

The Hazards of Growing Up: A Study of the Changing Mechanisms of Bullying Among Girls in Shenzhen

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Among the many contending theories of bullying, the widely accepted thesis known as frustration-aggression assumes that bullying is a form of aggressive behavior induced by external stress. Recently, researchers have discovered that the relationship between external stressors and bullying is sometimes moderated by internal frustration. The present investigation is an attempt to examine which of the above mechanisms can better explain female students' bullying behaviors. Data analysis, using structural equation modeling, was based on 1,069 girls selected from 14 primary schools and 16 junior secondary schools in Shenzhen, China. The result of the analysis suggests that while bullying by girls in primary schools is directly related to external stress, bullying in secondary schools is moderated by internal frustration. The authors suggest that several risk factors, namely, (a) the competitiveness of the education system, (b) socialization processes within families and schools, and (c) developmental changes in females during puberty, may be contributing to the difference between bullying mechanisms in primary and secondary schools.

Parmi les nombreuses théories contraires portant sur l'intimidation, la thèse largement acceptée, connue sous le nom de frustration-agression postule que l'intimidation est une forme de comportement agressif provoqué par le stress externe. Les chercheurs ont récemment découvert que le rapport entre les agents de stress externes et l'intimidation est parfois modéré par la frustration interne. La présente étude vise à déterminer lesquels de ces mécanismes expliquent le mieux les comportements d'intimidation par les élèves. L'analyse de données, suivant la modélisation par équation structurelle, était basée sur 1 069 filles sélectionnées de 14 écoles primaires et 16 écoles secondaires à Shenzhen, en Chine. Les résultats de l'analyse donnent à penser que l'intimidation par les filles à l'école primaire est directement liée au stress externe, alors que l'intimidation à l'école secondaire est modérée par la frustration interne. Les auteurs proposent qu'il est possible que plusieurs facteurs de risque, notamment (a) la compétitivité du système d'éducation, (b) les processus de socialisation en sein des familles et des écoles et (c) les changements de croissance chez les filles pendant la puberté, contribuent aux différences entre les mécanismes d'intimidation à l'école primaire et à l'école secondaire.

Existing knowledge about school bullying and victimization, and its prevention is mainly derived from research conducted in Western countries (Olweus, 1993, 2010; Slee, 1995; Smith & Brain, 2000; Swearer & Espelage, 2004). One widely accepted explanation of bullying, known as the frustration-aggression thesis, hypothesizes that bullying is a form of aggressive behavior triggered by external stressors (Camodeca, Goossens, Schuengel, & Terwogt, 2003; Craig, 1998;

Dodge, 1993; Dollard, Doob, Miller, Mowrer, & Sears, 1939; Olweus, 1993; Whitney & Smith, 1993). Supporters of this thesis believe that bullies lose control of their temper and bully their peers when they are aroused by stressful external circumstances, such as being treated unfairly by teachers, being scolded by parents, or being ridiculed by peers. However, evidence has also suggested that people sometimes engage in aggressive behaviors because they are unhappy and depressed (Berkowitz, 1989; Callaghan & Joseph, 1995; Catalano, Novaco, & McConnell, 2002; National Institute for Educational Policy Research, 2006; Neary & Joseph, 1994; Slee, 1995). This explanation suggests that apart from external stressors, internal frustration of children may also contribute to school bullying.

Many studies in Western countries have focused on environmental factors in explaining the problem of bullying behavior. However some of the findings were questionable. For example, competition at school and learning stress has been investigated as a potential factor contributing to bullying behaviors of students, but the results of such research have been inconclusive (Konishi & Hymel, 2009; Olweus, 1997). Also, authoritarian parenting style has been found to be of significance in the development of bullying behaviors in young adolescents (Nelson, Hart, Yang, Olsen, & Jin, 2006). If this is the case, given that there is a high prevalence of authoritarian parenting style among parents in China (Chang, Schwartz, Dodge, & McBride-Chang, 2003; Lam, Tam, & Leung, 2006), there should be a high frequency of bullying behaviors among students. However, this is not the case (Zhang, 2002). Hence, there are still many gaps in our understanding of bullying behaviors of children, especially on the interaction between the external environment and the internal self in Asian contexts.

A recent survey conducted among female 6th and 8th graders in Tokyo and Hong Kong found that bullying committed by Japanese girls might be explained by the anxiety-reduction mechanism, or bullying as a means of reducing anxiety, but that the same mechanism was not evident in bullying committed by Hong Kong girls (Tam & Taki, 2007). This finding gives rise to the questions of why there seem to be two different mechanisms of bullying at work, and whether the different mechanisms could be related to variations in the socialization of children of the two regions.

The present investigation is a further attempt to investigate the mechanism of bullying among girls, and to find out whether age maturity is another factor which could give rise to variations in the bullying mechanism. This investigation is deemed important because many studies have investigated the trajectories of juvenile antisocial and aggressive behaviors (Fortin, 2003), but few attempts have been made to understand the underlying mechanisms. Also, if it is indeed true that different age groups could engage in different bullying mechanisms, this could alert school practitioners to use appropriate approaches to handle students of different ages who exhibit bullying behaviors.

Literature Review

Bullying behaviours among females

Most researchers categorize bullying as a subset of aggressive behaviors that involves an intention to hurt another person (Camodeca et al., 2003; Olweus, 1993; Smith & Thompson, 1991). It is inflicted repeatedly and regularly over time (Olweus, 1993), and it usually involves an imbalance in power, either real or perceived (Craig, 1998; Whitney & Smith, 1993). Bullying can be manifest in a variety of ways. Not only can it be displayed physically, through direct

aggressive acts such as pushing, hitting, kicking, pinching, and taking belongings or money, but also by activities such as name calling and cruel teasing which may be covert and elusive. Rivers and Smith (1994) indicate that verbally aggressive notes can be passed in the classroom without teachers even being aware that bullying is taking place. Another form of aggressive behavior called indirect or relational bullying is a form of social exclusion whereby students inflict damage through spreading malicious gossip or withdrawing friendship (Björkqvist, Lagerspetz, & Kaukiainen, 1992).

Much of the current understanding of bullying behavior can be traced back to earlier research in Sweden on mobbing and delinquent behavior by youth mainly committed by gangs of delinquent boys from families with poor socioeconomic backgrounds (Elliott, 2003; Hayes, 1992; Olweus, 1978). These boys usually preyed on victims who were younger, smaller in physical size and powerless to fight back (Olweus, 1978). Because of this historical development, earlier literature on bullying often made the assumptions that bullying, although committed by both boys and girls, is mainly a male aggressive behavior. As a result, it was suggested that in order to curb bullying among students, "It is important to have an adequate number of adults on duty among the students during break periods, and that the school provide good supervision of the students' activities" (Olweus, 1993, p. 70).

