

Family and School Strains and Their Effects on Adolescent Deviance in Taiwan: A Mediating Study

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Abstract

General strain theory is an established criminological theory. Although the theory has been examined by many, the propositions of mediating effects through negative emotions, lower social control, and criminogenic social learning environment are understudied. In addition, previous studies that touched on these mechanisms were limited to cross-sectional data or on samples from Western countries, mostly the United States. Consequently, proper casual relationships and possible cultural influences are ignored. The present study used a panel sample of youths from Taiwan to examine the three pathways from strains to deviance. We found that strains, school and family related, were related to deviance, and these strains increased student deviance by increasing depressive level, lowering school engagement, and increasing delinquent peer associations. Furthermore, we also found some complex relationships between these mediating factors, strains, and deviance. Some limitations were also discussed.

Keywords

delinquency, stress, depression, parenting, culture

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Introduction

General strain theory (GST; Agnew, 1992, 2001) argues that strain, in various forms, may lead to unconventional behavior and arouse negative emotions in individuals, which in turn may foster delinquent coping behavior. Although this basic form of GST has fared well under empirical scrutiny in many studies, these studies have used mainly western samples (e.g., in the United States). This limited application has inspired us to investigate the usefulness of GST in accounting for the deviant behavior of adolescents in Taiwan, where cultural settings are quite different from those of the United States and many western countries (e.g., western European countries and Canada).

Moreover, some recent developments of GST have received only limited attention. For example, Agnew (2006) delineated three underlying mechanisms that link strain to unconventional behaviors such as deviance: negative emotions, low social control, and social learning. However, most previous studies have examined the first of these pathways, strain → negative emotions → deviance. The latter two pathways, strain → low social control → deviance, and strain → social learning → deviance, which integrate social control (Hirschi, 1969), social learning (Akers, 1998), and differential association (Sutherland, 1947) are not included in many previous studies. These two pathways broaden the explanation of why deviance is a more likely response to strain for some individuals than others. Second, Agnew (2006) argued that research should examine the impact of types of criminogenic strain, of which he gave a list, on deviance. Moreover, some criminogenic strains, such as negative secondary school experiences and strict parental control, have not been incorporated in previous studies while testing GST.

GST and the Pathways to Deviance

Classic strain theory posited that antisocial behavior is the consequence of some limited strains, such as monetary or economic goal blockage in a democratic society (Cloward & Ohlin, 1960; Merton, 1938) or failure to achieve middle-class status (Cohen, 1955). Consequently, some criticized it for its limited types of goals (Agnew, 1985) and limited explanations of antisocial behavior (Akers, 2000). Agnew's (1992, 2006) GST avoided these limitations by introducing two additional types of strain and applying the model to a broad range of unconventional behaviors (e.g., crime and deviance). The focus of GST is on three broader types of major strains: (a) situations in which others prevent the individuals from achieving positively valued goals (classic strain), (b) situations in which others present or threaten to present

negative stimuli, or (c) situations in which others remove or threaten to remove positively valued stimuli.

According to the GST (Agnew, 2006), the relationship between strain and deviance may be understood through three pathways. First, for the most, strain could lead to consequent deviance by generating negative feelings in the individual. Empirical studies have documented that life stressors or strains can lead to various negative emotions, including depression (Olweus, 1994; Vaux & Ruggiero, 1983), anger (Broidy, 2001; De Coster & Kort-Butler, 2006), and anxiety (Aseltine, Gore, & Gordon, 2000). According to GST (Agnew, 1992, 2006), among the many possible negative emotions, anger is probably the most widely studied emotional response to strain, because it is particularly potent in instigating an individual to respond with deviance. While anger is central to GST, another important negative emotion, depression, deserves attention. On one hand, we have seen that depression has a great impact on youths. For example, a report from the World Health Organization (2001) has indicated that depression has become a serious mental health problem among youths. Other scholarly studies have also supported this finding (Petersen, Compas, & Brooks-Gunn, 1992). On the other hand, depression is also an important negative emotion from GST's perspective. For example, GST argues that depression makes people feel uncomfortable, which might lead them to take drugs to "feel better" (Agnew, 1992). Studies have found that depressed juveniles are more likely to have problem behaviors including general delinquency (Beyers & Loeber, 2003; Petersen et al., 1992), substance use (Ford & Schroeder, 2009), and violent behavior (Ostrowsky & Messner, 2005). In fact, Beyers and Loeber (2003) have reported that an elevated level of depressive mood not only increased delinquency (e.g., shoplifting and vandalism) concurrently but was also related to a slower decline in delinquency longitudinally.

Besides the mechanism mentioned above (strain → negative emotions → deviance), the other two pathways involve concepts from social control (Hirschi, 1969) and social learning (Akers, 1998). That is, strain could temporarily reduce one's social control and foster a social learning situation of deviance, which are risk factors for deviant involvement (Brezina, 1998). Although each of these two mediating concepts encompasses several theoretical components, including all of them is beyond the scope of one study. As such, many previous studies often included some of the important components in their models. For example, with regard to social control, school engagement may be important, particularly for the present study because during the adolescent period (12-17), school is one of the most influential institutions. Hence, weakened school engagement is a risk factor for various deviances during this life stage (Lin, Cochran, & Mieczkowski, 2011). This

view is consistent with Agnew's (2006) assertion that stated that strains "may reduce adolescent investment or commitment to conventional institutions like school and work" (pp. 36-37). Similarly, delinquent peer association is often used as a representative of social learning theory, and is relatively important for students during adolescence.

