Deviant Behavior

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/udbh20

The Effects of Classroom Anger, Strain, and Negative Emotions on Delinquency among Vocational School Students in China

Jinwu Zhang , Jianhong Liu , Shan Cui & Honglan Shuai

To cite this article: Jinwu Zhang , Jianhong Liu , Shan Cui & Honglan Shuai (2020): The Effects of Classroom Anger, Strain, and Negative Emotions on Delinquency among Vocational School Students in China, Deviant Behavior, DOI: 10.1080/01639625.2020.1789293

To link to this article: https://doi.org/10.1080/01639625.2020.1789293

Published online: 01 Jul 2020.

DEVIANT BEHAVIOR
https://doi.org/10.1080/01639625.2020.1789293

Routledge
Taylor & Francis Group

The Effects of Classroom Anger, Strain, and Negative Emotions on Delinquency among Vocational School Students in China

Jinwu Zhang, Jianhong Liu, Shan Cui, and Honglan Shuai

University of Macau, Macau, China

ABSTRACT

General Strain Theory delineates the intervening paths from strain to deviance and crime, mediated by negative emotions. In addition to explaining individual strain-delinquency relationships, a macro version of General Strain Theory describes the effects of aggregate variables on individual delinquency and individual strain-delinquency associations. Using a sample of 902 students (Individual Level) nested in 30 classrooms (Classroom Level), the present study tests the macro version of General Strain Theory using Chinese data. The results revealed the differences among classrooms for their delinquency and provided evidence that classroom anger had an influence on individual delinquency. Classroom anger also reinforced the individual strain-delinquency and negative affect-delinquency associations. Limitations and future studies were discussed.

ARTICLE HISTORY
Received 23 March 2020
Accepted 17 June 2020

General Strain Theory (GST) has been utilized to explain individual delinquency. The macro version of General Strain Theory was also delineated to investigate the differences of crime rates among social collectives, such as communities or schools, and such version of General Strain Theory was titled MST (Op de Beeck, Pauwels, and Put 2012). A school is an important place for adolescents to be socialized, and some studies have focused on the school environment to explain juvenile delinquency within the framework of MST (Zhang et al. 2018). Considering most juveniles spend most of their time in classrooms interacting with classmates and teachers, the classroom environment is important to understanding adolescents' behavior. The present study contributes to the literature by utilizing MST to investigate the classroom environment's effects on delinquency in China for the first time.

General Strain Theory (GST)

General Strain Theory (GST) entails that various types of strain can produce negative emotions, especially anger and depression. Such negative affect increases the likelihood of delinquency. Strain is defined as negative relationships with others in which individuals are treated in ways they would not like to be treated. Three types of strain are especially important: failure to achieve positively valued goals; loss of positively valued stimuli; and presence of negatively valued stimuli (Agnew 1992).

The first type of strain focuses on relations in which others prevent adolescents from achieving positively valued goals, as has been described by the classic strain theories of R. Merton, A. Cohen, and R. Cloward and L. Ohlin. This type of strain comprises disjunction between aspirations (ideal goals) and actual achievements, disjunction between expectations (mostly income expectations) and actual achievements, and disjunction between just/fair outcomes and actual outcomes. The second type of strain points to the removal from or loss of positively valued stimuli by an adolescent, such as the loss of boyfriend/girlfriend, the death of a friend or relative, or the divorce of parents. The third type of

CONTACT Jianhong Liu Jliu@umac.mo Faculty of Law, University of Macau

strain involves the presence of negative stimuli such as child abuse, physical punishment, negative relations with peers or parents, verbal insults, noise, or high density (Agnew 1992).

Negative affect serves as an important link between strain and delinquency, which mediates the effects of strain on delinquency, and a pathway of strain, negative emotions, and delinquency was presumed. Individuals may generate negative emotions such as anger, resentment, depression, and anxiety when they are confronted with strain, and one coping strategy toward those negative emotions may be delinquent behavior. Adolescents are pressured into delinquency by the negative emotions generated from strain (Agnew 1992). Propositions about the effects of negative emotions have received empirical support (Bao, Haas, and Yijun 2004). On the other hand, personal traits and environment will also influence the individual's coping choice, such as individual's problem-solving skills, low socioeconomic status (Agnew 1992, 2013).

Anger is the most critical emotional reaction among the negative emotions within the GST framework. Anger increase an individual's feeling of injury, creates a desire for revenge, and lowers inhibitions (Agnew 1992). Delinquent activities, especially interpersonal violence or aggression, can be possible responses to strain when anger creates a desire for corrective steps (Agnew 1992; Brezina, Piquero, and Mazerolle 2001). The linking mechanism of anger among strain and delinquency has been testified by previous studies (Agnew 1985; Broidy 2001; but see Mazerolle et al. 2000).