However, evidence has indicated that the above suggestion may work only in some circumstances, and may not be effective when it comes to combating bullying committed by girls (Block, 1983; Espelage, Bosworth, & Simon, 2000; Hyde, 1986; Knight, Guthrie, Page, & Fabes, 2002; Owens, Daly, & Slee, 2005; Parke & Slaby, 1983). For example, male bullies (a) tend to be physically aggressive, (b) threaten to hit or take things from peers, (c) are physically stronger than their victims, and (d) have a need to control others. Female bullies, in comparison, (a) tend to be socially aggressive, (b) use nasty, dismissive glances and gestures, (c) start and spread rumors, gossip, (d) send intimidating notes, (e) threaten social exclusion, (f) play mean games, (g) manipulate friendships, and/or (h) leave a classmate out of the group (Craig, Pepler, Connolly, & Henderson, 2001; Crick et al., 1999; Espelage, Mebane, & Swearer, 2004; Felix & Green, 2010; Maccoby, 2004). Whereas males use their strength to subdue their peers, female bullies may not be physically stronger than their victims (Craig et al., 2001; Espelage et al., 2004).

It has been reported that girls tend to engage in indirect or relational bullying behaviors that are different from those perpetrated by boys (Espelage, Bosworth, & Simon, 2000). Moreover, evidence also points to the fact that the relational bullying employed by girls is a more sophisticated form of victimization than simply the brutal use of power (Owens et al., 2005; Owens, Slee, & Shute, 2000), and those who engage in relational bullying usually do so as a means of thwarting social goals valued by their victims. Also, research conducted among Finnish school children aged 8-18 years reports that older girls are using significantly more indirect or relational bullying than younger ones (Björkqvist et al., 1992).

It has been suggested that females are likely to internalize their emotions, such as fear, sadness, and anxiety, in response to stress (Connor, 2002; Taylor, Klein, Lewin, Gruenewald, Gurung, Updegraff, 2000; Tobin, Graziano, Vanman, & Tassinary, 2000; Verona, Reed, Curtin, & Pole, 2007). In a participant observation ethnographic study of 6th to 8th graders, Eder (1985) pointed out that girls strive to be popular by being friendly to others whom they may not really like. For instance, sometimes they pretend to smile as a way of masking their anger toward their popular peers. These girls also tend to deliberately underachieve academically in order to avoid resentment by others and to stay with the group. In another study, it was

suggested that females bully because they are bored and want to create excitement, and that they are acting out television soap operas (Owens, Slee, & Shute, 2001).

Reasons behind relational bullying

When attempting to explain the factors contributing to the high frequency of relational bullying among girls, one possible explanation is the socialization pressures on girls. There are several socialization processes that occur at the time girls enter primary school:

1. Parents and teachers encourage girls to suppress their feelings rather than expressing their frustration (Keenan & Shaw, 1997).
2. Beginning in kindergarten, children begin to adhere strongly and somewhat rigidly to gender stereotypes, identifying themselves as either “boys” or “girls,” and engaging in school and play activities typical of their gender (Pepler & Craig, 2005).
3. Peer relationships and peer approval become increasingly important for girls at an earlier age than boys (Mann, 1994).

Thus, increasing pressure from parents, teachers, and peers for children to conform to gender-stereotyped behaviors, and the increasing desire to seek approval from peers may partially explain the delayed onset of bullying behaviors for girls.

The high frequency of relational bullying may also be explained with reference to biological reasons. Early effects of neuroendocrine hormones such as testosterone and cortisol on girls are not the same for boys (Pajer, Gardner, Rubin, Perel, & Neal, 2001; Silverthorn & Frick, 1999). Also, the timing of puberty may have important implications for the development of covert antisocial behaviors in girls (Pepler & Craig, 2005). Current research supports a biosocial interaction between early menarcheal age and mixed-gender school environments that appears to heighten the risk for conduct disorder among girls (Caspi, Lynam, Moffitt, & Silva, 1993). This may be because in mixed-gender schools, delinquent behavior is more normative than in all-girl schools, and girls tend to learn to exhibit antisocial behaviors from boys.

A third explanation is that a combination of individual and environmental factors occurring at about the time of puberty serves to increase the risk of aggressive behaviors among adolescent girls:

1. There is evidence that the numerous physical and psychological changes induced by puberty are viewed rather negatively by females (Conner, 2002; Petersen, Sarigiani, & Kennedy, 1991).
2. Research suggests that the presence of psychosocial stressors during childhood, such as parent-child conflicts and school problems, is associated with earlier menarche (Pepler & Craig, 2005).
3. There are psychological disruptions such as lowered self-esteem as girls move through puberty (Simmons & Blyth, 2008).
4. These physiological and psychological changes also occur at a time when parental supervision of adolescent girls begins to diminish, possibly offering more opportunities for them to act in antisocial ways (Mann, 1994).

Therefore, although girls are encouraged to exhibit more prosocial behaviors and to

internalize their personal problems, (a) physical and hormonal changes associated with puberty, (b) the effects of earlier menarche on antisocial behavior, (c) a negative self-image and diminishing self-esteem, and (d) peer modeling and social reinforcement for antisocial behaviors in the school environment, may thus all combine to lead them into more covert aggressive behaviors during adolescence. Because of the increased tendency for girls to engage in indirect or relational bullying, it has been predicted that girls are in fact at greater risk of psychological maladjustment than boys (Crick & Bigbee, 1998; Pepler & Craig, 2005; Serbin et al., 2004). It has also been reported that teenage girls with a history of conduct disorder who marry may have higher rates of marital difficulties, marital violence and divorce than other psychiatric patients and healthy control groups (Pajer, 1998).

Mechanisms of bullying

Much research has been targeted at trying to understand the mechanism behind bullying behaviors based on the frustration-aggression hypothesis originally proposed by Dollard et al. (1939). Based on this hypothesis, bullying is induced because the person is irritated by external stressors (Olweus, 1993). The irritation mechanism assumes that the individual's aggressive behavior is a response to external stressors, which are defined as any physical or psychological strain that is considered aversive (Verona et al., 2007). Card and Little (2006) distinguish between *reactive* and *proactive* aggression. Reactive aggressiveness is a stable tendency to become angry when thwarted. This is in contrast to proactive aggressiveness, which is the use of aggressive acts to meet one's goals and which may not involve an angry reaction to a specific event. Carver and Harmon-Jones (2009) describe anger and discontent as drive states in humans that build up aggressive urges that eventually "spill over" and are released. In a study of 558 middle school students, anger was found to be the strongest predictor of bullying (Bosworth, Espelage, & Simon, 1999). Anger was also a significant predictor of an increase in bullying over a six-month period; students who were the most angry at the beginning of the academic year reported an increase in bullying behaviors over the school year (Espelage, Bosworth, & Simon, 2001).

