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Abstract

Using a nationally representative sample of 3,058 junior high school students in Taiwan, this study examines a model of how personal traits, family factors, and school dynamics influence school violence committed by students against students and teachers. This model proposed that school violence is directly influenced by personal traits, victimization, and parental monitoring as well as indirectly influenced by personal traits, victimization, and parental monitoring through school engagement, risky peers, and student–teacher relationship. Structural equation modeling was used to examine the theoretical model. The model showed a good fit for the sample as a whole. Similar findings were also found between male and female students. Overall findings suggested that negative personal traits, victimization, and parental monitoring have direct influence on school violence as well as indirect influence mediated through school variables. Implications for theory, policy and practice, and recommendation for future research are discussed.

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bullying, school violence, Taiwan

Introduction

During the past decade, there has been a dramatic increase in the number of publications on risk factors for school violence in Western countries (Bosworth, Espelage, & Simon, 1999; Connolly & O'Moore, 2003). By contrast, large-scale representative data on risk factors in Asia remain limited (Chen & Astor, 2009a, 2009b, 2010). There is almost no evidence that the theoretical assumptions from school violence studies in Western countries are relevant to Asian cultures, although significant differences exist between the East and West regarding beliefs and perceptions (Nisbett, 2003).

Furthermore, many studies have examined how students' personal, family, and school experiences that act as "risk factors" directly affect student violence against their school peers (e.g., Baldry, 2003; Chen, & Astor, 2010). Few studies have focused on how risk factors contribute to school violence against teachers, that are committed by students (Khoury-Kassabri, Astor, & Benbenishty, 2009). Even less is known about organizational or school variables that could be mediators between personal traits, victimization, family factors, and school violence. There is a paucity of empirical evidence that investigates how gender influences patterns of relationships between risk factors and school violence. Using the nationally representative data from an Asian culture, this study will examine if school factors mediate between personal traits and family factors, and school violence perpetration committed by students against peers and teachers in Taiwanese junior high school.

Taiwan is one Asian society where long-standing cultural values and outside influences must be considered simultaneously when examining the relationships between risk factors and school violence. The nation has experienced democratization, rapid industrialization and urbanization, a growing population of immigrants from other Asian countries, and an expanding economy over the past four decades. These factors obviously influence social values and norms. Yet, the Taiwanese are still partially guided by values stemming from a blend of Confucianism, Taoism, and Buddhism (Nisbett, 2003). Although school violence issues have been a major public concern for many years, for political reasons (China's lack of recognition of Taiwan as an independent country) Taiwan has never been part of any large-scale cross-national studies on these topics (Akiba, LeTendre, Baker, & Goesling, 2002). Yet from an empirical perspective, Taiwan represents a modern, industrial,

capitalistic, and pro-Western democracy that is currently and historically part of Chinese culture.

Recently, a handful of published studies have indicated that school violence is far more severe in junior high school than other school types (e.g., elementary school and high school) in Taiwan and suggested immediate attention should be paid to design an effective intervention to alleviate school violence in junior high school (e.g., Chen & Astor, 2009a, 2009b). Furthermore, researchers and school practitioners have argued that effective school violence intervention programs should address specific needs for junior high school students (Chen, 1999; Chen & Astor, 2009a, 2009b; Hu & Lin, 2001) because previous literature and theories suggested that student psychosocial development, the educational purposes, and school structure in junior high school appear to differ from other types of schools (e.g., Astor, Meyer, Benbenishty, Marachi, & Rosemond, 2005). Thus, this study focuses on examining the patterns of relationships among risk factors in this specific context of junior high school. We believe this kind of examination could provide educators, school psychologist, and social workers with meaningful information to design systematic prevention and intervention programs aiming at mitigating school violence in junior high school in Taiwan.

School violence in this study refers to student perpetration intending to harm other students and teachers or to cause damage to belongings or school property. The definition includes physical and verbal violence, psychological harm, threatening behavior, and property damage. (Astor, Benbenishty, Pitner, & Zeira, 2004; see Benbenishty & Astor, 2005 for a critical discussion).

Factors Associated With School Violence: East and West

Western studies on school violence clearly indicate that students' negative personal traits (i.e., aggressive attitudes, poor anger traits, and lack of impulsive control—Byrne, 1994; Connolly & O'Moore, 2003; McConville & Cornell, 2003), low parental monitoring and involvement (Baldry & Farrington, 2000; Rigby, 1993, 1994), prior victimization (Baldry, 2003; Flannery, Wester, & Singer, 2004), poor school engagement (Haynie et al., 2001; Nansel et al., 2001; Natvig, Albrektsen, & Qvarnstrom, 2001; Slee, 1995; Slee & Rigby, 1993), risky peers (Huttunen, Salmivalli, & Lagerspetz, 1996), and poor interaction with teachers (Junger-Tas, 1999; Olweus, 1999) are strongly associated with school violence.

Empirical studies in Taiwan or other Asian countries have shown that student violence against students in junior high school was related to students' negative personal traits, parental monitoring, and victimization (Chen, 1999; Chen &

Astor, 2010; Hu & Lin, 2001), poor school engagement (Ando, Asakura, Simons-Morton, 2005; Chen & Astor, 2010; Hu & Lin, 2001), risky peers (Ando et al., 2005; Chen & Astor, 2010; Hu & Lin, 2001), and poor interaction with teachers (Chen & Astor, 2010; Hu & Lin, 2001; Ma, Shek, Cheung, & Tam, 2002; Wong, 2004; Yoneyama & Naito, 2003).

