

Cyber-Bullying Among University Students: An Empirical Investigation from the Social Cognitive Perspective

Bo Sophia Xiao

*Department of Information Technology Management
Shidler College of Business
University of Hawaii at Manoa*

Yee Man Wong

*Department of Computer Science
Hong Kong Baptist University*

ABSTRACT

Rising incidents of, and tragedies from, cyber-bullying have alerted researchers, educators, government officials, and parents to the severe consequences of this new form of bullying. Existing research on cyber-bullying is mostly conducted without sound theoretical foundation. In addition, previous studies focus on children and adolescents; there is a paucity of empirical examination of cyber-bullying behavior among university students. Drawing from social cognitive theory and focusing on university students, this study hypothesizes about, and empirically tests the effects of, personal and environmental factors on the likelihood for university students to perform cyber-bullying behavior. The results from a survey of university students in Hong Kong reveal that social norms, as well as personal factors such as Internet self-efficacy, motivations, and cyber-victimization experience, are strong predictors of university students' cyber-bullying behavior. This study not only enriches our understanding of determinants of cyber-bullying behavior by university students but also provides valuable insights to educators, government officials, and parents.

Keywords: Cyber-bullying, bullying, social cognitive theory, motivation, aggression

1. INTRODUCTION

With more than two thousand millions Internet users worldwide [Internet World Stats, 2011], the Internet plays an increasingly important role in people's daily activities. Nowadays, people, and especially youths, live with the Internet. For instance, teenagers have been found to spend more than 30 hours a week online [The Telegraph of London, 2011]. The Internet, however, has proved to be a double edged sword: although it brings unprecedented convenience to everyday life, it also provides a breeding ground for various types of undesirable behaviors, such as cyber-bullying, a type of bullying that occurs via electronic media [Li, 2006]. Traditional bullying is often caused by physical, verbal, or psychological attack or intimidation [Farrington, 1993], with the victims being repeatedly hurt in an imbalanced-power situation [Olweus, Limber, and Mahalic, 1999].

Although cyber-bullying is a relatively recent phenomenon, the prevalence and adverse consequences of such behavior have been documented by researchers in many parts of the world [Li, 2008; Menesini and Spiel, 2012; Navarro and Jasinski, 2012; Smith, et al., 2008; Vandebosch and Van Cleemput, 2009; Wang, Iannotti, and Nansel, 2009]. For instance, Raskauskas and Stoltz [2007] showed that nearly half of the adolescents surveyed were victims and about one fourth were cyber-bullies. Victims of cyber-bullying were often found to suffer high distress, emotional instability, and social anxiety. Denspey and colleagues [2009] also showed a positive relationship between online bullying and the symptoms of social anxiety. In the most extreme cases, cyber-bullying can also lead to suicide or physical harm. The widely publicized suicides of Megan Taylor Meier, Phoebe Prince, and Tyler Clementi have truly underscored the serious consequences of cyber-bullying and called attention to this new form of bullying behavior.

Cyber-bullying is clearly an important concern for government agencies, educational administrators, and parents. To take actions against cyber-bullies,

government agencies worldwide have passed or proposed legislation to reprimand cyber-bullying behavior. For instance, a number of states in the United States passed laws [e.g., the Megan Meier Cyber-Bullying Prevention Act] against electronic harassment ["Megan Meier Cyberbullying Prevention Act," 2009]. In Hong Kong, members of the legislative council have also proposed legislation to deter cyber-bullying behavior [Lee, 2010].

In addition to legislation, education on what is appropriate or inappropriate online behavior can be an important preventive measure. For instance, the U.S. Health Resources and Services Administration has set up an educational website to illustrate the consequences of cyber-bullying and to introduce strategies for preventing and coping with such behavior [Epstein and Kazmierczak, 2007]. The Hong Kong government has also established a website to provide general information about the best practices for preventing different types of cyber-crimes, including cyber-bullying [InfoSec, 2012].

Moreover, education and social welfare institutions in different countries have launched a series of surveys to better understand cyber-bullying behavior and its impact. Findings of the surveys are shared with parents and youngsters to help them tackle this issue more effectively [Hong Kong Federation of Youth Groups, 2010].

In recent years, there has an increased interest among academic researchers regarding the phenomenon of cyber-bullying. Most of the studies focus on comparing and contrasting traditional bullying and cyber-bullying behaviors [Beran and Li, 2007; Dehue, Bolman, and Vollink, 2008; Hinduja and Patchin, 2010; Law, Shapka, Hymel, Olson, and Waterhouse, 2011]; examining the prevalence of cyber-bullying [Li, 2006; Yilmaz, 2011]; and investigating the characteristics [or profiles] of cyber-bullies and cyber-victims [Katzer, Fetchenhauer, and Belschak, 2009; Navarro and Jasinski, 2012; Raskauskas and Stoltz, 2007].

Existing research on cyber-bullying is generally atheoretical, and this absence of a theoretic foundation in most of the empirical studies conducted so far [a notable exception being Zhang, Land, and Dick, 2010] hinders the scientific analysis of the cyber-bullying phenomenon [Tokunaga, 2010]. Given this apparent gap in the existing literature, the primary objective of our study is to conduct a rigorous, theory-based investigation into factors determining the likelihood of cyber-bullying behavior from the perspective of social cognitive theory.

An additional objective of our study is to examine the current state of cyber-bullying behavior among university students. The majority of prior studies on cyber-bullying focused on children and adolescents, aged from 9 to 18 years old [e.g., Dooley, Shaw, and Cross, 2012; Hinduja and Patchin, 2008; Juvonen and Gross, 2008; Raskauskas and Stoltz, 2007; Smith, et al., 2008]. There has been a scarcity of research investigating cyber-bullying behavior among university students. A recent Internet use survey revealed that 95% of young adults [18-29 years old] were active users of the Internet, representing the highest use among all the age groups [Pew Internet and American Life Project, 2010]. Since the frequency of using the computer and the Internet has been found to be an indicator of exposure to risks, young adults are likely to be exposed to cyber-bullying behavior, a known risk online [Huang and Chou, 2010; Li, 2007a, 2007b], which lends importance and relevance to our study.

Moreover, the limited number of cyber-bullying studies on university students was all conducted in non-Asian countries, such as the U.S. and Turkey. For instance, in the United States, Finn [2004] found that about 10% to 15% of 339 students at the University of New Hampshire had received threatening or harassing e-mails or instant messages and more than 50% had received unwanted pornography. Another study of 439 students in a Midwestern university in the United States revealed that 8.6% of the students had cyber-bullied others and 21.9% had been cyber-bullied [MacDonald and Roberts-Pittman, 2010].

In the Turkish context, Dilmac [2009] found that 22.5% of 666 students at Selcuk University had performed cyber-bullying and 55.3% of the students surveyed were online victims. A more recent survey of bullying via electronic media showed that 59.8% of the 579 university students recruited for the study had been cyber-bullied [Turan, Polat, Karapirli, Uysal, and Turan, 2011].

Given the prevalence of cyber-bullying behavior among university students in Western countries (as revealed from prior research), it is worthwhile to examine such behavior among university students in an Asian society, such as Hong Kong, to enhance our understanding of the cyber-bullying phenomenon.