Earlier research into bullying supported the irritation mechanism mainly because there was no overwhelming evidence for concluding that bullies were different from non-bullies with regard to emotional problems (Olweus, 1978, 1993, 1999). However, research findings in the past decade have suggested that such a position may not be tenable in all circumstances. Evidence also suggests that any relationship between external stressors and bullying may be moderated by internal frustration such as depression and anxiety, or what is referred to as anxiety-reduction mechanism (Berkowitz, 1989; Catalano et al., 2002; Craig, 1998; Dodge, 1991; Marcus-Newhall, Pedersen, Carlson, & Miller, 2000; Slee, 1995). In the anxiety-reduction mechanism, it is suggested that the psychosomatic symptoms of stress play a moderating role between stressors and bullying behaviors. Research suggests that depression is a common symptom experienced by victims of bullying as well as bullies (Callaghan & Joseph, 1995; Neary & Joseph, 1994; Slee, 1995). Also, clinically elevated depression levels have been found in both boys and girls who bully their peers (Slee, 1995). In one study, bullies, victims and non-bullies were compared for depressive symptoms and suicidal thoughts; one of the conclusions was that bullies scored significantly higher than neutral students on depressive symptoms (Roland, 2002). Hence, the association between aggressive impulses and internal frustration of a person is well founded.

Recently, in a trans-national study of bullying among students in Japan, Korea, Australia and Canada, it was reported that psychosomatic symptoms of stress are not only correlates of bullying, but may also be moderating factors between external stressors and bullying (National Institute for Educational Policy Research, 2006). In a recent Structural Equation Modeling (SEM) study comparing bullying behaviors among 6th and 8th grade female students in Tokyo and Hong Kong, it was found that the bullying behavior in the Tokyo sample could be explained by the anxiety-reduction mechanism, while the bullying behavior in the Hong Kong sample could not (Tam & Taki, 2007). The authors suggested that the collectivistic approach in socialization of girls in Japan may have taught them the importance of not expressing their emotions in public. This may explain why aggression was associated with internal frustration among girls in Japan but not in Hong Kong.

There is also evidence to support both the irritation mechanism and the anxiety-reduction mechanisms of bullying. Given that frustration and depression are expected to be higher in highly competitive social contexts and more prevalent among more mature students (Harber, 2004), is it possible that the anxiety-reduction mechanism could explain bullying more accurately among older students than younger ones? The present study is an attempt to investigate the bullying mechanisms of school age children, and the focus is on differences in the bullying behaviors of students in primary and secondary schools in mainland China. Comparing primary and secondary students in the same country enables researchers to put cultural factors aside to a large extent and concentrate mainly on the influence of socialization within families and schools and the effect of competition on bullying for different age cohorts. Mainland China was selected because China is a collective society where conformity and Confucian values are emphasized (Pye, 2000), and competition within secondary schools in China is very keen, but competition within primary schools is considerably less so (Cleverly, 1991). These social conditions are controlled to some extent so that results in the present study can be used to make comparisons with previous studies conducted by the authors.

School Bullying in China

In China, although severe school violence, such as shooting or fighting with weapons, is infrequent, bullying in school is not a new phenomenon. The Chinese are generally less prone to engage in antisocial behaviors, probably because they conform more to social norms (Leung & Fan, 1996). However, the trend of increasing juvenile delinquency in major cities in China is particularly worrisome as approximately 50% of all crimes are committed by juveniles. This trend is expected to continue with China's ongoing economic reforms and ideological relaxation associated with transition to the market economy. Moral and ideological education, which used to be the stronghold for youth development in China, tends to be increasingly inadequate. The rise of individualism among the younger generation in China, which is partly the result of the one-child policy, causes considerable difficulties in school education. The large class sizes also contribute to a high frequency of human conflicts within some schools, and the selection system results in a high concentration of students with low motivation and weak academic ability in some junior secondary schools in metropolitan cities.

In a large scale study of 9,205 students aged 7 to 16 years conducted in the Shangdong and Hebei provinces in 2002, 10.4% in primary school and 4.1% in secondary school were identified as bullies, (Zhang, Wang, Kun, & Wu, 2002). This is considerably smaller than the range of 20% to 30% self-reported bullies in Western and Japanese studies (Morita, Soeda, Soeda, & Taki,

1999; Olweus, 1999). Among these students, 5.9% of boys and 2.1% of girls in primary schools, and 2.5% of boys and 0.4% of girls in secondary schools confessed to being frequent bullies (Zhang, 2002). In the same study, three modes of bullying were reported by the victims. Percentages of primary students reported to be suffering from physical bullying, verbal bullying and indirect bullying were 25%, 45% and 17%, respectively, among girls, and 29%, 43% and 27%, respectively, among boys. Percentages of secondary students reported to be suffering from physical bullying, verbal bullying and indirect bullying were 10%, 22% and 12%, respectively, among girls, and 19%, 28% and 16%, respectively, among boys.

In the existing academic literature in China, several studies have been conducted to look at the issues of learning stress and frustration among adolescents (Liu, 1997; Mak, 1998; Zhao & Yuan, 2006). However, no study has been done to look at the relationship between stressors and bullying, and frustration symptoms and bullying. In a survey of learning stress and stress symptoms among 519 junior and senior high students, Zhao and Yuan (2006) reported that 9.1% of students claimed that they felt very stressed and 32.9% felt somewhat stressed. Also, female students experienced a significantly higher level of stress and stress symptoms than their male counterparts. In order of severity, the students reported that (a) stressors from learning (such as effectiveness in learning, lack of time, peer competition and poor results) ranked first, (b) stressors from school (such as competition for promotion and too much homework) ranked second, (c) stressors from family (such as comparing with relatives and high expectation) ranked third, and (d) stressors from external circumstances (such as future career opportunities and pollution) ranked fourth. Moreover, a high percentage of the female students reported various stress symptoms such as bodily fatigue (26.6%), headache (25.0%), worry (33.1%), depression (23.7%) and irritation (19.7%; Zhao & Yuan, 2006). This can be compared to another study of female junior secondary students in Hong Kong that reported similar figures: bodily fatigue (44.0%), headache (20.3%), worry (36.0%), depression (17.8%) and irritation (32.2%; Tam & Taki, 2007).

Conceptual Framework

Figure 1 presents the conceptual framework of the present study, which is based on Taki (2001), who proposed one of the first integrative models to investigate the effect of competition on the psychosocial behaviors of adolescents. It is postulated that students' bullying behavior is mainly influenced by three factors: (a) competition, (b) stress, and (c) frustration. Students experience stress when they are troubled by study, irritated by their peers, and have problems with their family members or with their teachers. These are assumed to be the main sources of stress giving rise to bullying (Chang et al., 2003; Tam & Taki, 2007; Zhou, Eisenberg, Wang, & Reiser, 2004). A punitive parenting style, for example, has been found to be of great significance in the development of bullying behaviors in young adolescents (Nelson, Hart, Yang, Olsen, & Jin, 2006). Stress may be alleviated or aggravated depending on an individual's attitudes and the availability of social support (Chen, 2006). Thus, family, community and school, which make up the social support system, is assumed to contribute to reduced frustration and stress experienced by the students (Chen, 2006; Nelson et al., 2006). This support system signifies whether parents understand a child, whether teachers listen attentively to a child in trouble, or whether peers are encouraging and helpful (Chao, 1994).

