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ORIGINAL ARTICLE

Self-esteem in adolescent aggression perpetrators, victims and perpetrator-victims, and the moderating effects of depression and family support

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Abstract The aims of this study were (1) to examine differences in the level of self-esteem among adolescents with different roles in aggression involvement (aggression perpetrators, victims, perpetrator-victims and neutrals) according to gender and (2) to examine the moderating effects of depression and family support on association between aggression involvement and self-esteem. A total of 8085 adolescents in Taiwan completed questionnaires. The relationships between self-esteem and aggression involvement were examined by multiple regression analysis. The moderating effects of depression and family support on the association between aggression involvement and self-esteem were examined. The results showed that in females, aggression victims had lower self-esteem than those in the other three groups ($t = -2.940$ to 2.173 , $p < 0.05$); however, there was no significant difference in self-esteem among perpetrators, perpetrator-victims, and neutrals ($t = 0.693$ – 0.933 , $p > 0.05$). In males, self-esteem in victims and perpetrator-victims was lower than in neutrals and perpetrators ($t = -3.339$ to -2.704 , $p < 0.01$); however, there was no difference in self-esteem between victims and perpetrator-victims ($t = -1.115$, $p > 0.05$) or between perpetrators and neutrals ($t = -1.396$, $p > 0.05$). Family support had a moderating effect on the association between self-esteem and victimization in males. Depression had a moderating effect on the association between self-esteem and perpetration-victimization and victimization in males. The results indicate that self-esteem in adolescents with different patterns of involvement in aggression is not the same as in those without involvement. The moderating effects of depression and family support should be considered when developing intervention strategies to raise self-esteem in adolescents with aggression involvement. Copyright © 2012, Kaohsiung Medical University. Published by Elsevier Taiwan LLC. All rights reserved.

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Introduction

Aggression is a destructive behavioral expression which can result in pain and discomfort to others. One study found that aggressive behaviors are prevalent among adolescents, and the associations with injury-related health outcomes across countries are very similar [1]. Both aggression perpetration and victimization increase the risks of externalizing and internalizing problems in adolescents [2]. Self-esteem evolves to reflect a person's level of status and acceptance in their social group [3]. A large number of studies on self-esteem have implicated it as a prime factor in a wide variety of mental health and adjustment outcomes [4–6]. These findings support the idea that both involvement in aggression and self-esteem are important issues affecting the health of adolescents. Understanding the association between them may be beneficial in developing strategies to raise self-esteem.

Studies on the relationships between aggression and self-esteem have provided mixed results. Some have found a relationship [7,8] but others did not [9,10]. One possibility for this discrepancy is that the studies did not take the roles of aggression involvement into account. Adolescents can be divided into four groups according to the pattern of their involvement in aggression: pure perpetrators, pure victims, perpetrator-victims, and neutrals. Research has found different distributions for externalization and internalization of problems among these four groups [2]. A previous study showed differences in the level of self-esteem among adolescents with different types of involvement in bullying [11]. Aggression may be related to, but is not the same as, bullying. Differences in the level of self-esteem among adolescents with different types of involvement in aggression warrant further study.

Another possibility for the discrepancy is that there are factors that moderate the relationship between aggression and self-esteem. Research has found that aggression increases the risk of low self-esteem in adolescents [12] and depression may also result in low self-esteem [13]. A relationship between depression and self-esteem in adolescents has also been reported [14]. According to the ecological theory of development [15], good family support can increase adolescent self-esteem [16] and reduce adolescent aggression [17]. The results of these studies support the notion that aggression, depression, and family support together may influence adolescent self-esteem. This raises the possibility that depression and family support may moderate the relationship between adolescent aggression and self-esteem because moderator variables are usually introduced when there is an inconsistent relationship [18]. To the best of our knowledge, no study has examined the moderating effects of depression and family support on the relationship between involvement in aggression and self-esteem.