These latter two pathways, from strain to delinquency through low social control and social learning of delinquency, respectively, have only been examined in a small number of studies. Early studies that focused on integrated theory found that strain (classic strain) leads to delinquent peer associations and low social control (e.g., weak school engagement), which in turn increases delinquency (Elliott, Ageton, & Canter, 1979). Later studies have directly adopted the GST perspective to examine the proposed pathways. These studies found not only the direct effects of strain on delinquency but also its indirect effects through weakening social control and strengthening delinquent peer associations. For example, Lin and colleagues (2011) found that direct and vicarious violent victimizations had a direct bearing on strain-increased delinquency and an indirect bearing on the impacts on delinquency through low social control (a combination of low school commitment and problem relationships with conventional others and institutes) and delinquent peer associations.

To complicate the matter further, the mechanism that leads from strain to deviance might not be so straightforward. For example, Brezina (2010) stated that strain may be related to negative emotions, which in turn lead to non-emotive factors, which then are related to deviance (e.g., strain → depression → delinquent peers → deviance). Others argue that strain may weaken social control, which may be a risk factor for delinquent peer association that in turn leads to deviance (Bao, Haas, Chen, & Pi, 2012). Indeed, Bao et al. (2012) found that strain from negative parental and teacher treatment reduced school attachment, which in turn led to delinquent peer association, and that in turn led to delinquency. Although the interrelationships among these mediating factors were not mentioned, they were central to the theoretical integration and life course theorists (Catalano & Hawkins, 1996; Elliott et al., 1979).

GST and Non-Western Studies

The GST model and the empirical research discussed above were limited to a western cultural background, mostly the United States. This is somewhat problematic, because different cultural settings might exert different influences on elements of GST. Chun, Moons, and Cronkite (2005) argue that cultural attitudes and values may influence one to define events and conditions as either typical or stressful; hence, what is seen as a strain in the United

States may not be seen as such in other cultures, and may not lead to negative emotions and delinquency. Aware of cultural influences, Agnew (2006) and Broidy and Agnew (1997) extend GST to accommodate group differences (e.g., male vs. female). However, the differences might be found on a broader scale—that is, when dramatically different cultural backgrounds are involved. A case in hand is the Chinese culture in Taiwan, which is very different from the Western culture (e.g., the United States).

Although the Chinese culture in Taiwan maybe somewhat different from that of China or other Chinese descendent countries (e.g., Hong Kong and Singapore), it retains the core of Chinese culture, a collectivistic mentality and Confucian thinking. Collectivism emphasizes relationship harmony and involves closely knit relationships among individuals, and strong expectations of mutual support and loyalty. Hence, obligation, interdependence, and fulfillment of social roles are the focal points. Collectivist societies stress a “we” mentality, and members are willing to give priority to the goals of the collective and emphasize group solidarity (Chun et al., 2005; Hofstede, 2001; Triandis, 1995). In addition to collectivism, Confucian ideology is also closely related to the Chinese culture. For example, Bond and Hwang (1986) stated that the center stage in almost all approaches to Chinese social behavior is occupied by the teachings of Confucius. Similar to a collectivistic mentality, a fundamental Confucian assumption is that man exists in relationship to others and that harmony is the most treasured social value (Bond & Hwang, 1986; King & Bond, 1985). The extension of such thinking is relational rules, such as obedience and respect from junior to senior. In addition to relationship regulation, a focus on education and educational attainment is a core of Confucian teaching. This emphasis affects individuals’ daily behaviors, and differentiates Chinese culture from Western culture. For example, Yi, Wu, Chang, and Chang (2009) stated that a unique aspect of the social background in the East Asian region in general and in Taiwan in particular is the competitive educational system and emphasis on educational achievement.

The above two major characteristics of Chinese culture in Taiwan appear relevant to GST and its mechanisms. On one hand, Chinese culture stresses obedience and proper relationship rules; hence, authoritarian (strict and controlling) parenting may be a common practice in Taiwan. Agnew (2006) mentioned that strict parenting is criminogenic; that is, it may increase negative feelings, damage social bonds, and create a deviant social learning environment, all of which are risk factors for antisocial behavior. Maxwell (2001) found that family strain (e.g., domestic violence and parent–child violence) was related to youthful delinquency in the Philippines. Simons, Wu, Lin, Gordon, and Conger (2000) found that corporal punishment by parents was associated with Taiwanese students’ antisocial behavior if such

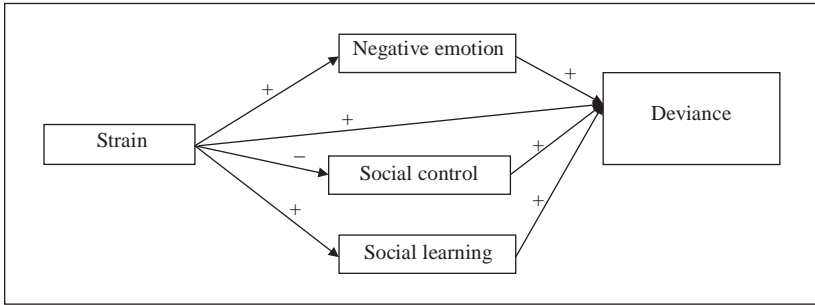


Figure 1. The conceptual model of GST.

