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 I–14 © The Author(s) 2017 Reprints and permissions. sagepub.com/journalsPermissions.nav DOI: 10.1177/0306624×17720182 journals.sagepub.com/home/ijo



Jinwu Zhang¹, Jianhong Liu², Xin Wang¹, and Anquan Zou¹

Abstract

General Strain Theory delineates different types of strain and intervening processes from strain to deviance and crime. In addition to explaining individual strain-crime relationship, a contextualized version of general strain theory, which is called the Macro General Strain Theory, has been used to analyze how aggregate variables influence aggregate and individual deviance and crime. Using a sample of 1,852 students (Level I) nested in 52 schools (Level 2), the current study tests the Macro General Strain Theory using Chinese data. The results revealed that aggregate life stress and strain have influences on aggregate and individual deviance, and reinforce the individual stress-deviance association. The current study contributes by providing the first Macro General Strain Theory test based on Chinese data and offering empirical evidence for the multilevel intervening processes from strain to deviance. Limitations and future research directions are discussed.

Keywords

life stress, strain, delinquency, schools, MST

Responding to criticisms of the traditional strain theories, Agnew (1992, 2007) presented the general strain theory (GST), which specifies sources of strain and the processes

¹Foshan University, Guangdong, China ²University of Macau, Taipa, China

Corresponding Author:

Jianhong Liu, Professor, Department of Sociology, University of Macau, Avenida da Universidade, Taipa, Macau, China. Email: Jliu@umac.mo between strain and crime or deviance. GST returns strain theory to the forefront of criminological research, and has received ample empirical support for individual strain–crime relationship, as well as the role of individual emotional states influencing such relationships (DeLisi, 2011; Ostrowsky & Messner, 2005).

Aside from extensive tests at the individual level, GST has also been utilized to analyze community differences in crime rates; thus, a contextual version of GST has been created and titled the Macro General Strain Theory (MST; Agnew, 1999; Brezina, Piquero, & Mazerolle, 2001). The key propositions of MST focus on associations between strain and deviance or crime at the aggregate level, as well as the effect of aggregate variables on individual behavior (Agnew, 1999). However, empirical research testing these aggregate and multilevel correlations is limited (Hoffmann & Ireland, 2004).

GST

GST regards strain as a major source of criminal motivation, and strain is conceptualized as "events and conditions that are disliked by individuals" (Agnew, 2015, p. 132). Three possible sources of strain had been defined: failure to reach positively valued goals, the loss of positive stimuli, and the presentation of negative stimuli. Within the first category of failure to achieve positively valued goal, such as monetary success or income expectations, different types of strain can be identified as disjunctions between aspirations and expectations or actual achievements, disjunctions between expectations and actual achievements, and disjunctions between just/fair outcomes and actual outcomes. The second category of strain normally involves negative life events that lead to actual or anticipated removal of positively valued stimuli, such as the loss of a boyfriend/girlfriend, the death or illness of a friend or family member, or the divorce of one's parents. The third category of strain includes a wide range of noxious stimuli, such as child abuse, criminal victimization, negative relations with parents or peers, negative school experiences, or physical pains (Agnew, 1992). On the contrary, GST argues that there is a distinction between "objective" strain and "subjective" strain, where objective strain refers to events or conditions disliked by most people and subjective strain refers to events or conditions disliked by those experiencing them; of the two, subjective strain is more strongly related to crime and deviance (Froggio & Agnew, 2007). Meanwhile, strains that are high in magnitude, unjust, or involving the intentional violation of relevant justice norms would be more conducive to criminal activities (Agnew, 2013).

GST also implies that the impact of strain on deviance and crime is conditioned by other variables such as social control or delinquent peers (Agnew, 2007). Despite the strain types and negative emotions, the likelihood of deviance is also influenced by the characteristics of strained individuals and social environments (Agnew, 2002, 2013). Conditioning factors include but are not limited to problem-solving and social skills, negative emotionality, low socioeconomic status (SES), social control variables, and/ or social learning variables such as association with other criminals (Agnew, 2013). Such factors influence the subjective evaluation of objective strain, the emotional

reactions to strain, and the impact of strain on deviance or crime (Agnew, 2013; Jang & Johnson, 2003). Social control and association with delinquent peers are two major conditioning factors identified by GST (Agnew, 2013; Mazerolle & Maahs, 2000). As noted by Agnew (2013), mixed results concerning conditioning effects might be accounted for by the fact that different types of strain had different associations with various conditioning factors, and most studies measured different conditioning factors in isolation. Agnew (2013) suggested researchers to combine several "marker" conditioning factors such as social control, self-control, association with delinquent peers, and pro-criminal beliefs into a scale, as above factors were often strongly correlated with each another.