GST has been regarded as one of the most important criminological theories since its introduction and extensive empirical support was obtained in the United States (Agnew et al. 2002; DeLisi 2011; Hoffmann and Ireland 2004; Mazerolle and Maahs 2000; Ostrowsky and Messner 2005) and other countries (Bao, Haas, and Yijun 2004, 2007; Botchkovar and Broidy 2013; Cheung and Cheung 2009; Moon, Morash, and McCluskey 2012; Wang et al. 2020). For Asian contexts, Agnew (2015) argued that GST is quite applicable to Asian societies and has the potential to shed much light on the causes of crime in Asian societies.

Focusing on individual delinquency, Agnew (1992) noticed the influence of macro-level variables on individuals' selection of delinquent or non-delinquent behavior to cope with strain. Social environment may affect an individual's emphasis on the goals of money and status, so that the individual may find it difficult to minimize the importance of money or status. Adolescents may find it difficult to handle negative relationships with school or family without enough resources. Adolescents in certain social environments may find applying non-delinquent coping strategies difficult or have little choice in them (Agnew 1992).

MST and classroom delinquency

In addition to explaining individual strain-delinquency relationships, a contextual version of GST was specified to analyze community or group differences in crime rates, leading to the creation of Macro General Strain Theory or MST (Agnew 1999; Brezina, Piquero, and Mazerolle 2001). Agnew (1999) argued that communities with certain aggregated characteristics tend to generate the loss of positive stimuli and/or the presence of negative stimuli, and create obstacles for individuals' economic goals, and that these communities are more likely to witness higher levels of crime rates. The key proposition of MST is that community or aggregate variables are correlated with aggregate crime, and have effects on individual criminal responses to strain.

MST highlights on the effect of community or group characteristics on individual strain. Communities with such characteristics as economic deprivation, inequality, overcrowding, or high population mobility are more likely to select or retain strained individuals, causing goal blockage and presence of negative stimuli to those strained individuals. Residents' negative emotions may be increased and aggregated levels of anger may have direct effects on aggregate crime rates. Individuals in these communities or groups have a higher frequency of interaction with other angry/frustrated residents, which may magnify their own anger. On the other hand, high rate of crime or high level of delinquency in these communities or groups functions as an important source of individual strain (Agnew 1999).

MST specifies a multilevel framework: the upper or aggregate level (level 2 or group level) focuses on group characteristics and group differences of delinquency or crime. The lower level (level 1 or individual level) focuses on individual strain and crime/delinquency. At the group level, aggregated strain, negative affect, and other social variables are correlated to group delinquency, and aggregate characteristics have an effect on individual strain-delinquency relationships (Agnew 1999; Brezina, Piquero, and Mazerolle 2001). Higher concentrations of strain or negative emotions at aggregate level would prompt individual strain and individual delinquency, and individual strain-delinquency relations are also influenced by other aggregate variables (Agnew 1999).

Most MST studies have investigated the relationships between neighborhood factors and delinquency (Burns 2009; Hoffmann 2003; Sexton 2011; Vincent 2011; Wareham et al. 2005), and some have examined the effects of school-level variables on delinquency and deviance (Brezina, Piquero, and Mazerolle 2001; Cheung and Cheung 2009; Hoffmann and Ireland 2004; Op de Beeck, Pauwels, and Put 2012). Much attention may be paid to ecological settings such as schools, in which adolescents spend most of their time (Op de Beeck, Pauwels, and Put 2012). More specifically, certain schools attract more strained adolescents and produce more strain and illegitimate opportunities (Brezina, Piquero, and Mazerolle 2001; Hoffmann and Ireland 2004; Op de Beeck, Pauwels, and Put 2012; Zhang et al. 2018; Chen and Cheung 2020).

Classroom contexts are important in affecting adolescents' social behaviors. For example, researchers found that peer acceptance of aggression, social withdrawal, and other social behaviors varied across primary school classes. Evaluating 2895 children in 134 regular first-grade classrooms, classroom levels of aggression were verified concerning their effects on the relationship between child aggression and peer preference, as aggressive behavior was more likely to lead to low peer preference when it was nonnormative in the classroom context (Stormshak et al. 1999).

The aggregate of classmates' aggression and delinquency demonstrates a significant influence on individual antisocial behavior in secondary school. Researchers found that the higher the level of antisocial behavior aggregated over classmates, the more individual antisocial behavior will be recorded later. The levels of student antisocial behavior may increase when hosted in classrooms with a high proportion of more antisocial students. Conversely, students with high levels of such behavior may show lower levels when they are hosted in classes with more prosocial classmates (Müller et al. 2016).

