

# Investigating the mechanisms of theory of planned behavior on Cyberbullying among Thai adolescents

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## Abstract

**Purpose** – The purpose of this paper is to examine the etiological model of cyberbullying behaviors among Thai adolescents, testing the hypothesis that the constructs of theory of planned behavior (TPB), including self-esteem, will influence and have impact on cyberbullying intention and behaviors.

**Design/methodology/approach** – Structural equation modeling (SEM) was used to analyze the data. Self-administered questionnaires were used among multi-stage stratified random samples from secondary schools in the Bangkok. The sample size consisting of 354 subjects included those who were victims (44.7 percent), perpetrators (33.1 percent) and witness (67.8 percent).

**Findings** – The SEM showed subjective norm (SN) to be the most direct influential factor of cyberbullying intention and behaviors, followed by attitude toward cyberbullying (Intention  $\beta = 0.31, 0.24$ ;  $p = 0.01, 0.01$ , Behavior  $\beta = 0.09, 0.07$ ;  $p = 0.012$  and  $0.05$ , respectively). However, the SEM revealed that all variables from TPB including self-esteem in the equation can explain the variation scores of intention and cyberbullying behaviors at 54 and 67 percent levels (adjusted  $R^2 = 0.54$  and  $0.67$ ), respectively. The SEM showed that model modification indices indicate a good fit to the data ( $\chi^2 = 0.00$ ,  $df = 0$ ,  $p > 0.05$ ,  $CMIN/df = 0$ ,  $GFI = 1$ ,  $AGFI = 1$ ,  $CFI = 1$  and  $RMSEA = 0$ ).

**Research limitations/implications** – The experiences or witness of family violence and support at school level, which is supposed to mitigate the bullying problems, were neglected from this study.

**Practical implications** – The preventive measures for cyberbullying behaviors among adolescents should involve activities fostering self-esteem, developing proper attitude and SN to prevent cyberbullying. The initiatives and developed school supportive system for adolescents to understand how to control themselves when engaging in social network are imperative. However, for future research, family violence witness and attempt to lure the cyberbullying victims into offline meeting should be explored more.

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**Social implications** – TPB and the use of social media should be taken into account for planning and designing appropriate intervention to reduce and eliminate cyberbullying among all stakeholders in both public and private sectors in the area of health and educational institutes in order to endeavor and to advocate the anti-cyberbullying policy in Thailand.

**Originality/value** – TPB and self-esteem explained a substantial portion of and more modest but significant amount of variance in cyberbullying intention and behaviors. However, SN and attitude toward cyberbullying which was found to be most influential factors could be the useful information for designing intervention toward cyberbullying prevention for Thai adolescents and advocate implementing the anti-cyberbullying policy in Thailand.

**Keywords** SEM, Cyberbullying, Theory of planned behaviour, Perpetrator

**Paper type** Research paper

## Introduction

Nowadays, information technology plays a significant role around the world in all activities of the people in the modern age. The increasing uses of mobile phones, internet and social networks are all significant pieces of evidence of its impacts[1]. This phenomenon is congruent with a statistical report among Thai population based on the usage of computer, the internet and mobile phones. During the past five years (2013–2017), statistics have shown that the number of computer, internet and mobile phone users has been steadily rising. Of all Thailand, the largest ratio of computer and internet users is in Bangkok metropolitan, the rate of which is 49.2 and 74.5 percent, respectively. The statistics also showed that majority group of user ranges between 15 and 24 year old (89.8 percent), followed by 25 and 34 year old (80.3 percent) and 6 and 14 year old (63.4 percent) which is higher in the proportion of internet use than last report and those of other age groups[2]. This easy access, availability or convenience to information technology can lead to inappropriate online communication that could become a new form of violence through electronic communication, the so-called “cyberbullying”[3].

Definition or scope of “cyberbullying” is diverse and is open for interpretation of researchers[4] and the differences of the term vary according to each country[5]. For Thailand, Child and Youth Media Institute defines the term “cyberbullying” as a bullying committed against other children by the pattern of insulting, verbal abuse or transmission of confidential data to defame other people by using internet, or simply the forwarding of the messages through mobile phones. To be categorized as bullying, the actions have to be committed on a continuous basis and cause emotional damage to the injured parties [2]. Heirman and Walrave [6] defined the term cyberbullying behaviors as “intentionally hurting or harming someone you personally know online or offline through the use of digital media such as the Internet or mobile phone” (p. 616). Each construct was measured in this study as related to the definition they provided.