Empirical tests at the individual level indicate support for GST's key propositions (Agnew, 2007, 2013, 2015), and the associations between individual strain and deviance or crime holds across a range of samples and countries (Agnew, Brezina, Wright, & Cullen, 2002; Bao, Haas, & Pi, 2004, 2007; Botchkovar & Broidy, 2013; Froggio & Agnew, 2007; Jang & Johnson, 2003; Moon & Morash, 2004; Moon, Morash, & McCluskey, 2012; Sigfusdottir, Kristjansson, & Agnew, 2012). As predicted by GST, strain generates negative emotions, which in turn foster deviant adaptation. The impacts of individual negative emotions, and social control and social learning variables on the individual strain–crime relationship have also been investigated and verified by a number of studies (Agnew, 2007, 2013; Gao, Wong Dennis, & Yu, 2014; Mazerolle, Burton, Cullen, Evans, & Payne, 2000; Sigfusdottir et al., 2012).

Contextual Version of GST

In addition to explaining individual strain–crime relationship, a contextualized version of GST was created to analyze community or group differences in crime rates, which was referred to as the Macro General Strain Theory or MST (Agnew, 1999; Brezina et al., 2001; De Beeck, Pauwels, & Put, 2012). MST posits that community or aggregate variables are correlated to aggregate crime, and have effects on individual criminal responses to strain. According to Agnew (1999), communities with certain characteristics tend to generate goal blockage, increase feelings of relative deprivation, cause the loss of positive stimuli and/or presentation of negative stimuli, and create obstacles for individuals' economic goals or increase the likelihood to be exposed to aversive stimuli such as undesirable life events and chronic strain, and these communities are more likely to witness higher levels of crime rates.

MST should be interpreted as a two-level model: The upper level (Level 2) focuses on community characteristics and deviance or crime, and the individual level (Level 1) focuses on individual strain and crime/deviance. At the upper (or aggregate) level, crime/deviance can be explained by strain, negative affect, and other social conditions (Brezina et al., 2001). On the contrary, aggregate characteristics influence the individual strain–crime relationship (Agnew, 1999). Differences across social collectivities such as community and school can be explained as aggregate strain influences aggregate negative affect, and aggregate negative affect mediates the effect of strain on crime rates, similar to the mechanism at the individual level. Meanwhile, it is important to control for aggregate variables such as disorganization and values (Agnew, 1999; Brezina et al., 2001). Higher concentrations of strain at the aggregate level would prompt individual strain and individual deviance; however, the individual strain–crime relation is also expected to be influenced by other aggregate variables such as low social control, presence of other criminals, the lack of social support, or the presence of values conductive to crime (Agnew, 1999).

There were a number of multilevel studies to examine the main claims of MST. Most such studies investigated the relationships between neighborhood factors and delinquency (Burns, 2009; Hoffmann, 2003; Sexton, 2011; Vincent, 2011; Wareham, Cochran, Dembo, & Sellers, 2003), and the others examined the effects of school-level variables on delinquency and deviance (Brezina et al., 2001; Cheung & Cheung, 2009; De Beeck et al., 2012; Hoffmann & Ireland, 2004). The results of empirical studies examining the contextual effects of neighborhood on delinquency and deviance were mixed, indicating that much attention should be paid to ecological settings such as schools, in which adolescents spend most of their time (De Beeck et al., 2012). More specifically, certain schools attract more strained adolescents and produce more strain and opportunities for illegitimate activities (Brezina et al., 2001; De Beeck et al., 2012; Hoffmann & Ireland, 2004).

Brezina et al. (2001) conducted the first MST study using representative data from national public high schools. Being the initial school-level assessment of MST, this study accessed the associations among aggregate variables, and the relationship between aggregate-level anger and individual aggressive behavior. Results of school-level aggregate analyses revealed that school levels of anger influenced school-level differences in problem behavior. Results of hierarchical linear model (HLM) analyses indicated that school-level anger had significant impact on individual student-to-student conflict, which lent support to the interpersonal-friction argument of MST that students attending a school harboring a relatively angry student population would be more likely to engage in fights and arguments with schoolmates. The authors suggested that future studies should examine broad range of dependent outcomes other than aggressive behavior, and investigate conditioning effects of aggregate variables as well as cross-level interactions.