Note. GST = general strain theory.

practice does not come with maternal warmth and care. Similarly, Wu (2007) showed that harsh maternal parenting is associated with children's depressive symptoms in Taiwan. On the other hand, the competitive educational system may create culture-specific strain for students in many Asian countries (e.g., Korea and China). This situation is similar to Merton's (1938) observation of anomie in the United States, where monetary success is a dominant goal. Educational attainment in Asia, instead of monetary success, becomes a strain for students who cannot reach this particular goal, and this may be related to deviance. Indeed, education-related strains and subsequent pathological states in juveniles have been documented in Korea (Moon & Morash, 2004) and Taiwan (Yi et al., 2009). Hence, negative treatment from parents and educational stress might be criminogenic strains that trigger the mechanisms that lead to deviance. Bao et al. (2012) showed that strain is related to juvenile delinquency not only directly but also indirectly through increasing deviant peer associations and decreasing social control. Similarly, Jang and Rhodes (2012) demonstrated that the criminogenic influences of strains on delinquency are mediated by negative emotions (e.g., trait anger) and low social- and self-control.

The Present Study

The present study is intended to examine the three pathways to deviance proposed by GST: Strain increases negative emotions, decreases social control, and creates a deviant social learning environment, all of which lead to deviance (see Figure 1). In addition, we also examined the more complex model that leads from strains to delinquency (e.g., strain → depression → deviant peer association → deviance). Although earlier studies, in a theory

integration manner, examined some of these pathways, they did not consider the three paths simultaneously. Even though some recent studies have investigated these newer GST models (Bao et al., 2012; Jang & Rhodes, 2012; Lin et al., 2011), they have certain limitations. First, some previous studies relied on American samples; hence, the results may have overlooked cultural influences. Second, those that applied GST in nonwestern cultures used cross-sectional data to investigate the GST model. Hence, while providing insights into GST, the proper chronological measures of theoretical concepts and the causal relationships among variables could not be established. To improve from previous studies, the present study used panel data collected in Taiwan to test the mediating assertions in GST. In doing this, we not only provide clear causal inference about the theoretical models but also investigate possible cultural influences on GST models. This is important because the firm results from this study may provide crucial support for the integrated GST model and its generalizability.

We tested the following hypotheses:

Hypothesis 1: Family- and school-related strains increase adolescent deviance.

Hypothesis 2a: Family- and school-related strains increase depression, which in turn increase adolescent deviance.

Hypothesis 2b: Family- and educational-related strains increase depression, which in turn strengthen deviant peer association that in turn leads to deviance.

Hypothesis 3a: Family- and educational-related strains reduce social control, which in turn increase adolescent deviance.

Hypothesis 3b: Family- and school-related strains increase social control, which in turn strengthen deviant peer association that in turn leads to deviance.

Hypothesis 4: Family- and school-related strains promote deviant peer association, which in turn increase adolescent deviance.

Method

Sample

Data for the present study were drawn from the Taiwan Youth Project (TYP), which was conducted by the Institute of Sociology, Academic Sinica, Taiwan. The TYP is an 8-year longitudinal research project that began in 2000 and included two student cohorts, 2,696 first-year junior high school students (J1) and 2,890 third-year junior high school students (J3). This research project

focused on how the social environment, especially family and school, affects the life trajectory of adolescents. The two cohorts were then surveyed annually for 8 years.

The TYP used a two-stage stratified and clustered sampling design. In the first stage, the TYP team used two steps. The first step was to select the first-level strata: two counties (Taipei County and Yilan County) and one city (Taipei) from northern Taiwan. The second step was to determine the strata for further sampling. After the strata were determined, the clustering sampling method was used. To select representative student samples, the project followed three principles. First, the number of students supplied by each second-level stratum was based on the proportion of students registered in each stratum relative to the entire student body in that county or city. Second, the research team divided the number of students by the average size of the stratum to determine the number of classes to be selected. Finally, on the basis of two classes for each school, the team determined the number of schools to be chosen. As a result of these calculations and determinations, 40 schools were selected: 16 from Taipei City, 15 from Taipei County, and 9 from Yilan County. After the random selection of these schools and two classes for each selected school, all students in each selected class were recruited for the project.

The present study used the J1 cohort, and all information about the variables used in the subsequent analyses emerged from the students' self-report surveys. In Wave 1, approximately 2,654 selected students finished the in-class self-administered questionnaires. These students were then followed-up annually for 7 years. The present study used Wave 1 (first year of junior high school) to Wave 3 (the last year of junior high school) data for consequent analysis. These years covered early adolescence and were full of many changes, such as physical changes (e.g., puberty), increasing emotional changes, and school stress.

The statistical methods (e.g., structural equation model and the theoretical guidance along with our panel data gave us confidence in properly specifying and testing the causal relationship between variables. However, we could not rule out the possibility of spurious effect. Consequently, the current study only presents strong evidence of causal order among our variables, but we do not show definite causality among the variables (Hoover, 1992).

Variables

Deviance (Waves 1 to 3). In this study, we used deviance as our main outcome, which is defined as the violation of all rules of social behavior (Liska & Messner, 1999) and is consistent with GST, which proclaimed to be able

to explain “any act which is condemned by most others in the society” (Agnew, 2006, p. 16). As such, we included behavior that violated laws (e.g., substance use) and behavior violating rules adhered to by organizations (e.g., cheating).

