Online Game Playing and Early Adolescents' Online Friendship and Cyber-victimization

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The present research comprised four studies to investigate the relation of online game playing and correlates of three important aspects, namely friendship, victimization and bullying, of social development of Hong Kong Chinese grade 5 and 6 students. Comparisons of these correlates across two contexts, the real life and internet experiences, were also made. Four hundred ninety-four grade five and six students (mean age = 11.54, *SD* = .91) participated in Study 1. Average times spent on different types of different type of computer games and the importance of social functioning of online games were determined. Average time spent per day on Massively Mutliplayer Online Games (MMOGs), solitary computer games, handheld video games e.g. NDS, PSP, and home video consoles (e.g., Wii) were 2.38 hours (*SD* =2.21), 1.66 hours (*SD* =1.86), 1.25 hours, (*SD* =1.54), and .67 hours (*SD* =1.15), respectively. Social functioning of online games was positively correlated with life satisfaction of early adolescents.

Seventeen teens (mean age = 11.71, *SD* = 1.26) who had experiences in playing online games participated in the focus group interviews of Study 2. Their responses were collected in order to develop comprehensive scales to measure cyber-victimization and cyberbullying, so as to better understand the differences between online and real life friendship and also to reveal the reasons behind playing online games. Studies 3 and 4 were based on the same sample of six hundred twenty-six grade 5 and 6 students (mean age =10.81, *SD* = .83), but with different

purposes. In Study 3, two scales, both ultimately (following test analyses) comprised of eight items were developed for measuring cyber-victimization and cyberbullying, They demonstrated satisfactory reliabilities and criterion validities. In Study 4, the relative quality of best friendship in online games versus in real life, aas well as the relative importance of friendship, victimization, and bullying in real life and in online games in relation to early adolescents' overall psychosocial adjustment were examined. Online victimization and online bullying were negatively related to psychological well-being of early adolescents. After controlling demographics, computer gaming habits, school victimization and real life friendship, online victimization still significantly and negatively explained additional variance in friendship satisfaction, while online friendship still positively and significantly explained additional variance in social competence, friendship satisfaction, self esteem and life satisfaction after demographics, computer gaming habits, school victimization, and real life friendship were statistically controlled. Gender moderated the relationship between real life friendship and social competence and friendship satisfaction, but it did not moderate the relationship between online friendship and the other psychological constructs. This research demonstrated the theoretical and practical importance of investigating social experiences (both negative, i.e. being cyber-bullied, and positive, i.e. building up online friendship) in the online context.

青少年與網絡遊戲、網上友誼及網絡欺凌

摘要

本研究分爲四個部分，以探討網絡遊戲與香港小學五、六級學童社交發展，並就友誼，受欺凌及欺凌他人這三種社交經驗於現實生活及在互聯網上各相關因素作出比較。研究第一部分調查了 494 名小學五、六年級學生（平均年齡 = 11.54，標準差= 0.91）花在不同類型的電腦遊戲上的時間，並確定了網絡遊戲社交功能的重要性。受訪學童每天平均花在多人線上遊戲（MMOGs），個人電腦遊戲，掌上型電子遊戲，例如 NDS，PSP 和家庭電視戲機（如 Wii 遊戲機）的時間分別爲 2.38 小時（標準差= 2.21），1.66 小時（標準差= 1.86），1.25 小時（標準差= 1.54）及 0.67 小時（標準差= 1.15）。此外，研究第一部分亦確定了在線遊戲的社交網絡功能與青少年的生活滿意度程度成正向關係。

爲制定一個更全面的量表來量度網絡欺凌，及更清楚了解現實生活和互聯網上友誼之分別與及青少年喜歡玩網絡遊戲的原因，17 個經常玩網絡遊戲的青少年（平均年齡 = 11.71，標準差= 1.26）參加了本研究的第二部分--焦點小組訪問。研究的第三及四部分均採用同一組有 626 名小五、六年級的學生（平均年齡爲 10.81，標準差= .83），但兩部分研究目的不盡相同。研究的第三部分主要是爲制定兩個量度被網絡欺凌與網絡欺凌他人的量表，其可靠性和有效性均達標。研究的第四部分則比較了網絡遊戲中與現實生活中的友誼質量，並反映了網絡欺凌與網上友誼與學童社交發展的關係。學童在網絡上欺凌人或是被欺凌的經驗與他們的社交發展呈負向關係。在控制了學童背景資料，玩電腦遊戲的習慣，於現實生活中的友誼及被欺凌的程度後，於網上被欺凌的經驗仍然顯著及負向地解釋了學童對友誼的滿意程度。與此同時，在控制了學童背

景資料，玩電腦遊戲的習慣，於現實生活中的友誼、被欺凌的程度，及於網上被欺凌的經驗後，網上友誼仍然顯著及正向地解釋了學童對友誼的滿意程度、生活滿意程度、自尊感及社交能力。本研究調查了兒童與青少年於網絡上可能遇到的正面(建立網上友誼)及負面(網絡欺凌)的影響，其理論和實用性俱佳。

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Chapter 1: Introduction

The goal of this dissertation was to compare the experiences and correlates of three important aspects of social development, i.e., friendship, victimization, and bullying, across two social contexts of daily life, i.e., school and the internet, among Hong Kong Chinese early adolescents. The social context of how online gaming may be related to peer relationships among early adolescents has been under-explored. As both positive and negative peer relationships are important, with development, for overall psychosocial adjustment among early adolescents. It is important to understand the extent to which online interactions with friends or bullies is associated with children's overall self-esteem and life satisfaction. Thus, in the present research, four studies were carried out to a) demonstrate the overall prevalence rate and importance of online gaming for Hong Kong Chinese early adolescents, b) construct and validate two scales with items on victimization and bullying in cyberspace and compare the experiences of victimization and bullying online and offline, and c) demonstrate the relative quality of best friendship in online games versus in real life, and also the relative importance of friendship, victimization, and bullying in real life and in online games in relation to early adolescents' overall psychosocial adjustment. In this dissertation, the importance of the online context among children and adolescents is first overviewed, followed by general research on friendship, victimization, and bullying, most of which has been conducted in school contexts. Online and real life (school) comparisons are then made.

Computer games: types and popularity

To study how computer games may be related to the development of early adolescents, the first issue is the nature of computer games themselves. Computer gaming is at least divisible into two broad categories, i.e., online vs. offline and solitary vs. social play. There

are many flash or shockwave games that are available online (i.e., on the internet) for a single player but the online element, i.e., the internet, merely serves as a medium for distributing these games (Chan & Vorderer, 2006). In contrast, some other online games allow players to play with a large number of other players simultaneously, and players interact, compete, or cooperate with other players. They can also communicate with each other to play in a virtual and detailed world. These games are called massively multiplayer online games (MMOGs). Most of the MMOGs are in fact MMORPG (massively multiplayer online role-playing game). In MMORPGs, players have their own characters, and they play the role of a given character in the virtual world (Chan & Vorderer, 2006). Despite the fact that computer games can be differentiated into different categories, in practice, as suggested by Durkin and Barber (2002), most researchers do not differentiate across different types of game equipment or the nature of games when describing their studies of computer games. Thus, for the sake of simplicity, unless otherwise specified, 'computer games' in the present review refers to all types of games mentioned above, including online or offline, playing in groups or alone, or playing using different kinds of hardware.

How popular are computer games? There are more than 41.1 million video game consoles in US households (Chan & Vorderer, 2006). In Germany, more than 80% of households with 12- to 13-year-old children own computers; children on average own more than 7 computer games. According to a 2003 statistic, most children begin using computers when they are six, and by the sixth grade, fewer than 20% of them have no experience in using computers (Feierabend & Klingler, 2003; cited in Salisch, Oppl, & Kristen, 2006). Children's computer usage appears to be increasing overtime as well. For example, in a study by Stanger and Gridina (1999), parents of children from 2 to 17 years old reported that their children spent around 1.5 hours per week on the computer. In the

HomeNet project, adolescents reported spending around 3 hours per week on the internet (when available), and around 10% of these teens ages 10 -19 years old reported playing computer games more than 16 hours per week (Kraut, Scherlis, Mukhopadhyay, Manning & Kiesler, 1996). However, in some more recent studies, children have reported spending even more time in playing computer games. For example, Gentile, Lybch, Linder and Walsh (2004) found that young American boys and girls reported spending on average 13 and 5 hours, respectively, on gaming per week. In Hong Kong, self-reports indicate that teens and young adults spend on average 3.1 hours on the internet per day, with approximately 10 hours per week spent on online games, up considerably from a previous study of teens and young adults done 6 years before (Breakthrough, 2003). Another survey including adolescents from Shanghai, Hong Kong and the U.S., carried out by a market research firm called Harris Interactive (Digital Communities, 2007)found that more than 90% of Hong Kong and Shanghai 15-21 year olds spent time on instant messaging , while about 69% of U.S. 15-21 year olds did the same. Sixty-four percent of those from Shanghai, 46%of Hong Kong adolescents, and 22% of U.S. teens (15-21 year olds) reported playing Massively Mutltiplayer Online Games (MMOGs) as well. Another recent report based on children to young adults (from 9 to 24 years old) in Hong Kong showed that they spent 2 to 4 hours on average per day on computers; early adolescents from 9 to 12 had positive evaluations of the use of computers (Comission on Youth, 2008).

Nevertheless, there is still a lack of local studies that particularly investigate the computer gaming habits among Hong Kong Chinese early adolescents. In order to understand more about the computer game playing habits of Hong Kong Chinese early adolescents, such as their time spent and frequency of games, their preferences and attitudes toward computer games, and some of their social experiences in online games, Study 1, which involved 461 Chinese fifth and sixth graders from two primary schools in

Hong Kong, was carried out . More details of the survey will be given in the method section. Some basic findings concerning the popularity of computer games in early adolescents suggested that 83% of the participants claimed that they had had more than 1 year of experience in playing computer games, while 68% of them had had at least 2 years of computer gaming experience.

Computer games and the social development of children and adolescents

Past research has shown both negative and positive influences of computer game playing on the development of children and adolescents. The negative impacts of potentially developing an aggressive affect and aggressive behaviors by playing violent computer games (e.g. Anderson & Dill, 2000; Sherry, 2001), and the problem of addiction (e.g. Griffths, 2000) have been the major concerns. Nevertheless, there has been more and more recent research showing how computer game playing may be related to the social development of children and adolescents. That is, more current research is increasingly focused not just on the socio-emotional impact of computer gaming for the individual in a general way but more specifically on the effects of such gaming on particular social relationships. Generally, there has been a concern that children and teens may spend too much time on computer games or the Internet, which may reduce their time for face-to-face interactions with friends and families and, therefore, would lead to social isolation (e.g. Kraut, et al., 1998; Nie & Erbring 2002). Despite these well-founded concerns, there are a number of positive aspects of computer game playing related to the social development of children as well. For example, computer game playing is positively related to better self concept (Durkin & Barber, 2002). In addition, frequent computer game players tend to have more friends (Colwell, Grady, & Rhaiti, 1995) than non-players. In general, teens tend to play computer games with others. Thus, rather than leading to social isolation, playing computer games can be a useful social experience (Durkin & Aisbett, 1999).

Indeed, some teens play these games precisely because they are attracted by the multi-player setting which allows them to have social interaction within the games (Raney, Smith, & Baker, 2006).

What attracts adolescents to play computer games? Several researchers suggested that computer games are appealing to children and adolescents because their designs match with several important tasks when they grow up (Raney et al., 2006; Salisch, Oppl, & Kristen, 2006). More specifically, computer game playing seems to be related to some of the developmental needs of friendship for children and adolescents. To understand how computer game playing is related to the friendship development of children and adolescents, it is important to understand the ways in which to characterize friendship development for children and adolescents in the first place.

There are many ways to define friends or friendship. In a broad sense, friendship means "affectionate attachments between two individuals" (Bukowski, Newcomb, & Hartup, 1996, p.3). It is different from family bonding as it is entirely voluntary. Although younger children's friends or playmates could represent either random or deliberate choices by parents for several reasons (Howes, 1996), starting from middle childhood, selecting friends becomes a decision that adolescents themselves make. Having common interests, liking each other, and having fun with one another are some of the conditions under which children's and adolescents' friendships develop (Bukowski et al., 1996). Piaget (1932) suggested that having true inherent equality and reciprocity, such as cooperation, is essential to the development of friendship for children and adolescents. Children first learn about cooperating with others and respecting each other based on friendship. Similarly, Sullivan (1953) suggested that cooperation, mutual respect, and reciprocity are the three major qualities for children's and adolescents' friendships. Starting from early adolescence, there are transitional changes and friendship pattern changes as well, probably due to

changes in puberty and changes in social roles. Early adolescents start to have different emergent needs. For instance, Erikson (1968) suggested that during early adolescence, one of the major crises is inferiority versus industry. In this stage, self esteem and self worth, important agentic needs, are strongly related to friendship. This is the time when teenagers start to value friends who are with them through their successes and failures, ups and downs. In addition, Sullivan (1953) suggested that communal needs, i.e., being accepted by friends and being involved with or loved by peers, are major developmental needs for teenagers. Buhrmester (1996) suggested that biological maturation, cognitive development, and other factors such as personal history and cultural expectations both affect what the most important issues at a particular time of development throughout the lifespan are, and these concerns will create several needs to be fulfilled in different types of relationships. As teenagers have particular esteem, self- exploration, and intimacy needs, their friendship relationships change accordingly to meet these needs.

Because of the global changes in adolescence and the above-mentioned changes in needs, the characteristics of teenagers' friendships are different from those of childhood. With the increase in cognitive and social ability due to maturation, friendship in early adolescence starts to be more "talk" than "play" oriented (Buhrmester, 1996). Teens also need various supports from their friends. Berndt (2004) identified four major types of support which are specifically important in characterizing adolescent friendship. The first is information support, which means the advice and guidance that teenagers can get from their friends when they encounter problems. The second is instrumental support, i.e., the different kinds of help and supports or benefits that they can get from friends. The third one is companionship support, which is the idea that friends can accompany each another in social activities share similar activities. The final aspect of support is esteem support, in which teenagers begin to realize their strengths and own worth, as well as facing their

successes and failures, through the eyes of their friends.

Overall, adolescents' friendship includes a much stronger emphasis on intimacy than it has up until this time. Adolescents start to experience a more intensive liking towards one or a few particular close friends (Laursen, 1996). In addition, adolescence is a time in which teens start to be independent from their families. That is, they try to rely more on their friends than their parents in relation to different issues. Indeed, friends start to become one of the most important sources of happiness for adolescents. In addition, early adolescents experience increasingly more complex social interactions, and from these, they master interpersonal competencies (Buhrmester, 1996). Friendship offer teens a context in which to experience interactions and prepare to develop all the necessary skills for future relationships (Newcomb & Bagwell, 1996). For example, as teenagers start to rely more on their friends, they have to work through more conflicts and cooperation with their friends within friendship. For instance, studies (e.g., Laursen, 1995) have found that, compared with younger children, adolescents are more willing to settle conflicts with their close friends. In addition, trust and loyalty from friends are much more highly valued for young adolescents (Berndt , 1996). Adolescents expect their friends will be "on their side" in the event of rumors being spread, and they expect that their friends will not talk about them "behind their back;" they also expect to fight together (especially among boys) if they are involved in any fights (Berndt, 1996).

As suggested by many past studies, social competences (Buhrmester, 1996) and self esteem (e.g. Berndt & Miller, 1993, Newcomb & Bagwell, 1996) would be psychological constructs that are highly related to friendship quality. Children and adolescents with more satisfying friendships are likely to have better social competences in terms of negative assertion, relationship initiation, conflict management, self-disclosure and emotional support. Having good friendship typically implies enjoying plenty of chances to practice

interacting with others; therefore, it is positively correlated with social competence. Finally, adolescents' friendship involves changes in contexts (Buhrmester, 1996). It is no longer necessary for adolescents to find friends from the classroom or playground only. There are plenty of other social contexts in which teens can find friends as they grow up. In the digital age, meeting friends in online games is a new such context.

Similar to other media that are popular, playing online games serve as a common topic for teens to talk about and share. Players exchange knowledge and teach skills related to computer games, including different game strategies or perhaps cheats and tactics of the games. Such conversations can help to improve their social and communication skills (Goldestein, 2003; Vandeventer, 1998). In addition, children can play these computer games with their friends together. Feierabend and Klingler (2003) found that 43% of the German girls and 59% of the boys were involved in game playing with their friends at least once a week, and talking about computer games among friends is one of the most popular topics among teens as more than 70% of them reported that most games information is from their peers. On the playground or in schools, it is common to see children and teens group together to talk about games. Those who are familiar with games may be much more easily be accepted by others; while those who never play may be rejected. Therefore, playing games is considered social capital to build up social networks, and this may be especially true among boys (Raney, Smith, & Baker, 2006). Owning games, knowing games, and playing games tie adolescents to their peers.

MMOGs and online friendship

Other than this global appeal of computer games as a source of commonality among adolescents, interactive games such as MMOGs further offer chances for teens to build up identity and friendship by interacting with others within games themselves. In the present research, massively multiplayer online games (MMOGs) was the major focus because it is

one of the favorite choices for teens and adolescents (Yee, 2007). As a matter of fact, the industry of MMOGs is expanding (Chan & Vorderer, 2006), and game developers invest resources in advancing MMOGs to make them a more realistic and exciting. MMOGs emphasize a virtual but persistent world, with visually realistic 3-dimensional environments for their players. Computer-mediated human voices, fantastic musical backgrounds, and realistic sound effects in games are the biggest selling points of MMOGs, and these aesthetic features increase the level of enjoyment and trigger more emotional responses for players and thus making the games more appealing. The interactive nature of MMOGs has captured the attention of researchers, with most of them suggesting that MMOGs facilitate the formation of social networks and social interactions (Cole & Griffiths, 2007; Yee, 2001; 2006; 2007).

Forming relationships and building up a social network is one of the major developmental tasks for adolescents (Gowers, 2005). MMOGs are appealing to adolescents because their interactivity matches the developmental needs of teenagers. They provide both entertainment and communication (Chan & Vorderer, 2006). There are several features of MMOGs which allow players to form groups. For instance, they can add names to a buddy list and form connections with a group of people. Players can also ask questions about tactics for the games, or chat, or put up announcements, etc. in the game. The function of instant messaging also allows players to have more social interactions. Gamers compete or cooperate with others in the games, and they can form a team to play together, which fulfill their needs for having affiliations with others. Players have a new opportunity to form social networks with people that they have not met in the "reality" (Gennaro & Dutton, 2007). Other than that, there are other properties of MMOGs which may allow the development of online friendships. For instance, players usually form groups to play and they exchange help with one another in order to advance in levels, and they exchange tips

and cheats in the games. They tend to support each other, or back each other up while other groups of players try to attack them. They may also exchange ideas or opinions on various topics via the instant messaging function. All these characteristics of MMOGs seem to provide instrumental, companionship, informational, and even esteem support to adolescents. All these supports are central elements of adolescent friendship. Furthermore, through playing in similar online games, adolescents are obviously interacting with friends who have shared preferences in media and leisure activities; as they back each other up in games, trust/loyalty can develop further. Also, feelings of intimacy may also be one result, as teens talk about their feelings and thoughts in games. The anonymous nature of online friendship may enable more self-disclosure about their true selves, which, for some, affords a kind of intimate relationship that cannot be experienced elsewhere (McKenna, Green & Gleason, 2002).

In addition, MMOGs allow players to communicate both in and outside of the games. The communication within the games acts as a base for the development of friendship. Players can then discuss things other than games and they may develop a friendship apart from the games themselves. In one recent survey, 18% of adolescents aged 14-17 reported that they made friends online, and 10% of them had then gone on to meet their online friends in person (Gennaro & Dutton, 2007). As for adult online gamers, about half reported that their relationships with their online friends are comparable to their offline friends, while more than 30% of them believed that their online friends are as trustworthy as their offline ones. For instance, shy people may feel particularly limited in everyday life interactions with people; yet, Sheeks and Birchmeier (2006) found that both people who are high in shyness and sociability experience more satisfactory online relationships. There are also studies that have suggested that computer talk can empower people with physical disabilities or disfigurements (Bull & Rumsey, 1988; Lea & Spears, 1995). For adolescents

who are not that physically attractive, or those who have not adapted to their body change due to puberty and have a low self image, MMOGs seem to be a good place for them to build up some networks to fulfill their needs of being accepted. In MMOGs, they do not have to show their face but are represented by a character, which may reduce their fear of interacting with others. While the media and society emphasize the importance of physical attractiveness, it seems that the anonymity nature in MMOGs may also be suitable for teens who are very shy.

How is the quality of online friendship compared with that of offline friendship? Despite the many similarities of online friendship with friendship in everyday life, including having various types of support, trust, intimacy, shared interests, etc., there could also be some differences between online and everyday life friendship, such as the lack of physical contact, physical cues, or perhaps in depth exchange of emotions. One may argue that online friendship is very much context-dependent. For example, depending on how much time players spend in the games, this kind of friendship may not be as enduring as everyday life friendship. Nevertheless, it is a fact that teens have friends in online games, and this is another context which is different from the interactions in everyday lives. Research on how online friendships are formed suggests that the new formation of online friendship is somewhat different from traditional theories of relationship formation. Physical appearance, verbal clues, and proximity are essential elements in which social relationships develop (e.g. Lea & Spears, 1995). However, these are all absent in a relationship based purely on online computer games.