In addition, some smaller scale studies in Taiwan have shown that negative personal traits, parental involvement, victimization, and risky behavior in school (Chen, 1999), school climate and school engagement (Chen, 1989, 1999), and poor student-teacher relationships (Huang & Hsien, 1987; Lin, 1986) were related to student violence against teachers in junior high schools. Because these studies are convenience samples, it is not clear how generalizable these findings are for Asian culture contexts such as Taiwan.

Furthermore, a review of the literature indicates that most previous studies on school violence have examined, only in separate studies, how students' experiences in each ecological context independently affect perpetration of school violence. How multiple ecological risk factors and nested contexts influence student violence against students and teachers has not yet been explored much in either the West or the East.

School Variables as Mediators

Benbenishty and Astor (2005) recently addressed the lack of theoretical integration surrounding the contexts of school violence. They propose a theoretical model of school violence that is influenced by numerous within-school variables such as school engagement and school interpersonal relationships, and other external variables such as students' personal and family characteristics. In their heuristic model, the influence of external variables on school violence can be mediated by school factors. In contrast with psychological models that center around the individual, they stress that the school itself as a social context should be the center of the theoretical model.

This model has been examined in case of school victimization across different cultures with Jewish Secular, Jewish Orthodox, Arabic, and American students (Astor, Benbenishty, Vinokur, & Zeira, 2006; Astor, Benbenishty, Zeira, & Vinokur, 2002; Benbenishty & Astor, 2005; Benbenishty, Astor, Zeira, & Vinokur, 2002). However, little research has been published with this theoretical orientation on perpetration of school violence (for an example of one, see Khoury-Kassabri et al., 2009). This study examines how these complex patterns between social contexts affect perpetration of school violence in Asian junior high schools. Empirical evidence that establish the

degree to which school variables mediate or contribute to perpetration in Asian junior high schools is sorely needed.

Background of Junior High School in Taiwan

Generally, there are three major systems of basic and intermediate education in Taiwan: elementary school (Grades 1 to 6), junior high school (Grades 7 to 9), and high school (Grades 10 to 12). Attending a 9-year compulsory education program from elementary to junior high school is mandatory. A competitive high school entrance exam must be taken if junior high school graduates seek higher education. In 2006, there were about 1.0 million students in 732 junior high schools in Taiwan (Taiwan Ministry of Education, 2006).

Overall, the educational purpose and school structure in junior high school appear to differ from other types of schools. In general, the main goal in junior high school is to prepare the student for a competitive joint high school entrance exam to enter the best high school and, subsequently, college. Thus, academic achievement is highly emphasized in junior high school. In this respect, junior high schools in Taiwan function more similarly to private preparatory schools in the West. While Western students often have multiple teachers with different students in each class, Taiwanese students remain in the same class with the same cohort of students for 3 years, and a homeroom teacher is assigned to each class. The main responsibility of the homeroom teacher is to help students achieve higher academic performance. Teachers are perceived as intellectual experts, and each subject is taught by one specialized teacher in that field. Thus, teachers in academic fields rotate from class to class. To achieve the highest status, most junior high schools encourage teachers to design innovative programs or conduct mock tests to help students succeed. Outstanding teachers are recognized publicly if their class has a high admissions rate for academic high schools.

Theoretical Model for Current Study

Based on the above analysis, a model was developed for examining how school variables mediate between personal traits, family experiences, and school violence. Based on previous literature and theory, this study proposes that the perpetration of school violence by students against peers and/or teachers is directly associated with negative personal traits, parental monitoring, victimization, low level of school engagement, risky peers, and

poor student–teacher relationships. Most important, in contrast with prior theoretical conceptions of school violence, this model proposes that low level of school engagement, risky peers, and poor student–teacher relationship mediate the association between variables external to the school (i.e., negative personal traits, parental monitoring, and prior victimization experiences) and school violence perpetration. The hypothesis is centered on the theoretical framework put forth by Benbenishty and Astor (2005) that school variables play a significant role that go beyond individual and family experiences.

Method

The data used in this study was part of a large-scale project of “Prevention and Control of School Violence in Taiwan” (Wu, Lee, Yin, & Hu, 2000). The survey was conducted throughout Taiwan among over 14,000 students from elementary schools (Grades 4 to 6), junior high schools (Grades 7 to 9), vocational high schools, and academic high schools (Grades 10 to 12). Students were given a structured questionnaire in classrooms under the guidance of professionally trained survey monitors. Respondents were assured of anonymity and were encouraged to respond truthfully. Participants were free to withdraw from the study at any time and for any reasons. This study was supported by Taiwan’s National Science Council (NSC). The questionnaires, procedures, informed consent forms, and other ethical concerns were reviewed and supervised by Taiwan’s NSC.

This sample was designed to represent all students from 4th to 12th grades in Taiwan. The students’ response rate was over 98%. The probability sampling method was a two-stage stratified cluster sample. The strata were northern/central/southern/eastern, urban/rural, and elementary/junior/technical/academic. In this article, only junior high school students, Grades 7 to 9, were selected for this study. In first stage, schools were randomly selected from the sampling frame according to those appropriate strata. In the next stage, two classes were randomly selected according to each grade in selected schools. All students in that class were included in sample.