Four items were used to measure our major outcome variable. We used deviance as an umbrella that covered behaviors that violate laws (e.g., substance use) and violate social norms in various forms (e.g., cheating and skipping class). Specifically, students were asked at each wave to report whether they had engaged in four deviant acts in the past year, including substance use, cheating, skipping classes without reason, and physical fighting. Substance use included illegal drug use (e.g., marijuana and amphetamine), alcohol use, and smoking cigarettes, while the other three items measured one particular type of deviance as indicated. As expected, the summation of raw scores is highly skewed at each wave; we used IRT (item response theory) to create an IRT score for each wave’s deviance (Osgood, McMorris, & Potenza, 2002). By doing this, we made the distribution of deviance close to normal, which is suitable for subsequent analysis. Higher scores indicate greater involvement in substance use and other delinquency.

Education-related strain (Wave 1). Because of the Chinese culture in Taiwan, many students, especially in the junior high school, may experience more or less education-related strain than elementary students. Hence, merely asking students to report whether they had experienced such a strain might be too general to measure a strain experience. Thus, we measured educational strain in a subjective manner, that is, an event with subjective evaluation (Agnew, 2006). Specifically, we asked students whether their parents used siblings’ and relatives’ educational experience (e.g., examination experience) as an example to talk with them, and whether they felt this is stressful. We therefore created two multiplicative terms (e.g., sibling educational experience \times feeling of stress), one for the siblings’ experience and one for the relatives’ experience. The summation of these two multiplicative terms served as a measure of the educational strain, and high scores indicated a higher level of educational strain.

One might argue that our measure may not reflect the focal strain construct. We argued that while grades or academic performance may not be the full story of education, it is the focal concern in Taiwan. Hence, when talking about education-related stress, students often refer to either examinations or other school performance. In addition, as mentioned in the context, we measured this strain in a subjective way, which captured the personal experience and feeling of a particular incident. Consequently, our measure presented the focal strain construct in a Taiwanese cultural setting.

Unjust strain (Wave 1). According to Agnew (2006), a strain is criminogenic if it is seen as unjust. We used two items to capture this unjust strain. For each student, we first asked whether their homeroom teacher showed special favor to students who scored high on various exams, and then we asked students how they felt about it. The responses ranged from *very fair* (1) to *very unfair* (4). These two items were then multiplied to create the unjust strain. This measure captured the unjust incident (e.g., teachers' partiality) and the recipients' feelings of fairness about such an incident. This measure of the unjust strain also fits the cultural setting, because in Chinese culture, teachers and instructors play a central role in directing students' education and behavior. Hence, this unjust feeling regarding their homeroom teacher would exert a significant influence on the students.

Harsh parental discipline (Wave 1). According to Agnew (2006), parental physical or emotional abuse or harsh discipline is one of the several criminogenic strains that occur during adolescence. We treated this strain variable as latent and measured it by two indicators: harsh paternal discipline (four items) and harsh maternal discipline (four items). These items were identical and asked students about four disciplinary practices of their fathers and mothers separately. For example, one of the four items asked students to report on how often their father and mother "beat them" when they violated rules. The response categories ranged from 0 (*never*) to 4 (*always*). Summation of the four items reflected harsh discipline for each of the parents. Higher scores indicated higher levels of strain.

Depression (Wave 2). Adolescent depression in this study was measured through a short version of the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1983) administered in Wave 2. This short version scale consists of 15 items that asked students to report whether they had experienced depressive symptoms, and how serious the experience was in the past week (no; yes, but not serious; yes, a little bit serious; yes, serious; yes, very serious). The symptoms include headaches, loneliness, depressed mood, insomnia, numbness in some parts of the body, feeling as if something is sticking in your throat, and weakness in some parts of the body. We used parceling (Bandalos, 2002) to create three parcels as three indicators of the latent variable—depression. Items in each scale with high to low standardized factor loadings were evenly distributed into the three parcels. Higher scores indicate greater depression.

School engagement (Wave 2). We used three indicators to measure the latent concept of school engagement: Involvement in leadership, participating in

school competitions, and performance in school, which were similar to that of a previous study that used similar data (Chen & Wu, 2004). The first two indicators—leadership and participation—capture the aspects of involvement in school. We summed three dichotomized items (being a class and club representative, and a teaching assistant) to form the leadership scale indicator. To measure participation, five dichotomized items that asked students whether they had participated in five different school competitions (e.g., calligraphy and scientific competitions) were summed. The third indicator, class rank, measures the students' commitment to school. One item that asked about the students' grade ranking in class in the previous semester was used. The response format was 1 for bottom of the class and 5 for being in the top five of the class. The three indicators loaded well on the latent construct—school engagement.

As mentioned before, including all components of social control is beyond the present study. However, our measure included three scales that measured the essential meaning of social bonding. For example, the grade ranking captured the commitment to school, and it is consistent with previous studies that used grade point average as a measure of commitment. The other two items, participation in competitions and being leaders, though not used in the previous studies, captured the involvement in school activities (e.g., being club leaders) and to some extent, attachment. If a student is not committed and attached to school, he or she is hardly a candidate for a particular competition for the class. Hence, we feel that our measurements, though limited, measure the central idea of social control and are suitable for this age period and the cultural setting (e.g., emphasizing school achievement).

Peers' school deviance (Wave 3). Agnew (2006) argued that strains may lead to deviance because they foster the social learning of deviance. For example, negative secondary school experience may lead individuals to form deviant subgroups or to associate with deviant peers, which leads to delinquency (Cohen, 1955). The present study used two items to measure this variable, each of which asked students to report the frequency of his or her good friends' truancy and getting into trouble with school officials (e.g., for fighting). The response categories ranged from *never* (0) to *often* (3). Higher scores indicated that good friend(s) engaged in these two types of deviance in a high frequency manner ($\alpha = .86$).