Compared with offline friendship, online friendships seem to have less social presence. Social presence refers to "the number of channels or codes available within the communication" (Chan & Cheung, 2004, p.306). Therefore, friendship that is merely based on computer mediated communication (CMC) seems to be of a lower quality than an

offline one because of a lack of these clues (e.g. Parks and Roberts, 1998). Nevertheless, Chan and Cheung (2004) have suggested that, as time goes by, the qualities of both online and offline friendship increase, and the differences between the two decrease: With sufficient time, the information and support exchanged in an online friendship start to become comparable to an offline one. From the literature above, it is clear that MMOGs offer a different experience to teenagers. Nevertheless, most past studies which studied online vs. offline friendship were generally on Computer-mediated communication (CMC) only, which means communication by instant messaging computer programs, e.g. Microsoft network (MSN), and "I seek you" (ICQ), or online forums, or else have not specified where these relationships were (e.g. Parks & Roberts, 1998; Sheeks & Birchmeier, 2006) . Based on the social presence theory, the extent to which there is a "real" the existence of the friend on the other side of the computer matters in the perception of the quality of friendship. It seems that in MMOGs, as teens are playing with other people in the game, and all their interactions are on a real-time basis, their subjective feelings of interacting with a real person should be relatively strong. However, no matter how interactive the communication on MMOGs may be, interacting with others on MMOGs by nature is still computer-mediated communication; thus, there is still a lack of facial expression, direction of looking, gesturing, and nonverbal cues (Walther, 1992).

Such communication may still be of a low social presence compared with real life interactions with friends. However, because of its interactive nature, in the virtually realistic MMOGs, a lot of players are playing or competing on a real- time basis, with their avatars representing themselves. The extent of social presence, in other words the feeling about how involved the other players are in communication, may also be higher here than those in the traditional CMC. The question of how online friendship in MMOGs may be different or similar to real life friendships is an important one. In addition, it is interesting

to consider the extent to which this additional online friendship matters in explaining the psychological well-being of early adolescents. The present study will explore this issue.

Despite the fact that friendship in MMOGs may be less well developed than real life friendship (e.g. Chan and Cheung, 2004), because of the nature of MMOGs, it seems that certain constructs that are important to friendship to real life can also be applied to friendship in MMOGs. In MMOs, instrumental support is believed to be strongly emphasized because players can achieve goals much more easily by staying with others; therefore, they may be willing to help each another in order to "level up" in a game. Also, as players tend to form teams with other players and some of them form unions in games, despite the fact that they cannot see each other, they may still tend to stick together if there are any kinds of bullying from players of other groups. In addition, as online friendship tend to be anonymous, without the concern for social desirability, it is likely that online friends would be frank to each other. They may feel even more comfortable talking about problems of themselves to their online friends. It is not rare to find highly personal problems, such as relationships, family or health issues are being exposed and discussed in a number of online forums. Such a trend may suggest that teens may trust their online friends perhaps as much as or even more than their real life friends.

Moreover, most MMOGs encourage a game spirit, which means players more easily gain points if they form teams, and they can trust each other in carrying out different missions in the game. Such a game nature may also facilitate the growth of trust and security among children who are their online friends. Similar to many adults who may prefer to phone or email to catch up with their friends (as opposed to face-to-face interaction), perhaps in part because it seems less embarrassing to do so, the anonymous nature of online friendships in MMOGs may make teens playing online games less embarrassed to initiate the talk/ play again even after they have had conflicts or problems

with one another. Because players usually stay in the same group or the same union to play MMOGs, this style may also make children think that problems can be resolved easily as long as they try to apologize if there are problems, and then they can play together again easily and, for example, fight with the big monster in the game together. Therefore, they may feel equally secure about online friendship as compared to real life friendship. In contrast, on friendship dimensions that emphasize more intimate attachments, such as emotional support or sensitivity, i.e., overall closeness of friendship quality, online friendship may be less facilitative than offline friendship. In addition, compared with friendship in reality, in which friends can accompany children to carry out many different tasks, online friends can only accompany them when they play computer games, and the majority of children and teens are not meeting their online friends in reality. It is, therefore, sensible to suggest that companionship in online friendships would also be less comparable to real life ones. Four subscales of the Bukowski et al. (1994) friendship qualities scale were used in the present study. The conflict subscale was not included because the items in the conflict subscale do not seem to fit into the context of online friendship as well as the other four because it involves items which ask directly about "getting into fights" and also arguing, both of which may not have similar parallel items for online friendship. Also, Demir and Urberg (2004) suggested that the conflict subscale measures negative aspects of friendship, while the other four capture the positive qualities of friendship. Therefore, including the four subscales on positive aspects of friendship only were thought to be sufficient to examine the similarities and differences of online and real life friendship.

Computer games and Cyber-bullying

Apart from the potential positive linkage between online friendship and interactive online games, there are also risks for children and teens in the social ambiguity of online

meetings, including ganging together of "bad" kids or even meeting ill-intentioned adults pretending to be teens. Unlike online friendship, which is common in MMOGs because of their interactive nature, cyberbullying and cyber-victimization are not only limited to MMOGs; indeed, they could happen as long as people have access to any electronic communication forms. The issue of being bullied in cyber space particularly worries parents and educators (Franek, 2004). Cyberbullying has various definitions, Mason (2008) summarized several research studies on cyberbullying, and he defined it as "an individual or a group willfully using information and communication involving electronic technologies to facilitate deliberate and repeated harassment or threat to another individual or group by sending or posting cruel text and/or graphics using technological means" (p.323). Examples of cyberbully include sending anonymous threatening messages, name-calling, gossiping in various forms, ignoring, blaming, or even hacking or virus bombing (Dehue, Bolman, Vollink, 2008) The two most common means of cyberbullying are through computers or cell phones (Patchin & Hinduja, 2006). Instant messages, emails, online chat rooms, online bulletin boards, online gaming, or even blogs that are popular among adolescents could all provide spaces for cyberbullying to occur (Mason, 2008). Similarly, threatening messages can be spread by mobile phones text as well.

Cyber-victimization and traditional victimization

If one is a victim of cyberbullying, such an experience is called cyber-victimization. How popular is cyber-victimization? Results on this are mixed but generally, past research has suggested that 9% to 25% of children and adolescents have experience in being cyberbullied and 15 to 28% of them have cyberbullied others. For instance, Wolak, Mitchell, and Finkelhor (2006) found that among American teenagers ages 10-17, 9% of them said that they have been harassed online, while 28% of them said that they have harassed people online before. Another web-based study with the majority of respondents

being Caucasian suggested that 29% of the teenagers have been cyberbullied before, while 11% reported that they have cyberbullied others, and 47% of them reported they have witnessed cyberbullying (Patchin & Hinduja, 2006). Li (2007) also found that about 54% of grade seven students in Canada were bullied victims from offline bullying and about one fourth of them have been cyberbullied as well, while 31 % of them were bullies offline, and 15% of them have also cyberbullied others.

How is cyber-victimization different from victimization in everyday life? To understand the issue, we have to overview the nature of bullying and victimization around school first. There are many different definitions of traditional bullying and victimization. Bullying can be classified into direct and indirect bullying. Direct bullying usually involves physical or direct verbal aggression. Hitting and punching, for instance, are examples of direct physical aggression, while scolding, name-calling, and direct verbal threatening are examples of direct verbal bullying. There is also indirect or relational bullying (e.g. Bjorkqvist, Lagerspetz &Kaukiainen, 1992 , Olweus,1993, Mynard & Joseph, 2000) which involves aggression that is more complicated and subtle in nature. Bullies use social manipulation such as intentional ignoring, isolating from group activities, spreading rumors, etc. to harm the victims. Research has suggested that indirect bullying is much more common in girls than in boys (e.g. Mynard & Joseph, 2000). Bullies tend to be more hostile, aggressive and less pro-social (Haynie et al., 2001) and they tend to have more externalizing problems associated with conduct disorders (e.g. Prinstein, Boergers, & Vernberg, 2001).

In general, victimization means there are victims who receive direct and indirect, verbal or psychological attacks from people with the intention to harm them, and this is repeated (e.g. Olweus,1993). Victims of traditional bullying usually have some special physical, behavioral or social attributes that make them easier to become targets of bullying

(e.g. Perry, Hodges, & Egan, 2001). For instance, victims tend to have some less socially acceptable physical attributes, such as being smaller in size or being fatter or clumsier physically, and this is especially true for boys; they may be more socially withdrawn or rejected (Smith, Boewrs, Binney & Cowie, 1999). Behaviorally, they may look more anxious, stressed or depressed and be less equipped in social skills to interact with people (e.g. Smith et al., 1999). Again, for boys, being withdrawn and timid is more sex-inappropriate and this may increase their chances of being victims. Also, being victimized repeatedly, some victims may not have the adequate cognitive skills to recognize how to handle some difficult social situations, which, in turn, can make them more vulnerable to being victimized (Rubin, Bukowski, & Parker, 1998). Indeed, there have been some debates on the reasons for teens to be victimized. Some victims tend to have characterological self blaming (Graham & Juvonen, 1998); they believe that it is their own passive, uncontrollable personality that contributes to their experiences, this kind of negative beliefs may further reinforce behavioral self blame, which means some victims tend to blame themselves that it is because they behave inappropriately, that they "deserve" to be bullied by others. Having this kind of self blame and believing that being harassed by others is something that cannot be avoided would lead to more maladaptive responses in children and adolescents. Nevertheless, the question of whether this kind of attribution is a disposition, i.e. a trait of victims, or it is just a situational style remains unanswered. It is possible that victims respond or react differently from context to context, and it is not necessarily that they are victims all the time when the context changes (Graham & Juvonen, 2001).

Besides the fact that the negative attribution of victims may cause them to be constantly victimized, there has always been an argument about what makes a victim a victim. Is victimization the result of being in a particularly difficult context with "bad"

people, or is it because of some qualities of the victims themselves that cause bullies to pick on them? (Ross, 1996). Contextual factors such as whether the context is of a particular structure to "facilitate" bullying and whether adult monitoring is sufficient in different social contexts may be relevant to the changes of roles of bullies and victims in different contexts (Parault, Davis & Pellegrini, 2007). Parault et al. (2007) found that, as the context varied, bullying behavior and cooperative behavior varied, suggesting that social contexts play a role in the prevalence rate of different social behavior. Craig, Pepler, and Atlas (2000) suggested that comparing primary schools students in the playground and in classroom settings, there are more aggressive behaviors in playgrounds than in classrooms, and even for non-aggressive students in the classroom settings, some of them become more aggressive in playgrounds. Craig et al. (2000) also suggested that such a difference could be attributable to the fact that there is more observed aggression in playgrounds, which cause children to believe that it is more socially acceptable to carry out aggressive acts on playgrounds. Also, students on the playground are less likely to face consequences (i.e., to be punished by teachers) because there is much less adult supervision in playground settings compared with classroom settings. These previous studies have suggested that when the social context is changed, the prevalence rate of bullying and victimization may differ.

In traditional bullying, bullies are usually people who know the victims. However, in the cyber world, everyone is faceless and it becomes a different context for both victims and bullies. People are represented by characters within games, or just an online name. In fact, a number of cyberbullied victims have claimed that they do not know who the bullies are. For example, Li (2007) suggested that 40% of cybervictims did not know their cyberbullies. In other words, despite some of the risk factors, such as physical or emotional weaknesses, for children being bullied by others from studies of bullying in schools, such

characteristics may not be particularly salient in the online context as they are in real life situations. Therefore, they may not be picked up on as easily as they are in comparison with the real life context. Another important difference is the lack of physical contact between cyberbullies and victims. In the cyber world, cyberbullies are not be confronted with the reactions or consequences of bullying others, while in offline contexts, they may be hit back or punished by adults; there are often more immediate consequences of bullying in real life. Thus, the inhibition effect is much less for online bullying, making adolescents feel more free to bully others (Mason, 2008). As most cybervictims are bullied while they are at home, but connected to the internet (Dehue et al., 2008), they experience this bullying in what they assume to be a safe and private environment. In fact, being the victim of cyberbullying means teens and adolescents can be bullied 24 hours per day if they get online. This could be a threatening experience because rumors and gossip could be spread to a much larger audience in a much faster time (Mason, 2008). However, at the same time, it is also less likely for the victims to get hurt physically. And if they are being bullied in some particular forums, or online games, they can choose to quit that forum or game to escape from the bullies, while such an escape is almost impossible for bullying in real life.

Another difference between traditional bullying and cyberbullying is about the awareness of the issue of cyberbullying. Dehue et al. (2008) suggested that parents are usually unaware of the new technology and they may neglect the issue of their kids being bullied online. Ybarra and Mitchell (2004a) suggested that more than half of adolescents claim that the monitoring from parents about online activities is poor. In addition, teens are not that comfortable telling adults about their experience of being cyberbullied. For instance, Li (2007) found that only 30% of teenagers did report it to adults. In fact, not only parents, but teachers and educators may also fail in any capacity or knowledge to deal with

it (Berman & Li, 2005). The lack of surveillance from parents may reinforce the behavior of cyberbullying. Indeed, Ybarra and Mitchell (2004b) found that adolescents with poor parent-child relationship are two times more likely to become online bullies

In fact, both kinds of victimizations have similar psychological consequences to the victims. Victims of traditional bullying might have some health problems such as suicidal ideation, eating disorders, and chronic illness, and they tend to be depressed and have poorer self esteem (Hawker & Boul, 2000; Mason, 2008; Olweus, 1993). Similarly, Wolak et al. (2006) suggested that cyberbullies are more likely to feel upset, extremely frightened, embarrassed, stressed and depressed. Dehue et al., (2008) suggested that some cybervictims lose trust in others and feel angry. Low self esteem, depression, suicidal ideation, and poorer academic performance are also related to the experience of being cyberbullied (Finkelor, Mitchell, & Wolak, 2000; Meadow et al., 2005).

Despite the many differences between traditional versus online bullying, the basic nature of these two kinds of bullying is still the same. They are both intentional aggression towards others, and aim at causing harm to others. Cyberbullying may tend to be more anonymous, and the breadth of cyberbullying may be larger and the threats may always be there because cyberspace is without boundaries. Nevertheless, under certain circumstances, cybervictims can try to block the bullied messages or threats by changing to another online name, going to other forums, playing other games, etc. Yet, victims of traditional bullying find it difficult to avoid confrontations with bullies because they are usually their classmates. Also, the psychological consequences seem to be similar for both. There has also been a debate about whether victims in reality will become bullies online because they may try to retaliate in an online context, for instance, Willard (2007) suggested that some online bullies are being hurt in real life so that they try to be "get-backers" to release their anger.

In contrast, some other studies have found that victims in real life will still tend to be victims in online situations (e.g. Li, 2006, 2007). This is probably because, even though the context is changed, the personality and the attribution styles of the victims do not change. For instance, Smith, Shu, and Madsen (2001) suggested that despite there being a decline in reports of victimization throughout childhood to adolescence, some children remain victims for many years. Some children may never attain the necessary social skills to deal with bullies and that is one reason for them remaining as victims. This is in line with the characterological self blaming (Graham & Juvonen, 1998) in which victims may tend to perceive that they have done something wrong no matter what and they deserve to be victimized. Based on the above literature review, the question of whether victims are still victims and bullies are still bullies across online and offline contexts arises. In other words, one issue is whether real life victimization experiences or real life bullying experiences can better predict online bullying. If one's real life victimization experience can explain additional variance for online bullying after controlling real life bullying experiences, that may suggest a pattern in which real life victims becoming online bullies. Other patterns would alternatively suggest that real life bullies still tend to be cyberbullies.

Similarly, the extent to which real life victimization and real life bullying predict online victimization should also be investigated in order to draw a clear picture of whether real life victims are still online victims. In addition, as suggested by previous studies (e.g. Hawker & Boul, 2000; Mason, 2008) It is hypothesized that the cyber-victimization experience would negatively predict one's psychological well-being. The unique variance of online victimization on early adolescents' psychological consequences should also be investigated. Finally, findings on the prevalence rates of cyberbullying and cyber-victimization have been mixed and few are based on Chinese population. Prevalence rates are likely to be different in different cultural contexts. Therefore, this research also

aimed at providing the overall prevalence rate of online bullying and victimization and they were compared with the overall prevalence rate of real life bullying and real life victimization.

Victimization and friendship

In the existing literature, the topics of victimization and friendship are sometimes studied together, because both of them represent different forms of social relationships that children and adolescents may experience and that may together contribute to the psychological outcomes of children's well-being (e.g., Ladd, Kochenderfer, & Coleman, 1997). Friendship has its protective function over victimization, probably because friendship offers a context in which children can learn and practice different social skills, and to build up their self concepts and self esteem so as to gain emotional support (Hodges, Boivin, Vitaro, Bukowski, 1999). Research has suggested that having one or more friends is a protective factor for being bullied (e.g. Bukowski, Sippola, & Bovin, 1995, Rizzo, 1989), while lacking supportive friends or being rejected by friends is a risk factor for being bullied (e.g. Hodges, Malone, & Perry, 1997). In other words, friendship, or more precisely, friendship that includes a good quality best friendship can buffer the negative effects of victimization. For instance, based on a sample of fourth and fifth graders, Hodges et al. (1999) demonstrated that having a best friend, especially one providing strong protection, can buffer a child against many negative consequences of victimization. With this consensus that real life friendship can buffer victimization experiences, can online friendship also provide similar buffering functions? After all, online interactions in MMOGS provide additional social contexts in which children and adolescents can interact. Perhaps if such a best friendship online is strong enough, that may also serve to buffer any real life or online victimization experiences.

Overview of the dissertation

To summarize, both online friendship and cyberbullying do exist and are common experiences for children and adolescents. Compared with traditional friendship and bullying, there are some similarities and some differences. Nevertheless, while MMOGs are a new and very popular online experience for teenagers, research on both online friendship, especially friendships and cyberbullying within MMOGs contexts, is rare. Therefore, it is important to study these two issues in more details. There were four major goals of this study. The first one was to gather basic information about the pattern of computer game playing in Hong Kong Chinese students. The second was to develop a scale for measuring the prevalence of cyberbullying and cyber-victimization and to investigate if the pattern of victimization and bullying might change from the real life to the online context. A third goal was to compare and contrast the differences in online and offline friendships in MMOGs and in everyday lives. The last goal was to compare the relative influences of these relationships to the psychological well-being of teenagers, and to investigate the extent to which online friendship might have an additional buffering effect against the consequences of online and real life victimization in children and early adolescents.

Four studies were carried out in the present research. Because of the lack of data for computer gaming habits among Hong Kong Chinese children and early adolescents, Study 1 aimed at exploring computer gaming habits among grade 5 and grade 6 students in Hong Kong. Their demographics, time spent on different types of computer games, preference of computer games, perceived social functions of online games, cyber-victimization experiences and also life satisfaction were investigated. Items on social functions of online games and cyber-victimization were simple and exploratory in nature, acting as a basis for

Studies 2 to 4. Study 2 was a qualitative exploration aimed at gathering in-depth information about the issue of online friendship and online bullying from children and adolescents who have experiences with the cyber world. The purposes of doing this were both to further explore the extent to which the social functions of online games are worth exploring and also to gather additional information for building up the cyberbullying and cyber-victimization scales. Studies 3 and Study 4 involved the same group of participants. However, as the purpose and sequence in which data were analyzed differed, for the sake of simplicity, there are referred to herein as two studies. The focus of Study 3 was the development of two scales for measuring online bullying and victimization; it also revealed the prevalence rates of traditional and online bullying and victimization in a Hong Kong Chinese student sample. As not all children access the internet for various reasons, it was assumed that the prevalence rate for online victimization and online bullying should be lower than for school victimization and bullying. Study 4 then explored the differences in quality of best friendships in real life versus best friendships in MMOGs. It was assumed that, because there would be a lack of social presence and other physical cues, quality of online friendship would not be as high as that of real life friendship. Indeed, the difference would be more salient if the best friend in the online situation (i.e. in MMOGs) was not the same best friend as in real life. In this Study, I also looked at the associations of online social relationships (i.e. cyber-victimization and also online friendship) and psychosocial well-being in early adolescents. It was hypothesized that online victimization would be negatively related to the psychological well-being of the participants, while online friendship would be positively related to the psychological outcomes of early adolescents.

Chapter 2: Empirical Studies

Study 1: Overall prevalence rate of computer games playing

It was important to carry out Study 1 initially for at least three main reasons. First, there has been no previous study that has specifically investigated the computer gaming habits of early adolescents in Hong Kong. Breakthrough's (2003) study, for instance, included teens from ages 10-24. This study, therefore, could not accurately represent the habits for younger adolescents. Second, most past studies have only focused on the total time children spend playing computer games (e.g. Durkin & Barber, 2003) without specifying the time spent on different types of games. Third, to my knowledge, no studies have directly asked about the preferences for different computer games, online friendship experiences, cyber-victimization experiences, and their linkages with social development such as life satisfaction. Nevertheless, the main purpose of this dissertation overall was to investigate the similarities and differences of online and offline friendship, bullying, and victimization experiences, so as to investigate the extent to which these experiences contribute uniquely in explaining early adolescents' psychosocial outcomes. It was, therefore, important to gather some background data before any further studies could be carried out. In the present study, students in grades 5 to 6 were the participants because past studies have usually focused on college students or teens who are older in online friendship and online victimization (e.g. Chan & Cheung, 2004; Durkin & Barber, 2002, Li, 2007). However, from the above-mentioned literature, it can be seen that early adolescents, e.g. those in grades 5 to 6, are already experienced in using computers and playing computer games. They are the generation who has grown up with computer games. Also, grade 5 and grade 6 students are in the initial stages of entering the puberty, starting to become adolescents. Early adolescence is a stage that is full of transitional changes, especially in

social development. It is a particularly important time for them to achieve social and esteem goals. It is therefore especially interesting to investigate friendship and bullying experiences for grade 5 and 6 early adolescents.

The first study was specifically carried out in order to answer these questions:

1) What are early adolescents' computer gaming habits? How much time do they spend on different types of computer games? What are the age and gender differences in such gaming?
2) How are time spent on computer games, preferences for computer games, online friendship experiences, and cyber-victimization experiences associated with children's own perceived life satisfaction?