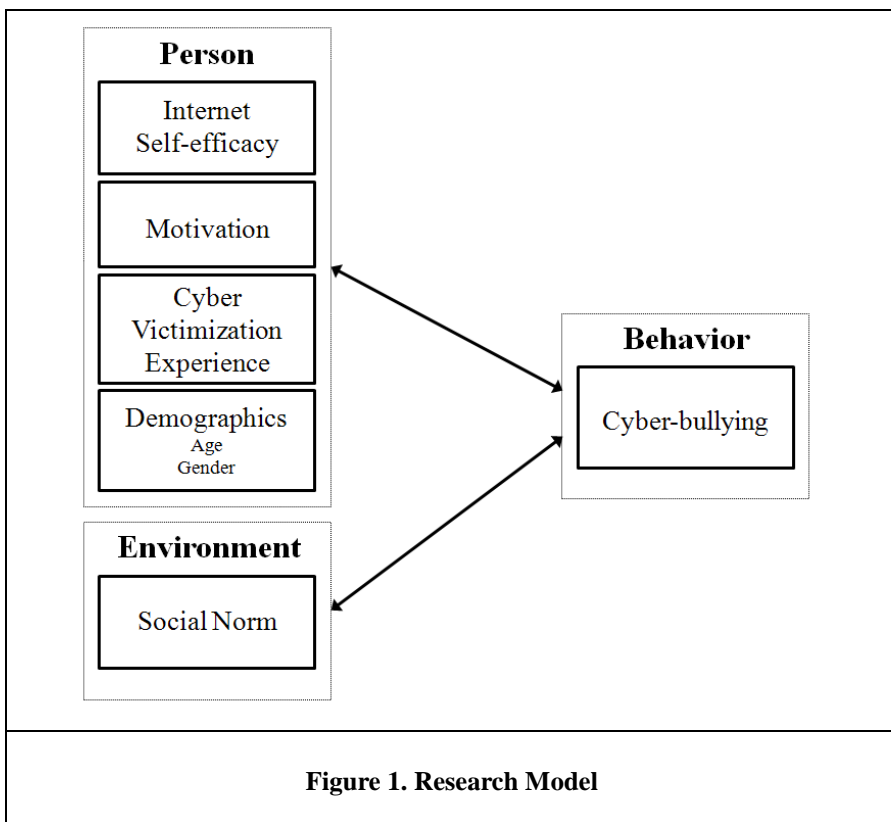
The remainder of this paper is organized as follows. In Section 2, we introduce the theoretical foundation for this study and present the research model and related hypotheses. In Section 3, we discuss the research methodology and present the results of our data analysis. In Section 4, we conclude with a discussion of our findings, the limitations of this study, and implications for both researchers and practitioners.

2. THEORETICAL FOUNDATION AND HYPOTHESES DEVELOPMENT

Social cognitive theory, which provides a framework for understanding, predicting, and changing human behavior [Bandura, 1977, 1986], identifies human functioning as an interaction of personal, behavioral, and environmental influences. The theory posits that both personal factors (in the form of cognitive, affective, and biological events) and environmental factors (such as peer support and stressful environment) can affect the development of an individual's behavior [Bandura, 1978]. Social cognitive theory has been widely applied to research in health [e.g., Resnicow, et al., 1997], education [e.g., McWhirter, Crothers, and Rasheed, 2000; Miltiadou and Savenye, 2003], and communication [e.g., LaRose and Eastin, 2004]. It has also been adopted to explain and predict traditional bullying behavior [e.g., Hymel, Rocke-Henderson, and Bonanno, 2005; Mouttapa,

Valente, Gallaher, Rohrbach, and Unger, 2004; Toblin, Schwartz, Hopmeyer Gorman, and Abou-ezzeddine, 2005] and aggression [e.g., Anderson and Huesmann, 2003; Schwartz, et al., 1998].

Drawing from social cognitive theory and a comprehensive review of prior research on bullying and cyber-bullying, we focus on *cyber-victimization experience*, *Internet self-efficacy*, *motivations*, and demographics [*age* and *gender*] as the personal factors, and *social norm* as the environmental factor determining university students' likelihood to engage in cyber-bullying behavior. Figure 1 depicts the research model.



2.1. Personal Factors

In this section, we advance hypotheses about the important role that personal factors play in influencing cyber-bullying behavior.

2.1.1. Internet Self-Efficacy

Self-efficacy refers to “people’s judgment of their capabilities to organize and execute courses of action required to attain designated types of performance” [Bandura, 1986, p. 391]. It has been confirmed extensively that the stronger the perceived self-efficacy, the more likely that an individual will take on a task [e.g., Hsu and Chiu, 2004; Olivier and Shapiro, 1993]. Whereas individuals generally shy away from tasks where their self-efficacy is low, they will engage in tasks where they are more optimistic about their capabilities. For instance, prior research reveals that health behaviors such as quitting smoking, physical exercise, dental hygiene, and breast self-examination are dependent on one’s perception of self-efficacy [Conner and Norman, 2005]. Andrew [1998] found that high levels of self-efficacy boosted students’ academic performance. In traditional bullying studies, researchers also showed that students with higher self-efficacy were more likely to perform bullying behaviors [Bulach, Fulbright, and Williams, 2003; Natvig, Albrechtsen, and Qvarnstrom, 2001].

In this study, *Internet self-efficacy* is adopted to measure an individual’s perception or judgment of his or her ability to accomplish tasks across the Internet application domains [Hsu and Chiu, 2004]. Compared with *self-efficacy*, it is a more specific construct emphasizing the effective establishment, maintainability, and utilization of general Internet use [Eastin and LaRose, 2000]. Prior research on cyber-bullying [Vandebosch and Van Cleemput, 2009] has revealed that most cyber-bullies considered themselves as Internet experts [Ybarra and Mitchell, 2004b], suggesting that individuals with a higher level of perceived *Internet self-efficacy* are more likely to engage in cyber-bullying behavior. Therefore, we hypothesize:

Hypothesis 1: Internet self-efficacy will positively affect the likelihood of committing cyber-bullying.

2.1.2. Motivation

In a nutshell, *motivation* studies why people think and behave as they do [Hofstede, 1980]. It has been widely recognized as an indispensable cause of human behavior [Bullock, Wong-Lo, and Gable, 2011], such as bullying [Skues, Cunningham, and Pokharel, 2005], aggression [Collins, 1973; Kornadt, 1984], violence [Hamberger, Lohr, Bonge, and Tolin, 1997], sexual abuse [Burk and Burkhart, 2003], and addiction [Saunders and Wilkinson, 1990]. In this study, we draw from literature on aggression [e.g., Edwards, 1999] to understand the effect of *motivation* on cyber-bullying behavior (a form of online aggressive behavior).

Motivation is goal-driven [Fontaine, 2007; Geen and Green, 2001]. In this study, we focus on *power*, *attention*, and *acceptance* [Reiss, 2004] as the instrumental drivers of cyber-bullying behavior. *Power* is the desire to control or influence others [Reiss, 2004]. Since the role of authority and power is generally emphasized in societies and organizations alike, people would attempt aggressive acts, such as cyber-bullying, to establish authority and demonstrate coercive power over others [Felson, 1984] as well as to build self-worth that ultimately leads to self-development [Tedeschi and Felson, 1994].

The craving for *attention* is intrinsic to human nature and is the motive for most of our actions [Ganesh, 2011]. Scholer and colleagues [2008] found that children often engaged in harmful behaviors to draw attention from others, rather than to intentionally hurt others. Attention-getting has also been confirmed as a motivator for traditional bullying [Cunningham, Cunningham, Ratcliffe, and Vaillancourt, 2010; Francis, 2011].

Acceptance is the desire for social or peer approval [Reiss, 2004]. Prior research has shown that bullies may perpetrate bullying or cyber-bullying behavior to seek peer approval; e.g., to impress their friends [Varjas, Talley,

Meyers, Parris, and Cutts, 2010]. Individuals, especially youngsters, are found to derive self-benefits in the form of enhanced self-esteem when they gain social approval from their peers [Benson and Spilka, 1973; Twenge and Campbell, 2001].

In sum, individuals with a high desire for *power, attention, or acceptance* will be more likely to perform cyber-bullying behavior. Thus, we hypothesize:

Hypothesis 2: Motivations (i.e., the desire for power, attention, or acceptance) will positively affect the likelihood of committing cyber-bullying.

2.1.3. Cyber-Victimization Experience

Behavioral acquisition or adoption always comes from learning and observation [Latham and Saari, 1979; Manz and Sims, 1986; Schunk, 1981]. Social cognitive theory [Bandura, 1978] asserts that individuals can observe behaviors of others and then reproduce the same actions. The cycle of violence hypothesis also postulates that individuals learn violent behaviors by being the victims of the aggressive behavior [Burgess, Hartman, and McCormack, 1987; McCord, 1988].

Empirical evidence is largely supportive of both theories. For instance, Ryan [1989] has noted the relationship between the victims and victimizers in sexual aggression and found that youths' sexual aggression often stemmed from their own victimization experience. Victimization has also been shown to increase children's likelihood of committing violent criminal behavior, such as robbery, burglary, and assault [Widom, 1989; Widom, Maxfield, and Justice, 2001].

