.61961	.00091	.00231
	211	378	4.23975	.00013	.00605
	212	379	3.72459	.00086	.00531
	213	380	5.16527	.00473	.00737
	214	381	4.47993	.00042	.00639
	215	382	5.26499	.00001	.00751
	216	383	.78981	.00000	.00113
	217	384	3.61198	.00057	.00515
	218	385	3.90902	.00381	.00558
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	221	388	1.80473	.00108	.00257
	222	389	4.00060	.00036	.00571
	223	390	2.16491	.00328	.00309
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	227	394	1.20019	.00147	.00171
	228	395	1.44155	.00022	.00206
	229	396	3.85792	.00500	.00550
	230	397	.09113	.00016	.00013
	231	398	3.32109	.00001	.00474
	232	399	.30091	.00009	.00043
	233	400	.96960	.00055	.00138
	234	401	6.05771	.00333	.00864
	235	402	.99916	.00183	.00143
	236	403	6.16198	.00157	.00879
	237	404	7.07943	.00000	.01010
	238	405	1.45810	.00271	.00208
	239	406	1.24712	.00043	.00178
	240	407	2.49914	.00197	.00357
	241	408	6.19179	.00028	.00883
	242	409	1.12891	.00142	.00161
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	244	411	2.45960	.00007	.00351
	245	412	3.21895	.00002	.00459
	246	413	1.74114	.00019	.00248
	247	414	.64613	.00134	.00092
	248	415	5.95230	.00245	.00849
	249	416	.77599	.00014	.00111
	250	417	1.97108	.00073	.00281
	251	418	7.46289	.00356	.01065
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	257	424	1.56953	.00047	.00224
	258	425	2.59791	.00165	.00371
	259	426	.87514	.00008	.00125
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	326	499	2.36828	.00455	.00338
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	481	659	.49213	.00035	.00070
	482	660	1.82815	.00184	.00261
	483	661	2.42947	.00041	.00347
	484	662	2.78895	.00001	.00398
	485	663	2.71901	.00085	.00388
	486	664	2.30807	.00009	.00329
	487	666	.42090	.00041	.00060
	488	667	3.62476	.00010	.00517
	489	668	1.99652	.00004	.00285
	490	669	5.21061	.00366	.00743
	491	670	2.61606	.00091	.00373

	492		671	3.72560	.00103	.00531
	493		672	.64053	.00008	.00091
	494		673	.66988	.00137	.00096
	495		674	7.35652	.00059	.01049
	496		675	3.34126	.00040	.00477
	497		676	2.82028	.00001	.00402
	498		677	3.10510	.00086	.00443
	499		679	2.43771	.00027	.00348
	500		680	.14753	.00022	.00021
	501		681	1.48702	.00094	.00212
	502		682	5.27253	.00184	.00752
	503		683	2.70722	.00041	.00386
	504		684	4.07193	.00170	.00581
	505		685	2.00826	.00182	.00286
	506		686	1.77235	.00000	.00253
	507		687	2.41087	.01562	.00344
	508		688	4.74959	.00014	.00678
	509		689	4.89801	.00064	.00699
	510		690	7.32434	.00641	.01045
	511		691	2.12105	.00043	.00303
	512		692	6.28064	.00011	.00896
	513		693	2.21385	.00065	.00316
	514		695	8.17572	.00274	.01166
	515		696	7.43037	.01570	.01060
	516		697	2.12105	.00043	.00303
	517		698	5.50404	.00056	.00785
	518		699	2.82179	.00046	.00403
	519		700	.02368	.00006	.00003
	520		701	1.89754	.00008	.00271
	521		702	1.32461	.00005	.00189
	Total	N		521	521	521
1	1		175	.24026	.00019	.00034
	2		182	3.88628	.00001	.00554
	3		206	.44687	.00016	.00064
	4		264	6.73924	.00074	.00961
	5		330	.19270	.00004	.00027
	6		339	4.83141	.00474	.00689
	7		352	.80852	.00003	.00115

		8		370	.95016	.00095	.00136
		9		371	2.64665	.00096	.00378
		10		428	.40888	.00013	.00058
		11		438	.95166	.00312	.00136
		12		441	1.98495	.00679	.00283
		13		461	1.17504	.00000	.00168
		14		483	1.07490	.00000	.00153
		15		490	6.52554	.00037	.00931
		16		517	5.08168	.00109	.00725
		17		521	3.85324	.00196	.00550
		18		596	1.83274	.00002	.00261
		19		599	2.69049	.00164	.00384
		20		622	.72669	.00252	.00104
		21		665	.85023	.00028	.00121
		22		678	.13091	.00001	.00019
		23		694	.56005	.00000	.00080
		Total	N		23	23	23
	Total	N			544	544	544

a. Limited to first 800 cases.