Method

Participants

Four hundred and ninety-four grade five and six students participated in Study 1. Their ages ranged from 10 to 14 years (249 boys, 242 girls), with an average age of 11.54 (*SD* = .91) years. They were from two primary schools in Tsing Yi, New Territories of Hong Kong. Both belong to middle rankings in terms of academic performance; 66.8% of the participants' flats were larger than 500 square feet, while only 2.5% of them lived in flats that were larger than 1100 square feet, indicating that the majority of them were from lower to middle class families. Their parents were also invited to answer two questions related to their concerns regarding computer games on a reply slip attached to the consent forms. Only 203 parents returned the return slips with answers.

Measures

Questions on computer game playing habits were asked in a newly designed, comprehensive questionnaire. Questions tapped issues such as years of playing, frequency

and time spent on playing different kinds of computer games, namely, interactive online games (e.g. MMOGs), solo-PC games, handheld video games (e.g. NDS) and family video console (e.g. Playstation3).

Enjoyment of computer games

Children's enjoyment (i.e., degree of liking) for computer games was tapped in 3 questions. These questions, posed as statements to rate, were "I think playing computer games can make me forget the unhappy things in life," "I think playing computer games is a good way to relax," and " I think playing computer games is exciting." Participants were asked to rate on a 1 to 7 likert scale, from 1 as strongly disagree to 4 as neither agree or disagree to 7 as strongly agree (with ratings between each). The cronbach's alpha for these three items together was .82, and EFA suggested that they formed 1 factor, which accounted for 73.5% of the variance. The factor loadings of the three items were .87, .85, and .85 respectively. Therefore, a composite score was formed by adding up scores on these three items to form a "enjoyment of computer games" construct.

Cyber-victimization experiences

To measure the extent of cyber-victimization experience, two items were included. They were "I have been humiliated by other online games players before" and "I have been attacked by other online game players before." Participants were asked to rate on a 1 to 7 likert scale, from 1 as strong disagree to 4 as neither agree or disagree to 7 as strongly agree (with other ratings in between). The cronbach's alpha for these two items was .72, and EFA suggested that they formed 1 factor, which accounted for 78.3% of the variance. The factor loadings of the two items were both .89. Therefore, a composite score was formed by adding up scores on these two items to form a "cyber-victimization" construct.

Satisfaction with Life Scale

This 5-item scale assesses children's overall perceived subjective well-being and has good cross-cultural validity (Diener, Emmons, Larsen & Griffin, 1985). Its reliability in this sample was .78.

Parents' concerns about computer games

Parents were asked to rate on a 1 to 7 likert scale, from 1=strongly disagree to 7=strongly agree (with 4 as a neutral point) two items. These were "I think it is important to know the influence of computer games on children" and "I have worries concerning the computer playing habits of my children." These questions were asked in order to investigate the extent to which it seemed practically important to study the issue of computer games.

Perceived social functions

To measure the perceived social functions by participants in MMOGs, four items were designed. The items were "I believe that I can make friends with people whom I have met in online games," "I believe interacting with other players in online games is an interesting experience", "I believe it's easy to make friends in online games", and "I believe that through discussing the content, skills, tactics, etc. about online games with my friends, I can improve our friendship." Participants were asked to rate each item on a 1 to 7 likert scale, (from 1 as strongly disagree to 7 as strongly agree). Different from the measures above, because these items are only relevant to students who have experience in playing MMOGs, only the responses made by those who indicated that they played MMOGs were included for further analyses. Three hundred and thirty-nine students' responses were included; in other words, 68.6% of the participants reported playing MMOGs. The cronbach's alpha for these four items was .85, and EFA suggested that they formed 1 factor, which accounted for 69.9% of the variance. The factor loadings for the four items were .91, .86, .85 and .71, respectively. Therefore, a composite score was formed by

adding up scores on these four items to form a "perceived social function" construct.

Procedures

Informed consent was obtained from parents and school principals. All children completed all questionnaires during school hours in their schools.

Results

82.1 % of the participants claimed that they had had at least 1 year of computer game playing experience, with 66.6% of them reporting at least 2 years of experience in it; 22.3% said that they had played computer games for at least 5 years, despite the fact that their mean age was only 11.54 years old. These statistics suggest that early adolescents have plenty of experience in playing computer games, and they are indeed growing up with computer games. Of the parents, 71.4% rated from points 5 to 7, that is, from slight agree to strongly agree, that it is important to study the associations between computer game playing and children's development, while 65% of parents indicated that they worried about the computer game-playing habits of their children. Thus, parents appear to be concerned about computer games in general, underscoring the practical importance of investigating computer game-playing among early adolescents.

Tables 1-4 show the percentage of early adolescents who spend different numbers of hours playing different types of computer games. The average time spent on different types of games, gender differences in time spent, and the age differences in time spent on games all indicate that students tend to spend more time on MMOGs compared with other types of computer games. Boys spent significantly more time on all types of games than did girls (MMOGS, t (480.33) = -6.33, $p < .00$, Cohen's d = .58,; solitary computer games, t (472.21) = -4.35, $p<.00$, Cohen's d = .40; handheld video games e.g NDS, PSP, t (469.73) = -3.06, $p<0.00$, Cohen's d = .28; home video consoles e.g. Wii, Playstation 3, t (426.39) =-4.76, p

< .00, Cohen's d = .46). There were no significant age differences in terms of time spent on the four types of games.

Table 5 shows the correlations among time spent on online games, enjoyment of computer games , perceived social functions of MMOGs, cyber-victimization experiences and life satisfaction among students who play MMOGs. Only participants who claimed that they played online games were included in the analysis. Time spent online games was positively and significantly correlated with perceived social functions of MMOGS and enjoyment of computer games. It is also clear that perceived social functions of MMOGs and enjoyment of computer games are both positively and significantly correlated with life satisfaction. Further regression analyses were carried out to investigate whether enjoyment of computer games and perceived social functions of MMOGSS could predict life satisfaction. After controlling school, age, grade, and gender, it was found that enjoyment of computer games uniquely explained 2.0% of life satisfaction, and perceived social functions of MMOGS uniquely explained 5.0 % of the variance in life satisfaction.

Table 1. *Percentages of early adolescents who spend different amounts of time per day on different types of computer games*

	Time spent on games		
Types of games	> 1 hour per day	> 3 hour per day	> 6 hour per day
MMOGs	60.3%	24.9%	7.9%
Solitary computer games	42.1%	14.2%	3.0%
Handheld video games e.g. NDS, PSP	33.2%	8.5%	1.2%
Home video consoles e.g. Wii, Playstation 3	17.2%	2.8%	0.4%

Table 2. *Average time spent per day on different types of games*

	Average time spent *(SD)*
MMOGs	2.38 hours (2.21)
Solitary computer games	1.66 hours (1.86)
Handheld video games e.g. NDS, PSP	1.25 hours (1.54)
Home video consoles e.g. Wii, Playstation 3	0.67 hours (1.15)

Table 3. *Gender differences in average time spent per day on different types of games*

	Average time spent (girls)	Average time spent (boys)
MMOGs	1.76	2.97
Solitary computer games	1.30	2.02
Handheld video games e.g. NDS, PSP	1.03	1.45
Home video consoles e.g. Wii, Playstation 3	.43	.92

Table 4. *Time spent per day on different types of games*

Age (N)	MMOGS	Solitary computer games	Handheld video games e.g. NDS, PSP	Home video consoles e.g. Wii, Playstation 3
10(N=51)	2.33	1.96	1.35	.69
11(N=203)	2.19	1.71	1.37	.74
12(N=174)	2.60	1.44	1.26	.64
13(N=49)	2.33	2.00	.69	.47
14(N=14)	2.64	1.64	.79	.71

Table 5. *Correlations among time spent on computer games, preference of computer games, perceived social functions of MMOGs, cyber-victimization experiences and life satisfaction. (N = 339)*

	Time spent	Perceived social functions of MMOGSS	Online victimization	Preferences of computer games	Life satisfaction
Time spent	-				
Perceived social functions of MMOGSS	.27**	-			
Online victimization	.06	.24**	-		
Enjoyment of computer games	.28**	.47**	.16**	-	
Life satisfaction	.08	.32**	.04	.20**	-

Table 6. *Regressing Life Satisfaction onto school, parental Warmth, time spent on online games and perceived social function of MMOGs*

Variable	Life Satisfaction			
	R2	*R2 changed*	*Beta*	*t*
Step 1				
School	.01	.01	.11	2.09*
Gender			-.02	-.44
Age			-.09	-1.69
Step 2				
Parental Warmth	.17	.15**	.40	7.94**
Step 3				
Time spent on Online games	.02	.04**	0.13	2.45*
Step 4				
Enjoyment of computer games	.22	.02**	0.05	.81
Step 5				
Perceived Social Function of Online Games	.28	0.05**	0.27	4.67**

Conclusion

These results suggested that teens spend considerable time playing computer games. In line with past literature, MMOGs, which are highly interactive in nature, seem to be the most popular games. Also, preferences on computer games and perceived social functions of MMOGs predict life satisfaction. These results suggest that experiences in online context can contribute to psychological experiences overall. Therefore, the interactive nature of MMOGs, which offer plenty of social interactions, explain psychological well-being in children and early. Study 1 also provides the groundwork for the hypothesis that online experience may be related to psychosocial functioning in early adolescents. Such online experiences can be positive (i.e., friendship), negative (e.g., bullying; victimization), or both.

Study 2: Focus group Interview

Despite the fact that cyberbullying has become of interest to psychologists and the public of late, to the best of my knowledge, there is no comprehensive scale to measure the experience of cyber-victimization and cyberbullying. Yet it is extremely important to develop one to allow testing of the extent to which cyberbullying and cyber-victimization are comparable experiences to offline bullying and victimization. The most common way to assess whether one has been cyberbullied or has been cyberbullied is to ask the respondents to select either "yes" or "No" in response to the statements, "I have been cyberbullied" and "I have cyberbullied others before" (e.g. Li, 2006, 2007) or by asking the respondents directly "Have you bullied someone / been bullied by someone via the internet by MSN/hacking, email, etc.?" (Dedue et al., 2008). These methods are straightforward, easy to understand, and easy to administer. Yet, there are a few potential problems with asking about these experiences of being cyberbullied directly. Deliberate deception can be a problem because bullying others or being bullied is a very sensitive question; asking it directly might lead to fake answers or at least less honest answers due to social desirability. Also, not every child may recognize that he/she has been victimized/ has bullied others if the definitions of cyber-victimization or bullying are not clear.

Therefore, it is necessary to develop a scale which aims at tapping the prevalence of cyber-bullying and cyber-victimization. In fact, based on past research on victimization, it is not difficult to design one. For instance, Mynard and Joseph (2000) developed a multi-dimensional peer victimization scale which consisted of 45 items, tapping four different constructs of victimization, namely physical, social manipulation, verbal and attack on property. Such a comprehensive scale can potentially serve as a reference for developing the new cyber-victimization scale. Similarly, the direct and indirect aggression

scales by Bjorkqvist, Lagerspetz and Osterman (1992) assess both direct and indirect bullying. Their scale can also be used as a basis from which to develop the online-bullying scale, despite the fact that cyberbullying should not involve direct physical aggression, as there is no physical contact between the bully and the victim. Nevertheless, no matter what researchers believe cyberbullying as a concept encompasses, teenagers' own perceptions of cyber-victimization matter the most. For instance, one may argue that there are no elements of physical attack in MMOGs; yet, does attacking the character which represents the player in real life match a physical attack in teenagers' eyes? Does stealing one's virtual property, such as weapons, in MMOGs imply an attack on property as in real life? These questions cannot be answered with current tools. In order to gather more information for developing scales of both cyber-victimization and cyberbullying, several small group interviews were, therefore, carried out in order to bridge this gap in the existing literature.

As the issue of social experience in MMOGs is relatively new and there is a lack of concrete theoretical frameworks for such a topic, a qualitative research design was carried out by having focus group interviews with children and early adolescents who had had some experience in playing MMOGs.

There were three major aims in carrying out this study: First, I wanted to explore the major reasons that early adolescents give for playing online games. Study 1 found that the perceived social functions of MMOGs were associated with better life satisfaction in early adolescents, and some previous study (e.g. Durkin & Aisbett, 1999) have suggested that playing computer games can be a positive social experience. Therefore, the first aim of Study 2 was to examine whether the social functioning of MMOGs is one of the major reasons that teens talk about for playing in the first place. If this social aspect is in fact a major reason for online play, this would add weight to for the concept of carrying out further studies on online friendship using MMOGs. A second rationale for this exploratory

study was to consider and understand the nature of online friendship in online games. More specifically, I sought to examine the quality of online friendships as perceived by teens who play games. Teens were asked to comment on how they felt towards four different constructs related to online friendship according to the Friendship Qualities scale of Bukowski et al. (1994), and to compare it with their real life friendships. This was done to provide extra information for further comparisons between online and real life friendships.

Finally, this study aimed to explore the nature of online bullying and online victimization in online games and on the internet. Thus, participants were asked if they have ever heard about/ experienced cyberbullying before. The term "cyberbullying" was further explained by the interviewers as "some people try to make you feel bad or unhappy on the internet or inside the online games". They were encouraged to suggest different ideas related to the issue.

Interviewers also prepared some extra start up and follow up questions when the children ran out of points to make related to the issue on their own. These questions included several possible examples related to cyberbullying, and participants were asked to consider the extent to which these ideas also belong to the category of cyberbullying. These concrete questions were prepared in two ways. Some of them were suggested by five adolescents (2 girls, 3 boys) aged from 12 to 14 in informal interviews by convenience sampling. They were online game "experts" as they all spent plenty of time playing online games everyday. Apart from giving opinions about cyberbullying, they were contacted once more to judge the level of violence of the MMOGs suggested by the participants in Study 2 after the interviews were conducted. Also, questions such as "Have you ever been cyberbullied? If yes, what happened?" were posted onto some local discussion forums to gather more examples of cyberbullying. Some examples of follow up questions include " Do you think being attacked by other players in groups in online games is

cyberbullying?" and "Do you think being taken advantage of by some illegal software of others in online games is cyberbullying?". One response was counted as each instance in which participants mentioned a particular event that could be defined as cyberbullying, or when they agreed that a given probe question could be used to define cyberbullying. Participating responders were also asked about their feelings about being cyberbullied. These questions were posted on a public online forum in Hong Kong that everyone could access. Thus, there is no information about who answered these and how old they are. Their responses were gathered expressly for the purpose of gaining more information about the measured constructs.

A helper and I coded the data together. As the size of the data set was not large, both coders agreed on the ways in which to code the responses based on ideas from the first three participants, and then the helper coded the responses alone, and the author recoded them again. Inconsistencies in the coding were then resolved by discussion between the two coders.

Method

Participants

Seventeen children and early adolescents (14 boys, 3 girls), with an average age of 11.71 (SD = 1.26) years participated in Study 2. They were invited to participate in the study by convenience sampling. Four helpers and the author of this paper looked for children and early adolescents that they know, and tried to arrange them into groups of 2 to 5 to interview them. A set of questions were prepared to ask the participants. However, as it was a focus group interview, not every participant answered every question asked.

Results

Demographics

On average, the participants reported having 2.99 (S*D*=1.87) years of experience in playing MMOGs, and they played 1.45 hours (S*D*=1.14) on average per day. When asked to list their favorite online games, a total of ten games were mentioned by the participants. Five of the participants did not provide any names, while four of them suggested more than one favorite online game. "Talesrunner," a popular non-violent sports game in which the avatars compete with their speed in running, was mentioned four times as teens' favorite game. "Counter Strike", a fighting/war game which involves violent fighting and shooting scenes, was mentioned five times as the favorite. "Survival project", a game that requires some strategy-planning and also some degree of fighting, was named twice as the preferred game. "Shin-sangokumusou", "Little Fighter Online", "Tibia", "World of Warcraft,"Crazy Taxi, "Fairy Land" and"Audition", were also each mentioned once by participants as their favorite. "Shin-sangokumusou", "Little Fighter Online", "Tibia", and "World of Warcraft all involve violent fighting and killing. "Crazy Taxi"is a car racing game, while "Fairy Land" also involves some fighting but in a less violent sense. Finally, "Audition" is a non-violent dancing game in which players compete with their own? proficiency in dancing. In other words, about half of the favorite MMOGs suggested are violent in nature, one about one-third are non-violent, and about one fourth are intermediate in terms of violence level in nature.

About online friendship

Given the qualitative nature of this focus-group study, students' responses are now summarized and described a bit below in order to give a complete picture of these adolescents' views about social issues related to MMOGSS playing. Responses are arranged in order by question.

Question 1: "What is the major reason for you to play online games?"

Fourteen responses were gathered for this question. Eight of the respondents focused on social aspects of this game-playing, reporting that the reasons for them to play were because some of their friends are playing it, their classmates are playing it, "everyone" is playing, or because they want to play it to keep in touch with others. Another six of them responded that they believe playing online games is exciting.

Question 2:

"Do you usually form teams and play with people whom you do not know in "real life" inside the online games?"

Thirteen of them answered this question; nine said "Yes;" four said "No."

Question 3:

"Do you usually play online games with people whom you know in reality?"

All of them answered this question, with fifteen saying "Yes", and two of them saying that they usually prefer to play alone.

Question 4:

"What do you think about friendship quality for the unknown players that you meet in online games? What is the difference in terms of online friendship quality versus real life friendship quality?" They were asked to comment on companionship, help, security, and closeness separately.

For companionship, seven participants answered this question. Four of them believed that they feel stronger companionship with their real life friends than with friends they have met in online games, because they haven't met their online friends before and they can only accompany them in playing online games but not other activities, and the only means they have by which to communicate with friends in online games are words. Three of them believed the level of companionship is more or less the same in real life and online

as long as there is somebody to accompany them to play, Among these three, two further claimed that they have more communication with real life friends, while another one believes that he sometimes is more eager to see and stay with his online friends, because it is not easy to meet them in games as easily as it is to meet his friends in school.

In terms of the help element, ten participants answered this question. Seven of them expressed the idea that they had received some kind of help, usually on how to play the games, from their friends in online games, while one said that no special help was received before. Three of them further suggested that the help in online games is based on an exchange of benefits. Therefore, if their online friends helps them, they need to offer something to them in exchange, while two of three further suggested that this kind of help is just limited to the game, and it is virtual in nature. Another two of them mentioned that they are sometimes afraid that their online friends may "sell them out" for benefits, particularly because sometimes they promise to help out but they break their promises easily.

As for the security dimension, six of them answered the question. One of them said that he trusted his online friend very much. One participant said that he likes his online friends because sometimes he is willing to talk about his secrets or problems with his online friends more than with his school friends even though he is not as familiar with them because they will not tease him and will only listen to him. One child suggested that online friends may spread personal information, so he cannot trust them fully. Three participants said that they have more trust of their real life friends more, with one of them further explaining that he understands his real life friends more.

Finally, seven participants talked about closeness specifically. One of them suggested that he likes his online friend a lot because he felt that he could talk to him and he understood him even better than his real life friends. Two of them suggested that they liked

their real life friends more. One of them suggested that real life friends understand them more, while the other three suggested that they are attached emotionally more to their real life friends because real life friends care about them more.

About Cyberbullying

Question 1:

"Have you ever been cyberbullied or heard about cyberbullying before?"

All of the participants answered this question. Four out of seventeen of them suggested that they have never experienced this before, but all of them have heard of it. One further suggested that he was not cyberbullied before because he is nice and helpful to others on the internet.

Question 2:

"What defines cyberbullying?"

For events that they believed to constitute cyberbullying, all of them answered this question and their responses could be divided into nine different categories. The results are summarized in Table 7.

Table 7. *Responses given by participants that they believed as events which define cyberbullying*

	Number of times mentioned
1. People sent virus to me	2
2. My account was stolen or my belongings (e.g. money, weapons) in MMOGs were cheated/ stolen	10
3. People said that they would help me but then betrayed me in MMOGs	4
4. Being attacked by others as a group intentionally in MMOGs	10
5. Being taken advantage of by illegal software (illegal software refers to some software that helps players crack the system of MMOGs, which allows them to earn more weapons, money and leveling up much more quickly than usual.)	2
6. Being insulted/ scolded with foul language	5
7. Being excluded from games/ignored	2
8. People gossip/say mean things about me (e.g. say that I am useless, or accused me falsely of using illegal software to level up faster in MMOGs)	10
9. People spread rumors to defame me	2

Question 3:

"How do you feel after being cyberbullied in MMOGs?"

Ten of them answered this question. Nine of them said that they would feel bad or angry,

while one suggested that she would just ignore them because it is just a cyber world, and nothing is real. Among the nine of them who suggested that they would feel bad or angry, five of them further mentioned that they would not be frustrated about it for too long, because everything can be restarted again and the money being cheated can be earned again. Another two of them suggested that they would try to find another game to play or just try to play alone.

Question 4:

"Are there any differences between being cyberbullied in MMOGs versus being bullied in real life, e.g. in the classroom, in the playground?"

Twelve of them answered this question. Four suggested that there is no big difference between the two forms of bullying because both of them are bad and the bullies do it intentionally to harm others. For the other eight who believed there are differences, one suggested that there are some things that people will only do on the internet, e.g. swear at people, but seldom at school. One of the participants suggested that if he got bullied in real life, he may try to fight back, but this may not be possible in online games. Also, he suggested that the nature for the two forms of bullying is different, because people bully others in real life to release their anger, but they bully others in online games for benefits (e.g. to get weapons, virtual money). Another one believed that cyberbullies can only use language to bully others, but not physically beat people up. Concerning the degree of severity, two suggested that if they were being bullied in real life, they might get hurt, but if it was something on the internet, that would be "no big deal." Two suggested that cyberbullying is much less serious because new accounts can be created or they can escape more easily in a cyber environment. Another one also suggested that it is physically safe even being bullied in games, because it is just a game.