In addition, previous research on cyber-bullying has revealed the positive impact of *cyber-victimization experience* on cyber-bullying behavior [Espelage and Swearer, 2003; Li, 2007b; Walrave, 2009; Ybarra and Mitchell, 2004a]. Individuals who have been victims of cyber-bullying are more likely

to commit cyber-bullying in the future, via the process of learning from and reproducing other bullies' behavior. We thus hypothesize:

Hypothesis 3: Cyber-victimization experience will positively influence the likelihood of committing cyber-bullying.

2.1.4. Demographics

Demographics includes age and gender.

Age. Early bullying studies suggested a positive relationship between age and bullying, because growing up implies better physical strength and power [Olweus, 1993]. More recent research, however, has reported distinct relationships between age and different types of bullying behaviors. Whereas younger adolescents (most of whom lack social skills such as emotional control and social expressivity) were more likely to engage in physical bullying [Brame, Nagin, and Tremblay, 2001], older individuals (who are more socially competent) were more likely to commit verbal attacks and relational aggression [Espelage, Mebane, and Swearer, 2004; Rys and Bear, 1997]. In the online context, empirical evidence has also been mixed. Some researchers found that cyber-bullying behavior increased with age [e.g., Hinduja and Patchin, 2008; Kowalski and Limber, 2007; Raskauskas and Stoltz, 2007; Ybarra, Mitchell, Finkelhor, and Wolak, 2007; Ybarra, Mitchell, Wolak, and Finkelhor, 2006]. Others reported a negative relationship between age and incidents of cyber-bullying [e.g., Dehue, et al., 2008; Sevcikova and Smahel, 2009].

In this study, we hypothesize a negative relationship between age and cyber-bullying behavior for two reasons. First, prior research on antisocial behavior has shown that the rates of offending appear highest during adolescence, peaking at about age 17 and dropping precipitously in young adulthood [Moffitt, 1993]. Most people are only temporarily involved in antisocial behaviors (when they are teenagers); they become more pro-social when they grow up, as a result of learning, mental development, and emotional maturity [Moffitt, 1993]. For

instance, a survey conducted by the U.S. Federal Bureau of Investigation [2003] revealed that the majority of criminal offenders were young adolescents (at 17 to 18 years old), with arrest rates decreasing and continuing to slow down in adulthood. Since our study focuses on university students (who are generally over 18 years old), we expect the incidents of cyber-bullying behavior to drop with the increase in age of the students. Second, anonymity on the Internet, as well as the elimination of physical strength as a necessary condition to perform aggressive behavior online, allows those who are younger and physically weaker to engage in cyber-bullying activities. Thus, we hypothesize:

Hypothesis 4: Age will negatively influence the likelihood of committing cyber-bullying.

Gender. Males have been found in many previous studies to be more aggressive than females [Eagly and Steffen, 1986; White, 1983]. This gender difference in performing aggressive acts may be due to biological predisposition [Eagly and Steffen, 1986; Frodi, 1978; Frodi, Macaulay, and Thome, 1977]. For instance, the size of the amygdala has been found to be positively associated with aggressive behavior, and in general the size of the male amygdala is larger than that of the female amygdala [Vochtelloo and Koolhaas, 1987].

The gender difference in aggressive behavior may also be explained by traditional gender roles and cultural norms [Bandura, 1973; Berkowitz, 1989]. Traditionally, braveness, independence, and aggressiveness are valued characteristics for males, whereas females are expected to be benevolent and tolerant [Maccoby, 1998]. In every culture, males have assumed a dominant role for protecting their families and countries [Aldous, 1969; Bielby and Bielby, 1992].

In the online context, prior research has revealed that more than half of the males surveyed had committed cyber-bullying, compared with a much lower percentage for females [Li, 2007b; Wang, et al., 2009; Ybarra, et al., 2006],

suggesting that the gender stereotype may still sustain in the cyber-bullying context [Huang and Chou, 2010; Slonje and Smith, 2008]. Therefore, we hypothesize:

Hypothesis 5: Males will more be likely to commit cyber-bullying than females.

2.2. Environmental Factor: Social Norm

According to social cognitive theory, social influence as an environmental factor can shape individuals' behavior [Bandura, 1977, 1986]. Social influence is an important source of "verbal persuasion" [Bandura, 1986]; it is similar to the concept of *social norm*, which refers to an individual's perception that people who are important to him or her think that he or she should or should not perform certain behavior [Fishbein and Ajzen, 1975]. Huesmann and Guerra [1997] found that youngsters who held normative beliefs about aggressive behaviors were more likely to perpetrate such behavior. Similar findings have been reported by studies on traditional bullying [Bentley and Li, 1995; Espelage and Swearer, 2003]. Likewise, in the online context, individuals will be more likely to engage in cyber-bullying behavior if important parties approve of such behavior. Thus, we hypothesize:

Hypothesis 6: Social norm will positively influence the likelihood of committing cyber-bullying.

3. RESEARCH METHODOLOGY

The target respondents in this study were current university students in Hong Kong. A total of 288 usable questionnaires were collected in June 2011, via invitations posted both off-line and online. Participation was on a voluntary basis. The questionnaire consisted of three parts designed to (1) collect respondents' demographic and background information, (2) probe their knowledge of, and

their experience with, cyber-bullying and cyber-victimization, and (3) explore factors contributing to cyber-bullying behavior.

The measurement items for potential predictors of cyber-bullying behavior were borrowed from prior research with modifications of question wording to fit the specific context of cyber-bullying. Multi-item measures were used for each construct to ensure construct validity and reliability. *Internet self-efficacy* was measured by four items, adapted from Hsu and Chiu [2004]. *Social norm* was measured by three items borrowed from Venkatesh and colleagues [2003]. The measurements for the three types of *motivations* (i.e., power, acceptance, and attention) were borrowed from Reiss [2004]. All the above-mentioned measurements (see Appendix) were phrased as questions on 7-point Likert scales, from *strongly disagree* (1) to *strongly agree* (7). Age was ranged from 18 to more than 30 years old. Gender was indicated by a dummy variable [Male = 1, Female = 0].

Prior to the study, we identified six types of cyber-bullying behavior (summarized in Table 2 in the next section) from a comprehensive review of prior literature. In the questionnaire, both cyber-bullying and cyber-victimization were measured on 5-point scales, ranging from *Never* (1) to *11 or more* (5), reflecting the frequency in performing cyber-bullying behavior or suffering from cyber-victimization.

4. DATA ANALYSIS AND RESULTS

This section presents information on descriptive statistics and assessment of measurement and structural models.

4.1. Descriptive Statistics

In this section, we present the descriptive statistics about the respondents' demographic data and their experience with cyber-bullying and cyber-victimization.

4.1.1. Demographic Data

As indicated in Table 1, our respondents consisted of 100 males (34.7% of total) and 188 females (65.3%). More than 94% of the respondents were between the ages of 18 and 25 years. A vast majority spent at least three hours each day on the computer (87.2%) and on the Internet (79.2%).

Table 1 Demographic Profile of the Respondents			
		Number of Respondents	Percentage
Gender	Female	188	65.3
	Male	100	34.7
Age	18-21 years	119	41.3
	22-25 years	152	52.8
	26-30 years	11	3.8
	>30 years	6	2.1
Hours on Computer per Day	Less than 1 hour	3	1.0
	1-2 hours	34	11.8
	3-4 hours	93	32.3
	5-6 hours	75	26.0
	7 hours or more	83	28.8
Hours on the Internet per Day	Less than 1 hour	5	1.7
	1-2 hours	55	19.1
	3-4 hours	114	39.6
	5-6 hours	70	24.3
	7 hours or more	44	15.3

4.1.2. Cyber-Bullying and Cyber-Victimization Experience

As shown in Table 2, the results of our data analysis reveal that, among the six types of cyber-bullying behavior, “deliberately ignoring or excluding someone from an online activity” was the one of the most frequently perpetrated behaviors by respondents (47.9%). Among cyber-victims, 43.8% reported that they had been victims of the behavior “disseminating private information/messages or posting images/videos without permission.”