Schools hosting strained student populations also serve as illegitimate opportunity providers. Illegitimate opportunities or illegitimate means are defined as environments for learning and opportunities to adopt the role of criminal (Hoffmann & Ireland, 2004). The relationship between school-level illegitimate opportunity structure and individual strain–delinquency association has been investigated in the study of Hoffmann and Ireland (2004), and school-level illegitimate opportunity structure is conceptualized as aggregate delinquency, aggregate problems, aggregate delinquent values, school quality, and school locations. Aggregate delinquent values and school quality were found to be significantly associated with individual strain–delinquency relationship. This result may be partly due to the average number of 14 students per school level (12,420 students nested in 883 schools), while a limited number of students per school would risk being unable to accommodate delinquent individuals. The

literature on power analyses for multilevel models demonstrates that the sample size of Level 2 units has a significant impact on the accuracy of the estimator (Snijders & Bosker, 1993), and Level 2 variations diminish rapidly when the average number of Level 1 units exceeds 10 (Cohen, 1998; Hoffmann & Ireland, 2004). Hox (1998) argued that the 50/20 rule (at least 50 groups with at least 20 individuals per group) would be desirable if researchers have a strong interest in cross-level interactions.

De Beeck et al. (2012) focused on the motivational aspect of strain and measured strain by life satisfaction, future prospects, and negative affect. They found that gender and school types are prominent variables explaining school differences in offending contexts. Meanwhile, the school level of negative affect and negative future prospects had a small effect on individual offending. After controlling for compositional effects of gender and school types, a high concentration of negative affect at school level was found to be significantly correlated to individual violent offending. It should be noted that this study did not include cross-level interaction analyses.

The Present Study

MST predicts that aggregate-level strain is correlated to aggregate-level crime/deviance and individual deviant behavior (Agnew, 1999), but the evidence is lacking. Much evidence would be needed to verify associations between aggregate strain and crime or deviance across social collectivities, or the impact of aggregate variables on individual strain-deviance relationship. To fill the gap, the present study aims to test MST by investigating the effects of contextual variables on aggregate deviance and individual deviance. The hypotheses of this study are as follows:

Hypothesis 1: Aggregate strain and life stress are correlated to school-level deviance after aggregate conditioning factor is controlled.

Hypothesis 2: School-level variables have influences on individual deviance, and individual strain–deviance relationship.

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 2015* 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, student 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 contrary, students in vocational schools do not have the chance to attend 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 the graduates enter labor markets to start their

working careers. According to the China Statistics Yearbook in 2016 issued by National Bureau of Statistics of the People's Republic of China, the totals of enrolled high school and vocational students at the end of 2015 were 23.8099 million and 16.5670 million, respectively.

The participants were selected among 10th-grade students in 52 schools with a cluster sampling method. Schools were sampled from the list provided by the Guangzhou Education Bureau to represent the 11 administrative districts of Guangzhou. In every school, a class in Grade 10 was randomly selected, and all the students in the class were invited to participate in the study. Informed consent was obtained. The students filled in and answered the questionnaire using the self-report method through group interviews without their teacher present.

Measurements

Level 1 independent variables: Strain, life stress, and conditioning factor. Life stress was measured by the Adolescent Self-Rating Life Events Check List (ASLEC; Xin & Yao, 2015). ASLEC comprised 27 items and asked respondents if they experienced negative life events in 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 stolen, conflicts within family members, expectations for achievements being defied, 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 strains 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 of the objective strain measure was .863.

Strain was indicated by goal blockage, which was measured by the gap between aspiration and expectation. Aspiration and expectation were assessed by immediate material goals scale and blocked opportunity scale, which was constructed by Cao and Deng (1998). The measure of immediate material goals involves two items: (a) I have to possess the latest clothes; and (b) I have to possess the latest mobile phone and tablet computer. Blocked opportunities consists of three items: (a) I am satisfied with my opportunities to reach my goals; (b) I am satisfied with my present financial situation; and (c) I am satisfied when comparing myself with other Chinese families. A 6-point scale is applied into all the above items varying from 1 = strongly disagree to 6 = strongly agree. Cronbach's alpha of the five items was .666.