On the global scale, the prevalence of Cyberbullying is approximately 20–40 percent and is found mostly at the school level[4, 7], especially among middle school students[8, 9]. According to a report of the US Department of Health and Human Services, Bureau of Justice Statistics and Cyberbullying Research Center, the rate of American students and American teenagers who experienced cyberbullying is as high as 52 and 33 percent, respectively[10]. In Asia, the survey results among high school students in the central part of China revealed that 34.8 percent of the respondents were the perpetrators of cyberbullying and 56.9 percent were the victims of cyberbullying[11]. In Thailand, the information from Thai Health Promotion Foundation revealed that 37.2 percent of Thai teenage internet users were cyberbullied. Similar to the results from the study of Sittichai [12] on cyberbullying behaviors among high school students in southern provinces, the results showed that 18.6 percent of the students were cyberbullied.

Cyberbullying is a type of violence in which the people who commit the bullying cannot be detected, or it cannot be determined whether it is an act of an individual or a group of individuals.

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Cyberbullying can be targeted to any person regardless of location and time[3]. It is impossible to control or inspect the action of cyberbullying, and it can be repeated to constantly reinforce the violence. Interestingly, the victims of cyberbullying can become the perpetrators of the cyberbullying in attempt to get revenge. This is in line with study done by Patchin and Hinduja[13] which found that revenge against bullies was the most frequently reported reason for cyberbullying perpetration which make the overlap between cyberbullying victimization and perpetration and it becomes an endless cycle of violence[14].

The literature shows that this cycle finally leads both cyberbullied children and perpetrators to be at a greater risk of experiencing a myriad of mental health problem such as frustration, indignation and disappointment[4, 13, 14], being rejected by a peer group, lose their self-esteem and self-confidence [13, 15], and a high risk of drug and cigarette dependence[16]. Inevitable impacts are deteriorating learning capacity, anxiety and lack of social life skills and interactions with friends and surrounding people[14, 17]. Importantly, people who are cyberbullied tend to feel irritated, stressed and anxious [18] which later on cause depressive symptoms[18, 19], suicidal ideation[19, 20] and suicide attempts[20–23]. Importantly, grown-up cyberbullied victims are at a high risk of maladaptive behaviors, antisocial behaviors and the potential to commit violence, which finally develops into a form of abuse[24].

The review literature showed that there are many factors associated with cyberbullying. However, in the past, the study focused on demographic, social and environmental aspects and the results of which varied depending on countries and cultures[25–27]. However, a study done by Vimolthip *et al.*[28] revealed that adolescents perceived cyberbullying as normal action which can be done deliberately by anyone. This was consistent with a study done by the Chinese University of Hong Kong where the result showed that 44 percent of perpetrators students admitted that cyberbullying was an exciting activity[2]. The result was in line with the study of Vimolthip *et al.*[28] who revealed that 28 percent of Thai adolescents viewed that cyberbullying is a normal behavior to express a certain level of ability.

Nevertheless, other studies revealed that adolescents' attitudes to cyberbullying were associated with the intention to develop cyberbullying behaviors[6, 29]. It also in line with a study of Doane *et al.*[30] who found that the college students who had a low level of empathy toward the cyberbullying victims had positive attitudes toward cyberbullying. These positive attitudes toward cyberbullying victims were the significant factors that can predict a higher level of intention to abuse others and, in turn, a high level of intention to abuse became the significant predicting factors that individuals tended to commit or conduct cyberbullying at a higher frequency[30]. In addition, the study revealed that influences from peers, significant other or people with close relationship and favored people were related to beliefs and cyberbullying behaviors among adolescents[20]. In other words, subjective norm (SN) related to the intention to commit cyberbullying[6]. Specifically, adolescents who believed in SN at a high level and perceived less behavioral control had a strong tendency to develop aggressive behaviors physically[31].

However, previous research on traditional bullying among adolescents has found a relatively consistent link between bullying victimization and lower self-esteem, while finding an inconsistent relationship between bullying offending and lower self-esteem[32, 33]. The study of Patchin and Hinduja found that students who experienced cyberbullying, both as a victim and an offender, had significantly lower self-esteem than those who had little or no experience with cyberbullying[13]. The finding from Buttabote[34] reported that self-esteem was related to bullying behaviors in ADHD victimized. The literature review results of O'Moore and Kirkham[35] indicated that high self-esteem protects children and adolescents from involvement in bullying. However, the literature is controversial in relation to the direction of the relationship between self-esteem and bullying that is not fully clarified

by the available literature. It is necessary to extend this body of knowledge by determining how self-esteem link to cyberbullying through the use of technology (such as computers and cell phones).