This study examined 3,058 students from 16 junior high schools (Grades 7 to 9). About 48.2% of the students were boys, 49.5% were girls, and 2.3% did not indicate gender; the grade-level distribution was as follows: 30.8% of the students were in seventh grade, 33.9% in eighth grade, 35% in ninth grade, and 0.2% did not indicate grade.

The questionnaire was developed on the basis of current school violence studies and theories from both Taiwan and Western countries, and validated by Wu and colleagues (2000). It included over 150 items in eight domains regarding students' basic demographic background and other information in their personal, family, and school experience. Each of the student questionnaires took approximately 30 minutes to complete. Before this survey was conducted, the Mandarin Chinese questionnaire was adjusted and adapted based on two pilot studies conducted in the Tainan metropolitan areas in Taiwan.

Measurement

To measure the latent variables in our model, several scales containing a number of subscales were constructed. Table 1 represents the means and standard deviations of the variables included in the model, broken down by genders. Table 2 represents the intercorrelations matrix among the variables. For the purpose of structural equation modeling analyses, several subscales were constructed based on conceptual and theoretical constructs. Table 3 lists the domains, questions items, factor loadings, and alphas for the theoretically created subscales. Each of these subscales creates the overall factor composites that represent the more general theoretical concepts discussed in literature review of this study.

Dependent Variables

Student violence against students. This domain involves asking students how many times they perpetrated violent behavior in school against other students during the last academic year. The variables in this domain were recoded into "never" and "at least once." This domain included three subscales on the basis of their content according to the type of violence. It included physical violence, vandalism, and verbal violence/threat/harassment. The score of each subscale was the sum of the items included in the subscale.

Student violence against teachers. This domain involved asking students to indicate how many times they perpetrated violent behavior in school against teachers during the last academic year. The variables in this domain were recoded as "never" and "at least once." This domain included three subscales on the basis of their content according to type of violence. It included physical violence, verbal violence/threat, and emotional violence/harassment. The score of each subscale was the sum of the items included in the subscale.

Table 1. Means and Standard Deviations of Subscales by Gender

Scale/subscale	Overall	Male	Female
Violence against students ^a	2.22 (2.35)	2.89 (2.54)	1.56 (1.92)
Physical	0.52 (0.86)	0.80 (0.98)	0.26 (0.61)
Vandalism	0.43 (0.68)	0.54 (0.74)	0.32 (0.60)
Verbal/threat/harassment	1.26 (1.28)	1.55 (1.35)	0.98 (1.13)
Violence against teachers ^a	0.52 (0.94)	0.61 (1.07)	0.42 (0.75)
Physical	0.03 (0.22)	0.05 (0.28)	0.02 (0.13)
Verbal/threat	0.12 (0.38)	0.16 (0.45)	0.07 (0.27)
Emotional/harassment	0.37 (0.59)	0.39 (0.61)	0.34 (0.56)
Negative personal traits ^b	51.00 (14.48)	53.37 (15.24)	48.74 (13.26)
Attitude toward violence	16.95 (5.96)	18.65 (6.45)	15.23 (4.90)
Impulsive control	12.26 (4.16)	12.51 (4.25)	12.00 (4.03)
Trait anger temperament	21.92 (6.50)	22.32 (6.68)	21.49 (6.26)
Parental monitoring ^b	29.52 (5.53)	29.27 (5.39)	29.74 (5.64)
Father monitoring	14.50 (2.99)	14.49 (2.86)	14.49 (3.12)
Mother monitoring	14.99 (2.82)	14.75 (2.72)	15.22 (2.90)
Victimization ^c	2.17 (2.83)	2.48 (3.09)	1.86 (2.52)
Direct victimization	1.04 (1.68)	1.30 (1.85)	0.78 (1.45)
Witness victimization	1.14 (1.72)	1.19 (1.81)	1.08 (1.63)
Low school engagement ^b	7.14 (2.47)	7.61 (2.61)	6.68 (2.25)
Doze off in class or skip class	1.47 (0.76)	1.56 (0.82)	1.39 (0.68)
Forget bringing material	2.09 (0.86)	2.18 (0.86)	1.99 (0.84)
Seldom turn in homework	1.89 (0.86)	2.07 (0.89)	1.72 (0.79)
Bring prohibited material	1.70 (0.84)	1.81 (0.90)	1.58 (0.77)
Risky peers ^b	9.35 (3.61)	9.91 (4.07)	8.83 (3.04)
Risky friendship	6.81 (2.88)	7.14 (3.11)	6.51 (2.61)
Risky acts	2.55 (1.13)	2.78 (1.35)	2.32 (0.81)
Poor student–teacher relationship ^b	9.11 (3.48)	9.50 (3.61)	8.71 (3.31)
Punish for no reason	1.79 (0.83)	1.89 (0.87)	1.68 (0.77)
Teachers do not like me	1.75 (0.81)	1.82 (0.85)	1.68 (0.77)
Teachers mock at me	1.65 (0.78)	1.73 (0.82)	1.57 (0.72)
Teachers never trust me	1.84 (0.89)	1.93 (0.93)	1.74 (0.84)
Observe me and snitch	2.09 (1.00)	2.14 (1.00)	2.05 (1.00)

a. On a scale: 0 = never, 1 = at least once in the past year.

b. On a scale: 1 = strongly disagree to 4 = strongly agree.

c. On a scale: 1 = never, 2 = sometimes, 3 = often, and 4 = almost every day.