Conditioning factor was measured by 24 items. The first 18 items consist of five dimensions: commitment to school, parental attachment, peer attachment, involvement in conventional activities, and conventional beliefs (Chapple,

McQuillan, & Berdahl, 2005). A 5-point scale was applied into all the above items, varying from 1 (*strongly disagree*) to 5 (*strongly agree*). The other six items asked respondents how many of their friends had engaged in activities of theft, force or threat of force to obtain money from someone, beat someone, smoked or drank alcohol, group fighting in the street or other public places, or the use of drugs. A 5-point scale was applied ranging from $1 = none \ of \ my \ friends$ to $5 = all \ of \ my \ friends$. Thus, a composite scale was created, which measured the conditioning effects of social control and delinquent peers. Cronbach's alpha of this scale was .720.

Level 1 control variables. The control variables in Level 1 were comprised of individual demographics of gender, age, and SES.

Level 2 independent variables: Strains and conditioning factor. The school means of life stress, strain, and conditioning factor were the school-level aggregates of respective individual-level variables.

Dependent variable: Deviance. Deviance was measured by two items, which were constructed with reference to the work of Jang and Johnson (2003). Respondents were asked how they acted when encountering the above negative life events in the past 12 months. The first item was "In the past 12 months, when you encounter the above negative events, your coping strategy is to drink or get high in other ways" and the second item was "In the past 12 months, when you encounter the above negative events, your coping strategy is to fight and argue with other people." A 5-point scale was applied, ranging from 1 (*never*) to 5 (*very often*). Cronbach's alpha of the two items was .720. The school mean of deviance was the school-level aggregate of individual deviance. As indicated by Jang and Johnson (2003), such measurements established a causal interpretation between negative life events and deviance.

Analyses

To test Hypothesis 1, regression modeling was used to examine the predicting validity of aggregate life stress and strain on school-level deviance, controlling the aggregate conditioning factor.

To test Hypothesis 2, hierarchical linear modeling were conducted to estimate the effects of aggregate variables on individual deviance and individual strain-deviance relationship. Individual deviance was the dependent variable. A null model was estimated to verify the differences of deviance across schools. In Model 1, a random effect regression using HLM was utilized for individual-level variables, while life stress, strain, gender, age, and SES were included. In Model 2, aggregated variables were included while all individual variables remained. In Model 3, cross-level interactions were investigated by calculating the effects of aggregate variables on individual strain-deviance regression coefficient.

Variables	М	SD	Minimum	Maximum
Level I variables (individual	level)			
Deviance	1.42	0.79	Ι	5
Age	16.12	0.69	14	17
SES	5.56	1.49	2	10
Negative life events	7.36	4.74	0	27
Goal blockage	-0.11	1.26	-2.96	5.51
Conditioning factor	3.61	.86	2.00	9.67
Level 2 variables (school le	vel)			
Deviance	1.48	9.30	1.09	2.67
Negative life events	7.42	1.41	3.88	13
Goal blockage	0.02	0.49	-0.88	1.48
Conditioning factor	5.02	0.191	4.50	5.55

Table I. Descriptions of Level I and Level 2 Variables.

Note. SES = socioeconomic status.

Table 2. Correlations Matrix for School-Level Negative Life Events, Goal Blockage, Negative Emotions, Conditioning Factor, and Deviance (N = 52).

		2	3	4
١.	Negative life events	.075	.242	.430**
2.	Goal blockage		059	.411**
3.	Conditioning factor			.645***
4.	Deviance			

*p < .05. **p < .01. ***p < .001.

Results

Descriptive Statistics

A total of 1,852 respondents completed the survey, for which the mean age was 16.12 (SD = .69), with 895 male (48.3%) and 957 female (51.7%) students nested in 52 schools. Table 1 presents the means and standard deviations of the Level 1 and Level 2 variables used in the present study.

Aggregated Variables Contributed to School-Level Deviance

Table 2 shows bivariate correlation results for negative life events, goal blockage, conditioning factor, and deviance at aggregate level. As expected, negative life events (r = .430, p < .01) and goal blockage (r = .411, p < .01) were significantly correlated to deviance. No significant correlation was found among negative life events, goal blockage, and conditioning factor.