In a study conducted in Chile among seventh graders, it was found that the level of marijuana use among the classmates was correlated to individual consumption. Utilizing the theoretical framework indicating that social control mechanisms work into social learning peer processes, researchers found that the classroom may increase or decrease marijuana use among students, in the sense that individual marijuana use was strongly associated with marijuana tolerance at the classroom level (Araos et al. 2014). The above studies explored the correlates of classroom-level delinquency. However, we could hardly find any publication investigating classroom-level delinquency using an MST framework.

Conditioning factors

A critical issue is that some strained individuals commit criminal behavior while some not. Whether people adopt delinquency to cope with strain is conditioned by various factors (Agnew 1999). Variables from other theories, such as social control theory (Hirschi 1969) and social learning theory, have been considered as influential factors in pathways from strain to crime. Such variables were controlled or included in the data analyses in many GST and MST studies. In an integrated model of GST, Agnew (2006) argued that strain will lead to delinquency via weakened social control and increased delinquent peer affiliation, apart from the mediating effect of negative emotions. Repeated strain may lead to the attenuation of social bonds, and also reduce the attachment to significant others, adherence to conventional beliefs and the commitment to conventional institutions. Social norms and

values may have less socializing effect, and strained individuals may be more likely to adopt delinquent ways to fulfill personal interests (Bao et al. 2014).

Similarly, strain may also reinforce the learning of and cognitive justification for delinquent behavior, and get individuals to join delinquent groups (Agnew 2006; Bao et al. 2014). For example, individuals who were abused in childhood might have learned violent behavior and developed cognitive justification for it at a young age. Delinquent affiliation also serves as a key mediating factor between strain and delinquency.

The mediating effects of social control and delinquent peers have received much empirical support (Bao et al. 2014; Jang and Rhodes 2012; Paternoster and Mazerolle 1994). Along with extensive research testing GST, more studies are necessary to employ a comprehensive or integrated model to test GST and its relationships with other criminological theories. Paternoster and Mazerolle's work in 1994 explored the relationship between GST and other criminological theories utilizing a comprehensive model. They found that strain has significant direct effects on social control and delinquent peer affiliation, which in turn have significant effects on delinquency. Such results indicated that strain leads to delinquency via reducing social control and increasing association with delinquent peers.

The present study

Sone MST studies in China focusing on school-level characteristics were found. One of those studies revealed that vocational schools have higher levels of delinquency than high schools, which raised the demand for investigating social variables correlated with delinquency in vocational schools (Zhang et al. 2018). From a multilevel perspective, examining the environment of classroom could shed much light on the correlates of delinquency inside vocational schools.

Associations between classroom-level correlates and antisocial behavior have been well documented, but less is known about how the aggregate of classmates' behavior influences individual-level delinquency (Müller et al. 2016). Meanwhile, it is difficult to find an MST study examining the contextual effects of classroom-level variables on individual delinquency. To fill this gap, the present study applies MST at classroom level and focuses on investigating the effects of classroom anger on individual strain-delinquency and negative emotion-delinquency associations. Hypotheses are as follows:

H1: Classroom-level anger is a significant predictor of classroom-level delinquency.

H2: There is significant variation of delinquency across classrooms。

H3: Individual negative affect is significantly correlated with individual delinquency.

H4: Classroom-level anger will amplify the effect of individual negative emotions on individual delinquency.

Method

Participants

The data came from Guangzhou, the third largest city in China. At the end of 2015, the resident population in Guangzhou was 13.50 million. According to the *Guangzhou Yearbook 2013* published by the local government, there were 220 schools (including high schools and vocational schools) in Guangzhou hosting grade 10 to grade 13 students. In high schools, students study hard to prepare for the College Entrance Examination *(Gao Kao)*, and those who gain high enough scores can be admitted

by universities and colleges. On the other hand, students in vocational schools do not have the chance to attend the College Entrance Examination. Established in 1978, the vocational education system aimed to provide Chinese society with a trained labor force equipped with technical skills and to enable the graduates to enter the labor market to start their working career. According to the *China Statistics Yearbook* of 2010 issued by the National Bureau of Statistics of the People's Republic of China, the totals of enrolled high school and vocational students at the end of 2010 were 24.273 million and 22.318 million, respectively.