Table 2. Matrix of Correlations Among School Violence Subscales for Junior High School

	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	E1	E2	F1	F2	F3	F4	G1	G2	H1	H2	H3	H4	H5
A1 Student physical	—	.45	.54	.24	.36	.37	.46	.36	.33	-.13	-.17	.27	.22	.30	.19	.26	.23	.40	.37	.20	.22	.19	.23	.18
A2 Student vandalism		—	.55	.14	.28	.39	.34	.33	.27	-.18	-.18	.18	.18	.24	.16	.22	.23	.29	.26	.21	.21	.19	.24	.19
A3 Student verbal/threat			—	.20	.34	.46	.38	.37	.34	-.17	-.19	.22	.24	.20	.18	.22	.23	.34	.28	.19	.20	.21	.24	.22
B1 Teacher physical				—	.47	.24	.11	.12	.08	-.03	-.04	.08	.06	.11	.07	.07	.06	.15	.20	.08	.07	.08	.09	.04
B2 Teacher verbal/threat					—	.44	.23	.22	.19	-.05	-.08	.12	.12	.22	.11	.14	.16	.28	.28	.15	.16	.17	.20	.14
B3 Teacher emotional						—	.26	.30	.26	-.14	-.15	.13	.18	.23	.15	.19	.20	.32	.22	.24	.22	.23	.25	.22
C1 Attitude toward violence							—	.59	.59	-.22	-.26	.20	.23	.33	.23	.31	.32	.48	.42	.29	.29	.26	.30	.26
C2 Impulsive control								—	.75	-.28	-.30	.20	.23	.34	.29	.36	.33	.44	.34	.28	.29	.25	.31	.26
C3 Trait anger temperament									—	-.21	-.22	.17	.21	.26	.25	.28	.25	.36	.27	.23	.25	.21	.26	.24
D1 Father monitoring										—	.80	-.08	-.08	-.22	-.19	-.25	-.23	-.17	-.12	-.18	-.19	-.16	-.18	-.13
D2 Mother monitoring											—	-.10	-.06	-.26	-.16	-.25	-.22	-.21	-.15	-.21	-.22	-.19	-.22	-.15
E1 Direct victimization												—	.39	.11	.10	.15	.12	.17	.16	.13	.15	.14	.15	.10
E2 Witness victimization														—	.12	.09	.11	.13	.23	.13	.13	.13	.13	.17

(continued)

Table 2. (continued)

	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	E1	E2	F1	F2	F3	F4	G1	G2	H1	H2	H3	H4	H5
F1 Dose off or skip														—	.33	.43	.46	.37	.38	.31	.30	.29	.32	.23
F2 Forget bringing material														—	.53	.31	.18	.19	.22	.21	.23	.24	.24	.18
F3 Seldom turn in homework															—	.42	.27	.27	.30	.29	.29	.29	.32	.22
F4 Bring prohibited material															—	.35	.29	.30	.30	.31	.32	.32	.32	.24
G1 Risky friendship																—	.54	.25	.25	.25	.25	.27	.27	.22
G2 Risky acts																—	.22	.21	.20	.20	.23	.23	.13	.13
H1 Teacher punish																	—	.73	.66	.66	.63	.63	.43	.43
H2 Teacher dislike																		—	.71	.64	.64	.44	.44	.44
H3 Teacher mock																			—	.62	.62	.44	.44	.44
H4 Teachers distrust																				—	.46	.46	.46	.46
H5 Teacher observe																					—	.46	.46	.46

Table 3. Theoretical Domains, Subscale, and Items for Junior High School

Domain (α s)	Subscales (loadings)	Items
Violence against students ($\alpha = .80$)	Physical (.72)	Students beat or kick other students (by group) to hurt him/her/them Students beat or kick other students (by individual) to hurt him/her/them Students use dangerous objects or instruments to harm students
	Vandalism (.66)	Students intentionally destroy or break school public belongings Students intentionally destroy or break other students' belongings
	Verbal/threat (.77)	Students verbally threaten or intimidate other students Students curse or insult other students Students threaten or blackmail other students Students tease, mock, or play physically harmful tricks on other students on purpose Students threaten or force others to buy things
Violence against teachers ($\alpha = .62$)	Physical (.50)	Students beat or kick teacher(s) Students use dangerous objects or instruments to harm teacher(s)
	Verbal/threat (.71)	Students curse or insult teacher(s) Students threaten or intimidate teacher(s) Students extort or blackmail teacher(s)
	Emotional (.66)	Students tease, mock, or play physically harmful tricks on teacher(s) Students oppose teacher(s) to cause them psychological harm
Negative personal traits ($\alpha = .93$)	Attitude toward violence (.72)	If someone insulted me or my family, beating him/her will make me feel better If someone disrespects me, I will beat him/her to regain honor I will feel unhappy if I do not beat someone who cursed me A coward is a person who never retaliates when he/she is insulted

(continued)

Table 3. (continued)