Despite awareness of the mental health risks associated with cyberbullying, few studies have applied a theoretical framework to understanding the perpetration of cyberbullying. To inform prevention and intervention of cyberbullying behaviors, the researcher applied Ajzen's theory of planned behavior (TPB)[32, 36] to explain cyberbullying perpetration among Thai adolescents. This theory stated that an individual's belief in a certain behavior, compliance with SN and perceived behavioral control (PBC) were the factors that would determine whether they had an intention to commit the behavior or not. This theory suit the developmental period of adolescents where influences from peers are most significant to them as the strong SN to their intention to commit behavior as mentioned earlier. Therefore, TPB was the focus of this study with objectives to examine the etiological model of cyberbullying behaviors among Thai adolescents, testing the hypothesis that the constructs of TPB on attitude toward cyberbullying (A), SN and PBC including self-esteem will influence and have impact on cyberbullying intention and behaviors including proposing a model of the factors that are significant in cyberbullying behavior among Thai adolescents. The result of the study would be fruitful for planning and designing appropriate intervention to prevent and minimize the problems that arose from adolescent cyberbullying behaviors in Thailand.

### Methodology

Research design in this study is a predictive study where correlations and structural equation modeling (SEM) were used to determine associations between measures and intent to commit cyberbullying including cyberbullying behaviors.

The population in this study was the Grades 7–9 students who were studying in secondary schools under the Office of the Basic Education Commission, Ministry of Education, Bangkok as the largest ratio setting of computer and internet users.

The sample consists of targeted adolescents who were recruited using the multi-stage random sampling technique from Zone 1 and 2 under OBE and the total of 354 subjects was calculated by the formula of Cochran[37] with the confidence interval at 95 percent and error at 10 percent. Targeted adolescents were recruited with parental permission and voluntarily complete the questionnaire.

#### *Step for multi-stage random sampling*

- Step 1: classify school into four groups: 42 extra-large size schools ( $\geq 2,500$ ), 44 big-size schools (1,500–2,499), 29 medium-size schools (500–1,499) and 4 small-size schools ( $< 50$ ).
- Step 2: random sampling of schools from each group by proportion: two extra-large size schools, two big-size schools, one medium-size school and one small-size school.
- Step 3: proportionately calculate sample from each school: 120 students from extra-large and 120 students from medium-size schools, 90 students from medium-size school and 15 students from small-size school.
- Step 4: proportionately calculate sample from grades 7–9 in each school: 20 students per grade from extra-large and big-size schools, 30 students per grad from medium-size school and 5 students per grad from small-size school. Then, approach teacher from each grade to meet the students in class.

*Inclusion criteria of the samples*

- (1) Male and female students, studying in Grades 7–9.
- (2) Students with parental permission.
- (3) Students who voluntarily complete the questionnaire.

*Exclusion criteria of the samples*

- (1) Students who did not attend school on the date of data collection.
- (2) Students who had physical problems and were unable to complete the questionnaire.
- (3) Students with hearing impairment or special needs children.

Data collection were conducted in July 2016, which was proceeded after being approved by Ethical Review Committee for Human Research Faculty of Public Health, Mahidol University (MUPH 2016-032). Prior to the administration of the cyberbullying survey, informed consent was obtained from parents and all samples. Data collection procedures were designed to cover all aspects of protecting the human subjects. Samples' names were not disclosed, and all other information was kept confidential. The data from the samples were destroyed upon completion of the study.

The instrument was a set of self-administered questionnaires partly developed by the researcher such as alternative choices of personal factors and four-point Likert Rating Scale of self-esteem in the Thai context. For other questionnaires, the researcher adapted questionnaires from Doane *et al.*[30] and Heirman and Walrave[6] with permission, which composed of five-point Likert Rating Scale of attitudes toward cyberbullying behavior, SN and PBC. For intention to commit cyberbullying and cyberbullying behavior, it was assessed using the 20-item perpetrator scale of Cyberbullying Experience Survey. The perpetration four-point Likert Rating Scale consists of four factors: malic (e.g. "Have you sent a rude message to someone electronically?" six items), deception (e.g. "Have you pretended to be someone else while talking to someone electronically?" three items), public humiliation (e.g. "Have you posted an embarrassing picture of someone electronically where other people could see it?" three items) and unwanted contact (e.g. "Have you sent an unwanted pornographic picture to someone electronically?" eight items).

All questionnaires were tested by three experts for its content validity index (CVI) and also tested by pilot testing with 30 subjects in order to find reliability of the entire questionnaires. The result was that the CVI was in the range of 0.93–1.0, and reliability was in the range of 0.72–0.97. The questionnaire was improved and then used for data collection.

*Data analysis and statistics used in the research.* Data were analyzed using SPSS for Window license version 18.0.

Correlation and SEM were used in the analysis with the level of significance 0.05.

**Results***Demographic characteristics*

The average age of the students was 13.8 year old ( $SD = 0.91$ ). The number of female students (54.8 percent) was slightly higher than that of males. The samples were studying in Grade 8 (37.3 percent), followed by Grade 9 (34.5 percent) and Grade 7 (28.2 percent). Academic performance was considered quite satisfactory (52.8 percent), with the average GPA of 2.99 ( $SD = 0.68$ ) (Table I).