The survey of the present study was conducted in 2015; six vocational schools were selected randomly from the list provided by the Guangzhou Bureau of Education. The six vocational schools were located in four districts in Guangzhou, and the population of students in each school ranged from 3000 to 5000. A total of 902 participants were selected among grade 10 students in 30 classrooms from these vocational schools, using a cluster sampling method. Classrooms were sampled from lists provided by relevant vocational schools. In every school, five grade 10 classes were randomly selected, and all of the students in the class were invited to participate in the study. Informed consent was obtained. The students filled out and answered the questionnaire using the self-report method through group interviews without their teacher present. The response rate was 97%.

Measurements

Dependent variable: Delinquency. Delinquency was measured by counting the number of different offenses the respondent reported in the previous 12 months, such as fare dodging, damaging public property on purpose, stealing something from a shop or department store, breaking into a building to steal something, stealing a bicycle, using a weapon, using or threatening to use force to get money or things from someone, carrying a weapon, such as a stick, knife, gun, or chain, taking part in a group fight on the street or in another public place, beating someone up or hurting someone with a stick or knife so badly that the person was injured.

Level 1 independent variables: strain and conditioning factors

Strain was measured by the Adolescent Self-Rating Life Events Check List (ASLEC), which specifies individuals' negative life events. The ASLEC comprised 27 items and asked respondents if they had experienced negative life events during the previous 12 months, such as being misunderstood or blamed wrongly by others, being discriminated, failure in exams, conflicts with schoolmates or friends, changes in lifestyle, reluctance to go to school, breakup of a romantic relationship, isolation from family members, heavy study loads, conflicts with teachers or family members, death of a friend or family member, being disgraced in front of others, being victim of theft, conflicts within the family, seeing expectations for achievements being frustrated, being criticized, transfer to another school, being fined, sickness, family financial difficulties, or being slapped or scolded by parents. These events tapped into the definitions of different types of objective strain in GST: failure to achieve positive goals, loss of positive stimuli, and the presence of negative stimuli. All items were dichotomized (0 = no such experience in the past 12 months; 1 = had experienced this in the past 12 months). An additive index of the 27 items was created, and Cronbach's alpha was.863.

Negative Emotions was measured by asking respondents how often they had felt jealous, ashamed, scared, angry, moody, or nervous in the past 12 months (Op de Beeck, Pauwels, and Put 2012). A six-point scale was applied ranging from "0: never" to "5: every day." Cronbach's alpha of these items was.869.

Social Control was measured by an 18-item instrument consisting of five dimensions: commitment to school; parental attachment; peer attachment; involvement in conventional activities; and conventional beliefs (Chapple, McQuillan, and Berdahl 2005). Higher scores indicate higher social control. Cronbach's alpha of these items was.780.

Delinquent Peer was measured by asking respondents how many of their friends had such activities like theft, force, or threat of force to get money from someone, beating someone, smoking or drinking alcoholics, group fighting on the street or in other public places, or using drugs. A five-point scale was applied ranging from "1 = none of my friends" to "5 = all of my friends." Cronbach's alpha of these items was.892.

Level 1 control variables. The control variables in level 1 were comprised of individual demographics of gender, age, and social-economic status (SES). SES is measured by two items, "How much is your pocket money" and "How do you feel for your family's financial situation," and both utilized five-point scale from "Much better than most classmates" to "Much worse than most classmates."

Level 2 independent variables: Anger. The classroom means of Anger were the classroom-level aggregates of individual-level Anger. Individual Anger was measured by a 10-item scale (Cronbach's alpha of these items was.956), including such items as "I felt angry," "I felt irritated," "I felt like banging on the table," "I felt like yelling at somebody" and "I felt like hitting someone" (Spielberger et al. 1983).

Results

Descriptive statistics

A total of 902 respondents completed the survey, whose mean age was 16.21 (SD = .76, min. = 14 and max. = 17). Table 1 presents the means and standard deviations of the variables used in the present study. Of the 902 students, 426 were male and 476 female. At student level, the mean of Delinquency is 1.24 (SD = .72) with a minimum of 1 and a maximum of 5, and the means of Negative Emotions and strain are 2.32 (SD = .81) and 7.2 (SD = 5.23), respectively. At classroom level, the mean of aggregate Anger is 2.23 (SD = .26) with a minimum of 1.81 and a maximum of 3.33.

Regression analyses

Regression analyses were conducted to examine school-level predictors of aggregated Delinquency, as shown in Table 2. Aggregated Anger (B = .361, $p < .05$) is significantly related to aggregated Delinquency, and so are aggregated Social Control (B = −.439, $p < .001$) and Delinquent Peers

Table 1. Descriptions of level 1 and level 2 variables.