The aims of the present study were (1) to examine the levels of self-esteem in aggression perpetrators, victims, perpetrator-victims, and neutrals by controlling for the confounding effects of baseline characteristics, depression and family support; and (2) to examine the moderating effects of depression and family support on the association between involvement in aggression and self-esteem in

a large-scale, representative, non-referred Taiwanese adolescent population. Because research has found gender differences in adolescent self-esteem [19], aggression [20], and depression [21], we examined the association between aggression involvement and self-esteem and the moderators among male and female adolescents separately to prevent the confounding effect of gender.

Methods

Participants

This study was a secondary analysis of data from the 2004 Project for the Health of Adolescents in Southern Taiwan, a mental health research program involving adolescents recruited from four counties and three metropolitan areas in southern Taiwan, as described elsewhere [2]. A stratified random sampling strategy was used. Twelve junior high and 19 senior high/vocational schools in urban districts and 11 junior high and 10 senior high/vocational schools in rural districts were randomly selected in southern Taiwan. The classes in these schools were further stratified into three levels based on grades. Some 207 classes with a total of 12,210 adolescent students were randomly selected based on the ratio of students in each grade. The protocol was approved by the Institutional Review Board of Kaohsiung Medical University.

Assessment

Aggression

We used three questions from the Adolescent Aggressive Behaviors Questionnaire [22] to assess the occurrence of aggression in the preceding year. In the past year, (1) Did you hit or kick someone on purpose?; (2) Did you grab or shove someone?; and (3) Did you threaten to hurt someone or take their things? Another three questions were used to ask if participants had been recipients of these same acts of aggression. The response format for these questions was 0 = never, 1 = once, 2 = two to five times, 3 = six to less than 10 times, 4 = 10 to less than 50 times, and 5 = 50 times or more. Participants whose answers were other than "0" to the first three questions were classified as having perpetrated aggression toward others in the preceding year. Participants whose answers were other than "0" to the last three questions were classified as having been victimized by perpetrators. The 2-week test–retest reliability was $\kappa = 0.691\text{--}0.712$ ($p < 0.001$).

Depression

We used the Chinese version of the Center for Epidemiological Studies Depression Scale (CES-D) [23] to assess depressive symptoms in the preceding week. Cronbach's alpha for the CES-D in the present study was 0.93. According to previous studies [24,25], we defined participants whose total CES-D score was higher than 28 as having significant depression.

Self-esteem

Current self-esteem was assessed using the Rosenberg Self-Esteem Scale (RSES), in which high scores indicate high self-

esteem. The RSES was previously used to evaluate the level of self-esteem among Taiwanese adolescents [26]. Cronbach's alpha in the present study was 0.86 and the 2-week test-retest reliability was 0.70.

Family support

We used the Chinese version of the Family APGAR Index (APGAR) to measure subjects' satisfaction with family support [27]. High scores indicate good family support. Cronbach's alpha was 0.84 and the 2-week test-retest reliability was 0.72.

Procedure and statistical analysis

Research assistants explained the purpose, procedure, and privacy for this study to the students in class. Written informed consent was obtained from the adolescents beforehand, and the participants were then invited to complete the research questionnaires anonymously. All students received a gift that was worth NT\$ 33 (US\$ 1) at the end of the assessment. Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) 17.0 software (SPSS, Chicago, IL, USA). According to their responses to questions assessing aggression, the participants were classified into four groups: pure perpetrators, those who perpetrated aggression toward others only; pure victims, those who were victimized by aggression only; perpetrator-victims, those who were involved in perpetrating aggression toward others and who were also victims; and neutrals, those who were not involved in aggression.