Domain (α s)	Subscales (loadings)	Items
		If someone impedes my plans, he/she will pay for it
		If someone tries to hurt me, I will take vengeance on him/her
		Violence is the best way to resolve any problem
		Violence is justice
		If someone makes me unhappy, beating him is what he/she deserves
		Violence is better than negotiation
	Impulsive control (.88)	I often make mistakes due to uncontrolled anger
		I often feel regretful about the things I do
		When I feel angry, no one can control me
		I have some bad habit that I always fail to change
		I can not help violating school rules
		I can not tolerate when others look down on me
	Trait anger temperament (.83)	I loose my temper easily
		I am an irritable person
		I am easily agitated
		I feel anger if someone's mistakes disturb my work
		I often can not control my anger
		When I feel angry, I will curse or use dirty words, such as fuck
		I will feel angry if someone criticizes me
		Beating others will make me feel better if I feel unhappy
		I feel upset if the work is done worse than I expect
		I feel angry if my work is criticized
Parent monitoring ($\alpha = .87$)	Father (.92)	My father (or father figure) knows my friends
		My father (or father figure) knows my conduct
		If I am not at home, my father (or father figure) will know where I am
		My father knows my schedules
		My father (or father figure) often takes activities with me

(continued)

Table 3. (continued)

Domain (α s)	Subscales (loadings)	Items
Victimization ($\alpha = .84$)	Mother (.87)	My mother (or mother figure) knows my friends
		My mother (or mother figure) knows my personality and general conduct
		If I am not at home, my mother (or mother figure) knows where I am
		My mother knows my schedule
		My mother (or mother figure) often does activities with me
	Direct (.63)	Have you been beaten or kicked by others?
		Has someone hit and hurt you with an object of any kind?
		Have you been beaten or kicked by groups of people after class or school?
		Have you been blackmailed by others?
		Have you been verbally threatened by others?
Witness (.62)	Have you been intimidated by others?	
	Has someone threatened or intimidated you by passing a slip of paper?	
	Have you seen anyone verbally threatened by others?	
	Have you seen anyone threatened by weapons?	
	Have you seen anyone destroy public belongings on purpose?	
	Have you seen anyone beaten by others or participating in group fights?	
	Have you seen anyone robbed by others?	
Have you seen anyone insulted by others?		
Low school engagement ($\alpha = .74$)	Doze off or skip (.66)	I often doze off in class or skip class
	Forget bringing (.57)	I often forget to bring required materials (textbooks/homework) to school
	Seldom turn in homework (.70)	I seldom turn in homework
	Prohibited material (.64)	I often bring prohibited materials to school

(continued)

Table 3. (continued)

Domain (α s)	Subscales (loadings)	Items
Risky peers ($\alpha = .79$)	Risky friendship (.79)	I have friends who are school gang members I have friends who dropped out due to problem behavior in school When I have conflicts with others, my friends will help me beat them or fight with them My friends are always on my side no matter what bad things I do
	Risky acts (loading=.68)	My friends and I often stay up all nights to drink, to gamble, or to do illegal activities My friends and I are often involved in fights or use our fists to protect our territory
Poor student-teacher relationship ($\alpha = .86$)	Punish (.83)	My teacher often punishes me for no reason
	Dislike (.86)	I feel that my teacher does not like me
	Mock (.81)	My teachers like to mock me
	Distrust (.77)	Even though I tell the truth, my teacher still distrusts me
	Snitch (.54)	Teachers often ask students to observe on what I am doing and snitch on me

Independent Variables

Negative personal traits. This latent variable asked students about their personal characteristics related to aggression. Three subscales were constructed on the basis of their content. These subscales were students' attitude toward violence, impulsive control, and trait anger temperament. The rating for each item in this scale ranged from 1 = *strongly disagree* to 4 = *strongly agree*. The score of each subscale was the sum of the items included in the subscale.

Parental monitoring. This latent variable consisted of two subscales: Father monitoring and mother monitoring. Respondents were asked about parental monitoring of them in daily life. The rating for each item ranged from 1 = *strongly disagree* to 4 = *strongly agree*. Both subscales of father and mother monitoring consisted of five items, and each subscale score was the sum of these five items.

Victimization. This latent variable asked students if they had experienced victimization surrounding their life in the past year. The rating for each item ranged from 1 = *never* to 4 = *almost every day*. This latent variable consisted

of two subscales on the basis of their content. The two subscales were direct victimization and witness victimization. The score of each subscale was the sum of the items included in the subscale.

School engagement. This domain consisted of four items, and students were asked questions to measure their level of school engagement. The ratings were provided on a 4-point scale and were coded from 1 = *strongly disagree* to 4 = *strongly agree*.

Risky peers. In this domain, students were asked questions to determine the quality of their group of friends. The ratings ranged from 1 = *strongly disagree* to 4 = *strongly agree*. The score of each subscale was the sum of the items included in the subscale. This domain was divided into two subscales based on preliminary factor analysis. The two subscales were risky friendships and risky acts.

Poor student-teacher relationship. This domain consisted of five items about whether the respondents experienced a poor relationship between teachers and themselves. The ratings for each item were provided on a 4-point scale from 1 = *strongly disagree* to 4 = *strongly agree*.

Analytical Plan

The primary analysis method in this study is latent variables structural equations modeling (SEM) with maximum likelihood estimation using AMOS program. Confirmative factor analysis (CFAs) was first to be conducted to ensure the measurement model as a good fit. Following the CFAs, the final SEM model including the full dataset of all junior high school students was tested. In addition, comparative analyses were conducted to determine whether patterns of relationships and mediating effects are different between male and female students.