Variables	Mean	SD	Min.	Max.
Level 1 variables (Individual level)				
Delinquency	1.24	.72	1	5
Age	16.21	.76	14	17
SES	5.57	.42	2	10
Negative Emotions	2.32	.81	1	5
Negative Life Events	7.20	5.23	0	26
Social Control	3.64	.46	1.33	5
Delinquent Peers	1.41	.72	1	5
Level 2 variables (Classroom level)				
Anger	2.23	.26	1.81	3.33
Social Control	3.58	.19	3.08	3.85
Delinquent Peers	1.48	.31	1.14	2.06

Table 2. Regression models with standardized coefficients of aggregate variables predicting classroom-level delinquency ($N = 30$).

	Standardized B	*t*	Sig.
Anger	.361	.130	.011
Social control	−.439	.215	.002
Delinquent peers	.339	.151	.019
Adjusted R2	.767		

(B = .339, $p < .05$). This model can explain 76.7% of differences of Delinquency among 30 classrooms (Adjusted R2 = .767).

The results provided support for Hypothesis 1, that classroom anger is a significant predictor of classroom delinquency. Higher classroom levels of anger are correlated with higher levels of aggregate delinquency at classroom level. Higher levels of social control at classroom level indicate lower levels of classroom delinquency, and higher intensity of delinquent peers at classroom level raises the likelihood of higher levels of aggregate delinquency at classroom level.

Effects of classroom anger on individual delinquency

To test the effects of classroom-level anger on individual delinquency, multilevel models were designed in which individual delinquency was the dependent variable. The first step was to test the null model to check whether a significant variation of Delinquency could be found across classrooms. Significant variation was indeed found across classrooms for Delinquency, and Hypothesis 2 was confirmed. The interclass correlation (ICC) of.0647 demonstrated a 6.47% variation of Delinquency across classrooms, as shown in Table 3.

Table 3 also shows the results of HLM, model 1 to model 3. In model 1, individual strain, Negative Emotions, Social Control, and Delinquent Peers were examined for their impacts on Delinquency, after controlling for demographic variables at individual level. Individual strain, Negative Emotions, Social Control, and Delinquent peers were significantly associated with individual Delinquency. Hypothesis 3 that individual negative affect has an impact on individual delinquency was supported. Higher levels of individual strain or Negative Emotions were associated with a higher likelihood of Delinquency.

In model 2, classroom-level Anger was included while all individual variables remained. Aggregate Anger was significantly associated with individual Delinquency. Classrooms with a higher concentration of angry individuals increased the likelihood of deviant behaviors among students. Higher levels of classroom Anger increased the likelihood of individual Delinquency.

Table 3. Multilevel models testing the impact of aggregated anger on individual delinquency.

	Model 0		Model 1		Model 2		Model 3	
	b	SE	b	SE	b	SE	b	SE
Fixed intercept	**1.27**	.042	**1.296**	.479	**1.303**	.043	**1.304**	.043
Level 1 (Student N = 902)								
Gender (Male = 1)			−.005	.050	−.005	.050	−.009	.048
Age			.002	.023	.002	.023	.012	.022
SES			.032	.019	.032	.019	.029	.018
Negative Emotions			**.091**	.034	**.091**	.034	**.010**	.033
Negative Life Events			−.001	.006	−.001	.006	−.001	.006
Social Control			.021	.059	.021	.059	.021	.059
Delinquent Peers			**.730**	.060	**.730**	.060	**.071**	.061
Level 2 (Classroom N = 30)								
Anger					**.662**	.134	**.664**	.134
Cross-level interactions:								
Aggregate Anger*Individual Negative Emotions							**.384**	.149
Aggregate Anger*Individual Negative Life Events							**.051**	.018
Random Level 1	**.0343**		**.0604**		**.0458**		**.0462**	
Level 2	**.4958**		**.2106**		**.2100**		**.2048**	
ICC	.0647		.223		.179		.1840	
DIC	1959.997		1257.402		1246.78		1232.19	

ICC: Intra-class Correlation; DIC: Deviance Information Criterion. Bold statistics: $p < .05$.

Model 3 shows how classroom Anger conditioned the impact of individual negative life events and Negative Emotions on individual Delinquency. A set of cross-level interactions was tested. The results showed that classroom-level Anger significantly influenced the Stress-Delinquency slope at an individual level in such a way that individual strain would have a stronger impact on individual Delinquency when harbored in classrooms with higher concentrations of Anger. Hypothesis 4, that classroom-level anger will amplify the effect of individual negative emotions on individual delinquency, was supported.