Age, self-esteem, and family support were compared among four groups of adolescents with different experiences of aggression involvement by analysis of variance (ANOVA), and *post hoc* Bonferroni correction tests were carried out. The proportions of participants with significant depression were compared by χ^2 test. Head-to-head

comparison of the level of self-esteem between different types of involvement in aggression in males and females was examined by analysis of covariance (ANCOVA) to adjust for the effects of age, depression, and family support. We further used the criteria proposed by Baron and Kenny [18] to examine whether levels of self-esteem were different in the groups with different experiences of aggression involvement in terms of the participants' depression and family support by multiple regression. The collinearity examination was passed because all condition indexes were less than 25. Homoscedasticity was also confirmed [28]. Cook's distance [29] was used to examine the outliers. We considered these as special cases and did not delete them [30]. When we tried to delete these outliers and repeated the multiple regression analysis, we found no significant changes compared with the original analysis. We made inferences at the 0.05 level of significance for all inferential statistical procedures.

Results

A total of 11,111 (91.0%) of the 12,210 adolescents returned written informed consent. Some 8085 (72.8%) participants completed all research questionnaires without omission. Those with missing questionnaire data were more likely to be male ($\chi^2 = 52.113$, $p < 0.001$) and from a junior high school ($\chi^2 = 92.824$, $p < 0.001$). A total of 416 (9.8%) female participants were classified as pure perpetrators, 126 (3.0%) as pure victims, 125 (2.9%) as perpetrator-victims, and 3572 (84.3%) as neutrals. Among males, 825 (21.5%) were classified as pure perpetrators, 167 (4.3%) as pure victims, 381 (9.9%) as perpetrator-victims, and 2473 (64.3%) as neutrals. Comparisons of self-esteem, age, depression and family support among adolescents who had different experiences of involvement in aggression are shown in Table 1.

Table 1 Self-esteem, age, depression and family support in adolescents with involvement in aggression.

	Perpetrators	Victims	PVs	Neutrals	F or χ^2	p	
Female	416	126	125	3572			
Age (y)	14.41 ± 1.64	14.75 ± 1.60	14.74 ± 1.72	14.76 ± 1.72	5.30	0.001	Neutrals > perpetrators
Self-esteem	27.42 ± 5.46	25.83 ± 5.84	26.45 ± 5.71	28.16 ± 5.23	13.32	<0.0001	Neutrals > perpetrators = PVs > victims
Depression	78 (18.8)	35 (27.8)	34 (27.2)	443 (12.4)	53.57	<0.0001	PVs = victims = perpetrators > neutrals
Family support	12.55 ± 3.73	13.59 ± 4.06	12.19 ± 3.76	14.37 ± 3.61	43.99	<0.0001	Neutrals > victims > PVs = perpetrators
Male	825	167	381	2473			
Age (y)	14.70 ± 1.74	14.37 ± 1.67	14.74 ± 1.69	14.78 ± 1.8)	2.93	0.03	Neutrals = perpetrators = PVs > victims
Self-esteem	28.46 ± 5.14	27.63 ± 5.61	27.06 ± 5.40	29.20 ± 5.49	21.24	<0.0001	Neutrals > perpetrators > PVs, Neutrals > victims
Depression	91 (11.0)	26 (15.6)	77 (20.2)	191 (7.7)	65.04	<0.0001	PVs = victims > perpetrators > neutrals
Family support	12.88 ± 3.63	13.65 (3.71)	12.29 ± 3.75	13.67 ± 3.79	20.68	<0.0001	Neutrals = victims > perpetrators = PVs

Data are presented as mean ± SD or n (%).

PV = perpetrator-victim.

Results for investigation of the association between aggression involvement and self-esteem in female adolescents are shown in Table 2. The results indicate that after controlling for the effects of age, depression, and family support, female aggression victims had lower self-esteem than those in the other three groups. However, there were no significant differences in self-esteem among perpetrators, perpetrator-victims, and neutrals.

Results for investigation of the association between aggression involvement and self-esteem in male adolescents are also shown in Table 2. The results indicate that levels of male self-esteem in victims and perpetrator-victims were lower than those in neutrals and perpetrators. However, there was no difference in self-esteem between victims and perpetrator-victims, or between perpetrators and neutrals.