*The cyberbullying experience*

It was found that 44.7 percent of the students had been cyberbullied, 33.1 percent were cyberbullying perpetrators and 67.8 percent had experiences by witnessing their friends being cyberbullied (Table II).

Variables	<i>n</i> = 354	Percentage
<i>Age (years old)</i>		
12	29	8.2
13	107	30.2
14	132	37.3
15	86	24.3
Mean = 13.8, SD = 0.91		
<i>Gender</i>		
Female	194	54.8
Male	160	45.2
<i>Education level</i>		
Grade 7	100	28.2
Grade 8	132	37.3
Grade 9	122	34.5
<i>Academic performance (GPA)</i>		
< 2 (Poor)	37	10.5
2-3 (Medium)	130	36.7
3-4 (High)	187	52.8
Mean = 2.99, SD = 0.68, Max = 4.00, Min = 0.92		

**Table I.**  
Demographic characteristics of middle school students

Cyberbullying	No. 354	Percentage
<i>Victims</i>		
Cyberbullying victims	158	44.7
Non-cyberbullying victims	196	55.3
<i>Perpetrator</i>		
Cyberbullying perpetrator	117	33.1
Non-cyberbullying perpetrator	237	66.9
<i>Witness</i>		
Cyberbullying witness	240	67.8
Non-cyberbullying witness	114	32.2

**Table II.**  
Cyberbullying experiences among middle school students

*The descriptive of independent factors to cyberbullying among middle school students*

The independent factors including in the equation for testing the hypothesis of TPB were composed of Attitude toward cyberbullying (A), SN and PBC[35]. The researcher also added self-esteem in the equation as it was supported by the literature that low self-esteem would be an effect of being a perpetrator among adolescent; therefore, the overall factors in the model of cyberbullying behavior would count for five factors as showed in Table III.

The result of descriptive statistics showed that overall the score of self-confidence and perceive behavioral control were at the moderate level (Mean = 23.6 and 98.0, respectively), whereas attitude toward cyberbullying behavior, SN, cyberbullying intention and behavior were at the low level (Mean = 39.4, 45.8, 26.5 and 24.9, respectively).

*Results of correlation matrix between factors related to cyberbullying*

Independent variables including self-esteem, attitude toward cyberbullying, SN, PBC, the intention to commit cyberbullying, age and academic performance were related to

**Table III.**  
Descriptive statistic

Factors	Min.	Max.	Mean	SD	Level	Score
<i>Independent variables</i>						
Self-esteem	13.0	32.0	23.6	3.9	Moderate	(20–26)
Perceived Behavioral Control	9.0	225.0	98.0	53.5	Moderate	(154–82)
Attitude towards cyberbullying	9.0	195.0	39.4	31.8	Low	(71–9)
Subjective norm	9.0	220.0	45.8	35.4	Low	(79–9)
Cyberbullying intention	18.0	71.0	26.5	9.7	Low	(35–18)
<i>Dependent variables</i>						
Cyberbullying behaviors	18.0	71.0	24.9	9.3	Low	(35–18)

**Notes:**  $n = 354$ . Score level based on Max–Min/3

cyberbullying in middle school students, with statistical significance of 0.05. The correlation values were  $-0.174, 0.626, 0.660, 0.116, 0.804, 0.072$  and  $-0.212$ , respectively (Table IV).

From correlation matrix among all variables, it can be found that there was no multicollinearity ( $r > 0.85$ )[37].

*The result of confirmatory factor analysis of cyberbullying behavior*

Table V and Figure 1 showed that the confirmatory factor analysis with a statistical program for developing predictor of cyberbullying behavior among middle school