Table 2 Frequency of Different Types of Cyber-Bullying		
Types of Cyber-Bullying Behavior	Cyber-Victims	Cyber-Bullies
	Respondents [%]	Respondents [%]
Sending threatening, harassing, humiliating, insulting and teasing messages, images, or videos	122 [42.4]	23 [8.0]
Disseminating private information/messages or posting images/videos without permission	126 [43.8]	71 [24.7]
Spreading rumors or gossips	41 [14.2]	20 [6.9]
Deliberately ignoring or excluding someone from an online activity	86 [29.9]	138 [47.9]
Pretending to be someone to send or post messages in someone's name	34 [11.8]	21 [7.3]
Attacking online accounts or modifying others' profile	69 [24.0]	8 [2.8]

Consistent with prior research on bullying and cyber-bullying, our results (see Table 3) show that more than half (51.7%) of the respondents were both

bullies and victims in cyberspace, with 60.4% having engaged in cyber-bullying behavior and 71.9% having been cyber-victims.

Table 3 Roles in Cyber-Bullying	
Roles	# of Respondents [%]
Cyber-Bully	174 [60.4]
Cyber-Victim	207 [71.9]
Cyber-Bully and Cyber-Victim	149 [51.7]

4.2. Assessment of Measurement and Structural Models

The partial least squares (PLS, as implemented in SmartPLS 2.0.M3) was used in this study to assess both the measurement model and the structural model [Hair, Anderson, Tatham, and Black, 1998].

4.2.1. Measurement Model

All the constructs, except for *cyber-victimization experience* and *cyber-bullying*, were modeled as reflective ones. We will first present the validation of the two formative constructs and then assess the reliability and validity of the reflective constructs in accordance with established guidelines [Gefen and Straub, 2005].

Validation of Formative Constructs. In this study, *cyber-victimization experience* and *cyber-bullying* were modeled as formative constructs. Unlike in the case of reflective constructs (where the indicators are *caused by* the constructs), the indicators of formative constructs *cause* the constructs [Diamantopoulos and Siguaw, 2006]. Since the indicators are not expected to correlate highly with one another (and are thus not interchangeable), dropping one of the indicators may result in a change of the meaning of the construct [Diamantopoulos and Siguaw, 2006; Petter, Straub, and Rai, 2008].

From an exhaustive literature review, we identified six distinct types of cyber-bullying behavior (shown earlier in Table 2). Because (1) each of the six types of behavior is not substitutable by any other behavior and (2) the presence of one behavior does not necessitate the presence of another behavior, the six types of cyber-bullying behavior were modeled as formative indicators of both cyber-victimization and cyber-bullying, from the perspective of victims or perpetrators.

We assessed the validity of cyber-victimization experience and cyber-bullying in accordance with established guidelines [Cenfetelli and Bassellier, 2009; Petter, et al., 2008]. First, we tested multi-collinearity among the indicators by computing the variance inflation factor (VIF) of each indicator. As shown in Table 4, the results indicate that all the VIFs ranged from 1.089 to 1.276 for cyber-victimization experience and 1.056 to 1.194 for cyber-bullying, both below the 3.33 threshold, thus indicating that multi-collinearity was not present [Diamantopoulos and Siguaw, 2006; Petter, et al., 2008].

Table 4		
VIF Statistics for Formative Measures		
Formative Items	Cyber-Victimization	Cyber-Bullying
	VIF	VIF
Sending threatening, harassing, humiliating, insulting and teasing messages, images, or videos	1.196	1.170
Disseminating private information/messages or posting images/videos without permission	1.276	1.168
Spreading rumors or gossips	1.193	1.194
Deliberately ignoring or excluding someone from an online activity	1.089	1.075
Pretending to be someone to send or post messages in someone's name	1.139	1.103
Attacking online accounts or modifying other's profile	1.171	1.056

Second, we assessed the weight of the indicators (see Table 5, next page) and found that the weights of all paths (i.e., the relative contribution) toward cyber-victimization (except that of *spreading rumors* and *attacking online accounts*) were significant. For cyber-bullying, the weights of all the indicators were significant. Although two indicators (*spreading rumors* and *attacking online accounts*) had a relatively small contribution to constructs, their absolute contribution (i.e., zero-order bivariate loadings) was quite strong. For instance, *spreading rumors* had a strong absolute contribution to cyber-victimization at 0.551. Although the absolute contribution of *attacking online accounts or modifying other's profile* was only 0.287 to cyber-victimization, it had an important absolute contribution to cyber-bullying. Since we wanted to explore the potential relationship between the likelihood of performing cyber-bullying and the different types of cyber-victimization experience, we decided to keep both indicators in our study, following the suggestion of Cenfetelli and Bassellier [2009].

Validation of Reflective Constructs. For reflective constructs, individual item reliability, internal consistency, and discriminant validity were examined following the approaches to testing measurement models in PLS suggested by Barclay et al. [1995] and Gefen and Straub [2005]. Individual item reliability was examined by the loadings of measures with their corresponding construct (see Table 6). All of the loadings exceeded 0.7, indicating good item reliability.

Internal consistency was assessed by examining the composite reliability index developed by Fornell and Larcker [1981], a measure of reliability similar to Cronbach's alpha. The benchmark for acceptable reliability is 0.7. All constructs met this criterion (see Table 7), indicating that the measures had good internal consistency.

Table 5						
T-Value, Item Weights, and Loadings of Formative Measures						
Formative Items	Cyber-Victimization			Cyber-Bullying		
	T-Statistic	Weight	Loading	T-Statistic	Weight	Loading
Sending threatening, harassing, humiliating, insulting and teasing messages, images, or videos	3.140***	0.271	0.603	4.938***	0.398	0.672
Disseminating private information/messages or posting images or videos without permission	3.362***	0.457	0.744	3.031***	0.273	0.632
Spreading rumors or gossips	1.240	0.176	0.551	4.478***	0.330	0.550
Deliberately ignoring or excluding someone from an online activity	3.997***	0.455	0.734	4.207***	0.271	0.639
Pretending to be someone to send or post messages in someone's name	1.728*	0.174	0.388	4.046***	0.254	0.464
Attacking online accounts or modifying other's profile	0.044	-0.004	0.287	3.011***	0.286	0.308
Note: *p<0.100 ** p<0.050 *** p<0.010						

Table 6 Loading and Cross-Loading of Measures			
	Motivation	Internet Self-Efficacy	Social Norm
Motivation 1	0.973	0.004	0.294
Motivation 2	0.981	0.001	0.278
Motivation 3	0.973	0.067	0.291
Internet Self-Efficacy 1	-0.017	0.687	-0.204
Internet Self-Efficacy 2	0.002	0.808	-0.118
Internet Self-Efficacy 3	0.081	0.822	0.045
Internet Self-Efficacy 4	-0.042	0.710	-0.054
Social Norm 1	0.290	-0.017	0.927
Social Norm 2	0.247	-0.110	0.911
Social Norm 3	0.230	-0.073	0.788

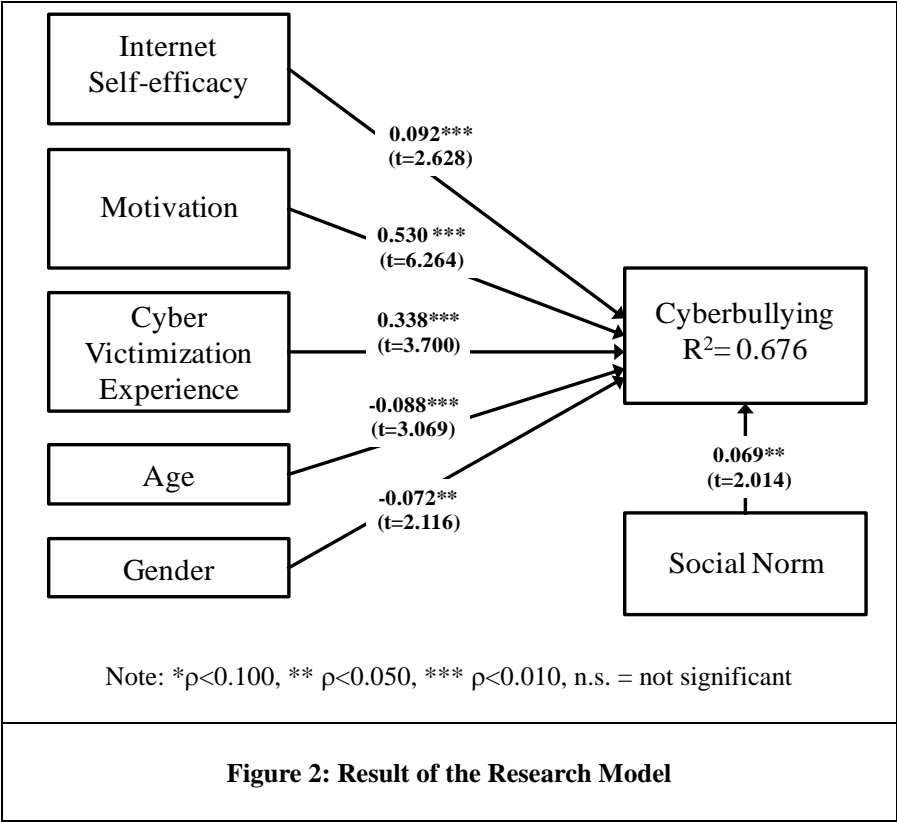
Table 7 Internal Consistency and Discriminant Validity of Constructs						
	Composite Reliability	Cronbach's Alpha	Average Variance Extracted	M	ISE	SN
M	0.98	0.98	0.95	0.976		
ISE	0.85	0.77	0.58	0.025	0.759	
SN	0.91	0.85	0.77	0.295	-0.069	0.877
Note 1: Bolded diagonal elements are the square root of AVE for each construct. Off-diagonal elements are the correlations between constructs. Note 2: M = Motivation ISE = Internet Self-Efficacy SN = Social Norm						