	C +		C::-C:
	Standardized D	t	Significance
Conditioning factor	.609	7.111	.000
Negative life events	.251	2.928	.005
Goal blockage	.428	5.135	.000
Adjusted R ²	.656		

Table 3. Regression Models With Standardized Coefficients of Aggregate Variables Predicting School-Level Deviance (N = 52).

Regression analyses were conducted to examine school-level predictors of aggregate deviance. As shown in Table 3, aggregate negative life events (B = .251, p < .01), goal blockage (B = .428, p < .001), and conditioning factor (B = .609, p < .001) were significantly correlated to aggregate deviance (adjusted $R^2 = .656$). Schools with higher level of strain are more likely to witness higher levels of deviance.

Effects of Contextual Variables on Individual Deviance

To test the effects of school-level variables on individual deviance, multilevel models were designed when individual deviance served as the dependent variable. Following the steps in most multilevel modeling exercises, the first step was to test the null model to check whether significant variation of deviance could be found across schools. Significant variation was found across schools for deviance, and the interclass correlation (ICC) of .0712 demonstrated a 7.12% variation of delinquency between schools, as shown in Table 4.

Table 4 also shows the results of HLM Model 1 to Model 3. In Model 1, life stress, strain, and conditioning factor were examined for their impacts on deviance after controlling for demographic variables at individual level. Individual life stress, strain, and conditioning factor were significantly associated with deviance. Higher levels of individual strain or goal blockage were associated with a higher likelihood of deviance.

In Model 2, school-level life stress, strain, and conditioning factor were included while all individual variables remained. Aggregate life stress, strain, and conditioning factor were significantly associated with individual deviance. Schools with a higher concentration of individuals who have more life stress and strain increased the likelihood of deviant behaviors among students.

Model 3 shows how contextual variables condition the impact of individual negative life events and goal blockage on individual deviance. A set of cross-level interactions was tested. The results showed that school-level life stress and strain significantly influenced the stress–deviance slope at individual level such that individual life stress would have a stronger impact on individual deviance when harbored in schools with higher concentrations of life stress and strain. School-level conditioning factor did not influence the individual-level strain–deviance relationship.

Table 4 also demonstrates the proportion reduction in school-level variance or the variance explained. Adding contextual variables and cross-level interactions to Model