**Table IV.**  
Correlation between independent variables related to cyberbullying

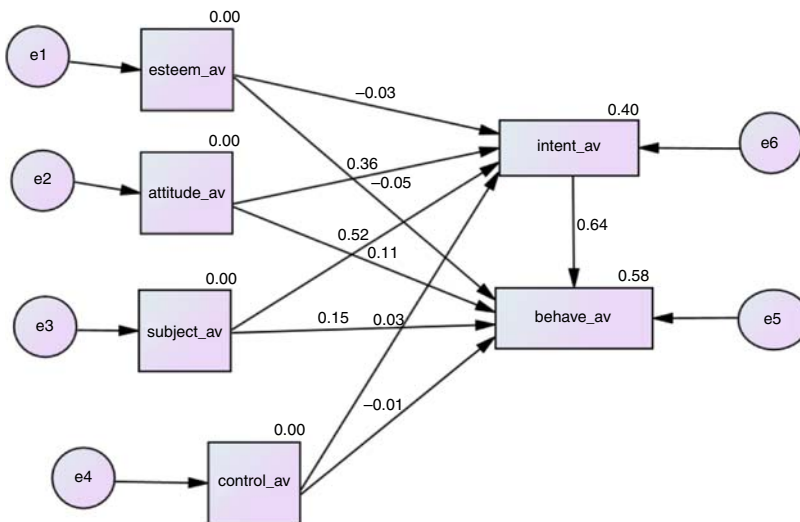
Factors	Correlation matrix							
	1	2	3	4	5	6	7	8
1. Self-esteem	1	-0.124*	-0.188**	0.133*	-0.146**	-0.174**	-0.015	0.189**
2. Attitude toward cyberbullying behaviors		1	0.753**	0.142**	0.665**	0.626**	0.069	-0.238**
3. Subjective norm towards cyberbullying behaviors			1	0.180**	0.701**	0.660**	0.105*	-0.235**
4. Perceived behavioral control				1	0.150**	0.116*	0.097	0.119*
5. Intention to commit cyberbullying					1	0.804**	0.077	-0.191**
6. Cyberbullying behaviors						1	0.072	-0.212**
7. Age							1	-0.218**
8. Academic performance								1

**Notes:** \*,\*\*Correlation is significant at the 0.05 and 0.01 levels, respectively (two-tailed)

**Table V.**  
Indices of confirmatory factor analysis of cyberbullying behavior

Indices	Criteria	Before model modification		After model modification	
		Statistic	Result	Statistic	Result
$p$ -value of $\chi^2_{df}$	$> 0.05$	$\chi^2_{df=6} = 330.623$	No	$\chi^2_{df=0} = 0$	Yes
CMIN/DF	$< 5.0$	55.10	No	0	Yes
GFI	$\geq 0.90$	0.66	No	1	Yes
AGFI	$\geq 0.90$	0.16	No	1	Yes
NFI	$\geq 0.90$	0.66	No	1	Yes
IFI	$\geq 0.90$	0.67	No	1	Yes
CFI	$\geq 0.90$	0.66	No	1	Yes
RMSEA	$< 0.05$	0.39	No	0	Yes

**Note:** Model meet the criteria of confirm factor analysis



**Notes:**  $\chi^2_{df=6}=330.62$ ,  $p$ -value < 0.001, CMIN/df = 55.10, GFI = 0.66, AGFI = 0.16, RMSEA = 0.39. *esteem\_av*, mean self-esteem; *attitude\_av*, mean attitude toward cyberbullying; *subject\_av*, mean subjective norm; *control\_av*, mean perceived behavioral control; *intent\_av*, mean intention to commit cyberbullying; *behave\_av*, mean cyberbullying behaviors

**Figure 1.** Model of cyberbullying behavior before modification

students revealed that  $\chi^2_{df=6} = 330.623$ ,  $p < 0.001$ . This means that the  $\chi^2$  value is significantly different from the null  $GFI = 0.667$  and  $AGFI = 0.169$  and  $RMSEA = 0.391$ . It showed that the main hypothesis is not accepted meaning that the researched model is not fitted to the empirical data.

Therefore, as shown in Table V and Figure 2, model modification is needed to adjust for more congruence and fit with empirical data. In this case, the researcher used model modification indices (MI) to modify the researched model. Model MIs with a statistical program for developing the predictor of cyberbullying behavior among middle school students revealed that  $\chi^2_{df=6} = 0$ ,  $p > 0.05$ . This means that the  $\chi^2$  value is not significantly different from the null.  $GFI = 1$  and  $AGFI = 1$  and  $RMSEA = 0$ . It showed that the main hypothesis is accepted meaning that the researched model is fitted to the empirical data.