Discussion

This study examined how classroom-level anger influences individual delinquency. Results suggested that students in classrooms with higher levels of anger have a higher likelihood of delinquency. On the other hand, individual strain and negative emotions have direct effects on individual delinquency, and such effects are stronger in classrooms that have higher levels of anger.

The results of regression analyses revealed that aggregate anger is a significant predictor of aggregate delinquency at classroom level. Hypothesis 1 was supported; the increase of classroom-level anger will produce a raise in classroom level of delinquency. On the other hand, lower classroom-level anger indicates a lower level of classroom-level delinquency. Aggregate social control and delinquent peers are also significant predictors of aggregate delinquency at classroom level. With more students with strong social bonding to school and parents, higher levels of social control at classroom level will be observed. Increased classroom-level social control lowers the level of delinquency at classroom level. The aggregate of students' delinquent behavior represents the level of classroom delinquency. The higher the proportion of the student population with criminal activities, the higher the level of delinquent peers at classroom level. Higher levels of delinquent peers at classroom level will raise levels of classroom delinquency.

The results of hierarchical linear modeling (HLM) Model 1 provide support to Hypothesis 2 that there is significant variation across classrooms at vocational schools. HLM Model 2 shows that classroom-level anger had a significant influence on individual delinquency, thus supporting the hypothesis that students in classrooms that host an angry population will be more likely to adopt delinquent behaviors. Students attending classrooms that have lower levels of anger will be less likely to have delinquent activities.

In HLM Model 3, cross-level interaction results reveal that the relationship between individual strain and delinquency was reinforced by classroom-level anger, which supports Hypothesis 4. The relationship between individual negative emotions and delinquency was also reinforced by classroom-level anger. Aggregate anger had a positive effect on the individual stress-delinquency slope. Thus, individual strain has a stronger impact on delinquency in classrooms with higher levels of anger. When classroom-level anger is greater, stressed students have a higher likelihood for deviant adaptation.

It should be noticed that the classroom serves as an important context for defining and forming the social relationships and behaviors of adolescents, as adolescents spend most schooltime in the classroom interacting with classmates, and most adolescents have less interactions with students in other classrooms. The findings support the postulation of the social context effect that contextual norms affect behaviors by reinforcing students' strain. Specifically, classroom anger strengthens the association between strain and delinquency, and also the association between negative emotions and delinquency.

The results show differences in crime rates across vocational school classrooms, and those classrooms with higher levels of delinquency deserve more attention. Classrooms are important social collectivities as the classmates study together, play together day after day, and play basketball or football games as classroom units. Classroom cultures and environments will have critical effects on the development of students' beliefs and behaviors, and on their peer culture. In classrooms filled with anger, students may be more aggressive and more conflicts can be anticipated. Classroom anger can

magnify students' negative emotions such as anger and depression, leading to a higher likelihood of delinquency.

Some classrooms have higher levels of delinquency, and some do not. Such results shed some light on the classroom as an intervention target, which might be interesting especially for policymakers and school managers. For the purpose of crime prevention, defining an appropriate target is the first step. Some classrooms in vocational schools, housing more angry students, have much delinquency in comparison with other classrooms with lower levels of anger. This suggests that those classrooms with higher levels of anger are more relevant when seeking to prevent delinquency in vocational schools. Programs like anger control or social skill training might be applicable to lower the levels of anger in those classrooms.

There are limitations to this study. Firstly, the number of classrooms is not big. Thirty classrooms were included in this study, which meets statistical criteria, but assessing more classrooms would be better. Secondly, the present study investigated the differences in classroom delinquency in vocational schools, while no classrooms in high schools were included. Thirdly, this study investigated the effects of aggregate anger on individual-level delinquency, and no aggregate strain was included in the HLM models. Future studies should collect data from more classrooms at vocational schools and high schools. More aggregate variables should be examined for their effects on individual delinquency in future studies.

Notes on contributors

Jinwu Zhang is the post-doc of Faculty of Law, University of Macau. His research interests include juvenile delinquency, crime prevention, and community governance.

Jianhong LIu is the Distinguished Professor of Faculty of Law, University of Macau. He is the winner of 2016 American Society of Criminology "Freda Adler Distinguished International Scholar Award" and the winner of 2018 Academy of Criminal Justice Sciences' "G. O.W. Mueller Award Prof Liu has published more than 150 academic books and articles His research interest include juvenile delinquency and criminological theory.

Shan Cui is a PhD candidate of Faculty of Law, University of Macau. Her research interests include juvenile delinquency, crime prevention, and criminological theory

Honglan Shuai is a PhD candidate of Faculty of Law, University of Macau. Her research interests include juvenile delinquency, crime prevention, and criminological theory

References

Agnew, Robert. 1985. "A Revised Strain Theory of Delinquency." *Social Forces* 64 (1):151–67. doi:10.1093/sf/64.1.151.