Control variables. In this study, we have two control variables: family socioeconomic status (SES), and gender. Family SES was created by family income. This item has 13 categories ranging from 1 (annual family income less than NT\$30,000) to 13 (more than NT\$150,000). Gender was coded as

Table 1. Descriptive Statistics.

Variables	Minimum	Maximum	<i>M</i>	<i>SD</i>
Gender (W1)	0	1	0.510	0.500
Family income (W1)	1	13	3.990	3.080
Educational strain (W1)	0	6	2.530	1.345
Unjust strain (W1)	0	6	0.790	1.502
Paternal harsh discipline (W1)	0	16	3.816	2.816
Maternal harsh discipline (W1)	0	16	3.963	2.738
Depression-1 (W2)	0	20	2.257	2.797
Depression-2 (W2)	0	18	2.189	2.469
Depression-3 (W2)	0	17	2.476	2.545
Leadership (W2)	0	3	1.230	0.927
Participation (W2)	0	5	1.300	0.713
Commitment (W2)	1	5	3.310	1.194
Delinquent peers (W3)	0	6	0.260	0.681
Deviance (W1)	-.202	1.664	0.084	0.430
Deviance (W2)	-.214	1.661	0.080	0.425
Deviance (W3)	-.349	1.623	0.116	0.577

Note. W1 = Wave 1; W2 = Wave 2; W3 = Wave 3. Male = 1,356; female = 1,298.
 Depression-1 = first parcel; Depression-2 = second parcel; Depression-3 = third parcel.

male (1) and female (0) and was evenly distributed (male: 1,356 [51.5%]; female: 1,298 [48.5%]). All of these variables have been demonstrated to be associated with differences in delinquency (Steffensmeier & Allan, 1996; Tittle & Meier, 1990; see Table 1 for descriptive statistics of all variables).

Analytic Strategies

A fully recursive path model was used to evaluate the four hypotheses, which examined not only direct strain–deviance relationships but also indirect effects of strains on deviance through depression, social control, and delinquent peer association. The analysis was conducted by using Mplus 6.0 (Muthén & Muthén, 2010). Mplus calculates a χ^2 test to gauge the fit of a model to its data. However, because the χ^2 test is sensitive to sample size, scholars have suggested that investigators report multiple fit indices and specify the “critical value” for each (T. A. Brown, 2006; Hoyle & Panter, 1995). Besides χ^2 , we used the χ^2/df ratio with ration under 5 indicating a good fit (Marsh & Hocevar, 1985), the comparative fit index (CFI) with values of .95 or over indicating a good fit (Hu & Bentler, 1999), and root mean square error of approximation (RMSEA) measures are used with values .05

or less suggesting a good fit (M. W. Brown & Cudeck, 1993). Along with the point estimate of RMSE, we also included the 90% confidence interval of RMSEA (MacCallum, Browne, & Sugawara, 1996).

With regard to missing data, we deleted about 250 students who did not report their family income. A series analysis did not show these students were statistically different from other students who reported family income on all waves in terms of deviance, all strain variables, depression, parental control, and delinquent peer associations. In addition, this particular variable was used as a control; hence, it was not “in the model” in the Mplus framework. As such, the default missing data analysis could not be applied on this variable. After deleting these 250 cases ($n = 2,404$), the rest of the missing data were handled by direct maximum likelihood (ML) method for subsequent analyses. This method provided a correct standard error (Allison, 2002).

Results

As can be seen in Table 2, harsh discipline is related to deviance cross-sectionally but not longitudinally, after controlling for gender, family income, and other related variables. That is, harsh parental discipline is positively related to Wave 1 deviance ($\beta = .019$) but is not a risk factor for later deviance. This result only partially supports Hypothesis 1, which predicts that there exists a direct relationship between strain and delinquency. The effects of harsh discipline on later deviance are mostly through depression, low school engagement, and delinquent peer association. More specifically, harsh parental discipline increases depression ($\beta = .086$) and delinquent peer association ($\beta = .014$) and decreases school engagement ($\beta = -.021$), all of which are related to deviance. Depression and school engagement are significantly related to Wave 2 deviance ($\beta = .027$ —depression; $\beta = -.127$ —school engagement) and Wave 3 deviance ($\beta = .019$ —depression; $\beta = -.138$ —school engagement), and delinquent peer association increases deviance ($\beta = .161$). Furthermore, we also found some evidence of the proposed more complex strain–delinquency mechanisms. For example, in our model, we see that harsh parental discipline increases the level of depression and decreases school engagement, which strengthens deviant peer association, and having deviant peers increases the risk of involvement in deviance. Therefore, we find support for Hypotheses 2a, 2b, 3a, 3b, and 4 with regard to harsh parental discipline.

With regard to the educational-related strain–deviance relationship, we find results similar to that of the harsh discipline–deviance relationship. That is, educational strain increases students’ deviance cross-sectionally ($\beta = .022$) but not longitudinally. Similar to harsh discipline, education-related strain is

Table 2. The Path Model With All Strain, Social Control, and Social Learning Variables ($n = 2,404$).