b SE b SE Fixed intercept 1.446 0.035 1.524 0.062 Level 1(Student = 1,852) Gender (male = 1) -0.047 0.034 Age 0.017 0.024 0.026 Age 0.017 0.017 0.026 Negative life events 0.019 0.006	• • • • • • • • • •	b SE 524 0.062 0.047 0.034 0.017 0.024 0.019 0.014 0.018 0.014 	b 1.542 1.542 1.542 1.542 0.017 0.017 0.018 0.048 0.048 0.048	SE 0.051 0.034 0.014 0.014 0.016 0.0136	<i>b</i> 1.545 -0.013	SE 0.051	equations (ritodel 3 compared with Model 1)
Fixed intercept 1.446 0.035 1.524 0.062 Level 1(Student = 1,852) -0.047 0.034 Gender (male = 1) -0.017 0.024 Age 0.018 0.019 SES 0.019 0.019 Negative life events 0.036	6 6 9 9 9 9 9 9 9 9 9 1 1 1 1 1 1 1 1 1 1	.524 0.062 .047 0.034 .017 0.024 .019 0.014 .036 0.006 .036 0.014 .421 0.036	1.542 1.542 -0.053 -0.017 0.019 0.019 0.036 0.048 0.048	0.051 0.034 0.014 0.014 0.006 0.014 0.036	1.545 -0.055 -0.013	0.051	
Level I (Student = 1,852) Gender (male = 1) Age SES Negative life events 0.005 0.006 0.007 0	ဝှဝုဝ ဝဝဝ	.047 0.034 .017 0.024 .019 0.014 .036 0.006 .048 0.014	-0.053 -0.017 -0.019 0.019 0.048 0.048	0.034 0.024 0.014 0.006 0.014 0.0136	-0.013		
Gender (male = 1) -0.047 0.034 Age -0.017 0.017 Ass 0.018 0.019 Negative life events 0.005	ဝုဝုဝ ဝဝဝ	.047 0.034 017 0.024 0.019 0.014 .036 0.006 .048 0.014	-0.053 -0.017 -0.019 0.036 0.036 0.048 0.048	0.034 0.024 0.014 0.006 0.014 0.036	-0.055		
Age –0.017 0.024 SES 0.019 0.014 Negative life events 0.006	ဝုဝဓဓဓ	.017 0.024 .019 0.014 .036 0.006 .048 0.014 .421 0.036	-0.017 0.019 0.036 0.036 0.048 0.048	0.024 0.014 0.006 0.014 0.036	-0.013	0.034	
SES 0.019 0.014 Negative life events 0.036 0.006	0000	.019 0.014 .036 0.006 .048 0.014 .421 0.036	0.019 0.036 0.048 0.421	0.014 0.006 0.014 0.036		0.023	
Negative life events 0.006	000	0.006 0.006 0.014	0.036 0.048 0.421 0.421	0.006 0.014 0.036	0.020	0.013	
	00	.048 0.014 .421 0.036	0.048 0.421 0.048	0.014 0.036	0.036	0.005	
Goal blockage 0.014 0.014	o	. 421 0.036	0.048	0.036	0.047	0.015	
Conditioning factor 0.421 0.036			0.048		0.417	0.037	
Level 2 (school = 52)			0.048				
Negative life events			0.00	0.020	0.048	0.020	
Goal blockage			0.218	0.043	0.217	0.043	
Conditioning factor			0.894	0.215	0.893	0.214	
Cross-level interactions: Contextual effects on individual negative life event-deviance relationship	it-deviance relations	thip					
Aggregate Negative Life Events × Individual Negative Life Events					0.006	0.003	
Aggregate Goal Blockage × Individual Negative Life Events					0.019	0.007	
Aggregate Conditioning Factor × Individual Negative Life Events					-0.004	0.033	
Cross-level interactions: Contextual effects on individual goal blockage-deviance relationship	eviance relationship						
Aggregate Negative Life Events × Individual Goal Blockage					-0.007	0.013	
Aggregate Goal Blockage × Individual Goal Blockage					-0.028	0.034	
Aggregate Conditioning Factor × Individual Goal Blockage					0.066	0.115	
Random							
Level I 0.0439 0.3670	0.0439	0.3670	0.36	59	0.36	41	0.79%
Level 2 0.5730 0.0506	0.5730	0.0506	0.01	58	0.01	58	68.77%
ICC 0.0712 0.1212	0.0712	0.1212	0.04	14	0.041	9	
DIC 4,291.152 3,523.75	4,291.152	3,523.75	3,48	8.83	3,514	1.31	

Table 4. Multilevel Models Testing the Impact of Aggregated Variables on Individual Deviance.

1 explained 0.79% more of the student-level variance and 68.77% more of the schoollevel variance in deviance.

Discussion

The present study examined Agnew's MST with Chinese data. At the school level, the key question is why some schools have higher levels of deviance. As shown by binary correlation results, life stress, strain, and conditioning factor were significantly related to deviance at the aggregate level. It is noteworthy that no significant correlation was found between any two of aggregate life stress, strain, and conditioning factor are significant predictors of school-level deviance. Higher concentrations of stressed and strained individuals in a school would increase the aggregate levels of strain, which in turn increases the likelihood of higher levels of aggregate deviance.

Results also highlighted the influence of conditioning factor. Agnew (2013) argued that mixed results concerning conditioning effects might be due to the fact that most studies measured different conditioning factors in isolation. Following the suggestion of Agnew (2013) to combine several "marker" conditioning factors such as social control and association with delinquent peers, the present study constructed the conditioning factor by including items measuring social control and delinquent peers. Results found that aggregate conditioning factor had significant correlation with aggregate deviance and had significant effect on individual deviance.

From a multilevel perspective, the key question is how school-level variables influence individual deviance, and individual strain–deviance relationship or stress–deviance relationship. Findings revealed that school-level life stress and strain had a significant effect on individual deviance after controlling for school-level conditioning factor and individual variables. A student has a higher likelihood of deviance if he or she enters a school that harbors a student population with higher levels of stress and strain, controlling for his or her own level of stress, strain, social control, and involvement with delinquent others. Aggregate-level life stress and strain are key mediators influencing individual deviant activities, demonstrating the direct effect of schoollevel life stress and strain on individual offending. In a school with higher concentration of life stress and strain, a student would have more interactions with strained individuals, which in turn increases his or her own level of stress and strain are key mode individuals stread schools with lower concentration of life stress and strain engage in less deviance.