Conclusion and Discussion

Study 2 found that about half of the favorite MMOGs suggested by the participants are violent in nature. It also found that 57% of the participants who answered the question about the major reason for playing MMOGs explicitly focused on its social functions. About 70% of the teens tended to play with people that that know in real life, and about 88% of them preferred to play MMOGs with others as compared to alone. Such findings suggest that playing MMOGs serves an important social function for children and adolescents as it offers a common activity and topic for them to have fun with. As for the differences in quality of the four friendship constructs, namely companionship, help, security and closeness between online and real life friendship, it seems that the majority of those who answered the questions believed that online friendship is less strongly associated with each than is real life friendship for all four constructs. With only two out of six of the participating early teens believing that they feel more secured with their online friends as compared to their school friends, and one out of seven believing that he is emotionally closer to his online friends. As a matter of fact, the channels of communication are much less available for online friendship compared with a real life one. As suggested by some participants, online friendship is "virtual" so that the only means by which they can communicate is through words. Therefore, it is not surprising that they found that online friendship is not necessarily comparable to real life friendship.

Of the participants, 76% suggested that they had been cyberbullied before, despite the fact that the majority of them expressed that they would not feel too frustrated after being cyberbullied and that they believe that cyberbullying is much less serious than bullying in real life because it is easier to escape from in the virtual world. Finally, when asked to define cyberbullying, "being insulted/ scolded using foul language", "being excluded from games/ignored", "people spread rumors to defame me" and "people gossip/ say mean

things about me" were counted 19 times, while the total count for this question was forty-seven. Therefore, about 40% of the events that may constitute cyberbullying are in fact items that have already been measured in the existing literature on school bullying and victimization scale (e.g. Bjorkqvist, Lagerspetz & Osterman, 1992; Schwartz, Chang & Farver, 2001). This suggests that despite the fact that the context of being bullied is different, children and teens still think that many of the events that happen in an everyday life context as examples of bullying also happen in the online context. However, as suggested by some of the participants, in terms of cyberbullying, there should not be any real physical attacks, (despite the fact that their avatars can be intentionally hurt (e.g., "beaten up") by others in MMOGs). Therefore, according to the opinions of the participants, cyberbullying, as expected, tends to be more verbal and indirect in nature as compared to school bullying. For the remaining 28 counts specifically related to the online context, about 35% were related to their account being broken/stolen. Another 35% of these counts were about being attacked in MMOGs by others as a group, and 15% of them were related to the complaint that "People said that they would help me but then betrayed me in MMOGs." The rest of the online bullying incidents concerned people sending viruses to them or being taken advantages by illegal software. These additional items that are more specific to the online context were then added to the bullying and victimization scales based on existing literature from the formation of the scale to measure cyberbullying and cyber-victimization in Study 3.

Study 3: Scale development

Upon completing Study 2, it was found that several items that captured cyberbullying seem fairly specific and should be added to the existing scales measuring school bullying and victimization. Therefore, in Study 3, these items were indeed included to produce scales on measuring cyberbullying and cyber-victimization. Items in accessing cyberbullying and cyber-victimization are identical except that in the cyberbullying one, participants were asked about their frequency of enacting those behaviors in relation to others, while in the cyber-victimization ones, they were asked about the frequency of being the victims of those behaviors. Such a method in administering questionnaires that measure bullying and victimization has been common in many past research studies (e.g. Bjorkqvist et al., 1992; Schawartz, Chang & Farver, 2001). Developing the two scales was the major focus of Study 3. At the same time, the prevalence rates of traditional and online bullying and victimization were also included in Study 3. Study 3 was also carried out to answer the question of whether victims in daily life would still be victims in an online context or if they might become bullies online because of a change in social context.

Method

Participants

Six hundred and twenty-six (with 318 boys and 308 girls) students in grades 5 and 6 from four primary schools in two districts of Hong Kong, namely Tsing Yi and Kwai Hing, participated in both Studies 3 and 4. Their ages ranged from 9 to 15, with an average age of 10.81 (SD = .83) years.

Procedure

Invitation letters were sent to principals of fifteen schools in Hong Kong to recruit students. Principals of 4 schools agreed to participate in the present study. Upon obtaining parental consent, students were invited to fill out an online questionnaire which included

several batteries of scales. An online questionnaire was used for two reasons. First, for practical reasons, when the data collection process was first started, Hong Kong was still under the threat of swine flu (H1N1), and most schools were under strict measures to suspend classes if there were several cases of infection in a school. Therefore, schools hesitated to allow outsiders (i.e., student helpers for administering questionnaires) to enter schools, making the arrangement of having students complete questionnaires in schools difficult. Second, web-based questionnaires can reduce the logistic costs and the duration of data processing. Past research has suggested that the quality of the data collected by computer-based questionnaires may be equal to or even better than paper-and-pencil versions, especially in terms of completeness of data, given that web-based questionnaires can be designed to include a default checking function to remind participants to fill out any missed questions (Kongsved, Basnov, Holm-Christensen, & Hjollund, 2007, Touvier et al., 2010). However, admittedly, the most important issue concerning the use of web-based questionnaires is the problem of self-selection (i.e., online questionnaires are only completed by those who access the internet and are willing to take the time to fill them out).

However, in the present study, the selection process was through schools, and the participating students were then asked to fill out the questionnaire via an online platform. In this case, the online platform is primarily just a tool for reducing logistic costs, but without creating the problem of self selection. One of the four participating schools, one arranged that their computer lesson time would be used for them to complete the questionnaires during computer lessons, under the supervision of their computer teachers. Students of the other three schools were asked to complete the questionnaire at home through a link that they received in their emails (with the help of the participating schools, who sent mass emails to those who consented to participate). Students could then access

the online questionnaire, and the computer system guaranteed that only those who accessed through the specific link could fill out the questionnaire, i.e. it ensured that only students from the four participating schools would be able to access the questionnaire. Finally, students who had not yet completed the questionnaires by themselves before deadline, perhaps either because they do not have computers at home or because they forgot to finish it, were asked and allowed to complete the questionnaires during computer lessons or lunch hours in schools.

To assist students in how to fill out the questionnaire, clear instructions with pictorial indications were given on the first page of the questionnaire, with audio clips which recorded the words of the instructions and every item throughout the whole questionnaire. Students could, thus, click to hear the words if and when they find any difficult terms to read. This was intended to ensure that no students would have difficulty understanding the items even though they were completing the questionnaire on their own. In addition, confidentially about all data collected was guaranteed in the instruction section of the questionnaire. The questionnaire had a default function to remind them to answer every item of the questionnaire as well. Therefore, even without close supervision of student helpers, the computer system already minimized the chances of missing items.

Measures

Demographics

Information on flat size and parents' education levels were gathered to tap basic demographics of the participants.

School victimization

The 5- item peer victimization scale by Schwartz et al. (2001) was used to tap the experience of being victimized in traditional settings. This questionnaire has been used with Chinese fifth and sixth graders before. It is short, time-saving to administered, and yet

comprehensive. The five items are: "Others tease or make fun of me?", "Others hit or push me?", "Others gossip or say mean things about me?", "Others hurt my feelings by leaving me out of play?", and "Others bully or pick on me?" Participants were asked to rate the frequency of these things happening to them on a 1-5 likert scale, from 1 as never, 2 as rarely,3 as sometimes, 4 as usually, 5 as everyday. The reliability of the scale in this sample was .89.

School bullying

The 5- item peer victimization scale by Schwartz et al. (2001) can also be used to measure bullying behavior by changing the wordings slightly. For instance, "Others tease or make fun of me" was changed to "I tease of make fun of others?" to measure bullying behavior. The original authors also changed the wordings in this way to tap school bullying in their study. The students in the present study answered the same 5-point likert scale as in school victimization. The reliability in this sample was .91.

Cyber-victimization

The Cyber-victimization scale was developed by integrating items from the peer victimization scale of Schwartz et al. (2001), the relational aggression scale of Crick and Grotpeter (1995), and also the verbal aggression and the indirect aggression subscales of the direct and indirect aggression scales (DIAS) of Bjorkqvist et al. (1992). As suggested in Study 2, the nature of cyberbullying and cyber-victimization should not be physical, but rather indirect and verbal in nature. Therefore, the item" Others hit or push me" from Schwartz et al. (2001) was not included; rather, it was changed to "others hit or push my avatars in online games deliberately" . Three items of the verbal aggression and three items from the indirect aggression subscales (DIAS) were chosen because they are suitable for applying to the online nature of peer relationships, and also because they were not covered by the Schwartz et al. (2001) peer victimization scale. Some minor modifications of the

items were made based on the descriptions of the common features of cyberbullying from the results of Study 2. For example, the item "Others insult me" was changed to "Others insult me by swearing at me in online games/ on the internet" because being exposed to foul language was mentioned as a cyber-victimization experience by several participants in Study 2. Two more items from the relational aggression scale of Crick and Grotpeter (1995) were also added to broaden the scope of the newly developed scale in terms of relational aggression. These 13 items are listed in Table 8, column I. Five additional items that are specifically related to the online context were added based on the results of Study 2; they are listed in column II of Table 8. Thus, a total of 18 items were included for the Cyber-vicitmization scale. Participants were asked to rate on a 1-5 likert scale, from never happened to happens everyday, each of these items.

Table 8. *Proposed Items for cyber-victimization scale*

Column I (items based on existing literature with minor modifications to fit the online context)	Column II (items based on Study 2, specifically related to online context)
1. Others tease or make fun of me in online games/ on the internet.	13. Others steal my account or my belongings (e.g. money, weapons) in online games/ on the internet.
2. Others gossip or say mean things about me in online games/ on the internet.	14. Others say that they would help me but then betray me in online games/ on the internet.
3. Others hurt my feelings by leaving me out of play in online games/ on the internet.	15. Others insult me by swearing to me in online games/ on the internet.
4. Others bully or pick on me in online games/ on the internet.	16. Others send viruses to me in online games/ on the internet.
5. Others say "If you don't do what I say, I will stop liking you" in online games/ on the internet.	17. Others attack me as a group intentionally in online games.
6. Others get mad at me, then they ignore or stop talking to me in online games/ on the internet.	18. Others take advantage of me by using some illegal software to defeat me in online games.
7.Others in online games/ on the internet say that they are going to hurt me.	
8. Others in online games/ on the internet call me names.	
9. Others pretend to be my friend as a kind of revenge in online games/ on the internet.	
10. Others make up false stories about me, saying that I am a bad kid, in online games/ on the internet.	
11. Others try to get others to dislike me because they are angry at me in online games/ on the internet.	
12. Others hit or push my avatars in online games deliberately.	

Cyber-bullying

The same 18 items were used to access cyberbullying, on a 1 to 5 likert scale. The wordings were changed to ask about the frequency with which such behaviors were carried out by the participants. For instance, "Others tease or make fun of me in online games/ on the internet" was changed to " I tease or make fun of others in online games/ on the internet".

Results

Descriptive Statistics

Demographic characteristics of the sample are presented in Table 1. Most students (78.3%) lived with both parents, while 8.3% of them lived only with their father, 3.2% of them lived only with their mother and 4.2% of them lived only with grandparents. 91.8% of the participants lived in flat with at least 2 rooms. Concerning parental education level, over 67.8 % of them had fathers who had at least finished Form 3 (i.e. having 9 years of formal education), while over 64.3 % of them had mothers who had received at least 9 years of formal education.

Psychometric Properties of the Cyber-victimization scale

The usual practice for confirming the factor structure of a scale is to validate it with another half of the sample or when the scale is used for the second time (Floyd & Widaman, 1995). The sample was therefore split in half by assigning a random number to each participant, and then a median split was carried out to randomly divide the sample into two halves. The eighteen items were then subjected to an exploratory principal component factor analysis (EFA) with oblimin rotation. The scree plot analysis suggested that one factor should be extracted. Therefore, EFA was run again to extract one factor. As a rule-of-thumb, optimal communalities of the items should be smaller than 0.4, six items with communalities lower than .4 of the cyber-victimization scale were deleted. The

remaining items were then subjected to an exploratory principal component again factor analysis (EFA) with oblimin rotation. The scree plot analysis shows that one factor could be meaningfully extracted. These ten items explained 63.15% of the total variance, eigenvalue = 7.58, with factor loadings ranging from .65 to .85. As EFA suggested that these twelve items may represent one meaningful latent factor, based on another half of the randomly split sample with 313 participants, a confirmatory factor analysis (CFA) was carried out. The twelve items were subjected to represent one latent factor in CFA. Netemeyer, Bearden, and Sharma (2003) suggested that several studies have used CFA to further trim down their model by removing some problematic items in order to attain a better fit. Kline (2005) also suggested that in interpreting a model of a latent factor with several items, the rule of thumb concerning the residual correlations among items is that they should be smaller than 0.1. As four items failed to attain this, they were removed. Finally, eight items were retained to be subject to a CFA for a second time, with one latent factor. A model has acceptable fit if the value of *CFI and NNFI* in upper .80s (Bentler, 1992), with a larger value indicating a better and better fit. *RMESA* and *SRMR* should not be larger than .1 for acceptable models and the RMR and SRMR indices should each be less than 0.5 for good models, with a smaller value indicating a better fit. The chi-square of my model was χ^2 (20, N =313) = 97.31; and the goodness-of-fit indices were as follows: p < .01; *CFI* =.96; *NNFI*= .94; *SRMR* =.036; *RMR*=.028; *RMSEA* = .11. All the fit indices except RMSEA suggested that this is a model with good fit. Chen et al. (2008) suggested that multiple goodness-of-fit indices should be interpreted at the same time when considering the overall fit of a model. That is, one should not reject a model just because its RMSEA does not meet the "cut-off" value. Given that all the fix indices indicated a good fit of the model, I accepted that this one factor model could adequately account for the variance in the eight items.

When this one factor model with eight items was applied again to the full sample with 626 students, the chi-square of the is: χ^2 (20, N =626) = 128.80, $p < .01$; and the goodness-of-fit indices are as follows: *CFI* =.97; *NNFI*= .96; *SRMR* =.027; *RMR*=.019; *RMSEA* = .09. It is clear that all the goodness-of- fit indeices worked even better in the full sample, and here, RMSEA improved to an acceptable value. The eight-item scale is listed in Table 9, and the items together accounted for 66.9% of the total variance when subjected to EFA with the 626 participants. The parameter estimates of the CFA of the cyber-victimization scale for the sample of 626 participants is presented in Figure 1.

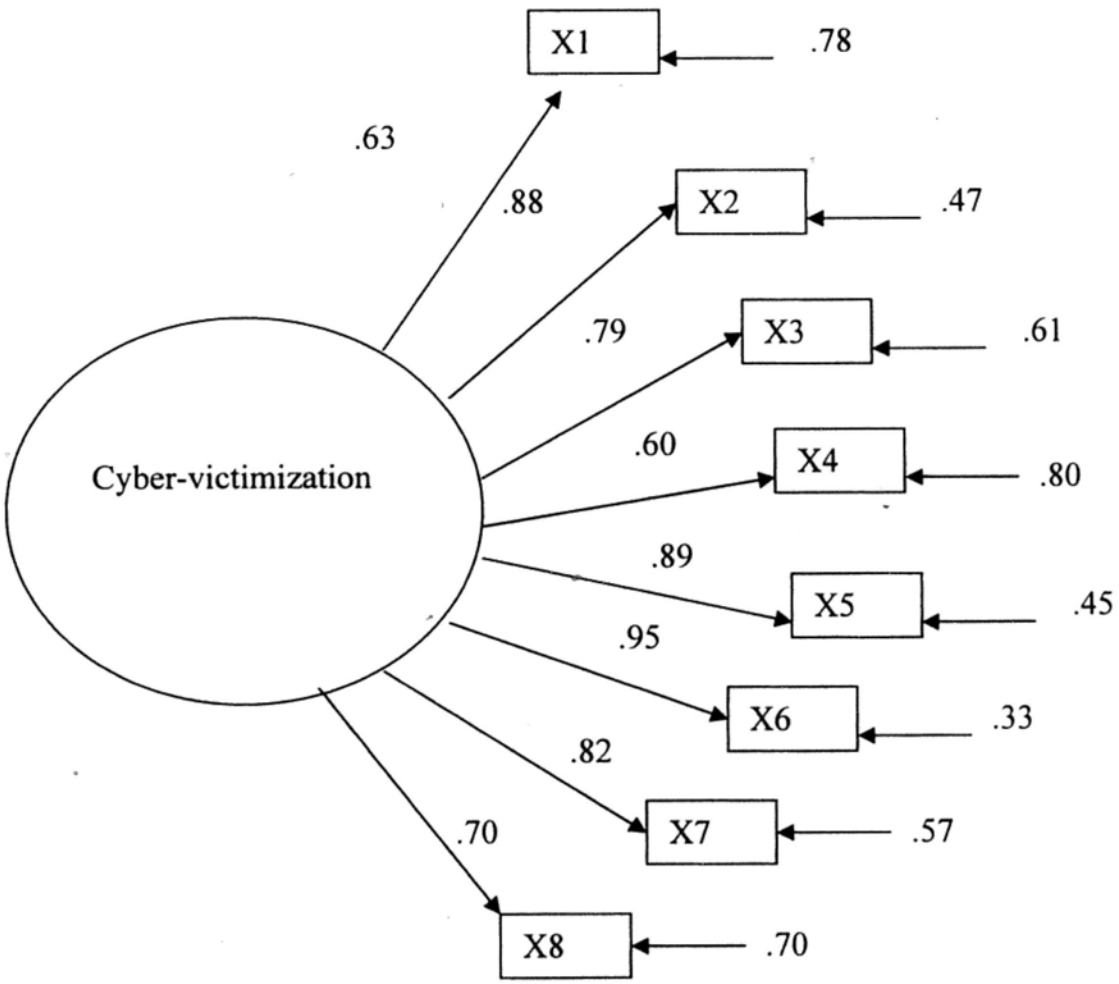

Figure 1. Cyber-victimization scale.

Notes. Oval indicates latent factor; rectangles indicate measured variables (the items); completely standardized parameter estimates including factor loadings and indicator error variances are shown.

Psychometric Properties of Cyberbullying scale

Similar procedures as those that were carried out for items in the cyber-victimization scale were applied to the items on the cyberbullying scale. Based on the split-half sample with 313 participants, in a reliability test, 1 item with a poor item-total correlation ($r < 0.5$) in the cyberbullying scale was deleted. The remaining items were then subjected to an exploratory principal component factor analysis (EFA) with oblimin rotation. The scree plot analysis shows that one factor could be meaningfully extracted here as well. These seventeen items explained 71.4% of the total variance, eigenvalue = 12.14, with factor loadings ranging from .75 to .91. Apparently, compared with the cyber-victimization scale, more items could be retained for CFA. However, most past studies of victimization and bullying tended to adopt identical, but changed, wordings in describing the actions by the participants as bullies or victims (e.g. Schwartz et al., 2001). For easy comparison between the two scales and for the ease of administration in using the two scales in future studies, the same eight items used in CFA for cyber-victimization scale were, therefore, used for CFA for the cyberbullying scale. As a matter of fact, two CFAs had been carried out based on the full sample with 626 participants. The first one was based on the seventeen items suggested by EFA, for which the chi-square of was: χ^2 (119, N =626) = 1282.50, $p < .01$; and the goodness-of-fit indices are as follows: *CFI* =.85; *NNFI*= .83; *SRMR* =.05; *RMR*=.03; *RMSEA* = .16, the goodness-of-fit indices suggested that such a fit may not be good enough. The second one was by following the 8-item structure of the cyber-victimization scale, χ^2 (20, N =626) = 141.14, $p < .01$; and the goodness-of-fit indices are as follows: *CFI* =.98; *NNFI*= .97; *SRMR* =.02; *RMR*=.01; *RMSEA* = .10. Clearly, the 8-item yielded much better goodness-of-fit indices, which suggested a good fit.

The eight-item scale is listed in Table 9, and they accounted for 76.7% of the total

variance when subjected to EFA with 626 participants, which explains more variance compared with the 17-item structure. Therefore, an eight-item structure with one factor was applied to the cyberbullying scale as well. The parameter estimates of the CFA of cyberbullying scale for the sample of 626 participants is presented in Figure 2.