*The result of model modification of cyberbullying behavior*

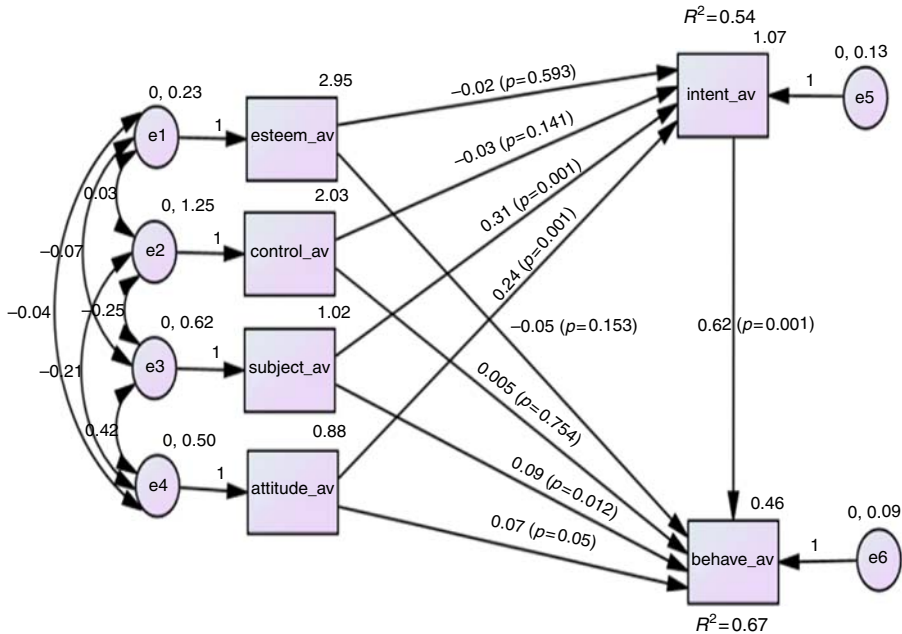
The confirmatory factor analysis revealed that the researched model is not fitted to the empirical data. The researched model was modified according to model MI, and it showed the researched model fitted with empirical data in Figure 2 that can be explained as follows.

*Standardized coefficient regression*

According to the details of the model in Figure 2, it was found that:

- (1) Intention to commit cyberbullying behavior factor had effect from self-esteem factor, attitude toward cyberbullying factor, SN and PBC factor  $-0.02$ ,  $0.24$ ,  $0.31$ , and  $-0.03$ , respectively. Regression weight all together is counted as in good level.





**Figure 2.**  
Model of  
cyberbullying  
behavior after  
modification

**Notes:** Model modification indices (MI):  $\chi^2_{df=0}=0, p\text{-value}>0.05, \text{CMIN}/df=0, \text{GFI}=1, \text{AGFI}=1, \text{CFI}=1, \text{RMSEA}=0.$  *esteem\_av*, mean self-esteem; *attitude\_av*, mean attitude toward cyberbullying; *subject\_av*, mean subjective norm; *control\_av* mean, perceived behavioral control; *intent\_av* mean intention to commit cyberbullying; *behave\_av*, mean cyberbullying behavior

- (2) Cyberbullying behaviors factor had effect from self-esteem factor, attitude toward cyberbullying factor, SN factor, PBC factor and intention to commit cyberbullying factor  $-0.05, 0.07, 0.09, 0.005,$  and  $0.62,$  respectively.

*R Squared of Model*

- (1) The effect from self-esteem, attitude toward cyberbullying, SN and PBC have the R squared of model 0.54 which mean when all independent variables are included in the equation, the equation could predict intention to commit cyberbullying at 54 percentage of accuracy (Adjusted  $R^2 = 0.54, p\text{-value}$  at 0.05).
- (2) The effect from self-esteem, attitude toward cyberbullying, SN, PBC and intention to commit cyberbullying have the R squared of model 0.67 which mean when all independent variables are included in the equation, the equation could predict cyberbullying behaviors at 67 percentage of accuracy (Adjusted  $R^2 = 0.67, p\text{-value}$  at 0.05).

*Structural equation modeling: direct effects, indirect effects and total effects*

The effect size of variables to cyberbullying behavior is analyzed by SEM using effect coefficient (Table VI). The explanation is as follows.

*Intention to commit cyberbullying.* The result revealed that self-esteem had negative effect on intention to commit cyberbullying with a path coefficient of  $-0.02.$  Attitude toward cyberbullying, PBC and SN had positive effect on intention to commit cyberbullying behaviors with path coefficients of  $0.24, -0.03,$  and  $0.31,$  respectively.

Dependent variable	Causal relationship	Self-esteem (SE)	Subjective norm (SN)	Independent variables			Total
				Perceived behavioral control (PBC)	Attitude (A)	Intention (INT)	
Intention (INT)	Direct effects	-0.02	0.31	-0.03	0.24	0.5	
	Indirect effects	0.00	0.00	0.00	0.00	0.00	
	Total effects	-0.02	0.31	0.01	0.24	0.5	
	Adjusted $R^2 = 0.54$						
Behavior (B)	Direct effects	-0.05	0.09	-0.005	0.07	0.62	0.72
	Indirect effects	-0.01	0.19	0.008	0.15	0.00	0.33
	Total effects	-0.06	0.27	0.002	0.21	0.61	1.05
	Adjusted $R^2 = 0.67$						