Barclay et al. [1995] suggest two criteria for discriminant validity. First, the square root of AVE of a construct should be greater than the correlations of the construct with other constructs, thus indicating that the construct shares more variance with its own measures than it shares with other constructs in a model. This criterion was satisfied by the current data, as shown in Table 7. Second, no item should load higher on a construct than on the one it intends to measure. An examination of the loadings and cross-loadings of measures shown in Table 6 reveals that all items satisfied this criterion.

4.2.2. Assessment of Structural Model

The results of the structural model from PLS, including path coefficients, explained variances, and significance levels, are illustrated in Figure 2. The results show that *cyber-victimization experience* ($\beta=0.338$; $p<0.01$), *Internet self-efficacy* ($\beta=0.092$; $p<0.01$), *social norm* ($\beta=0.069$; $p<0.05$), and *motivation* ($\beta=0.530$; $p<0.01$) had significant positive effect on the likelihood of performing cyber-bullying behavior. In addition, *age* ($\beta=-0.088$; $p<0.01$) and *gender* ($\beta=-0.072$; $p<0.01$) were found to exert a significant negative impact on cyber-bullying, suggesting that older students and male students were *less* likely to engage in cyber-bullying behavior.

In sum, all the hypotheses [except H5] were supported by our data.



5. CONCLUSION AND DISCUSSION

This section presents the conclusions of our study, discusses the implications for research and practice, and explains the limitations and opportunities for future research.

5.1. Conclusions of the Study

The primary objective of this study was to investigate factors determining the cyber-bullying behavior of university students. The results of a survey of university students in Hong Kong reveal that both personal and environmental factors are important predictors of cyber-bullying behavior.

Consistent with social cognitive theory and prior research on traditional bullying, *Internet self-efficacy* was found to have a significant positive influence on cyber-bullying behavior. University students who had more expertise in operating the Internet and using Internet applications were more likely to perform different types of online bullying behavior (e.g., sending harassing messages, modifying images, or posting videos] without others' technical support and assistance.

In addition, consistent with social cognitive theory, the cycle of violence hypothesis, and prior cyber-bullying research [Beran and Li, 2007; Varjas, Henrich, and Meyers, 2009], *cyber-victimization experience* was found to exert a strong positive impact on the likelihood to perform cyber-bullying behavior. University students may have learned such behavior from their experience being victims of cyber-bullying [Burgess, et al., 1987; McCord, 1988]. Exposure to violence from different channels may have also lessened their perception of the negative consequences of aggressive behavior [Baldry, 2003], and thus lowered their inhibition in performing such behaviors.

Social norm was also found to have a significant impact on the likelihood of cyber-bullying. Consistent with the predication of social cognitive theory [Bandura, 1986], university students had a greater tendency to engage in cyber-bullying behavior when they held positive normative beliefs about such behavior (i.e., when they believed that people who were important to them approved of such behavior).

Motivation was revealed to be the strongest predictor of cyber-bullying. University students who desired power, attention, and/or peer approval were significantly more likely to perpetrate cyber-bullying behavior. This finding is consistent with that of Campbell [1982], who has identified self-worth, the need for acceptance, and social approval as core factors contributing to aggressive acts. The finding is also consistent with Workman's [2010] research, which reveals

that people were more inclined to perform cyber-harassment when they needed social acceptance or approval.

Both *age* and *gender* were found to be significant predictors of cyber-bullying behavior. University students who were older (an indicator of cognitive and emotional maturity) were less likely to engage in cyber-bullying behavior, a finding that is consistent with that of previous studies and confirmative of our expectations. However, contrary to our expectations, female students were found to have a greater tendency to perform cyber-bullying behavior compared with males. Although this finding is different from that of most bullying and cyber-bullying studies conducted previously, it does have some empirical support in prior research [e.g., Kowalski, Limber, and Agatston, 2008]. For instance, research on traditional bullying and aggression shows that females prefer relational and verbal aggression to physical aggression [Athanasziades and Deliyanni Kouimtzis, 2010; Chisholm, 2006]. The Internet (which confers anonymity in communication) has provided an ideal platform for females to perpetrate such relational/verbal aggression [Crick, Casas, and Nelson, 2002] as spreading rumors, excluding someone from their social network, and sending harassing messages. Future research can further explore gender effect on different types of cyber-bullying behavior.

5.2. Implications for Research and Practice

This study makes several contributions to cyber-bullying research. First, it is one of the first attempts to study cyber-bullying in a rigorous, theory-driven manner. Drawing from social cognitive theory, this study identifies potential predictors of cyber-bullying and empirically tests their effects on individuals' likelihood to engage in cyber-bullying behavior. This study enhances our understanding of the personal and environmental factors affecting cyber-bullying behavior and thus contributes to theory building in this area of research.

Second, by examining the cyber-bullying behavior of university students in Hong Kong, this study addresses an additional gap in prior literature – the paucity of cyber-bullying research on university students, particularly university students in Asia. The study thus enriches our knowledge of the prevalence and the predictors of cyber-bullying behavior in a demographic sector and geographical area not studied extensively in prior literature.

This study also has significant implications for practice. The results of the study can alert government agencies, university administrators, and parents to the prevalence of cyber-bullying behavior among university students, and particularly university students in Hong Kong. Appropriate legislation, policies, and education/training programs aimed to prevent and deter acts of cyber-bullying among university students can then be devised and implemented. For instance, as social norm is found to exert significant impact on the likelihood to perform cyber-bullying behavior, parents, teachers, siblings, and peers can take an active role in dissuading their children, students, brothers and sisters, and fellow students from engaging in cyber-bullying.

5.3. Limitations and Future Research

This study has a number of limitations. First, the results of the study show that only 67.6% of the variance of cyber-bullying has been explained by personal and environmental factors. Future research may explore the impact of other factors (e.g., traditional bullying experience, self-control, emotional regulation) on cyber-bullying behavior. Second, since this study is based on self-reports, respondents may have over- or under-reported their cyber-bullying behavior and cyber-victimization experience. Future research may supplement self-reports with data collected from educators and parents. Third, this study gathered data from 288 Hong Kong students. The generalization of the findings of this study to a different context needs caution.

APPENDIX: MEASUREMENT ITEMS

Construct	Item	Measures	Adapted from
Internet Self-Efficacy	ISE1	I know how to find information by using a search engine.	Hsu and Chiu [2004]
	ISE2	I know how to download or upload files.	
	ISE3	I know how to install an application or software.	
	ISE4	I know how to exchange messages or chat with other users online.	
Social Norm	SN1	People who are important to me think that it is acceptable to harass or act aggressively toward others on the Internet.	Venkatesh et al. [2003]
	SN2	People in my life whose opinions I value think that it is all right to harass or act aggressively toward others on the Internet.	
	SN3	People who influence my behavior think that it is cool to harass or act aggressively toward others on the Internet.	
Motivation	M1	Power	Reiss [2004]
	M2	Acceptance	
	M3	Attention	

REFERENCES

- Aldous, J. 1969. Occupational characteristics and males' role performance in the family. *Journal of Marriage and the Family* 31(4), 707-712.
- Anderson, C.A., and L.R. Huesmann. 2003. Human aggression: A social-cognitive view. In M.A. Hogg and J. Cooper [eds.], *The Sage Handbook of Social Psychology* (pp. 296-323). London: Sage Publications Ltd.
- Andrew, S. 1998. Self-efficacy as a predictor of academic performance in science, *Journal of Advanced Nursing* 27(3), 596-603.
- Athanasiades, C., and V. Deliyanni Kouimtzis. 2010. The experience of bullying among secondary school students, *Psychology in the Schools* 47(4), 328-341.
- Baldry, A. C. 2003. Bullying in schools and exposure to domestic violence, *Child Abuse and Neglect* 27(7), 713-732.
- Bandura, A. 1973. *Aggression: A Social Learning Analysis*, New York: Prentice-Hall.