The results also reveal that family support was positively associated with self-esteem in all types of aggression involvement. On the contrary, depression was negatively associated with self-esteem in all types of aggression involvement. To examine the moderating effects, we included the interactions between aggression involvement and depression and between aggression involvement and family support in multiple regression analysis. Results for the moderating effects of family support and depression are shown in Table 3. In females, neither depression nor family support moderated the relationship between aggression involvement and self-esteem. In males, the interaction between aggression involvement and family support was positively associated with self-esteem when comparing victims and neutrals. This positive interaction effect means that the difference in self-esteem between male pure victims and neutrals who perceived higher family support was less significant than that between victims and neutrals perceiving lower family support. There was no moderating effect of family support on the relationship between aggression involvement and self-esteem in male perpetrator-victims and neutrals. The interaction between aggression involvement and family support was positively associated with self-esteem when comparing victims and perpetrators. This positive interaction effect meant the difference in self-esteem between male pure victims and perpetrators perceiving higher family support was less significant than that between victims and perpetrators perceiving lower family support.

The interaction between aggression involvement and depression was positively associated with self-esteem when comparing male victims and neutrals. We further examined differences in the level of self-esteem between male victims and neutrals with regard to depression. The results show that self-esteem in male victims without significant depression was lower than in male neutrals without depression (28.40 ± 5.20 vs. 29.80 ± 5.05 , $p = 0.007$). However, there was no difference in the level of self-esteem between male victims and neutrals with depression (23.00 ± 5.57 vs. 22.11 ± 5.57 , $p > 0.05$).

The interaction between aggression involvement and depression was positively associated with self-esteem when comparing male perpetrator-victims and neutrals. We further analyzed the relationship and found that there was no significant difference in self-esteem between male perpetrator-victims and neutrals with depression

(23.26 ± 5.29 vs. 22.11 ± 5.57 , $p > 0.05$). However, self-esteem in male perpetrator-victims without depression was lower than in male neutrals without depression (28.03 ± 4.99 vs. 29.80 ± 5.05 , $p < 0.001$).

Discussion

We found that among females, victims had the lowest level of self-esteem among the four groups. Male victims had lower self-esteem than neutrals and perpetrators; however, there were no significant differences in self-esteem between male victims and perpetrator-victims. Our results support the idea that levels of self-esteem are not the same in adolescents with different patterns of involvement in aggression. An early theory proposed that self-esteem is a basic human need, the need for respect from others, and the need for self-respect [6]. Modern theories of self-esteem explore the reasons why humans are motivated to maintain high regard for themselves, and self-esteem can be defined as how favorably a person evaluates himself or herself in consideration of social acceptance [31]. Of special note, the sociometer theory suggests that self-esteem evolves to reflect a person's level of status and acceptance in his or her social group [3]. Therefore, in both early and modern theories, self-esteem is associated with respect from or acceptance by peer groups. Aggression victimization may result in bad feelings in victims about peers not liking or rejecting them and, even further, feeling helpless or hopeless about stopping the hurtful behavior of others towards them [32,33]. These negative experiences may partly account for why a lower level of self-esteem develops in victims of both sexes. We found that aggression perpetrators had higher self-esteem than victims for both sexes. Baumeister and colleagues found that aggression may be a coping strategy in directing anger outwards as a way of avoiding a downward revision of self-concept [34]. The high level of self-esteem in perpetrators may result from this psychological defense mechanism [34,35].

The results also reveal a gender difference in the association between self-esteem and involvement in aggression. While male perpetrator-victims had lower self-esteem than perpetrators, no difference in self-esteem was found between female perpetrator-victims and perpetrators. Conversely, while no difference in self-esteem was found between male perpetrator-victims and victims, female perpetrator-victims had higher self-esteem than female victims. Thus, male perpetrator-victims had similar self-esteem levels to victims, but female perpetrator-victims had similar self-esteem levels to perpetrators. Previous studies found that aggression victimization is a risk factor for aggression perpetration in the future [36,37]. In addition, aggression perpetrators also have a high risk of becoming victims later [34,38]. Therefore, either perpetrators or victims may become perpetrator-victims later. We hypothesized that the gender difference in the self-esteem of perpetrator-victims may be due to a gender difference in the origin of perpetrator-victims. This warrants further study.