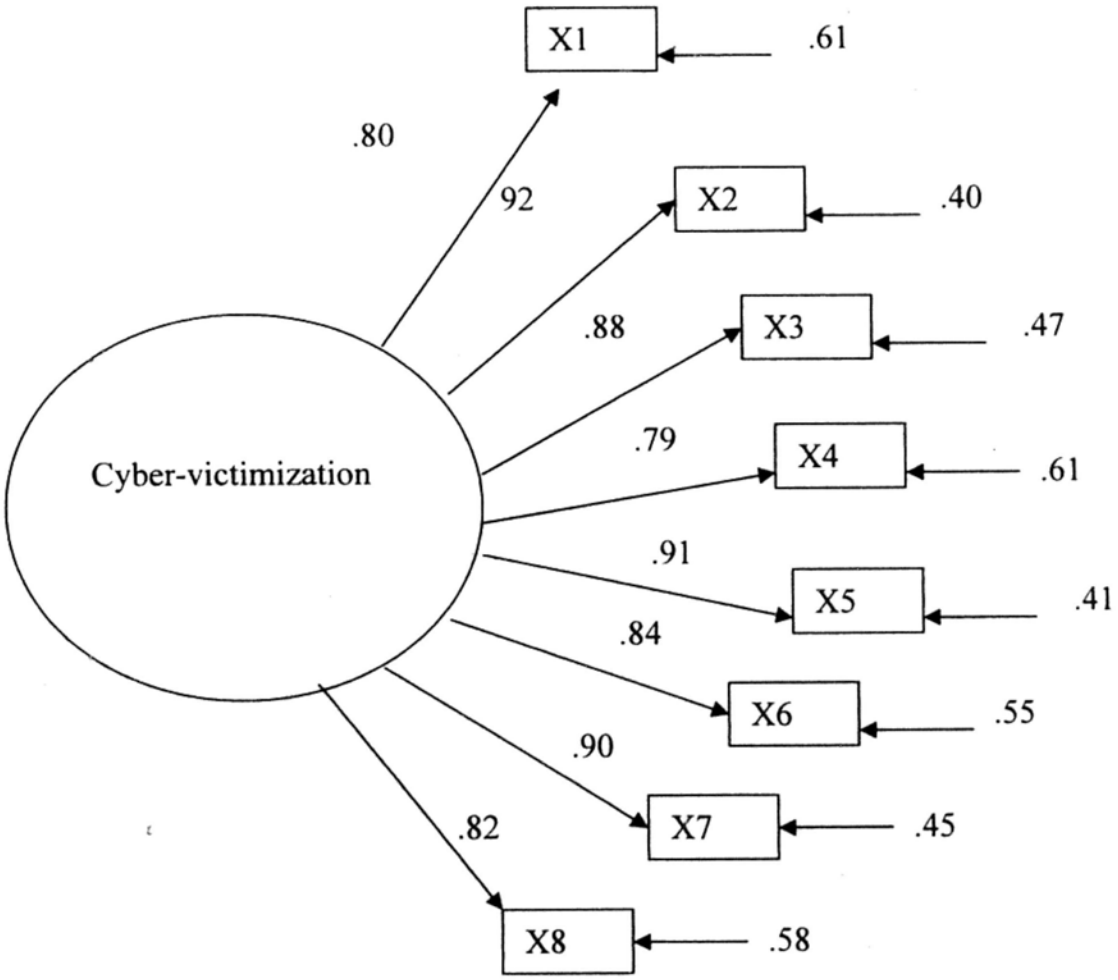

Figure 2. Cyberbullying scale.

Notes. Oval indicates latent factor; rectangles indicate measured variables (the items); completely standardized parameter estimates including factor loadings and indicator error variances are shown.

Table 9. *Eight Items of Cyber-victimization scale and cyberbullying scale*

Cyber-victimization scale	*Cyberbullying scale*
1. Others gossip or say mean things about me in online games/ on the internet.	1. I gossip or say mean things about others in online games/ on the internet.
2. Others say "If you don't do what I say, I will stop liking you" in online games/ on the internet.	2. I say "If you don't do what I say, I will stop liking you" to others in online games/ on the internet.
3. Others get mad at me, then they ignore or stop talking to me in online games/ on the internet.	3. I get mad at others, then I ignore or stop talking to others in online games/ on the internet.
4. Others steal my account or my belongings (e.g. money, weapons) in online games/ on the internet.	4. I steal others' account or belongings (e.g. money, weapons) in online games/ on the internet.
5. Others pretend to be my friends as a kind of revenge in online games/ on the internet.	5. I pretend to be others' friends as a kind of revenge in online games/ on the internet.
6. Others tell bad or stories about me, saying that I am a bad kid, in online games/ on the internet.	6. I tell bad or stories about others, saying that others are bad kids, in online games/ on the internet.
7. Others try to get others to dislike me because they are angry at me in online games/ on the internet.	7. I try to get others to dislike someone else because I am angry at them in online games/ on the internet.
8. Others say that they would help me but then betray me in online games/ on the internet.	8. I say that I would help others but then betray others in online games/ on the internet.

Prevalence rate of victimization and bullying in two social contexts

Means, SD, correlations among school victimization, bullying, and cyber-victimization and cyberbullying and the respective prevalence rates were listed in Table 10a and Table 10b. Among the four types of school and online bullying and victimization, the most prevalent one is school victimization, followed by school bullying, cyber-victimization and cyberbullying, if we consider the frequency of such events from happening as more than never, i.e. it happened before, to it rarely happened (with the mean

score of the scale from more than 1 to 2, while "1" means never, "2" means rarely). In other words, some types of school victimization and bullying probably happen once in awhile to students, while online victimization and bullying are less prevalent compared with the school ones. Also, bullying is a less prevalent behaviour compared with victimization in both online and school contexts. Therefore, if we would like to answer the question of whether school victimization or cyber-victimization is more common among fifth and sixth graders in Hong Kong, the answer would be school victimization; the same applies to bullying. However, the pattern of prevalence rate changes when we consider the frequency of such events from happening as "sometimes" to "happening everyday" (i.e. mean of scores on the scale >3, while "3" means often, "4" means usually, and "5" means everyday). If we consider how common it is for children to be frequently involved in school and online victimization and bullying, the most prevalent one is still school victimization, followed by cyber-victimization and cyber-bullying, with the least prevalent one as school bullying. Victimization is still more prevalent than bullying in both contexts, but online bullying happens relatively more commonly as these events become more frequent (more serious).

Also, the prevalence rate of frequent victimization in school and in online context became quite comparable at this end. In addition, proportionally, fewer kids are being heavily/frequently victimized in school, (only 8% out of those who have been victimized) but there is a larger portion of kids who get heavily victimized online (11.2% out of those who have been victimized); the same applies for bullying. Only 2.76% of the total of those who rated themselves as school bullies would say that they did this very frequently, but 12.82% of the total of those who rated themselves as cyber-bullies said that they did it very frequently.

Table 10a. *Means, SD, correlations among school victimization, bullying and cyber-victimization and cyberbullying*

Scale (alpha)	Mean (*SD*)	School victimization	School bullying	Cyber-victimization	Cyber-bullying
School victimization (.89)	1.98 (.82)	-			
School bullying (.91)	1.63 (.70)	.53**	-		
Cyber-victimization (.93)	1.38 (.66)	.34**	.36**	-	
Cyberbullying (.96)	1.27 (.60)	.24**	.43**	.69**	-

Note. **$p < .01$, two-tailed.

Table 10b. *Prevalence rate of School and online bullying and victimization*

Scale (alpha)	Percentage of students saying they have experienced it (score of scale >1)	Percentage of students saying they have frequently experienced it (score of scale >2)	Percentage of students saying they have very frequently experienced it (score of scale >3)
School victimization	80.5%	36.1%	6.5%
School bullying	65.2%	21.9%	1.8%
Cyber-victimization	47.3%	16.3%	5.3%
Cyberbullying	31.2%	12.1%	4.0%

Are bullies still bullies? Are victims still victims?

To answer the question of whether school victims may become online bullies when the context change, or whether, instead, they would tend to be victimized even when the context of social interaction changes, two regression analyses were carried out. School bullying scores were entered as step 1 in the hierarchical regression model, with School victimization scores entered as step 2. The sequence was then reversed to show the relative additional variance that each IV can explain in the DV after controlling for the other variable. They were regressed on cyberbullying and cyber-victimization respectively. The

result is shown in Table 11.

Table 11. *Hierarchical regression analysis for variables predicting Cyberbullying and Cyber-victimization*

		Cyberbullying			Cyber-victimization		
		R^2	R^2 Change	Beta (*t*-value)	R^2	R^2 Change	Beta (*t*-value)
Step1	School 2	.01	.01	-.03 (-.57)	.01	.01	-.01 (-.28)
	School 3			-.05 (-1.02)			-.05 (-1.01)
	School 4			-.02 (-.40)			-.00 (-.04)
Step2	School Bullying	.18	.18**	.42** (9.61)	.13	.12**	.25** (5.58)
Step 3	School Victimization	.18	.00	.02 (.55)	.16	.03**	.22** (5.00)
Step2	School Victimization	.06	.06**	.02 (.55)	.12	.12**	.22** (5.00)
Step 3	School Bullying	.18	.12**	.42** (9.61)	.16	.04**	.25** (5.58)

Note: * p >.05, ** p>.01

Results showed that despite the fact that school victimization itself can explain 6.0% of the variance in cyberbullying when it is entered in Step 1, with the inclusion of the experience of school bullying in Step 2, school bullying still explained 12.0% of additional unique variance in cyberbullying; with this inclusion, the standardized beta of school victimization in predicting the final model was not significant. In contrast, school bullying itself accounted for 18.0% of the variance in cyberbullying, while adding school victimization in Step 2 did not explain any further variance. In other words, school bullying is a better predictor compared with school victimization, therefore, it seems that school victims are not more likely than school bullies to become online bullies. As for cyber-victimization, both school bullying and school victimization explained significant

variance in cyber-victimization; the standardized beta weights of both predictors were also comparable, suggesting that both of them explain the DV equally well. In other words, both school victimization and school bullying experience explain one's cyber-victimization experience. While victims in the school context would tend to be victims in an online context, bullies in schools are not "exempted" from becoming cyber-vitcims as school bullying scores predicted cyber-victimization as well. In short, school bullying experience is much more strongly related with cyber bullying experience compared with school victimization behaviour, but both school bullying and school victimization experiences are equally strongly related with cyber-victimization experiences. Such a result seems to support the idea that school victims are not likely to bully others in the online context, but both school victims and school bullies are likely to be victimized in the online context.

Conclusions and Discussion

Online bullying and victimization in general are less common than in the face-to-face school context, probably due to the fact that not every student can access the internet. However, when we consider the prevalence rate of frequently occurring cases of victimization and bullying, the online ones are more prevalent. Also, a larger portion of students claim that they are heavily bullied/they bullied others frequently in the online context than in the offline ones. It may actually be more meaningful to consider these frequently happened bullying and victimization cases because it sounds common to be ever bullied/ been victimized once or while in school or online. As a matter of fact, some past studies (e.g. RØnning et al., 2009) also suggested that it would be meaningful to compare children's different levels of bullying ("non-bullies", "sometimes-bullies" and "frequent-bullies") as they predict psychiatric disorders that occurred in adulthood in different odd-ratios. After all, we have all faced / done some of these at some time in our lives. However, frequently occurring bullying and victimization may reflect psychological

constructs that are more stable. In addition, by definition, both bullying and victimization mean repetitive aggression towards others and being repetitively victimized, therefore, some more discussion would be made based on the prevalence rate of the frequently occurring bullying and victimization.

Such a finding may probably suggest that only a small proportion of children who are the most aggressive and destructive would tend to bully others frequently in a school context; however, more children would tend to be frequently aggressive towards others when it is in the online context. This could be due to the fact of a lesser inhibitory effect for cyberbullying to happen because cyberbullies would not be confronted with the reactions or consequences of bullying others, while they may be punished by adults offline. In addition, they do not need to be physically stronger to become bullies. Similarly, despite the fact that fewer students had the experience of being cyber-victimized then of being victimized in schools, a larger proportion of students are victims of frequent cyber-victimization compared with the school context. This may suggest that it is more common for children and early adolescents to be frequently victimized online than in school. It is likely that, different from school victimization, where victims tend to have certain characteristics that draw the attention of potential bullies, there are no such clues available in the online context. For instance, a strong boy may not be frequently victimized in schools, and he may even been able to protect himself by exerting some bullying behaviors toward others, but when such physical clues are sealed in the online context, he may also be as likely as a small and anxious boy to be frequently victimized in the online context. Such an explanation can also be applied to explain the fact that both school victimization and bullying experience could predict cyber-victimization in the regression analyses. Both of them predict cyber-victimization equally well, meaning that they are both strongly correlated with cyber-victimization. In other words, being a bully does not

"protect" a child from being an online victim; on the contrary, it is as strongly correlated with online victimization as school victimization is. Another possible explanation for the prevalence rate and the regression result would be that bullies in a school context tend to be hostile and angry kids. They may not be victims in real life, but because of this hostile personality, they could have made people angry in the online context as well. Without their physical advantages or their original group of friends who bully both directly or indirectly together with them, the hostile personality could just make them more easy targets of others in the online context.

Study 4: Comparison of friendship and victimization across two social contexts

There are several research questions and hypotheses to be tested to Study 4. First of all, similar to Study 1, the patterns of playing different types of games were explored. This was done in order to test whether students tend to spend a lot of time on MMOGSs compared with other types of games, and also to demonstrate the different types of MMOGSs that children and adolescents in Hong Kong are playing. Based on the categories of the games that were selected by the players, the games were then divided into violent or non-violent types for later analyses. There are some common concerns as to whether spending time on online games means children will spend less time interacting with friends and the extent to which this would potentially be problematic for children's overall psychological well-being. Thus, a comparison in terms of children's psychological well-being, which includes life satisfaction, friendship satisfaction, self esteem and social competence, was done between students who are MMOGs players versus those who are not players. Based on past literature as described above, playing online games is an interactive and enjoyable activity, which may actually be an important social activity for children and adolescents. Therefore it was hypothesized that no such differences would exist.

Second, a comparison was made between real life friendship versus online friendship. For analyses which involve friendship, only children who played MMOGs were included (as they would be more likely to form some kinds of online friendship and MMOGs was the major focus of the present study). Therefore, online friendship here was defined as online friendship on MMOGs. Children were asked to think about their best friend whom they know in their real lives (e.g. in school, playground, etc.), and rate the friendship quality on this friend. They were then asked to think of a best friend in MMOGs, and rate the friendship quality on this friend as well. Because the best friend in MMOGs and in real

life could be the same person, the comparison of friendship across the two contexts was divided into two sessions. One was about the comparison of on-and-offline friendship when the two friends' names were different. Another one was when the friend was actually the same person in two contexts. Based on past literature (e.g. Chan & Cheung, 2004), and the result of Study 2 where children and adolescents were asked to comment on the nature of online friendship in MMOGs, it was hypothesized that online friendship's quality would be lower than an offline one if the best friend from the online game was different from the traditional one because in the online context, there are fewer overall ways to interact, and the feeling of such a relationship as a real one may be less salient. However, if the online friend and the real life friend are actually the same person, the online one would be more likely to be an extension of the real life friendship (playing together in MMOGs is just an activity with their best friend in real life). Thus, I hypothesized that, if there are any differences between the perceptions of online and the offline friends, such differences would be much smaller. Moreover, if a difference could be shown even for the same friend as chosen across both contexts, this may further suggest that interacting in a real life context and interacting in an MMOGs context, even with the same friend, constitute two different experiences.

Finally, it was hypothesized that cyber-victimization would be negatively related to psychological well-being of children and early adolescents. Added to it, there has been a consensus that strong and reliable friendship can buffer the negative effect of victimization in school context (e.g. Hodges et al., 1999). Therefore, I hypothesized that even though cyber-victimization is negatively related to psychological well-being, online friendship in an MMOGS context could actually buffer its negative effect.

For the measurement of psychological well-being, self esteem, social competence, friendship satisfaction and life satisfaction were used. This is because self esteem is one of

the most important agentic needs for adolescents (Buhrmester, 1996) and it has been used as a measurement of well-being of adolescents in other studies of social development as well (e.g. Berndt & Miller, 1993). Also, past studies have shown that victims tend to be more anxious and have lower self-esteem (e.g. Hawker & Boul, 2000; Mason, 2008; Olweus, 1993). Social competence is chosen because it is another important skill that teenagers could achieve from friendship. Being competent socially means a teen is better at communicating with others and better able to adapt to more challenging social roles in the future. It is also one of the measures of developmental outcomes of friendship that has been included in past studies (e.g. Buhrmester, 1993). Friendship satisfaction means the general satisfaction that children and early adolescents can obtain from friendship. This is an important aspect to show how much satisfaction children can gain from their social interactions with friends. Finally, victims of traditional bullying often suffer health problems such as chronic illness or depression as well. Therefore, it is likely that their general happiness, i.e. life satisfaction, may be affected as a consequence of bullying. Thus, measuring life satisfaction can help us understand the consequences of being bullied.

Method

Participants

The same group of six hundred and twenty-six fifth and sixth graders from four primary schools in Hong Kong participated in Study 3 participated in this Study.

Measures

Obtained reliabilities for all of the scales used in this Study were satisfactory, with all above .70. Because, in the later part of the analyses which involved online friendship, only the sample of participants who played MMOGs was included, the reliabilities of different scales based on the full sample and the selected sample are both shown in Table 13. As the friendship qualities scale, victimization and bullying scales were similar and were

administered twice in the questionnaire, automatic randomization of the scales was carried out by the computer system. All of the participants answered questions related to demographics and psychological well-being first, and then half of the participants completed scales related to online friendship first, followed by the real life situation; the other half followed the opposite sequence.

Demographics

Information on age, grade, gender, flat size, and parents' education levels was gathered in Study 3.

Computer game playing habits

Computer game playing habits were tapped in a newly designed, comprehensive questionnaire. Questions tapped issues such as frequency and time spent on playing different kinds of computer games, namely interactive online games (e.g. MMOGs), solo-PC games, handheld video games (e.g. NDS) and family video console (e.g. Playstation3). Nevertheless, items on habits related to types of computer games other than MMOGs were mainly descriptive in nature for the sake of understanding the overall pattern of computer game playing in Hong Kong. Gaming habits on MMOGs were the major focus. Other questions such as the type of MMOGs they played, whether their best friend in MMOGs is the same best friend were also answered when participants indicated that they played MMOGs (because there was no reason for those who do not play MMOGs to answer these, a logic link was set in the online questionnaire and the system automatically guided students to the next question based on their answers to the previous ones). Students were then asked to think about their favorite MMOGS and to indicate whether the game belongs to a category of 1) fighting, 2) war, 3) car racing, 4) adventure, 5) strategy, 6) dancing, 7) sports (e.g. running), 8) clothing/design, 9) pets, 10) others. Categories 1 to 3 are usually highly violent, while violent elements are relatively few or

non-exist in other types. Twenty-five participants selected "others" when they were asked to indicate what type of game they believed their favorite MMOGs belonged to. Further categorizations of the games were done based on the types suggested by children. Only children who indicated that they have played MMOGs and that they had formed some type of online friendship were included for further analyses.

Friendship qualities

There are several ways to measure friendship. The most common is to measure the friendship components/ features of friendship quality. For instance, Berndt and Miller (1993) measured the positive and negative attributes of friendship by interviewing children and adolescents. Bukowski et al. (1994) developed a scale which measures the companionship, help, security, closeness and help qualities of friendship. The friendship quality scale of Bukowski et al. (1994) is well-developed and has been used widely on early adolescent populations.

Four subscales of the Friendship Qualities scale by Bukowski et al. (1994) were used. The four subscales are companionship, help, security and closeness. These four subscales each represent an important aspect of early adolescents' friendship and could be used independently or as a composite score. Demir and Urberg (2004) suggested that these dimensions represent positive qualities of friendship, and therefore, when investigating the hypothesis of how online friendship is different from real line friendship, each dimension was compared online and offline independently, aiming to show more clearly how different constructs may be compared across both contexts. A sample item of the companionship subscale (consists of 4 items) is "My friend thinks of fun things for us to do together." A sample item for the help construct is "My friend helps me if I have trouble with something." There are 5 items for the help construct from the original scale. However, 1 item had to be dropped because the original item "If I forgot my lunch or needed a little

money, my friend would loan it to me" is not suitable for the online context. Therefore, this item was dropped for measuring both the online and offline help constructs. A sample item of the security construct (consists of 5 items) is "If there is something bothering me, I can tell my friend about it even if it is something that I cannot tell others." A sample item for the closeness construct (consists of 5 items) is, "I feel happy when I am with my friend." Same items were used to measure both online and real life friendship, but the wordings were changed according to the social contexts. For instance, when measuring companionship construct in the online context, the item was "My friend thinks of fun things for us to do together in online games".

For analyses that aimed at investigating the question of how real life and online friendship quality may explain psychological well-being, for the sake of easy administration of the variables in the regression model, and also, as these four subscales added together can represent positive friendship quality, composite scores of the four subscales on online and real life context were formed, representing overall friendship quality. Participants were asked to think about one of their best friends in real life (e.g., in school, playground) and then input that friend's name and asked to think about the friend for answering the items related to friendship qualities. Students were also asked to think about one of their best friends in MMOGs, and then input that friend's name and asked to think about that particular friend for answering the items related to friendship qualities. The instructions were clear that this person could be the same or different across the two contexts.

Cyber-bullying, Cyber-victimization, School bullying, & School victimization

These scales used in Study 4 were the same as those that were developed in Study 3. Results from Study 3 were used for analyses in Study 4.

Parental monitoring of computer use

Parental monitoring over children' use of the computer is an important factor to be included as the development of children and early adolescents is highly related to parenting. Parental monitoring of computer use may be related to the time spent on computer games and perhaps other online activities, such as online bullying or victimization. Therefore, despite the fact that I had no specific hypothesis concerning the effect of parental monitoring on peer relationships online and offline in the present study, this variable was included as a control variable in regression analyses and as an exploratory variable used to investigate the potential relationship between parental monitoring and other measured variables in this Study.

A parental monitoring scale was developed based on the parental knowledge scale by Kerr and Stattin (2000) in addition to issues that are specifically relevant to computer game playing. Kerr and Stattin (2000) suggested that what parents know accounts for how well parents can monitor their children, and how much children are willing to disclose. Parents who are willing to take the initiative to be concerned about the activities that their children are engaged in and how rules are set to control children's activities are effectively monitoring them. However, not all of the items of their subscales necessarily apply to the online context. Thus, some changes were made, and a 6-item scale measuring parents' monitoring of computer use was ultimately developed based on previous work (Kerr & Stattin, 2000). The items included "I tell my parents what I am doing on the internet," "My parents take the initiative to ask what I am doing in online games/ on the internet," "My parents know clearly what I am doing in the online games/ on the internet," "My parents set rules about the time that I can spend on computer games everyday," "My parents remind me to be cautious about bad people on the internet," and "My parents know clearly what kind of friends I have made on the internet/ in MMOGs". They were asked to rate on a 6-point likert scale, from 1 as strongly disagree to 6 as strongly agree each of these items.