**Table VI.** Direct effects, indirect effects and total effects

*Cyberbullying behaviors.* The result revealed that there were variables which had both direct and indirect effects on cyberbullying behaviors. Self-esteem had direct and indirect negative effects on cyberbullying behaviors with a path coefficient of  $-0.06$  ( $TE = DE (-0.05) + IE (0) = -0.01$ ). Attitude toward cyberbullying had direct and indirect positive effects on cyberbullying behaviors with a path coefficient of  $0.21$  ( $TE = DE (0.07) + IE (0) = 0.15$ ). For SN, there was direct and indirect positive effects on cyberbullying behaviors with a path coefficient of  $0.27$  ( $TE = DE (0.09) + IE (0) = 0.19$ ) and PBC had direct and indirect positive effects on cyberbullying behaviors with a path coefficient of  $0.002$  ( $TE = DE (-0.005) + IE (0) = 0.008$ ). Finally, intention to commit cyberbullying had direct and indirect positive effects on cyberbullying behaviors with a path coefficient of  $0.61$  ( $TE = DE (0.62) + IE (0) = 0.00$ ).

*SEM of intention.* The SEM of intention to commit cyberbullying behaviors from the effect of self-esteem, attitude toward cyberbullying, SN and PBC could be written as follows (Table VI):

$$INT = -0.02 \times ES + 0.31 \times SN - 0.3 \times PBC + 0.24 \times A.$$

This equation showed R squared of model in predicting intention to commit cyberbullying of 54 percentage (Adjusted  $R^2 = 0.54$ ).

*SEM of behavior.* The SEM of cyberbullying behaviors from the effect of self-esteem, attitude toward cyberbullying, SN, PBC, and intention to commit cyberbullying could be written as follows (Table VI):

$$BC = -0.05 \times ES + 0.09 \times SN - 0.005 \times PBC + 0.07 \times A + 0.62 \times INT.$$

This equation showed R squared of model in predicting cyberbullying behaviors of 67 percentage (Adjusted  $R^2 = 0.67$ ).

In conclusion, there was negative association between PBC and self-esteem to cyberbullying behaviors ( $R^2 = -0.116$  and  $-0.174$ , respectively, with  $p = 0.05$  and  $0.01$ ). Intention to commit cyberbullying, SN and attitude toward cyberbullying showed significant positive association with cyberbullying behaviors ( $R^2 = 0.804$ ,  $0.660$  and  $0.626$ , respectively with  $p = 0.01$ ). The SEM showed SNs to be the most direct influential factors of cyberbullying intention and behaviors, followed by attitude toward cyberbullying (Intention  $\beta = 0.31$ ,  $0.24$  with

$p = 0.01$ , Behavior  $\beta = 0.09, 0.07$  with  $p = 0.012$  and  $0.05$ , respectively). However, the SEM revealed that all variables from TPB (A, SN and PBC) including self-esteem in the equation can explain the variation scores of intention to commit cyberbullying and cyberbullying behaviors at 54 and 67 percent (Adjusted  $R^2 = 0.54$  and  $0.67$ , respectively). The SEM showed model MI indicate a good fit to the data ( $\chi^2 = 0.00$ ,  $df = 0$ ,  $p > 0.05$ , CMIN/df = 0, GFI = 1, AGFI = 1, CFI = 1 and RMSEA = 0).

## Discussion

The aim of this study was to examine the etiological model and test the hypothesis that the constructs of TPB can predict cyberbullying behaviors among Thai adolescents. The result of the study was supported by the study done by Heirman and Walrave[6] who found that attitude toward cyberbullying (A), SN (SN), PBC and cyberbullying intention could predict cyberbullying behaviors.

In this study, the results showed that students experienced certain forms of cyberbullying with the cyberbullied victims being 44.6 percent, the perpetrators of cyberbullying 33.1 percent and the cyberbullying witnesses 67.8 percent. The results were consistent with the study of the Wisdom Society for Public Opinion Research of Thailand that reported the youth in Bangkok were cyberbullied (43.9 percent) and became the perpetrators of cyberbullying (28.9 percent)[28]. The result is also congruent with the global scale where the prevalence of cyberbullying was approximately 20–40 percent[4, 7].

Intention to commit cyberbullying in this study was found to be most correlated with cyberbullying behaviors  $r = 0.804$  with  $p$  being 0.01 (Table IV). Additionally, SEM result revealed that intention to commit cyberbullying had direct and indirect positive effects on cyberbullying behaviors with a path coefficient of 0.61 (TE = DE (0.62) + IE (0) = 0.00). This is congruent with the study done by Doane *et al.*[30] who revealed that a higher level of intention to commit cyberbullying became a predicting factor that individuals tended to commit cyberbullying at a higher frequency. The finding was consistent with TPB, and the research hypothesis of this study regarding intention to commit a specific behavior had a strong correlation and was a strong predicting factor of actual intention to commit such behavior[34, 35].