We found that both depression and family support were independently associated with a low level of self-esteem in

Table 2 Association between aggression involvement and self-esteem in female and male adolescents, controlling for the effects of age, depression, and family support.

	β	t	β	t	β	t	β	t	β	t	β	t
Female												
Perpetrators vs. neutrals	0.013	0.933										
Victims vs. neutrals			-0.042	-2.940**								
Perpetrator-victims vs. neutrals					-0.003	-0.235						
Perpetrator-victims vs. perpetrators							-0.026	-0.693				
Perpetrator-victims vs. victims									0.123	2.173*		
Victims vs. perpetrators											-0.094	-2.193*
Age	-0.066	-4.728***	-0.065	-4.502***	-0.065	-4.524***	-0.069	-1.829	-0.020	-0.361	-0.097	-2.268*
Depression	-0.334	-23.305***	-0.331	-22.226***	-0.331	-22.203***	-0.378	-9.753***	-0.389	-6.698***	-0.348	-8.244***
Family support	0.268	18.547***	0.271	18.277***	0.268	17.929***	0.217	5.622***	0.291	4.969***	0.250	5.877***
Male												
Perpetrators vs. neutrals	-0.022	-1.396										
Victims vs. neutrals			-0.051	-2.929**								
Perpetrator-victims vs. neutrals					-0.056	-3.339**						
Perpetrator-victims vs. perpetrators							-0.071	-2.704**				
Perpetrator-victims vs. victims									-0.050	-1.155		
Victims vs. perpetrators											-0.093	-2.827**
Age	-0.049	-3.091**	-0.056	-3.199***	-0.055	-3.270**	-0.033	-1.263	-0.075	-1.763	-0.028	-0.839
Depression	-0.311	-19.454***	-0.313	-17.698***	-0.307	-17.824***	-0.292	-10.711***	-0.232	-5.303***	-0.300	-8.907***
Family support	0.246	15.282***	0.267	15.037***	0.253	14.678***	0.215	7.930***	0.320	7.114***	0.245	7.261***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. β = standardized beta coefficient.

Table 3 Moderating effect of depression and family support on self-esteem in female adolescents, controlling for the effects of age, depression, and family support.

	β	t	β	t	β	t	β	t	β	t	β	t
Female												
Perpetrators vs. neutrals	0.006	0.331										
Victims vs. neutrals			-0.042	-2.494**								
Perpetrator-victims vs. neutrals					-0.015	-0.783						
Perpetrator-victims vs. perpetrators							-0.040	-0.801				
Perpetrator-victims vs. victims									0.125	1.815		
Victims vs. perpetrators											-0.085	-1.707
Age	-0.066	-4.720***	-0.065	-4.502***	-0.065	-4.525***	-0.070	-1.835	-0.023	-0.389	-0.096	-2.239*
Depression	-0.334	-21.539***	-0.332	-21.612***	-0.332	-21.585***	-0.382	-8.381***	-0.376	-4.947***	-0.347	-7.097***
Family support	0.273	17.739***	0.269	17.799***	0.271	17.777***	0.225	5.130***	0.301	4.000***	0.235	4.782***
Aggression involvement \times depression	0.000	0.001	0.005	0.298	0.003	0.139	0.006	0.111	-0.021	-0.263	0.000	0.003
Aggression involvement \times family support	-0.015	-0.871	0.008	0.508	-0.922	-0.356	-0.020	-0.376	-0.018	-0.218	0.032	0.634
Male												
Perpetrators vs. neutrals	-0.048	-2.644**										
Victims vs. neutrals			-0.050	-2.614**								
Perpetrator-victims vs. neutrals					-0.090	-4.353***						
Perpetrator-victims vs. perpetrators							-0.076	-2.342*				
Perpetrator-victims vs. victims									-0.128	-2.503*		
Victims vs. perpetrators											-0.056	-1.426
Age	-0.046	-2.940**	-0.054	-3.099***	-0.054	-3.208**	-0.034	-1.289	-0.058	-1.344	-0.023	-0.700
Depression	-0.339	-17.591***	-0.326	-17.461***	-0.346	-17.403***	-0.322	-8.998***	-0.279	-3.700***	-0.313	-8.441***
Family support	0.246	15.282***	0.254	13.943***	0.255	13.900***	0.204	6.206***	0.466	6.550***	0.207	5.727***
Aggression involvement \times depression	0.051	2.514*	0.049	2.411*	0.082	3.724***	0.052	1.343	0.055	0.696	0.033	0.805
Aggression involvement \times family support	-0.030	-1.485	0.054	2.806**	-0.008	-0.377	0.024	0.622	-0.205	-2.636**	0.114	2.873**