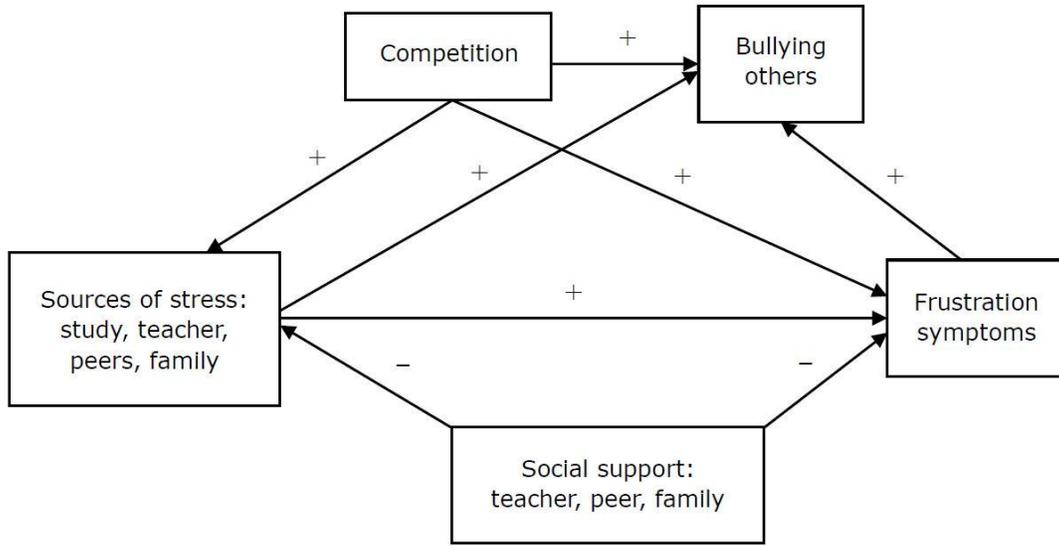


Figure 1. Conceptual framework of the present study.

Students' experiences due to competition with other students may contribute to a higher frequency of bullying and a higher level of stress within themselves. This means that a competitive attitude may result in a higher rate of bullying, and may also aggravate relationships with teachers, peers and family members, as well as stress in learning. Furthermore, stress from study also has an impact on stress from teachers, peers and family. What this means is that learning stress may be dissipated in students' social network and affect their relationship with teachers, peers and family members. The combination of stressors and social support may be somewhat complicated and need more explanation. For example, teachers sometimes get angry and scold a student without sufficient understanding of the reasons for the student's behavior. If the student has a good relationship with the teacher, he or she may think that the teacher is scolding them for their own good. In this case, stress from the teacher is alleviated. However, if the student has a poor relationship with the teacher, he or she may think that the teacher is unfair. In this case, stress is aggravated. A similar explanation can be extended to peers and families.

Finally, the frustration-aggression theory posits that aggressive behaviors are the results of external stressors. Yet, bullying could also be induced by internal frustration. Added together, internal frustration may play a moderating role between stressors and aggression as shown in Figure 1. However, this may not be the case for all children because children at different ages may react differently to stressors (Smith, Cowie, Olafsson, & Liefoghe, 2002). Therefore, the authors of this paper hypothesize that bullying behaviors of older children can be explained by the *anxiety-reduction mechanism* (i.e., frustration symptoms serving as an intermediate step) while those of younger children can be explained by the *irritation mechanism* (i.e., without the path between frustration symptom and bullying).

Method

Sampling

The target population in this study were female students studying in grades Primary 5 and Secondary 1 in the metropolitan area of Shenzhen, a major Southern city in Guangdong province of The People's Republic of China. The sample was composed of 495 students (average age 11.35 years) from 14 primary schools, and 574 students (average age 13.43 years) from 16 junior secondary schools. The data was collected in June, 2007. The ages were chosen to represent the onset of adolescence at age 11 and the challenge of physical and emotional changes at age 13. The schools were all publicly funded. The survey questionnaire was sent to the local education department as well as the school principals for their approval prior to administering the survey. In each of the sampled schools, arrangements were made in such a way that all students in Primary 5 and Secondary 1 of that school were assembled in the school hall or in their classrooms and were given a survey form to complete, but individual students' identities remained anonymous.

Measures

All instruments used in the present study had been validated in previous studies. The Frustration Symptoms scale and Sources of Stress scale are adopted from Okayasu (1997). The Competition scale, Social Support scale and Bullying Others scale are based on Taki (2001), who validated and established norms for the instrument in the Japanese student population. The original instruments were written in Japanese and were translated to Chinese. The Chinese version of the instrument was administered to a sample of Chinese students in Hong Kong and were found to be valid and reliable (Tam & Taki, 2007).

Competition is a 3-item scale which describes students' feelings about their classmates in the areas of school work, appearance and sport. A sample item is "I feel unhappy if I don't do better than my classmates in my school work." Respondents are asked to rate each of the items on a four-point scale with the descriptors: Strongly disagree, Disagree a little, Agree a little and Strongly agree. Alpha reliability of the scale reported in this study is 0.73.

Sources of Stress describes students' perceptions of sources of unhappy experiences. The scale contains four subscales – learning, teachers, peers and family – each of which contains 3 items. Some examples of the items are, "I can't understand my lessons," "Teachers tell me off without listening to me," "Classmates put me down because of the way I look," and "I get nagged in my family." Respondents are asked to rate each of the items on a four-point scale with the descriptors: Never, A little, Sometimes and Very often. Alpha reliability of the four sub-scales is in the range of 0.57 to 0.75.

Social Support describes the degree of support students feel they are getting from their parents, teachers and classmates, each of which contains 3 items. Some examples of the items are, "If I feel left out I am encouraged by my parents," "If I express my troubles/problems I am listened to by my classmates," and "My teachers usually try to understand my feelings." Respondents are asked to rate each of the items on a four-point scale with the descriptors: Strongly disagree, Disagree a little, Agree a little and Strongly agree. Alpha reliability of the three sub-scales is in the range of 0.80 to 0.84.

Frustration Symptoms is a 12-item scale which describes students' emotional condition in four domains: (a) physical, (b) apathy, (c) aggression, and (d) depression. These items include "I don't have much energy," "I don't feel interested in things," "I can't concentrate on school work," "I feel sick and tired," "I get sick a lot," "I get headaches," "I get depressed," "I worry about things," "I feel very lonely," "I get irritated easily," "I get angry easily," and "I feel like shouting at others." Respondents are asked to rate each of the items on a four-point scale with the descriptors: Not at all like me, Not much like me, A little like me and A lot like me. Alpha reliability of the scale reported in this study is 0.87.

Bullying Others is a 6-item scale which asks students to recall the frequency they take part in bullying other students. The six types of bullying behaviors are the following:

1. Physical bullying, jokingly (e.g., hitting, kicking, spitting, slapping, pushing or doing other physical harm);
2. Physical bullying on purpose, harshly;
3. Taking things from victims or damaging their property;
4. Verbal assault (e.g., teasing, calling names, threatening others, or saying mean things to them);
5. Social exclusion (e.g., excluding or ignoring others, spreading rumours or saying mean things about them to others or getting others not to like them); and
6. Harassing others by using the computer, e-mail or SMS messages.