Agnew, Robert. 1992. "Foundation for a General Strain Theory of Crime and Delinquency." *Criminology* 30 (1):47–88. doi:10.1111/j.1745-9125.1992.tb01093.x.

Agnew, Robert. 1999. "A General Strain Theory of Community Differences in Crime Rates." *Journal of Research in Crime and Delinquency* 36 (2):123–55. doi:10.1177/0022427899036002001.

Agnew, Robert. 2006. *Pressured into Crime: An Overview of General Strain Theory*. USA: Oxford University Press.

Agnew, Robert. 2013. "When Criminal Coping Is Likely: An Extension of General Strain Theory." *Deviant Behavior* 34 (8):653–70. doi:10.1080/01639625.2013.766529.

Agnew, Robert. 2015. "Using General Strain Theory to Explain Crime in Asian Societies." *Asian Journal of Criminology* 10 (2):131–47. doi:10.1007/s11417-014-9198-2.

Agnew, Robert, Timothy Brezina, John Paul Wright, and Francis T. Cullen. 2002. "Strain, Personality Traits, and Delinquency: Extending General Strain Theory." *Criminology* 40 (1):43–72. doi:10.1111/j.1745-9125.2002.tb00949.x.

Araos, Consuelo, Macarena Cea, Matías Fernández, and Eduardo Valenzuela. 2014. "The Role of School Context on Marijuana Use in Chile: A Classroom-Level Analysis." *Deviant Behavior* 35 (5):412–32. doi:10.1080/01639625.2014.855100.

Bao, Wan-Ning, Ain Haas, Xiaojin Chen, and Pi. Yijun. 2014. "Repeated Strains, Social Control, Social Learning, and Delinquency: Testing an Integrated Model of General Strain Theory in China." *Youth & Society* 46 (3):402–24. doi:10.1177/0044118X11436189.

Bao, Wan-Ning, Ain Haas, and Pi. Yijun. 2004. "Life Strain, Negative Emotions, and Delinquency: An Empirical Test of General Strain Theory in the People's Republic of China." *International Journal of Offender Therapy and Comparative Criminology* 48 (3):281–97. doi:10.1177/0306624X03258686.

Bao, Wan-Ning, Ain Haas, and Pi. Yijun. 2007. "Life Strain, Coping, and Delinquency in the People's Republic of China: An Empirical Test of General Strain Theory from a Matching Perspective in Social Support." *International Journal of Offender Therapy and Comparative Criminology* 51 (1):9–24. doi:10.1177/0306624X06294428.

Botchkovar, Ekaterina and Lisa Broidy. 2013. "Accumulated Strain, Negative Emotions, and Crime: A Test of General Strain Theory in Russia." *Crime and Delinquency* 59 (6):837–60. doi:10.1177/0011128710382346.

Brezina, Timothy, Alex R. Piquero, and Paul Mazerolle. 2001. "Student Anger and Aggressive Behavior in School: An Initial Test of Agnew's Macro-Level Strain Theory." *Journal of Research in Crime and Delinquency* 38 (4):362–86. doi:10.1177/0022427801038004002.

Broidy, Lisa M. 2001. "A Test of General Strain Theory." *Criminology* 39 (1):9–36. doi:10.1111/j.1745-9125.2001.tb00915.x.

Burns, Padraic Joseph. 2009. "Disadvantaged Neighborhoods and Anger: Implications for Community-Level Theories of Crime and Delinquency." Master dissertation, North Carolina State University

Chapple, Constance L., Julia A. McQuillan, and Terceira A. Berdahl. 2005. "Gender, Social Bonds, and Delinquency: A Comparison of Boys' and Girls' Models." *Social Science Research* 34 (2):357–83. doi:10.1016/j.ssresearch.2004.04.003.

Chen, Xi and Yuet-wah Cheung. 2020. "School Characteristics, Strain, and Adolescent Delinquency: A Test of Macro-Level Strain Theory in China." *Asian Journal of Criminology* 15 (1):65–86. doi:10.1007/s11417-019-09296-x.

Cheung, NW and YW Cheung. 2009. "Linking Individual and Contextual Strains to Adolescent Gambling: A Macro-Level General Strain Theory Assessment." Paper presented at the ASC annual meeting, November 3, Philadelphia, PA.

DeLisi, Matt. 2011. "How General Is General Strain Theory?" *Journal of Criminal Justice* 39 (1):1–2. doi:10.1016/j.jcrimjus.2010.12.003.