The SEM revealed that attitude toward cyberbullying in this study had positive effect on intention to commit cyberbullying behaviors with a path coefficient of 0.31. However, attitude toward cyberbullying had direct and indirect positive effects on cyberbullying behaviors with a path coefficient of 0.21 (TE = DE (0.07) + IE (0) = 0.15). The result of this study was in line with the study of Heirman and Walrave[6] and Pabian and Vandebosch[29] in which the attitudes toward cyberbullying of adolescents were positively correlated with their willingness to commit cyberbullying and were the decent factors to predict cyberbullying behaviors. It was found to be the most robust predictor of cyberbullying intention. In addition, the studies found that attitudes toward cyberbullying had a sizable indirect effect on cyberbullying behaviors via cyberbullying intention.

The SEM showed that PBC had a positive effect on intention to commit cyberbullying behaviors with a path coefficient of 0.01. In addition, PBC had direct and indirect positive effects on cyberbullying behaviors with a path coefficient of 0.002 (TE = DE -0.005) + IE (0) = 0.08). SN toward cyberbullying had positive effect on intention to commit cyberbullying behaviors with a path coefficient of 0.012. The finding congruent with Heirman and Walrave[6] and Lazaras *et al.*[33] indicated that PBC for cyberbullying behaviors was a predicting factors for intention to commit cyberbullying behaviors.

The SEM showed that self-esteem had a negative effect on intention to commit cyberbullying with a path coefficient of -0.02; however, self-esteem had direct and indirect negative effects on cyberbullying behaviors with a path coefficient of -0.06 (TE = DE (-0.05) + IE (0) = -0.01). This was in line with a study done by Brewer and Kerlake who

found that self-esteem was a predictor of bullying perpetrators and the cyberbullied victims. People with low self-esteem were often treated as the victims of cyberbullying. A sense of being worthless which cannot be expressed emotionally in the real world may encourage adolescents to do so in the digital world.

For SN, SEM showed that the SN had direct and indirect positive effects on cyberbullying behaviors with a path coefficient of 0.027 ( $TE = DE (0.09) + IE (0) = 0.19$ ) which was in line with the results from a study done by Heirman and Walrave[6] together with Doane *et al.*[30] who found that the SN was the predictor of the intention to cyberbully. A study done by Burton *et al.*[31] revealed that students in Grades 6–8 believed in a SN at a high level tended to develop aggressive behaviors physically and through the cyber world. A study done by Lazuras *et al.*[33] also found that social norms can predict a willingness to commit cyberbullies. Students who had seen their peer were cyberbullied or sometimes referred to as the bystander or the witness may initiate or imitate those behaviors as they tend to understand that cyberbullying was acceptable and was approved by their peers as their SN that was in accordance with the stage of adolescent development where significant other like friend have most influentially effect on their behavior. The study results was also approved by Williams and Guerra[38] who revealed that internet bullying was significantly related to normative belief approving from friends.

In addition, this study revealed unique associations for some predictors, which have stronger relationships with one cyberbullying status group than the other. Cyberbully victims seemed to be more likely to internalize psychological problems, whereas cyberbullies had a more deviant, antisocial or aggressive background. Individuals who engaged in traditional bullying were more prone to being involved as cyberbullies, whereas those who were victims of traditional bullying had a higher risk of being victimized by cyberbullies. These findings were consistent with the meta-analysis of Guo[39], which emphasized that traditional bullies tended to continue their real-world bullying behaviors in the virtual world, and victims of bullying at school were significantly more likely to be bullied online. Furthermore, compared with cybervictims, cyberbullies were more likely to hold supportive beliefs or attitudes toward aggressive behaviors, perceiving the aggression as acceptable or even morally justified. Getting involved in persistent peer relationship troubles placed individuals at higher risk for being victims of cyberbullying than for being cyberbullies that is congruent with the study done by Cooke *et al.*[40] and Williams and Guerra[38] who revealed that cyberbullying victims were partly significant related to poor informant source especially from negative peer support.

### **Strength and weakness**

The strength of the study is to provide an overview mechanism of cyberbullying among Thai adolescents framed by TPB and self-esteem.

As the weakness of the study, the experiences or witness of family violence which is supposed to be one of the most influential factors of bullying as well as the information and support at school level which is supposed to mitigate the bullying problems were neglected.

### **Suggestion for future research**

The preventive measures for cyberbullying behaviors among adolescents should involve activities to foster self-esteem, develop proper attitude and SN to prevent cyberbullying. The initiatives and developed school supportive system for adolescents to understand how to control themselves when engaging in social network are imperative. However, for future research, family violence witnessing and attempting to lure the cyberbullying victims into offline meeting should be explored more.

### Implication for public health policy

TPB and the use of social media should be taken into account for planning and designing appropriate intervention to reduce and eliminate cyberbullying among all stakeholders both public and private sectors in the area of health and educational institutes in order to endeavor and to advocate the anti-cyberbullying policy in Thailand.

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