Respondents are asked to rate each item on a five-point scale with the descriptors: Never, Once or twice, A few times a month, Once a week and Several times a week. Alpha reliability of the scale reported in this study is 0.76.

The properties of these instruments, their means and standard deviations, number of items, number of response categories, and reported reliability are summarized in Table 1, and the covariance matrix of the latent variables are presented in Table 2.

Table 1
A Summary of the Psychometric Properties of the Survey Instruments

Instrument	No. items	Response categories	P5 girls		S1 girls		T-score	Reported reliability
			Mean	SD	Mean	SD		
Competition	3	1 to 4	1.713	0.674	1.896	0.663	-4.468***	0.731
Sources of stress	16	1 to 4	1.670	0.402	1.804	0.469	-4.962***	0.781
Learning	3	1 to 4	1.653	0.541	1.900	0.629	-6.826***	0.741
Teacher	3	1 to 4	1.321	0.476	1.472	0.621	-4.425***	0.749
Peer	3	1 to 4	1.531	0.527	1.543	0.573	-0.364	0.577
Family	3	1 to 4	2.176	0.806	2.300	0.852	-2.430*	0.759
Social support	9	1 to 4	3.385	0.506	3.270	0.554	3.457***	0.808
Teacher	3	1 to 4	3.310	0.738	2.974	0.840	6.882***	0.848
Peer	3	1 to 4	3.397	0.731	3.578	0.570	-4.562***	0.803
Family	3	1 to 4	3.449	0.728	3.258	0.803	4.040***	0.842
Frustration symptoms	12	1 to 4	1.595	0.484	1.812	0.550	-6.962***	0.877
Physical	3	1 to 4	1.571	0.629	1.811	0.709	-5.820***	0.763
Depression	3	1 to 4	1.566	0.614	1.801	0.701	-5.788***	0.729
Aggression	3	1 to 4	1.661	0.615	1.828	0.689	-4.148***	0.714
Apathy	3	1 to 4	1.581	0.578	1.828	0.604	-6.819***	0.689
Bullying score	6	1 to 5	1.218	0.408	1.160	0.351	2.493*	0.766

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 2
Covariant Matrix of Latent Variables of the Conceptual Framework

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Competition	.454									
(2) Learning stressor	.073	.317								
(3) Teacher stressor	.057	.104	.305							
(4) Peer stressor	.089	.117	.097	.363						
(5) Family stressor	.147	.122	.131	.168	.693					
(6) Teacher support	.056	.110	.106	.119	.313	.600				
(7) Peer support	.098	.203	.073	.140	.175	.305	.658			
(8) Family support	.065	.026	.067	.052	.070	.055	.127	.430		
(9) Frustration symptoms	.121	.113	.086	.158	.176	.147	.172	.084	.283	
(10) Bullying others	-.022	-.036	-.050	-.036	-.047	-.027	-.042	-.039	-.035	0.144
Means (N=1,069)	3.189	3.598	3.463	3.214	2.757	3.346	3.130	3.494	3.286	1.187

Statistical Model

The present study mainly employs LISREL 8.3 (Jöreskog & Sörbom, 1993) as a statistical tool for data analysis. LISREL (Linear Structural Relations) is often employed to estimate the structural relationships between observed variables in a quantitative regression model. It estimates the relationship among the latent variables based on the covariance matrices of the observed variables. In sum, a fitted structural equation model will provide information about the correlation coefficients of the latent constructs, the t-values of the coefficients, and information about whether the model fits well with the observation. To determine the overall fitness of a structural equation model, a number of indexes are usually used. The weighted “least square” chi-square is used to measure the overall fitness of the model to the data. However, in order to avoid poor fit in large sample sizes, the goodness-of-fit measure (GFI) and adjusted goodness-of-fit measure (AGFI) are developed since they do not depend on sample size explicitly but measure how much better the model fits as compared to no model at all (Tanaka & Huba, 1985). Also, Browne and Cudeck (1993) have suggested the use of Root Mean Square Error of Approximation (RMSEA) as a measure of discrepancy per degree of freedom to take account of the error of approximation in the population. They have suggested that a value of 0.05 indicates a close fit and that values up to 0.08 represent reasonable errors of approximation in the population. As a rule of thumb, the closer the model fits the data set, the closer these indices approach a value of one.

Results

Table 1 also compares the means and standard deviations of the scales of the Primary 5 and Secondary 1 cohorts using t-test scores. The result in Table 1 suggests that the girls in secondary school in this study experience higher stress from learning, teachers and family than girls in primary school, but that the perceived social support from the family and teachers is much lower than their primary school counterpart. For example, in terms of teacher stressor, comparing primary girls to secondary girls, the latter have a much stronger feeling of being ignored and treated unfairly by the teachers. In terms of family stressor, secondary girls have a much

stronger feeling of being nagged in their families, too much being expected of them by their parents, and too much importance being placed on doing well at school. Also, secondary girls experience more competition from peers and have a higher level of frustration in all of the stress symptoms. Secondary girls have less energy and concentration, and feel less interested in things, tire more easily, are more worried about things, and are more lonely and depressed than their primary school counterparts. However, the bullying scores for primary girls are higher than secondary girls. Therefore, in general, primary girls are experiencing less competition, stress and frustration, and have better family and teacher support than secondary girls, yet they engage in a higher frequency of bullying behaviors.

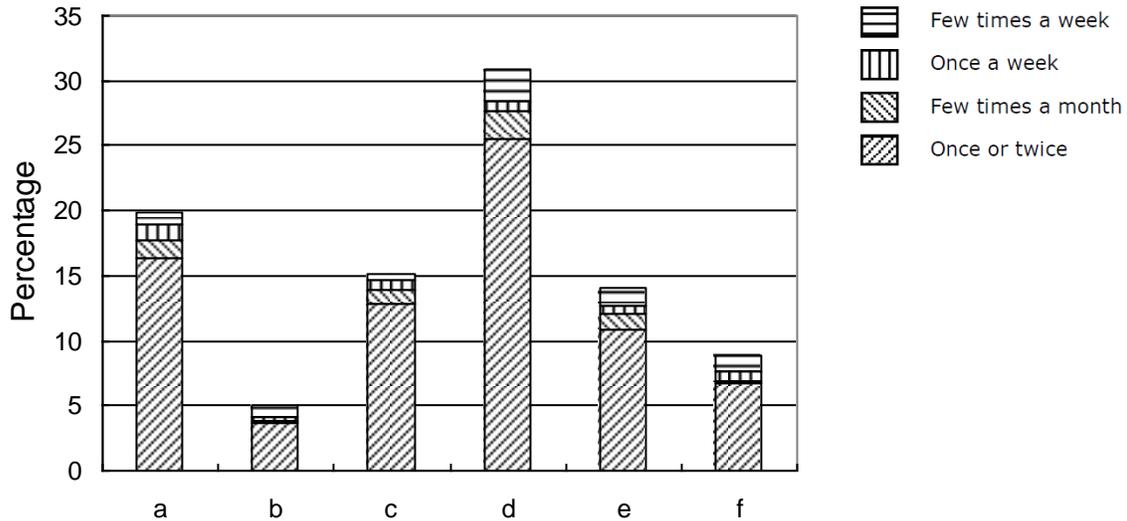
Figure 2 shows the bar charts of six types of bullying behaviors reported by Primary 5 and Secondary 1 girls. The six types of bullying behaviors are (a) physical bullying, jokingly, (b) physical bullying, harshly, (c) taking or damaging belongings, (d) teasing and name calling, (e) excluding or ignoring, and (f) sending electronic messages. It appears that primary girls have a much higher frequency in all types of bullying behaviors than secondary girls, with the exception of teasing and name calling, for which the frequencies are approximately the same. Also, primary girls, rather than their secondary counterparts, are more likely to repeat their bullying behavior in all types of bullying.