The chi-square coefficient has often been used to assess if the data fit the theoretical model. However, due to the sensitivity of the chi-square coefficient to sample size, it is not a preferred fit index for large samples such as those in this study. Indeed, researchers have addressed the chi-square limitation by developing goodness-of-fit indices that take a more pragmatic approach to the evaluation process. More commonly used fit indices include Bentler and Bonnett's (1980) Normed Fit Index (NFI), Bollen's (1989) Incremental Fit Index (IFI), and Bentler's (1990) Compared Fit Index (CFI). Typically, these three fit indices consider a model to be a good fit when the value is above .90 (Bentler, 1992), and a superior fit when it is close to .95 (Hu & Bentler, 1999). A common misfit measure, the Root Mean Square Error (RMSEA), is also reported in the SEM analysis. The RMSEA considers

a mediocre fit to range from .08 to .10 and a good fit to be below .06 (Hu & Bentler, 1999).

Results

Overall Model

The results of the analysis based on total sample provides a good fit to the data, χ^2 (224, $N = 3,058$) = 1827.31, $p < .001$ and with NFI = .94, IFI = .95, CFI = .95, and RMSEA = .05. This suggested that the model is a good one. Figure 1 presents the paths in this model.

Figure 1 shows that student violence against students is directly influenced by students' negative personal traits ($\beta = .24$) and prior victimization ($\beta = .24$). The variable of risky peers has stronger mediating effects than student-teacher relationships and school engagement on student violence against students for negative personal traits and victimization. By contrast, student violence against teachers is not strongly influenced by negative personal traits ($\beta = .05$), parental monitoring ($\beta = .02$), and victimization ($\beta = .09$). Instead, student violence against teachers is indirectly influenced by negative personal traits and victimization through the strongest mediating variable of risky peers. Student violence against teachers is also indirectly influenced by negative personal traits, parental monitoring, and victimization through the mediating variable of poor student-teacher relationships. Poor student-teacher relationship has a small but important mediating impact on violence against teachers. Together, all of these variables accounted for around one half of the explained variance for student violence against students ($R^2 = .49$) and around one third for student violence against teachers ($R^2 = .32$).

Gender Analysis

The gender analysis of this study focused on the inquiry of whether the same theoretical model was applicable to the samples of male and female students. In this analysis, factor loadings, the paths, and the covariances are constrained to be equal to fit the covariance matrices of the male and female subgroups simultaneously to the same model. The analysis provided a good fit to the data, χ^2 (492, N : male = 1,475, female = 1,514) = 2,303.46, $p < .001$ and with NFI = .92, IFI = .93, CFI = .93, and RMSEA = .04. Thus, the same theoretical model fit the data from both genders well.

Next, the model was tested to find out if releasing equality constraints on the paths could significantly improve the fit. After releasing path constraints

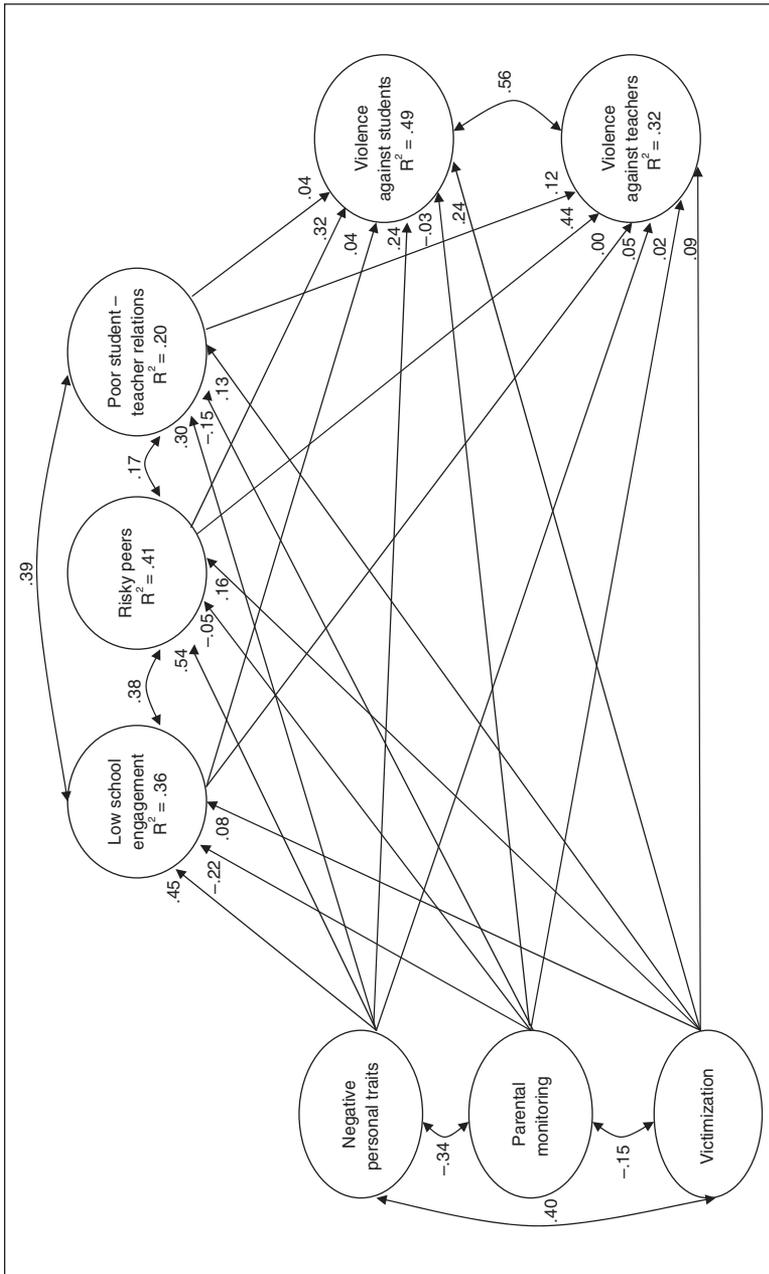


Figure 1. Structural equation modeling of direct and mediating effects on junior high school students' violence against students and teachers