- Bandura, A. 1977. Self-efficacy: Toward a unifying theory of behavioral change, *Psychological Review* 84(2), 191-215.
- Bandura, A. 1978. Social learning theory of aggression, *Journal of Communication* 28(3), 12-29.
- Bandura, A. 1986. *Social Foundations of Thought and Action: A Social Cognitive Theory*, New York: Prentice-Hall, Inc.
- Barclay, D.; R. Thompson; and C. Higgins. 1995. The Partial Least Squares [PLS] approach to causal modeling: Personal computer adoption and use as an illustration, *Technology Studies* 2(2), 285-309.
- Benson, P., and B. Spilka. 1973. God image as a function of self-esteem and locus of control, *Journal for the Scientific Study of Religion* 12(3), 297-231.
- Bentley, K.M., and A.K.F. Li. 1995. Bully and victim problems in elementary schools and students' beliefs about aggression, *Canadian Journal of School Psychology* 11(2), 153-165.
- Beran, T., and Q. Li. 2007. The relationship between cyber-bullying and school bullying, *Journal of Student Wellbeing* 1(2), 15-33.
- Berkowitz, L. 1989. Frustration-aggression hypothesis: Examination and reformulation, *Psychological Bulletin* 106(1), 59-73.
- Bielby, W.T., and D.D. Bielby. 1992. I will follow him: Family ties, gender-role beliefs, and reluctance to relocate for a better job, *American Journal of Sociology* 97(5), 1241-1267.
- Brame, B.; D.S. Nagin; and R.E. Tremblay. 2001. Developmental trajectories of physical aggression from school entry to late adolescence, *Journal of Child Psychology and Psychiatry* 42(4), 503-512.
- Bulach, C.; J.P. Fulbright; and R. Williams. 2003. Bullying behavior: What is the potential for violence at your school? *Journal of Instructional Psychology* 30(2), 156-164.
- Bullock, L.M.; M. Wong-Lo; and R.A. Gable. 2011. Cyber-bullying: What is it and how can we combat it? *Preventing School Failure: Alternative Education for Children and Youth* 55(2), 63-63.
- Burgess, A.W.; C.R. Hartman; and A. McCormack. 1987. Abused to abuser: Antecedents of socially deviant behaviors, *American Journal of Psychiatry* 144(11), 1431-1436.
- Burk, L.R., and B.R. Burkhart. 2003. Disorganized attachment as a diathesis for sexual deviance: Developmental experience and the motivation for sexual offending, *Aggression and Violent Behavior* 8(5), 487-511.

- Campbell, A. 1982. Female aggression. *In* P. Marsh and A. Campbell [eds.], *Aggression and Violence* [pp. 137-150]. Oxford, UK: Blackwell.
- Cenfetelli, R.T., and G. Bassellier. 2009. Interpretation of formative measurement in information systems research, *Management Information Systems Quarterly* 33(4), 689-707.
- Chisholm, J. F. 2006. Cyberspace violence against girls and adolescent females, *Annals of the New York Academy of Sciences* 1087(1), 74-89.
- Collins, W. A. 1973. Effect of temporal separation between motivation, aggression, and consequences: A developmental study, *Developmental Psychology* 8(2), 215-221.
- Conner, M., and P. Norman [eds.]. 2005. *Predicting Health Behaviour* [2nd ed.]. Buckingham, England: University Press.
- Crick, N.R.; J.F. Casas; and D.A. Nelson. 2002. Toward a more comprehensive understanding of peer maltreatment: Studies of relational victimization, *Current Directions in Psychological Science* 11(3), 98-101.
- Cunningham, C.E.; L.J. Cunningham; J. Ratcliffe; and T. Vaillancourt. 2010. A qualitative analysis of the bullying prevention and intervention recommendations of students in grades 5 to 8, *Journal of School Violence* 9(4), 321-338.
- Dehue, F.; C. Bolman; and T. Vollink. 2008. Cyber-bullying: Youngsters' experiences and parental perception, *Cyberpsychology and Behavior* 11(2), 217-223.
- Dempsey, A.G.; M.L. Sulkowski; R. Nichols; and E.A. Storch. 2009. Differences between peer victimization in cyber and physical settings and associated psychosocial adjustment in early adolescence, *Psychology in the Schools* 46(10), 962-972.
- Diamantopoulos, A., and J.A. Siguaw. 2006. Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration, *British Journal of Management* 17(4), 263-282.
- Dilmac, B. 2009. Psychological needs as a predictor of cyber-bullying: A preliminary report on college students, *Kuram Ve Uygulamada Egitim Bilimleri* 9(3), 1307-1325.
- Dooley, J.J.; T. Shaw; and D. Cross. 2012. The association between the mental health and behavioural problems of students and their reactions to cyber-victimization, *European Journal of Developmental Psychology* 9(2), 275-289.
- Eagly, A.H., and V.J. Steffen. 1986. Gender and aggressive behavior: A meta-analytic review of the social psychological literature, *Psychological Bulletin* 100(3), 309-330.

- Eastin, M.S., and R. LaRose. 2000. Internet self-efficacy and the psychology of the digital divide, *Journal of Computer Mediated Communication* 6(1).
- Edwards, D.C. 1999. *Motivation and Emotion: Evolutionary, Physiological, Cognitive, and Social Influences*, Thousand Oaks, California: Sage Publishers.
- Epstein, A., and J. Kazmierczak. 2007. Cyber-bullying: What teachers, social workers, and administrators should know, *Illinois Child Welfare* 3(& 2), 41-51.
- Espelage, D.L.; S.E. Mebane; and S.M. Swearer. 2004. Gender differences in bullying: Moving beyond mean level differences, *In* D L. Espelage and S.M. Swearer [eds.], *Bullying in American Schools: A Social-Ecological Perspective on Prevention and Intervention* (Vol. XXI, pp. 15-35), Mahwah, NJ, U.S.: Lawrence Erlbaum Associates Publishers.
- Espelage, D.L., and S.M. Swearer. 2003. Research on school bullying and victimization: What have we learned and where do we go from here? *School Psychology Review* 32(3), 365-383.
- Farrington, D.P. 1993. Understanding and preventing bullying, *Crime and Justice* 17, 381-458.
- Federal Bureau of Investigation. 2003. Age-Specific Arrest Rates and Race-Specific Arrest Rates for Selected Offenses, 1993-2001. Retrieved from http://www.fbi.gov/about-us/cjis/ucr/additional-ucr-publications/age_race_arrest93-01.pdf.
- Felson, R.B. 1984. Patterns of aggressive social interaction, *In* A. Mummendey [ed.], *Social Psychology of Aggression: From Individual Behavior to Social Interaction* (pp. 107-126), Berlin: Springer-Verlag.
- Finn, J. 2004. A survey of online harassment at a university campus, *Journal of Interpersonal Violence* 19(4), 468-483.
- Fishbein, M., and I. Ajzen. 1975. *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*, Reading, MA: Addison-Wesley.
- Fontaine, R.G. 2007. Disentangling the psychology and law of instrumental and reactive subtypes of aggression, *Psychology, Public Policy, and Law* 13(2), 143-165.
- Fornell, C., and D. Larcker. 1981. Evaluating structural equation models with unobservable variables and measurement error, *Journal of Marketing Research* 18(3), 39-50.
- Francis, C. 2011. Help children conquer abuse and bullying: An annotated bibliography, *JCCC Honors Journal* 2(2/5), 1-15.
- Frodi, A. 1978. Experiential and physiological responses associated with anger and aggression in women and men, *Journal of Research in Personality* 12(3), 335-349.