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. β = standardized beta coefficient.

adolescent aggression perpetrators, victims, and perpetrator-victims. Lower family support and more severe depression were associated with lower self-esteem. Previous results showed that both reducing depression and enhancing family support may result in increased self-esteem [39,40]. Although these studies did not take aggression involvement into account, our results may support the idea that improving depression and enhancing family support are essential for the development of strategies to increase self-esteem in adolescents with different aggression involvement.

Another important finding is that family support and depression are moderators of the association between involvement in aggression and self-esteem in male adolescents for some patterns of involvement. We found that family support was a moderator for the association between victimization and self-esteem in males. This result indicates that high family support may have a buffer effect on self-esteem in male pure victims. It also highlights the notion that enhancement of family support is essential when addressing the issue of self-esteem in male adolescents who are pure victims of aggression.

We also found that depression has a moderating effect on the association between involvement in aggression and self-esteem in male perpetrator-victims and victims. Statistical analysis reveal significantly positive effects of the interaction between perpetration-victimization and depression and of the interaction between victimization and depression on self-esteem. This may counteract the effects of perpetration-victimization and victimization on self-esteem because the levels of the effects were similar but in the opposite direction. Therefore, perpetrator-victims without significant depression had lower self-esteem than neutrals without significant depression. No significant differences in the level of self-esteem were found between perpetrator-victims and neutrals with depression, or between victims and neutrals with depression. One possible explanation is that the association between depression and low self-esteem is so strong that being a perpetrator-victim or victim has no additional negative effect on self-esteem.

Methodological considerations

This study examined several issues that have drawn research attention recently, such as comparison of the level of self-esteem among adolescents with different types of aggression involvement and examining the moderating effects of depression and family support according to gender. Selection bias was minimized by sampling participants from a non-referred representative school-based sample. However, some limitations of this study should be addressed. First, determining causal relationships between aggression involvement and self-esteem was not the main aim of this study, as the cross-sectional research design limited our ability to draw these conclusions. The cross-sectional design also limited the possibility of determining the definite roles of moderators found in this study. For example, although we found that depression had a moderating effect on the association between self-esteem and perpetration-victimization and victimization in males, it is

also possible that high self-esteem can protect the effect of aggression to depression. Second, the data were self-reported by the adolescents, and some factors, such as aggression involvement, are difficult to validate. Third, we recruited school-going adolescent students as the research population; adolescents who had dropped out of school or attended night school were not recruited, and they may have different patterns of involvement in aggression. Fourth, there might have been a recall bias when participants reported their involvement in aggression in the preceding year.

Implications

According to the study results, male victims and perpetrator-victims had lower levels of self-esteem than perpetrators and neutrals. Female victims had lower self-esteem than perpetrator-victims, perpetrators, and neutrals. Depression and low family support not only had direct associations with low self-esteem in both male and female adolescents, but also had moderating effects on the association between aggression involvement and self-esteem in male adolescents for some types of aggression involvement. These results can serve as a basis for developing individual strategies to increase self-esteem in adolescents involved in aggression.