one at a time, it was determined that the release of the constraints between negative personal traits and risky peers, between victimization and low level of school engagement, and between victimization and student violence against students yield a significantly better fit to the model; thus, the results for the final model with the three constraints released together were χ^2 (489, N : male = 1,475, female = 1,514) = 2259.95, $p < .001$ and with NFI = .92, IFI = .94, CFI = .94, and RMSEA = .04.

Figure 2 represents the results of the gender analysis. The beta coefficients for both male and female models exhibit remarkable similarity. However, victimization has stronger direct effect on student violence against students for female students than males ($\beta = .21$ for boys vs. $\beta = .29$ for girls). By contrast, the strength of the relationship between victimization and low level of school engagement ($\beta = .10$ for boys vs. $\beta = .02$ for girls) as well as relationship between negative personal traits and risky peers ($\beta = .57$ for boys vs. $\beta = .46$ for girls) are stronger for male students. Among all factors, the factor of risky peers is the best predictor of both types of school violence for male and female students. Overall, the theoretical model explains a similar proportion of the variance of student violence against students (44% for boys and 49% for girls) and student violence against teachers (31% for boys and 33% for girls) for both genders.

Discussion

Based on the nationally representative sample in Taiwan, this study was conducted using Benbenishty and Astor's (2005) theoretical orientation to examine how the complex patterns of factors within and outside of the school affect school violence perpetration committed by students against teachers and students in Asian junior high schools. In addition to direct effects, this study proposed that external school variables would have indirect effects on school violence mediated through within-school variables. This study also expected that the model fit male and female junior high school students, but certain paths within the model may differ.

The results of this study show that negative personal traits and victimization not only had a direct influence on student violence against students, but also had an indirect influence mediated through risky peers. In addition, the results show that negative personal traits, parental monitoring, and victimization have weak direct effects on student violence against teachers, but have indirect influence on violence against teachers mediated through risky peers and poor student-teacher relationships. These findings support Benbenishty

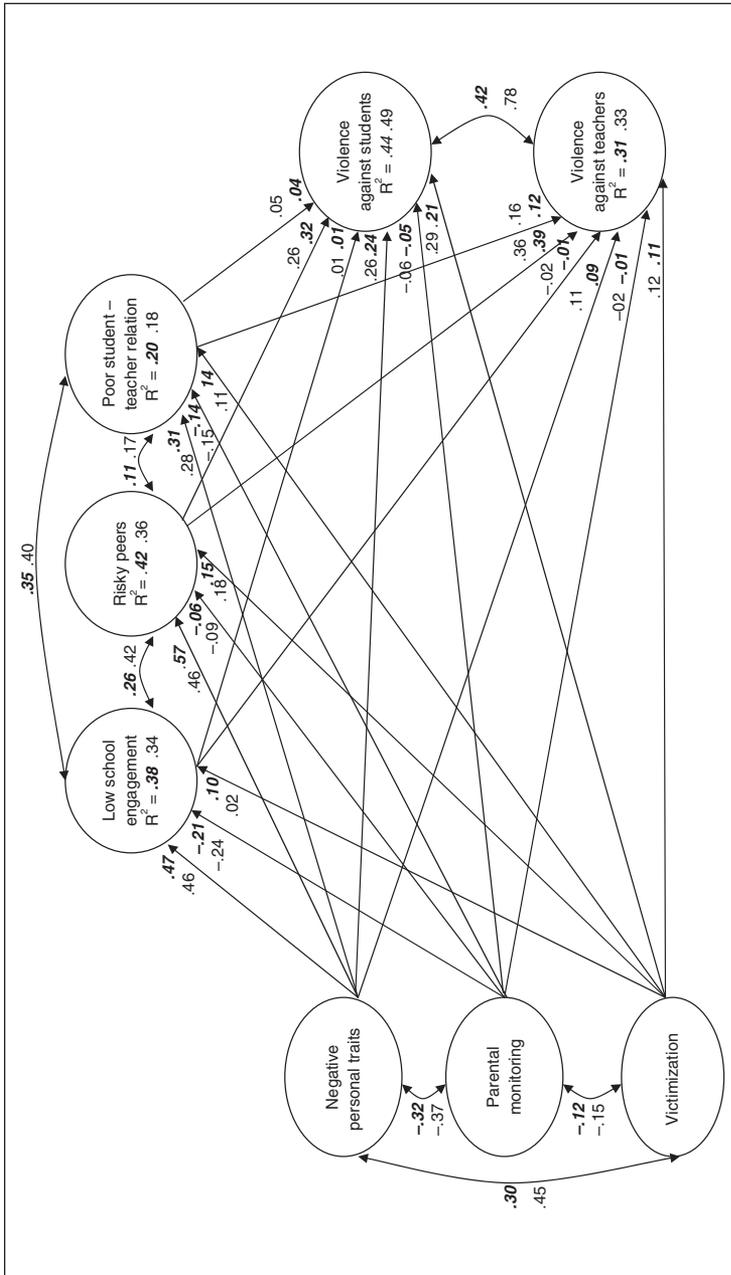


Figure 2. Structural equation modeling of direct and mediating effects on male and female junior high school students' violence against students and teachers. The coefficients in regular print and those in bold and oblique print, represent, respectively, the results for the female and the male samples