The 6 items were then subjected to EFA, and 1 factor was extracted, with an eigenvalue = 3.53, which accounted for 58.85% of the total variance. The factor loadings of the respective items are listed in Table 12.

Table 12. *Factor Structure and Loadings of the Parental monitoring on computer use*

Item	Factor loadings
My parents know clearly about what kind of friends I have made on the internet/ in MMOGS.	.82
My parents take the initiative to ask what I am doing in online games/ on the internet	.81
My parents set rules about the time that I can spent on computer games everyday.	.7.739
I will tell my parents what I am doing on the internet.	.73
My parents remind me to be cautious about bad people on the internet.	.72
My parents know clearly what kind of friends I have made on the internet/ in MMOGS	
Eigenvalue	3.53
% variance explained	58.85

Social Competence

The Social Competence subscale of the Perceived Competence Scale for Children (Harter, 1982), which assesses participants' self perceived social competence, was administered. A sample item is " I am easily liked by others."

Friendship satisfaction

The friendship's satisfaction subscale of the Multidimensional Students' Life Satisfaction Scale by Huebner (1998) was used. Participants were asked to rate the general satisfaction that they get from both online friendship and from offline friendship. It was a

9-item general measure of the general satisfaction that children perceived as they could gain from friendship. It measures the sense of satisfaction rather than quality of a particular friend. A sample item is " My friends are good to me."

Self Esteem

The Rosenberg Self-Esteem Scale (Rosenberg, 1965), a 10-item measure of global personal self-esteem on a five-points scale was used. A sample item is "I have plenty of good qualities."

Satisfaction with Life

This scale assesses children's overall perceived subjective well-being on a seven-point scale. It has good cross-cultural validity (Diener et al., 1985). A sample item is "My life is close to ideal."

Results

Descriptive Statistics, means, SD and correlations

The average time that the students reported spending (and *SD* for each) in the four types of games was: MMOGs: 1.12 hours (*1.44*); solitary computer games: .73 hours (*1.09*); handheld video games e.g NDS, PSP: .73 hours (*1.21*); and home video consoles: .52 hours (*1.09*). It can be seen that 56% of the sample had reportedly played MMOGs in the last three months. Boys played significantly more than girls in MMOGs, solitary computer games and handheld video games, but did not differ significantly in time spent on home video consoles (MMOGS, t (596.32) = -5.79 p < .00, Cohen's d = .47; solitary computer games, t (600.70) = -3.21, p<.00, Cohen's d = .26; handheld video games e.g. NDS, PSP, t (549.05) = -4.08, p<.00, Cohen's d = .35; home video consoles, t (605.18) = 1.87, p >.05 . The effect sizes ranged from small to medium, with the biggest gender difference in time spent on MMOGs. Gender differences were found for online victimization , t (322.19) =

2.37, p <.05, Cohen's d = .26, and real life friendship, t (324) = -2.59, p <.05, Cohen's d = .29. Boys experienced more online victimization than girls, while girls had better quality of real life friendship than boys; the effect sizes suggested a small gender difference on these two measured variables. A likely explanation for boys experiencing slightly more cyber-victimization than girls would be that they spend more time on most types of computer games than girls. However, there were no gender differences on other measured constructs including school victimization, t (324) = -.34, p > .05 , school bullying, t (307.49) = .11, p > .05, online bullying, t (306.61) = 1.49, p > .05, online friendship, t (308) = 1.62, p > .05, life satisfaction, t (324) = .37, p > .05, self –esteem, t (324) = .21, p > .05, friendship satisfaction, t (324) = .16, p > .05, and social competence, t (324) = .33, p > .05. There were no significant grade differences in terms of time spent on the three types of games, but there was a significant grade difference in time spent on MMOGs only, t (585.70) = 3.18, p<0.00), Cohen's d= .26, suggesting a small effect size, with Grade 6 students spending more time on MMOGs than grade 5 students. Tables 13 and 14 display for the complete sample (N = 626) the reliabilities, means and SD of the measured variables, and the numbers of participants in the sample by gender, grade, habits of playing MMOGs (players vs. non-players), types of online game played (violent vs. non-violent) and types of online friendship (best friend in reality and best friend in MMOGs is the same person vs. are two different people).

Table 13. *Reliabilities, mean and SD of all the measured variables*

Scale	Cornbach's Alpha (if applicable)	Range	Mean (*SD*)
Age	-	9-15	10.81(*.83*)
Parents' education (years of receiving formal education)	-	6-18	11(*2.78*)
Number of rooms at home	-	0-4	2.51(*.94*)
Time spent on MMOGs	-	0-7 (hours)	1.12 hours (*1.44*)
Friendship subscale-Companionship (real life)	.83	1-5	3.86(*.87*)
Friendship subscale-Help (real life)	.87	1-5	3.88(*.91*)
Friendship subscale-Security (real life)	.73	1.2-5	3.75(*.76*)
Friendship subscale-Closeness (real life)	.93	1-5	3.91(*.93*)
Friendship subscale-Companionship (online)	.90	1-5	3.23(*1.20*)
Friendship subscale-Help (online)	.87	1-5	3.24(*1.22*)
Friendship subscale- Security (online)	.75	1-5	3.35(*1.00*)
Friendship subscale- Closeness (online)	.92	1-5	3.17(*1.20*)
Overall real life friendship quality (composite of 4 constructs)	.94	1.22-5	3.85(*.77*)
Overall online friendship quality (composite of 4 constructs)	.94	1-5	3.25(*1.04*)
Parental monitoring on computer use	.86	1-5	3.65(*.98*)
School victimization	.89	1-5	1.98(*.82*)
School bullying	.91	1-5	1.63(*.70*)
Cyber-victimization	.93	1-5	1.98(*.66*)
Cyberbullying	.96	1-5	1.27(*.60*)
Social competence	.88	1-4	2.90(*.63*)
Friendship satisfaction	.83	1-4	3.11(*.51*)
Self-esteem	.76	1.2-3.9	2.79(*.46*)
Life satisfaction	.83	1-7	4.88(*1.32*)

Table 14. *Number of participants by categories*

	Participants by category (*N*)	
Gender	Boys (*318*)	Girls (*308*)
Grade	Grade 5 (*265*)	Grade 6 (*325*)
Players of MMOGs (have played MMOGs in the last 3 months)	Yes (*349*)	No(*267*)
Favourite game type of MMOGS is violent	Yes *(161)*	No (*187*)
Players of MMOGs and formed online friendship	Yes (*326*)	No (*23*)
Players of MMOGs who formed online friendship, have selected that their online best friend is the same person as their real life best friend	Yes(*238*)	No (*88*)

Correlations among measured variables based on full sample (N = 626)

Correlations among age, parental education and number of rooms at home (these two can serve as a very rough an indicator of family background/SES), parental monitoring of computer use, victimization and bullying in online and real life contexts, and psychological well-being, including social competence, friendship satisfaction, self esteem and life satisfaction of the full sample ($N = 626$) is shown in Table 15.

Table 15. *Correlations among age, parental education and number of rooms at home , parental monitoring on computer use, victimization and bullying in online and real life contexts, social competence, friendship satisfaction, self esteem and life satisfaction, N = 626*

		1.	2.	3.	4.	5.	6.	7.	9.	10.	11.	12.	13.
1.	Age	-											
2.	Parents' average education	-.08	-										
3.	Numberof rooms at home	-.09*	.33**	-									
4.	Parental monitoring on computer use	-.03	.12**	.01	-								
5.	School victimization	-.00	-.07	.03	-.03	-							
6.	School bullying	.10*	-.09*	.05	.05	.53**	-						
7.	Cyber-victimization	.08	-.07	.03	-.01	.34**	.36**	-					
8.	Cyberbullying	.07	-.06	.06	.01	.24**	.43**	.69**	-				
9.	Social competence	-.04	.05	.04	.14**	-.32**	-.14**	-.10*	-.03	-			
10.	Friendship satisfaction	-.03	.09*	-.01	.11*	-.38**	-.31**	-.19**	-.19**	.54**	-		
11.	Self-esteem	-.02	.10*	.00	.10*	-.33**	-.21**	-.18**	-.15**	.44**	.31**	-	
12.	Life satisfaction	-.02	.09*	-.02	.19**	-.20**	-.16**	-.12**	-.11**	.34**	.28**	.39**	-

Note: * p <.05, ** p<.01

School bullying, victimization, and cyber-victimization and cyberbullying were all negatively and significantly correlated with the four psychological well-being constructs (with the exception that cyberbullying was not correlated significantly with social competence). This was in line with past literature above suggesting that while being victimized is related to worse psychological well-being, bullies also tend to report diminished psychological health. The question of whether being victimized in an online context is related to negative psychological outcomes can be understood by looking at the correlational analyses. As expected, online victimization was negatively and significantly correlated with most of the psychological outcomes, (cyberbullying did not significantly correlated with social competence); the Pearson rs for online victimization ranged from -.1 to -.19, suggesting a small to medium correlation between online social experience in terms of bullying and victimization and psychological outcomes. However, school victimization was in fact correlated much more strongly with all the psychological outcomes, with Pearson rs ranged from .20 to .38. Despite the fact that cyber-victimization is negatively associated with psychological well-being, we should not overlook the fact that cyber-victimization and school-victimization were moderately and significantly correlated (r = .34). Children who tended to be victimized in schools also tend to be victimized online, and the negative association between school victimization and psychological well-being was much stronger than the one that between online victimization and well-being. After controlling school victimization, the partial correlations between cyber-victimization and the psychological constructs were as follows: social competence, r = .01 (p =.75), friendship satisfaction, r = -.07 (p =.07), self esteem, r = - .08 (p =.05), life satisfaction, r = .06 (p =.16). Cyber-victimization did not correlate significantly with any of the psychological constructs, despite the fact that it was negatively and weakly correlated with self esteem.. In other words, despite the fact that cyber-victimization is

negatively related to children's psychological well-being, it probably does not add to their perceived difficulties given their experience of victimization in real life.

Differences between MMOGs players and non-players

However, this above-described analysis was based on the complete sample, which comprised students who played and did not play MMOGs. Despite the fact that victimization and bullying in an online context can be experienced by both players and no-players, it is likely that players of MMOGs are much more involved in online situations than are the non-players, and it is likely that the pattern of how online social interactions are perceived by MMOGS players would be different from the general population. To further investigate the extent to which there are any differences between those who play MMOGs and do not play MMOGs, t-tests were carried out on age, parental education, number of rooms at home, parental monitoring on computer use, school victimization and bullying, online victimization and bullying and the four psychological constructs across these two groups. Non-players were significantly lower than players in terms parental monitoring of computer use, t (592) =-2.64 , $p < .01$ Cohen's d = .22; school victimization, t (624) =-3.38, $p < .00$, Cohen's d = .27; school bullying, t (544.10) =-4.88, $p < .00$, Cohen's d = .42; cyber-victimization, t (622.68) =-7.95, $p < .00$, Cohen's d = .64 and cyberbullying, t (600.72) = -6.05, $p < .00$, Cohen's d = .60; while non-players were significantly higher than players in terms of self esteem, t (624) =2.07, $p < .05$, Cohen's d =.17 .There is a clear difference between the two groups of participants. This difference is especially salient, with a large effect size, for cyber-victimization and cyberbullying, while differences in parental monitoring, and school victimization were small to medium. The difference in school bullying between the two groups of children yielded a medium effect too, suggesting that players of MMOGs are involved in more school bullying behavior. Despite the differences in the above dimensions, when it comes to differences in terms of

psychological outcomes, only self esteem was found to be significantly different between the two groups, with non-players having a higher self-esteem than players, yet, the effect size is small (Cohen's d = .17) suggesting that the difference in psychological well-beings between players and non-players is not very salient.

Correlations among measured variables based on those who played MMOGs and made friends in MMOGs (N = 326)

As only those who played MMOGs and made friends in MMOGs were included for further analyses (with $N = 326$), another correlation analysis was carried out as shown in Table 16 to demonstrate the relations among age, parental education and number of rooms at home, parental monitoring on computer use, time spent on MMOGs, victimization and bullying in online and real life contexts, overall friendship quality in online and real life contexts, and psychological well-being, including social competence, friendship satisfaction, self esteem and life satisfaction, for these students only. Cyber-victimization and cyber-bullying were negative correlated with the psychological constructs in a small to moderate magnitude, except that cyberbullying was not correlated with social competence. Compared to the complete sample, the strength of correlations of online bullying and victimization for the participants who played MMOGs was stronger. This could be related to the fact that time spent on MMOGSs was also moderately correlated with online bullying and victimization, and it seems that whatever happens in the online context might be more relevant to kids who spend more time on MMOGs, compared with the complete sample that included non-players of MMOGs. Online victimization and school victimization again positively correlated with each another moderately (r =.30).

Table 16. *Correlations among measured variables (based on the sample who played MMOGSs and have online friendships), N =326*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Age	-														
2. Parental education	-.11	-													
3. Number of rooms at home	-.03	.30**	-												
4. Parental monitoring on computer use	-.06	.15**	-.02	-											
5. Time spent on MMOGS	.25**	-.03	.05	-.17**	-										
6. School victimization	-.05	-.06	.02	-.02	.01	-									
7. School bullying	.06	-.05	.07	.04	.19**	.49**	-								
8. Cyber-victimization	.02	-.06	.04	-.08	.16**	.30**	.35**	-							
9. Cyber bullying	.02	-.09	.05	-.07	.24**	.23**	.42**	.66**	-						
10. Social competence	.02	.05	-.00	.07	.02	-.36**	-.16**	-.17**	-.09	-					
11.Friendship satisfaction	.04	.06	-.03	.05	.08	-.38**	-.30**	-.24**	-.24**	.55**	-				
12. Self-esteem	.01	.16**	-.02	.10	-.09	-.31**	-.21**	-.20**	-.19**	.39**	.26**	-			
13. Life satisfaction	-.01	.10	-.01	.22**	-.15**	-.18**	-.17**	-.14**	-.15**	.32**	.25**	.42**	-		
14. Real life friendship	-.06	.08	.02	-.15**	-.03	-.13*	-.24**	-.20**	-.26**	.27**	.28**	.14*	.18**	-	
15. Online friendship	-.07	.09	.06	-.06	.15*	-.12*	-.15**	-.06	-.07	.26**	.31**	.19**	.17**	.45**	-

Note: * p <.05, ** p<.01

To explore the extent to which online victimization still correlated with psychological constructs after controlling school victimization in MMOGs players, partial correlation analyses were carried out. The results suggested that cyber-victimization and the psychological constructs were correlated as follows: social competence, r = -.08 (p =.18), friendship satisfaction, r = -.15 (p <.01), self esteem, r = - .12 (p <.01), life satisfaction, r = -.10 (p =.08). The results suggest that even after the seemingly stronger predictor, school victimization, was controlled, online victimization was still negatively correlated with three psychological constructs, and for life satisfaction, it was marginally significant (p =.08). This may suggested that for the group of students who played MMOGs, online victimization still matters to them to a small to moderate extent.

Friendship qualities in real life versus in an online context

Concerning the differences between online friendship in MMOGs and real life friendship, repeated measures on the four different constructs, namely companionship, help, security, and closeness, of friendship were carried out on the data from 326 participants who were MMOGs players and who reported meeting online friends in MMOGs. As it was expected that the difference between the two (online and real life) would depend on whether the best friend in MMOGs was the same as the best friend in real life, separate repeated measures were done separately. For the participants who had the same best friend in MMOGs and in real life, the only difference was found in the reported closeness construct, t (83) = 2.17, p<0.05; Cohen's d = .27, with a small to medium effect size; real life friendship's closeness was rated as significantly higher than that of the online one even though the focus was on the same friend. No significant differences were found in the companionship construct, t (83) = .86; p > 0.05; help construct, t (83) = .75, p >0.05, or security construct, t (83) = .44, p>0.05. For the participants who had different best friends in MMOGSs and in real life, significant differences in rated friendship qualities measured

by four constructs were found, with real life friendship being significantly stronger than online ones. For the companionship construct, t (225) = 4.62; $p < .00$, Cohen's d = .36; help construct, t (225) = 3.78, $p < 0.00$, Cohen's d = .26, security construct, t (225) = 2.11, $p < 0.05$, Cohen's d = .15, closeness construct, t (225) = 5.65, $p < .00$, Cohen's d = .28.

Hierarchical regression analyses for predicting social competence, friendship satisfaction, Self-esteem and life satisfaction

Regression analyses were carried out to investigate the combining effects of friendship and victimization in real life and in the online contexts. Gender differences were found for time spent on online games, real life friendship, and cyber-victimization. Thus, to further investigate whether gender would play a moderating role in how time spent on online games, and victimization and friendship in both contexts explained variance in the psychological outcomes, five interaction terms were formed by multiplying gender with school victimizaiton, school bullying, online victimization, online bullying, real life friendship, online friendship and average time spent of computer games. Only the interaction term of real life friendship could significantly predict some of the constructs of psychological well-being, however. Therefore, only this interaction term is shown in Table 17.

The results suggest that after controlling the effects of school, grade, age, parental education, number of rooms at home (though not as accurate as family income, these two could be an indicator of SES) and parental monitoring on computer use, school victimization was negatively related to the four psychological constructs, and it added significant variance in explaining all the psychological constructs, while real life friendship were positively correlated with social competence, friendship satisfaction and life satisfaction, and added significant variance in explaining the three constructs but not self esteem. After controlling all the real life social experiences, cyber-victimization still

explained 1% additional variance in friendship satisfaction, and it was negatively correlated with friendship satisfaction. Online friendship added 2-3% additional significant unique variance across all the constructs, and it was positively related to the four of them as well. Gender only moderated the relationship between real life friendship and social competence and friendship satisfaction. This result suggests that, despite the fact that real life friendship is positively related to psychological well-being, compared with boys, such a relationship is less salient in girls. However, no moderating role of gender was found for online friendship, suggesting that both boys and girls benefit to the same degree from online friendship.

Finally, Study 3 showed that there was a big difference in base rate for both school and online victimization and bullying to occur. One may argue that including participants who have never experienced any type of school or online bullying or victimization before into the analyses may not be ideal, as it may not reveal the pattern for those who were frequent bullies or victims. To further investigate this issue, another set of regression analyses using identical procedures to the one listed in Table 17 were carried out. These analyses only include participants (N = 302) who are players of MMOGs, and who have also experienced any of these before (i.e. the composite score of any of the four scales is larger than 1, as "1" refers to "never experienced this before"). The results were very similar to the regression analyses that were based on the entire sample of MMOGs players. Similar to the results in Table 17, for this set of regression analyses, online victimization negatively and significantly explained 1.3% of additional variance in friendship satisfaction only, but not for other psychological constructs. Online friendship still positively and significantly explained additional variance for social competence (2.1%), friendship satisfaction (2.3%), self esteem (2.7%), and life satisfaction (1.8%). However, the moderating effect of gender on the relationship between real life friendship and social

competence and friendship satisfaction was non-significant in this selected sample. This result suggests that for both the entire sample of MMOG players or the sample that consisted of players who have experienced some kinds of online or school victimization or bullying before, the relationships between online victimization and online friendship and the psychological constructs were comparable.

Table 17. *Hierarchical regression analysis for predicting social competence, friendship satisfaction, self-esteem and life satisfaction*

		Social competence			Friendship satisfaction			Self-esteem			Life satisfaction		
Step		R^2	ΔR^2	Beta (*t*-value)	R^2	ΔR^2	Beta (*t*-value)	R^2	ΔR^2	Beta (*t*-value)	R^2	ΔR^2	Beta (*t*-value)
1	School 2			-.10(-1.48)			-.01(-.13)			-.15(-2.09)*			-.12(-1.7)
	School 3			.03(.47)			-.01(-.08)			-.06(-.92)			-.04(-.56)
	School 4			-.16(-2.31)*			-.08(-1.20)			-.12(-1.75)			-.14(-2.06)*
	Grade			-.08(-1.16)			.05(.71)			-.01(-.08)			-.03(-.45)
	Age			.10(1.42)			.01(.13)			.06(.90)			.10(1.43)
	Gender	.05	.05	.05(.70)	.03	.03	-.06(-.95)	.06	.06*	-.00(-.02)	.08	.08**	.02(.31)
	Parental Education			.01(.10)			.03(.59)			.14(2.34)*			.08(126)
	Number of rooms at home			.02(.35)			-.05(-.86)			-.04(-.74)			.00(.05)
	Parental monitoring			.08(1.36)			.07(1.33)			.06(.96)			.19(3.18)**
2	School Victimization	.16	.11**	-.29 (-5.16)**	.17	.14**	-.29(5.31)**	.14	.08**	-.23(-3.87)**	.10	.02**	-.-11(-.18)
3	Real life friendship	.19	.03**	.19(2.67)**	. 22	.05**	.21(2.99)**	.14	.01	.02(.20)	.13	.03**	.13(1.70)
4	Time spent on MMOGS	.20	.01	.03(.64)	.23	.01	.06 (1.09)	.15	.00	-.08(-1.38)	.14	.02	-.15(-2.43)*
	Type of MMOGS			-.09(-1.44)			-.05(-.84)			-.02(-.30)			-.05(-.78)
	Best friend			-.00(-.05)			-.06(-1.17)			.01(.11)			.05(.81)
5	Cyber-victimization	.20	.00	-0.01 (-.22)	.24	.01*	-.13(-2.26)*	.16	.01	-.10(-1.70)	.14	.00	-.05(-.87)
6	Online friendship	.22	.02**	0.17 (2.83)**	.27	.03**	.19(3.22)**	.18	.02**	.18(2.90)**	.16	.02*	.15(2.36)*
7	Real life friendship X Gender	.24	.01*	-0.14(-2.18)*	.28	.01*	-.12(-1.96)*	.18	.00	-.04(-.63)	.16	.00	-.03(-.45)

Note: * $p <= .05$, ** $p < .01$

Note. *Type of MMOGS: "violent" games coded as "0", non-violent as "1"; Best friend refers to if the best friend in real life & MMOGS is the same person, the same person is coded as "0", not the same person is coded as "1*

Conclusion and Discussion

Study 4 provided information about the pattern of computer gaming habits among the Hong Kong Chinese students. More than half of the children and early adolescents in Hong Kong are MMOGS players, while more than 93% of them formed some online friendship in MMOGs. This suggests that the social functioning of MMOGs is an important issue to be studied. From the results of Study 4 , it seems that players are having more social problems at school (school bullying was higher for players than non-players, with a medium effect size; while school victimization was also higher for players than non-players with a small to medium effect size). In addition, time spent on MMOGs was also correlated moderately and positively with school bullying. Past literature has suggested that children and adolescents often feel powerless to meet ever-changing demands in life, leading to increases in stress (Grodal, 2000). In contrast, computer games are predictable, and they offer an escape from reality and a way to relax (e.g., Vorderer et al., 2004). Durkin and Aisbett (1999) found that the most frequently mentioned emotions linked to computer games were enjoyment and fun, followed by excitement, relaxation, peace, calmness and quiet. Other studies have suggested that computer games may also serve the purpose of catharsis. That is, the media can induce negative emotions such as anxieties, anger, etc. which then creates some relief in emotions for the audience (e.g. Zillmann, 1998). Some researchers (e.g. Gunter (1980), cited in Durkin (2006) have suggested that some individuals could create fantasies after playing computer games, particularly violent games which may improve their mood. Despite the fact that there is still a lack of empirical evidence on the role of computer games in producing catharsis (Durkin, 2006), the results of Study 4 seems to indicate a relation between the choice of playing MMOGs and some social problems at school. Players are also more likely to experience more online victimization than non-players with a large

effect size as well. However, with all these seemingly "harmful" experiences, which are supposed to make players more prone to a poorer psychological well-being, players and non-players only differed in terms of self esteem (with a small effect size), but not other aspects of psychological well-being. Such a result may be explained by the fact that 93% of the MMOGs players sought friendships in MMOGs, and this additional online friendship was positively correlated with all psychological constructs even after real life social experiences were controlled.