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References

- [1] Simpson K, Janssen I, Craig WM, Pickett W. Multilevel analysis of associations between socioeconomic status and injury among Canadian adolescents. *J Epidemiol Community Health* 2005;59:1072–7.
- [2] Yen CF, Ko CH, Yen JY, Tang TC, Chang YP, Cheng CP. Internalizing and externalizing problems in adolescent aggression perpetrators, victims, and perpetrator-victims. *Compr Psychiatry* 2010;51:42–8.
- [3] Leary MR, Tambor ES, Terdal SK, Downs DL. Self-esteem as an interpersonal monitor: the sociometer hypothesis. *J Pers Soc Psychol* 1995;68:518–30.
- [4] Andrews B, Brown GW. Stability and change in low self-esteem: the role of psychosocial factors. *Psychol Med* 1995; 25:23–31.
- [5] Dori GA, Overholser JC. Depression, hopelessness, and self-esteem: accounting for suicidality in adolescent psychiatric inpatients. *Suicide Life Threat Behav* 1999;29:309–18.
- [6] Maslow AH, Frager R. *Motivation and personality*. 3rd ed. New York: Harper and Row; 1987.
- [7] Donnellan MB, Trzesniewski KH, Robins RW, Moffitt TE, Caspi A. Low self-esteem is related to aggression, antisocial behavior, and delinquency. *Psychol Sci* 2005;16:328–35.
- [8] O'Donnell L, Stueve A, Wilson-Simmons R. Aggressive behaviors in early adolescence and subsequent suicidality among urban youths. *J Adolesc Health* 2005;37:517.
- [9] Barry TD, Thompson A, Barry CT, Lochman JE, Adler K, Hill K. The importance of narcissism in predicting proactive and