Exogenous variables	Endogenous variables			
	Educational strain	Harsh discipline	Unjust strain	W1 deviance
Male	<i>ns</i>	.798 (.100)**	-.263 (.062)**	.076 (.018)**
Income	<i>ns</i>	<i>ns</i>	.030 (.010)**	<i>Ns</i>
Educational strain		.134b**	.132b**	.022 (.007)**
Harsh discipline			<i>ns</i>	.019 (.004)**
Unjust strain				.024 (.006)**
R ²				.035
	Depression	School engagement	W2 deviance	
Male	-.868 (.100)**	-.113 (.026)**	<i>ns</i>	
Income	<i>ns</i>	.022 (.004)**	<i>ns</i>	
Educational strain	.172 (.037)**	<i>ns</i>	<i>ns</i>	
Harsh discipline	.086 (.025)**	-.021 (.006)**	<i>Ns</i>	
Unjust strain	.223 (.032)**	.014 (.008)†	.026 (.005)**	
W1 deviance	.618 (.116)**	-.199 (.031)**	.365 (.020)**	
Depression		.075**	.027 (.004)**	
School engagement			-.127 (.022)**	
R ²			.225	
	Delinquent peers		W3 deviance	
Male	.266 (.030)**		.120 (.022)**	
Income	<i>ns</i>		.007 (.003)*	
Educational strain	<i>ns</i>		<i>ns</i>	
Harsh discipline	.014 (.007)†		<i>ns</i>	
Unjust strain	<i>ns</i>		<i>ns</i>	
Depression	.017 (.007)*		.019 (.005)**	
School engagement	-.136 (.039)**		-.138 (.028)**	
W2 deviance	.223 (.036)**		.418 (.027)**	
W1 deviance	<i>ns</i>		.202 (.027)**	
Delinquent peers			.161 (.016)**	
R ²			.324	

Note. Standard errors are in parentheses. $\chi^2(59) = 207.195$ ($p < .01$); $\chi^2/df = 3.63$; CFI = .980; RMSEA = .033 (90% CI = [.028, .038]). These were correlation coefficients. CFI = comparative fit index; RMSEA = root mean square error of approximation. *ns* = nonsignificant path.

† $p < .1$. * $p < .05$. ** $p < .01$.

significantly related to depression ($\beta = .172$), but it does not have any impact on school engagement or delinquent peer association. Consequently, parents who compare their children’s academic performance with others may risk damaging their well-being (e.g., increasing depression and deviant involvement). And again, being at a high level of depression increases the risk of having deviant peers, which is related to deviance. Besides above impacts, no

other negative impacts on students are found. Consequently, only Hypotheses 2a and 2b are supported.

In contrast to the above results, unjust strain increases not only Wave 1 deviance ($\beta = .024$) but also Wave 2 deviance ($\beta = .026$) directly. Besides the direct relationship, unjust strain, as GST proposed, exerts indirect effects on deviance through depression. That is, the strain of unjust feelings in school increases depression ($\beta = .223$), which increases juvenile deviance at Wave 2 ($\beta = .027$) and Wave 3 ($\beta = .019$). In addition, high depression pushes adolescents to associate with deviant peers, which in turn leads to deviance. Surprisingly, unjust strain does not increase later deviant peer association, but is marginally related to school engagement ($\beta = .014$). Hence, we find support for Hypotheses 2a and 2b but not other hypotheses.

Besides the direct and indirect relationship between strain and deviance, some other interesting relationships among mediators are worth mentioning. For example, depression ($\beta = .017$) and school engagement ($\beta = -.136$) are related to delinquent peer association, which is a risk factor for deviance at Wave 3 ($\beta = .161$). As mentioned above, while educational strain and unjust strain do not have indirect effects on deviance through delinquent peers, these two kinds of strain still exert effects on delinquent peers through their impacts on depression and school engagement.

Some significant relationships between the control variables and other variables appear in Table 2. A thorough analysis of these patterns is beyond the scope of the present study, but some interesting results are mentioned here. For example, as expected, male students experience harsher discipline ($\beta = .798$), are involved in more deviance ($\beta = .076$ —Wave 1; $\beta = .120$ —Wave 3), and have more delinquent peers ($\beta = .266$) than female students do. In contrast, male students experience lower levels of depression ($\beta = -.868$) and school engagement ($\beta = -.113$), and less unjust strain ($\beta = -.263$) than female students do. Family income, in contrast to gender, does not have consistent effects on variables in the model. For example, it increases students' school engagement ($\beta = .022$) but is only weakly related to Wave 3 deviance ($\beta = .007$). It has no effects on depression, Wave 1 deviance or Wave 2 deviance.

The results from Table 2 show some support for the hypotheses; however, they do not give direct information on the mediating effects of strains on deviance. To further disentangle these relationships, we use bootstrapping to examine the mediating effects of strain on deviance through depression, school engagement, and delinquent peers. One problem in evaluating the significance of an indirect effect is that such an effect is not distributed normally; hence, the standard error and related tests of significance are biased. We used bootstrapping to test our indirect effects, which is in concert with the literature (Bollen & Stine, 1990; MacKinnon, Lockwood, & Williams, 2004).

Table 3. The Significant Indirect Effects of Strains on Deviance Through Mediating Variables.

Paths	W2 deviance	W3 deviance
Harsh discipline → depression	.002 [.001, .004]	.002 [0, .003]
Educational strain → depression	.005 [.002, .008]	.003 [.001, .006]
Unjust strain → depression	.006 [.003, .009]	.004 [.002, .007]
Harsh discipline → school engagement	.003 [.001, .005]	.003 [.001, .006]
Unjust strain → school engagement	-.002 [-.004, 0]	-.002 [-.005, 0]
Harsh discipline → delinquent peers		.002 [0, .005]
School engagement → delinquent peers		-.022 [-.038, -.008]
Depression → delinquent peers		.003 [0, .006]

Note. 95% confidence interval is in the bracket. Nonsignificant indirect effect is not reported here. Bootstrapping with 5,000 draws.