The results suggest that there is a small to moderate difference between online friendship and real life friendship in all constructs of friendship qualities if the best friend in the online and real life contexts is different. As a matter of fact, the possibility that such a difference is due to the fact that the friendship is with two different persons, rather than because of two different contexts could not be ruled out. However, whom you met is also confounded by the context, so it would be difficult to disentagle the two. The results suggest that online friendship is less comparable with real life friendship, which probably suggests that within the online context, perhaps because of a reduced social presence, it would be more difficult to develop friendship that is as positive as the real life one even if it represents the best friendship inside MMOGs. In the analyses involving participants who chose the same best friend in both contexts, there was still a small to medium difference in terms of the closeness construct. Such a pattern further suggests that even for the same person, the friendship quality in terms of closeness perceived could be different, which further supports the idea that, due to the different nature of the two contexts, friendship qualities differ.

Despite the fact that a difference was found between the two, the differences were only small to medium in terms of effect size. The fact that after controlling a series of real life social experiences, including real life friendship, that online friendship is still

positively correlated with all of the psychological constructs suggests the usefulness of online friendship, regardless of what the source is and its quality is slightly lower than a real life friendship is encouraging. In line with past literature that shows that friendship or even having one best friend could buffer the negative effect of victimization, Study 4 suggested that online friendship can have a similar function. This is encouraging because for children and teens who may not be able to have good quality real life friendship, it seems that having some online friendship is also beneficial to them. One more interesting finding was that self-esteem was not correlated with real life friendship but with online friendship, and self –esteem is also the only psychological construct that was mildly lower for players of MMOGs compared with those do not play. As suggested in the literature review in the introduction, computer-mediated communication seems to particularly benefit people who are shy or have a physical disabilities (e.g. Sheeks & Birchmeier, 2006; Lea & Spear, 1995). Thus, it seems that despite the fact that real life friendship should be a strong predictor for psychological well-being, for players of MMOGs, the strength of real life friendship seems not to be enough to buffer the negative effects from school victimization or hampered self-esteem. Rather, probably because of its fewer physical clues being involved and slightly more distant nature, online friendship provides its protective function by providing some chances for children to regain their self-esteem.

The results seem to have suggested a trend that children who are having social troubles at school are more likely to be players MMOGs, and within MMOGs, almost all of them built up some kind of online friendship with others. In addition, while the positive benefits from real life friendship on social competence and friendship satisfaction were moderated by gender with girls benefitting less from it, online friendship benefits both gender to a similar degree. In other words, online friendship seems to have an important additional role in the psychological well-being of early adolescents, as much for girls as for

boys. Despite being limited by the context, the quality of this online friendship is less good compared with the real life friendship, and this additional positive experience is positively associated with the psychological well-being of children, which may cancel out any potential differences between players and non-players of MMOGs.

Chapter 3: General Discussions

Computer game playing is a favorite activity among children and early adolescents. The present research is among the first to examine the issue of online game playing in relation to cyberbullying, cyber-victimization, and online friendships. I also investigated how social experiences in the online context (i.e., how being cyber-victimized or cyber-bullied or how making friends on the internet), on top of social experiences in real life, could explain psychological well-being in Hong Kong Chinese children and early adolescents.

Among the many types of computer games, online games (MMOGs) are the most popular. Many past research studies have focused on the potential negative effects of computer gaming on development. These negative effects often include aggression and addiction. However, some more recent research has started looking at the social aspects of online games by investigating the potential for positive online friendships (e.g. Raney et al., 2006). At the same time, the issue of being cyberbullying in the virtual world is becoming a common concern for researchers, educators and parents. However, research based on Chinese populations that reveals patterns of bullying, victimization, or other aspects of social relationships in playing online games is scarce, so the prevalence rate of children being cyberbullies and cyber-victims has, thus far, been unclear. In addition, despite the fact that some past studies have examined the differences in online versus real life friendship in college student samples (e.g. Chan & Cheung, 2004), a comparison based on friendship focused on the most popular computer games, i.e. MMOGs, for children and early adolescents, has been lacking. Finally, both the cyber-victimization experience and online friendship are social experiences in the online world, and despite the fact that, in the existing literature, victimization and friendship tend to be studied together to illustrate their

relative importance in explaining the psychological well-being of children, such a strategy seems not to have been applied to the online context. These different contexts (i.e., online and "offline") were, therefore, brought together in the present study in order to examine the relative predictive power of each to the psychological well-being of Hong Kong Chinese children and early adolescents.

In the present research, four studies were carried out to investigate the above issues. Both qualitative and quantitative research methods were applied. In Study 1, based on a sample of 494 grade five and six students in two primary schools in Hong Kong, I focused on basic issues of computer-gaming, such as total time spent on computer games. It was found that among different types of computer games, children spent much more time on MMOGs than on any other types of computer games. In addition, the perceived social functioning of MMOGs (e.g., I believe that I can make friends with people that I meet in MMOGs" was positively related to children's life satisfaction, suggesting that the social function elements (e.g., online friendship) in MMOGs are worth examining. In Study 2, a focus group interview was carried out with 17 experienced MMOGs players. This was carried out to provide extra quantitative information on several issues related to experience on the internet. It was found that one of the major reasons for them to play MMOGs is because of its social functions, either because a lot of friends are playing or as a means to keep in touch with others. When asked about the nature of online friendship in MMOGs, most children suggested that the quality of online friendship for compansionship, help and closeness are less comparable to real life friendship, usually because they believe online friends are strangers that they cannot meet in real life. However, a couple of the respondents believed that for the security construct (which measures the extent to which children believe that the best friend can be trusted for problem sharing and also for making up even after conflicts), the two were comparable in online and real life contexts. These

comments were consistent with the findings in Study 4, in which among the four constructs of friendship, the smallest difference found between online and real life friendship was the security construct. In Study 2, respondents' response and comments on what constitutes cyberbullying were gathered. Most of their responses suggested that the most common events that they would categorize cyberbullying can be captured via the existing literature which measures indirect and also verbal aggression. A few items were added on top of existing scales in order to measure victimization and bullying to form two scales that aim at measuring cyber-victimization and cyberbullying.

In Study 3 and Study 4, both were based on a sample with 626 grade 5 and 6 students, EFA and CFA were carried out to confirm the construct validity of both scales, each containing 8 items. The two scales were short and easily understood by children in grades 5 and 6; it also could explain reasonable variance in social adjustment outcomes and showed high internal consistency reliabilities. The development of these two scales fills a gap in the existing literature in measuring cyberbullying and cyber-victimization, given that, in past work, single items were typically used to tap cyberbullying and cyber-victimization in children and adolescents. With this more comprehensive scale, the validity of measuring such a phenomenon may be improved. In addition, it was found that school bullying behavior is a stronger predictor than school victimization in explaining online bullying, while both school victimization and school bullying predicted online victimization equally well. Therefore, children who have school bullying experience would still tend to do this in the online context, while students who have more victimization experience in school would also exert more cyber bullying. Yet, with a much weaker strength, school victimization did not account for any variance in cyber bullying experience once school bullying was statistically controlled. However, both school victimization and school bullying explained similar variance with similar strength for online victimization. This suggests that school

bullies are still likely to be online bullies, but both school bullies and victims are equally likely to be victimized in the online context.

A number of past research studies have suggested that being cyber-victimized would be negatively associated with psychological well-being (e.g. Dehue et al., 2008). Based on the same group of 626 children and early adolescents in the present study, more analyses were carried out to investigate the issue. Online victimization was negatively, weakly to moderately but also significantly correlated with the four psychological constructs, namely social competence, friendship satisfaction, self esteem and life satisfaction, all of which are important indicators of psychological well-being. Such a pattern in correlation was even stronger for the sample of participants who played MMOGs (N = 326), However, given the fact that online victimization and school victimization were correlated moderately in both the full sample which consisted of players who played MMOGs only, the sole relationship between online victimization and psychological well-being was tested by carrying out partial correlations between the two after controlling school victimization. The results suggested that online victimization was only correlated negatively with self esteem at a marginally significant level ($p = .05$) for the full sample; and with the sample of participants who played MMOGs (therefore, this is a sample which also spend more time on the internet and probably have more chances to be cyber-victimized), online victimization was correlated with self esteem and friendship satisfaction negatively (with a small to moderate strength), while it was negatively correlated with life satisfaction at a level of marginal significance ($p = .08$). In the later regression analysis, after controlling real life social experience which includes real life friendship and school victimization, online victimization explained 1% in the change in R square for friendship satisfaction but not other psychological constructs.

Despite the fact that being victimized in the online context was negatively related to

psychological outcomes, comparatively, school victimization is an even worse experience to children. Such a result was in line with the findings from Study 2, in which most MMOGs players suggested that they would feel bad or angry after being cyberbullied. They often at the same time tended to believe that it is just something happening in the cyber world and could be ignored, and therefore, believed that it would not be as bad as being victimized in school. However, despite the fact that online victimization may be less serious than school victimization, this does not imply that cyber-victimization is not an issue that is worth examining. Cyber-victimization still explained additional variance after controlling real life and school social experiences for friendship satisfaction, suggesting it is a meaningful predictor to be included. If a child is already a victim at school, being victims in the online context again would further reduce the friendship satisfaction that they can get. Even though real life friendship and online friendship are both positively related to friendship satisfaction, which may help buffer some negative association between victimization and friendship satisfaction, for children who have lower friendship quality, but with both school victimization and online victimization, the buffering effect may be lowered, and their psychological well-being may be hampered. Dehue et al. (2008) suggested that for those who are already having depressive symptoms, being additionally cyberbullied would lead to the experience of much more negative consequences compared with youngsters who are not depressed in the first place. The present research suggested that cyber-victimization and school victimization are correlated with each other moderately; the addictive effect of victimization experienced by children in both contexts could be detrimental.

Fortunately, there is also a positive aspect of children going online. Griffiths (2010) suggested that despite there having been some concerns about addiction to computer games, some recent research has also suggested that children and adolescents can meet friends

when they go online, which can be a socially important thing to do. Building up online friendship in MMOGs is positive for teens. In the repeated measures analyses, online friendship quality was rated as lower than the real life one. However, online friendship was positively related to all psychological constructs, and the standardized beta in the final mode (as shown in Table 17) was comparable to the strength of the beta of real life friendship. Moreover, interestingly, real life friendship could not explain significant changes in self-esteem but online friendship can. This suggested that online friendship seems to be especially important among MMOGs players for their self esteem. Having more friends, no matter whether the sources of friendship are from online or offline sources, is beneficial to the development of children and early adolescents. While there is already consensus that having at least one good friend could buffer the negative impacts of victimization, the present research suggested that if children could also have online friendship, their psychological well-being would be better. Combining both the relationship of online victimization and online friendship and the psychological consequences of children and early adolescents, it would be an over-simplification to say that because of the potential threat of being cyber-bullied when kids go online, that playing online games are bad for kids. Rather, we should take into account what children are doing exactly online (for both their online friendship and online victimization experienced online) at the same time to draw a clear conclusion. Children who have experienced lesser online victimization but with more high quality online friendship would benefit from such an online experience, while children who have experienced more online victimization but without quality online friendship would be the most "at-risk" group.

Time spent on MMOGs was negatively correlated with life satisfaction but not with other psychological constructs. This suggests either that playing more MMOGs would make kids more dissatisfied with their life or children who are more unhappy about their

lives would choose to spend more time on playing MMOGs. Both explanations are feasible, as one of the reasons for children to play computer games is to seek fantasy and escape from reality. Ng et al. (2005) did research based on Hong Kong Chinese adolescents, and they suggested that one of the major reasons for adolescents to play online games is because they achieve little elsewhere but they try to get the feeling of achievement from games. It is therefore likely that those who are less satisfied about their lives may spend more time on MMOGs. Another possible explanation for the fact that time spent is negatively related to life satisfaction is because life satisfaction is a more universal well-being construct compared with the other three constructs that measure psychological well-being. Thus, it could be related to some more different constructs that were not included in the present study. For instance, despite the fact that being able to interact with others in MMOGs is fun and could provide online friendship for children and adolescents, this may also be related to more familial conflicts because parents generally would not agree to have their children spending too much time on playing computer games. For instance, Kayany and Yelsma (2000) suggested that computer use was negatively related to familial communication. Holder, Coleman and Sehn (2009) suggested that as computer game playing is a passive and sedentary leisure activity, in which physical activity is not involved, time spent on computer games should be negatively related to the overall life satisfaction in children and adolescents. Moreover, about half of the respondents of the focus group suggested that one of the major reasons for them to play MMOGs is because they found life boring and games is exciting. The big contrast in games versus in actual life would be another source of generating more dissatisfaction towards real life.

Considerable efforts were made to develop the cyber-victimization and cyberbullying scales. This was done in order to develop short, easy to administered, reliable and valid measures. The 8-item scale developed in the present research accomplished the goal.

Moderate positive correlations among cyberbullying, cyber-victimization, school bullying and school victimization suggest criterion validity of the scales developed. The correlations of cyber-victimization and cyberbullying with psychological constructs in this study were all negative, and their small to moderate association also underscored the validity of the scales. Cyber-victimization is becoming a hot topic in the area of social developmental research. Past research which was not based on Chinese samples has suggested various percentages of prevalence of cyberbullying and cyber-victimization. The present study suggested that if we include all students who claimed they have ever been cyberbullied or bullied others before, the overall prevalence of each was 47.3 % and 31.2% respectively; both were much less prevalent then school victimization and school bullying. However, if we consider those who are "frequent online-victims" and "frequent online-bullies", the prevalence rate of online and real life victimization were comparable, and the number of "frequent online-bullies" (4%) was double that of "frequent school-bullies"(1.8%). This shows that it is common for kids to have engaged in some kind of cyberbullying or experienced some cyber-victimization, but not many of them would have experienced very frequent online bullying or victimization.

The fact that frequent online bullying is much more prevalent than frequent school bullying could be due to the lesser social inhibition effect and the anonymity of online bullying. Mason (2008) suggested that many socially accepted roles were removed because the real identity was shielded by a virtual and anonymous identity on the internet. Added with the fact that online bullies would not be confronted by online victims, the consequences of bullying of others are further reduced. In addition, Mason (2008) suggested that the anonymous nature of the internet may make people tend to follow the social norm as the feeling of private self decreases and is substituted by a social self. Willard (2007) suggested that there is a concept of harmful bystanders in cyberbullying.

Harmful bystanders are "those who encourage and support the bully or watch the bullying from the sidelines, but do nothing to intervene or help the target" (Willard, 2007, p. 6). Despite not being studied in the present research, the role of harmful bystanders could be one of the sources that contribute to frequent and intensive online bullying. While there are also bystanders in school bullying, harmful bystanders in the online context could be of indefinite numbers. These bystanders could sometimes interject some harmful comments to support the online bullying acts.

For instance, there has been recent news in Hong Kong in which a secondary school girl was being falsely accused by people on the internet of having physically abused a dog and killed it cruelly. That was a false accussation and the owner of the dog tried to explain that but it did not help to stop the wrong accusation (Yahoo News, 2010). More than 10,000 people joined the group which attacked the innocent girl on facebook, and people started doing searches on the internet to reveal all the personal identities of the girl. The victim needed to receive counseling treatment after the event. This recent news was absolutely a case of cyberbullying and those who signed up to join the attack group were harmful bystanders, who help to sustain cyberbullying. Harmful bystanders could be one of the potential sources that contribute to the higher prevalence rate of "frequent online-bullying" acts as compared with "frequent school-bullying".

Most children and early adolescents would be bystanders rather than the bullies that start the online bullying. One practical implication for educators and parents concerning the means that they may consider using to reduce cyberbullying would be to raise students' awareness that being a harmful bystander would be likely to exert a lot more harm to the victims. With the ease of access to the internet among teens, joining some online groups that attack people, or forwarding some attacks on the internet to other people by simply clicking a button may seem to be an act without consequences. However, these actions

could results in the online bullying acts becoming seemingly endless. If children and early adolescents are taught to consider having a second thought before responding or joining these cyberbullying events, there is hope of reducing its prevalence rate. Students should be taught to raise their awareness of their roles on this issue, and as suggested by Willard (2007), students could be encouraged to be helpful online bystanders, by helping to stop the online bullying from happening. Ways include encouraging them to report any suspected cases of cyberbullying to the administrators of online forums or online games and perhaps contacting school teachers if they know the victims/ bullies. In addition, teaching them not to be engaged in further discussing the issue or forwarding some online bullying messages to others could be another way to stop a particular online bullying event from receiving more and more attention from a bigger audience.

There has been a long debate on whether computer game playing is positively or negatively related to the social well-being of children and adolescents. One of the most famous theories by Kraut, et al. (1998) suggested that spending more time on computer games would displace the time that players can spend on other social activities and which would eventually render them disadvantaged in social development. Despite the fact that time spent on MMOGs was negatively correlated with life satisfaction, online friendship built up in MMOGs seems to be able to buffer the negative effect. Despite a small difference (with small effect size)in self esteem, MMOGs players were not inferior to non-players in terms of life satisfaction, social competence and friendship satisfaction, suggesting that playing MMOGs is probably not related to more problems in social development.

On the contrary, players of MMOGs are likely to develop online friendship (93% of all the players) and online friendship is related o all psychological constructs in the present study. Based on a sample of grade 7, grade 9 and grade 11 students in Hong Kong, Ho and

Lee (2001) suggested that time spent should not be the sole predictor to be included when investigating the positive or negative associations of computer playing and social well-being. They found that time spent on computer usage did not compete for the time spent on other types of recreation activities, and did not make adolescent players more socially withdrawn than the non-players. Rather, they found that adolescents who used computers to communicate with others would do more exercises and have a more physically active life style with more social support, while frequent computer game players tend to have less physical activities, less relaxation activities and less perceived social support. However, Ho and Lee (2001) did not distinguish between different computer games, and as they said, the underlying mechanism in why different computer usage and patterns would be related to different life styles remained unanswered. MMOGs were not as popular in 2001 as they are now in 2010, and the computer games played by the participants could have included both solitary game and online game. However, the present study clearly suggests that playing MMOGs, which is the most popular game type with the most interactive elements, would probably reinforce the development of online friendship, which is positively related to children's social development.

Just as when television was becoming more popular more than 50 years ago, there has always been a debate on the relationship of computer gaming playing and the social development of children. It is true that several past studies have suggested that playing violent computer game may be related to more aggressive behavior (e.g. Anderson and Dill, 2000), and a certain percentage of computer game players may be addicted to it (Griffths, 2000), which may arouse suspicious about computer players potentially having more problems than the non-players. However, as suggested by many other researchers (e.g. Chan & Vorderer, 2006), the positive social aspects of computer games, especially online games, should not be overlooked. The present study suggested that based on a Hong Kong

Chinese population, it would be within the norm if a child spent one to two and a half hours per day playing MMOGs. Perhaps instead of simply objecting when children play these, parents and teachers could try to look at the issue from other perspectives by considering the positive impact of online friendship to the psychological development of children and early adolescents. Playing computer games would be one of the social capitals of children and early adolescents. Games act as a common topic among teens, and teens are happy about playing them. As long as the time spent on playing such games does not affect other everyday life activities (e.g., they are not addicted), a more open attitude could be applied to the debate on allowing children and early adolescents to play computer games.