Figures 3 and 4 show the path diagrams of the relationship between sources of stress, social support, depression and bullying for primary and secondary girls, respectively, using a structural equation modeling technique. All path coefficients (γ) being reported are standardized. A few phenomena shown in Figures 3 and 4 are worthy of mention:

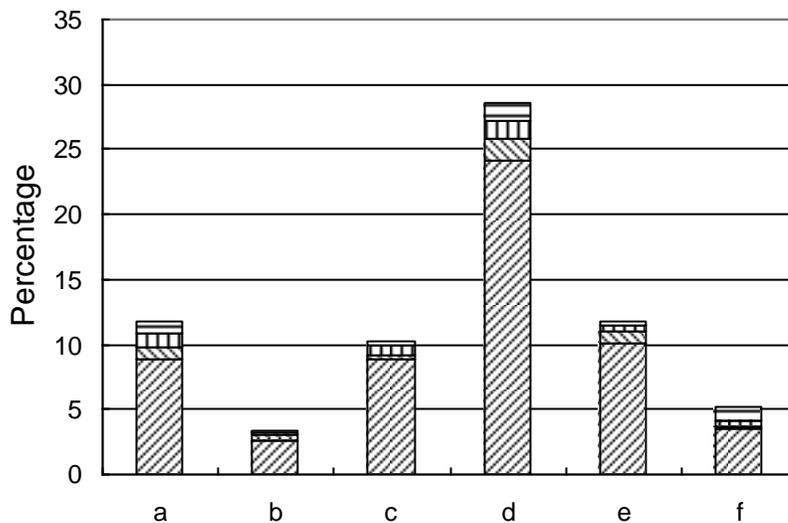
1. With regards to the relationship between sources of stress, frustration symptoms and bullying, for the primary cohort, only peer stressor ($\gamma = 0.41$) contributes to bullying, while both study stressor ($\gamma = 0.55$) and family stressor ($\gamma = 0.22$) contribute to frustration symptoms. Also, frustration symptoms do not contribute significantly to bullying. In contrast, for the secondary cohort, peer stressor contributes to bullying ($\gamma = 0.27$), while both study stressor ($\gamma = 0.39$) and teacher stressor ($\gamma = 0.16$) contribute to frustration symptoms. Also, it is important to note that for the secondary cohort, frustration symptoms contribute significantly to bullying ($\gamma = 0.12$).
2. With regards to the effect of competition on sources of stress and frustration symptoms, for the primary cohort, competition contributes to all four stressors, with the contribution due to study stressor having the largest magnitude ($\gamma = 0.41$). The contributions due to family stressor ($\gamma = 0.35$), peer stressor ($\gamma = 0.22$) and teacher stressor ($\gamma = 0.20$) are smaller. For secondary girls, only the contribution of competition due to family stressor is significant ($\gamma = 0.16$). However, it appears that competition has a direct effect on the interpersonal relationships of the primary girls, but its effect on the secondary girls is more lasting because it contributes significantly to frustration symptoms ($\gamma = 0.27$).
3. With regards to the effect of social support on frustration symptoms and sources of stress, for the primary cohort, support from teachers helps to reduce frustration symptoms ($\gamma = -0.29$), while the contribution from family and peer support is insignificant. For the secondary cohort, there is no direct contribution from teacher support to frustration symptoms, but the contribution from family support ($\gamma = -0.18$) and peer support ($\gamma = -0.18$) is significant. Also, the contribution of social support on sources of stress for the primary cohort has the same order of magnitude as that of the secondary cohort, hence it might be assumed that its effects on stressors for both cohorts are approximately the same.

Thus, it appears that for the primary girls, bullying is provoked mainly by irritation by peers, while for the secondary girls, bullying is provoked partly by peer irritation, and partly by the indirect effect of stressors from study and teachers through the moderating role of frustration. Therefore, in the present study of female students of primary and secondary schools in

A. Frequency of different types of bullying by P5 girls.



B. Frequency of different types of bullying by S1 girls.



- a. physical bullying, jokingly;
- b. physical bullying on purpose, harshly;
- c. taking things from victims or damaging their property;
- d. verbal assault (e.g., teasing, calling names);
- e. social exclusion (e.g., excluding or ignoring others); and
- f. using computer, e-mail or SMS messages.

Figure 2. Bar charts of six types of bullying behaviors committed by P5 & S1 girls.

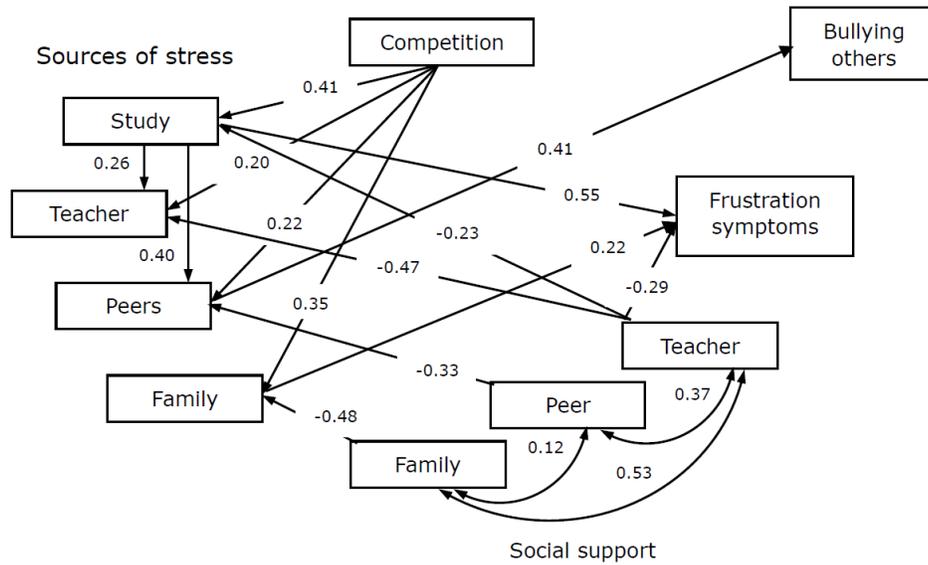


Figure 3. Path diagram of relationship between sources of stress, support, frustration and bullying for P5 girls in Shenzhen schools (all paths are significant and all coefficients are standardized). (Model statistics: Chi square = 1598; degrees of freedom = 761; GFI = 0.864; AGFI = 0.846; CFI = 0.874; RMSEA = 0.047)

Shenzhen, bullying among primary girls can be explained by the irritation mechanism, but bullying among secondary girls is explained better via consideration of the mediation mechanism.