As can be seen in Table 3, most of the proposed indirect effects from types of strain to deviance are fairly small in size, although these effects are all significant. For example, harsh discipline has no significant direct effect on Wave 2 deviance; however, harsh discipline has a significant indirect effect on Wave 2 deviance through depression ($\beta = .002$, 95% CI = [.001, .004]) and school engagement ($\beta = .003$, 95% CI = [.001, .005]). Although indirect effects are fairly small, the total indirect effects account for about 56% of all effects of harsh discipline on Wave 2 deviance. Similarly, the magnitude of the direct effects of harsh discipline on Wave 3 deviance through delinquent peer association is also weak ($\beta = .002$, 95% CI = [0, .005]), and direct and indirect effects account for about the same portions of total effects.

Conclusion and Discussion

The direct effects of strain on deviance have been documented by many studies (Agnew, 2006), and many empirical tests investigate the indirect effects of strain on deviance through negative emotions, including anger (Broidy, 2001; De Coster & Kort-Butler, 2006) and depression (Lin et al., 2011). However, the pathway leading from strain to deviance is not limited to this particular pattern. Agnew (2006) lays out two additional pathways, and others extend GST by proposing more complicated mechanisms (Catalano & Hawkins, 1996; Elliott et al., 1979). So far, only a few studies pay attention to these mechanisms (Bao et al., 2012; Jang & Rhodes, 2012; Kaufman, 2009; Lin et al., 2011), and these early studies are limited because they relied on cross-sectional data (Bao et al., 2012; Lin et al., 2011) or western samples, mostly in the United States (Jang & Rhodes, 2012; Kaufman, 2009). Hence, these

studies may either lack power to establish proper causal order among variables or ignore possible cultural influences (e.g., culturally specific strain).

Using panel data from Taiwan, we tested the three GST mechanisms and underlying mechanisms that are more complex. In our sample of Taiwanese adolescents, strains from harsh parental discipline, education-related strain (e.g., educational comparison), and unjust strain (e.g., unfair treatment by teachers) have cross-sectional effects, but these do not have long-term effects on juvenile deviance. Hence, we find only partial support for Hypothesis 1, which predicts a direct effect from strain to deviance cross-sectionally and longitudinally. This partially supportive result is puzzling because, for example, harsh parental discipline is expected to be directly related to deviance, based on theoretical (Agnew, 2006) and empirical evidence (Lei & Wu, 2004). However, the null effects found in the longitudinal model are actually consistent with previous studies that found weak or nonsignificant effects of parental abuse on later delinquency in the United States (Evans, Simons, & Simons, 2012; Kaufman, 2009) and in Taiwan (Lei & Wu, 2004). Hence, the effect of strain on deviance may be short-lived. Besides the short-lived effects, another possible explanation is that when including autoregressive relationships between deviance (e.g., Wave 3 deviance is regressed on Wave 2 deviance), there may be little variance left to be explained.

Although we offer some explanations of the insignificant direct effects of strain on deviance, these insignificant results may also raise a challenge to GST. Early studies that integrated the strain variables and other theoretical variables (e.g., social control and social learning) also found similar results (Elliott et al., 1979). In addition to our suspicion that the effect of strain is short-lived, the long-term effects of strain may be realized through the proposed mediating mechanisms. That is, the longitudinal criminogenic effect of the strain on an individual may be indirect, through negative emotions (e.g., depression) and nonemotive mediators, such as school engagement and deviant peers, but not direct.

It is also surprising that education-related strain exerts no significant effects on deviance, given that the Chinese culture in Taiwan emphasizes educational attainment excessively, which is similar to Merton's (1938) observation of anomie in the United States where success is almost solely equated to monetary or material accumulation. Some qualitative research conducted in Taiwan has also pointed out that education-related strain is related to delinquency (Li & Chiang, 2001). Two possible explanations may be offered. First, unlike a situation of anomie, wherein one goal is emphasized without giving proper means to success, in Taiwan, there are means to educational success other than regular school education, such as cram schools. Moreover, the rapid development of the Internet, together with

globalization and development of Taiwan, is causing cultural traditions to fade somewhat. Hence, although educational success is still important, the society is changing to embrace various goals (e.g., learning skills) and widening the road to educational success (e.g., increasing the numbers of colleges). Second, Agnew (2006) also argues that some strains or goal blockage are weakly related or least likely to lead to deviance, such as excessive demands associated with conventional pursuits, and failure to achieve conventional goals (e.g., educational success).

Although the direct effects of strain on deviance receive partial support, the indirect effects of strain on deviance via depression, school engagement, and deviant peer association are consistent with theoretical expectations. First, the results from this study find that students who experience strains as measured in this study are more likely to experience depressive symptoms, which in turn leads to deviance at Waves 2 and 3. Consequently, we find full support for Hypothesis 2a. Hence, family and school strains and unjust strain are harmful to youths not only because these strains increase deviance but also because of their influences on depression, which is related to deviance. Second, we find only partial support for Hypotheses 3a and 4. That is, only harsh parental discipline is significantly related to school engagement and deviant peer association, both of which are risk factors for deviance. In other words, students who experience harsh parental discipline may be at risk of deviance, and at the same time, this family strain reduces students' willingness to engage in school, increases their depression, and pushes them to associate with deviant peers or friends, all of which are found to be risk factors for deviance. Education-related strain and unjust strain do not influence these two mediators, and by Baron and Kenny's (1986) principle, the indirect effects from these two strains on deviance via school engagement and deviant peer association are nonsignificant or do not exist. While we find some significant indirect effects, these effects are fairly small. These small effect results were also presented in one recent study by Jang and Rhodes (2012).