This research extended what is known about computer gaming and its relation with psychosocial development to children in a Chinese population. New and comprehensive scales on measuring cyberbullying and cyber-victimization were developed. Also, I explored the extent to which friendship and victimization may have similar and different manifestations on and offline. Finally, it investigated the issue about if online experiences in friendship and victimization may add unique variances to explain various developmental outcomes in early adolescents.

However, there were a few limitations to this research as well. First of all, despite the fact that the scales on cyber-victimization and cyberbullying have good validities and reliabilities and they were created by including frequent players' suggestions and items from the past literature on victimization, the extent of this measurement was limited to the verbal and indirect aggression which is similar to those that would happen in school, as most past research measuring school bullying and victimization were measures that were specifically aimed at investigating school bullying and victimization. As a matter of fact, there could be more different ways of being cyber-bullied, such as having all of one's personal identity revealed by others on the Net, or receiving some messages that is related

are sexual harassment, or continuous threatening of endangering one's life, etc (Willard, 2007). These kinds of more serious cyberbullying may be very rare and less likely to happen in school for children and teens, and they were not well-captured by the present scale. However, these events may actually be very much more negative in their psychological consequences.

Future studies should include more items aimed at measuring these kinds of issues concerning cyberbullying and cyber-victimization. In addition, Bond, Wolfe, Tollit, Butler, and Patton (2007) suggested that what researchers and adults believe to be bullying and victimization could be different from how children and adolescents view it. While the overall prevalence of online victimization is less than that of school victimization, this does not necessarily mean the harm caused for more serious forms of online bullying would be lesser. Respondents of Study 2 in the present study suggested that they believe cyberbullying is less serious than school bullying, but they also feel bad and depressed after experiencing it. Future studies should further include children's feelings of being cyberbullied and being bullied in school, to compare the difference in the subjective seriousness of the two victimization experiences in two contexts. The present study found that players of MMOGs would experience higher online victimization but at the same time, their online friendship seems to be able to buffer the negative effect. However, whether frequent MSN users or online forum users actually would be more "at risk" of being cyberbullied remains unanswered. Future studies should also try to answer these concerns.

In school bullying, victims could be differentiated into different categories. According to Ross (1996), passive victims are the major type in which victims are usually more timid, anxious, intelligent and quiet, yet could not fight back. Provocative victims sometimes create problems by themselves, and because of this, they are usually more aggressive than passive victims, and subsequently attract the attention of bullies. Also, a small group of

children belong to the category of bully-victims, in which they try to bully others back because they have been bullied by others. However, such categorizations are scarce in existing limited literature on cyberbullying. Future research could include questions that investigate the antecedents of cyber-victimization for us to better understand the different profiles of children who fall into different categories of victims. Also, it would be important to include questions to investigate what actions on the internet may attract attacks from other people, to better prevent it from happening.

The present research investigated online friendship related to MMOGs only, because these are currently the most popular gaming choice among children and early adolescents. However, I was not able to investigate other online friendship that is built in other online contexts such as online discussion forums, facebook, or other kinds of instant messaging software (such as MSN). Online friendship built in these different online contexts is less likely to be as activity-based as the one in MMOGs, but at the same time might involve building friendships among friends who teens may already know in real life (especially for facebook and MSN). The different contexts in which friendship is built and maintained could be accounted for by different online friendship qualities, and therefore, future studies should involve investigating online friendship based on a variety of online contexts. The quality of online friendship matters to the social development of MMOGS players. As suggested by Chan and Cheung (2004), quality of online friendship may become more comparable to real life friendship as the duration of maintaining the online friendship increases.

The present research has suggested that online friendship is lower in quality as compared to real life friendship. However, this pattern may change as the duration of online friendship to be maintained is lengthen. More future studies could be done on investigating the issue. Moreover, children and adolescents may not stay in the same

MMOGs for a very long time period as the trend of playing different MMOGs keeps changing. Would changing favorite MMOGs mean changing the best friend in MMOGs as well? A better understanding on these issues should be included in future studies.

Despite the fact that, in the present research, it was found that time spent on MMOGs was negatively related to life satisfaction (but not other psychological well-being constructs being measured), it would be an oversimplification for us to conclude that it is bad for children to spend any time on playing online games. The present research shows that what children actually do in online games also matter. When the cyber-victimization was negatively related with children's psychological well-being, online friendship was positively related to psychological well-being. This research suggested a more comprehensive approach to look into the issue. MMOGs are the most popular type of computer games among teenagers, and its interactive nature provides more interactions for children in the games, which makes it different from solitary computer games. Many past studies (e.g. Blais et al., 2008; Holder et al., 2009; Ho & Lee, 2001) have found negative correlations between computer game use or time spent on computer games as negatively related to well-being or a less social life style. However, they did not look into what children were actually doing in computer games, nor did they try to differentiate different types of computer games before they drew these conclusions.

For instance, Blais et al. (2008)suggested that in their longitudinal study, over a 1 year period of time, computer usage for communication purposes (chat rooms or MSN) was positively related to best friendship in real life, but computer usage for entertainment and gaming purposes was negatively related to real life best friendship. However, without differentiating what kinds of games children are playing over the internet, it is oversimplified to draw such a conclusion. MMOGs are different from other types of computer games in terms of their highly social environment. Thus, MMOGs seem to be

positively related to children's social development because they provide an extra base from which social interactions can develop, despite some past literature suggesting that computer games playing was bad for children. To answer the question of whether computer game playing fits into the reduction/displacement theory (Kraut et al., 1998), that Internet activities reduce social activities, or to the contrary, fits the stimulation theory that Internet activities can serve to stimulate relationship quality (Valkenburg and Peter, 2007), in future studies, time spent and also enjoyment towards different categories of games should be included. Comparisons could be made between the psychological consequences of players and non-players of different types of games to illustrate the respective social functions of different types of games. Also, future studies should include a longitudinal comparison of online friendship in MMOGs versus friendship in real life to provide a clear pattern of whether online friendship would replace or reduce the quality of real life friendship or not.

Only parental monitoring of computer use was included in the present study and it was not related to any of the online behaviors (e.g. online bullying) nor time spent in MMOGs of students. Rather it correlated moderately and positively with the psychological constructs measured. It seems that the role of parents in controlling time spent was not salient. Rather, just as for any other positive parental behavior, parental monitoring was more related to overall psychological well-being of children. While some other studies (e.g. Punamäki, Wallenius, Hölttöa, Nygård, & Rimpelä, 2009) have suggested that computer use was negatively correlated with parent-and-child relationships among intensive game players, i.e., more conflicts arose in the parent-and-child dyads as children played more computer games, the present research did not investigate the role of parents and the possible relationship between computer game playing patterns with parent-and-child relationships. Playing different types of computer games may be a factor that affects the parent-and-child relationship, for instance, home video consoles (e.g. Will, Xbox) are

usually placed in the dinning room and parents may play with children together, while children would rarely play MMOGs with their parents. Also, parents' attitudes and mediation strategies towards computer gaming (Nikken & Jansz, 2006) could be relevant to children's gaming habits. Griffiths (2010) suggested that parents should notice the social experiences that children gain from playing online games, and they can encourage children to play interactive online games more than solitary ones. Naturally, they should alsoset time limits for their children in playing computer games. The role of parenting in studies that investigate social development of children should not be overlooked in future studies.

Efforts have been paid in including both qualitative and quantitative research methods in the present research. Nevertheless, the research is still correlational in nature, and with single source of information only, this means no causal conclusion could be drawn. Observational data, experimental, longitudinal and the use of multilevel information should be included in future studies.

Despite these limitations, this research has made several important contributions. Practically, this research investigated a hot topic- online game playing. It helps in answering some public concerns about whether computer gaming has a positive or negative relationship with emotional and relational development in children. Such findings may influence educational practices and potentially shape parenting strategies concerning computer game monitoring. It can also raise public awareness about the issue of cyberbullying, a potential danger in the cyber millennium. Theoretically, it bridges the gap between existing literatures with some unexplored elements concerning internet experience, including developing measures that could provide more comprehensive measurement of online bullying and online victimization, affording an investigation of the relationship between online friendship and well-being of children. Social experiences in MMOGs are

important to the social development of children, and online friendship explains unique variances on the well-being of students over everyday life social experiences, implying that in future studies, this part of online experiences cannot be overlooked. Despite the fact that online friendship is something "virtually based", the positive aspects of friendship is "realistic" to the players. This also suggests that it is important to have a balanced view of both the positive and negative associations of online game playing and the psychological development of children and early adolescents.

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Appendix A
Scales used in Study 1

Part 1_basic demographics
Class: _____ Class Number: _____

Gender: □Boys □Girls Age: _____ years old

Part 2
How long have you been using computer?
□Less than 1 year □1 year □2 years □3 years □4 years □5 years
□6 years □7 years □8 years or above

In the past 3 months, how much time do you play these games per day (averaging school days and weekends)?

	I don't play	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours	7 hours	8 hours or more
MMOGs (games that you play with many other players on the internet)	□	□	□	□	□	□	□	□	□
Solo PC games	□	□	□	□	□	□	□	□	□
Home video consoles (e.g. Playstation, Xbox, etc.)	□	□	□	□	□	□	□	□	□
Handheld (e.g. PSP, NDS)	□	□	□	□	□	□	□	□	□

Part 3
Enjoyment of computer games

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
1. I think playing computer games can make me forget the unhappy things in life.	1	2	3	4	5	6	7
2. I think playing computer games is a good way to relax.	1	2	3	4	5	6	7
3. I think playing computer games is exciting.	1	2	3	4	5	6	7

Part 4
Cyber-victimization scale

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
1. I have been humiliated by other online games players before.	1	2	3	4	5	6	7
2. I have been attacked by other online game players before.	1	2	3	4	5	6	7

Part 5
Satisfaction with Life Scale

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
1. In most ways my life is close to my ideal.	1	2	3	4	5	6	7
2. The conditions of my life are excellent.	1	2	3	4	5	6	7
3. I am satisfied with life.	1	2	3	4	5	6	7
4. So far I have gotten the important things I want in life.	1	2	3	4	5	6	7
5. If I could live my life over, I would change almost nothing.	1	2	3	4	5	6	7

Part 6
Parents' concerns about computer games

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
1. I think it is important to know the influence of computer games on children.	1	2	3	4	5	6	7
2. I have worries concerning the computer playing habits of my children.	1	2	3	4	5	6	7

Part 7
Perceived social functions

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
1. I believe that I can make friends with people whom I have met in online games.	1	2	3	4	5	6	7
2. I believe interacting with other players in online games is an interesting experience.	1	2	3	4	5	6	7
3. I believe it's easy to make friends in online games.	1	2	3	4	5	6	7
4. I believe that through discussing the content, skills, tactics, etc. about online games with my friends, I can improve our friendship.	1	2	3	4	5	6	7

Appendix B
Scales used in Study 3 and 4

Part 1_basic demographics
Class: _____ Class Number: _____

Gender: □Boys □Girls Age: _____ years old

Who do you live with?
□ Father and Mother □Father only □Mother only □Grandparents only
□Others：_____

Parents'education：
Father □ Primary School □F.3 □F.5 □F.7 □University or above
Mother □ Primary School □F.3 □F.5 □F.7 □University or above

How many rooms are there in your home?
□no rooms □1 room □2 rooms □3 rooms □4 rooms or above

Part 2

Satisfaction with Life Scale

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
1. In most ways my life is close to my ideal.	1	2	3	4	5	6	7
2. The conditions of my life are excellent.	1	2	3	4	5	6	7
3. I am satisfied with life.	1	2	3	4	5	6	7
4. So far I have gotten the important things I want in life.	1	2	3	4	5	6	7
5. If I could live my life over, I would change almost nothing.	1	2	3	4	5	6	7

Part 3

Rosenberg Self Esteem Scale

	Strongly Disagree	Disagree	Neither Agree or Disagree	Disagree	Strongly Agree
1. On the whole I am satisfied with myself.	1	2	3	4	5
2. At times I think that I am no good at all.	1	2	3	4	5
3. I feel that I have a number of good qualities.	1	2	3	4	5
4. I am able to do things as well as most other people.	1	2	3	4	5
5. I feel I do not have much to be proud of.	1	2	3	4	5
6. I certainly feel useless at times.	1	2	3	4	5
7. I feel that I am a person of worth, at least the equal of others.	1	2	3	4	5
8. I wish I could have more respect for myself.	1	2	3	4	5
9. All in all, I am inclined to feel that I am a failure.	1	2	3	4	5
10. I take a positive attitude toward myself.	1	2	3	4	5

Part 4
Friendship Satisfaction Scale

	Strongly Disagree	Disagree	Neither Agree or Disagree	Disagree	Strongly Agree
1. My friends treat me well.	1	2	3	4	5
2. My friends are nice to me.	1	2	3	4	5
3. I wish I had different friendship.	1	2	3	4	5
4. My friends are mean to me.	1	2	3	4	5
5. M y friends are great.	1	2	3	4	5
6. I have a bad time with my friends.	1	2	3	4	5
7. I have a lot of fun with my friends.	1	2	3	4	5
8. I have enough friends.	1	2	3	4	5
9. My friends will help me if I need it.	1	2	3	4	5

Part 5
Social Competence Scale

	Strongly Disagree	Disagree	Neither Agree or Disagree	Disagree	Strongly Agree
1. I have a lot of friends.	1	2	3	4	5
2. I am popular with kids.	1	2	3	4	5
3. I am easy to like.	1	2	3	4	5
4. I like to do things with other kids.	1	2	3	4	5
5. I am easy to make friends.	1	2	3	4	5
6. I am important to my classmates.	1	2	3	4	5
7. Most kids like me.	1	2	3	4	5

Part 6
Friendship Qualities (In real life)
Think about the best friend that you have in school, or in playground. Thinking of him/ her, answer the following questions.
What is his/ her name? _____

	Strongly Disagree	Disagree	Neither Agree or Disagree	Disagree	Strongly Agree
Companionship					
1. My friend and I spend all our free time together.	1	2	3	4	5
2. My friend thinks of fun things to do together	1	2	3	4	5
3. My friend and I go to each others' houses after school and on weekends.	1	2	3	4	5
4. Sometimes my friend and I just sit around and talk about things like school, sports and things we like	1	2	3	4	5
Help					
5. My friend helps me when I am having trouble with something.	1	2	3	4	5
6. My friend would help me if I needed it.	1	2	3	4	5
7. If other kids were bothering me, my friend will help me.	1	2	3	4	5
8. My friend would stick up for me if another kid was causing me trouble.	1	2	3	4	5
Security					
9. If I have a problem at school or at home, I can talk to my friend about it.	1	2	3	4	5

10. If there is something bothering me, I can tell my friend about it even if it is something I cannot tell to other people.	1	2	3	4	5
11. If I said I was sorry after I had a fight with my friend, he would still stay mad at me.	1	2	3	4	5
12. If my friend or I do something that bothers the other one of us, we can make up easily.	1	2	3	4	5
13. If my friend and I have a fight or argument, we can say "I'm sorry" and everything will be alright.	1	2	3	4	5
Closeness					
14. If my friend had t move away, I would miss him.	1	2	3	4	5
15. I feel happy when I am with my friend.	1	2	3	4	5
16. I think about my friend even when my friend is not around.	1	2	3	4	5
17. When I do a good job at something, my friend is happy for me.	1	2	3	4	5
18. Sometimes my friend does things for me, or makes me feel special.	1	2	3	4	5

Part 7
School Victimization Scale

	Never	Seldom	Sometimes	Usually	Everyday
1. Other kids tease you or make fun of you	1	2	3	4	5
2. Other kids bully or pick on you	1	2	3	4	5
3. Other kids gossip or say mean things to you	1	2	3	4	5
4. Other kids hurt your feelings by leaving you out of play	1	2	3	4	5
5. Other kids hit or push you.	1	2	3	4	5

Part 8
School Bullying Scale

	Never	Seldom	Sometimes	Usually	Everyday
1. I tease you or make fun of others	1	2	3	4	5
2. I bully or pick on others	1	2	3	4	5
3. I gossip or say mean things to others	1	2	3	4	5
4. I hurt others' feelings by leaving others out of play	1	2	3	4	5
5. I hit or push others.	1	2	3	4	5

Part 9

How long have you been using computer?

□Less than 1 year □1 year □2 years □3 years □4 years □ 5 years
□6 years □7 years □8 years or above

In the past 3 months, how much time do you play these games per day (averaging school days)?

	I don't play	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours	7 hours	8 hours or more
MMOGs (games that you play with many other players on the internet)	□	□	□	□	□	□	□	□	□
Solo PC games	□	□	□	□	□	□	□	□	□
Home video consoles (e.g. Playstation, Xbox, etc.)	□	□	□	□	□	□	□	□	□
Handheld (e.g. PSP, NDS)	□	□	□	□	□	□	□	□	□

In the past 3 months, how much time do you play these games per day (averaging weekends)?

	I don't play	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours	7 hours	8 hours or more
MMOGs (games that you play with many other players on the internet)	□	□	□	□	□	□	□	□	□
Solo PC games	□	□	□	□	□	□	□	□	□
Home video consoles (e.g. Playstation, Xbox, etc.)	□	□	□	□	□	□	□	□	□
Handheld (e.g. PSP, NDS)	□	□	□	□	□	□	□	□	□

Part 10
Parental monitoring on computer use

	Strongly Disagree	Disagree	Neither Agree or Disagree	Disagree	Strongly Agree
1. My parents know clearly about what kind of friends I have made on the internet/ in MMOGS.	1	2	3	4	5
2. My parents take the initiative to ask what I am doing in online games/ on the internet	1	2	3	4	5
3. My parents set rules about the time that I can spent on computer games everyday.	1	2	3	4	5
4. I will tell my parents what I am doing on the internet.	1	2	3	4	5
5. My parents remind me to be cautious about bad people on the internet.	1	2	3	4	5

Part 11
Cyber-victimization

	Strongly Disagree	Disagree	Neither Agree or Disagree	Disagree	Strongly Agree
1. Others gossip or say mean things about me in online games/ on the internet.	1	2	3	4	5
2. Others say "If you don't do what I say, I will stop liking you" in online games/ on the internet.	1	2	3	4	5
3. Others get mad at me, then they ignore or stop talking to me in online games/ on the internet.	1	2	3	4	5
4. Others steal my account or my belongings (e.g. money, weapons) in online games/ on the internet.	1	2	3	4	5
5. Others pretend to be my friends as a kind of revenge in online games/ on the internet.	1	2	3	4	5
6. Others tell bad or stories about me, saying that I am a bad kid, in online games/ on the internet.	1	2	3	4	5
7. Others try to get others to dislike me because they are angry at me in online games/ on the internet.	1	2	3	4	5
8. Others say that they would help me but then betray me in online games/ on the internet.	1	2	3	4	5

Part 12
Cyberbulllying

	Strongly Disagree	Disagree	Neither Agree or Disagree	Disagree	Strongly Agree
1. I gossip or say mean things about others in online games/ on the internet.	1	2	3	4	5
2. I say "If you don't do what I say, I will stop liking you" to others in online games/ on the internet.	1	2	3	4	5
3. I get mad at others, then I ignore or stop talking to others in online games/ on the internet.	1	2	3	4	5
4. I steal others' account or belongings (e.g. money, weapons) in online games/ on the internet.	1	2	3	4	5
5. I pretend to be others' friends as a kind of revenge in online games/ on the internet.	1	2	3	4	5
6. I tell bad or stories about others, saying that others are bad kids, in online games/ on the internet.	1	2	3	4	5
7. I try to get others to dislike someone else because I am angry at them in online games/ on the internet.	1	2	3	4	5
8. I say that I would help others but then betray others in online games/ on the internet.	1	2	3	4	5

Part 13
For those who answered they have played MMOGs before, the computer system would automatically asked them to answer Part 13 and 14.

The online game that I play most often is called _____ (please type) ,
Its type is:
□ fighting □war □dancing □strategies, planning □pets
□sports □ adventure □ fashion □ car racing □ others:_____

Part 14
Please think of one friend that is most familiar with you in the online game that you play the most often,
Thinking of him/ her, answer the following questions.
What is his/ her name? _____

Is he/she also the same best friend that you know in the reality?

	Strongly Disagree	Disagree	Neither Agree or Disagree	Disagree	Strongly Agree
Companionship					
1. My friend and I spend all our free time together in online games/ on the internet.	1	2	3	4	5
2. My friend thinks of fun things to do together in online games/ on the internet.	1	2	3	4	5
3. My friend and I play online games together on weekends.	1	2	3	4	5
4. Sometimes my friend and I just play online games together.	1	2	3	4	5
Help					
5. My friend helps me when I am having trouble with something in online games/ on the internet.	1	2	3	4	5
6. My friend would help me if I needed something in online games/ on the internet.	1	2	3	4	5
7. If other kids were bothering me in online games/ on the internet , my friend will help me.	1	2	3	4	5
8. My friend would stick up for me if another kid was causing me trouble in online games/ on the internet.	1	2	3	4	5
Security					

9. If I have a problem, I can talk to my friend about it.	1	2	3	4	5
10. If there is something bothering me, I can tell my friend about it even if it is something I cannot tell to other people.	1	2	3	4	5
11. If I said I was sorry after I had a fight with my friend, he would still stay mad at me.	1	2	3	4	5
12. If my friend or I do something that bothers the other one of us, we can make up easily.	1	2	3	4	5
13. If my friend and I have a fight or argument, we can say "I'm sorry" and everything will be alright.	1	2	3	4	5
Closeness					
14. If my friend do not show up on the internet/ in the online games, I would miss him.	1	2	3	4	5
15. I feel happy when I am playing online games with my friends.	1	2	3	4	5
16. I think about my friend even when my friend is not around.	1	2	3	4	5
17. When I do a good job at something, my friend is happy for me.	1	2	3	4	5
18. Sometimes my friend does things for me, or makes me feel special.	1	2	3	4	5