Cross-level interaction results revealed that the relationship between individual life stress and deviance was reinforced by school-level life stress and strain. Aggregate life stress and strain had a positive effect on the individual stress-deviance slope. Thus, individual life stress has a stronger impact on deviance in schools with higher levels of stress and strain. When school-level life stress and strain are greater, strained students have a higher likelihood for deviant adaptation. It should be noted that aggregate conditioning factor did not affect the individual stress—deviance relationship in this study, though aggregate conditioning factor did have a direct effect on individual deviance. Such results are similar to those found by Hoffmann and Ireland (2004). It is argued that such a nonsignificant effect might be accounted for by other school-level variables (Hoffmann & Ireland, 2004) or measurement issues when asking youth to speculate on peer deviance rather than asking one's peers directly (Haynie, 2002).

There are limitations for the present study. First, the cross-sectional data limit further investigation concerning the direction and changes of the strain-deviance relationship. The fact that all data were collected at the same time makes it difficult to specify the causal direction of strain, negative emotions, and deviance over time. Longitudinal data should be considered and collected in future studies. Second, data from school field prohibited the possibility to investigate differences in crime rates across other social collectives such as neighborhoods. Third, measures for conditioning factors were not fully developed. For example, the present study measured social learning with six items concerning delinquent peers, which may not be sufficient to capture more dimensions of social learning theory. Future studies should include more measures to investigate the effects of conditioning factors. Fourth, the present study did not include negative affect in the analyses, which leaves much room for future studies. One of the key propositions of GST is that strain creates negative affect and the latter mediates the effect of strain on deviance. Negative affect, especially in the form of anger, plays an important part as mediator between strain and delinquent adaptations (Agnew, 1992). Strain generates a range of negative emotions, such as anger, frustration, and depression, and such negative emotions provide a major impetus for deviance, thus increasing the likelihood of engaging in criminal activities (Agnew, 2013; Agnew, 2015; Sigfusdottir et al., 2012). Future studies need to include more precise measurements of negative affect, and examine the effects of negative emotions on deviance and crime. Fifth, there is a lack of measuring more delinquent activities of the respondents, and future studies should measure such delinquency as fare dodging, damaging public property, stealing, carrying weapons, taking part in a group fight, using weapons, and force or threats to get money from others.

In summary, this study verified the multilevel correlations among life stress, strain, and deviance with Chinese data, revealing that aggregate life stress and strain are significantly correlated to school-level deviance. On the contrary, aggregate life stress and strain have direct influences on individual deviance and magnify the individual stress–deviance relationship. MST has the potential to explain community differences or changes in crime rates in China, which indicated that MST can be generalized into the China context.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

- Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. *Criminology*, 30, 47-87.
- Agnew, R. (1999). A general strain theory of community differences in crime rates. *Journal of Research in Crime and Delinquency*, 36, 123-155.
- Agnew, R. (2007). *Pressured into crime: An overview of general strain theory*. New York, NY: Oxford University Press.
- Agnew, R. (2013). When criminal coping is likely: An extension of general strain theory. Deviant Behavior, 34, 653-670.
- Agnew, R. (2015). Using general strain theory to explain crime in Asian societies. *Asian Journal* of Criminology, 10, 131-147.
- Agnew, R., Brezina, T., Wright, J. P., & Cullen, F. T. (2002). Strain, personality traits, and delinquency: Extending general strain theory. *Criminology*, 40(1), 43-72.
- Bao, W. N., Haas, A., & Pi, Y. (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, 281-297.
- Bao, W. N., Haas, A., & Pi, Y. (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, 9-24.
- Botchkovar, E., & Broidy, L. (2013). Accumulated strain, negative emotions, and crime test of general strain theory in Russia. *Crime & Delinquency*, 59, 837-860.
- Brezina, T., Piquero, A. R., & Mazerolle, P. (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, 362-386.
- Burns, P. J. (2009). Disadvantaged neighborhoods and anger: Implications for community-level theories of crime and delinquency (Unpublished master's thesis). Faculty of Sociology, North Carolina State University, Raleigh.
- Cao, L., & Deng, X. (1998). Shoplifting: A test of an integrated model of strain, differential association, and seduction theories. *Sociology of Crime, Law, and Deviance*, 1, 65-83.
- Chapple, C. L., McQuillan, J. A., & Berdahl, T. A. (2005). Gender, social bonds, and delinquency: A comparison of boys' and girls' models. *Social Science Research*, 34, 357-383.
- Cheung, N. W., & Cheung, Y. W. (2009, November 3). Linking individual and contextual strains to adolescent gambling: A macro-level general strain theory assessment. Paper presented at the ASC annual meeting, Philadelphia, PA.
- Cohen, M. P. (1998). Determining sample sizes for surveys with data analyzed by hierarchical linear models. *Journal of Official Statistics*, 14, 267-275.
- De Beeck, H., Pauwels, L., & Put, J. (2012). Schools, strain and offending: Testing a school contextual version of General Strain Theory. *European Journal of Criminology*, 9, 52-72.
- DeLisi, M. (2011). How general is general strain theory? *Journal of Criminal Justice*, 39(1), 1-2.
- Froggio, G., & Agnew, R. (2007). The relationship between crime and "objective" versus "subjective" strains. *Journal of Criminal Justice*, 35, 81-87.
- Gao, Y. J., Wong Dennis, S. W., & Yu, Y. P. (2014). Maltreatment and delinquency in China: Examining and extending the intervening process of General Strain Theory. *International Journal of Offender Therapy and Comparative Criminology*, 60(1), 38-61.