One interesting and surprising finding is that the unjust strain leads to great school engagement, which is negatively related to deviance. This result countered our expectation based on GST. One possible explanation is that the homeroom teacher, who is with the class for the whole junior high school period, may build bonds with students. Consequently, even the teacher exercises the practices that cause students' unjust feeling may ignite students to try harder in school to "eliminate" this unjust strain. Moreover, in Chinese culture, students are taught to be hardworking and respect authority, and therefore, unjust teacher treatment (favoritism) may be seen as a "privilege" that is attractive to students. Agnew (2006) mentioned that conventional burdens might exert no negative impact on an individual. However, whether this

negative impact could actually be a positive stimulus to the recipients remains to be evaluated further in the future.

With regard to models that are more complex, we find that the three strains do increase depression at Wave 2, which in turn pushes the youths to associate with deviant peers, and that in turn increases deviance at Wave 3. Similarly, we also find that harsh parental discipline decreases school engagement, which in turn leads to deviant peer association, which then is positively related to deviance. Hence, we find support for Hypotheses 2a and 3a. Based on these results, we support the previous empirical findings and theoretical assertions that show that the mechanism linking strain to delinquency may be more complex. Not only are the strains directly related to deviance, they may also deteriorate the recipients' other life domains (e.g., school engagement) and create a criminogenic environment. Furthermore, the indirect effects may be subtle, that is, the effect of the strain may be channeled toward the deviance through various conduits, such as strain \rightarrow depression \rightarrow deviant peers \rightarrow deviance.

The above findings may offer some useful suggestions for parents and educators. For example, the results point out that the strain from parents and teachers may have concurrent and negative impacts on adolescents. Hence, parents may consider other disciplining methods (e.g., authoritative parenting), and teachers may refrain from showing partiality. One Taiwanese study (Lei & Wu, 2004) has shown that while harsh parental discipline may have a negative impact on students, those whose parents have good relationships with their offspring can offset such negative impacts to some extent. We think this can extend to the teacher–student relationship as well. While encouraging parents to use authoritative parenting (Baumrind, 1978; Steinberg, Mounts, Lamborn, & Dornbush, 1991) may be a priority, helping parents and teachers to start building warm relationships with adolescents is also important. By doing this, we can decrease students' deviance and weaken the chain effects of strain on the students' well-being (e.g., lowering depression level and enhancing school engagement).

Notwithstanding the contribution of this study, some limitations must be addressed here. First, depression is measured by using depressive symptoms, which is a trait-like measure of negative emotion; however, Agnew (2006) encourages researchers to use a state-like measure of emotions. Although we also advocate using a state-like measure, we would like to point out that in a more direct measure of situational depression by using vignettes, Ganem (2008) failed to capture the pure situational depression, as the respondents reported other emotions along with depression. Second, we only examined a partial GST model, the direct and indirect effects of strain on deviance. Another important theoretical mechanism, moderating effect, was not included in this study. Hence, while we find support for GST's mediating

model, we do not claim that we find support for the full GST model. However, so far, even some studies that proclaimed to do a comprehensive test of GST did not examine the full GST model (Moon, Morash, McCluskey, & Hwang, 2009), such as the mediating mechanisms examined here. Third, our measure of parental harsh discipline may be limited, because only one study in Taiwan has shown the parent–child relationship condition for the negative effect of parental discipline on adolescents (Lei & Wu, 2004). Agnew (2006) argued that the characteristics of strains must be considered when measuring strain so that the negative influences could be realized. Fourth, what we discover here is between-individual differences, not intraindividual differences. For statistical reasons, we cannot apply models (e.g., a growth curve model) that can discover intraindividual differences, which may provide a more rigorous test of the GST. This is because these statistical models examine intraindividual changes, which use individuals as their own control. Consequently, the risk of the uncontrolled third variable is eliminated. Finally, while this study and many previous studies have applied GST in nonwestern cultures, it nevertheless lacks a direct comparison of the GST model cross-culturally. This might limit our understanding, as without a direct comparison the revealed differences might be due to different research material.

Future studies should build on the present result by first including more theoretical congruent measures of strains as well as mediating factors. Specifically, one can follow the present study by measuring strain in a subjective way, and by using similar measures used by previous studies to measure situational negative emotions (Jang, 2007; Jang & Johnson, 2003). Furthermore, it is desirable to have longitudinal data with more waves for examining the GST model. By doing this, more advanced models (e.g., a latent growth model) can also be used, and these models could help to build causal order with more confidence. Consequently, the present models can be replicated and improved. Cross-cultural studies similar to those of Sigfusdottir, Kristjansson, and Agnew (2012), and

Lin, Sellers, Cochran, and Mieczkowski (2013) should be conducted to rigorously examine the differences across cultures.

From this study, we conclude that the detrimental impact of strain on adolescents lies in its broad influence on adolescents' various life domains. Strains from family and school not only increase deviant involvement but also exert negative impacts on adolescents' social life (e.g., delinquent peer association), school life (e.g., school engagement), and well-being (e.g., depression). These results generally echo previous studies in the United States and other western countries, and increase the generalizability of GST. In addition, complex relationships between strain, negative emotions, non-emotive concepts, and delinquency are also found. These render further revision of GST necessary in the future.

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