- Frodi, A.; J. Macaulay; and P.R. Thome. 1977. Are women always less aggressive than men? A review of the experimental literature, *Psychological Bulletin* 84(4), 634-660.
- Ganesh, T.V. 2011. The Lure of Praise Available from the website: http://www.associatedcontent.com/article/7988527/the_lure_of_praise.html
- Geen, R.G., and R.G. Green. 2001. *Human Aggression*, Buckingham, England: University Press.
- Gefen, D., and D. Straub. 2005. A practical guide to factorial validity using PLS-graph: Tutorial and annotated example, *Communications of the Association for Information Systems* 16(1), 91-109.
- Hair, J.F.; R.E. Anderson; R.L. Tatham; and W.C. Black. 1998. *Multivariate Data Analysis*, Upper Saddle River, NJ: Prentice Hall.
- Hamberger, L.K.; J.M. Lohr; D. Bonge; and D.F. Tolin. 1997. An empirical classification of motivations for domestic violence, *Violence Against Women* 3(4), 401-423.
- Hinduja, S., and J.W. Patchin. 2008. Cyber-bullying: An exploratory analysis of factors related to offending and victimization, *Deviant Behavior* 29[2], 129-156.
- Hinduja, S., and J.W. Patchin. 2010. Bullying, cyber-bullying, and suicide, *Archives of Suicide Research* 14(3), 206-221.
- Hofstede, G. 1980. Motivation, leadership, and organization: Do American theories apply abroad, *Organizational Dynamics* 9(1), 42-63.
- Hong Kong Federation of Youth Groups. 2010. *A Study on Cyber-bullying among Hong Kong Secondary Students*, Hong Kong: Hong Kong Federation of Youth Groups.
- Hsu, M.H., and C.M. Chiu. 2004. Internet self-efficacy and electronic service acceptance, *Decision Support Systems* 38[3], 369-381.
- Huang, Y.Y., and C. Chou. 2010. An analysis of multiple factors of cyber-bullying among junior high school students in Taiwan, *Computers in Human Behavior* 26(6), 1581-1590.
- Huesmann, L.R., and N.G. Guerra. 1997. Children's normative beliefs about aggression and aggressive behavior, *Journal of Personality and Social Psychology* 72[2], 408-419.
- Hymel, S.; N. Rocke-Henderson; and R.A. Bonanno. 2005. Moral disengagement: A framework for understanding bullying among adolescents, *Journal of Social Sciences* 8(1), 1-11.

- InfoSec. Cyber-bullying. Retrieved March, 03, 2012, from <http://www.infosec.gov.hk/english/youngsters/cyberbullying.html>
- Internet World Stats. 2011. Internet Usage Statistics. Retrieved October 12, 2011, from <http://www.internetworldstats.com/stats.htm>
- Juvonen, J., and E.F. Gross. 2008. Extending the school grounds? Bullying experiences in cyberspace, *Journal of School Health* 78(9), 496-505.
- Katzer, C.; D. Fetchenhauer; and F. Belschak. 2009. Internet-chatrooms: A new playground for bullies. A comparison of bullying behavior in school and in chatrooms from the perpetrators' perspective, *Zeitschrift Fur Entwicklungspsychologie Und Padagogische Psychologie*, 41(1), 33-44.
- Kornadt, H.J. 1984. Motivation theory of aggression and its relation to social psychological approaches, In A. Mummendey [ed.], *Social Psychology of Aggression: From Individual Behavior to Social Interaction* (pp. 21-31), New York: Springer-Verlag.
- Kowalski, R.M., and S.P. Limber. 2007.. Electronic bullying among middle school students, *Journal of Adolescent Health* 41(6), S22-S30.
- Kowalski, R.M.; S.P. Limber; and P.W. Agatston. 2008. *Cyber-Bullying: Bullying in the Digital Age*, Oxford: Blackwell Publishing.
- LaRose, R., and M.S. Eastin. 2004. A social cognitive explanation of Internet uses and gratifications: Toward a new theory of media attendance, *Journal of Broadcasting and Electronic Media* 48(3), 358-377.
- Latham, G. P., and L.M. Saari. 1979. Application of social-learning theory to training supervisors through behavioral modeling, *Journal of Applied Psychology* 64[3], 239-246.
- Law, D.M.; J.D. Shapka; S. Hymel; B.F. Olson; and T. Waterhouse. 2011. The changing face of bullying: An empirical comparison between traditional and Internet bullying and victimization, *Computers in Human Behavior* 28(1), 226-232.
- Lee, S. 2010. Cyber-bullying a growing problem in city, *China Daily*. Retrieved from http://www.chinadaily.com.cn/hkedition/2010-02/06/content_9437534.htm
- Li, Q. 2006. Cyber-bullying in schools - A research of gender differences, *School Psychology International* 27(2), 157-170.
- Li, Q. 2007a. Bullying in the new playground: Research into cyber-bullying and cyber-victimisation, *Australasian Journal of Educational Technology* 23(4), 435-454.
- Li, Q. 2007b. New bottle but old wine: A research of cyber-bullying in schools, *Computers in Human Behavior* 23(4), 1777-1791.

- Li, Q. 2008. A cross-cultural comparison of adolescents' experience related to cyber-bullying, *Educational Research* 50(3), 223-234.
- Maccoby, E.E. 1998. *The Two Sexes: Growing Up Apart, Coming Together*, Cambridge, MA: Belknap Press of Harvard University Press.
- MacDonald, C.D., and B. Roberts-Pittman. 2010. Cyber-bullying among college students: Prevalence and demographic differences, *Procedia-Social and Behavioral Sciences* 9, 2003-2009.
- Manz, C.C., and H.P. Sims. 1986. Beyond imitation: Complex behavioral and affective linkages resulting from exposure to leadership training models, *Journal of Applied Psychology* 71(4), 571-578.
- McCord, J. 1988. Identifying developmental paradigms leading to alcoholism, *Journal of Studies on Alcohol* 49(4), 357-362.
- McWhirter, E. H.; M. Crothers; and S. Rasheed. 2000. The effects of high school career education on social-cognitive variables, *Journal of Counseling Psychology* 47(3), 330-341.
- Megan Meier Cyberbullying Prevention Act. 2009. Retrieved October 12, 2011, from <http://www.govtrack.us/congress/billtext.xpd?bill=h111-1966>
- Menesini, E., and C. Spiel. 2012. Introduction: Cyber-bullying: Development, consequences, risk and protective factors, *European Journal of Developmental Psychology* 9(2), 163-167.
- Miltiadou, M., and W.C. Savenye. 2003. Applying social cognitive constructs of motivation to enhance student success in online distance education, *Educational Technology Review* 11(1), 78-95.
- Moffitt, T.E. 1993. Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy, *Psychological Review* 100(4), 674-701.
- Mouttapa, M.; T. Valente; P. Gallaher; L.A. Rohrbach; and J.B. Unger. 2004. Social network predictors of bullying and victimization, *Adolescence* 39, 315-336.
- Natvig, G.K.; G. Albrektsen; and U. Qvarnstrom. 2001. School-related stress experience as a risk factor for bullying behavior, *Journal of Youth and Adolescence* 30(5), 561-575.
- Navarro, J. N., and J.L. Jasinski. 2012. Going cyber: Using routine activities theory to predict cyber-bullying experiences, *Sociological Spectrum* 32(1), 81-94.
- Olivier, T.A., and F. Shapiro. 1993. Self-efficacy and computers, *Journal of Computer-Based Instruction* 20(3), 81-85.
- Olweus, D. 1993. *Bullying at School: What We Know and What We Can Do* [Understanding Children's Worlds], Malden, MA: Blackwell. ISBN, 631192417.