- Haynie, D. L. (2002). Friendship networks and delinquency: The relative nature of peer delinquency. *Journal of Quantitative Criminology*, 18, 99-134.
- Hoffmann, J. P. (2003). A contextual analysis of differential association, social control, and Strain theories of delinquency. *Social Forces*, 81, 753-785.
- Hoffmann, J. P., & Ireland, T. O. (2004). Strain and opportunity structures. Journal of Quantitative Criminology, 20, 263-292.
- Hox, J. J. (1998). Multilevel modeling: When and why. In I. Balderjahn, R. Mathar, & M. Schader (Eds.), *Classification, data analysis, and data highways* (pp. 147-154). New York, NY: Springer Verlag.
- Jang, S. J., & Johnson, B. R. (2003). Strain, negative emotions, and deviance among African Americans: A test of general strain theory. *Journal of Quantitative Criminology*, 19, 79-105.
- Mazerolle, P., Burton, V. S., Cullen, F. T., Evans, T. D., & Payne, G. L. (2000). Strain, anger, and delinquent adaptations: Specifying general strain theory. *Journal of Criminal Justice*, 28, 89-101.
- Mazerolle, P., & Maahs, J. (2000). General strain and delinquency: An alternative examination of conditioning influences. *Justice Quarterly*, *17*, 753-778.
- Moon, B., & Morash, M. (2004). Adaptation of theory for alternative cultural contexts: Agnew's general strain theory in South Korea. *International Journal of Comparative and Applied Criminal Justice*, 28, 77-103.
- Moon, B., Morash, M., & McCluskey, J. D. (2012). General strain theory and school bullying: An empirical test in South Korea. *Crime & Delinquency*, 58, 827-855.
- Ostrowsky, M. K., & Messner, S. F. (2005). Explaining crime for a young adult population: An application of general strain theory. *Journal of Criminal Justice*, *33*, 463-476.
- Sexton, C. W. (2011). The impact of strain on hate crime: Testing Agnew's macro-level general strain theory (Unpublished doctoral dissertation). Department of Sociology, University at Buffalo, The State University of New York.
- Sigfusdottir, I. D., Kristjansson, A. L., & Agnew, R. (2012). A comparative analysis of general strain theory. *Journal of Criminal Justice*, 40, 117-127.
- Snijders, T. A., & Bosker, R. J. (1993). Standard errors and sample sizes for two-level research. Journal of Educational and Behavioral Statistics, 18, 237-259.
- Vincent, M. B. (2011). Chicago neighborhoods and crime: A test of Agnew's Macro-level Strain Theory (Unpublished doctoral dissertation). Department of Sociology, Tulane University, New Orleans, LA.
- Wareham, J., Cochran, J. K., Dembo, R., & Sellers, C. S. (2003). Community, strain, and delinquency: A test of a multi-level model of general strain theory. *Western Criminology Review*, 6, 177-133.
- Xin, X., & Yao, S. (2015). Validity and reliability of the Adolescent Self-Rating Life Events Check List in middle school students. *Chinese Mental Health Journal*, 29, 355-360. (In Chinese)