and Astor's (2005) theoretical model that school violence is influenced by a combination of numerous within-school and external-school variables, and within-school variables can mediate contributions from external contexts. These mediation findings also provide empirical evidence to support the school environment as a unique developmental setting to school violence compared with other normative environments such as community and home (Astor et al., 2002; Benbenishty et al., 2002). According to this study, to better understand school perpetration in junior high school, it is important to understand the school context such as how students interact with their school peers and teachers. Our findings also indicate that school perpetration is a unique and context-bounded form of interpersonal violence that should be addressed separately from perpetration in other social developmental contexts (Benbenishty & Astor, 2005).

Overall, the findings of this model indicate that the variable of risky peer group influences on school grounds showed stronger mediating effects than poor student-teacher relationships and low level of school engagement. These findings imply that school risky peers play a more important role in school context in school perpetration among Taiwanese junior high school students. It is possible that Taiwanese collectivistic culture stresses that individual interests should be subordinated to peer group norms (Triandis, 1995). If some Taiwanese junior high school students are alienated due to personal, family, and community experiences, they may then choose to affiliate with risky peers at school. These risky friends may influence them to engage more frequently in school violence. However, this dynamic may not be unique to Taiwan or Asian cultures. The findings also mirror previous theories and research findings suggesting that peer influence is more important than adults to influence adolescent psychosocial and behavioral development (e.g., Benbenishty & Astor, 2005; Papalia, Olds, & Feldman, 2009).

In addition, the findings of this study indicate that the variable of poor student-teacher relationships is a significant mediator between external factors and student violence against teachers. However, this is not the case for student violence against students. The quality of interaction between student and teacher plays a more important mediating role in the context of student violence against teachers than student violence against students. It may be that Taiwanese junior high school students' aggressive acts toward teachers are more impulsive or emotional reactions to some perceived frustration when interacting with teachers (e.g., Chen & Astor, 2009). This kind of emotional reaction to teachers was not reflected in their aggressive acts toward their peers.

Surprisingly, low levels of school engagement showed the weakest and almost zero mediational effect to both types of school violence. These are unexpected findings because this variable is an important factor of school violence in previous Western literature and theory (Natvig et al., 2001). An explanation for this finding may be due to the comprehensive model, sample, and data-analysis approach in the present study (e.g., other studies are based on smaller convenience samples). Another possible explanation may be a relatively high level of school engagement and stressful academic environment in Asian junior high schools, compared with the Western countries (Chen & Astor, 2010; Jang, 2002). These possibilities should be further explored in future comparative studies.

This study shows that the influence of the personal, family and school variables in this model account for a relatively large amount of the explained variance for student violence against students and student violence against teachers. To maximize effectiveness of school violence intervention programs, interventions must integrate personal, family, and school-level approaches (Ahmed & Braithwaite, 2004). The findings suggest that interventions for junior high school students in Taiwan should be targeted toward reducing personal victimization and increasing the quality of peers and student–teacher relationships. Interventions focusing on students’ involvement with at-risk peers may lead to the greatest reduction of student violence against students and teachers.

The results show that the overall theoretical model is applicable across both genders. This finding suggests that although male students have higher rates of perpetration in school violence than females, how male and female students’ personal, family, and school experiences affect student violence against students and teachers are quite similar. This finding also indicates that school violence interventions or policy incorporated at a national level could be effective across genders. However, it is interesting to note that students’ negative personal traits have stronger influence on risky peers for males than females. This suggests the variable of negative personal traits has stronger indirect influence for male students on student violence against students and teachers mediated through risky peers. The findings imply that interventions aimed at improving students’ negative personal traits would reduce student violence against students and teachers and would be more likely to affect male students. In addition, female prior victimization has a stronger impact on student violence against students. The finding suggests that interventions aimed at decreasing victimization would reduce student violence against students and would be more effective for female students than for male students.

The overall results of this study show that most of the same relationships between risk factors and school violence reported in studies from Western countries are also found in Asian cultural contexts, especially in Taiwan. The findings provide useful information for school policy makers or clinicians, who are interested in developing new internationally based school-violence prevention and intervention strategies.

Finally, there are some limitations that need to be considered. First, the investigation in this study is cross-sectional. The results of this study may not be used to establish cause-effect inference, which may require longitudinal data. Second, the self-reporting characteristic of the data and the 12-month reporting window may have resulted in students underreporting events due to poor memory or overreporting violent behavior that they assume to be commonplace (Benbenishty & Astor, 2005). Future researchers will benefit from collecting information from additional sources such as teacher, parents, or peer reports. Also, future research could apply this theoretical model in other countries to further confirm the similarities or differences across cultures in school violence findings.

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