- reactive aggression in moderately to highly aggressive children. *Aggress Behav* 2007;33:185–97.
- [10] Boden JM, Fergusson DM, Horwood LJ. Self-esteem and violence: testing links between adolescent self-esteem and later hostility and violent behavior. *Soc Psychiatry Psychiatr Epidemiol* 2007;42:881–91.
- [11] O'Moore M, Kirkham C. Self-esteem and its relationship to bullying behaviour. *Aggressive Behav* 2001;27:269–83.
- [12] Robins RW, Donnellan MB, Widaman KF, Conger RD. Evaluating the link between self-esteem and temperament in Mexican origin early adolescents. *J Adolesc* 2010;33:403–10.
- [13] Guillon MS, Crocq M-A, Bailey PE. The relationship between self-esteem and psychiatric disorders in adolescents. *Eur Psychiatry* 2003;18:59–62.
- [14] Dishman RK, Hales DP, Pfeiffer KA, Felton GA, Saunders R, Ward DS, et al. Physical self-concept and self-esteem mediate cross-sectional relations of physical activity and sport participation with depression symptoms among adolescent girls. *Health Psychol* 2006;25:396–407.
- [15] Lerner RM, Castellino DR. Contemporary developmental theory and adolescence: developmental systems and applied developmental science. *J Adolesc Health* 2002;31:122–35.
- [16] Juhasz AM. Significant others and self-esteem: methods for determining who and why. *Adolescence* 1989;24:581–94.
- [17] Brookmeyer KA, Fanti KA, Henrich CC. Schools, parents, and youth violence: a multilevel, ecological analysis. *J Clin Child Adolesc Psychol* 2006;35:504–14.
- [18] Baron RM, Kenny DA. The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J Pers Soc Psychol* 1986;51:1173–82.
- [19] Bachman JG, O'Malley PM, Freedman-Doan P, Trzesniewski KH, Donnellan MB. Adolescent self-esteem: differences by race/ethnicity, gender, and age. *Self Identity* 2011;10:445–73.
- [20] Card NA, Stucky BD, Sawalani GM, Little TD. Direct and indirect aggression during childhood and adolescence: a meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Dev* 2008;79:1185–229.
- [21] Naninck EFG, Lucassen PJ, Bakker J. Sex differences in adolescent depression: do sex hormones determine vulnerability? *J Neuroendocrinol* 2011;23:383–92.
- [22] McConville DW, Cornell DG. Aggressive attitudes predict aggressive behavior in middle school students. *J Emot Behav Disord* 2003;11:179–87.
- [23] Chien CP, Cheng TA. Depression in Taiwan: epidemiological survey utilizing CES-D. *Seishin Shinkeigaku Zasshi* 1985;87:335–8.
- [24] Garrison CZ, Addy CL, Jackson KL, McKeown RE, Waller JL. The CES-D as a screen for depression and other psychiatric disorders in adolescents. *J Am Acad Child Adolesc Psychiatry* 1991;30:636–41.
- [25] Yang HJ, Soong WT, Kuo PH, Chang HL, Chen WJ. Using the CES-D in a two-phase survey for depressive disorders among nonreferred adolescents in Taipei: a stratum-specific likelihood ratio analysis. *J Affect Disord* 2004;82:419–30.
- [26] Yen CF, Yen JY, Liu SC, Huang CF, Ko CH. Concern over weight and dieting in Taiwanese adolescents: correlations of gender, age, weight, and multidimensional characteristics. *J Nerv Ment Dis* 2009;197:202–6.
- [27] Chau TT, Hsiao TM, Huang CT, Liu HW. [A preliminary study of family APGAR index in the Chinese]. *Kaohsiung J Med Sci* 1991;7:27–31.
- [28] Siegel S. *Nonparametric statistics for the behavioral sciences*. New York: McGraw-Hill; 1956.
- [29] Cook RD, Weisberg S. *Residuals and influence in regression*. New York: Chapman and Hall; 1982.
- [30] Lang TA, Secic M. In: *How to report statistics in medicine: annotated guidelines for authors*. 2nd ed. New York: American College of Physicians; 2006.
- [31] Baumeister RF, Bushman BJ. *Social psychology and human nature*. Brief ed. Belmont, CA: Thomson Higher Education; 2008.
- [32] Ladd GW. Peer rejection, aggressive or withdrawn behavior, and psychological maladjustment from ages 5 to 12: an examination of four predictive models. *Child Dev* 2006;77:822–46.
- [33] Ladd GW, Kochenderfer-Ladd B. Identifying victims of peer aggression from early to middle childhood: analysis of cross-informant data for concordance, estimation of relational adjustment, prevalence of victimization, and characteristics of identified victims. *Psychol Assess* 2002;14:74–96.
- [34] Baumeister RF, Smart L, Boden JM. Relation of threatened egotism to violence and aggression: the dark side of high self-esteem. *Psychol Rev* 1996;103:5–33.
- [35] Baumeister RF. *Evil: inside human violence and cruelty*. New York: W.H. Freeman; 1999.
- [36] Champion HL, Durant RH. Exposure to violence and victimization and the use of violence by adolescents in the United States. *Minerva Pediatr* 2001;53:189–97.
- [37] Borum R. Assessing violence risk among youth. *J Clin Psychol* 2000;56:1263–88.
- [38] Shaffer JN, Ruback RB. Violent victimization as a risk factor for violent offending among juveniles [electronic resource]. Washington, DC: Office of Juvenile Justice and Delinquency Prevention, US Department of Justice; 2002.
- [39] Brown GW, Bifulco A, Andrews B. Self-esteem and depression. IV. Effect on course and recovery. *Soc Psychiatry Psychiatr Epidemiol* 1990;25:244–9.
- [40] Kuhlberg JA, Pena JB, Zayas LH. Familism, parent–adolescent conflict, self-esteem, internalizing behaviors and suicide attempts among adolescent Latinas. *Child Psychiatry Hum Dev* 2010;41:425–40.