- Olweus, D.; L. Limber; and S.F. Mahalic. 1999. Bullying Prevention Program, Boulder, Colo.: Center for the Study and Prevention of Violence, Institute of Behavioral Science, University of Colorado at Boulder.
- Petter, S.; D.W. Straub; and A. Rai. 2008. Specifying formative constructs in information systems research, *Management Information Systems Quarterly* 31(4), 623-656.
- Pew Internet and American Life Project. 2010. Updated: Change in internet access by age group, 2000-2010. Retrieved from -- <http://www.pewinternet.org/Infographics/2010/Internet-access-by-age-group-over-time-Update.aspx>
- Raskauskas, J., and A.D. Stoltz. 2007. Involvement in traditional and electronic bullying among adolescents, *Developmental Psychology* 43(3), 564-575.
- Reiss, S. 2004. Multi-faceted nature of intrinsic motivation: The theory of 16 basic desires, *Review of General Psychology* 8(3), 179-193.
- Resnicow, K.; M. Davis-Hearn; M. Smith; T. Baranowski; L.S. Lin; J. Baranowski; et al. 1997. Social-cognitive predictors of fruit and vegetable intake in children, *Health Psychology* 16(3), 272-276.
- Ryan, G. 1989. Victim to victimizer: Rethinking victim treatment, *Journal of Interpersonal Violence* 4(3), 325-341.
- Rys, G.S., and G.G. Bear. 1997. Relational aggression and peer relations: Gender and developmental issues, *Merrill-Palmer Quarterly* 43[1], 87-106.
- Saunders, B., and C. Wilkinson. 1990. Motivation and addiction behaviour: A psychological perspective, *Drug and Alcohol Review* 9(2), 133-142.
- Scholer, S.J.; P.A. Brokish; A.B. Mukherjee; and J. Gigante. 2008. A violence-prevention program helps teach medical students and pediatric residents about childhood aggression, *Clinical Pediatrics* 47(9), 891-900.
- Schunk, D.H. 1981. Modeling and attributional effects on children's achievement: A self-efficacy analysis, *Journal of Educational Psychology* 73(1), 93-105.
- Schwartz, D.; K.A. Dodge; J.D. Coie; J.A. Hubbard; A.H.N. Cillessen; E.A. Lemerise; et al. 1998. Social-cognitive and behavioral correlates of aggression and victimization in boys' play groups, *Journal of Abnormal Child Psychology* 26(6), 431-440.
- Sevcikova, A., and D. Smahel. 2009. Online harassment and cyber-bullying in the Czech Republic: Comparison across age groups, *Zeitschrift fur Psychologie/Journal of Psychology* 217(4), 227-229.

- Skues, J.L.; E.G. Cunningham;; and T. Pokharel. 2005. The influence of bullying behaviours on sense of school connectedness, motivation and self-esteem, *Australian Journal of Guidance and Counselling* 15(1), 17-26.
- Slonje, R., and P.K. Smith. 2008. Cyber-bullying: Another main type of bullying? *Scandinavian Journal of Psychology* 49(2), 147-154.
- Smith, P.K.; J. Mahdavi; M. Carvalho; S. Fisher; S. Russell; and N. tiuppett. 2008. Cyber-bullying: Its nature and impact in secondary school pupils, *Journal of Child Psychology and Psychiatry* 49(4), 376-385.
- Tedeschi, J.T., and R.B. Felson. 1994. *Violence, Aggression, and Coercive Actions* (Vol. XII), Washington, D.C., U.S.: American Psychological Association.
- The Telegraph (London). 2011. Teenagers spend an average of 31 hours online. (Tuesday 11 October 2011). Retrieved from <http://www.telegraph.co.uk/technology/4574792/Teenagers-spend-an-average-of-31-hours-online.html>
- Toblin, R.L.; D. Schwartz; A. Hopmeyer Gorman; and T. Abou-ezzeddine. 2005. Social-cognitive and behavioral attributes of aggressive victims of bullying, *Journal of Applied Developmental Psychology* 26(3), 329-346.
- Tokunaga, R.S. 2010. Following you home from school: A critical review and synthesis of research on cyber-bullying victimization, *Computers in Human Behavior* 26(3), 277-287.
- Turan, N.; O. Polat; M. Karapirli; C. Uysal; and S.G. Turan. 2011. The new violence type of the era: Cyber-bullying among university students -- Violence among university students, *Neurology, Psychiatry and Brain Research* 17(1), 21-26.
- Twenge, J.M., and W.K. Campbell. 2001. Age and birth cohort differences in self-esteem: A cross-temporal meta-analysis, *Personality and Social Psychology Review* 5(4), 321-344.
- Vandebosch, H., and K. Van Cleemput. 2009. Cyber-bullying among youngsters: Profiles of bullies and victims, *New Media and Society* 11(8), 1349-1371.
- Varjas, K.; C.C. Henrich; and J. Meyers. 2009. Urban middle school students' perceptions of bullying, cyber-bullying, and school safety, *Journal of School Violence*, 8(2), 159 - 176.
- Varjas, K.; J. Talley; J. Meyers; L.. Parris; and H. Cutts. 2010. High school students' perceptions of motivations for cyber-bullying: An exploratory study, *Western Journal of Emergency Medicine* 11(3), 269-273.
- Venkatesh, V.; M.G. Morris; G.B. Davis; and F.D. Davis. 2003. User acceptance of information technology: Toward a unified view, *MIS Quarterly* 27(3), 425-478.

- Vochtelloo, J., and J. Koolhaas. 1987. Medial amygdala lesions in male rats reduce aggressive behavior: Interference with experience, *Physiology and Behavior* 41(2), 99-102.
- Walrave, M. 2009. Research on cyber-bullying in Belgium, and Internet rights observatory advice, *Zeitschrift Fur Psychologie-Journal of Psychology* 217(4), 234-235.
- Wang, J.; R.J. Iannotti; and T.R. Nansel. 2009. School bullying among adolescents in the United States: Physical, verbal, relational, and cyber, *Journal of Adolescent Health* 45(4), 368-375.
- White, J.W. 1983. Sex and gender issues in aggression research, *In* R.G. Geen and E.I. Donnerstein [eds.], *Aggression: Theoretical and Empirical Reviews* 2 (pp. 1-26), New York: Academic Press.
- Widom, C. S. 1989. The cycle of violence, *Science* 244(April), 160-166.
- Widom, C.S.; M.G. Maxfield; and N.I. Justice. 2001. An Update on the "Cycle of Violence," U.S. Department. of Justice, Office of Justice Programs, National Institute of Justice.
- Workman, M. 2010. A behaviorist perspective on corporate harassment online: Validation of a theoretical model of psychological motives, *Computer and Security* 29(8), 831-839.
- Ybarra, M.L., and K.J. Mitchell. 2004a. Online aggressor/targets, aggressors, and targets: a comparison of associated youth characteristics, *Journal of Child Psychology and Psychiatry* 45(7), 1308-1316.
- Ybarra, M.L., and K.J. Mitchell 2004b. Youth engaging in online harassment: associations with caregiver-child relationships, Internet use, and personal characteristics, *Journal of Adolescence* 27(3), 319-336.
- Ybarra, M.L.; K.J. Mitchell; D. Finkelhor; and J. Wolak. 2007. Internet prevention messages - Targeting the right online behaviors, *Archives of Pediatrics and Adolescent Medicine* 161(2), 138-145.
- Ybarra, M.L.; K.J. Mitchell; J. Wolak; and D. Finkelhor. 2006. Examining characteristics and associated distress related to Internet harassment: Findings from the Second Youth Internet Safety Survey, *Pediatrics* 118(4), E1169-E1177.
- Yilmaz, H. 2011. Cyber-bullying in Turkish middle schools: An exploratory study, *School Psychology International* 32(6), 645-654.
- Zhang, A.T.; L.P.W. Land; and G. Dick. 2010. Key Influences of Cyber-bullying for University Students. Paper presented at the Pacific Asia Conference on Information Systems, Taipei, Taiwan.

ACKNOWLEDGMENTS

The authors acknowledge with gratitude the generous support of Hong Kong Baptist University for the project (FRG2/11-12/171) without which the timely production of the current report/publication would not have been feasible.

ABOUT THE AUTHORS

Bo Sophia Xiao is an assistant professor in the Department of Information Technology Management, Shidler College of Business, University of Hawaii at Manoa. She received her Ph.D. in management information systems from the University of British Columbia. Her research interests include human–computer interaction; virtual communities and social networking; online trust, risk, and deception; and online consumer decision support. Her research has been published in top journals in the field of information systems, including *Management Information Systems Quarterly* and *Information Systems Research*.

Yee Man Wong is an MPhil candidate in computing and information systems in the Department of Computer Science at Hong Kong Baptist University. Her research interests include online behaviors, cyber-bullying, cyber-crime, and social media.