Discussion

The analysis of data of the present study suggests that bullying among primary school girls and secondary school girls is operating through different mechanisms, supporting the hypothesis proposed by the authors. Secondary girls report bullying partly because they are provoked by their peers, and partly because they are frustrated internally. Primary girls report bullying as a reaction to provocation by their peers. They also report symptoms of frustration, but the frustration is not related to their bullying behaviors. Given the fact that frustration symptoms signify the existence of an inwardly directed aggression, the finding suggests that female students in Shenzhen are at the risk of psychological maladjustment when they are promoted from primary to secondary schools. Also, given the contribution of competition to frustration and stressors, both directly and indirectly (see Figures 3 and 4), there is the likelihood that the frustration experienced by the two cohorts of female students is partly due to the pressure of competition within the school system. Although there is insufficient evidence to suggest a causal relationship between characteristics of the two cohorts and bullying mechanisms, the analysis presented does point to avenues for further exploration. Hence, the following paragraphs are speculations on the factors that could lead to the different bullying mechanisms.

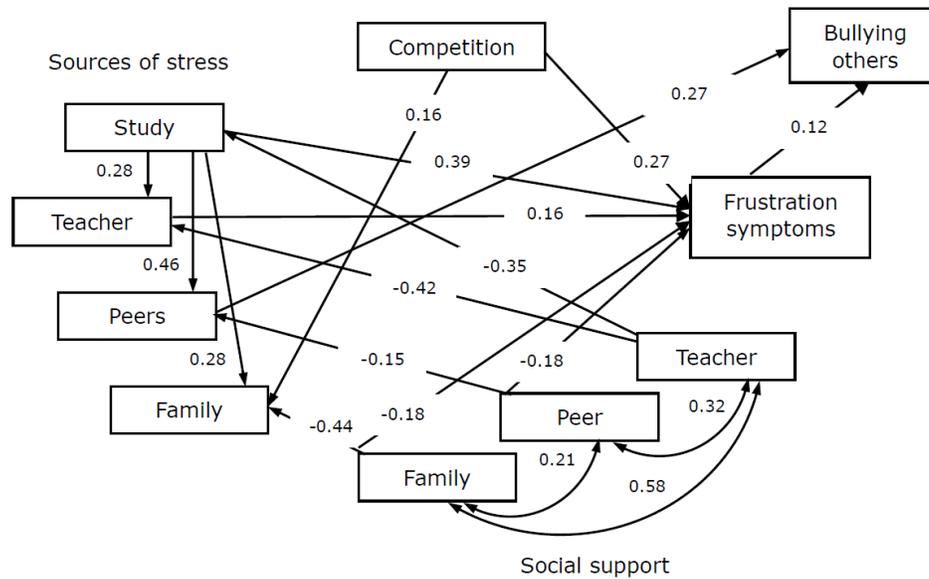


Figure 4. Path diagram of relationship between sources of stress, support, frustration and bullying for S1 girls in Shenzhen schools (all paths are significant and all coefficients are standardized). (Model statistics: Chi square = 1989; degrees of freedom = 761; GFI = 0.855; AGFI = 0.835; CFI = 0.864; RMSEA = 0.053)

Competition within the system

It has been suggested that one of the reasons for the achievement of high international ranking in mathematics and science by Asian countries is that the educational system actively works to build students' motivation to learn (Wu, 1999). Suffice to say, much of this motivation to learn comes from competition. In the case of China, there are several milestones of competition within the education system:

1. The first milestone is the municipal primary school test, which is administered to all Primary 6 students by the municipal authority. The result of this test becomes the basis for allocation to junior secondary schools. In Shenzhen, as in most of the major cities in China, student sorting and student ranking are the result of the primary school test. The position of ranking determines whether a student is allocated to a high-ranked, mid-ranked or low-ranked junior secondary school.
2. The second milestone is the provincial junior secondary school test, which is taken by all junior secondary graduates and is organized by the educational authority at the provincial level. Again, if a student scores high in this test, he or she is allocated a place in a high-ranked senior high school. If the test score is low, the student may use the result to apply for a place in vocational or technical schools, or enter directly into the job market.
3. The third milestone is the national university entrance examination, which selects students for entry into the elite universities. Currently in China, compulsory education is enforced up to junior Secondary 3, but a high percentage of junior secondary school graduates are admitted to senior high schools and are eventually accepted into publicly-funded or self-funded programmes in the universities.

In Shenzhen, approximately 95% of junior high school graduates are promoted to senior high schools and vocational education, and the percentage of high school graduates entering universities is approaching 90% (Shenzhen Statistics Bureau, 2006). Opportunity for university entrance in Shenzhen is significantly higher than in other parts of China because of the economic disparity between Guangdong and other provinces, and between the cities and rural areas. Nevertheless, competition to enter a high-ranked high school in Shenzhen is still very keen since a high-ranked high school increases a student's chance of admission into a top-ranked university, which is a good guarantee for employment after graduation or for postgraduate educational opportunities.

Therefore, there are screening mechanisms in Year 6 (Primary 6), Year 9 (Secondary 3), and Year 12 (High School 3) in China that allocate students along the education ladder. Students start to feel the intensity of competition when they enter Primary 6, and the intensity increases as students become older. Parents and teachers are also involved in the competition, but their motivation for involvement is somewhat different. Since places in high-ranked schools are in short supply, parents tend to put pressure on their children early in their primary years to outperform their fellow schoolmates in examinations. Further, teachers tend to put pressure on the students for them to perform well in the public examinations, to help build the reputation of their schools. These factors may explain why teacher stressor contributes to frustration symptoms for the secondary cohort but not for the primary cohort, and family stressor contributes to frustration symptoms for the primary cohort, but not for the secondary cohort.

Teacher-student interaction

Schools in China have a higher teacher-student ratio and larger average class size than what is normally seen in developed countries. The official figures for teacher-student ratio are 26.42 in primary schools and 20.92 in junior secondary schools (National Bureau of Statistics of China, 2006). The average class size in Shenzhen is 48.2 for public schools, and 44.7 for private schools (Shenzhen Statistics Bureau, 2006). The large class size practically forces teachers to rely mainly on a traditional lecture type of lesson delivery and limits teachers' ability to pay individualized attention to weaker students. All primary and secondary school teachers in China are subject trained, and each class is assigned a class master/mistress to supervise student behavior. Also, most primary and secondary schools employ ability grouping mechanisms to try to reduce student diversity within the classrooms, which may contribute to labeling and competition within the school. Since Chinese society has a Confucian heritage, the education system has a dual emphasis. On the one hand, it seeks to give attention to group harmony, respect of tradition and rule conformance in the student life aspect (Lee, 1991). On the other hand, it emphasizes competition and an individual effort to achieve. However, given the large class sizes in China, there is reason to believe that teachers will emphasize conformity and rule following in the classroom, and will train students to take responsibility for their own academic performance.. Based on the perceptions of students in the present study, stress from teachers is higher in secondary schools than in primary schools, while social support from teachers is lower in secondary schools than in primary schools. Hence, it appears that when students in China move from primary to junior secondary school, not only do they experience more intense competition, and more pressure from learning and from their teachers, they may also receive less support from their teachers.