Hirschi, Travis. 1969. *Causes of Delinquency*. Berkeley: University of California Press.

Hoffmann, John P. 2003. "A Contextual Analysis of Differential Association, Social Control, and Strain Theories of Delinquency." *Social Forces* 81 (3):753–85. doi:10.1353/sof.2003.0034.

Hoffmann, John P. and Timothy O. Ireland. 2004. "Strain and Opportunity Structures." *Journal of Quantitative Criminology* 20 (3):263–92. doi:10.1023/B:JOQC.0000037734.89980.57.

Jang, Sung Joon and Jeremy R. Rhodes. 2012. "General Strain and Non-Strain Theories: A Study of Crime in Emerging Adulthood." *Journal of Criminal Justice* 40 (3):176–86. doi:10.1016/j.jcrimjus.2011.09.003.

Mazerolle, Paul, Velmer S. Burton, Francis T. Cullen, T. David Evans, and Gary L. Payne. 2000. "Strain, Anger, and Delinquent Adaptations Specifying General Strain Theory." *Journal of Criminal Justice* 28 (2):89–101. doi:10.1016/S0047-2352(99)00041-0.

Mazerolle, Paul and Jeff Maahs. 2000. "General Strain and Delinquency: An Alternative Examination of Conditioning Influences." *Justice Quarterly* 17 (4):753–78. doi:10.1080/07418820000094751.

Moon, Byongook, Merry Morash, and John D. McCluskey. 2012. "General Strain Theory and School Bullying: An Empirical Test in South Korea." *Crime and Delinquency* 58 (6):827–55. doi:10.1177/0011128710364809.

Müller, Christoph Michael, Verena Hofmann, Janine Fleischli, and Felix Studer. 2016. "Effects of Classroom Composition on the Development of Antisocial Behavior in Lower Secondary School." *Journal of Research on Adolescence* 26 (2):345–59. doi:10.1111/jora.12195.

Op de Beeck, Hanne, Lieven J. R. Pauwels, and Johan Put. 2012. "Schools, Strain and Offending: Testing a School Contextual Version of General Strain Theory." *European Journal of Criminology* 9 (1):52–72. doi:10.1177/1477370811421646.

Ostrowsky, Michael K. and Steven F. Messner. 2005. "Explaining Crime for a Young Adult Population: An Application of General Strain Theory." *Journal of Criminal Justice* 33 (5):463–76. doi:10.1016/j.jcrimjus.2005.06.004.

Paternoster, Raymond and Paul Mazerolle. 1994. "General Strain Theory and Delinquency: A Replication and Extension." *Journal of Research in Crime and Delinquency* 31 (3):235–63. doi:10.1177/0022427894031003001.

Sexton, Chad W. 2011. "The Impact of Strain on Hate Crime: Testing Agnew's Macro-Level General Strain Theory." Ph.D. dissertation, State University of New York at Buffalo.

Spielberger, CD, G Jacobs, S Russell, and RS Crane. 1983. "Assessment of Anger: The State-Trait Anger Scale." Pp. 161–89 in *Advances in Personality Assessment*, Vol. 2, edited by J. N. Butcher and C. D. Spielberger. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Stormshak, Elizabeth A., Karen L. Bierman, Carole Bruschi, Kenneth A. Dodge, and John D. Coie. 1999. "The Relation between Behavior Problems and Peer Preference in Different Classroom Contexts." *Child Development* 70 (1):169–82. doi:10.1111/1467-8624.00013.

Vincent, M Bess. 2011. "Chicago Neighborhoods and Crime: A Test of Agnew's Macro-Level Strain Theory." Ph.D. dissertation, Tulane University.

Wang, Xin, Jinwu Zhang, Xiaoxiang Wang, and Jianhong Liu. 2020. "Intervening Paths from Strain to Delinquency among High School and Vocational School Students in China." *International Journal of Offender Therapy and Comparative Criminology* 64 (1):22–37. doi:10.1177/0306624X19856513.

Wareham, Jennifer, John K Cochran, Richard Dembo, and Christine S Sellers. 2005. "Community, Strain, and Delinquency: A Test of A Multi-Level Model of General Strain Theory." *Western Criminology Review* 6(1):117–33. Online publication.

Zhang, Jinwu, Jianhong Liu, Xin Wang, and Anquan Zou. 2018. "Life Stress, Strain, and Deviance across Schools: Testing the Contextual Version of General Strain Theory in China." *International Journal of Offender Therapy and Comparative Criminology* 62 (8):2447–60. doi:10.1177/0306624X17720182.