Parent-child interaction

Collectivist societies, such as China, are commonly thought to encourage interdependence and connectedness, or relationship patterns in which the development of a person is associated with family loyalty, responsiveness to group expectations, interpersonal togetherness, and obedience to authority figures (Ho, 1994). Chinese parents are expected to discourage such things as the expression of hostility, aggression, and impulsive behavior by the young (Meredith, Abbott, & Shu, 1989). Chinese youth are socialized to think of themselves as being prepared to serve societal rather than individual goals (Lam, 1997). This is in contrast to the emphasis of independence and personal assertiveness as socializing climates among young adolescents, and parenting goals of encouraging freedom of action, refraining from severe restrictiveness, and encouraging self-confidence for exploratory behavior in western societies (Kağitçibaşı, 1996; Triandis, 1995).

In fact, patterns of socialization in families in China are changing:

1. Because of the one-child policy, much attention is centered around the needs of the child within the family.
2. Economic reforms in China and accumulation of wealth have resulted in a change of lifestyle for many families living in the cities with activities such as vacations, dining out and shopping for the latest fashions.
3. Western values promoted in the mass media have also weakened the socialist ideologies and introduced an individualistic dimension to parenting in China (Meredith et al., 1989). Hence, some Chinese parents are now having difficulty in striking a balance between nurturing the child's self-esteem and assertiveness, and teaching him or her to conform to established social norms in a collective society (Fuligni, 1998; Peterson, Cobas, Bush, Supple, & Wilson, 2005).

In the present study, perception of family stressors by secondary girls is slightly higher than that of primary girls, but the perceived support from the family is slightly lower. This suggests that the change in parenting practices when these girls move from primary schools to secondary schools is not drastic. Also, as shown in the structured equation model in Figures 3 and 4, family stress contributes to symptoms of frustration for primary girls but not for secondary girls, while family support reduces symptoms of frustration for secondary girls but not for primary girls. These, together with the increased emphasis on competition and behavioral norms by teachers at the junior secondary level, suggest that although parenting practices have not changed much in the transition from primary to secondary schools, the stress system experienced by these girls is slowly shifting from the family to the school, while the support system from family is becoming more important in order to reduce internal frustration.

Bullying mechanism

In the above section, it has been proposed that female students in Shenzhen are experiencing considerable stress both at home and in school, and that much of it originates from the examination system. Students may internalize the stress and unhappy experiences and become depressed and frustrated. They may externalize these experiences by throwing tantrums, hitting, shouting, and engaging in bullying behaviors. We suggest that (a) the emphasis on rules and

conformity in the junior secondary classrooms, (b) the increased pressure from parents to conform to gender-stereotyped behaviors, (c) the increasing desire to seek approval from peers, and (d) the physical and psychological changes resulting from puberty might have caused older girls to internalize their unhappy experiences. Parents with primary school children are forced to assume a disciplinary role in relation to school work, which gives rise to many conflicts in the family, as well as putting stress on the students, thereby resulting in frustrating experiences.

Why do secondary girls in Shenzhen give vent to their frustration by bullying their peers? One possible explanation is that students may develop the anxiety-reduction mechanism of bullying when they engage in a high frequency of indirect or relational bullying behaviors (Tam & Taki, 2007). In other words, the anxiety-reduction pathway may have been a consequence of people forming a habit of exhibiting aggressive behaviors in an indirect manner.

Thus, findings of the present study should alert Chinese parents and educators to the harmful effect of engaging in indirect or relational bullying by female students. In Chinese schools, common practices of correcting students who bully their peers are scolding and punishment. However, these means of punishment may not be effective when combating covert types of bullying behaviors, especially when the students who engage in such bullying behaviors do so out of internal frustration. If this anxiety-reduction mechanism of bullying is valid, then bullying prevention programmes should focus mainly on helping students with stress management so they can deal with their frustration more positively, by arranging counseling treatments for them, or through the use of less punitive methods such as peer mediation (Barton, 2006; Dillon, 2004).

Findings of the present study also confirm existing evidence about effective parenting and educational practices among Chinese parents and teachers, that *quan jiao* (discipline) requires adults to assert control and governance with care and concern (Chao, 2000; Peterson et al., 2005). That is, parenting and teaching practices employed by the Chinese include supervising, governing and controlling so that order, discipline, self-control and conformity are fostered firmly but not through punitive actions. Such aspects of firm control are complemented by care and concern within the family and the schools that foster both self-esteem and conformity (Wu, 1999).

Conclusion

Previous research on school bullying has hypothesized bullying as either a form of aggression behavior that is stimulated by external stress, or a displaced mechanism triggered to reduce internal anxiety. It has not explained the reasons behind the two different mechanisms. This paper used structural equation modeling to investigate whether school bullying in primary and secondary schools in Shenzhen follows different mechanisms according to site. Findings in the present paper suggest that in Shenzhen, girl bullying in primary schools is a reactive behavior due to irritation by external stressors, while bullying in secondary schools is both stress-induced aggressive behavior and a reaction to external stressors. The authors suggest that the competitiveness of the education system, socialization processes within families and schools, and developmental maturity of females, may be contributing to differences in girl bullying in primary and secondary schools. This suggests that females in China have to deal with competition in the education system and to conform to role models at home and in school, and while they are doing so, they are likely to internalize their frustration and are at a high risk of psychological maladjustment.

There are some limitations in the present findings:

1. The present study has not controlled the socioeconomic background of the students by including it as a variable in the structural equation model. Hence, it is possible that there may be a social class difference in the parent-child interaction as well as in the bullying behaviors of students.
2. The present study considered the psychosocial variables behind bullying, but neglected classroom level factors and school level factors that may also contribute to bullying. We suspect that there are social contexts affecting the different bullying mechanisms and these should be further explored in order to gain a more holistic picture of bullying in school.
3. The present study uses a cross-sectional survey method to study the mechanism of bullying, but has neglected other methods of investigation. In light of the fact that school bullying may be partly a process that involves children's psychological defense mechanisms triggered by external stress, more in-depth investigations employing qualitative approaches may be necessary to probe the psychodynamic of the inner being when it responds to external threats.
4. The present study selected student samples from primary and secondary schools in Shenzhen. These schools may represent the school population in Shenzhen, but cannot represent the general school population in China or elsewhere. Hence the results of this study should not necessarily be generalized to other student populations in China or in other countries.

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